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1976

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BELL & HOWELL

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Vol. 948 Number 1

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of the UNITED STATES PATENT AND TRADEMARK OFFICE

American Revolution Bicentennial

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Commemoration of the Bicentennial Year

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PATENTS
July 6, 1976

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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 6, 1976 Volume 948 Number 1

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PATENT NOTICES

Certificates of Correction for the Week of July 6, 1976

D. 239,371
3,181,939
3,380,388
3,510,481
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3,955,778
3,958,984
3,959,093
3,959,245
3,960,539

Disclaimers

Reissue No. 26,240.—*Carl I. Wasserman*, Queens Village, N.Y. HIGH SPEED PRINTERS WITH COLUMN SPANNING HAMMERS. Patent dated July 18, 1967. Disclaimer filed Apr. 21, 1976, by the assignee, *Potter Instrument Co., Inc.*

Hereby enters this disclaimer to claims 7, 12 and 13 of said patent.

Design No. 197,458.—*Ernest H. Bucknell* and *Irving A. Ward,* Los Angeles, Calif. FOUNTAIN BRUSH. Patent dated Feb. 11, 1964. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher,* part interest.

Hereby disclaims her entire interest in all claims of said patent.

Design No. 207,440.—*Ernest H. Bucknell,* Los Angeles, and *Jack K. Rauh* and *Irving A. Ward,* Hacienda Heights, Calif. SPRAY VALVE. Patent dated Apr. 11, 1967. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher,* part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,390,981.—*Lewis C. Hoffman,* Wilmington, Del. METHOD FOR THE PRODUCTION OF FINELY DIVIDED METALS. Patent dated July 2, 1968. Disclaimer filed Apr. 30, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to claims 1–7, 9–11, and 17 of said patent.

3,699,089.—*Otto Wichterle,* Prague, Czechoslovakia. ANHYDROUS SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS. Patent dated Oct. 17, 1972. Disclaimer filed Feb. 3, 1976 and Mar. 12, 1976, by the assignee, *Ceskoslovenska Akademie Ved.*

Hereby enters this disclaimer to claims 1 through 13 of said patent.

3,770,242.—*Joseph O'Connor, Jr.,* Goshen, N.Y. AERODYNAMICALLY AND HYDRODYNAMICALLY STABLE TORQUED BUTTERFLY VALVE AND VANE. Patent dated Nov. 6, 1973. Disclaimer filed Jan. 23, 1975, by the assignee, *Kieley & Mueller, Inc.*

Hereby enters this disclaimer to claims 3 and 10 of said patent.

3,825,018.—*Dominic Ferraro,* Walla Walla, Wash. VINER. Patent dated July 23, 1974. Disclaimer filed May 13, 1976, by the assignee, *Chisholm-Ryder Company, Inc.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,851,393.—*Charles M. Weiss* and *Isiah Lew,* New York, N.Y. ORAL IMPLANT. Patent dated Dec. 3, 1974. Disclaimer filed May 11, 1976, by the assignee, *Oratonics, Inc.*

Hereby enters this disclaimer to claims 1–20 of said patent.

3,868,324.—*Robert F. Taylor,* Milwaukee, *Donald A. Strow,* Hales Corners, and *Hosein Mansouri,* New Berlin, Wis. WATER INTAKE AND FISH RETURN SYSTEM. Patent dated Feb. 25, 1975. Disclaimer filed May 17, 1976, by the assignee, *Envirex Inc.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,919,181.—*Kenneth C. Petersen,* Scotia, and *Royal A. Meader, Jr.,* Amsterdam, N.Y. PREPARATION OF HYDROCARBON RESINS USING ZIRCONIUM TETRACHLORIDE. Patent dated Nov. 11, 1975. Disclaimer filed May 7, 1976, by the assignee, *Schenectady Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 28–32 of said patent.

3,928,480.—*Iwao Tabushi,* Fukuoka, and *Koji Fukunishi,* Kyoto, Japan. PROCESS OF PRODUCING ALKYL ADAMANTANES. Patent dated Dec. 23, 1975. Disclaimer filed May 4, 1976, by the assignee, *Idemitsu Kosan Co., Ltd.*

Hereby enters this disclaimer to claims 1 through 16 of said patent.

3,936,956.—*Joseph P. Famolare, Jr.,* Florence, Italy. REFLEX ACTION SOLE FOR SHOES HAVING SINUOUS CONTOURED BOTTOM SURFACE. Patent dated Feb. 10, 1976. Disclaimer filed May 14, 1976, by the assignee, *Famolare, Inc.*

The term of this patent subsequent to July 8, 1989, has been disclaimed.

Dedications

2,882,632.—*Donald M. Rockwell,* and *Armand E. Keeley,* and *William D. Joseph,* Huntingdon, Pa. MARKER MATERIAL AND METHOD. Patent dated Apr. 21, 1959. Dedication filed Apr. 13, 1976, by the assignee, *Prismo Universal Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,168,412.—*John R. Wald, Jr., Rufus W. Wilson,* and *Robert B. Bagshaw,* Huntingdon, Pa. REFLECTORIZING APPARATUS AND METHOD. Patent dated Feb. 2, 1965. Dedication filed Apr. 13, 1976, by the assignee, *Prismo Universal Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,218,186.—*Eduard R. De Vries,* Huntingdon, Pa. MOISTUREPROOFING REFLECTIVE MARKERS. Patent dated Nov. 16, 1965. Dedication filed Apr. 13, 1976, by the assignee, *Prismo Universal Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,223,005.—*Harold V. Carlson,* Hudson, Ohio. SEALING MEANS FOR CRACKED SURFACES. Patent dated Dec. 14, 1965. Dedication filed May 18, 1976, by the assignee, *Firestone Tire & Rubber Company.*

Hereby dedicates to the People of the United States the remaining term of said patent.

3,247,005.—*Allan D. Parry,* East Freedom, and *William H. Riley,* Jr., Altoona, Pa. METHOD OF PRODUCING DUAL MESSAGE SIGNS. Patent dated Apr. 19, 1966. Dedication filed Apr. 13, 1976, by the assignee, *Prismo Universal Corporation.*

Hereby dedicates to the Public the entire term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 19, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-8-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-22-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-16-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-4-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-19-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-22-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-16-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	3-31-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists: Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-9-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,893,005 to 2,897,499 inclusive
Plant Patents	Numbers 1,850 to 1,855 inclusive

DEFENSIVE PUBLICATIONS

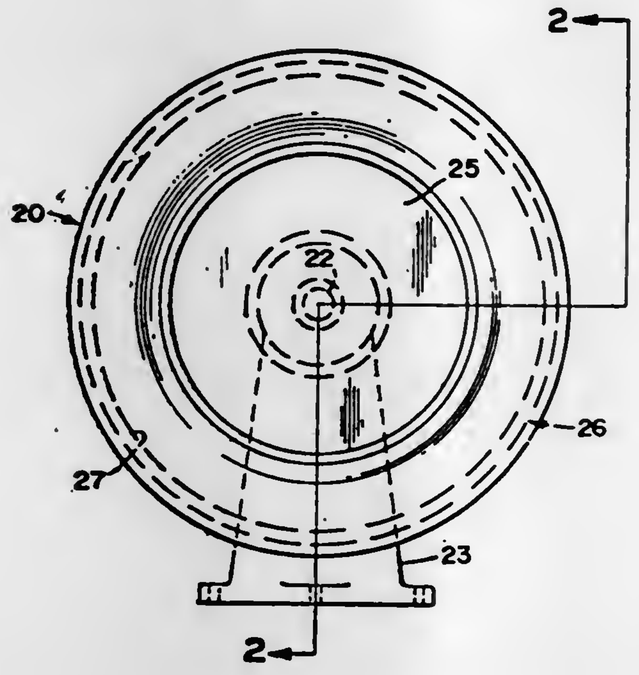
PUBLISHED JULY 6, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification. including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T948,001
METHOD OF CENTRIFUGALLY CASTING A COMPOSITE TIRE OR SIMILAR ARTICLE

Floyd Mount Smith, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation of abandoned application Ser. No. 855,706, Sept. 5, 1969. This application Oct. 26, 1973, Ser. No. 409,840
Int. Cl. B29c *5/04*
U.S. Cl. 264—311
2 Sheets Drawings. 8 Pages Specification

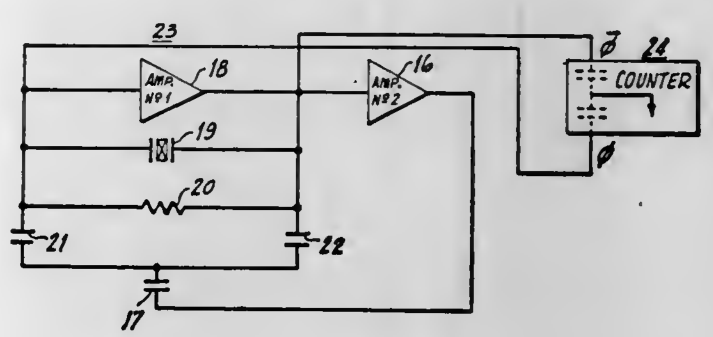


A method of centrifugally casting a composite tire structure by introducing into a rotating mold a curable liquid resin and particles having a greater specific gravity than the resin and the desired physical characteristics for use in a tire tread area. The particles, because of centrifugal force, move outwardly through the resin and position themselves in the tread stock area and the remainder of the tire is formed of the curable liquid resin. The particles are preferably added after the resin however, they may be added before or at the same time as the resin.

T948,002
QUARTZ CRYSTAL OSCILLATOR

Eugene R. Keeler, Camp Hill, Pa., assignor to Timex Corporation, Waterbury, Conn.
Filed Apr. 28, 1975, Ser. No. 572,362
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 R
1 Sheet Drawing. 9 Pages of Specification

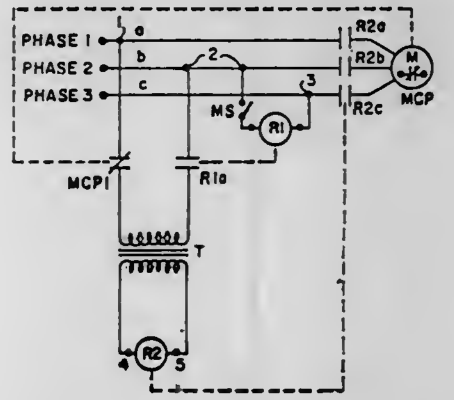
A Pierce type oscillator comprises a parallel resonant crystal and an inverting amplifier which provides the required signal inversion and voltage gain. The subject oscillator is essentially a modified Pierce circuit including first and second amplifiers wherein the second amplifier is used to provide a signal in phase with the signal at the input of the first amplifier, said first amplifier acting basically as a Pierce circuit. The second amplifier reinforces the tendency of the first amplifier to oscillate.



The crystal oscillator comprising the present invention can be configured to use less power than an equivalent Pierce oscillator and may be used advantageously in electronic watch circuits.

T948,003
PHASE FAILURE PROTECTION CIRCUIT FOR A REGENERATIVE LOAD

Dannis R. Johnson, Prior Lake, and John E. Waldschmidt, Burnsville, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Continuation of abandoned application Ser. No. 497,343, Aug. 14, 1974. This application May 7, 1975, Ser. No. 575,290
Int. Cl. H02h *3/32*
U.S. Cl. 317—46
1 Sheet Drawing. 10 Pages of Specification



A phase failure protection circuit for a three phase regenerative load comprising a circuit breaker for controlling power to the load and being energized by current from a first phase of the source, a relay having normally open contacts which is energized by a second phase of the source for controlling the circuit breaker energization current, and a thermal switch having normally closed contacts which responds to the temperature of the load for controlling the energization current to either the relay or circuit breaker, wherein the circuit breaker contacts will not initially close if any phase of the source is absent and the circuit breaker will be certain to open if one phase of the source should fail during excitation of the load due to overheating of the load even in the presence of regeneration from the load.

T948,004
PROCESS FOR TEMPORARILY REDUCING NUMBER OF SPINNING ORIFICES IN SPINNERET

James O. Casey, 2476 Wildwood Drive 37660, and Bobby M. Phillips, Rte. 8, 5741 Chestnut Hills Drive 37664, both of Kingsport, Tenn.

Filed June 9, 1975, Ser. No. 585,152

Int. Cl. B28b *7/04;* **D01d** *1/10*
U.S. Cl. 264—40

No Drawing. 5 Pages of Specification

Process for temporarily reducing the number of spinning orifices in a given spinneret to spin a specific filament count yarn and for recovering at a later time the use of all the spinning orifices, by plugging selected spinning orifices with a material suitable for withstanding normal operating temperatures and pressures encountered by a spinneret, a material such as silver solder comprising by weight about 45% silver, about 30% copper and about 25% zinc and having a melting point of about 677° C., spinning the desired specific filament count yarn from the non-plugged spinning orifices, and then removing the material used for plugging by cleaning the spinneret in a suitable molten salt bath followed with caustic and acid washes, and water rinses.

T948,005
CATALYTIC VAPOR PHASE OXIDATION OF ISOBUTYLENE

David C. Lini, 705 Pine Ridge Road, Springfield, Pa. 19063, and John J. McCoy, 825 Rhoads Drive, Media, Pa. 19064

Continuation of abandoned application Ser. No. 370,095, June 11, 1973. This aplication June 30, 1975, Ser. No. 591,543

Int. Cl. C07c *45/04*
U.S. Cl. 260—604 R

No Drawing. 11 Pages of Specification

Isobutylene is oxidized to methacrolein in the vapor phase with molecular oxygen at temperatures in the range of from 970° F. to 1150° F. in the presence of a bismuth molybdate or bismuth phosphomolybdate catalyst in particulate form admixed with masses of a metal or metal alloy having a melting point ranging from above the reaction temperature employed up to about 250° F. above the reaction temperature to aid in the dissipation of the exothermic heat of reaction and thereby improve the selectivity of the reaction for the production of methacrolein.

T948,006
COATED FILMS

Cyril John Ealding, Puckeridge, near Ware, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 24, 1975, Ser. No. 616,302

Claims priority, application Great Britain, Oct. 18, 1974, 45,205/74

Int. Cl. B32b *27/08*
U.S. Cl. 428—515

No Drawing. 15 Pages of Specification

Films of polyethylene terephthalate having an ink coating thereon and suitable for use as drafting papers are disclosed. With such films the ink is adhered to the underlying sheet using a new polyvinyl alcohol admixture with other coating materials and the resulting product is substantially or completely devoid of broadening or spreading beyond the intended confines of the lines while maintaining good ink adhesion to the underlying sheet.

The synthetic plastics film is coated on one or both sides of its surfaces with a layer susceptible to marking by hydrophilic inks with a coating of (1) polyvinyl alcohol, or partially hydrolyzed polyvinyl acetate which has been hydrolyzed to a degree of at least 72 mole percent, and preferably 72–88, to provide adhesion of the ink to the film, and (2) from weight percent calculated on the total weights of (1) plus (2), of 10–70 a hydrophobic additive. Component (2) is selected from suitable waxes and polymeric materials including a film-forming or non-film-forming polymer or copolymer of acrylic or methacrylic acid, or an ester of either acid, or a polymer or copolymer of vinyl acetate, copolymerizable monomers for the acrylates include styrene, alkyl substituted styrene, acrylonitrile, methacrylonitrile, vinyl acetate, methacrylic acid, acrylic acid, maleic acid, fumaric acid, itaconic acid, crotonic acid, acrylamide and methacrylamide. Conventional coating additives may be included in the coating layer. Various plastics film bases may be used; biaxially oriented polyethylene terephthalate films are preferred.

Specific hydrophobic additives (2) include: copolymers of ethylacrylate, methyl methacrylate and methacrylic acid, and an aqueous emulsion of homopolyvinyl acetate. Coating weights of the dried coating layer, in terms of the weight of component (1), range from 0.04 to 0.3 g./m.^{2}

T948,007
ALKALI METAL COMPOUNDS AS POLYESTERIFICATION CATALYSTS FOR UNSATURATED POLYESTERS BASED ON 2,2,4-TRIMETHYL-1,3-PENTANEDIOL

John R. Dombroski, Rte. 13, 5608 Cheyenne Trail, Kingsport, Tenn. 37664

Filed Oct. 31, 1975, Ser. No. 627,646

Int. Cl. C08g *63/52*
U.S. Cl. 260—75 UA

No Drawing. 8 Pages Specification

This invention is concerned with a class of materials which is useful for improving the polyesterification process of 2,2,4-trimethyl-1,3-pentanediol. In particular, this invention relates to the use of Group IA alkali metal acetates, carbonates, hydroxides, oxalates, alkoxides and soluble oxides as polyesterification catalysts and co-catalysts for the preparation of unsaturated polyester based on 2,2,4-trimethyl-1,3-pentanediol and blends of 2,2,4-trimethyl-1,3-pentanediol and other glycols. It is shown in this invention that the alkali metal compounds enable the preparation of unsaturated polyesters based on 2,2,4-trimethyl-1,3-pentanediol with (1) a shorter polyesterification time and (2) reduces the loss of 2,2,4-trimethyl-1,3-pentanediol due to undesirable side reactions.

T948,008
POLYMER COMPOSITIONS

Terence Edwin Attwood, Kimpton, and John Leslie Freeman and Leslie Richard John Hoy, St. Neots, England, assignors to Imperial Chemical Industries Limited, London, England

Claims priority, application Great Britain, Mar. 14, 1974, 11,439/74, 11,440/74

Filed Feb. 25, 1975, Ser. No. 553,069

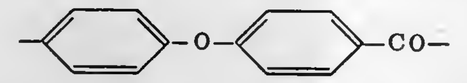
Int. Cl. I08k *1/01*
U.S. Cl. 260—45.7 P

No Drawing. 17 Pages of Specification

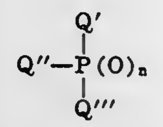
Aromatic polyetherketones are characterized by their high softening point and high melt viscosities, thus making them useful where the resulting article must withstand high service temperatures.

Novel thermoplastic compositions comprising an aromatic polyetherketone are modified with organic phosphorous compounds to at least stabilize, and in some instances reduce, the melt viscosity of the composition thereby rendering the polyetherketone compositions easier to melt-fabricate.

For example, compositions comprising an aromatic polyetherketone, such as containing the repeating units:



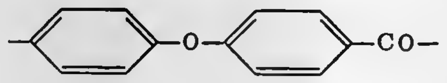
in which some (i.e. up to 25%) of the —CO— groups may be replaced by —SO_2— groups, and 0.01 to 4% (preferably from 0.01% to 2%) of at least one phosphorus additive compound of formula:



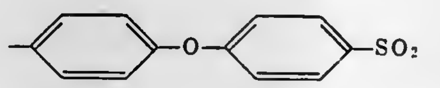
$$Q''-\overset{\displaystyle Q'}{\underset{\displaystyle Q'''}{P}}(O)_n$$

where each of Q′, Q″ and Q‴ if R or OR where R is a hydrocarbon radical consisting up to 20 carbon atoms *n* is 0 or 1 are disclosed.

A specific example is the polymer consisting of repeating units of:

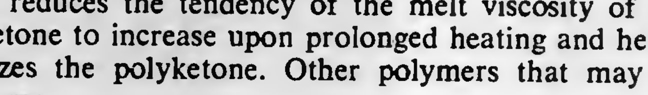


and

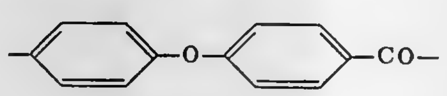


in the ratio of 95:5 to which is added 0.2% tri (nonyl phenyl) phosphite.

Incorporation of the phosphorus compound, as indicated, reduces the tendency of the melt viscosity of the polyketone to increase upon prolonged heating and hence stabilizes the polyketone. Other polymers that may be used are:



alone or copolymerized with:



Triphenyl phosphate is a preferred phosphorous compound.

T948,009
HYDRAULIC CEMENT-HYDROXYPROPYL METHYLCELLULOSE COMPOSITIONS

George K. Greminger, Jr., and Geoffrey S. Newhouse, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of abandoned application Ser. No. 366,899, June 4, 1973. This application Mar. 26, 1975, Ser. No. 562,312

Int. Cl. C04b *7/353*
U.S. Cl. 106—93

No Drawing. 20 Pages of Specification

An intimate mixture of (a) a hydraulic cement; (b) about 0.01% to about 5.0%, based on the dry weight of the cement, of a hydroxypropyl methylcellulose having about 0.4 to about 1.3 methoxyl degree of substitution and about 0.4 to about 1.8 hydroxypropyl degree of molar substitution; and optionally (c) a filler material such as sand, limestone, asbestos fibers, concrete aggregate and the like provides an improved cementitious material for preparation of masonry and tile mortars, stucco, concrete, etc. Cement products prepared from this material have improved water-retention properties especially at elevated temperatures without unduly extended set times.

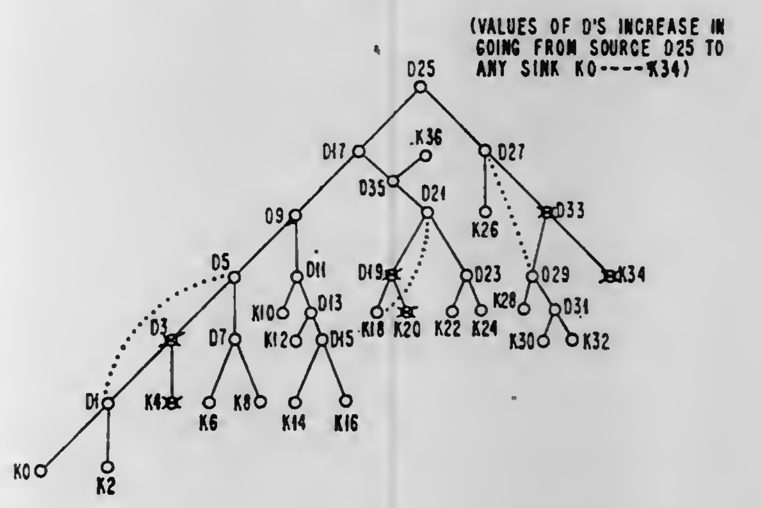
T948,010
DIRECTORY INSERTION AND DELETION METHOD AND MEANS

Luther J. Woodrum, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 411,545, Oct. 31, 1973, which is a continuation of application Ser. No. 136,951, Apr. 23, 1971. This application Apr. 10, 1975, Ser. No. 566,892

Int. Cl. G06f *7/00*
U.S. Cl. 444—1

27 Sheets Drawing. 187 Pages of Specification



An electrical method for generating and maintaining an electrical directory entity in a data processing machine. The directory may be used to automatically locate objects in the computer system, e.g. in main store or on I/O devices. The objects are represented by electrical identifier signals received as input to the method. Electrical signals are generated comprising connected inner vertices and sinks. The signals comprising each inner vertex from a bit-index field, a flag field, and a connecting edge field. The inner vertices are connected in ascending order along a path in the tree structure by the electrical signals forming the edge fields of the inner vertices in the connected paths. The physical configurations of the electrical identifier signals are used as search arguments for insertions or deletion in a connected path when it is traced. The physical layout of the vertices permits total flexibility by allowing each next vertex in a connected path to be physically located anywhere in the directory entity. Each vertex other than the source is located in one of a pair of cells. Each edge field connects its vertex to two other vertices in a pair of cells. The edge fields may be in absolute, offset, or invertible form, each form having different advantages when using the invention, e.g. the invertible edge permits backward tracing along a connected path.

T948,011
DETERMINATION OF AMINE OR AMIDE NITROGEN CONTENT IN VEGETABLE OIL

James C. Kuck, New Orleans, La., assignor to the United States of America as represented by the Secretary of Agriculture

Filed Jun. 9, 1975, Ser. No. 585,214

Int. Cl. C11b *3/04;* **G01n** *33/26*
U.S. Cl. 23—230 R

No Drawings. 7 Pages of Specification

Minute amounts of nitrogen in amines or amides in vegetable oils are determined. A sample of vegetable oil is weighed into an extraction flask and hydrochloric acid and ethanol are added. After refluxing for about 12 hours, aqueous hydrochloric acid is added and the mixture is refluxed for about 6 more hours. The contents of the flask are then transferred to a separatory funnel and allowed to stand until separation is attained. The bottom layer containing the ethanol and aqueous hydrochloric acid is then collected and the oil layer returned for further extraction and refluxing by the same method. This procedure is repeated twice and each time the bottom layer is collected. The collected bottom layer material is then digested by the Kjeldahl method, titrated with .1N sodium hydroxide, and the percent nitrogen extracted is calculated. The method is useful in detecting and measuring traces of toxic substance is vegetable oils.

T948,012
MULTIPROCESSOR INTERFACING APPARATUS

Max A. Bouknecht and Michael I. Davis, Boca Raton, Fla., and Matthew J. Mitchell, Jr., Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

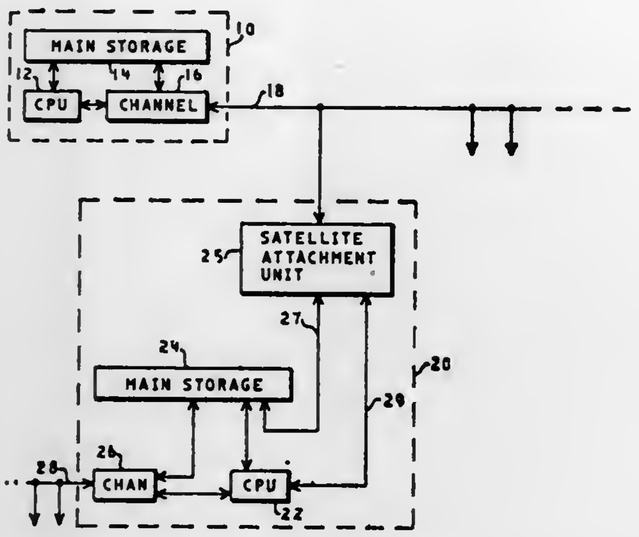
Continuation of application Ser. No. 374,448, June 28, 1973, This application July 29, 1975, Ser. No. 600,181

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5

4 Sheets Drawing. 20 Pages of Specification

A host data processing system communicates through a channel to a subsystem capable of performing autonomous tasks. The host processor provides a special control command in association with a data set defining the tasks to be performed with both this command and the data set being transferred through the channel to the subsystem. An interfacing adapter recognizes the presence of the special command to provide a response to the channel relieving it of further connection to the subsystem after the task defining data set transfer is completed. Execution of the task defined by the data set in the subsystem causes he adapter to return a signal to the channel indicative that the task has been performed. The channel can then notify the host processing system or, if command chaining is indicated, can immediately proceed to transfer data reflecting the results of the task performance to the host processing system.



T948,013
RADIAL CARCASS PLIES CONTAINING LOOSELY TWISTED NYLON OR POLYESTER STRANDS

John L. Brownlee, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 15, 1975, Ser. No. 613,684

Int. Cl. B60c *9/04*

U.S. Cl. 152—356

No Drawing. 13 Pages Specification

Carcass plies composed of loosely twisted nylon 66 or polyester strands embedded in rubber are used instead of conventional plies in radial tires. Use of the plies of the invention provides radial tires at reduced manufacturing costs without sacrificing durability, performance or riding comfort.

REISSUE PATENTS

GRANTED JULY 6, 1976

ERRATA

For CLASS	See PATENT NO.
229-014 B	28,892
292-292	28,893

REISSUES

JULY 6, 1976

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,889

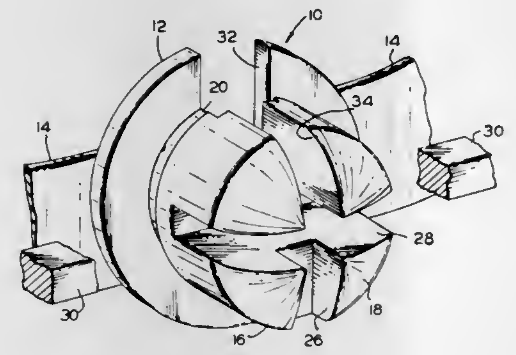
METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT

Alexander J. Wildman, Eugene, Oreg., assignor to Consyne Corporation, San Marcos, Calif.

Original No. 3,578,744, dated May 18, 1971, Ser. No. 857,351, Sept. 12, 1969. Application for reissue Feb. 24, 1972, Ser. No. 229,217

Int. Cl.^{2} A61C *7/00*

U.S. Cl. 32—14 A **17 Claims**



1. An orthodontic arch wire bracket for attachment to a tooth band and for connection to an arch wire means of predetermined thickness comprising:

a body member including a base portion having a base surface for attachment to a tooth band, a head portion having a labial surface,

said head portion having a horizontal groove therein opening to said labial surface for receiving an arch wire, said groove having a depth greater than the said arch wire thickness,

said head portion having a first vertical groove therein opening to said labial surface and having a depth relative to the depth of said horizontal groove by an amount substantially no less than said arch wire thickness,

said base portion having a second vertical groove therein,

said head portion having a notch therein extending between said first and second vertical grooves and opening to said labial surface of said head portion,

a follower member comprising a base portion adapted slidably to engage within said second vertical groove, an arm portion adapted to be received within said notch, and a finger portion adapted to be received in said first vertical groove and to extend over an arch wire engaged within said horizontal groove,

and lock means for releasably engaging said follower to prevent accidental removal of the same form from said body member.

Re. 28,890

ACTUATOR ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

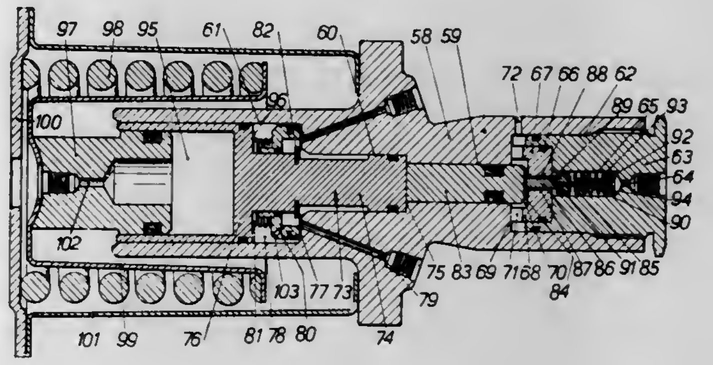
Brian Ingram, Lugamo, Australia; David Anthony Harries, Solihull, and Lancelot Phoenix, Birmingham, both of England, assignors to Girling Limited, Birmingham, England

Original No. 3,694,038, dated Sept. 26, 1972, Ser. No. 73,202, Sept. 17, 1970. Application for reissue Jan. 15, 1974, Ser. No. 433,510

Claims priority, application United Kingdom, Sept. 17, 1969, 45705/69; Jan. 6, 1970, 531/70; Mar. 8, 1970, 13117/70

Int. Cl.^{2} B60T *8/06*

U.S. Cl. 303—21 F **25 Claims**



17. An actuator assembly for a vehicle hydraulic braking system comprising a housing having first and second opposite ends, means in said housing adjacent to said first end defining at least one chamber having a first inlet for connection to hydraulic fluid under pressure and an outlet for connection to a slave cylinder of a wheel brake, a valve controlling communication between said inlet and outlet, a piston assembly working in a cylinder bore in said housing in communication with said chamber and movable between an advanced position in which said valve is held open and the effective volume of said chamber is at a minimum value and a retracted position in which said valve is shut and the effective volume of said chamber is greater than the minimum, means in said housing for enabling fluid from a high pressure source to urge said piston assembly to said advanced position, means in said housing for enabling fluid to move said piston assembly to said retracted position when the deceleration of a braked wheel controlled by a supply of hydraulic fluid from said outlet exceeds a predetermined value, a movable member in said housing disposed between said piston assembly and said second end of said housing and movable between a first position in which said member permits said piston assembly to assume said retracted position and a second position in which said member maintains said piston assembly in said advanced position, resilient means for constantly biassing said movable member to said second position, and means in said housing for enabling the fluid from said high pressure source to hold said movable member in said first position in opposition to said resilient means, whereby, in the event of the pressure of said high pressure source falling, said resilient means can move said movable member to said second position to maintain said piston assembly in said advanced position.

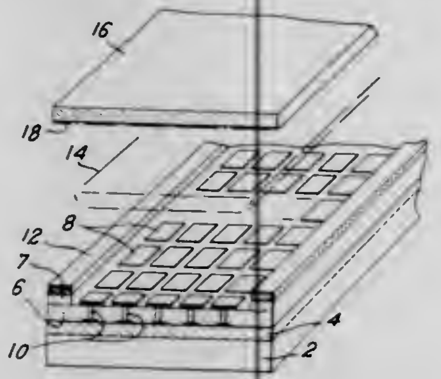
Re. 28,891
LIQUID CRYSTAL DISPLAY DEVICE

Joseph Borel, Echirolles, and Jacques Robert, St. Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Original No. 3,716,290, dated Feb. 13, 1973, Ser. No. 190,178, Oct. 18, 1971. Application for reissue June 25, 1974, Ser. No. 483,028

Int. Cl.² G02F *1/16*

U.S. Cl. 350—160 LC **2 Claims**



9. An electrooptical device of the type comprising a film of liquid crystals located between a first insulating and transparent plate which is provided on one face with a uniform coating of conductive and semi-transparent material and a second plate which is provided on one face with a system of electrodes adapted for connection to electrode excitation circuits wherein said first plate rests by means of its coated face on a metallic wall which is deposited at the periphery of said second plate, the design function of said wall being to ensure leak-tightness of the device as well as optimum thickness of liquid crystals and an electrical connection to said first plate coated face.

Re. 28,892
CARTON

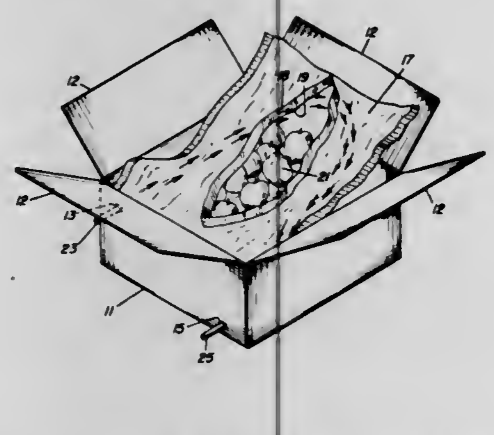
Joseph J. Esty, San Diego, Calif., assignor to The U.C. San Diego Foundation, La Jolla, Calif.

Reissued No. Re. 27,872, dated Jan. 8, 1974, Ser. No. 126,652, Mar. 22, 1971.

Original No. 3,521,806, dated July 28, 1970, Ser. No. 645,968, June 14, 1967. Application for reissue Feb. 7, 1975, Ser. No. 547,966

Int. Cl.² B65D *5/60, 81/20*

U.S. Cl. 229—14 B **5 Claims**



1. An inherently stable package for shipping and preserving perishable products such as food and flowers, said package comprising:

(A) an inherently stable carton having:
  (1) two openings for tubes;
(B) a flexible and sealable container having:
  (1) a sealable product opening,
  (2) a permanently sealable inlet tube, for purging gas, hermetically connected with the container, said tube being aligned with and extendable through one of the said openings in the carton for connecting the same with a source of purging gas,
  (3) a permanently sealable outlet tube hermetically connected with the container, said latter tube being aligned with and extendable through the other of said openings in the carton.

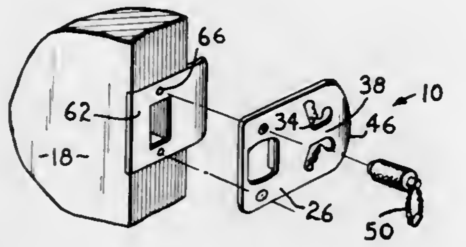
Re. 28,893
DOOR LOCK

Archie D. Adkison, Jr., 7007 Chapel Woods Lane, Kansas City, Mo. 64152

Original No. 3,731,965, dated May 8, 1973, Ser. No. 207,478, Dec. 13, 1971. Application for reissue Apr. 17, 1975, Ser. No. 568,916

Int. Cl.² E05C *1/18*

U.S. Cl. 292—292 **8 Claims**



6. Lock apparatus for use with a door having a latch adapted to be received in a notch in the door frame, said apparatus comprising:

a planar member adapted to be disposed between the door and the frame;

said member having a pair of slots therein disposed in diverging relationship to a horizontal plane passing through said structure when the latter is disposed between the door and the frame;

said member including a divider element lying in said horizontal plane for separating said slots one from the other;

each of said slots having at least one edge thereof configured to present a plurality of seats along the edge of the slot;

means for mounting said member on said frame; and

keeper means adapted to be received in one of said slots when said member is disposed between the door and the frame with the keeper means received in the seat adjacent the door whereby said keeper means presents a dead bolt lock to preclude opening of the door.

Re. 28,894
METHOD FOR THE PREPARATION OF CONCENTRATED ANION-DEFICIENT SALT SOLUTIONS

Johannes B. W. Kanij, Zevenaar; Arend J. Noothout, Oosterbeek, and Marie E. A. Hermans, Arnhem, all of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Original No. 3,838,062, dated Sept. 24, 1974, Ser. No. 283,291, Aug. 24, 1972. Division of Ser. No. 106,922, Jan. 15, 1971, abandoned. Application for reissue June 16, 1975, Ser. No. 587,209

Claims priority, application Netherlands, Jan. 16, 1970, 7000674; Australia, Jan. 8, 1971, 24159/71

Int. Cl.² C01G *43/00*

U.S. Cl. 252—301.1 **2 Claims**

1. A method for preparing a concentrated anion-deficient actinide salt solution containing at least one actinide oxide selected from the group consisting of PuO_2, UO_2, UO_3 and U_3O_8, said method including dissolving at a temperature of at least 60° C., said [salt] *oxide* in an aqueous solution of thorium nitrate having a concentration of at least 4 molar.

PLANT PATENTS
GRANTED JULY 6, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,931
WILT RESISTANT OLIVE TREE

Stephen Wilhelm and James E. Sagen, Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 29, 1974, Ser. No. 518,307

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—33 **1 Claim**

1. The new and distinct variety of olive tree (*Olea europaea* L.) useful as a rootstock to which may be grafted high yield commercial varieties, as herein described and illustrated, characterized particularly as to novelty by the small size and volume of its fruit, its high tolerance to the disease know as Verticillium wilt, its high vigor and ease of propagation.

3,932
ORCHID NAMED MOLIERE (VALECOR)

Maurice Lecoufle and Michel Vacherot, Boissy-St.-Leger, France, assignors to Les Petits-fils et fils de Vacherot and Lecoufle, Boissy-Saint-Leger, France

Filed Mar. 24, 1975, Ser. No. 561,324

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct variety of orchid plant of the Odontonia species substantially as herein shown and described, characterized by its vigorous growth habit and rapid production of new bulbs, its abundant production of large, well-formed flowers, the attractive coloring of the flowers, and its relatively long blooming period.

3,933
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed June 11, 1975, Ser. No. 585,861

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly by the combined characteristics of lavender-pink inflorescence color, flat inflorescence form which is not known to reflect at maturity, spoon-anemone inflorescence type, tall plant height, spreading branching pattern, six week flowering response in controlled programs, average natural season flower date of Sept. 20, and 2.25 to 3.0 inches diameter across face of inflorescence at maturity.

3,934
PEACH TREE

Charles Preuss, 8690 N. Minnewawa Ave., Clovis, Calif. 93612

Filed June 27, 1975, Ser. No. 590,825

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described which is generally similar to the Preuss Suncrest (U.S. Plant Pat. No. 2,797) in vigorous growth, and in regular heavy bearing of yellow-fleshed freestone fruit which are somewhat more spherical, have skin which has more yellow and somewhat less red, but of a brighter and lighter shade, than the Preuss Suncrest and which ripens approximately six days earlier than the Preuss Suncrest and the Merrill 49er (unpatented) and about sixteen days earlier than the Fay Elberta (unpatented).

3,935
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed July 24, 1975, Ser. No. 598,671

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type as illustrated and described, characterized by buds and flowers resembling the Scarlet Gem (Plant Pat. #2,155) miniature rose in general form and size but color is a rich deep red and flowers tending to be more rounded (ball shaped), the general color effect, both outdoors and in greenhouse; being deep red; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings, with small semi-glossy foliage and an abundance of bloom, with flowers usually borne several to the stem in moderately tight clusters.

3,936
PLANT OF THE FERN FAMILY

Howard G. McAllister, 1100 NW. 75th Ave., Plantation, Fla. 33313

Filed Aug. 14, 1975, Ser. No. 604,637

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the fern family substantially as herein described and characterized by a growth habit which provides specimens that have robust appearing, compound, bipinnate fronds that grow in a compact rosette arrangement with a notable absence of sori, and that in comparison to the fronds of the *Nephrolepis exaltata* "Curly Boston" variety are faster maturing, generally longer and wider appearing at maturity, and provided with a rachis having an abaxial surface color at its proximal end that extends further distally on the rachis than that of the "Curly Boston" variety and is dominated by red and/or reddish brown hues.

PATENTS

GRANTED JULY 6, 1976

ERRATA

For CLASS	See PATENT NO.
029-194	3,967,355
053-030 R	3,967,423
106-288 B	3,967,563
124-024 R	3,967,609
140-124	3,967,661
242-222	3,967,800
272-070	3,967,820
296-028 C	3,967,859
417-054	3,967,917
526-068	3,968,059
261-077	3,968,086
526-283	3,968,088
526-088	3,968,090
528-503	3,968,091
526-017	3,968,092
526-303	3,968,093
526-914	3,968,094
526-914	3,968,095
526-914	3,968,096
264-343	3,968,198
423-626	3,968,225
260-470	3,968,314
335-230	3,968,470
352-109	3,968,506

PATENTS

GRANTED JULY 6, 1976

GENERAL AND MECHANICAL

3,967,321

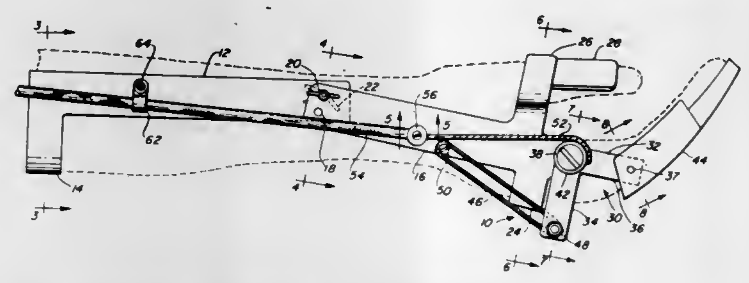
ELECTRICALLY DRIVEN HAND ORTHOSIS DEVICE FOR PROVIDING FINGER PREHENSION

John Patrick Ryan, Indianapolis; James Walter Cowan, Oaklandon; Paul Kent Sharp; Marilyn Elaine Fess, both of Indianapolis, and James L. Babcock, Brownsburg, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Feb. 5, 1975, Ser. No. 547,272

Int. Cl.² A61F *1/00, 5/10*

U.S. Cl. 3—1.1 **20 Claims**



1. An orthosis comprising, in combination:

prehension means for providing grasping capability in conjunction with a disabled extremity of the body of a patient and adapted for attachment to said extremity;

drive means operatively connected to said prehension means and adapted to provide operative prehensile force to said prehension means;

a power source;

control means comprising:

electronic switch means for switching to provide a switch signal in response to touch contact by the patient of a touch sensitive contact means;

oscillator means for oscillating in response to receipt of the switch signal from said electronic switch means;

delay means for providing a time delayed signal in response to oscillation of the oscillator means;

flip-flop means for providing and maintaining a relay signal in response to receipt of the time delayed signal;

relay means for providing a direction of operation signal to said drive means in response to receipt of the relay signal.

3,967,322

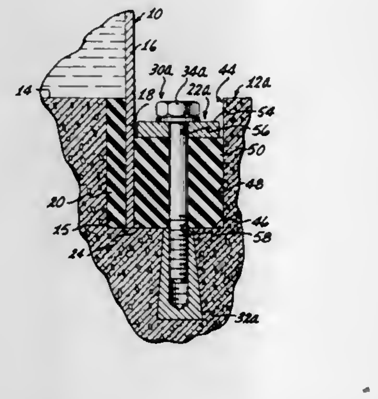
FLUID CONTAINING STRUCTURE

Adam D. Goettl, and Bruce A. Goettl, both of Phoenix, Ariz., assignors to Amoy Research and Development Co., Phoenix, Ariz.

Division of Ser. No. 363,345, May 24, 1973, Pat. No. 3,833,944. This application June 3, 1974, Ser. No. 475,823

Int. Cl.² E04H *3/16*

U.S. Cl. 4—172 **3 Claims**



1. A fluid containing structure comprising:

a. a base having a platform circumscribed by a vertically depending periphery which forms the inner vertical surface of an endless upwardly facing U-shaped in cross section trough, said trough having an endless bottom extending outwardly from the lower end of the periphery of the platform and having an endless outer vertical surface extending upwardly from the outermost end of the bottom of said trough;

b. an endless upstanding wall having the lower end thereof encircling the periphery of the platform of said base in juxtaposed relationship thereto;

c. a resilient compressible gasket interposed between the periphery of the platform of said base and the lower end of said upstanding wall;

d. compression exerting band means encircling the lower end of said upstanding wall in said trough for applying a circumferentially compressive force thereto, said compression exerting band means comprising;

  a resilient compressible body positioned within said trough and held thereby in contiguous engagement with the outwardly facing surface of the lower end of said upstanding wall, and

  at least a pair of arcuately shaped elongated plates placed in end to end relationship with each other atop the upwardly facing surface of said resilient compressible body; and

e. draw means mounted at radially disposed spaced increments about the periphery of the platform of said base and engaging said compression exerting band means for causing said compression exerting band means to apply the circumferentially compressive force.

3,967,323

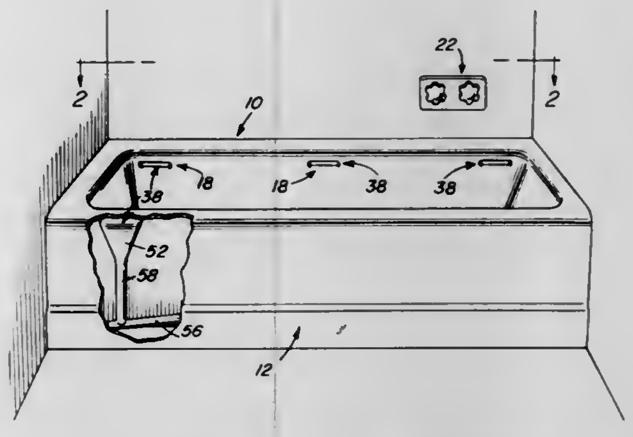
THERAPEUTIC CONSTANT FLOW BATH

Jeannette H. Serio, 27 Orange Ave., Natchez, Miss. 39120

Filed Dec. 31, 1974, Ser. No. 537,659

Int. Cl.² A47K *3/00;* **A61H** *33/00*

U.S. Cl. 4—173 R **8 Claims**



1. A therapeutic constant flow bath, comprising, in combination:

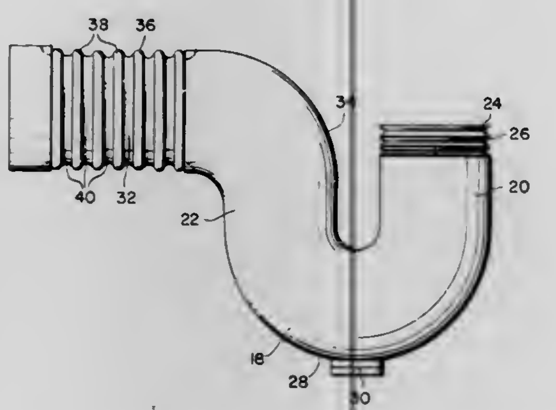
a. a tank forming a container for a liquid bath;

b. inlet means arranged beneath a predetermined normal surface level of the liquid bath for continuously feeding liquid into the tank; and

c. outlet means arranged at the predetermined normal surface level of the liquid bath for continuously draining liquid from the tank, the outlet means including a plurality of outlets connected to a common drain, the outlets being divided into a pair of sets, with each of the outlets of each one of the sets being connected together as well as to the common drain, the tank having a bottom wall and opposed sidewalls extending codirectionally from the bottom wall, with the outlets being provided in the sidewalls, one of the sets of outlets being disposed in one of the sidewalls and the other of the sets of outlets being disposed in the other of the sidewalls, with the inlet means being arranged adjacent the sidewalls.

3,967,324
FLEXIBLE TRAP FOR A WASTE LINE ASSEMBLY

Ernest Gene Olive, Maspeth, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 2, 1975, Ser. No. 574,014.
Int. Cl.^{2} E03C *1/00*
U.S. Cl. 4—207 **3 Claims**



1. A one piece flexible trap adapted to be received in a waste line assembly which comprises:

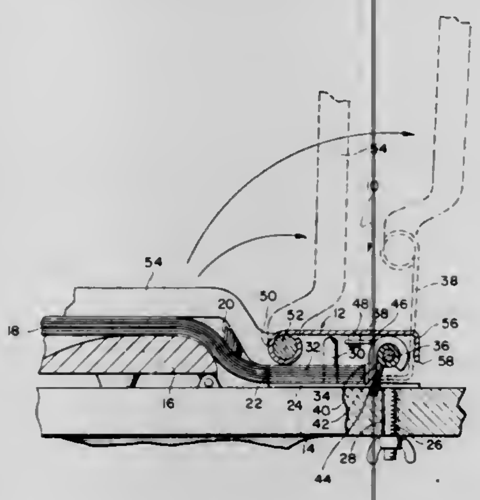
a. a U-shaped portion having a pair of upwardly extending legs, a lower section having a threaded hole therethrough, one said leg being longer than other said leg, an upper end of one said leg having a threaded outer surface;

b. a linear portion having a corrugated section therein, one end of said linear portion joined in a smooth curved continimum to an upper end of said other leg of said U-shaped portion, said U-shaped portion and linear portion having a continuous bore therethrough, said corrugation section including a plurality of alternate annular ribs and channels; and

c. a threaded plug member threadably engaging into said threaded hole.

3,967,325
HYGIENIC TOILET-SEAT

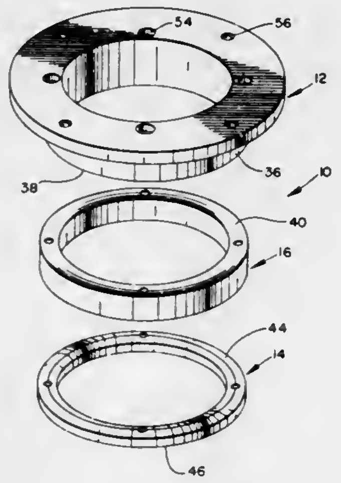
Ennio Chinio Rodriguez, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed July 11, 1975, Ser. No. 595,213
Int. Cl.^{2} A47K *13/14*
U.S. Cl. 4—245 **2 Claims**



1. A cover apparatus for maintaining a stack of sanitary sheets overlaying a toilet seat comprising a holder for receiving a margin of said stack of sanitary sheets, means for mounting said holder in back of said toilet seat, a cover member pivotly mounted on said holder, said cover member being rotatable between a generally horizontal orientation for capturing said sheet margin and a generally vertical orientation for exposing said sheet margin to enable replacement of said sheets, spring means for urging said cover member to a horizontal orientation and resilient catch means carried by said cover member for maintaining said cover member in a vertical orientation against the urging of said spring means.

3,967,326
FLANGE ASSEMBLY FOR INSTALLING A TOILET FIXTURE

Johnny Lee Tammen, 420 Cauley Lane, San Angelo, Tex. 76901
Filed Mar. 3, 1975, Ser. No. 554,591
Int. Cl.^{2} E03D *11/00*
U.S. Cl. 4—252 R **10 Claims**



1. In a toilet fixture supported by a support surface in overlying relationship respective to a soil pipe which has a free marginal end portion extending through the support surface to leave an annulus between the soil pipe and the support surface, so that the toilet fixture is arranged in spaced axially aligned relationship respective to a sanitary waste discharge from the fixture, the improvement comprising:

a mounting flange assembly by which the fixture is attached to the support surface and soil pipe; said mounting flange assembly comprising a horizontally disposed flange having a minor and major diameter and opposed upper and lower faces, a downwardly depending cylindrical skirt affixed to said minor diameter of said flange and arranged normally to the lower face thereof; a terminal free end of said skirt forming a face which is disposed parallel to said upper face;

a resilient gasket, a compression ring; said skirt, gasket and ring being concentrically aligned along a common axis with said gasket being interposed between said ring and said terminal free end of said skirt;

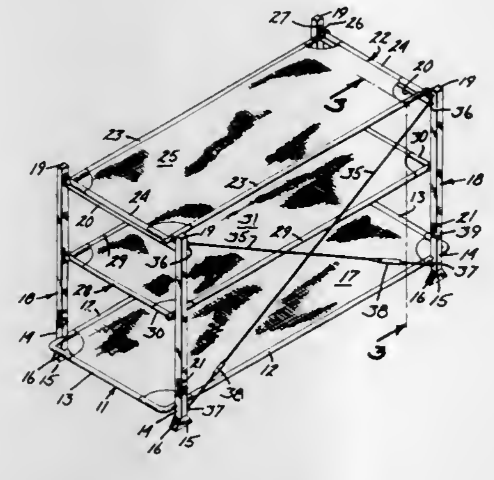
apertures formed through said flange, skirt, gasket, and ring to form a bolt receiving passageway which is radially spaced from and parallel to the axial centerline of said skirt; a tension bolt received through said apertures;

fastener means by which the toilet fixture is affixed to the mounting flange assembly;

means by which tension can be placed on said bolts to force said resilient gasket into engagement with said skirt and said ring, to cause radial expansion of said resilient gasket so that it completely fills a marginal length of said annulus and thereby releasably affixes the toilet fixture, soil pipe, horizontally disposed flange, and support surface to one another.

3,967,327
FOLDABLE BED

Harvey M. Severson, 8418 Dupont Ave. South, Minneapolis, Minn. 55420
Filed Feb. 10, 1975, Ser. No. 548,687
Int. Cl.^{2} A47K *4/00, 11/00*
U.S. Cl. 5—9 B **5 Claims**



1. A foldable bed comprising:

a. a horizontal generally rectangular base frame having a pair of support legs adjacent each of the ends thereof;

b. a pair of end frames each disposed at an opposite end of said base frame, each end frame including a pair of laterally spaced parallel posts and a cross member secured at its opposite ends to said posts adjacent one end of the posts;

c. means pivotally connecting the posts of each end frame at their other ends to different ones of said legs at a respective end of said base frame on aligned horizontal axes extending transversely of the base frame for swinging movements of said end frames between folded inoperative horizontal positions in upwardly spaced relation to said base frame and vertically disposed operative positions;

d. an elongated generally rectangular top frame disposed laterally between the posts of said end frames and adapted to be moved between an operative position overlying said cross members and an inoperative position closely overlying said base frame whereby, when said top frame is moved to its inoperative position, said end frames will be disposed in overlying relation to said top frame when moved to their folded inoperative positions;

e. mounting means including said cross members, hooks and hook-receiving loops on respective ones of said posts and top frame, detachably securing said top frame to said end frames against relative longitudinal and lateral movements therebetween;

f. brace means between said base frame and said end frames in said operative positions of the end frames;

g. and individual body supporting means carried by said base and top frames.

3,967,328
LOAD LIFTING AND TRANSFERRING DEVICE WITH MULTIPLE POWERED BELTS

Ellis V. Cox, 18601 S. Pear Road, Oregon City, Oreg. 97045
Filed Sept. 6, 1974, Ser. No. 503,710
Int. Cl.^{2} A47B *83/04;* **A61G** *1/02*
U.S. Cl. 5—81 R **12 Claims**

1. A load-lifting and transporting device comprising in combination,

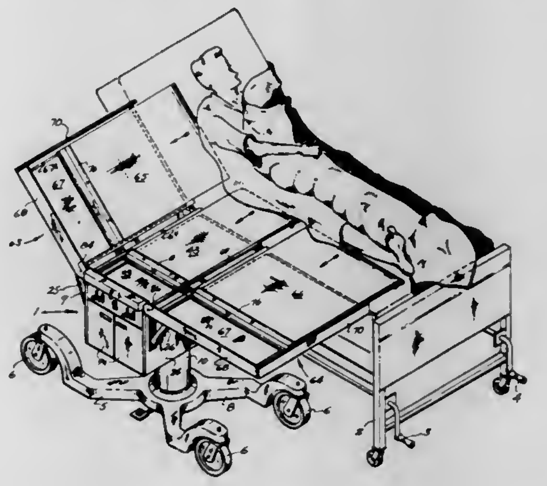
a wheel-supported base,

a cabinet adjustably carried by said base and positionable upwardly therefrom, roll means mounted on said cabinet adjacent one edge thereof,

a carriage supported by said cabinet and forwardly extensible past said one edge of the cabinet into engagement with the object to be lifted, said carriage including a plate hingedly mounted at one of its ends to the carriage, a belt entraining roller at the distal end of said plate, a power roll, a load contacting belt entrained on the power roll and plate mounted roller and having top and bottom runs, the bottom run of said belt in supported contact with the cabinet mounted roll means during extension and retraction of the carriage, said plate also supported by said cabinet roll means,

powered means concealed within said cabinet coupled with said carriage and imparting forward and rearward movement thereto, and

belt control means including fixed axis, cable reels mounted adjacent opposite sides of said cabinet, a carriage-mounted cable reel in driving connection with said carriage power roll, said belt control means further including a continuous cable a lower run of which directly interconnects the cabinet-mounted cable reels, an upper run of the cable additionally entrained about said carriage mounted cable reel, operator controlled locking means for locking one of said cabinet-mounted reels against rotation whereupon forward extension of the carriage toward an object to be lifted will cause rotation of said carriage-mounted cable reel and said carriage power roll and hence movement to the load contacting belt in a direction opposite to the forward movement of the carriage, subsequent unlocking of the locking means prior to carriage retraction permitting the carriage mounted cable reel, power roll and belt with loaded object thereon to remain in a fixed relationship to the carriage during retraction of same.



3,967,329
INVALID LIFTING DEVICE

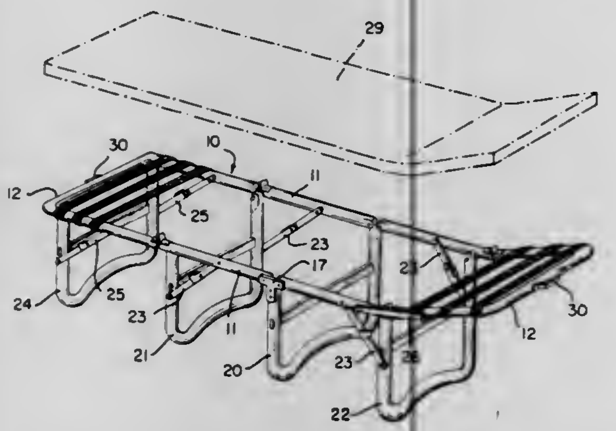
Robert E. Whitton, Jr., 5155 Thirteen Mile Road, Warren, Mich. 48092, and Harold M. Stith, 16559 Ohio, Detroit, Mich. 48221
Filed Apr. 24, 1975, Ser. No. 571,418
Int. Cl.^{2} A61G *1/02*
U.S. Cl. 5—92 **5 Claims**

1. A device for aiding a first person in raising a second person from a seated position to a standing position, said device including a first part shaped to conform to and adapted

to be attached to and carried by a knee of the first person and a second part shaped to conform to and adapted to attach to the knee of the second person whereby a fixed spaced relationship between the knees of the two persons is maintained while the first person moves the upper part of the second person from a bent seated position to a straight standing position.

3,967,330
FOLDING BED

Bohdan Zawadowsky, Islington, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 21, 1975, Ser. No. 566,619
Int. Cl.^{2} A45F *1/00*
U.S. Cl. 5—114 **7 Claims**



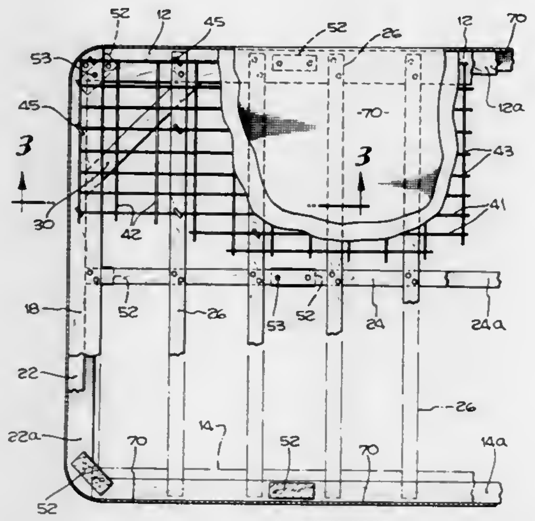
1. A folding bed, comprising a substantially rectangular frame adapted to carry body supporting means in the plane thereof and articulated longitudinally into two central sections and two end sections; a central U-shaped leg having the upper free ends thereof secured to the vertical stems of a pair of T-shaped brackets, the two central sections of the frame being pivotally attached to the lateral arms of said T-shaped bracket so as to be foldable downwardly to lie against said central leg; the two end sections of the frame being pivotally attached to their adjacent central sections and foldable upwardly to lie against said central sections; longitudinally spaced legs pivotally attached to each central section remote from and on the opposed longitudinal sides of said central leg and foldable upwardly to lie against said central sections; a further leg pivotally attached to one of the end sections remote from the leg of the adjacent central section and foldable upwardly to lie against said end section; and means for releasingly securing the other of the end sections in a plane inclined to the plane of the frame.

3,967,331
SPRINGLESS BED SPRING

Arthur R. Glassman, Torrance, Calif., assignor to De Lamar Bed Spring Corporation, Los Angeles, Calif.
Filed Apr. 17, 1975, Ser. No. 569,108
Int. Cl.^{2} A47C *23/06*
U.S. Cl. 5—236 R **1 Claim**

1. In a box spring, the sub-assembly comprising:
- a rigid upper rectangular wooden frame assembly having parallel side pieces and a plurality of slats disposed in spaced parallel relationship upon said side pieces, the ends of said slats being secured to respective ones of said side pieces;
- a lower rectangular wooden frame;
- a wire mesh panel which is substantially coextensive with said upper wooden frame, being disposed upon said slats, said wire mesh panel including spaced parallel longitudinal wires and spaced parallel transverse wires, the spacing between adjacent ones of said parallel wires being less than the spacing between adjacent ones of said slats;
- a plurality of fasteners in spaced locations on said wire mesh panel and securing corresponding wire portions thereof to the respectively adjacent upper surface portions of said wooden slats;

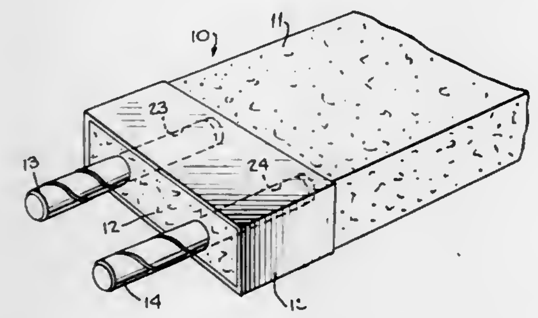
whereby a relatively thick insulating pad may be placed upon said wire mesh panel for providing a box spring assembly; and and



- a plurality of vertically extending wooden blocks attached to the underside of said upper frame and extending downwardly therefrom to said lower frame, whereby said upper frame is rigidly supported in elevated relationship to said lower frame.

3,967,332
COMPOSITION BOARD UPHOLSTERY RAIL

Handley H. Fincher, Morganton, N.C., assignor to Champion International Corporation, Stamford, Conn.
Continuation of Ser. No. 456,963, April 1, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,215
Int. Cl.^{2} A47C *19/00*
U.S. Cl. 5—286 **2 Claims**



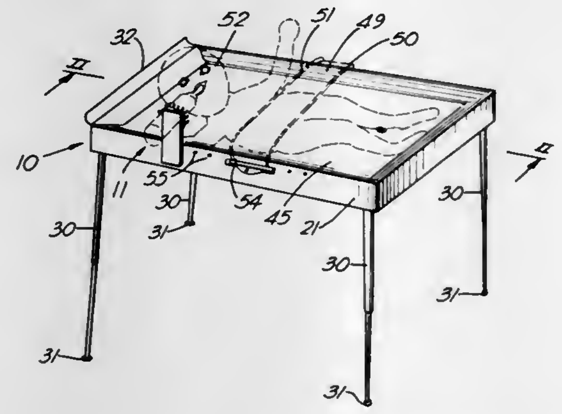
1. A rail for the frame of an upholstered article of furniture adapted to receive upholstery material, said rail comprising a body of composition board consisting essentially of fiberboard or essentially of particle flakeboard having at least one end for joining said rail to said frame, at least one dowel secured within a bore in said one end of said body and projecting therefrom, and a seamless unitary band of reinforcing material in the form of a sleeve having significant tensile strength and encircling said body with a press fit adjacent said one end for preventing said composition board from splitting in the vicinity of said dowel in response to lateral force applied to said dowel.

3,967,333
BABY FEEDING DEVICE

Mervin S. Boyd, Scarborough, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y. and Allan Krystie, Agincourt, Canada, part interest to each
Filed Nov. 29, 1974, Ser. No. 528,255
Int. Cl.^{2} A47C *21/00*
U.S. Cl. 5—317 R **3 Claims**

1. A baby feeding bed, which comprises:

- a. a one piece plastic molded body having a bottom base, two upwardly extending sidewalls and two upwardly extending end walls joined to said bottom base, said sidewalls and said end walls joined at beveled angles to said bottom base, one said end wall of said facing having an aperture therethrough;
- b. rectangularly shaped facing, said facing joined to the top edges of said sidewalls and said endwalls, said facing extending vertically downward below a horizontal plane of said bottom base;
- c. a horizontally placed board, said horizontally placed board joined to the bottom edges of said rectangularly shaped facing, said board having four opening therethrough;
- d. four sleeve brackets, one said sleeve bracket affixed to a bottom corner of said bottom base, one said sleeve bracket vertically aligned with each said opening;
- e. a two sectional telescopic leg assembly having a bottom base foot memberly slidably mounted in each said sleeve bracket, each said leg assembly extending through one of said openings in said horizontally placed board;

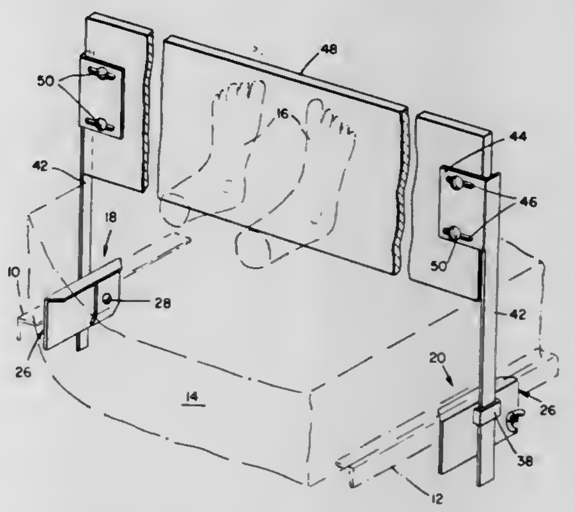


- f. a horizontally placed plunger rod slidably contained within said aperture of said facing;
- g. a knob handle affixed to an outer end of said plunger rod;
- h. a spring assembly affixed to an inner end of said plunger rod between said horizontally placed board and said bottom base of said body;
- i. a vertically placed plate affixed to said spring assembly, said plate engaging said base of said body upon inward movement of said plunger rod causing said one end wall of said body to left vertically upward while another end of said body remains stationary;
- j. a mattress inserting into said body;
- k. a cylindrical reel assembly affixed to a first sidewall portion of said facing;
- l. a belt having a free end communicating with said cylindrical reel assembly, said belt adapted to engage a baby laying on said mattress;
- m. a clamp assembly affixed to a second sidewall portion of said facing said clamp assembly engaging said free of said belt;
- n. a bottle holding device communicating with said bed, said bottle device adapted to hold a bottle therein.

3,967,334
HOSPITAL BED FOOTBOARD ASSEMBLY

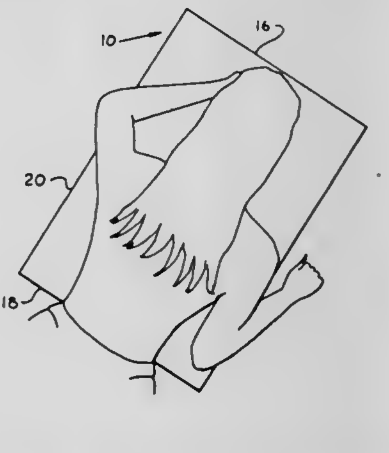
Maurine E. Ricke, 153 Smith Road, and Vern S. Ryan, 2565 Stone Valley Road, both of Danville, Calif. 94526
Filed Mar. 31, 1975, Ser. No. 563,652
Int. Cl.^{2} A47C *21/00*
U.S. Cl. 5—319 **3 Claims**

1. A footboard assembly comprising: a footboard; a pair of opposed vertical supports secured to the ends of said footboard; a pair of support brackets each receiving one of said vertical supports and removably secured to a framerail of a bed, each support bracket including a horizontal member adapted to rest on a frame rail of a bed and a vertical member depending from said horizontal member; a clamping plate adjustably secured to said vertical member, said clamping plate including a lower portion angularly offset toward said vertical member and a lower edge impinging on said vertical member, said clamping plate including an upper portion spaced apart from said vertical member and opposed thereto for receiving the frame rail therebetween, said vertical member includes a collar extending outwardly therefrom, said collar includes a slot extending vertically therethrough for receiving one of said vertical supports in sliding fashion.



3,967,335
SUNBATHING AID

Lula L. Rhoads, Rte. 1, Slaton, Tex. 79364
Filed Mar. 14, 1974, Ser. No. 450,980
Int. Cl.^{2} A47G *9/00*
U.S. Cl. 5—338 **4 Claims**



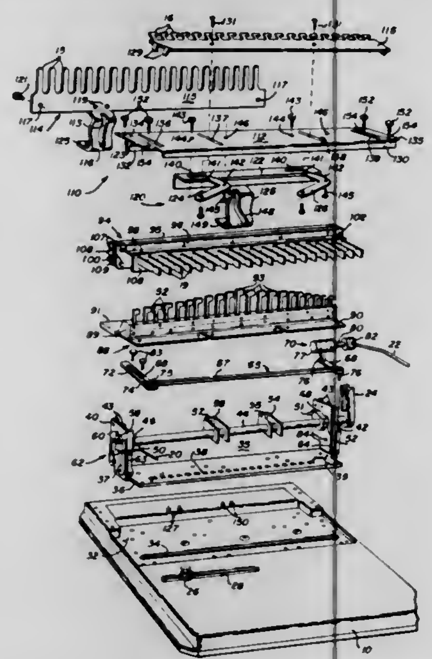
1. A cushion to support the bosom and head of a sunbathing woman lying upon her stomach comprising
- a. a thick sheet of soft, resilient material,
- b. said sheet of sufficient length to extend from the waist to above the head,
- c. two holes extending through the material to fit under the mammary glands,
- d. the top of the holes at about the mid-point of the length of the cushion,
- e. the thickness of the cushion being uniform and about 40% of the diameter of each hole,
- f. the distance between the holes being about 2 inches, and
- g. the cushion covered with terry cloth.

3,967,336
PUNCHING AND BINDING APPARATUS

James W. Cutter, Los Altos, Calif., assignor to NSC International Corporation, Hot Springs, Ark.
Filed Apr. 14, 1975, Ser. No. 567,622
Int. Cl.^{2} B42C *19/00*
U.S. Cl. 11—1 AC **12 Claims**

1. Punching and binding apparatus, comprising:

punching means for punching apertures along an edge of a stack of sheet material;
binding means for inserting the flexible fingers of a comb binder through the punch apertures for binding the sheet material together and including,
  an elongated rigid comb plate member having a plurality of comb teeth,
  an elongated rigid hook plate having a plurality of hooks corresponding in number to the number of said comb teeth, and
  guide means to which said comb plate and said hook plate are mounted, said guide means permitting said comb plate to move in its longitudinal direction between a first position and a second position, said hook plate being mounted adjacent said comb means with its hooks being positioned proximate said comb plate and being movable away from said comb plate; and
actuating means for actuating said punching means and said binding means including,



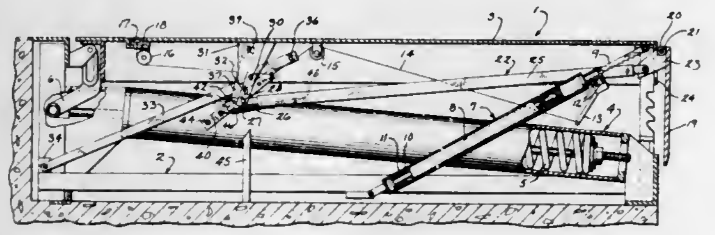
an actuating shaft,
a first camming means coupled to said comb plate and including a first camming surface,
a second camming means coupled to said hook plate and including a second camming surface,
a first arm extending radially from said shaft and having one end affixed thereto and an opposite end cammingly engaging said first camming surface, and
a second arm extending radially from said shaft and having one end affixed thereto and an opposite end cammingly engaging said second camming surface;
whereby rotation of said shaft in one direction actuates said punching means and rotation of said shaft in the opposite direction causes said first arm to move said first camming means which in turn moves said comb plate from said first position to said second position and rotation of said shaft in said opposite direction also causes said second arm to move said hook plate away from said comb plate.

3,967,337
RETURN TO DOCK LEVEL MECHANISM FOR A DOCKBOARD

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Mar. 25, 1975, Ser. No. 561,972
Int. Cl.^{2} B65G *11/00*
U.S. Cl. 14—71.7 — 17 Claims

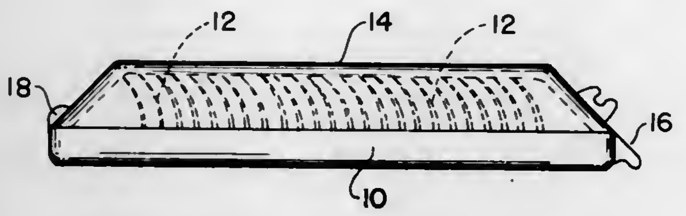
1. A dockboard, comprising a supporting structure, a ramp hinged at its rear end of the supporting structure, a lip hinged to the forward edge of the ramp and movable between a downwardly hanging pendant position and an outwardly extending position where the lip forms an extension to the ramp, ramp lifting means operably connected to the ramp for pivoting the ramp upwardly from a horizontal position to an upwardly inclined position, releasible holding means interconnecting the ramp and the supporting structure for preventing upward movement of said ramp unless released but permitting free downward movement of the ramp, said holding means including a flexible operating cable, lip lifting means operably connected to the lip for moving the lip from the pendant position to the extended position, an operating member pivotally carried by the ramp and secured to said operating cable, operating means operably connected to the operating member and responsive to the ramp being at a below dock level position and responsive to the lip moving from the extended position toward the pendant position for pivoting said operating member in a direction to exert a force on said cable to release said holding means and enable the ramp lifting means to elevate the ramp, and means responsive to a predetermined elevation of the ramp from said below dock level position for deactivating said operating means and re-engaging the holding means to stop upward movement of the ramp.



3,967,338
BRUSH ASSEMBLY

Marty M. Russell, 254 N. Clark Drive, Beverly Hills, Calif. 90211

Filed June 30, 1975, Ser. No. 591,658
Int. Cl.^{2} A46B *9/02*
U.S. Cl. 15—185 — 2 Claims



1. A brush assembly including: a one-piece base member; a plurality of bristles formed of resilient synthetic material set in the base member in a perpendicular upright position thereon; and a one-piece flat cover mounted on the base member and movable between an open position and a closed position to enclose the bristles when the brush assembly is not in use, said cover being in sufficiently close proximity with the upper ends of the bristles when in its closed position to cause the bristles to bend over from their upright position into the plane of the base member, and the cover being shaped to form a handle for the brush when in its open position.

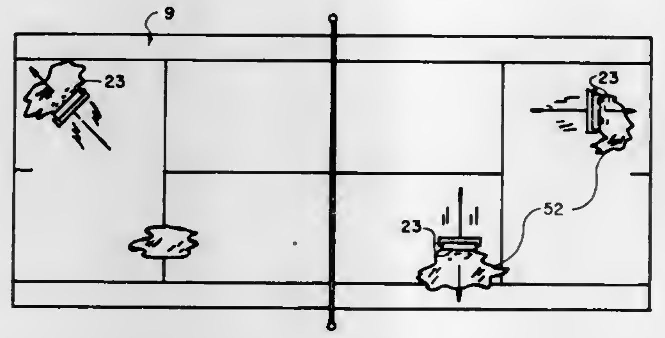
3,967,339
ROLLER FOR REMOVING WATER FROM AND SIMULTANEOUSLY DRYING HARD SURFACES

C. Ray Newman, Houston, Tex., assignor to Rol-Dri, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 412,230, Nov. 2, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,124
Int. Cl.^{2} A47L *13/11*
U.S. Cl. 15—244 A — 1 Claim

1. A liquid-removing device adapted to remove a liquid body lying on a substantially flat hard surface, said device comprising:

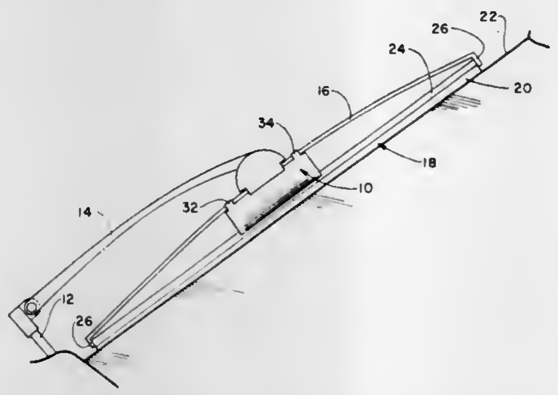
a carriage;
a resilient foam roller having a high abrasion-resistance and being characterized by a compression load density between 20 to 60 pounds, by a density between 1 to 4 pounds per cubic foot, by a porosity between 50 to 100 pores per linear inch, by a tear strength between 0.25 to 0.45 pounds per inch, by an elongation factor between 100 to 400%, and by a tensile strength between 15 to 40 pounds per square inch; and
means rotatably supporting said roller on said carriage whereby, in use, a moving seal is established between said roller and said surface.



3,967,340
WINDSHIELD WIPER PRESSURE DISTRIBUTION BLOCK

Charles F. Cmolik, Berwyn, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 1, 1975, Ser. No. 618,320
Int. Cl.^{2} B60S *1/02*
U.S. Cl. 15—250.42 — 3 Claims



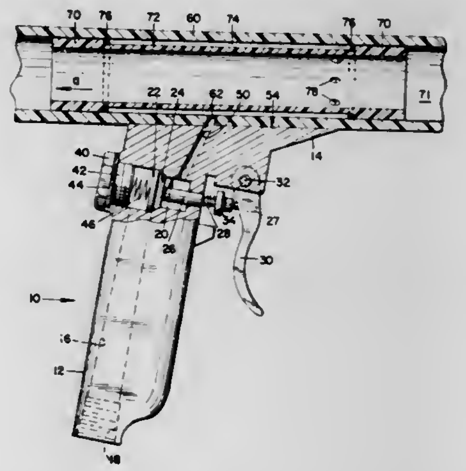
1. A device for distributing the pressure applied to an elongated windshield wiper squeegee, having a blade portion projecting from a backing portion, by an arcuate holder arm carrying opposite ends of the squeegee comprising a block dimensioned to be wedged between the centers of the holder arm and the backing portion of the squeegee, groove means in said block dimensioned for engagement about the backing portion, and tie means carried by said block, for fastening about said holder arm.

3,967,341
VACUUM AND COMBINATION VACUUM/BLOW MEANS

Linus A. Gavin, Box 136, Bagg Road, Chesterfield, Mass. 01012

Filed Aug. 14, 1975, Ser. No. 604,638
Int. Cl.^{2} A47L *5/14, 5/16*
U.S. Cl. 15—345 — 3 Claims

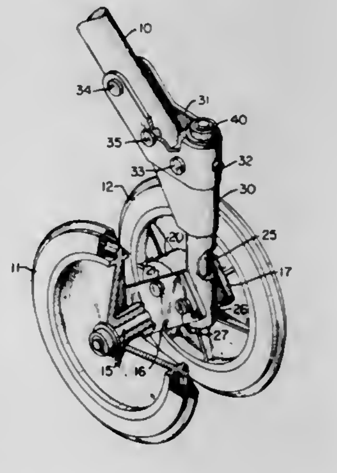
3. In an air gun converted to a suction cleaner and having an air inlet connected to a source of pressurized air and an air outlet and a trigger actuated valve means therebetween, the improvement comprising: a tubular longitudinally extending barrel mounted on the air gun and having opposite forward and rearward extremities and an opening in the wall thereof coaxially aligned with the air outlet, a tubular flow interrupter sealingly sleeved within the barrel and having an outer peripheral recess inboard of its opposite ends defining a sealed annular air space in communication with the barrel opening, a plurality of spaced circumferentially-arranged angularly inclined rearwardly directed flow reversal openings extending through the wall of the flow interrupter and communicating between the air space and interior of the flow interrupter for bleeding pressurized air from the former to the latter while reversing the direction of flow thereof through the barrel and toward the rearward barrel extremity while generating a suction at the forward barrel extremity, a rotatable selector valve means receivable within the air gun and in communication with the trigger actuated valve means and being actuatable for closing off the air outlet, a tube having a forward nozzle end and being connectible at its opposite end of the selector valve means and extendable to a point of adjacency to the forward barrel extremity and serving as a passage for the pressurized air from the trigger actuating valve means to the forward nozzle end.



3,967,342
SUSPENDED SWIVEL WHEEL ARRANGEMENT FOR BABY CARRIAGES AND THE LIKE

Albert W. Gebhard, Boulder, Colo., assignor to Gerico, Inc., Boulder, Colo.

Filed Jan. 13, 1975, Ser. No. 540,320
Int. Cl.^{2} B60B *33/00*
U.S. Cl. 16—48 — 6 Claims



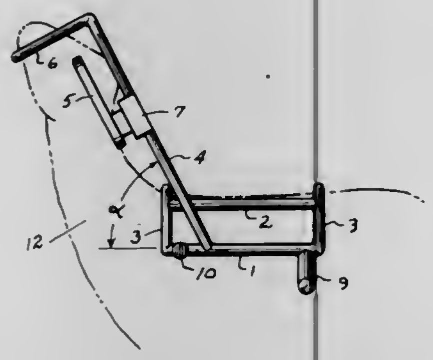
1. Movable suspension apparatus for a wheeled vehicle comprising:
  a horizontal wheel axle,
  a pair of wheels rotatably mounted in spaced relation to one another on said axle,
  at least one arm rotatably mounted at one end on said axle inwardly of said wheels,
  a vertical mounting spindle having an upper and lower section, said lower section rotatably mounted to the other end of said arm and having an upper shoulder between said upper and lower sections,

means mounted on said arm for resiliently restricting the rotation of said spindle relative to said arm, and

sleeve means attached to the vehicle and rotatably mounted on said upper section of said spindle for applying the weight of said vehicle on said spindle shoulder and retaining said spindle in a substantially upright position, said sleeve means and at least said lower section of said vertical mounting spindle being constructed of durable materials having characteristics of low sliding friction therebetween and wherein said sleeve means has a bore therethrough for rotatably receiving said spindle upper section and which further includes a weight-transmitting surface sloped relative to the axis of said spindle, said apparatus further including means for attaching said vehicle to said sleeve means at said sloped surface.

3,967,343
ANIMAL HOLD DOWN/NECK STRETCHER FOR KOSHER SLAUGHTER ON A DOUBLE-RAIL ANIMAL SUPPORT SYSTEM

Rudy G. Westervelt, Newfield, N.Y., and Walter Giger, Jr., Wethersfield, Conn., assignors to Council of Livestock Protection, Inc., New York, N.Y.
Filed Oct. 1, 1975, Ser. No. 618,463
Int. Cl.² A22B *5/02*
U.S. Cl. 17—1 A **1 Claim**

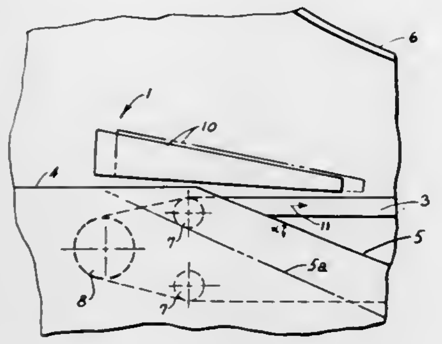


1. A neck stretching and body restraining frame, comprising
a pair of parallel inner bars;
a pair of parallel outer bars;
a circularly shaped cross bar interconnecting said inner and outer bars;
a pair of parallel holding bars extending at an angle from one end of said interconnected outer bars;
a jaw holder means comprising a circularly shaped extension connected to the unconnected ends of said parallel holding bars and extending perpendicular thereto in a direction opposite said inner and outer bars;
a neck restraining means comprising flexible double strips connected between said parallel holding bars and located between said extensions and said outer bars and being sufficiently spaced to hold the neck of an animal; and
outwardly extending bearing connected to said outer bars for movably holding said frame on the back of said animal.

3,967,344
TRANSITION FOR ANIMALS TO BE SLAUGHTERED ON DOUBLE-RAIL SYSTEM

Ralph P. Prince; David H. Johnson, both of Storrs, and Walter Giger, Jr., Wethersfield, all of Conn., assignors to Council of Liverstock Protection, Inc., New York, N.Y.
Filed Oct. 1, 1975, Ser. No. 618,468
Int. Cl.² A22B *5/02*
U.S. Cl. 17—1 A **3 Claims**

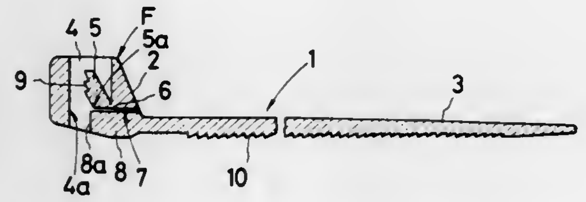
1. A transition arrangement for transferring an animal from a chute to a conveyor, comprising
a horizontal platform;
a ramp inclined downward from said platform;
a triangular wedge having a sloping top surface located above said platform and above said ramp; said triangular wedge having the shape of a truncated triangle with the upper end thereof being between a pair of said conveyors and the bottom end thereof above said platform;



means for moving said wedge horizontally whereby said animal attempting to step on said conveyors will step on said wedge and slip and slide on said ramp and go upright onto said conveyors with its legs straddling said conveyors; and
cover means disposed above said wedge at a distance about equal to the rump dimension of said animal for prevent said animal from stepping on said conveyors.

3,967,345
BINDING STRAP

Yasukichi Sumimoto, Tokyo, Japan, assignor to Tokyo Style Company, Ltd., Tokyo, Japan
Filed Feb. 7, 1975, Ser. No. 548,170
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **4 Claims**

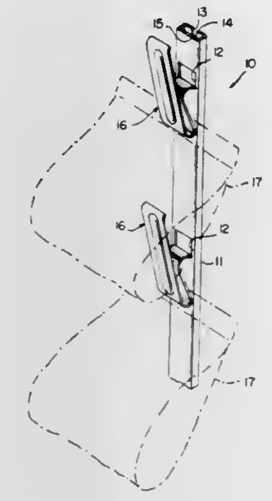


1. A binding strap comprising a head portion and a strap body extending from said head portion, said head portion comprising: A. a strap body insertion hole at the center thereof;
B. a tongue joined to an inner wall of said insertion hole by a flexible junction, the bottom face of said tongue being flat;
C. a support means facing said bottom face of the tongue;
D. there being slit between said support means and said bottom face of the tongue, said slit passing through said head portion between said strap body insertion hole and the exterior of said head; and
E. saw blade teeth formed on one face of said tongue, wherein said strap body has saw blade teeth on one face thereof for engaging said teeth of the tongue to hold said strap within said head portion.

3,967,346
DISPLAY RACK CLIP

Bruce Young, Jr., 105 Masters Road, Hixson, Tenn. 37343
Filed Sept. 5, 1974, Ser. No. 503,489
Int. Cl.² A47F *5/10*
U.S. Cl. 24—73 B **14 Claims**

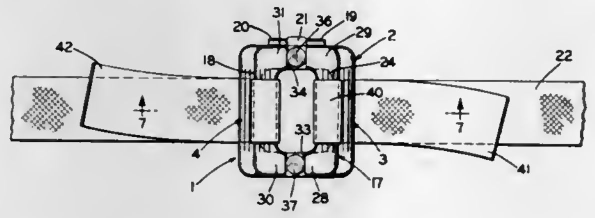
1. A display rack clip for supporting articles, such as bags of chips and the like, for display and sale to the public, comprising a substantially S-shaped spring clip having first and second end portions and an intermediate portion and first and second curved portions joining the intermediate portion with a respective end portion, one end portion adapted to be inserted through a clip-receiving opening in a support member for yielding but firm engagement of an adjacent one of said curved portions against said support member to releasably grip an article therebetween, and the other of said end portions comprising a lever for disengaging said one curved portion from the support member to release the article, said one



end portion including two angularly offset portions and an axially extending tip portion which engages one face of the support member to urge said second end portion and said intermediate portion relatively apart for effecting a secure clamping action between said first curved portion and the support member.

3,967,347
BUCKLE CONSTRUCTION

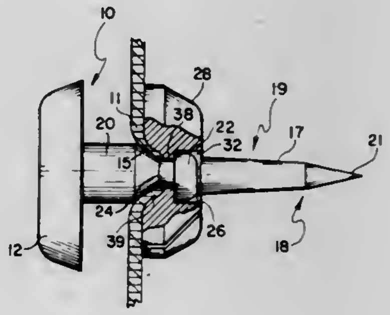
George J. Bickis, Sr., Massillon, Ohio, assignor to Indenco, Inc., Massillon, Ohio
Filed Mar. 27, 1975, Ser. No. 562,793
Int. Cl.² A44B *11/00, 11/02*
U.S. Cl. 24—74 A **8 Claims**



1. Buckle construction for securing the ends of flexible strapping about an object, including
a. a rectangular base having a pair of opposite side members and a pair of opposite end members forming a single rectangular aperture therebetween;
b. first and second individual posts formed integrally with the base, each of said posts projecting upwardly from the midpoint of a respective one of the base end members;
c. a pair of spaced fingers movable between open and closed positions, each of said fingers having a straight bar-like portion terminating in end portions, with said end portions each having an inner surface;
d. individual strips of flexible material hingedly connecting the fingers to one of the end members;
e. the fingers extending in spaced parallel relationship outwardly from the said one base end member when in open position with the inner surfaces of opposite finger end portions forming spaces therebetween, and with the width of said spaces being predetermined and generally equal to the width of the posts;
f. the fingers being foldable individually toward the base in a direction generally transverse to the end members and parallel with the side members when moving from open to closed position;
g. the posts being located each in a respective space between the finger end portions when the fingers are in closed strap engaging position; and
h. the finger inner end surfaces engaging the respective interposed post during tensioning of the strapping to equally distribute the tensioning force on the fingers and posts.

3,967,348
BUTTON STRUCTURE

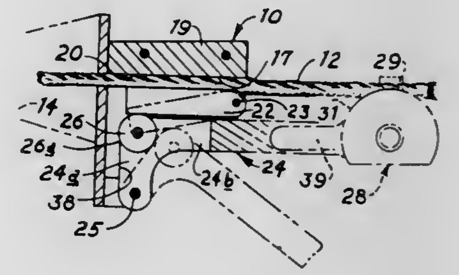
Neil E. Rogen, 3 Beaver Dam Road, Upper Saddle River, N.J. 07458
Continuation-in-part of Ser. No. 387,390, Aug. 10, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,151
Int. Cl.² A44B *1/34, 1/44*
U.S. Cl. 24—90 E **9 Claims**



1. A button structure comprising:
a. a simulated button;
b. a shank attached to the simulated button having an elongated post attached to said button, a pointed portion on the opposite end of said shank and an intermediate collar joined to said post and said pointed portion by reduced cross sections forming first and second grooves respectively, said post having an enlarged cross section relative to the collar and pointed portion, said pointed portion being adapted to be broken off at said second groove; and
c. an essentialy annular fastening member having an enlarged recess for containing said collar, terminating in an inwardly protruding lip defining a concentric passage having a diameter smaller than said collar and said post, a pair of oppositely spaced radial slots extending inwardly from the edge of the fastening member, one slot extending to said passage and recess whereby said passage may be resiliently opened and closed to fit over said collar, said lip having a thickness which is substantially equal to the length of the first groove whereby fabric is adapted to be clamped in said first groove by said lip.

3,967,349
CLAMP FOR FLEXIBLE ROPE

Donald E. Christensen, Orofino, Idaho, assignor to David Gladhart, Pierce, Idaho, a part interest
Filed Apr. 11, 1975, Ser. No. 567,289
Int. Cl.² F16G *11/00*
U.S. Cl. 24—134 KC **4 Claims**



1. A self-tightening clamp assembly for flexible rope, comprising:
a clamp body defining a straight longitudinal opening extending therethrough from a front to a back end for receiving a portion of a flexible rope so that the ends

thereof extend forward and backward of the clamp assembly;

a clamp surface mounted to the clamp body to extend longitudinally along one side of the opening;

clamp plate means pivotably mounted to the clamp body on an opposite side of the opening with a smooth clamp plate surface for pivoting about a first axis to engage the rope and clamp it against the clamp surface;

lever means mounted to the clamp body for pivotal movement about a second axis spaced longitudinally from the first axis with one end operatively connected to the clamp plate and a remaining end projecting rearwardly from the clamp plate body for pivoting the clamp plate toward and away from the clamp surface in response to pivotal movement of the remaining lever end;

connecting means for releasably securing the remaining lever end to the flexible rope so that as the rope is moved to a straightened condition with ends protruding from the assembly along a substantially straight line, the lever means is automatically operated to force the clamp plate toward the clamp surface and thereby clamp the rope tightly therebetween and so that as the rope is slackened between ends, the lever means is automatically operated to relax clamping pressure on the rope.

3,967,350

SLIDER FOR HEAVY DUTY SLIDE FASTENERS

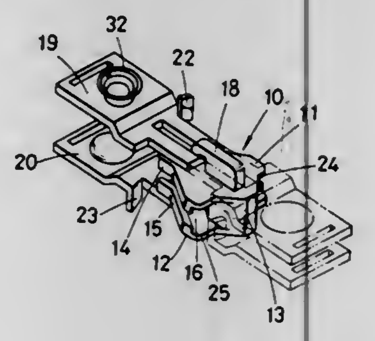
Teruaki Kawashima, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Mar. 26, 1975, Ser. No. 562,237

Claims priority, application Japan, Apr. 6, 1974, 49-39218[U]

Int. Cl.² A44B *19/30, 19/36*

U.S. Cl. 24—205.14 R **1 Claim**



1. In a slider for a slide fastener of the type having a pair of stringers carrying respective rows of interengageable fastener elements and end stops, the slider having upper and lower wings connected to define a generally Y-shaped guide channel having an entrance end through which the rows of fastener elements are passed, and a pair of pull tabs each pivotally connected to a corresponding one of said wings, the improvement which comprises in combination a pair of matching connector elements each on a corresponding one of said pull tabs, said connector elements being disposed for releaseable engagement to secure the pull tabs together when said pull tabs are pivoted toward each other; and a locking member projecting from each of said pull tabs, each locking member being disposed to engage a corresponding end stop when the slider is positioned to receive said end stops at the entrance end of the quide channel and the pull tabs are secured together by said connector elements.

3,967,351

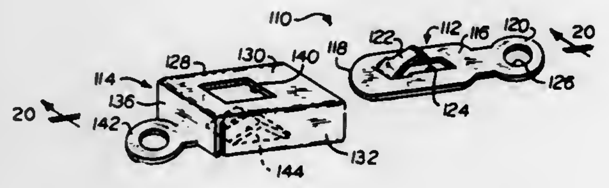
CLASP

Melvin Rosenberg, and Sheldon Brickner, both of New York, N.Y., assignors to Melvin Rosenberg and Morris Schwartz, both of North Woodmere, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,259

Int. Cl.² A44B *17/00*

U.S. Cl. 24—230 SC **12 Claims**



1. A clasp for an article of jewelry comprising:

a. a thin latch member having a forwardly insertable end portion and a resiliently depressible hook portion projecting outwardly from said latch member to form an open-ended passage between said hook portion and said latch member, said hook portion extending rearwardly of said insertable end portion and being disposed for movement from a normally extended position to a flexed position in the direction toward said latch member;

b. a keeper member having thin spaced walls defining an opening of smaller dimension than the corresponding dimension of said latch member when said hook portion is in its extended position and through which the latch member may be inserted or withdrawn when said hook portion is in its flexed position;

c. retaining means positioned at a pre-selected location on said keeper member engageable with said hook portion upon insertion of said latch member to permit said hook portion to move to its extended position for fastening said clasp;

d. said retaining means comprising an edge portion of at least one of said walls located adjacent said hook portion when said clasp is fastened;

e. said hook portion being sized to extend beyond said edge portion when said latch member and said keeper member are engaged and to receive said edge portion in said open-ended passage when said engaged latch member is moved in the direction of withdrawal from said keeper member to prevent movement of said hook portion to its flexed position;

f. said keeper member extending beyond said retaining means a distance greater than the length of said latch member received therein when said hook portion is engaged with said retaining means and extends beyond said edge portion thereof to permit additional movement of said latch member relative to said keeper member in the direction of insertion;

whereby said clasp is unfastened by moving said latch member in the direction of insertion in said keeper member to disengage said hook portion from said retaining means and then moving said hook portion to its flexed position to permit said latch member to be withdrawn through the opening in said keeper member.

3,967,352

METHOD FOR MAKING A SCROLL TYPE HOUSING FOR A CENTRIFUGAL BLOWER

Kenneth Crowe, Simsbury, Conn., assignor to Torin Corporation, Torrington, Conn.

Filed June 17, 1975, Ser. No. 587,644

Int. Cl.² B23P *15/00*

U.S. Cl. 29—156.4 R **9 Claims**

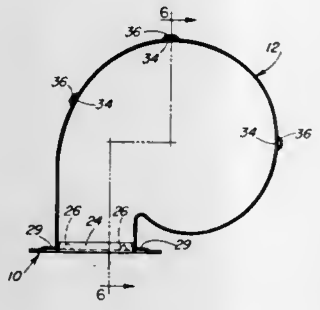
1. A method for making a scroll type housing for a centrifugal blower, said method comprising the steps of:

a. providing a flat discharge plate constructed of sheet material with a rectangular discharge opening therethrough,

b. forming at least one integral side plate attachment means adjacent each of a first pair of opposing parallel edges of the discharge opening,

c. providing an elongated generally flat scroll member of flexible sheet material and of a width aproximately equal to the length of the second pair of parallel opposing edges of said discharge opening, said member having a narrow end flange formed integrally along each end edge, and said flanges projecting generally at right angles from the member and in the same direction, said member also having a generally reverse bend adjacent one end portion at least approximately in the form of a desired final configuration of a cut-off section of the scroll housing, and said member also having at least one integral side plate attachment means adjacent each side edge and between the ends thereof,

d. gradually arcuately bending said scroll member to bring the opposite ends thereof toward each other with said end flanges facing outwardly and in opposite directions and until the overall dimension between inner and outer edges of opposite flanges is less than the distance between said second pair of opposing edges at said opening in said discharge plate,



e. entering the flanged end of said scroll member in said discharge opening with said end flanges extending parallel with said second pair of opposed edges and thereafter allowing said member to flex outwardly whereby to assemble the scroll member and discharge plate with said second pair of opposing edges engaging and restraining the scroll member against outward springing movement, and with said end flanges flatly engaging the discharge plate on the side opposite the body of the scroll member to prevent withdrawal of the member from the discharge opening,

f. providing a pair of similar flat side plates of sheet material with a scroll configuration at their periphery and a transverse linear edge at their discharge ends, each side plate having at least one integral attachment means adapted to cooperate with said scroll attachment means and at least one integral attachment means adapted to cooperate with said discharge plate attachment means,

g. and respectively entering said plates in opposite side openings of the scroll member with each plate having its linear discharge edge in engagement with the discharge plate and each of plate having its scroll and discharge plate attachment means engaged respectively with a corresponding scroll and discharge plate attachment means.

3,967,353

GAS TURBINE BUCKET-ROOT SIDEWALL PIECE SEALS

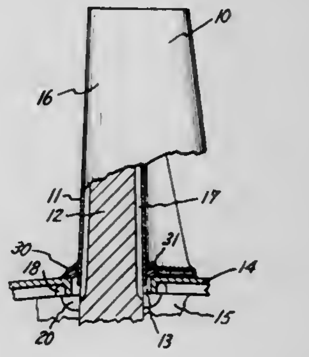
Gasper Pagnotta, Rexford, and John H. Eskesen, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 18, 1974, Ser. No. 489,799

Int. Cl.² B23P *15/04*

U.S. Cl. 29—156.8 R **4 Claims**

1. In the method of assembling a fluid-cooled gas turbine including the steps of locating buckets in their respective openings in a platform and securing the buckets to a turbine disc, the combination of the steps of shaping the platform to provide space of width from 0.005 to 0.040 inch between the buckets and the platform within the bucket openings, placing a wire in contact with the upper surface of the platform around the periphery of each bucket-receiving opening and in contact with an annular portion of the bucket skin above the platform, spot-welding each so located wire to the platform



and to its respective bucket, covering each spot-welded wire around its length and at least partially filling annular spaces between each said wire and the bucket and the platform with a mixture of powdered braze alloy and binder, firing the assembly to melt the braze while maintaining the braze outside the bucket openings in the platform, and cooling and solidifying the braze in situ and thereby sealing each bucket fluid-tightly to the platform.

3,967,354

HEAT EXCHANGER

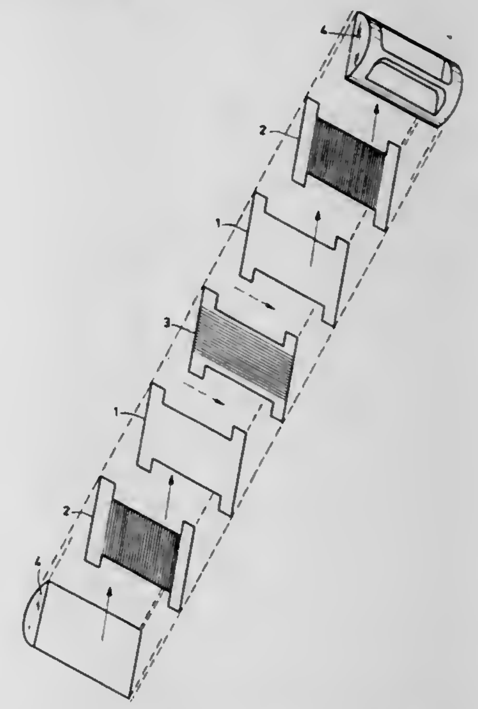
Hendrik Alphons Jaspers, Briarcliff Manor, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,363

Claims priority, application Netherlands, Mar. 26, 1963, 7304161

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 D **7 Claims**



1. A method of manufacturing a cross-flow heat exchanger formed of at least one set of first, second, and third adjacent heat exchange plates having end portions, a first corrugated plate having side edges and end portions and having between said side edges thereof, lengthwise corrugations from end to end of said plate, this corrugated plate being between and defining with said first and second heat exchange plates first fluid flow paths along corrugations thereof, a second corrugated plate similar to the first corrugated plate and situated between and defining with said second and third heat ex-

change plates, second fluid flow paths similar to and transverse of the direction of said first fluid flow paths, said heat exchange and corrugated plates all comprising adjacent I-shape surfaces of substantially the same size and orientation, and an end plate outward of each of the two opposite outermost surfaces of said heat exchange plates, the method comprising the steps: coating said plates with a fusible coating, bending each of the end portions of each corrugated plate over on itself to form a double thickness sealing edge, positioning said plates in a stack with the I-shaped surfaces adjacent, adhering said plates together by compressing said plates together and thermally treating same, and thereby fusing coatings of said adjacent plates and machining said assembled plates to a cylindrical shape whose axis is parallel to the axes of the I's of said plates.

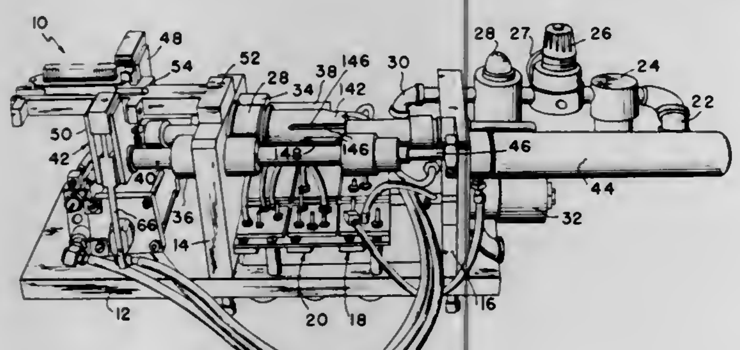
3,967,355
COMPOSITE SINGLE CRYSTAL ARTICLE
Anthony F. Giamei, Middletown, and Bernard H. Kear, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1974, Ser. No. 536,043
Int. Cl.^{2} B23K *28/00*
U.S. Cl. 29—194 **6 Claims**

1. A composite metallic crystalline article having good mechanical properties at elevated temperatures, consisting of at least two adjacent single crystal components bonded by a bond which is essentially identical in chemical composition to at least one of the single crystal components, said adjacent components having the following relationships:
  a. having identical crystal lattice structures in the plane of the at least one bond,
  b. having substantially identical lattice parameters,
  c. having substantially identical crystallograhic orientations, whereby the article, is characterized by the absence of mobile high angle grain boundaries in the region of the at least one bond.

3,967,356
INSERTION TOOL OPERABLE IN ACCORDANCE WITH A PREDETERMINED PROGRAM TO INSERT A PLURALITY OF CONDUCTORS IN INSULATION-PIERCING CONTACTS DISPOSED ON OPPOSITE SIDES OF AN ELECTRICAL CONNECTOR
Harley Raymond Holt, Hillside, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

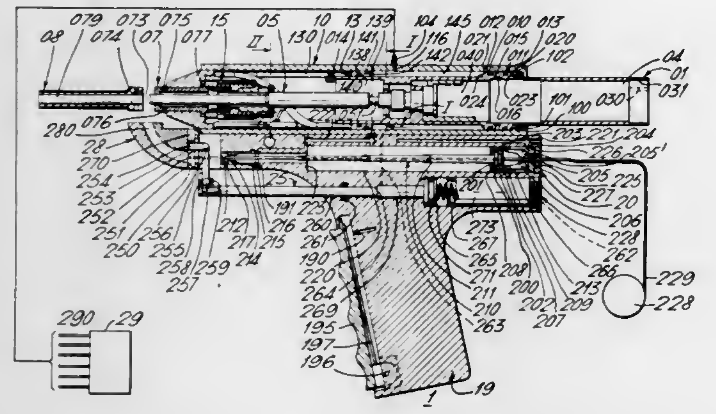
Continuation of Ser. No. 407,781, Oct. 19, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,830
Int. Cl.^{2} H01R *43/04*
U.S. Cl. 29—203 MW **40 Claims**



1. Apparatus for terminating a plurality of free-ended insulated conductors in respective insulation-piercing contact portions arranged in separate rows on each side of an electrical connector, said apparatus comprising:
- connector support means for supporting the connector with the contact portions oriented to receive respective conductors disposed immediately adjacent and parallel thereto;
- a plurality of insertion levers each including an upper and a lower end and each pivotally mounted in alignment with each other on opposite sides of said connector support means;
- a pair of conductor insertion tools each mounted at said upper end of a respective insertion lever and each including at least one insertion blade for engaging and pressing a conductor into an insulation-piercing contact portion;
- a circuit including a device having extensible means connected to said lower ends of said insertion levers, first switch means operable to cause said extensible means of said device to pivot the upper ends of said insertion levers toward each other to effect conductor insertion, and second switch means operated by one of said levers upon completion of insertion to reverse said device and withdraw said extensible means; and
- insertion lever carriage means mounted for movement relative said connector support means between points spaced a distance of at least the spacing between the parallel content portions of a row.

3,967,357
WIRE SKINNING AND WRAPPING TOOL
Frans Pharailda Jozef Bolssens, Heide Kalmthout, and Guy Charles Joseph Leon Gilbert Ghislain Marie Franck, Borsbeek, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 3, 1975, Ser. No. 610,020
Int. Cl.^{2} H01R *43/04*
U.S. Cl. 29—203 D **17 Claims**



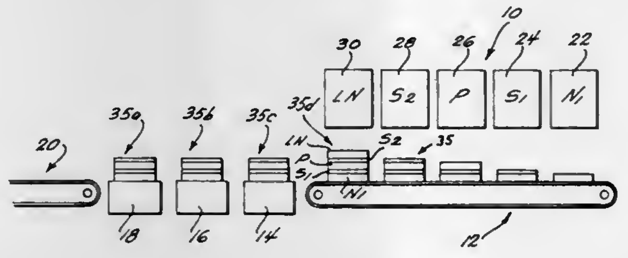
1. A wire skinning and wrapping tool for carrying out successive first and second wire skinning and wrapping operations, said tool including rotatable skinning and wrapping means to skin a portion of an insulated wire and to wrap the so obtained skinned portion and second means to bring said portion to be skinned and wrapped and said skinning and wrapping means in proximity of each other prior to each of said first and second skinning operations so that said portion may then be skinned, characterized in that after each wrapping operation said second means are able to rotate said skinning and wrapping means (05, 07) so as to bring them in proximity of said portion to be skinned and wrapped.

3,967,358
CONTROL SYSTEM FOR BATTERY PLATE STACKING APPARATUS
Daniel Orlando, New Berlin, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 11, 1975, Ser. No. 603,398
Int. Cl.^{2} H01M *10/14*
U.S. Cl. 29—204 R **19 Claims**

1. An electrical control system for controlling a battery plate stacking apparatus which includes a plurality of battery plate and separator dispensers for continuously forming books of battery plates and separators, a station for accumulating at least one book to form a battery element, and a shuttle device

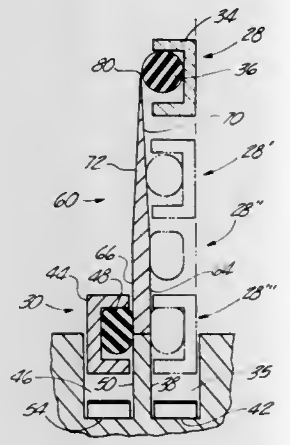
for transferring the battery element for further processing, the control system comprising:
- first counter means for determining the number of cycles of operation of the stacking apparatus and means responsive to said first counter means for controlling the disposition of the last plate or separator of the battery element, and



- second counter means for determining the number of books accumulated at said station and means responsive to said second counter means for actuating the shuttle device after a preselected number of books sufficient to form a battery element have been accumulated.

3,967,359
LOADING DEVICE FOR INSTALLATION OF ROTARY ENGINE OIL SEALING RINGS
Lewis M. Davis, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

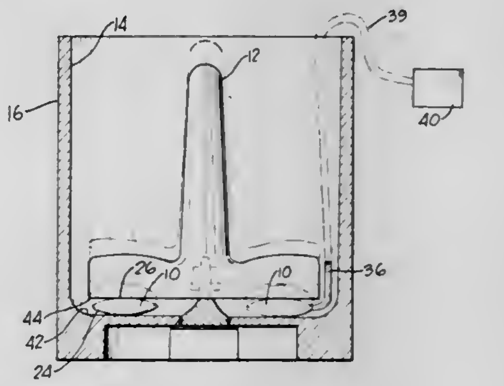
Filed Oct. 23, 1974, Ser. No. 517,087
Int. Cl.^{2} B23P *19/02*
U.S. Cl. 29—235 **7 Claims**



1. The combination comprising a body having a first radially inwardly facing cylindrical wall surface having a first wall diameter, a second radially outwardly facing cylindrical wall surface having a second wall diameter which is greater than said first wall diameter and an end face surface which intersects said first and second wall surfaces, said first and second wall surfaces having parallel axes, a first annular resilient seal having a radially outwardly facing sealing edge with a first relaxed diameter and adapted for sealing engagement with said first wall surface, a second annular resilient seal having a radially inwardly facing sealing edge with a second relaxed diameter and adapted for sealing engagement with said second wall surface, and a loading device comprising an annular sleeve including means providing a first surface adapted to rest upon said end face surface and means defining first and second frustoconical surfaces coaxial with said wall surfaces respectively and converging axially outwardly of said first surface, said first conical surface having a minimum diameter equal to said first wall diameter and a maximum diameter at least equal to said first relaxed diameter, said second conical surface having a maximum diameter equal to said second wall diameter and a minimum diameter equal to or less than said second relaxed diameter.

3,967,360
PNEUMATIC JACK DEVICE
Ted W. Nolte, Safford, Ariz., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part inerest

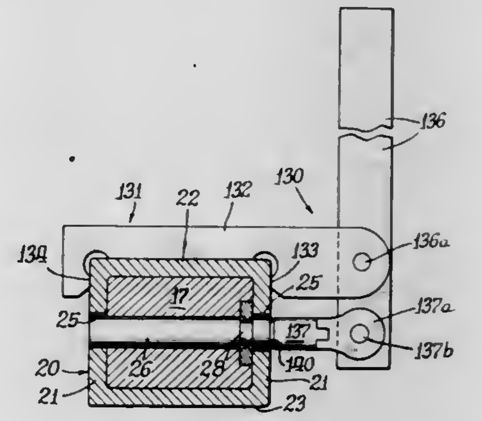
Filed July 1, 1975, Ser. No. 592,279
Int. Cl.^{2} B25B *27/14*
U.S. Cl. 29—252 **1 Claim**



1. A pneumatic jack device, which comprises:
  a. an agitator having a bottom annular shoulder of a tub of a washing machine;
  b. an annular split member having a pair of closed ends, distendable surfaces, an opening through one said surface, and a hollow chamber therein, said member inflatable into a split toroidial shaped configuration, said inflated member frictionally engaging a bottom surface of said annular shoulder of said agitator;
  c. an eyelet affixed to one said end of said annular split member;
  d. a hook element hingably joined to said other end of said annular split member, said hook element engaging said eyelet to hold said annular split member in said torodial configuration under said annular shoulder of said agitator;
  e. a valve member having a stem extending inwardly into said opening of said annular split ring member, said stem being externally threaded;
  f. an annular collar sealing said valve member to said annular split ring member;
  g. a pressurizing source; and
  h. a pressurized line threadably engaging said stem and communicating with said pressurizing source.

3,967,361
PIN REMOVER AND INSTALLER
Russell Dwane Merkel, Coal City, and William Edwin Lanz, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 9, 1975, Ser. No. 584,996
Int. Cl.^{2} B23P *19/04*
U.S. Cl. 29—267 **2 Claims**



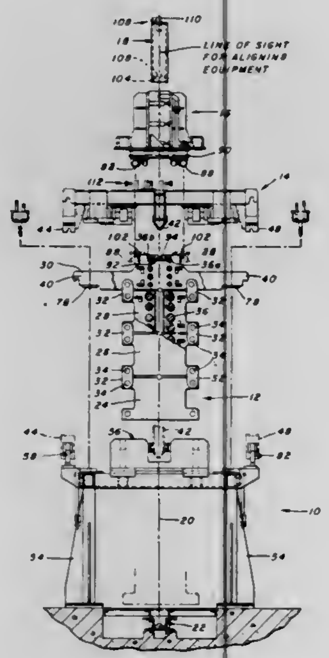
1. A tool for removing or installing a retaining pin of an assembly which includes a supporting shank having a through bore, a member which has parallel side walls and transverse

walls defining a socket to receive said shank with aligned holes in said side walls that register with the through bore when the member is properly mounted on the shank, a retaining pin which impales said through bore and aligned holes, and a retainer washer which seats in a cavity of the assembly and engages said pin, said tool comprising, in combination:
- a mounting element which includes a web and means for securing said mounting element to the member with an end portion of said web spaced laterally outside the plane of one of the sidewalls, said means consisting of a pair of parallel, fixed flanges projecting from a side of said web, the space between said flanges being such that they closely embrace the sidewalls of the member to secure the web stably to said member, one of said flanges being at the end of the web remote from said end portion, and the other of said flanges being adjacent said end portion;
- a lever pivoted on said end portion of the web for rotation in a plane normal to said sidewalls, said lever having an arm alongside said one of said sidewalls when said mounting element is secured to said member;
- and a stud pivoted on said arm of the lever, said stud being in axial alignment with the retaining pin when the mounting element is secured to the member, said stud having a pin engaging end portion that is smaller in diameter than the holes in the sidewalls, said lever being constructed to provide manually operable force multiplying means by which the stud may be moved effectively axially to slide the retaining pin endwise and selectively engage or disengage the pin and the retainer washer.

3,967,362
CONTINUOUS CASTER ALIGNMENT METHOD

Alfred J. Capriotti, Falls Township, Bucks County, and Louis G. Lazzaretti, Harmony Township, Beaver County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed July 14, 1975, Ser. No. 596,035
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 **6 Claims**

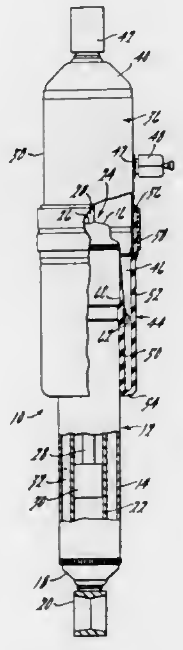


1. A method of aligning elements of a continuous-casting apparatus including a mold, a mold support, a mold oscillator table and a discharge rack said method comprising:
- spacing the roller elements of the discharge rack a given distance from a given line which is coincident with the center line of the product passing through such continuous-casting apparatus;
- leveling the discharge rack about a portion thereof through which such discharge rack is supported within such continuous-casting apparatus;
- supporting the discharge rack about the supporting portions thereof;
- locating a first locating assembly at the top of the discharge rack, such first locating assembly being configured having a target located in an established dimensional relationship with the center line of the product passing through such continuous-casting apparatus;
- locating the mold oscillator table on top of the discharge rack;
- placing such mold support on top of the oscillator table;
- locating a second locating assembly within a bottom portion of the mold, such second locating assembly being configured having a target located in such established dimensional relationship with the center line of the product passing through such continuous-casting apparatus;
- placing the mold within the mold support;
- locating an optical instrument within the top of the mold, the optical instrument having a line of sight located in such established dimensional relationship with the center line of the product passing through such continuous-casting apparatus;
- sighting through the optical instrument; and
- adjusting the positions of the discharge rack, mold oscillator table and mold support relative to one another until all of the targets are aligned with a target located below the discharge rack which is in such established dimensional relationship with the center line of the product as it enters the remainder of such continuous-casting apparatus.

3,967,363
METHOD AND APPARATUS FOR MANUFACTURING COMBINATION SHOCK ABSORBERS AND LEVELING STRUTS

Robert R. Meyer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Dec. 13, 1973, Ser. No. 424,294
Int. Cl.² B23P *15/00;* **F16F** *9/04*
U.S. Cl. 29—434 **15 Claims**

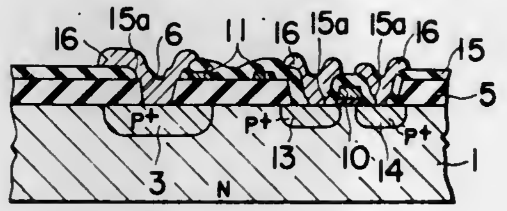


1. A method for installing a diaghragm on a combination shock absorber-leveling unit of the type including a shock absorber having a piston and piston rod supported for reciprocal movement in a body member and with a dirt shield connected to the piston rod comprising the steps of:
- locating the diaphragm on the body member;
- connecting a first end of the diaphragm to the body member;
- moving the diaphragm longitudinally to a position wherein the opposite end thereof extends around a plurality of radially movable deforming fingers arranged concentrically of the shock absorber,
- thereafter moving said fingers radially outwardly and thereby radially expanding a portion of said opposite end of said diaphragm so as to define a generally radially extending portion of said diaphragm,
- moving said dirt shield and said diaphragm axially of one another so that the adjacent end of said dirt shield engages said radially extending expanded portion of said diaphragm and continuing to move said dirt shield and diaphragm axially of one another such that said end of said dirt shield moves axially interiorly of said fingers and thereby transpositions said opposite end of said diaphragm off from said fingers and onto the end of said dirt shield, and
- connecting said opposite end of said diaphragm to the dirt shield.

3,967,364
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Hiroshi Kawamoto, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 6, 1974, Ser. No. 503,875
Claims priority, application Japan, Oct. 12, 1973, 48-113931
Int. Cl.² H01L *21/88, 21/441*
U.S. Cl. 29—578 **16 Claims**

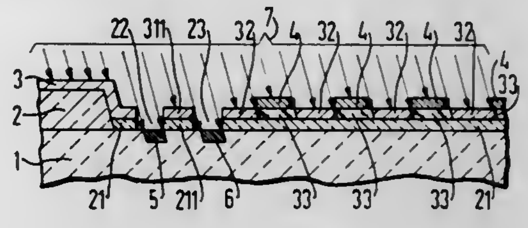


1. A method of manufacturing a semiconductor device comprising the steps of:
- a. selectively introducing a first impurity of a first conductivity type into a first surface portion of a semiconductor substrate of a second conductivity type, opposite said first conductivity type, to form a first semiconductor region of said first conductivity type in the surface of said substrate;
- b. forming a first layer of insulating material on the surface of said substrate;
- c. forming a first hole in said first layer of insulating material to expose a second surface portion of said substrate spaced apart from said first surface portion;
- d. introducing a second impurity into said substrate through said first hole to form a second semiconductor region which constitutes a semiconductor circuit element;
- e. forming a wiring layer on a part of said layer of insulating material covering said first surface of said first semiconductor region;
- f. forming a second hole in said first layer of insulating material to expose a surface portion of said first semiconductor region;
- g. forming a second layer of insulating material to cover at least said wiring layer and a portion of said second semiconductor region; and
- h. connecting, through said first and second holes, electrodes to said first and second semiconductor regions.

3,967,365
PROCESS FOR THE PRODUCTION OF A TWO-PHASE CHARGE SHIFT ASSEMBLY

Hans Friedrich, Poering, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 9, 1974, Ser. No. 496,153
Claims priority, application Germany, Aug. 24, 1973, 2342923
Int. Cl.² B01J *17/00*
U.S. Cl. 29—579 **6 Claims**

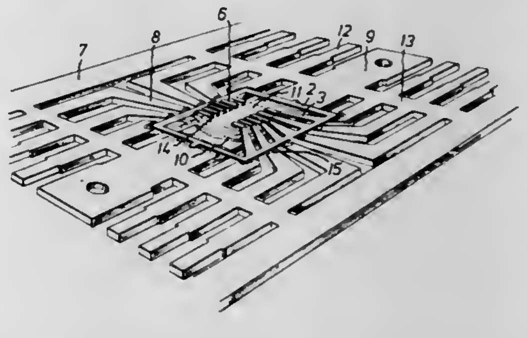


1. A process for the production of a two-phase charge shift assembly comprising applying an insulating layer to a semiconductor substrate, applying a highly ohmic polycrystalline silicon layer to said insulating layer, forming metal electrodes on said polycrystalline layer, said electrodes being arranged so that they protect the substantially non-conductive polycrystalline zones lying beneath them, said metal electrodes having spaced edges thereon, implanting charge carriers by ion implantation in an oblique direction with respect to said edges and the surface of said substrate into zones of said layer of polycrystalline silicon to thereby form conductive electrodes in the layer of polycrystalline silicon to serve as electrodes between electrically insulating zones of polycrystalline material, some of said edges shading the underlying polycrystalline layer against ion implantation so that no electrical connections exist between the electrodes and the polycrystalline layer at said edges, while ion implantation occurs at others of said edges to thereby provide electrical connections between such other edges and the ion implanted polycrystalline layer.

3,967,366
METHOD OF CONTACTING CONTACT POINTS OF A SEMICONDUCTOR BODY

Georg Birglechner, Obereisesheim, and Leonard Botzenhardt, Heilbronn, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 22, 1974, Ser. No. 453,880
Claims priority, application Germany, Mar. 29, 1973, 2315711
Int. Cl.² B01J *17/00*
U.S. Cl. 29—588 **11 Claims**



10. A method for contacting contact points of a semiconductor body comprising the steps of: attaching said semiconductor body to a heat conducting portion of a first frame having inwardly projecting tongues directed towards said contact points on said semiconductor body, positioning a second frame, having a closed outer portion and a plurality of inwardly projecting tongues, with the ends of these said tongues in engagement with said contact points of said semiconductor body and with at least said closed outer portions of said second frame in engagement with said tongues of said first

frame, attaching said second frame by its engaging parts to said semiconductor body and to said first frame, cutting said outer portion of said second frame at positions between said tongues of said first frame to separate said tongues of said second frame, and render them extensions of said tongues of said first frame, and separating said first frame to separate said tongues of said first frame to provide insulated lines to said contact points of said semiconductor body.

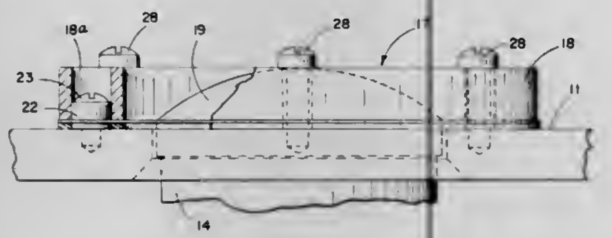
3,967,367
METHOD FOR ALIGNING LOUDSPEAKER DIAPHRAGM AND VOICE COIL ASSEMBLY

William L. Hayes, and Jerry A. Siciliano, both of Anaheim, Calif., assignors to Altec Corporation, Anaheim, Calif.

Filed Oct. 14, 1975, Ser. No. 621,963

Int. Cl.² H04R *31/00*

U.S. Cl. 29—594 **4 Claims**



1. A method for accurately installing a diaphragm and voice coil assembly in a driver type loudspeaker with the voice coil of the assembly centered in an annular magnetic gap between a pole piece-phasing plug and a top plate of the speaker, comprising the steps of:

- placing spacer means in said gap, said spacer means having a thickness dimension equivalent to the desired spacing between the coil and the pole piece-phasing plug,
- loosely installing at least a pair of dowel members on retaining means attached to the top plate, said dowel members being free to move radially relative to the top plate,
- placing the diaphragm and voice coil assembly over the phasing plug and on the top plate with the voice coil in the magnetic gap and with the spacer means acting to center the coil in the gap, said assembly having a mounting ring with apertures formed therein into which the dowel members are fitted snugly, said dowel members assuming a position on the top plate due to the centering of the voice coil in the gap,
- with the diaphragm and voice coil assembly installed in position, locking the dowel members, in their assumed position, to the top plate by means of their associated retaining means, and
- fastening said assembly to the top plate.

3,967,368
METHOD FOR MANUFACTURING AND USING AN INTERNALLY BIASED MAGNETORESISTIVE MAGNETIC TRANSDUCER

George W. Brock, Boulder, and Frank B. Shelledy, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

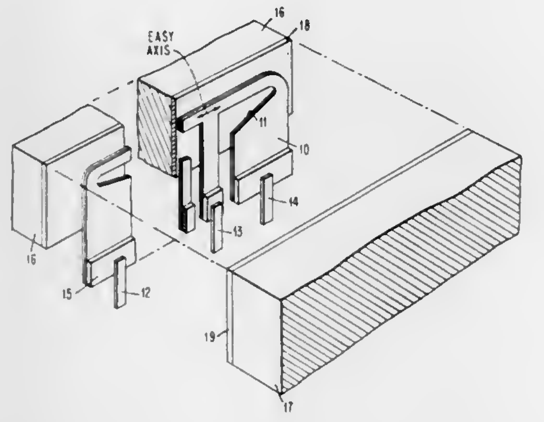
Continuation of Ser. No. 448,132, March 4, 1974, abandoned, which is a division of Ser. No. 296,742, Oct. 11, 1972, Pat. No. 3,813,692. This application Apr. 30, 1975, Ser. No. 572,976

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 **2 Claims**

1. A method of manufacturing a magnetic read head including the steps of:

- depositing a first layer of insulating material on a magnetic supporting substrate;
- depositing a second layer of relatively conductive constant resistance material in contact with the first layer;
- depositing a third layer of variable resistance material exhibiting a magnetoresistive effect directly in contact with the second layer;
- applying a highly conductive metal to selected areas of the layers;
- applying a mask to portions of the metalized areas;
- etching the unmasked areas with an etchant to remove portions of the variable resistance material and highly conductive metal;



- depositing a layer of insulating material over the remaining portions of the variable resistance material and highly conductive metal; and
- placing a magnetic covering over aforesaid layer wherein said magnetic covering and said magnetic substrate comprise pole pieces in said magnetic read head.

3,967,369
PROCESS FOR MAKING ELECTRICAL SWITCHES

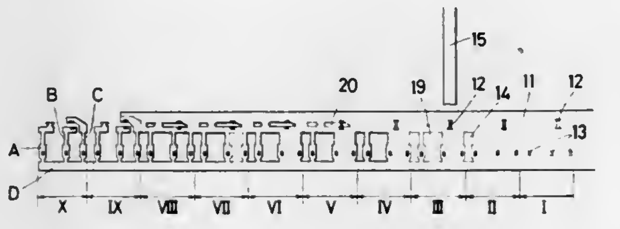
Tetsuo Takano, Toyama, Japan, assignor to Takano Precision Industry Co., Ltd., Japan

Division of Ser. No. 399,681, Sept. 24, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,645

Claims priority, application Japan, Sept. 26, 1972, 47-96402

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 **5 Claims**



1. A process for the manufacture of an electric switch, characterized by the following steps:

- punching I-shaped holes through a sheet conductor,
- forming contact pieces substantially conforming to said I-shaped holes by punching from a strip of contact material,
- inserting said contact pieces under pressure into said I-shaped holes,
- swaging the contact pieces both upwardly and downwardly so as to retain said pieces within said sheet conductor,
- subsequently perforating the I-shaped contact pieces across the middle thereof in conjunction with the adjoining portion of the surrounding sheet conductor so as to remove a predetermined portion of said contact pieces for thereby simultaneously forming two oppositely disposed contacts and a contact gap therebetween, and
- simultaneously finishing the opposed faces of the resultant paired contacts by the treatment of shaving so as to impart to said contacts a smooth surface finish and to precisely adjust the size of said gap therebetween.

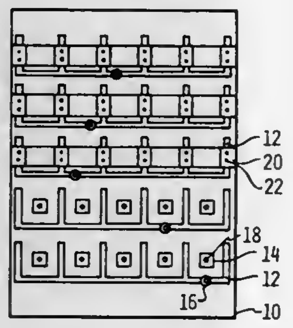
3,967,370
METHOD OF MANUFACTURING A MULTICONTACT SWITCH

Harry Charles Griffin, Mountain View; Thomas Edwin Holden, Scotts Valley, and Orland Edgar Upton, Campbell, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 3, 1975, Ser. No. 564,948

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 **23 Claims**



1. A method of making a multicontact switch comprising the steps of:

- providing an insulative substrate having a plurality of first and second contact areas thereon;
- providing a strip of conductive material;
- forming a series of arched portions in the strip of material by passing the strip between a first and a second roller, the first roller having a series of indentations about its circumference and the second roller pressing the strip into the indentations in the first roller to form the arched portions;
- aligning each of a predetermined number or arched portions on a selected length of the strip with selected ones of the first and second contact areas on the substrate;
- fastening the selected length of strip to the substrate by attaching portions of the strip between each arched portion in the selected length of strip to the second contact areas so that each of the predetermined number of arched portions is arched over a first contact area; and
- severing the selected length of strip from the remainder of the strip.

3,967,371
METHODS OF MANUFACTURING MULTILAYER INTERCONNECTIONS FOR INTEGRATED CIRCUITS AND TO INTEGRATED CIRCUITS UTILIZING SAID METHOD

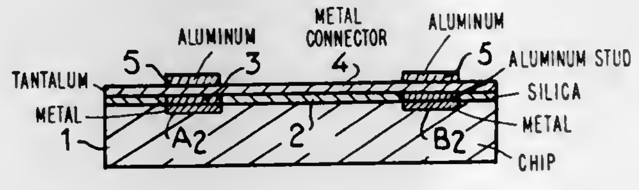
Michel Croset, and Noel Nouailles, both of Paris, France, assignors to Sescosem- Societe Europeenne des Semi-Conducteurs et de Microelectronique, Paris, France

Continuation of Ser. No. 269,871, July 7, 1972, abandoned, which is a continuation of Ser. No. 102,379, Dec. 29, 1970, abandoned. This application Aug. 21, 1973, Ser. No. 390,298

Claims priority, application France, Jan. 6, 1970, 70.00288

Int. Cl.² H01L *21/88*

U.S. Cl. 29—625 **3 Claims**



1. Process of manufacturing multilayer interconnection patterns for interconnecting elements integrated over the same substrate comprising the steps of:

- a. forming a contact zone for each element;
- b. depositing over said substrate a first conductive layer of a first metal, etching according to a predetermined pattern, said first layer interconnecting some of said contact zones;
- c. depositing over said conductive layer a second layer of a metal easily oxidizable by a well defined thermal treatment and that upon oxidation forms an oxide having a high resistance to chemical agents and high dielectric properties;
- d. depositing protecting studs over said second layer, said studs extending over some of said contact zones and being made of a body resistant to said thermal treatment;
- e. treating the whole assembly thermally in an oxidizing atmosphere at elevated temperature, whereby the non-protected zones of said second layer are preferentially oxidized to a non-conductive oxide and thereby forming a third dielectric layer, and the non-protected zones of said second layer are at most only partially oxidized;
- f. depositing over said assembly a third conductive layer of said resistive metal as in step (b); and
- g. etching said third layer according to a predetermined pattern thereby interconnecting some of said contact zones.

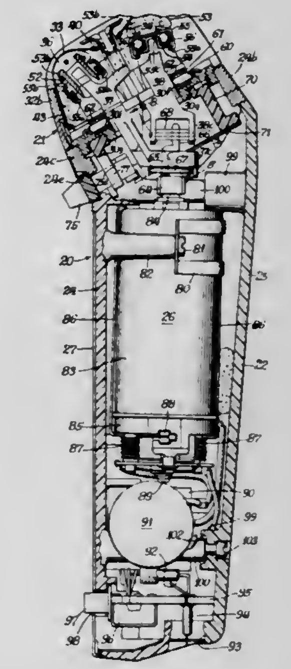
3,967,372
SHAVER WITH ADJUSTABLE LONG HAIR TRIMMER

William P. Beck, Westchester; Francis L. Carr, Downers Grove; Howard R. Chapin, Park Ridge, and Gordon Bast, West Chicago, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Mar. 31, 1972, Ser. No. 239,998

Int. Cl.² B26B *19/10*, *19/04*

U.S. Cl. 30—34.1 **17 Claims**



1. An electric shaver having means for cutting long and short facial hair and for trimming moustaches and sideburns comprising a pair of arched perforated shaving combs supported in spaced parallel relation on a supporting frame, a housing enclosing a motor, oscillating driving means connected to said motor and extending outside of said housing, a pair of separated cutting means each driven by said driving means and each engaged with the underside of one of said combs to cut hair therebetween, a T-shaped trimmer having mounting and driving portions extending between said combs and said cutting means toward said housing, said trimmer having support means which guide said trimmer for movement in the direction in which said mounting portion extends to position said trimmer in at least two alternative positions, said trimmer having oppositely facing rows of cutting teeth which overlie the edges of said combs, one of said positions being a position in which said teeth lie in a plane tangent to the curva-

ture of said combs, the other of said positions being a second position in which said trimmer is elevated above said combs to permit trimming of hair independent of the use of said shaving combs, said housing enclosing a rotary cam which is actuable from the exterior of said housing to position said trimmer in either of said positions, cam followers extending from said cam through the wall of said housing into engagement with the mounting portions of said trimmer, a manually operated slide on said housing for actuating said cam, said slide comprising a one piece plastic member having a pair of outwardly extending flexible arms which engage the outside wall of said housing and a connecting portion extending through a slot in said housing into engagement with said cam, combination retaining and detent means in said connecting portion biased into engagement with the interior of said housing by said arms.

3. An electric shaver comprising two spaced short hair shaving heads and a long hair trimmer supported in part on a head frame which is removably mounted on a housing, said housing enclosing a motor which drives the shaving heads and trimmer, said shaving heads include a pair of cutters mounted for reciprocating movement on said housing within said head frame, said shaving heads also including perforated flexible combs mounted on said head frame, guide means on said head frame supporting said trimmer for movement toward and away from said shaving heads, cam means on said housing to control the position of said trimmer, and means on said head frame biasing said movable trimmer into engagement with said cam means.

3,967,373
OUTER BLADE FOR ELECTRIC SHAVER

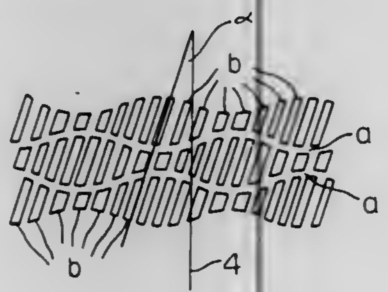
Satoshi Sakai, Hirakata; Norio Shimizu, Neyagawa, and Junji Nomura, Takatsuki, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 20, 1974, Ser. No. 453,042

Claims priority, application Japan, Mar. 22, 1973, 48-32859; Mar. 22, 1973, 48-32860

Int. Cl.^{2} B26B *19/04*

U.S. Cl. 30—43.92 **10 Claims**



1. An outer blade for an electric shaver in the form of a flat perforated thin metal plate of rectangular outline capable of being bent into "U" shape for cooperating with a cyclically moving set of interior blades of conforming profile for shearing beard hairs, the outer blade having a frame portion and a field portion, the field portion having generally longitudinally extending ribs extending along axes which are spaced generally parallel to one another, adjacent ribs defining between them respective series of closely spaced openings extending from rib to rib, the ribs being of wavy sinusoidal configuration with adjacent ribs being out of phase with one another so that the length of adjacent openings as measured from rib to rib differs, the length increasing and decreasing on a cyclical basis, and with a substantial difference in length between the longest openings and the shortest openings so that the longest openings are long enough to admit long beard hairs for shearing by the interior blades, adjacent ones of the closely spaced openings being of generally similar shape parallel to one another.

10. In an electric shaver, an outer blade and an inner blade assembly, the outer blade being in the form of a perforated thin metal plate, the outer blade having a frame portion and a field portion, the field portion having generally longitudinally extending ribs extending along axes which are spaced generally parallel to one another, adjacent ribs defining between them respective series of closely spaced openings extending from rib to rib, the ribs being of wavy sinusoidal configuration with adjacent ribs being out of phase with one another so that the length of adjacent openings as measured from rib to rib differs, the length increasing and decreasing on a cyclical basis, and with a substantial difference in length between the longest openings and the shortest openings so that the longest openings are long enough to admit long beard hairs for shearing by the interior blades, adjacent ones of the closely spaced openings being of generally similar shape and parallel to one another, the inner blade assembly being in the form of a reciprocated set of interior blades arranged in spaced parallel relation to one another and of "U"-shaped profile; the outer blade being bent into conforming profile, the closely spaced openings in the outer blade being so angled that the longitudinal edges thereof bear a constant shallow angle with respect to the edges of the interior blades.

3,967,374
SHAVING HEAD FOR A DRY-SHAVING APPARATUS

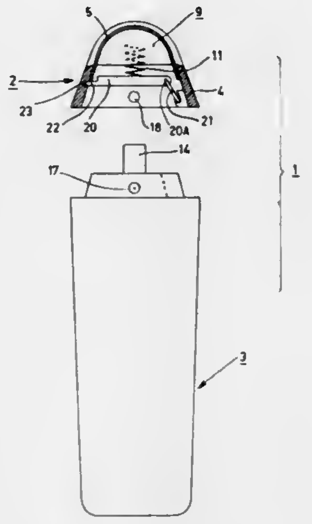
Ebbe Boiten, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,493

Claims priority, application Netherlands, Apr. 25, 1974, 7405554

Int. Cl.^{2} B26B *19/04*

U.S. Cl. 30—43.92 **10 Claims**



1. In a dry shaving apparatus including a housing, a motor with a drive member in said housing, a shaving head which is detachably mounted on said housing and includes a cap having first and second opposite side walls, a top part and an open bottom part, a shear plate with hair-receiving apertures therein at said top part, a cutter having a base and a plurality of blades for engaging and cooperating with said shear plate for cutting hairs extending through said shear plate apertures, and coupling means on said base for engaging said drive member, the improvement in combination therewith, of a frame for supporting said cutter within said cap, said frame having first and second opposite sides corresponding to said first and second side walls of said cap, spring means extending between and engaging said frame and said base of the cutter, pivotable hinge means comprising a body part, a first pivot connection engaging said first side of said cap and a second pivot connection engaging said first side of said frame, latch means comprising first and second parts on said second sides of said frame and cap respectively, said frame being pivotable between operative position and open position, said frame when in operative position, being disposed within said cap with said spring means compressed and urging said cutter blades against shear plate, said spring also urging said first and second parts of said latch means into releasable locking engagement, and

said frame when in open position, being completely outside the cap.

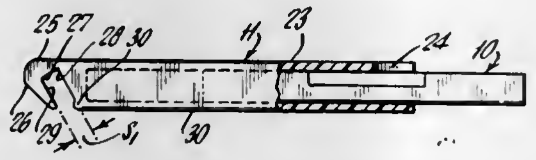
3,967,375
RAZOR CONSTRUCTION

Edward J. Hoffschmidt, Harpsichord Turnpike, Stamford, Conn. 06903

Continuation of Ser. No. 335,447, Feb. 26, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,548

Int. Cl.^{2} B26B *21/52;* **B65D** *81/00*

U.S. Cl. 30—47 **10 Claims**



9. In combination, an elongated integral single-piece generally prismatic molded-plastic sheath having a hollow generally prismatic interior open to one of the sides of said sheath, the sectional extent of said open side being of at least the sectional extent of the interior to which access is had via said open side; and a razor-blade subassembly comprising blade means and a rigid back permanently united to and supporting said blade means with at least one elongate straight cutting edge positioned and exposed for a shaving cut, said back defining between front and back faces blade-mounting means at and adjacent to a back edge parallel to said cutting edge, one of said faces having a central locking recess offset from said back edge, the overall length, width and thickness dimensions of said subassembly conforming to the length, width and thickness dimensions of the interior of said sheath, whereby the subassembly is removably insertable in said sheath via said open side; at least one of the longitudinal-end sides of said sheath being closed and including a hooked lug formation of width substantially coextensive with the width dimension of said sheath and defining a razor-mounting opening having an inner-wall contour integrally formed with one longitudinal-end side of said sheath and substantially matching the longitudinally central sectional contour of said subassembly at least at the region thereof which includes said back-edge and at adjacent portions of said front and back faces, the outermost end of said lug formation defining with the opposed inner-wall contour a blade-clamping span which is no greater than the lug-overlapped local effective thickness of said blade-mounting means when the back edge of said blade assembly is received in said hooked lug formation, and said sheath having at the lug-formed end thereof a centrally located integral detent formation projecting within said span and positioned for razor-retaining register with said recess when the longitudinally central back-edge region of said razor-blade subassembly is fitted to said contour.

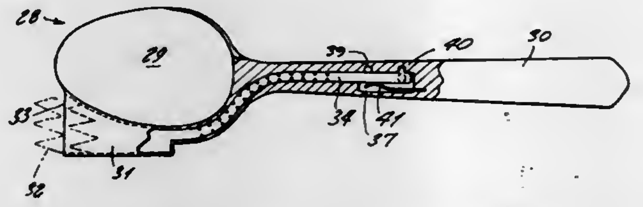
3,967,376
CLEAN UP/CUT SPOON

Donald E. Foley, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Feb. 5, 1974, Ser. No. 440,133

Int. Cl.^{2} A47J *43/28*

U.S. Cl. 30—150 **1 Claim**



1. In an article of cutlery, a feeding implement having means to be selectively used as either one of several different conventional feeding implements, said implement comprising a spoon bowl integral with a handle, a flange integral with one side edge of said bowl, an outer side edge of said flange being straight so that said flange serves as a food scraper, said flange being hollow and containing a second feeding implement slidable inwardly or outwardly of an opening in said flange, wherein a push rod slidable in a longitudinal channel within said handle serves to selectively slide said second feeding implement inwardly or outwardly of said flange, wherein a knob on an end of said push rod projects outward of a slot in said handle for manual control to slide said push rod, wherein said second implement comprises a fork integral with said push rod and which is slidable from a front end of said flange.

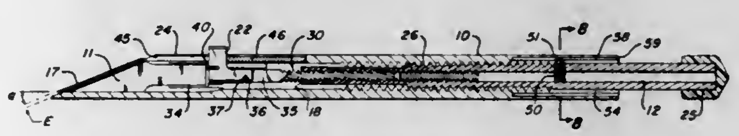
3,967,377
PRECISION POSITIONING DEVICE FOR TOOL BLADES AND THE LIKE

Royzell F. Wells, 6936 S. Sycamore St., Littleton, Colo. 80120

Filed Mar. 17, 1975, Ser. No. 558,709

Int. Cl.^{2} B26B *1/08, 5/00*

U.S. Cl. 30—320 **9 Claims**



1. Apparatus for providing precise linear positioning of a member comprising:

housing means having a cylindrical threaded portion thereon,

spindle means having first and second cylindrical threaded sectors in spaced relation thereon with said first threaded sector being arranged for cooperative engagement with said threaded portion of said housing means,

chuck means including means at one end for gripping the member and a cylindrically threaded segment at the other end for cooperatively engaging said second cylindrical threaded sector of said spindle means, the threads of said segment and said second sector being of a smaller pitch but common direction relative to the threads of said housing means and said first sector, and

means retaining said chuck means for permitting axial movement thereof relative to said housing means while preventing rotary motion between said chuck means and said housing means, said retaining means including means extending through and externally accessible from said housing means for releasably engaging said gripping means with the member, whereby application of relatively large rotary motion to said spindle means results in relatively small linear motion of the member gripped by said chuck means.

3,967,378
SAW CHAIN GUIDING ARRANGEMENT

Uwe F. Arff, and Ronald J. Hatton, both of Peterborough, Canada, assignors to Outboard Marine Corporation, Waukegan, Ill.

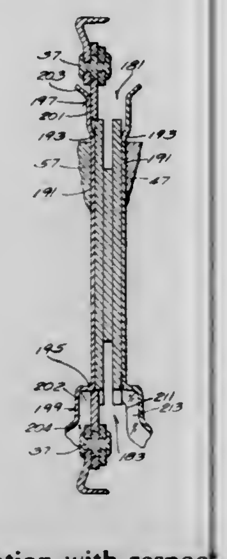
Filed Nov. 25, 1974, Ser. No. 526,704

Int. Cl.^{2} B25B *17/02;* **B23D** *57/02*

U.S. Cl. 30—383 **16 Claims**

1. A chain saw comprising a frame, an engine supported by said frame, a chain sprocket rotatably supported by said frame and driven by said engine, a sprocket guard supported from said frame, a cutter bar having an end supported between said frame and said sprocket guard in spaced relation from said sprocket, a first guide plate supported between said frame and said cutter bar and including a main part, and a guide portion extending from said main part and including a first part extending in generally parallel and laterally outwardly offset relation with respect to said cutter bar and a second part diverging laterally outwardly from said first part, and a second

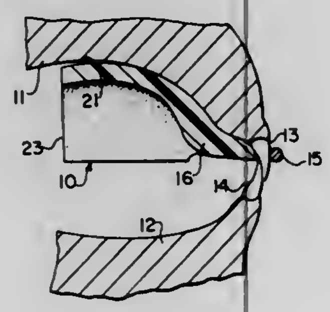
guide plate supported between said sprocket guard and said cutter bar and including a main part, and a guide portion extending from said second guide plate main part and including a first part extending in generally parallel and laterally



outwardly offset relation with respect to said cutter bar, and a second part diverging laterally outwardly from said first part of said guide portion of said second guide plate, and a chain trained around said sprocket and extending between said guide portions and around said cutter bar.

3,967,379
PREFORMED ANTERIOR LABIAL RETAINER

Earl O. Bergersen, 950 Linden Ave., Winnetka, Ill. 60093
Filed Dec. 18, 1974, Ser. No. 534,095
Int. Cl.^{2} A61C *7/00*
U.S. Cl. 32—14 B **63 Claims**



1. A preformed orthodontic device adapted to be placed within a patient's mouth and reshaped against the lingual surfaces for holding a wire against the labial surfaces of the patient's anterior teeth, said device comprising:

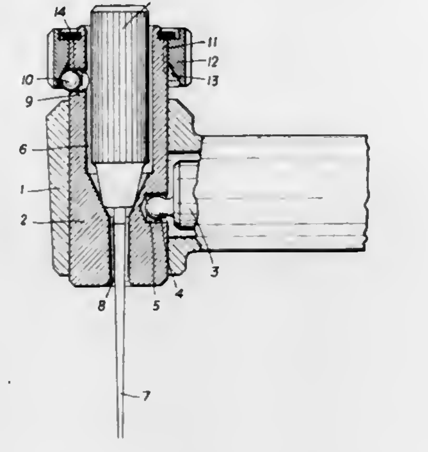
a forward portion having a front edge positionable adjacent the lingual surfaces of the said anterior teeth,

and a rearward portion extending rearwardly along the lingual surfaces of some posterior teeth including at least the bicuspid teeth, said rearward portion including an essentially plain exterior surface lying adjacent said posterior teeth at least from that side of the gingival edges away from the occlusal edges, across the gingival edges to at least part of the distance towards the occlusal edges thereof.

3,967,380
CLAMPING MECHANISM FOR RECIPROCATING DENTAL TOOL

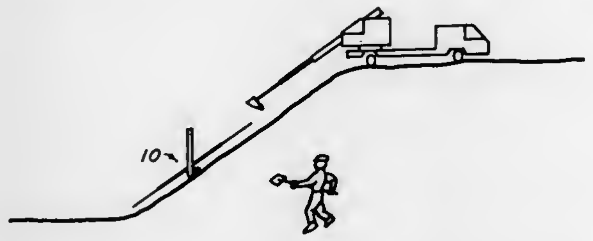
Peter Malata; Josef Buchsteiner, both of Burmoos, and Otto Rosenstatter, Seeham, all of Austria, assignors to Dentalwerk Burmoos Gesellschaft m.b.H., Burmoos, Austria
Filed Aug. 23, 1974, Ser. No. 500,019
Int. Cl.^{2} A61C *1/10*
U.S. Cl. 32—27 **9 Claims**

1. A reciprocating tool holder assembly, particularly suited for mounting a tool useful in the practice of dentistry, said assembly comprising, in combination, a hollow generally cylindrical tool holder defining therein a tool holder chamber adapted to have a tool inserted therein, means engaging said tool holder to produce reciprocating motion thereof, a plurality of bores formed through the walls of said tool holder and opening into said tool holder chamber, a plurality of generally shperically shaped clamping members, loosely fitted one within each of said bores and configured to partially extend to within said tool holder chamber to effect a radial clamping force against the body located within said chamber, said bores being shaped to limit movement of said clamping members radially inwardly of said bores to prevent said clamping members from passing through said bores into said tool holder chamber while enabling said clamping members to extend partially into said tool holder chamber to engage said tool and apply a radial clamping force thereagainst, a clamping nut adjustably engaged upon said tool holder and having defined thereon conical surface means located to engage said clamping members and adapted to force said clamping members radially inwardly of said bores toward said chamber upon adjustable positioning of said nut relative to said tool holder, and a conically shaped internal abutment surface defined interiorly of said tool holder chamber and adapted to be engaged by a complementary surface of a body placed within said chamber for axially positioning a tool within said chamber, with a tool inserted within said tool holder chamber being axially positioned by said internal abutment surface and have applied thereto a radially directed clamping force by operation of said clamping nut and said clamping members to hold said tool in place during operation of said assembly.



3,967,381
GROUND SLOPE INDICATING INSTRUMENT

Edward N. Chesbro, Stowel Hill Road, Londonderry, Vt. 05148
Filed Jan. 3, 1975, Ser. No. 538,302
Int. Cl.^{2} G01C *15/00*
U.S. Cl. 33—1 H **6 Claims**



1. A ground slope indicating instrument for guiding the construction of an embankment comprising:

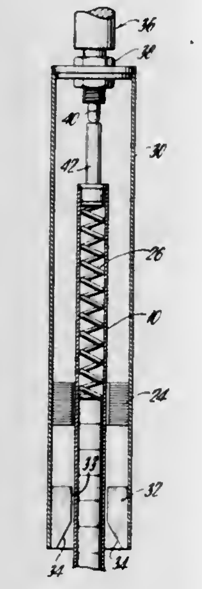
a shaft being tapered to a point at one end whereby stable mounting may be realized by pushing said point into the ground;

a spirit bubble level indicator being mounted to said shaft for the purpose of guiding said mounting of said shaft to a predetermined vertical position; and

a plurality of slope indicating rods, said shaft having a plurality of pairs of holes, each said hole adapted to receive and fixedly attach one end of one of said rods, said holes of each of said pairs being coaxial and positioned on opposite sides of said shaft, and said rods attached in said coaxial holes defining a single straight line, said coaxial rods defining an angle in a vertical plane relative to said vertically mounted shaft to indicate a desired grade to earth moving machine operators at a work area remote from said instrument.

3,967,382
PLENUM CHAMBER LENGTH MEASUREMENT SYSTEM FOR NUCLEAR FUEL

Keith O. Johnson, and Fredrick M. Coffman, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.
Filed Jan. 10, 1975, Ser. No. 540,152
Int. Cl.^{2} G01B *7/14*
U.S. Cl. 33—125 R **12 Claims**



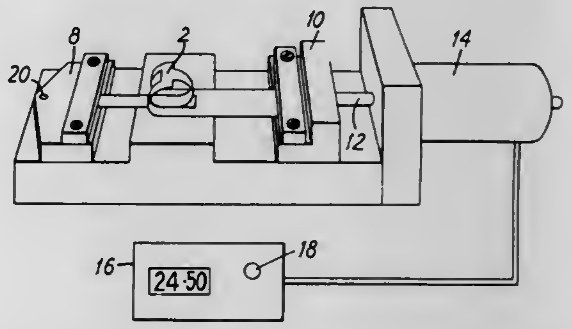
1. A system for use in measuring the length of the plenum chamber of a nuclear fuel rod including a plenum spring having a first end in contact with a fuel column, said system comprising casing means having mounted at one end thereof a transducer means having a displaceable plunger extending into said casing means for contact with said nuclear fuel rod when said rod is disposed in said casing, said transducer providing an output signal proportional to the displacement thereof by an adjacent end of said fuel rod, and coil means mounted within said casing means spaced from said one end a predetermined distance for receiving said fuel rod therein and adapted to produce an output signal when said first end of said plenum spring is centrally located in said coil.

3,967,383
CIRCUMFERENCE GAUGE AND RECORDING METHOD

Terrence Collins, Whitburn, England, assignor to American Filtrona Corporation, Richmond, Va.
Filed Apr. 17, 1975, Ser. No. 568,854
Claims priority, application United Kingdom, Apr. 17, 1974, 16838/74
Int. Cl.^{2} G01B *3/10, 3/02*
U.S. Cl. 33—179 **25 Claims**

17. A measuring tape comprising an elongated element including an intermediate portion forming means defining a closed loop with its two end portions extending away from the loop in opposite directions, said end portions of said looped element being firmly affixed to respective separate plates, said plates having inwardly directed end portions extending arcuately towards one another around a portion of the circumference of said loop.

22. A measuring gauge comprising, in combination, a tape including an intermediate portion forming means defining a closed loop with its two end portions extending away from the loop in opposite directions, two mounting members, one fixed relative to each end portion of said tape and mounted for relative movement towards and away from one another to increase or decrease the loop circumference, and means responsive to the distance apart of two datum points, one fixed relative to each mounting member to indicate the size of said loop, means resiliently biasing said mounting members away from each other to tighten said loop, cam means comprising a generally annular body having an inner peripheral cam surface, cam follower means including at least one cam follower member attached to a movable mounting member and operatively engaging said cam surface, said cam means being rotatable and said cam surface having first portions which, when engaged by said cam follower means, moves said mounting members towards each other against said resilient bias to loosen said loop for acceptance or release of a rod to be measured, and second positions which permit said resilient bias to move said mounting members away from each other to tighten said loop around a rod to be measured, motor means operatively associated with said cam means to rotate said cam means, and control means for actuating and deactuating said motor means for rotating and stopping rotation of said cam means, said control means including means for actuating said motor means to rotate said cam means to a first position in which said cam follower means engage said first portions of said cam surface and said loop is at its maximum circumference, means to deactuate said motor means in said first position to permit insertion of a rod to be measured into said loop, means to again actuate said motor means after the rod to be measured is inserted into said loop to rotate said cam means to a second position in which said cam follower means is juxtaposed to said second portions of said cam surface to permit said resilient bias to tighten said loop around the rod to be measured, means to deactuate said motor means in said second position to allow measurement, and means to again actuate said motor means to rotate said cam means to a third position in which the loop is loosened, means to deactuate said motor means in said third position to permit removal from said loop of the rod that has been measured, said means for actuating said motor means to rotate said cam means to said first position being activated on removal of the rod that has been measured from said loop.



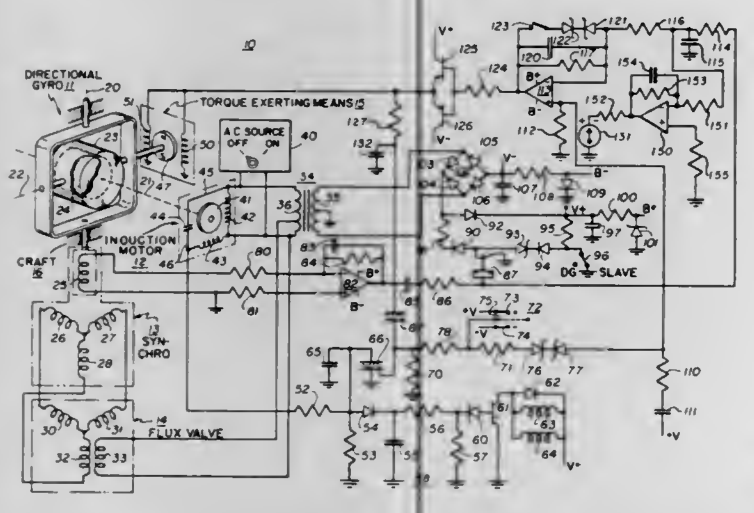
3,967,384
START-UP CONDITIONING MEANS FOR AN AZIMUTH REFERENCE

Harold L. Swartz, and Paul E. Tallman, both of Glendale, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Aug. 19, 1974, Ser. No. 498,689
Int. Cl.^{2} G01C *19/02*
U.S. Cl. 33—324 **15 Claims**

1. In a gyromagnetic compass system including a directional gyroscope normally slaved to magnetic meridian data as detected by a flux valve, a synchro coupled between the gyroscope and the flux valve for producing a slaving error signal, a drive motor for the rotor of the gyroscope including means for providing a signal in accordance with the speed thereof, a torque motor coupled to the gyroscope for controlling the

azimuthal position of the gyroscope, and an improved electronic circuit responsive to the slaving error signal and the rotor speed signal for controlling the torque motor to synchronize the gyroscope with the flux valve data, said improved electronic circuit comprising

amplifier means coupled between the synchro and the torquer for providing a slaving error drive signal to the torquer in accordance with the slaving error signal for valves of gyro rotor speed below a prescribed value,

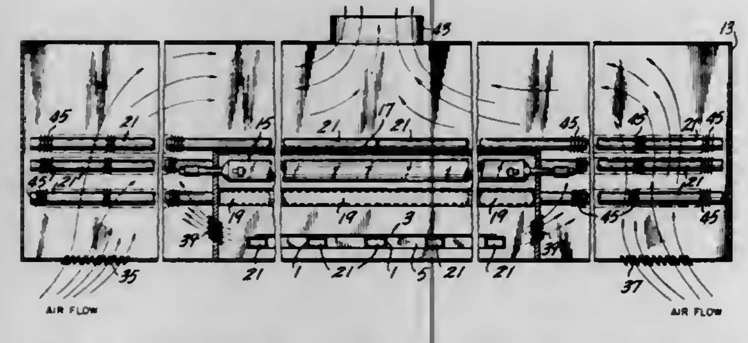


speed detector means coupled between the motor and said amplifier means, said detector means being responsive to the rotor speed signal for limiting the gain of said amplifier means for values of rotor speed above a prescribed value, and

null detector means coupled between said amplifier means and said speed detector means, and responsive to said slave error drive signal for inhibiting said speed detector means from limiting the gain of said amplifier means until said slave error drive signal is below a prescribed value thereby indicating that the gyro is substantially synchronized with the flux valve.

3,967,385
UTILIZATION OF HEAT PIPES FOR COOLING RADIATION CURING SYSTEMS

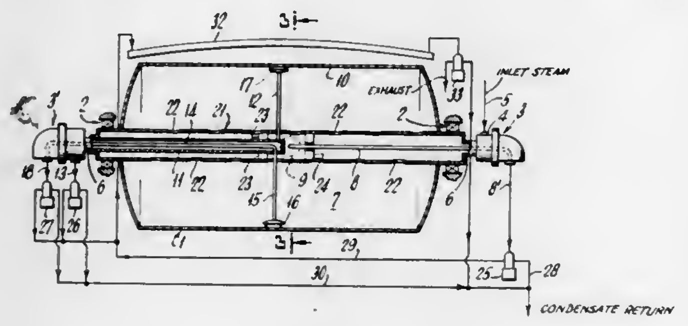
Donald L. Culbertson, Mountain Lakes, N.J., assignor to National-Standard Company, Wagner-Litho Machinery Division, Secaucus, N.J.
Filed Aug. 26, 1974, Ser. No. 500,576
Int. Cl.² F26B *3/34*
U.S. Cl. 34—4 **6 Claims**



1. In an apparatus for curing radiant energy curable material in which apparatus includes moving work to which said radiant energy-curable material is applied, a supporting-conveying means for said moving work, radiant energy means in spaced position relative to said moving work, said radiant energy means comprising an ultraviolet producing source and a reflector partially encasing said ultraviolet producing source and adapted to reflect radiant energy from said ultraviolet producing source toward said moving work, shutter means operable to a closed position relative to said radiant energy means for blocking the radiant energy from said ultraviolet producing source from impinging upon said moving work; the improvement which comprises providing in said apparatus a plurality of spaced heat pipes affixed to said reflector and said shutter means for cooling said elements.

3,967,386
MULTIPLE ROTARY SYPHON FOR CONDENSATE REMOVAL FROM A STEAM-HEATED ROTARY CYLINDER

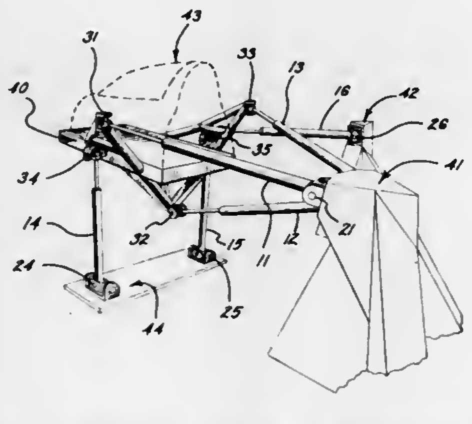
Abraham C. Miselem Asfura, Pachuca No. 87-102, Mexico City, Mexico
Continuation-in-part of Ser. No. 396,158, Sept. 11, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 504,994
Int. Cl.² F26B *11/02*
U.S. Cl. 34—124 **15 Claims**



1. In combination, a rotary drum having cylindrically bored main bearings at opposite longitudinal ends, a separate tube through the bore at each bearing and in spaced relation to such bore, whereby two independent passages exist between inside and outside of said drum via each bearing, separate rotary-joint connections to said passages at each end whereby independent stationary conduit connections may be made to each of the four independent passages involved, three separate angularly spaced syphon devices within said drum and secured for rotation therewith, each syphon device being independently connected to a different one of three of the four independent passages, said syphon devices having independent condensate-pickup relation with the inner surface of said drum and at locations spaced angularly with respect to the drum axis, and an external steam-supply connection to the fourth of said passages, whereby independent stationary condensate separators may be connected to the respective syphon devices to enable a continuous flow of steam for succeeding-stage utilization.

3,967,387
MOTION SIMULATOR

Daniel Marchegiani, 804 Bedford St., Fremont, Calif. 94538
Filed Oct. 21, 1974, Ser. No. 516,260
Int. Cl.² G09B *9/08*
U.S. Cl. 35—12 P **8 Claims**



1. A motion simulator capable of imparting motion to a payload in at least three degrees of freedom, comprising in combination:

a. a movable platform capable of supporting such a payload and in combination with said payload providing a center of mass, upon which can be defined an orthogonal X, Y and Z coordinate axis system, corresponding to a longitudinal lateral and vertical reference axis respectively;

b. three substantially separated points of support on said platform defining the corners of a triangular base, said base when oriented in a substantially vertical plane, the perpendicular to said plane lies substantially parallel to the longitudinal axis defined at the center of mass of said movable platform and payload combination;

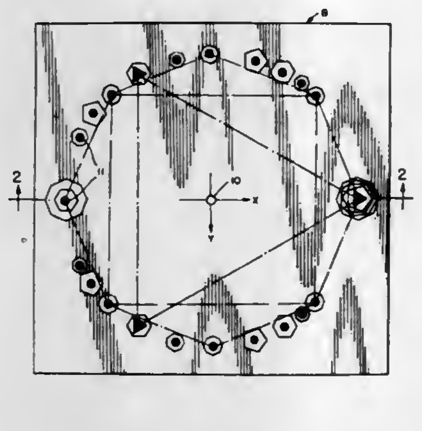
c. a first fixed support base in a second plane spaced substantially aft of said movable platform;

d. three generally coincident points of support on said fixed support base in proximity to each other and the longitudinal axis extended from the center of mass on said movable platform; and

e. a first means for imparting substantially pure longitudinal forces and displacements to the center of mass of said combined movable platform and payload, and imparting substantially pure rotational moments and displacements in the pitch and yaw degrees of motion about said center of mass, said means comprising three extensible and retractable actuators each having one of its ends connected to a respective one of the generally coincident points on said fixed support base and its opposite end connected to a respective one of the separated points of support on said movable platform, to thereby generally form a tetrahedral arrangement of actuators having its base defined by the triangular base in said first plane on said movable platform and its apex defined by the three generally coincident points of support on said first fixed support base.

3,967,388
MECHANICAL SYSTEM FOR VISUALLY DETERMINING PERMITTED ELECTRON DISTRIBUTIONS WITHIN MOLECULES

John C. Verkade, and Klaus Ruedenberg, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Continuation-in-part of Ser. No. 470,536, May 16, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,604
Int. Cl.² G09B *23/26*
U.S. Cl. 35—18 R **10 Claims**



1. An apparatus system for determining mechanically those combinations of AO's that are permitted for MO formation in a given molecule, comprising:

a. horizontally-extending base means providing on the upper surface thereof a central position and a plurality of peripheral positions arranged generally in a ring around said central position, said peripheral positions including sets of positions representing the corners of plane geometric figures including at least a straight line, an equilateral triangle, and a square;

b. pin means supportable at said central position to extend vertically upward therefrom for defining a generator axis;

c. a plurality of movable pin means selectively positionable on said base means at selected ones of said peripheral positions comprising the corners of one of said geometric figures corresponding to the general shape of the molecule for which the MO's are to be determined and extending upwardly from said base means around said central pin means;

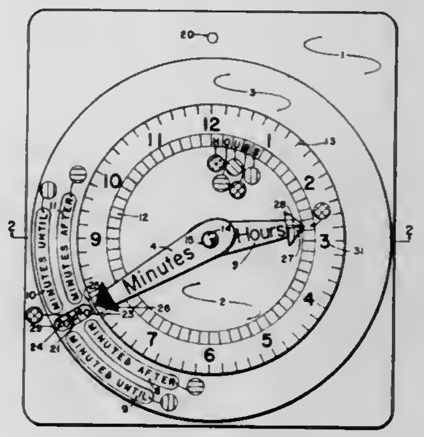
d. means for temporarily mounting said movable pin means at said selected positions;

e. a plurality of atomic orbital models (AO's) capable of representing *s* and *p* types of AO's, said AO models comprising bodies removably mountable on said peripheral pins at selected heights and orientations thereon; and

f. a plurality of generator models including models capable of representing said *s* and *p* types of AO's, said generator models comprising bodies removably mountable on said central pin means at selected heights and orientations thereon; said *s* type bodies for use on both said central and peripheral pin means being of generally spherical shape and including ones with one kind of matchable indicia and others with a different kind of matchable indicia, said *p* type bodies being symmetrical and having two axially-aligned lobes, one lobe of each *p* type body being provided with said first kind of matchable indicia and the other lobe with said other kind of matchable indicia, whereby sequented substitutions of the different AO bodies on said central pin means matching and mismatching alignments thereof with said AO bodies on said peripheral pin means will select those permitted arrangements of the AO's which form the MO's for a wide variety of molecules.

3,967,389
TIME TELLING TEACHING AID

Barry R. Brooks, 3945 Harvard Way, Livermore, Calif. 94550
Filed Mar. 24, 1975, Ser. No. 561,238
Int. Cl.² G09B *19/12*
U.S. Cl. 35—39 **5 Claims**



1. A time telling teaching aid comprising of,

a. a clockface with standard concentric clock indicia of minute segments and hour numerals with the addition of a concentric color and script coded minute ring made up of sixty equal segments, where five consecutive segments complete a sequence of different colors and script between any two hour numerals,

b. a base with minute numerals applied clockwise 1 to 59 at 6 ° intervals, minute numerals applied counterclockwise 1 to 30 at 6° intervals, a base color and script coded minute ring between said clockwise and counterclockwise minute numerals made up of five equal segments of the same five different sequenced colors and script as found within the forementioned clockface color and script coded minute ring between any two hour numerals, with said base indicia concentric about a pivot hole at a radius greater than that of the peripheral edge of the clockface and with the word "O'CLOCK" applied vertical to, and in the same vertical axes of, said pivot hole at the same radius as the forementioned base indicia,

c. a rotatable peripheral ring that covers the indicia of paragraph (b) which has an oblong selector window where said window exposes the forementioned clockwise and counterclockwise minute indicia, the base color and script coded minute ring, and the word "O'CLOCK" at top center at one minute intervals, and where said window has two labels of the same color on each side of the selector window at the same radius as the base clockwise minute numbers with each label having the words "MINUTES AFTER" applied to it and two labels of the same color, but different from the color of the forementioned labels, on each side of the selector window at the same radius as the counterclockwise numbers with each label having the words "MINUTES UNTIL" applied to it, and of the four said labels, the two labels to the right of the selector window, viewing them from the pivot hole towards the periphery, are right-side-up whereas the two labels to the left of the selector window, with the same forementioned orientation, are upside-down,

d. a circular spacer of a lesser diameter than the clockface between the clockface and base to allow the securing of said clockface to said base and the free movement of the rotatable peripheral ring around said circular spacer between said clockface and base,

e. a minute hand with the word "MINUTES" applied to it with an equilateral triangle forming the point, and

f. an hour hand with the word "HOURS" applied to it with an equilateral triangle forming the point such that the tip of said point lies within the clockface color and script coded minute ring, with said triangle made up of two equal sized colored triangles each of a different color such that the color of the triangle adjacent to any previous hour numeral is the same as that of the "MINUTE AFTER" label of paragraph (c) and the color of the triangle adjacent to any succeeding hour numeral is the same as that of the "MINUTE UNTIL" label of paragraph (c), and with said hour hand manipulated separately from the minute hand about the forementioned pivot hole.

3,967,390
SHOE

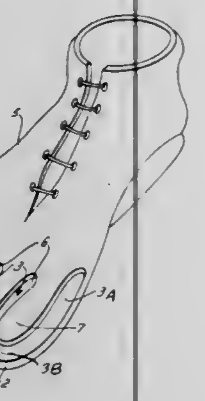
Luis Sentis Anfruns, Panama St. 2&4, Barcelona, Spain

Filed Mar. 6, 1975, Ser. No. 556,122

Claims priority, application Spain, May 8, 1974, 202,922[U]

Int. Cl.^{2} A43B *17/00*

U.S. Cl. 36—94 **5 Claims**



1. A shoe comprising; a relatively rigid sole; a relatively flexible upper generally marginally secured to said sole; both said sole and said upper having tip portions defining five toe compartments separate from one another; and flexible wall means interconnecting the tip portions of the relatively flexible upper with the tip portions of the relatively rigid sole, comprising flexible side walls of each toe compartment, and four flexible walls, one between every two of the toe compartments, to enable the separate toe compartments to flex independently of one another and of the remainder of the sole and upper.

3,967,391
SKIING BOOT

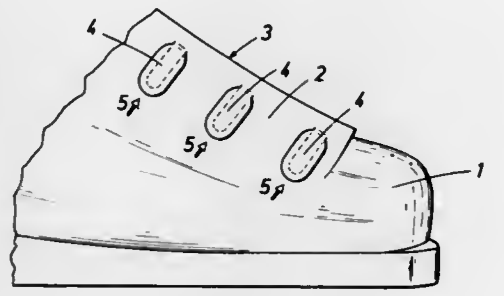
Hermann Kastinger, Hauptstrasse 27, Seewalchen am Attersee, Austria

Filed Mar. 6, 1975, Ser. No. 556,176

Claims priority, application Austria, Feb. 3, 1975, 789/75

Int. Cl.^{2} A43B *11/00;* **A43C** *11/00*

U.S. Cl. 36—50 **31 Claims**



1. A skiing boot which comprises an upper of flexible material, said upper defining a slot, at least one fastener for closing said slot of the upper, said fastener comprising a loop, a tightener which is engageable with said loop, and a tightener base part connected to said tightener, and at least one tightener holder which is integrally formed with said upper on the outside thereof and conforms to said tightener base part, said tightener base part being detachable fitted to said tightener holder on the outside of said upper and adapted to be pulled from said tightener holder away from said slot when said upper is open.

3,967,392
GRIPPER ELEMENTS FOR SPORTS SHOES

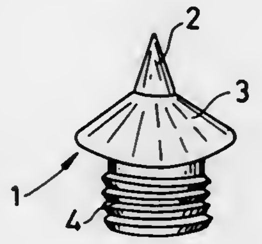
Adolf Dassler, Am Bahnhof, D-8522 Herzogenaurach, Germany

Division of Ser. No. 360,815, May 16, 1973, Pat. No. 3,859,739. This application Nov. 13, 1974, Ser. No. 523,317

Claims priority, application Germany, May 24, 1972, 2225143; May 24, 1972, 2225144

Int. Cl.^{2} A43C *15/00*

U.S. Cl. 36—67 B **2 Claims**



1. A gripper element for a sports shoe for use on plastics tracks, said gripper element comprising a substantially circular plate-like body having first and second faces, an upstanding peripheral portion at said body on one of said faces thereof, said peripheral portion having a rim provided with a plurality of radially extending sharp edges and a plurality of notches respectively extending between said edges.

3,967,393
UNDERWATER SOLIDS COLLECTING APPARATUS

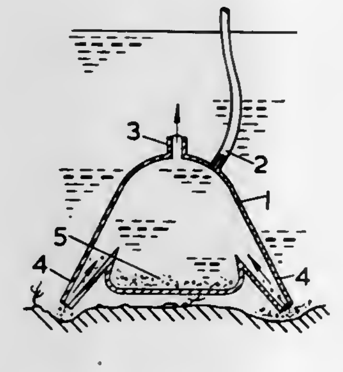
Ralph Alan Nixon, Hamilton, Scotland, assignor to The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 21, 1974, Ser. No. 453,638

Claims priority, application United Kingdom, July 4, 1973, 31935/73

Int. Cl.^{2} E02F *3/88*

U.S. Cl. 37—58 **3 Claims**



1. Underwater solids collecting apparatus for harvesting in bulk bed material from the bed of a volume of liquid comprising a substantially hollow structure submersible in said volume of liquid and having a closed solid bottom portion forming a hopper-like collecting area in which bed material may be collected, at least two intake passageways located in the lower regions of said structure with at least one on each side of said closed bottom portion, an extraction passageway communicating directly with and continuously open to the upper portion of said structure; said apparatus also including an air inlet passageway connected to the upper portion of said structure adjacent but laterally offset from the extraction passageway through which air under pressure is fed into the interior of said structure continuously during use of the apparatus, said air being extracted from the interior of said structure through said extraction passageway thereby inducing into the interior of said structure through said intake passageways liquid from the lower strata of said volume of liquid, said liquid being induced into said interior with sufficient momentum to carry into said interior solid material from the bed of said volume of liquid, said induced liquid being extracted from said hollow structure along with said air through said extraction passageway and said solid material being deposited in said hopper-like collecting area between said intake passageways, said substantially hollow structure being, in section at least, in the general form of a diving bell with said intake passageways extending downwardly from the lower region of said bell like peripheral legs, each leg having an inlet opening at its lower end positioned below the closed bottom portion of said structure and communicating with an upwardly extending passageway having an outlet opening at its upper end in communication with the interior of said bell above said hopper-like collecting area.

3,967,394
AUTOMATIC GRAB CRANE

Charles S. Kelley, 253 Bradwell Rd., Barrington, Ill. 60010, and James A. Westlund, 1685 Portage Pass, Deerfield, Ill. 60015

Filed Sept. 23, 1974, Ser. No. 508,274

Int. Cl.^{2} B66C *3/00;* **E02F** *3/88;* **B65G** *47/00*

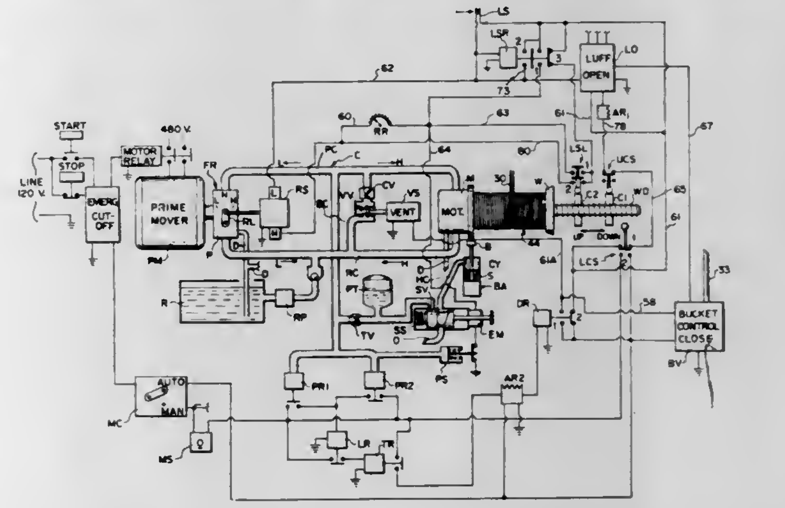
U.S. Cl. 37—71 **16 Claims**

1. In a grab crane having a power driven hydraulic positive displacement pump and a hoist means driven by a hydraulic positive displacement motor for raising and lowering the crane grab,

conduit means including parallel high pressure conduit and low pressure conduit interconnecting said pump and motor in series flow relationship,

switch means controlled by said hoist means and activated when said grab is submerged in water,

means for detecting grab contact with submerged work material including hydraulic pressure responsive means activated by said switch means and connected to and critically responsive to a change of hydraulic pressure in said high pressure conduit from that pressure that is induced therein by the effective weight of the grab being lowered empty under gravity through the water at a controlled rate,



means actuated by said activated hydraulic pressure means for changing the pattern of hydraulic flow in the conduits between the motor and pump, and

control means actuated by said activated pressure responsive means for closing said grab in timed relation to said change in hydraulic pressure.

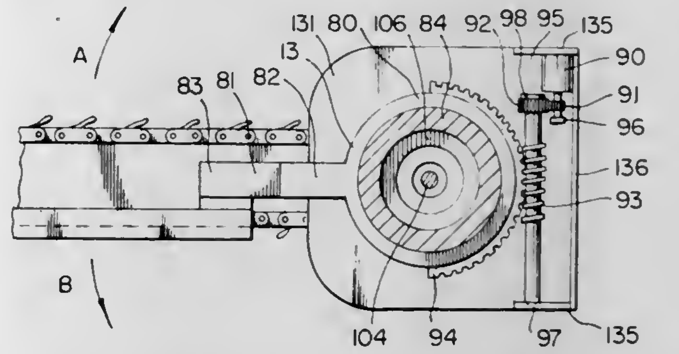
3,967,395
CROSSING UNDERCUTTER AND SWITCH UNDERCUTTER MOUNTED ON TRACTOR-TYPE VEHICLE

John Kenneth Stewart, Columbia, S.C., assignor to Canron, Inc.

Filed Apr. 4, 1974, Ser. No. 458,021

Int. Cl.^{2} E01B *27/04;* **E02F** *3/08*

U.S. Cl. 37—104 **2 Claims**



1. An undercutting apparatus for removing ballast and other material from beneath solid structures comprising a carrier capable of moving over ordinary ground, a first frame member pivotable about a vertical axis, ballast removing means for removing said ballast from beneath said solid structures, said removing means including an elongated plate member and a chain member mounted to slide about at least a substantial portion of the periphery of said plate member, said ballast removing means being supported by said first frame member, means for driving said ballast removing means, a second frame means on which said first frame member is mounted to pivot about said vertical axis with respect to said second frame means, pivot means for pivoting said first frame member about said vertical axis and thereby pivoting said ballast removing means, a travelling frame member and a track frame member on which said travelling frame member is mounted, means for moving said travelling frame member vertically with respect to said track frame member, said second frame means being pivotable about a primary axis, which is generally horizontal when said track frame member is in an upright position, and pivotally connected to said travelling frame member, said track frame member being pivotally connected to said carrier, means for pivoting said second frame means about said horizontal axis, means for pivoting said track frame member on said carrier about a second generally horizontal axis which is perpendicular to said primary axis, whereby in operation said carrier is moved along one side of the structure to be undercut and said ballast removing means is moved beneath said structure to remove said ballast.

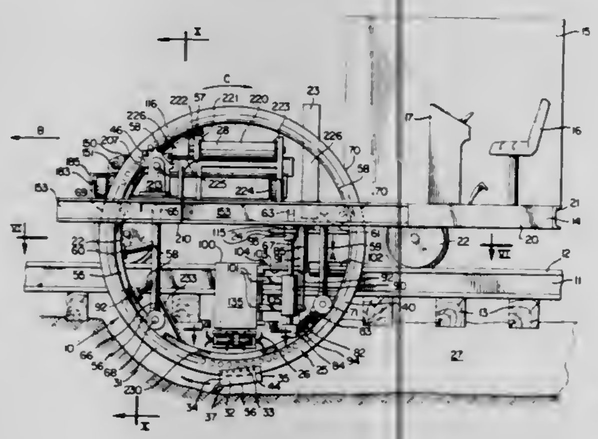
3,967,396
UNDERCUTTER WITH ROTARY TRENCHER

Hubert Maisonneuve, West Columbia; Helmuth von Beckmann, Columbia, and Joseph C. Sun, Lexington, all of S.C., assignors to Canron, Inc., New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,169

Int. Cl.^{2} E01B *27/04*; E02F *5/08*, *5/18*

U.S. Cl. 37—104 **21 Claims**



1. An apparatus for removing material from beneath railroad track comprising a rotary trench digging means having digging buckets arranged to circulate about an open space in the interior of said trench digging means, so as to dig a trench beside said track when in their lowest position and discharge to a receiving means when they are near their highest position, and horizontally extending, elongated chain digging means to dig and transport said material horizontally, said chain digging means during normal operation extending underneath said track and having one end located adjacent the bottom of said trench digging means and within said open space in the interior of said trench digging means, wherein said material is transported by said chain digging means from beneath said railroad track to said trench digging means at a point below ground level and beside said railroad track and drops by force of gravity into said digging buckets as said buckets pass beneath said one end of said chain digging means, said trench digging means serving to dig said trench alongside of said track while at the same time transporting the material delivered by said chain digging means to said receiving means, said receiving means being above the ground level.

3,967,397
RAKE ATTACHMENT FOR BACK HOE AND THE LIKE

Harold Nault, 48 Beau St., Norwalk, Conn. 06880

Filed Feb. 6, 1975, Ser. No. 547,384

Int. Cl.^{2} E02F *3/76*

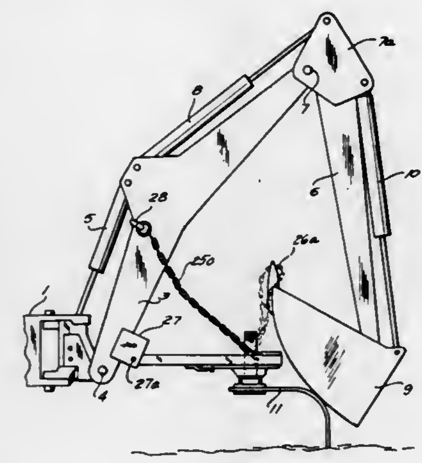
U.S. Cl. 37—117.5 **4 Claims**

1. A rake attachment for a back hoe having a main frame and a swing frame pivotally mounted on said main frame at one of its ends about a horizontal and a vertical axis, comprising in combination,

a longitudinal first member adapted to be pivotally mounted at one of its ends on said swing frame;

a rake assembly operatively mounted on said first member distant from the pivotal connection between said first member and swing frame; and

means connected to the first member adjacent to its other free end and to said swing frame;



whereby said free end of said first member and said rake assembly is suspended from said swing frame via said connecting means when said rake assembly is lifted by said swing frame.

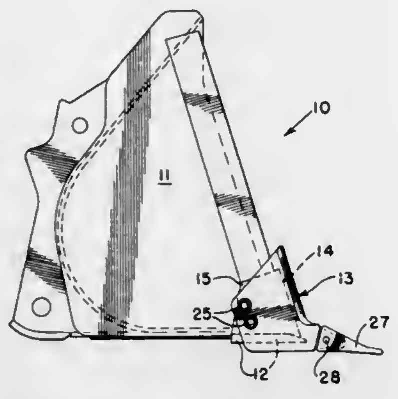
3,967,398
DETACHABLE CORNER PROTECTOR FOR WORK IMPLEMENTS

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 25, 1975, Ser. No. 616,788

Int. Cl.^{2} A01B *35/32*

U.S. Cl. 37—141 R **10 Claims**



1. A work implement comprising a pair of laterally spaced end walls, a cutting edge extending between said end walls and secured forwardly on said work implement, a corner protector disposed on a forward edge of each of said sidewalls and adjacent to said cutting edge, mounting means slidably mounting said corner protector in interlocking relationship on a forward edge of said sidewall by solely permitting said corner protector to be moved linearly along said forward edge and fastening means releasably attaching said corner protector to said sidewall.

3,967,399
RETAINING MEANS FOR GROUND-ENGAGING TOOL

Lloyd K. Heinold, and Richard E. Livesay, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 5, 1974, Ser. No. 494,405

Int. Cl.^{2} E02F *9/28*; B25G *3/26*

U.S. Cl. 37—142 A **7 Claims**

1. In an earth-working device, the combination comprising:

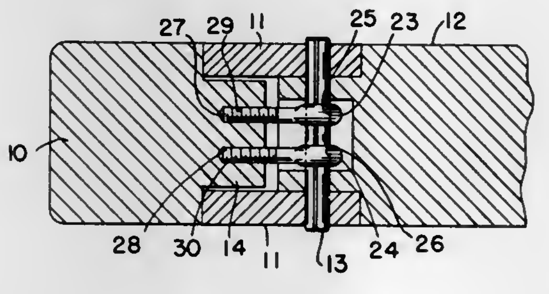
support means including means defining a shank-receiving socket extending along an axis;

a tooth element having a digging portion and a narrower shank extending along an axis away from said digging

portion for being received in said socket for thereby mounting said tooth element on said support means;

a pair of aligned bores formed in said support means transverse to the axis of and intersecting said shank receiving socket;

detachable adjustable means one end secured to and carried by said shank the other end defining a fixed diameter bore extending transverse to the axis of said shank, the axis of said bore being independently selectively adjustable



along said axis of said shank for selected partial misalignment of said axis of said bore with the axis of said bores in said support member; and,

an elongated generally cylindrical radially expandable pin extending through said partially aligned bores for simultaneous engagement with said bore of said adjustable means on said shank and said bores in said socket for biasing said tooth element into engagement with said support means for retaining said shank in said socket.

3,967,400
IDENTIFICATION CARD

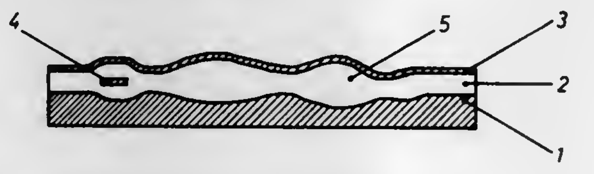
Günther Siegfried Otto, Munich, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organisation m.b.H., Germany

Continuation of Ser. No. 338,043, March 5, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,430

Claims priority, application Austria, Mar. 16, 1972, 22210/72

Int. Cl.^{2} G09F *3/02*

U.S. Cl. 40—2.2 **11 Claims**



1. An identification card comprising a laminated structure consisting of an outer base layer, an intermediate layer and an outer cover layer; said base layer comprising a supporting layer of relatively thick transparent foil material providing the necessary durability, rigidity and a portion of the desired thickness of said card; said intermediate layer comprising special paper having zones of respectively different thicknesses distributed therein and discernable by visual and tactile inspection, and containing security and authenticity features; said outer cover layer comprising a covering of transparent material sufficiently thin to conform to the different thicknesses of said intermediate layer, whereby said different thicknesses are accurately reproduced in the outer surface of said cover layer for such visual and tactile inspection.

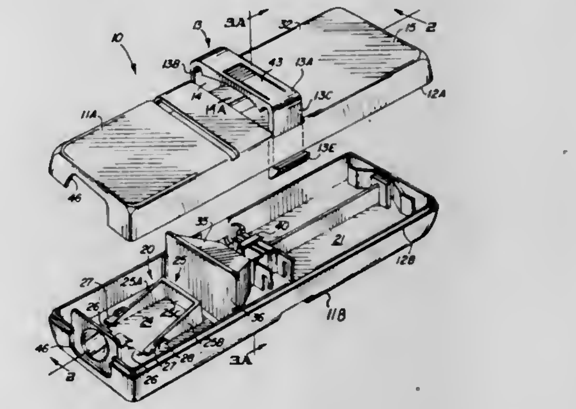
3,967,401
VIEWER WITH MOVABLY MOUNTED SLIDE HOLDER

Jody L. Numbers, 2212 S. Priest, Tempe, Ariz. 85282

Filed May 5, 1975, Ser. No. 574,682

Int. Cl.^{2} G09F *11/30*

U.S. Cl. 40—63 A **16 Claims**



1. A viewer for slide mounted negatives comprising:

a housing having cooperating top and bottom portions,

a slide receiving slot formed to extend through said top portion,

a slide holder formed in said bottom portion of said housing comprising a cutaway portion of said bottom portion hingedly mounted at one end thereof to move from a position in surface alignment with the outer periphery of said bottom portion to a position angular with said bottom portion,

said cutaway portion being aligned with said slot so that a slide inserted in said slot engages the other end of said cutaway portion and upon pressure applied thereto pivotally moves said holder to said angular position, thereby aligning the slide in a given optical viewing position in said housing.

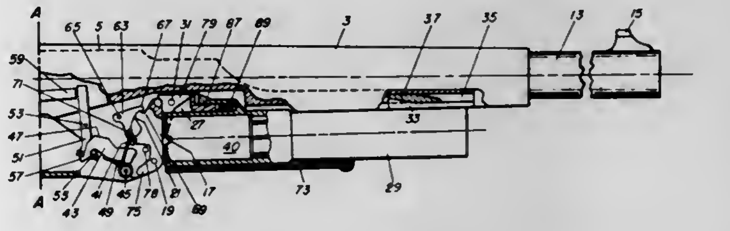
3,967,402
MANUALLY-OPERATED FIREARM WITH FORWARD-MOVING BARREL AND PIVOTED BREECH BLOCK

George E. Cooksey, East Moline, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1975, Ser. No. 543,100

Int. Cl.^{2} F41C *11/00*

U.S. Cl. 42—10 **10 Claims**



1. A breech-loading firearm comprising:

a stationary receiver having a forwardly-facing abutment;

a breech block pivotally mounted near one end on said receiver and having a rearward-facing second abutment engaging said first abutment in firing position;

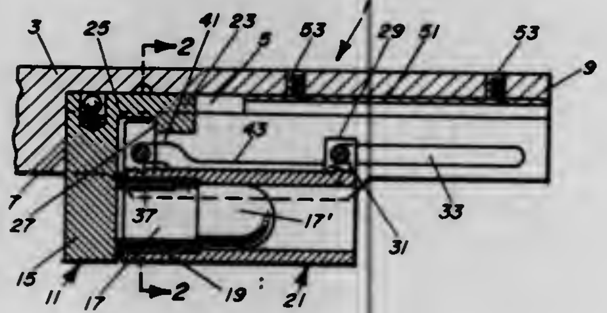
a barrel slidably mounted near its forward end for forward and rearward movement on said receiver and pivotally connected at its rear end to the other end of said breech block; and

means for firing a cartridge disposed in the rear end of said barrel;

whereby forward movement of said barrel to open the breech at the rear of the barrel bore during firing is prevented by said pivotal connection and the rearward reaction of the expanding gases on said breech block, but said barrel and said other end of said breech block can be moved forwardly after firing to open the breech.

3,967,403
MANUALLY-OPERATED FIREARM WITH FORWARD-MOVING BARREL AND AUTOMATIC BREECH LOCK

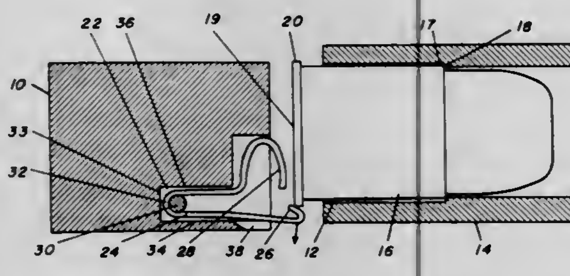
George L. Reynolds, Cambridge, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 22, 1975, Ser. No. 543,101
Int. Cl.² F41C *27/06*
U.S. Cl. 42—10 **8 Claims**



1. A breech-loading firearm comprising:
a stationary receiver having a forward-facing first abutment;
a breech block mounted for forward and rearward movement in said receiver and having a rearward-facing second abutment engaging said first abutment in firing position;
a barrel mounted for forward and rearward movement on said receiver; and
means for locking the breech end of said barrel to said breech block in firing position;
whereby forward movement of said barrel to open the breech at the rear of the barrel bore during firing is prevented by said locking means and the rearward reaction of of the expanding gases on said breech block, but said barrel and breech block can be moved forward after firing to open the breech.

3,967,404
COMBINATION CARTRIDGE EXTRACTOR-EJECTOR

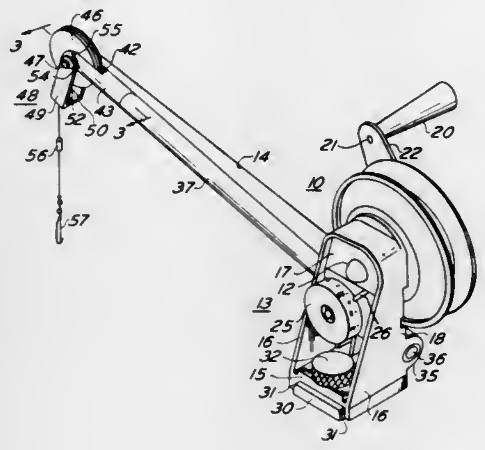
George L. Reynolds, Cambridge, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 15, 1974, Ser. No. 524,286
Int. Cl.² F41C *15/00*
U.S. Cl. 42—25 **6 Claims**



1. A device for extracting and ejecting a cartridge case having a flanged rear rim from a breech of a firearm comprising in combination:
a body movable in axial alignment with the breech and
a hook means and a biasing means mounted in the body and projecting therefrom, wherein the hook means and the biasing means are combined in a unitary structure,
wherein the hook means is adapted to slide over and engage the flanged rim on the rear end of the cartridge case and the biasing means is adapted simultaneously to press against the rear end of the case when the body is moved proximate to the case for engagement therewith, and wherein the biasing means and the hook means cooperate so that when the body is moved away from the breech sufficient to extract the engaged cartridge case therefrom, the biasing means causes the case to pivot on the hook means through a sufficient angle to disengage the rim from the hook means and thereby eject the case from the firearm.

3,967,405
TROLLING APPARATUS

Walter J. Henze, and San Thein, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa. Continuation-in-part of Ser. No. 556,552, March 10, 1975. This application May 5, 1975, Ser. No. 574,382
Int. Cl.² A01K *91/02, 87/04*
U.S. Cl. 43—27.4 **6 Claims**



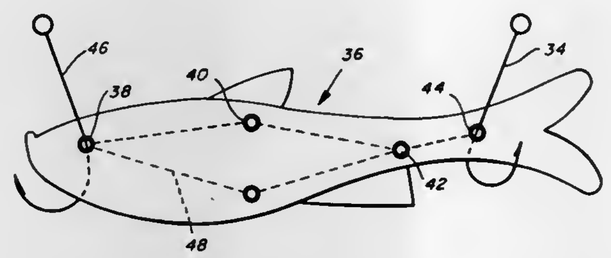
1. Trolling apparatus for fishing which comprises
a base,
a reel for a supply of line rotatably mounted on said base,
a boom secured at one end to said base and having a hollow tubular free end,
a pulley for said line, and
means for mounting said pulley at said free end for pivotal movement about the longitudinal axis of said boom,
said pulley being mounted on an axis transverse to the longitudinal axis of said boom,
said means for mounting said pulley comprising
  a plug inserted in said hollow tubular free end and detachably retained therein,
  a sleeve on said plug and detachably retained thereon and rotatable with respect to said hollow tubular end,
  said pulley being rotatably mounted on said sleeve, and
  a pivotally mounted line guiding bracket carried by said sleeve, and
  said guide bracket being mounted on the same pivotal axis as said pulley.

3,967,406
FISH LURE

Ray C. Anderson, 6655 S. New Haven, Tulsa, Okla. 74136
Filed Mar. 10, 1975, Ser. No. 556,793
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.24 **4 Claims**

1. A fish lure comprising:
a molded product of a fish attracting shape; and

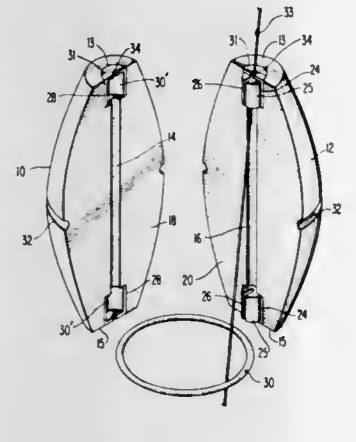
and internal flexible wire connecting a plurality of small metal grommets disposed at spaced locations in the



molded product forming opening through which fish hooks or other attachments may be inserted.

3,967,407
FISHING FLOATER

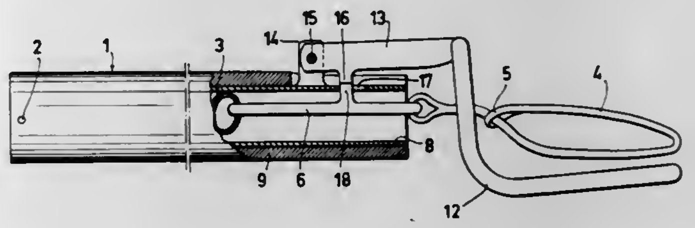
Gerald K. Halbasch, 880 Mandalay Ave., Apartment 729, Clearwater, Fla. 33515
Filed Apr. 30, 1975, Ser. No. 573,082
Int. Cl.² A01K *93/00*
U.S. Cl. 43—44.9 **3 Claims**



1. A fishing floater comprising a pair of duplicate half-sections having inwardly disposed flat surfaces each of which are provided with first grooves extending substantially the length thereof and arranged to slidably receive a fishing line, said half-sections further including barrel-like exterior walls having truncated end portions with said barrel-like exterior walls arranged to receive an elastic O-ring to retain the inwardly disposed flat surfaces in juxtaposed relation, said first grooves terminating in recesses provided at opposite ends of each said half-section of said floater, each said recess having a greater depth than said first grooves, with each of said respective recesses in one of said half-sections of said floater receiving secondary line guide means having longitudinally slotted curvilinear walls, the said slotted walls each communicate with dimpled areas in supplemental line guide means provided in the end walls, each recess in said other half-section provided with supplemental line guide means, each said supplemental line guide means in said other half-section having a dimpled area, the curvilinear walls of the first said one half-section being received in complementally formed pockets defined by said recesses in said second half-section and said respective dimpled areas arranged to merge into means defining a smooth uninterrupted means defining an opening in the opposite end walls of said assembled floater.

3,967,408
ANIMAL TRAP

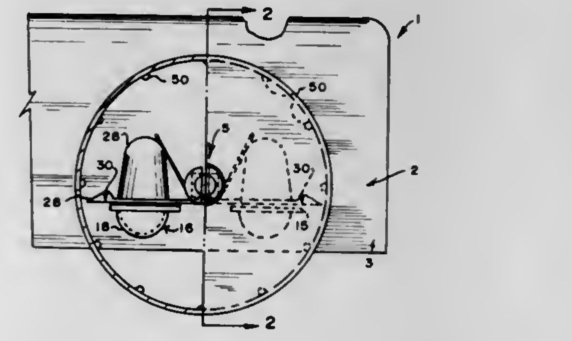
Jan Åberg, Pl. 3, Fallbacken, Skelleftea, Sweden (S-931 00)
Filed Apr. 17, 1975, Ser. No. 568,925
Claims priority, application Sweden, Apr. 25, 1974, 7405565
Int. Cl.² A01M *23/34*
U.S. Cl. 43—87 **11 Claims**



1. A trap for predatory animals to be laid in animal runways comprising a tubular body member, a protective casing of non-metallic material surrounding the major portion of the body member, a spring in said body member and having one end fastened thereto, a snare, a trap setting mechanism connected between the snare and the other end of the spring, said setting mechanism including a catch adapted for insertion into a hole in the body member for engaging the body member with the spring in an extended set position and maintaining the spring tensioned in said set position, and treadle means on which the animal is to tread attached to said body, said treadle means having a release arm for engaging and releasing said catch from engagement with the body member when an animal treads on said treadle means to thereby release the setting mechanism and cause the snare to move inwardly toward the body member.

3,967,409
MOTOR NOISE SIMULATOR FOR WHEELED TOYS

Beverly W. Taylor, Hermann, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.
Filed Nov. 24, 1975, Ser. No. 634,648
Int. Cl.² A63H *5/00*
U.S. Cl. 46—111 **9 Claims**



1. In a wheeled toy having a frame member and a wheel mounted for rotation with respect to said frame member closely adjacent said frame member the improvement comprising a boss on said frame member projecting from said member in a direction toward said wheel; two fixed resonators fixedly mounted on said frame symmetrically on either side of said boss, said resonators having a supporting platform; a clopper including a pair of percussion units, a bridging piece between said percussion units, and pawls projecting outboard of each of said percussion units, said percussion units engaging the supporting platforms of said resonators and said bridging piece spanning therebetween and being wedged between said surfaces and a facing surface of said boss, and a multiplicity of spaced trip means carried by said wheel and positioned to engage both of said pawls as said wheel is rotated.

3,967,410

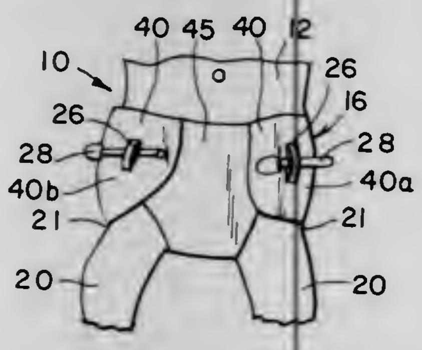
TOY DOLL

Nicholas S. Hodska, Stratford, Conn., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1975, Ser. No. 553,751

Int. Cl.² A63H *3/24*

U.S. Cl. 46—116 **11 Claims**



1. A toy doll, comprising:

a. a doll member resembling an infant human and comprising at least one apertured protrusion disposed at the abdominal area thereof and

b. a diaper element comprising a flap portion that comprises a slot therein, said slot being disposed so as to receive said protrusion when said doll member is dressed with said diaper element, whereby a retaining element can be removably disposed at the aperture of said protrusion so as to hold said diaper in position therein said diaper element comprises an elongated central portion and respective said flap portions extending in opposite directions from said first end part, connected at opposite sides of a first end part of said central portion and said central portion comprising a second end part disposed opposite said first end part, said second end part comprising oppositely disposed said slots and each of said flap portions comprising a said slot.

3,967,411

PASSAGES FOR ONE-WAY TRAVERSAL ESPECIALLY FOR PASSENGER TRAFFIC IN STATIONS

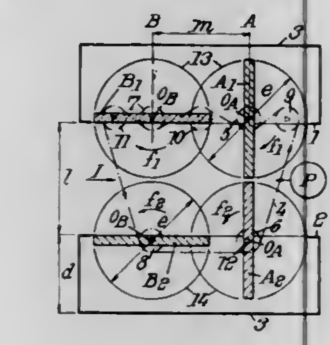
Charles Ulmann, Paris, France, assignor to Etablissements Georges Klein, Paris, France

Filed June 14, 1974, Ser. No. 479,523

Claims priority, application France, June 19, 1973, 73.22246

Int. Cl.² E06B *7/00*

U.S. Cl. 49—68 **9 Claims**



1. In a passage for traversal in one direction, means defining the passage, two successive gates for controlling traversal of said passage, each gate comprising at least one gate leaf, means mounting each gate leaf for rotation in a single direction only such that each gate successively opens and closes said passage during rotation, said rotational movement in a single direction of each gate leaf being such that the portion of the gate leaf in the passage at any time moves arcuately generally in said one direction only, and movement in the opposite is prevented by antireturn means, each gate being mounted such that a traversal path of said passage lies only on one side of the rotational axis of each gate leaf, means conjugating said gates to one another such that initially one is closed and the other open and such that on the opening of either one the other is closed, said successive gates being sufficiently closely spaced to one another as to resist the traversal of said passage by a person in other than said one direction upon opening of the first gate for traversal by a person in said one direction, and hence the simultaneous closing of the other gate, said passage being defined by barrier walls forming sides and entry and exit ends of the passage, and each gate leaf being pivotally mounted along a side of said passage such that during a complete rotation the gate leaf portion on one side of the pivot axis moves successively into said passage and into its side barrier wall, the pivot axes of successive gates being closely spaced such that their rotational trajectories intersect and overlap in said passage.

3,967,412

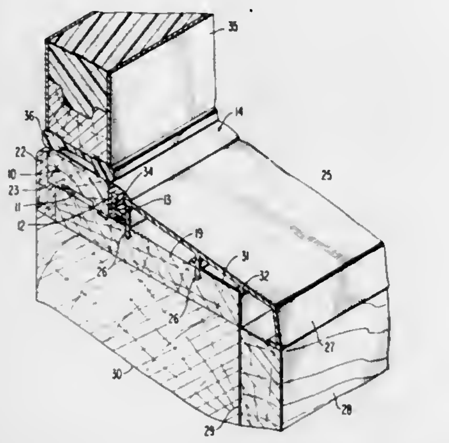
ADJUSTABLE THRESHOLD

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Sept. 17, 1975, Ser. No. 613,977

Int. Cl.² E06B *1/70*

U.S. Cl. 49—468 **8 Claims**



1. An adjustable threshold assembly comprising in combination a base member, a sill anchored to the base member and overlying it, a rigid water stop fixed to the base member and spaced from the sill and projecting above the base member, a compressible seal anchored to the sill and above the base member and in opposing spaced relation to said water stop and substantially parallel thereto, an adjustable threshold member disposed between the rigid water stop and said seal and substantially coextensive lengthwise therewith and disposed above the base member and adapted to rest thereon when in a full down position, and plural spaced adjusting and leveling screw devices for said adjustable threshold member carried thereby and having screwthreaded engagement within stationary nut means on said base member underlying said adjustable threshold member.

3,967,413

VIBRATORY FINISHING SYSTEMS

Achille K. Ferrara, Addison, Ill., assignor to Ultramatic Equipment Company, Addison, Ill.

Filed Nov. 15, 1974, Ser. No. 524,257

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163.1 **12 Claims**

1. A vibratory finishing system,

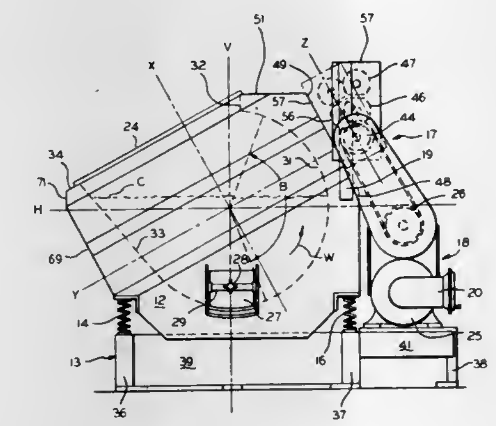
said system including a tub-like container for receiving therein finishing media and pieceparts requiring finishing,

base means,

resilient means for mounting said tub-like container to said base,

vibratory means mounted to said container to vibrate said container causing said media and pieceparts to move in a orbital counterclockwise direction rising in the back and falling in the front of said container, whereby said finishing media interacts with said pieceparts to debur and finish said pieceparts,

said tub-like container having an opening normally slanting downwardly from back to front, and



the inner left and right side walls of said container flaring outwardly for inducing a transverse motion to the media in addition to the orbital motion while said container is vibrating.

3,967,414

GRINDING MACHINE WITH A REST APPARATUS

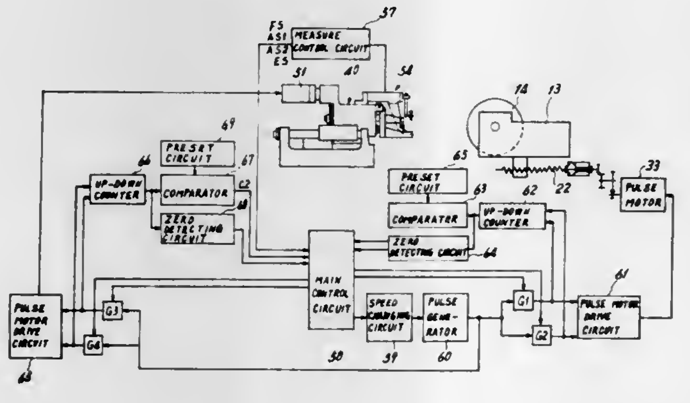
Tsuyoshi Tamesui, Okazaki; Shuichi Nakata, Kariya, and Minoru Enomoto, Handa, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Feb. 7, 1975, Ser. No. 548,020

Claims priority, application Japan, Feb. 12, 1974, 49-17303

Int. Cl.² B24B *49/00*

U.S. Cl. 51—165.77 **8 Claims**



1. A grinding machine comprising:

work support means for rotatably supporting a workpiece,

a wheel support to rotatably support a grinding wheel,

rest means for support said workpiece and for bending the same toward said grinding wheel,

means for advancing said wheel support for a preliminary grinding operation and for stopping the same at a predetermined position while maintaining engagement between said grinding wheel and said workpiece,

means for advancing said rest means for bending said workpiece toward said grinding wheel while said wheel support is stationary and for stopping said rest means after said workpiece has been ground by said grinding wheel with a predetermined stock removal being left,

and means for re-advancing said wheel support after stopping of said rest means for grinding said workpiece until it deviates from engagement with said rest means whereby the same will be positioned at its rotational center.

3,967,415

DEVICE FOR MOUNTING AND DISMOUNTING A GRINDING WHEEL ASSEMBLY ONTO OR FROM, RESPECTIVELY, THE GRINDING SPINDLE OF A GRINDING MACHINE

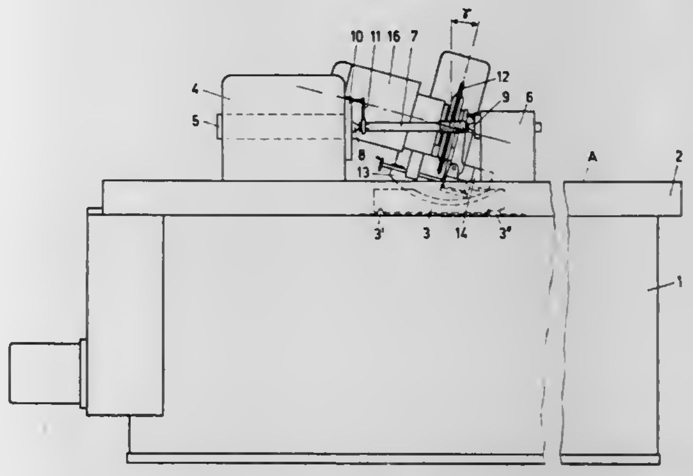
Ernst Seckinger, Zurich; Emil Vogelsanger, Dietlikon, and Robert Wirthlin, Effretikon, all of Switzerland, assignors to Reishauer AG, Switzerland

Filed Sept. 11, 1974, Ser. No. 505,056

Claims priority, application Switzerland, Sept. 17, 1973, 13302/73

Int. Cl.² B24B *41/00*

U.S. Cl. 51—168 **4 Claims**



1. In a grinding machine having a grinding spindle positioned in a grinding support and adapted to have a grinding wheel assembly connected thereto, the combination comprising:

a sliding carriage slidably mounted on said grinding support;

a grinding wheel carrier mounted on said sliding carriage for receiving thereon a grinding wheel assembly;

a threaded spindle threadedly connected to said sliding carriage for slidably moving said sliding carriage and said grinding wheel carrier in a longitudinal direction parallel to the axis of the grinding spindle;

pivotable mounting means supporting said grinding wheel carrier on said sliding carriage for selectively pivoting said grinding wheel carrier about an axis transverse to the grinding spindle between its operating and rest positions;

whereby in the operating position of said grinding wheel carrier a grinding wheel assembly may be moved into position on the grinding spindle by manipulation of said threaded spindle connected to said sliding carriage;

a plate member fastened to said carrier; and

means defining openings in said plate member through which screws may be inserted into mating threaded openings in said grinding wheel assembly.

3,967,416

SYSTEM FOR COMPENSATING THE UNBALANCE OF A ROTATING BODY, ESPECIALLY OF A GRINDING WHEEL

Dieter Birkenstock, Bad Konig, and Otto Jäger, Ueberau, both of Germany, assignors to Gebr. Hofmann KG, Darmstadt, Germany

Filed Aug. 12, 1975, Ser. No. 603,966

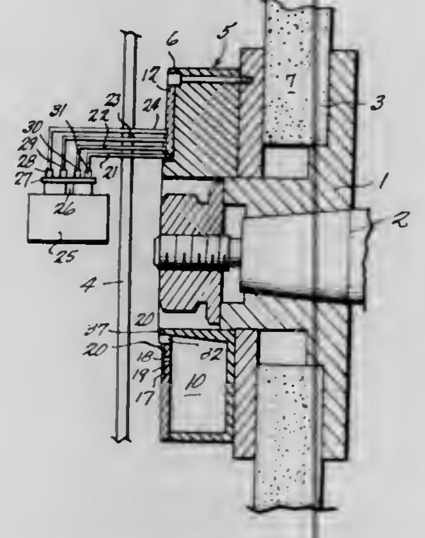
Claims priority, application Germany, Aug. 22, 1974, 7428410[U]

Int. Cl.² B25B *41/04*

U.S. Cl. 51—169 **9 Claims**

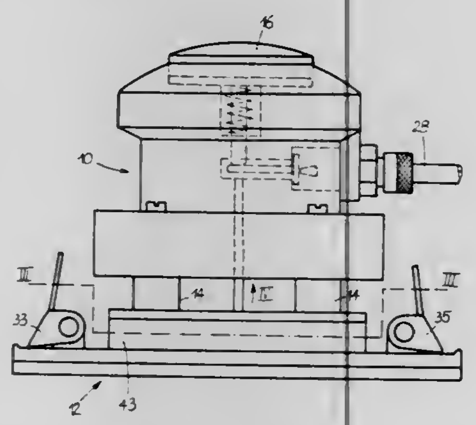
1. In an apparatus for compensating for the unbalance of a rotating body including a machine tool with several chambers arranged around the axis of rotation, which rotate together with the rotor and into which, controlled by a control unit, a balancing fluid may be injected, the chambers being disposed in a ring-shaped container at one side of which fluid inlets are provided, arranged on different radii, whereby each inlet on

a certain radius is assigned to a certain chamber and one fluid feed pipe is provided for each radius, the improvement wherein solid dividing walls extend between adjoining chambers at least between said inlets.



3,967,417
SANDING DEVICES

Ivan Jurak, Am Feldrand 8, Niefern, Germany
Filed Mar. 27, 1975, Ser. No. 562,483
Claims priority, application Germany, Mar. 29, 1974, 7411062[U]
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 TL **7 Claims**

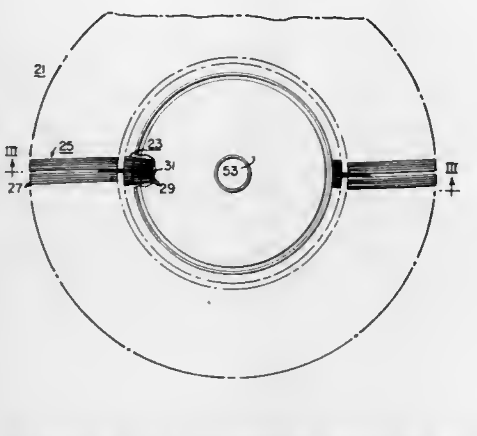


1. An oscillating sanding device comprising a casing, a sanding table, means resiliently connecting the sanding table to the casing, an unbalanced rotor carried by and rotatable with respect to the sanding table, means operatively connecting the rotor to the sanding table in impart to the sanding table vibrations imparted to the rotor by rotation thereof in consequence of such unbalance, and valve controlled fluid pressure means operatively connected to the rotor to produce rotation thereof.

3,967,418
WORK POLISHING TOOL AND METHOD OF MAKING SAME

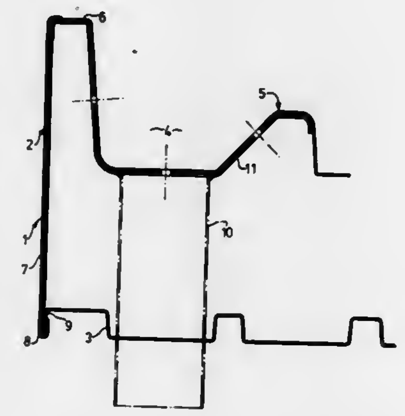
Gus J. Schaffner, III, Pittsburgh, Pa., assignor to Schaffner Manufacturing Company, Inc., Pittsburgh, Pa.
Filed Feb. 20, 1975, Ser. No. 551,377
Int. Cl.² B24D *13/06*
U.S. Cl. 51—334 **18 Claims**

1. A tool for polishing work comprising an annulus of spacers having interposed at intervals therebetween readily radially collapsible strips of a material which is readily deformable to provide said collapsible function in use of the tool, said strips extending radially outwardly from said annulus, said spacers and strips being secured together by an adhesive into a rigid central core from which said strips extend freely, and a plurality of leaves of a polishing material secured to the portion of each of said strips which extends from said core.



3,967,419
GUTTERING SYSTEMS

Brian Robinson, Caerphilly, England, assignor to Catnic Components Ltd., Caerphilly, United Kingdom
Filed Dec. 14, 1973, Ser. No. 424,641
Claims priority, application United Kingdom, Dec. 22, 1972, 59377/72
Int. Cl.² E04D *13/04*
U.S. Cl. 52—16 **21 Claims**



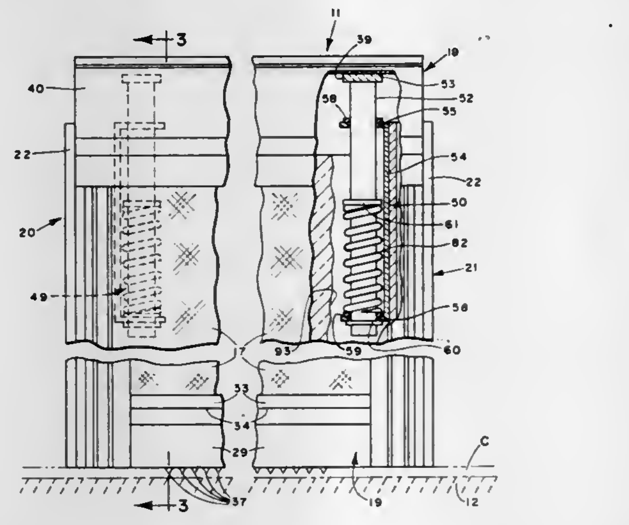
1. Members of a combined fascia-soffit-gutter unit for the dispersal of rainwater from a roof of a building, comprising a preformed first member including a gutter portion and first hinge means, said first member also including a fascia portion, and a preformed second member including a soffit portion and second hinge means complementary to said first hinge means, whereby when the first and second hinge means are connected a hinge is formed so that said first member and said second member are connected for relative angular movement with respect to one another and comprise said combined fascia-soffit-gutter unit, and said first member further including a tilting portion integrally connected to the gutter portion at a part thereof remote from said fascia portion, said tilting portion being adapted, when used in connection with a sloping roof, to support a lower end of a tile of the roof in the course of tiles nearest said first member.

3,967,420
PORTABLE WALL SYSTEM AND METHOD OF INSTALLING SAME

William G. Papsco, and Harry Cohn, Jr., both of Portola Valley, Calif., assignors to Papsco, Inc., Sunnyvale, Calif.
Filed Apr. 30, 1974, Ser. No. 465,524
Int. Cl.² E04B *2/74*
U.S. Cl. 52—127 **12 Claims**

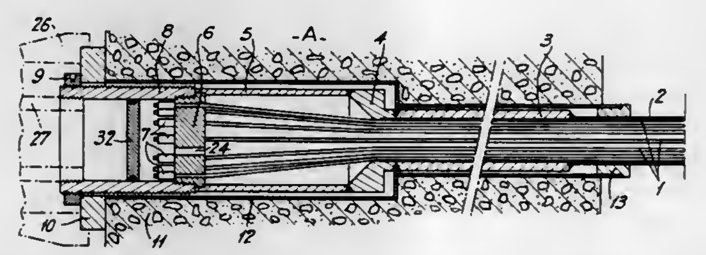
9. A modular wall system comprising a plurality of modules adapted to extend between the floor and the ceiling of a room, each module comprising

a panel having top and side edges and a bottom edge supported on the floor,
a post telescoped over each of said side edges,
a ceiling channel telescoped over the panel top edge and the upper portions of said posts, said channel having a top wall and side walls depending from said top wall, at least one of said side walls having external engagement means adapted to be engaged for moving the channel toward the panel top edge comprising a longitudinally extending upwardly and outwardly opening groove adjacent the lower edge of the side wall, and
spring assembly means directly interconnecting said ceiling channel and at least one of said side posts and resiliently spacing said channel top wall from said panel top edge, said ceiling channel being movable toward said panel against the force of said spring assembly means whereby to reduce the height of the module for installation and removal of same in a wall system.



3,967,421
TIE FORMED OF STRESSED HIGH-TENSILE STEEL TENDONS

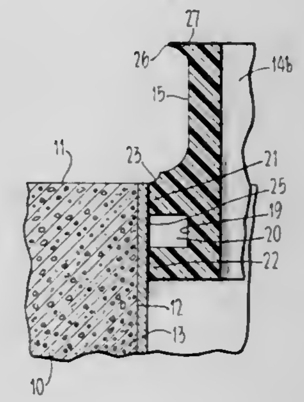
Marcel Emile Dufossez, Boulogne-Billancourt, France, assignor to Societe Technique pour l'Utilisation de la Precontrainte, France
Filed July 2, 1975, Ser. No. 592,527
Claims priority, application France, July 9, 1974, 74.23819
Int. Cl.² E04C *3/10, 5/08*
U.S. Cl. 52—146 **10 Claims**



10. A construction structure comprising a plurality of stays extending each between a couple of points of said structure distant from each other, each of said stay consisting of a tie constituted by a plurality of stressed steel tendons, enclosed in a protective sheath filled with hardened material and including, at its ends, anchoring devices for the transfer of the pull from the tie to the structure, the said sheath forming a conduit whose ends are fixed securely to said anchoring devices, the said conduit being isolated, throughout its length, from said structure so as to be longitudinally slidable with respect to the structure, at least one of said anchoring devices including connection means for the active part of a tensioning apparatus and also including means for bearing against the structure, said bearing means being adjustable on the anchoring device in the longitudinal direction of the tie.

3,967,422
DISPOSABLE MOLD FORM AND METHOD OF MOLDING

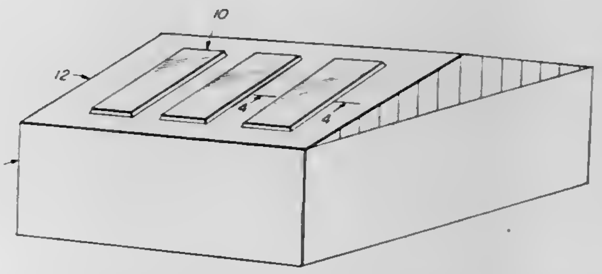
William J. Stegmeier, 878 Erickson Road, Concord, Calif. 94520
Filed Sept. 23, 1968, Ser. No. 761,726
Int. Cl.² E04B *1/34;* **E04G** *17/00*
U.S. Cl. 52—169 R **12 Claims**



1. In a disposable form adapted for use in molding a concrete coping along the upper edges of the generally vertical walls of a swimming pool or the like, an integral elongated one piece form section having a surface portion thereof configurated in the finished shape to be imposed thereby upon such coping and being sufficiently stiff to confine a moldable mass of amorphous concrete in such finished shape of the coping, said form section having also an attachment portion provided with attachment surfaces facing in the same general direction as said configurated surface portion and being attachable to such vertical walls of a pool adjacent the upper edges thereof, and said form section including its attachment portion being bendable along the length thereof to enable it to conform to both inside and outside arcuate corners along any such walls of a pool.

3,967,423
SKYLIGHT SYSTEM

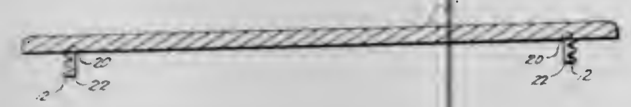
Robert T. Hammond, N. Main St., Plaistow, N.H. 03865
Filed July 28, 1975, Ser. No. 599,695
Int. Cl.² E04B *7/18*
U.S. Cl. 52—200 **8 Claims**



1. A system for maintaining a weather-tight seal between an elongated skylight having a frame of one material and a roof of another material having dissimilar expansion characteristics comprising:
- a. a flange mountable along the side edges of said skylight and of a material having an expansion characteristic similar to that of said frame;
- b. said flange being formed with an outer lip extending in spaced relation to the outer surface of said skylight; and
- c. an elongated flashing mountable along one edge to said roof and of a material having an expansion characteristic similar to that of said roof;
- d. said flashing being formed along the opposite edge with a U-shaped channel slidably engaging said flange lip to form a slip joint therewith.

3,967,424
BOAT WINDOW

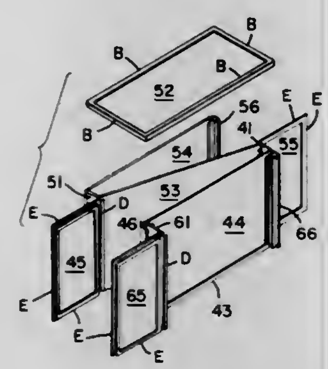
John I. Gates, 114 Via Mentone, Newport Beach, Calif. 92660
Filed May 2, 1975, Ser. No. 573,808
Int. Cl.² E06B *3/00*
U.S. Cl. 52—208 **9 Claims**



1. A window for openings in the walls of boats, trailers and the like comprising a pane and a mounting member extending effectively continuously circumferentially of the pane a selected distance inwardly of the edge of the pane and mounting the pane therein, the mounting member being fabricated of rigid synthetic thermoplastic material, such mounting member extending substantially normal to the interior surface of the pane, and wherein when the window is mounted in an opening, the surface of the pane between the mounting member and the edge of the pane is mounted against the surface of the wall, and the mounting member extends into the opening and is mounted against the edge of the opening.

3,967,425
MODULAR STORAGE UNITS FOR BICYCLES OR THE LIKE

Richard A. Wolverton, 1620 N. Main St., Walnut Creek, Calif. 94596, and Gordon H. Cooper, 785 T Oak Grove Road, Concord, Calif. 94518
Continuation-in-part of Ser. No. 398,931, Sept. 20, 1973, abandoned, which is a continuation of Ser. No. 170,716, Aug. 11, 1971, abandoned. This application Aug. 26, 1974, Ser. No. 500,388
Int. Cl.² E04B *1/343*
U.S. Cl. 52—237 **12 Claims**



1. A sub-combination of a modular unit for storing a plurality of bicycles or the like in a linear array on a substrate whereby each bicycle is stored in an individual selectively closable locker, said sub-combination comprising:

a. a first plurality of identical upstanding horizontally elongated rectangular-shaped planar walls having vertical ends and horizontal sides, said walls being equally spaced from each other by a given distance in parallel array with their horizontal sides extending normally to a given line passing through the centers thereof.

b. a plurality of pairs of identical vertically extending tubular posts, each pair of said posts being associated with a different one of said first plurality of walls and each post of each pair being rigidly connected to the one of said first plurality of walls associated therewith along a different one of said vertical ends thereof;

c. a plurality of pairs of identical vertically elongated generally rectangular-shaped planar end walls having vertical sides and horizontal ends, each pair of said end walls being associated with a different one of said first plurality of walls and each end wall of each pair having one of its vertical sides rigidly connected to a different one of said pair of posts with said horizontal ends of said pair of end walls extending normally to said horizontal sides of said one of said first plurality of walls associated therewith in opposite directions therefrom;

d. a plurality of pairs of identical vertically elongated generally rectangular-shaped planar doors having vertical sides and horizontal ends, each pair of said doors being associated with a different one of said first plurality of walls and each door of each pair being hinged along one of its vertical sides to the free vertical side of a different one of said end walls, each of said doors and the one of said end walls associated therewith having a total horizontal extent substantially equal to said given distance by which said first plurality of walls are spaced from each other and the horizontal ends of said end walls having a length less than one-half of the length of the horizontal ends of said doors;

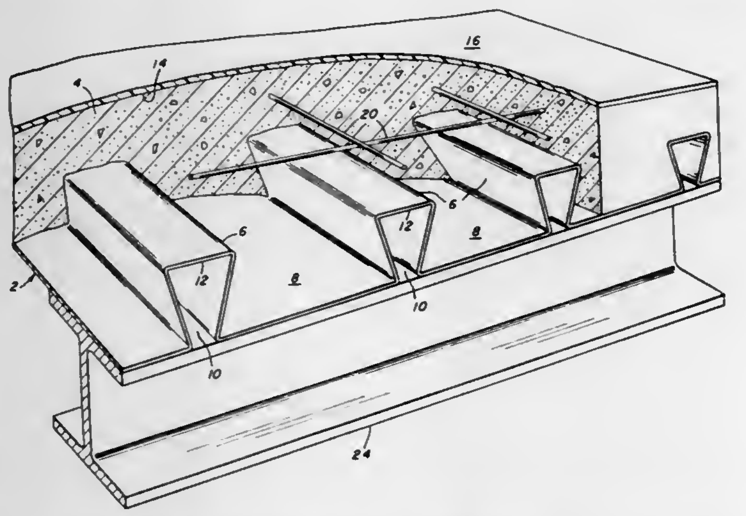
e. a second plurality of identical upstanding horizontally elongated rectangular-shaped planar walls having vertical ends and horizontal sides, each of said second plurality of walls being positioned between a different pair of said first plurality of walls with one of its vertical ends rigidly connected to the hinged joint between an end wall and door associated with one of said pair of said first plurality of walls and its other end rigidly connected to the hinged joint between an end wall and door associated with the other of said pair of said first plurality of walls;

f. a plurality of identical elongated rectangular-shaped planar top walls each having horizontal sides equal in length to the horizontal sides of said first plurality of walls and horizontal ends substantially equal in length to said given distance by which said first plurality of walls are spaced from each other, each of said plurality of top walls being associated with a different pair of said first plurality of walls with each horizontal side of each top wall rigidly connected to a different one of said pair of said first plurality of walls associated therewith; and

g. means for rigidly connecting each of said first plurality of walls to said substrate.

3,967,426
REINFORCED COMPOSITE SLAB ASSEMBLY

Robert L. Ault, Export, Pa., and Nathan Kelly, Miami, Fla., assignors to Epic Metals Corporation, Pittsburgh, Pa.
Filed May 8, 1972, Ser. No. 251,419
Int. Cl.² E04B *1/16*
U.S. Cl. 52—252 **11 Claims**



1. A composite slab assembly comprising

an elongated metal deck having a number of longitudinally oriented upwardly directed downwardly open integrally formed ribs disposed in alternating relationship with respect to elongated panel sections of said metal deck,

said metal deck panel sections disposed generally within a first plane and said ribs having upper wall portions disposed generally within a second plane generally parallel to and above said first plane,

said downwardly open ribs having a restricted throat opening which is narrower than said rib upper wall portion,

a concrete layer disposed on said metal deck and having longitudinally oriented portions in complementary surface to surface engagement with said metal deck, thereby causing said metal deck into a unitary composite structure,

a transversely oriented integral reinforcing beam formed by thickened portions of said concrete layer,

said metal deck having at least one total discontinuity within which at least a portion of said transverse concrete beam is received,

said upper surface of said concrete layer being disposed generally in a third plane which is above and substantially parallel to said first and second planes,

the lower extremity of said slab being defined generally by said first plane,

the maximum depth of said composite slab being substantially equal to the distance between said first and said third planes,

said composite slab having a maximum depth in the sector of said transverse concrete beam less than or generally equal to the maximum depth or said composite slab in remaining portions thereof,

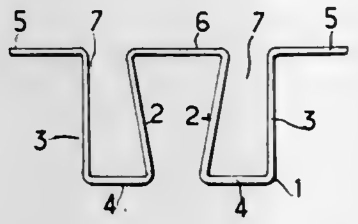
said transverse reinforcing beam having a lower extremity disposed below the level of said second plane,

at least one elongated generally transversely oriented reinforcing member disposed within and reinforcing said transverse concrete beam, and

support means transversely discontinuously supporting said transverse concrete beam, whereby said composite slab will be monolithic and devoid of filler joists and will span greater lengths between adjacent transverse continuous support walls or members than would be the case without said transverse concrete beam.

3,967,427
COMPLEX LIGHT METAL FRAMEWORK PRODUCED BY COMBINING SECTIONAL PIECES INTERCONNECTED IN A DETACHABLE MANNER BY MEANS OF FLEXIBLE STRIPS HAVING A NOVEL STRUCTURE

Maurice Piget, Boisset-les-Prevanches, (Eure), France
Filed Sept. 6, 1974, Ser. No. 503,573
Int. Cl.² E04B *2/58*
U.S. Cl. 52—502 **7 Claims**



1. A complex metal framework for use in fabricating structural members having means to clamp a sheet like article, said framework comprising:

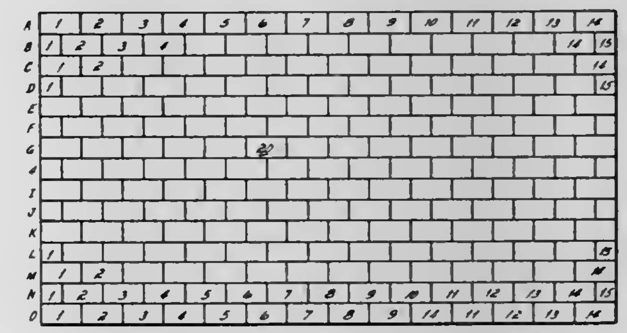
a. a main sectional piece having a wall defining a plurality of longitudinally extending cavities therein including a central cavity and a plurality of laterally displaced cavities, each lateral cavity having at least one inclined wall, and the central cavity having two inclined walls, each cavity having an open end and a base portion disposed opposite said open end, the width of the open end being less than the width of the base portion;

b. a second sectional piece shape so as to be inserted into one of said cavities such that a first portion of the second sectional piece contacts a portion of the wall defining the cavities and a second portion of the second sectional piece contacts the sheet like article; and

c. a resilient flexible strip inserted into said one cavity, said resilient flexible strip having a short section and a long section the ends of which contact the inclined wall of said one cavity, and a median section formed integral with and located between said short and long sections, said median section contacting the second sectional piece inserted into said one cavity so as to bias said second sectional piece against said sheet like article to clamp said article between said second sectional piece and said main sectional piece.

3,967,428
PORTABLE FLOOR CONSTRUCTION

Arthur W. Pierce, Milford, and Robert A. Stoehr, Cincinnati, both of Ohio, assignors to Cincinnati Floor Company, Cincinnati, Ohio
Continuation of Ser. No. 430,216, Jan. 2, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 577,566
Int. Cl.² E04C *1/30;* **E04B** *1/343*
U.S. Cl. 52—582 **12 Claims**



1. A floor panel for use in fabricating sectional floors of the type having an uninterrupted upper surface and including a plurality of like panels, said panel comprising:

a rectangular finished horizontal upper surface having first and second long edges interconnected by two short edges;

first, second, third and fourth brackets mounted beneath said finished surface for forming subsurface connections releasably locking said panel to adjacent panels;

each of said brackets comprising a horizontal arm lying in a plane below the plane of said finished upper surface and extending outwardly beyond the periphery of said panel and adapted to lie in superimposed relationship with a cooperating bracket on an adjacent panel;

said first bracket horizontal arm extending from said panel outwardly beyond a straight line coincident with said first long edge thereof adjacent to a first corner of said panel, said second bracket horizontal arm extending from said panel outwardly beyond a straight line coincident with a first short edge thereof adjacent to a second corner diagonally opposite said first corner, said third bracket horizontal arm extending from said panel outwardly beyond a straight line coincident with the first long edge of said first corner adjacent to a third corner of said panel, and said fourth bracket horizontal arm extending from said panel outwardly beyond a straight line coincident with the intermediate portion of said first long edge;

said first and third arms each being located in different vertical planes below said plane of said finished upper surface to facilitate said superimposed relationship with a cooperating bracket of an adjacent panel when assembled therewith, and said second and fourth arms each being located in different planes below said plane of said finished upper surface to facilitate said superimposed relationship with a cooperating bracket of an adjacent panel when assembled therewith;

each of said horizontal arms having an opening therein disposed entirely outwardly of the periphery of said finished surface and adapted to receive a headed drop pin, said openings of said first, third and fourth arms being located entirely outwardly beyond a straight line coincident with said first long edge, and said opening of said second arm being located entirely outwardly beyond said first short edge and located entirely inwardly of a straight line coincident with said second long edge, said drop pin being adapted to be inserted downwardly through said opening and through an aligned opening in the cooperating bracket of the adjacent panel to lock said panels together.

3,967,429
METHOD OF GROUTING USING SPECIFIC MORTAR COMPOSITION

David S. Weiant, Morrestown, N.J.; Frank E. Bernett, Yardley, Pa., and William R. Velivis, Trenton, N.J., assignors to Tile Council of America, Inc., Princeton, N.J.

Division of Ser. No. 304,727, Nov. 8, 1972, which is a continuation of Ser. No. 105,109, Jan. 8, 1971, abandoned. This application Sept. 4, 1974, Ser. No. 503,153

Int. Cl.^{2} E04G *21/00*

U.S. Cl. 52—744 **29 Claims**

1. A method of setting and grouting tile which comprises employing at room temperature an aqueous non-hydraulic mortar composition having a viscosity of about 120,000 cps comprising about 10% by weight (solids) of a mixture of film-forming, room temperature cross-linkable polymers in the form of an emulsion, suspension, dispersion or partial solution consisting of an acrylic resin having methylol acrylamide and acid cross-linkable groups and about 77% by weight (solids) of a water-insoluble filler consisting of a mixture of silica, glass and alumina trihydrate.

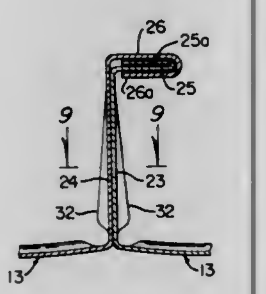
3,967,430
BUILDING METHOD

Gary A. Knudson, 7485 Upham Court, Arvada, Colo. 80002

Division of Ser. No. 408,942, Oct. 23, 1973, Pat. No. 3,902,288, which is a division of Ser. No. 226,173, Feb. 14, 1972, abandoned. This application Nov. 27, 1974, Ser. No. 527,528

Int. Cl.^{2} E04G *21/14*

U.S. Cl. 52—745 **3 Claims**



1. In a method of making a building by connecting together a pair of adjacent individual building panels the steps of:
- providing a pair of generally U-shaped panels, each said panel having a pair of spaced parallel side portions, one panel having an outturned flange portion extending outwardly of the upper marginal edge and in a direction substantially perpendicular to one of said side portions and a downturned terminal portion forming an inverted channel extending the full length thereof and the other panel having an inturned flange portion extending inwardly of the upper marginal edge and in a direction substantially perpendicular to the other of said side portions positioned in the inverted channel and extending the full length thereof; and
- turning substantially the entire length of the downturned terminal portion sharply back in a direction substantially parallel to said outturned flange portion and up against the underside of the inturned flange portion to the extent necessary to engage a substantial portion of the width of said inturned flange portion to form a continuous seam connection along the pair of panels.

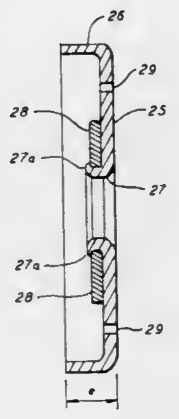
3,967,431
SHEAR PLATES

Thomas W. Jones, Buckhorn Lake, Unadilla, N.Y. 13849

Filed July 10, 1975, Ser. No. 594,720

Int. Cl.^{2} F16B *7/00*

U.S. Cl. 52—753 L **12 Claims**



1. A structural interconnection between a bolt and a wooden member, comprising, in combination: an annular piece of metal having an annular flange seated within a recess within said wooden member and an annular central hub having a central opening, and a metal ring surrounding said hub, said hub and said ring being seated within a recess in said wooden member, said wooden member having a bore aligned with said central opening in said hub, and a bolt extending through said central opening and said bore.

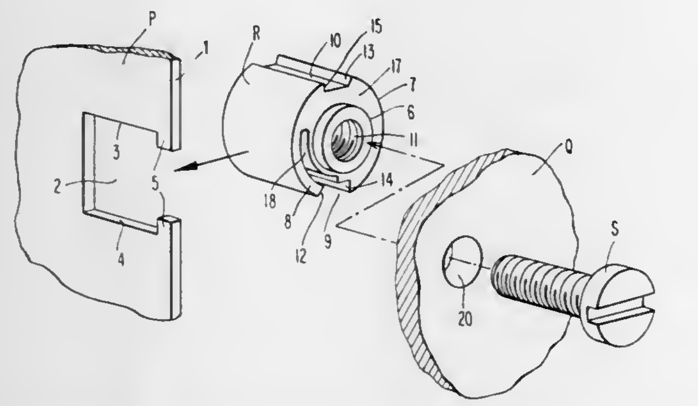
3,967,432
PANEL EDGE FASTENER RECEPTACLE AND JOINT

Victor B. Starr, Aston, Pa., assignor to Southco, Inc., Lester, Pa.

Filed July 23, 1975, Ser. No. 598,325

Int. Cl.^{2} F16B *5/02*

U.S. Cl. 52—758 D **17 Claims**



1. A fastener receptacle adapted for installation at the edge of a thin panel, said receptacle comprising:
- a. a body of resilient material;
- b. a peripheral spring element having one end integral with said body and the other end free;
- c. a first peripheral recess located adjacent said other end of said spring element;
- d. a second peripheral recess diametrically opposite said first recess;
- e. said first and second recesses adapted to engage and cooperate with the edges of an opening prepared in said panel in which said receptacle is to be installed;
- f. said spring element being adapted to be flexed inwardly toward the center of said body by one edge of said panel opening during installation and then to return outwardly to its unflexed position as, during installation, the spring element passes beyond said edge of said panel opening, said spring element in its unflexed outward position being adapted to retain said receptacle in said panel opening.

3,967,433
PROCESS AND MACHINE FOR WRAPPING AND PACKAGING ITEMS IN STRETCHABLE FOIL MATERIAL

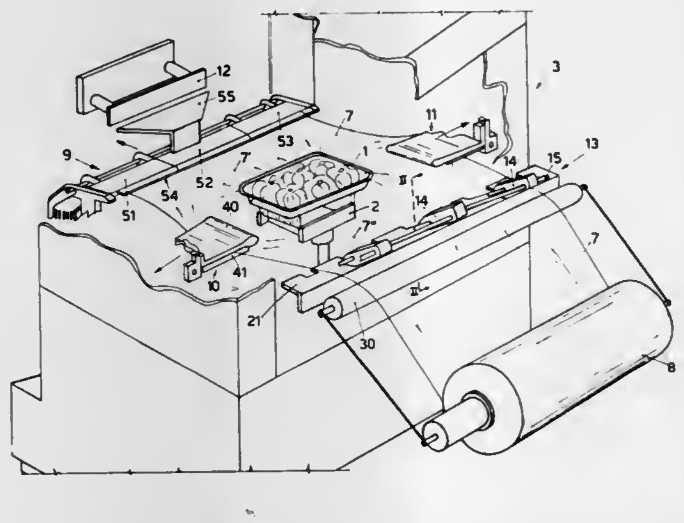
Sergio Bonfiglioli, Via Emilia Ponente 14, Bologna, Italy

Filed Sept. 19, 1974, Ser. No. 507,424

Claims priority, application Italy, Oct. 5, 1973, 29819/73

Int. Cl.^{2} B65B *11/16*

U.S. Cl. 53—30 R **7 Claims**



1. A process for wrapping and packaging a tray-like receptacle containing a generally irregularly shaped article in a foil sheet of stretchable plastic material, which receptacle has a flat bottom shallowly recessed from a low, outwardly-curved rim, said process comprising the steps of:
- a. positioning said receptacle on a support at a wrapping location;
- b. unreeling a section of a continuous foil web from a storage roll under evenly distributed tensile stress by gripping the leading edge of said foil and translating the foil section to said wrapping location in a direction normal to the leading edge proximate said supported receptacle;
- c. stretching said foil section by a predetermined amount in at least the dimension transverse to the unreeling direction from locations at opposite sides of said supported receptacle;
- d. longitudinally holding fast the transversely stretched foil section while severing said section from said storage roll to form a sheet from said foil section;
- e. bringing said article-containing receptacle into contact with the stretched foil sheet while folding the longitudinally extending edges of the transversely stretched sheet over said rim and onto the bottom surface of said receptacle and simultaneously reducing the transverse tension effected by said stretching in order to maintain the predetermined amount of stretching in said foil;
- f. folding the leading and trailing edges of said foil sheet over said rim and onto said bottom surface of said receptacle; and
- g. welding said leading, trailing and longitudinally extending edges to said bottom surface.

3,967,434
CARTONNING APPARATUS

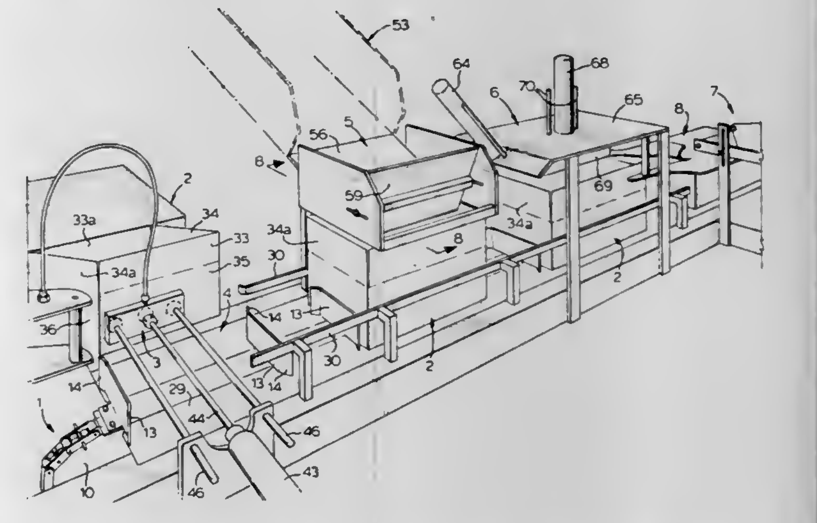
Derek Mancini, Stouffville, Canada, assignor to Portion Packaging Limited, Rexdale, Canada

Filed May 19, 1975, Ser. No. 578,713

Int. Cl.^{2} B65B *43/28*

U.S. Cl. 53—186 **17 Claims**

7. An automatic cartonning apparatus comprising a conveyor, means for advancing said conveyor a predetermined distance, means operable following conveyor advance to withdraw a single carton blank from a stack of carton blanks and open same up to a set up condition ready to receive a plurality of articles on said conveyor at a first position, said carton in said set up condition having a closed bottom and open top end and side flaps, means for guiding articles into a set up carton at a second carton loading position displaced along the conveyor path a whole multiple of said predetermined distance from said first position, means operable following conveyor advance for closing the carton end flaps at a third carton flap closing position displaced along the conveyor path a whole multiple of said predetermined distance from said second loading position, means for closing the carton side flaps subsequently to the closing of the end flaps and control means for said conveyor advancing means whereby the event of conveyor advance is adapted to be related to the completion of the filling of a set up carton at said second carton loading position, said means for advancing said conveyor said predetermined distance comprising an oil operated cylinder driven by compressed air.



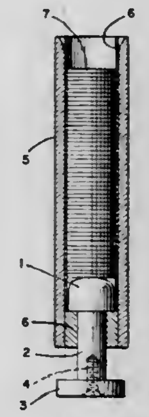
3,967,435
COIN-STACKING AND COUNTING DEVICE

Gerard J. Bergmaier, 1238 Union Ave., Delair, N.J. 08110

Filed Sept. 13, 1974, Ser. No. 505,842

Int. Cl.^{2} B65B *67/02*

U.S. Cl. 53—254 **1 Claim**



1. A coin-stacking and counting device for use with an open-ended coin wrapper having a length greater than the height of a stack of a predetermined number of coins to be wrapped to provide at each end of the wrapper an end portion capable of being folded over to enclose the end of said stack comprising:
1. a coin-holding tube circular in cross section and of diameter slightly greater than the diameter of said coins and having an open coin-receiving end for receiving said coins and the length of said tube being slightly greater than the sum of (1) the height of said stack of predetermined number of coins and (2) said diameter;
2. a coin-supporting head contained within said tube at the other end thereof and movable within said tube into a coin-stacking position and a wrapper-sealing position, said head extending into said tube in said coin-stacking position a distance such that the distance from the top of said head to the top of the coin-receiving end of said tube equals the height of said stack of said predetermined number of coins, said head having a length substantially equal to the radius of said tube so that the distance from

the top of said head to said other end, in said wrapper-sealing position, is substantially equal to the radius of said tube; said head having a convex shape to hold said coins in a horizontal position and to position angularly inserted coins in said horizontal position;

3. a sleeve at said other end of said tube having a diameter equal to the inside diameter of said tube and having an opening therein, the diameter of which is less than said inside diameter;
4. base means external of said tube for supporting said device in an upright position when said head is in said coin-stacking position; and
5. a movable rod positioned within said opening having one end connected to said base means and the other end connected to the bottom of said head.

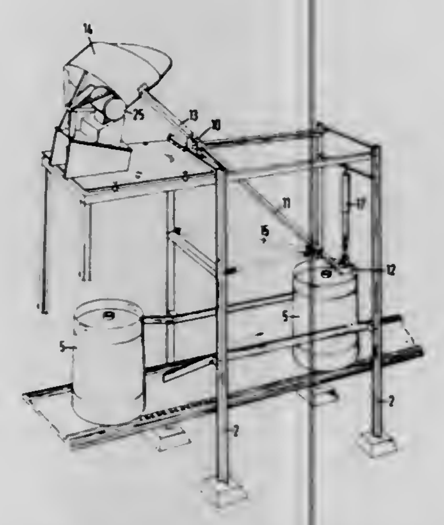
3,967,436
CAPSULATING MACHINE

Elbert Gravesteyn, Leiderdorp, Netherlands, assignor to Heineken Technisch Beheer B.V., Netherlands

Filed Apr. 16, 1975, Ser. No. 568,457

Int. Cl.^{2} B65B *7/28;* **B67B** *3/00*

U.S. Cl. 53—315 **3 Claims**



1. A capsulating machine for applying covers or caps to the opening of the neck portion of a container, such as the bung hole closure on beer casks and the like comprising a frame, a sloping feed chute for said caps pivotally carried by said frame for movement in a vertical plane, a cap dispenser carried at the end of said chute, means on said frame for guiding said containers beneath said cap dispenser and with said opening in alignment with said dispenser, spring loaded positioning cams for retaining the leading cap in position in said dispenser, means for normally retaining said dispenser at a position below said container opening, said chute functioning as a camming means to raise the dispenser upon engagement by a container neck and force the leading cap into engagement therewith and prevent displacement of the leading cap upon contacting a container surface of greater size than said neck and means within said dispenser to effect pressure engagement of said cap with said neck and urge it into tight engagement therewith.

3,967,437
INDICATOR FOR A HARVESTING PLATFORM

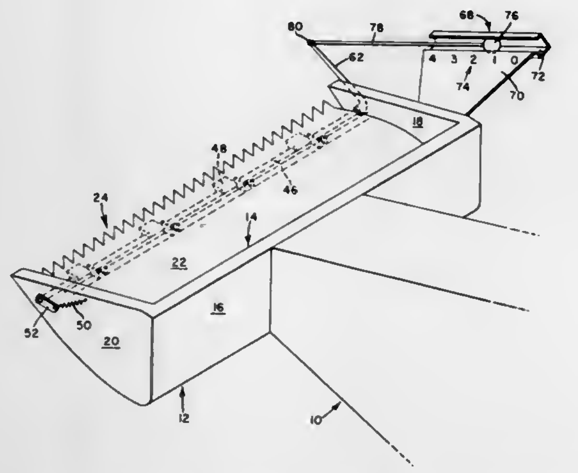
Roger Eugene Mott, Bettendorf, and Jerry Gary Barnett, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 13, 1975, Ser. No. 586,565

Int. Cl.^{2} A01D *67/00;* **G09F** *9/00*

U.S. Cl. 56—10.2 **4 Claims**

1. In a mobile harvesting machine having a transversely elongated harvesting platform including a frame with opposite lateral sides and harvesting means mounted forwardly on the frame and including a plurality of generally fore and aft, transversely spaced mounting means connecting the harvesting means on the frame for independent vertical adjustment of sections of the harvesting means relative thereto within a limited range each mounting means including an independently vertically adjustable harvesting means element, the vertical position of which is responsive to the vertical position of the respective harvesting means section, and ground engaging means operatively connected to the respective harvesting means elements for vertically adjusting the harvesting means elements in response to changes in the contour of the ground, the combination therewith of an indicator system for indicating the position of the uppermost harvesting means element to a machine operator and comprising: a transverse rockshaft journaled on the frame and substantially extending between the opposite frame sides; a plurality of feeler members attached to and extending radially from the rockshaft and being respectively engageable with the uppermost of the harvesting means elements so that vertical adjustment of the uppermost harvesting means elements causing rotation of the rockshaft; a stationary indicator element mounted on the platform adjacent one of the platform sides; a movable indicator element mounted on the platform adjacent the stationary element for shifting movement relative thereto; and connecting means operatively connecting the rockshaft to the movable indicator element for shifting the movable indicator element relative to the stationary indicator element in response to rotation of the rockshaft, so that the position of the movable indicator element relative to the stationary indicator element is responsive to the position of the uppermost harvesting means element relative to the frame.



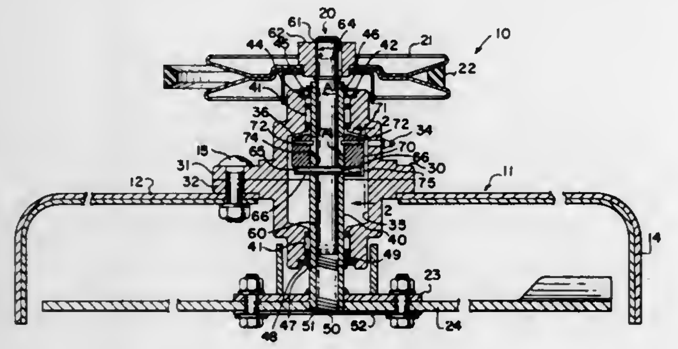
3,967,438
ROTARY MOWER SPINDLE ASSEMBLY

Michael D. Tombers, Merrillville, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Apr. 18, 1975, Ser. No. 569,238

Int. Cl.^{2} A01D *35/26*

U.S. Cl. 56—113 **12 Claims**



1. In a rotary mower having a housing, a vertical spindle assembly mounted on said housing, a power input member mounted at the upper end of said spindle assembly and adapted to be rotatably driven from an associated source of power, and a rotary impact cutting blade mounted to the lower end of said spindle assembly for high speed rotation, the improvement wherein said spindle assembly comprises a support sleeve having a first braking surface, a hollow outer shaft journalled in said sleeve and having a circumferential slot, an inner shaft mounted for rotation within said outer shaft, a radially extending drive pin fixed in said inner shaft in registry with said circumferential slot and extending therethrough, a brake member having a second braking surface mounted on the outside of said outer shaft for rotation therewith, said braking member being axially movable on said outer shaft to engage said first and second braking surfaces, said braking member further having a cammed surface disposed for engagement with said drive pin, the configuration of said cammed surface relative to said pin being such that upon said source of power being interrupted and said cutting blade overrunning said input member, said drive pin axially shifts said brake member on said outer shaft to a position engaging said braking surfaces.

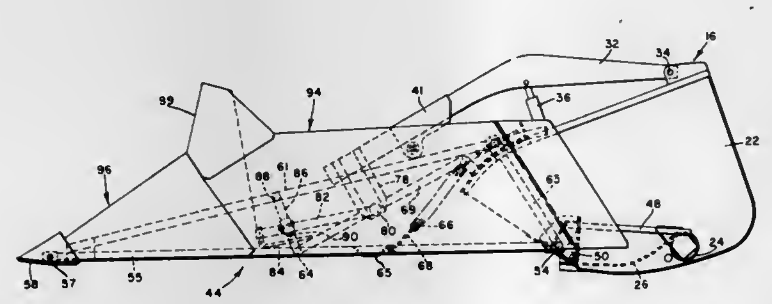
3,967,439
CROP DIVIDER FOR A HARVESTER

Roger Eugene Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 24, 1975, Ser. No. 598,851

Int. Cl.^{2} A01D *63/00*

U.S. Cl. 56—314 **17 Claims**



1. In a harvesting machine having a forwardly disposed transversely elongated platform including a frame with opposite upright side walls and a crop handling means mounted on the frame and including a harvester reel mounted on and extending between a pair of generally fore and aft arms mounted on the frame for vertical adjustment and including control means for controlling the position of the arms, and transverse crop engaging members having opposite ends inwardly of and adjacent to the side walls, the combination therewith of at least one crop divider mounted on and extending forwardly from a side wall and comprising: a generally fore and aft divider frame; a first transverse pivot means adjacent the rearward end of the divider frame swingably mounting the divider frame on the side wall for vertical adjustment relative thereto between a lower operating position and a raised transport position; a divider skin mounted on the divider frame and including a forwardly converging forward portion tapering to a divider point located adjacent the ground when the frame is in its operating position; lock means selectively operative between the divider frame and the platform side wall for selectively locking the divider frame to the side wall in a selected position about said first pivot means; and connecting means operatively connecting the divider frame to the adjacent reel arm for vertical adjustment of the divider when the divider frame is not locked to the side wall in response to a predetermined amount of vertical adjustment of the reel arm.

3,967,440
DEVICE FOR CUTTING A TAIL-END OF A YARN PACKAGE FORMED ON A BASE PORTION OF EACH SPINDLE IN A TEXTILE MACHINE

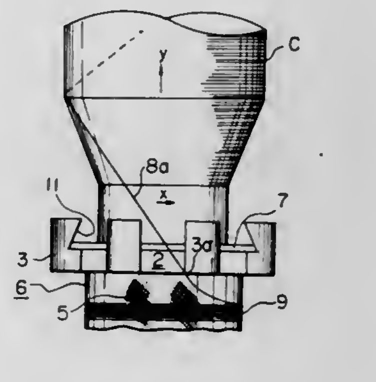
Akio Narumi, Obu; Shuji Takahisa, Toyota; Masanao Kobayakawa, Anjyo, and Yoshihal Fujimoto, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Dec. 27, 1974, Ser. No. 536,750

Claims priority, application Japan, Dec. 27, 1973, 49-298[U]

Int. Cl.^{2} D01H *1/38*

U.S. Cl. 57—34 TT **5 Claims**



1. In a device for cutting a tail-end yarn portion connecting a spiral wind formed on a yarn package and a tail-end winding formed on a base portion of each spindle of a textile machine, which supports said yarn package, at a time of carrying out the doffing operation, an improvement comprising a cylindrical crip member coaxially mounted on said base portion of each spindle for forming said tail-end yarn portion thereon, a guide member coaxially formed on said crip member and a ring shaped cutter incased in said guide member, said guide member provided with an upwardly opened ring shaped recess thereon for stably receiving said cutter and a plurality of cut-out grooves formed at a circumferential edge portion thereof, said cutter provided with a sharp knife edge formed at a circumferential side thereof and a part of said knife edge projected upward from a bottom surface of each said cut-out groove of said guide member, but positioned within the outer-periphery of said guide member, said crip member provided with a knurled surface, the diameter of said crip member being sufficiently larger than the diameter of said crip member so that said tail-end yarn portion is capable of sliding on said knife edge of said cutter at anyone of said cut-out grooves of said guide member under tensioned condition when said yarn package is taken from said spindle.

3,967,441
YARNS AND PROCESS FOR PRODUCTION THEREOF

Katsumi Yasuzuka, Uji; Takaaki Matsuo, Kyoto, and Hachiro Fujiwara, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Apr. 29, 1974, Ser. No. 464,878

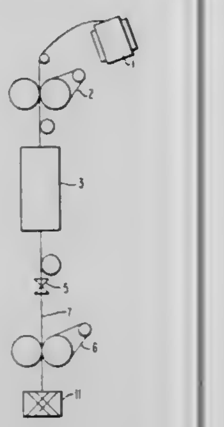
Claims priority, application Japan, Apr. 28, 1973, 48-48200

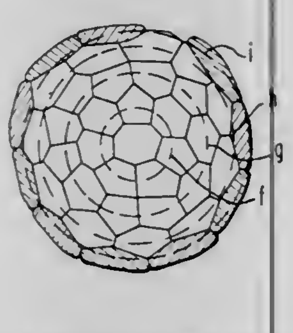
Int. Cl.^{2} D02G *3/00, 1/00;* **D01G** *1/06;* **D01H** *5/30*

U.S. Cl. 57—140 J **45 Claims**

1. A yarn comprising thermoplastic synthetic staple fibers in which the individual fibers constituting the yarn contain twisted crimps and have cross-sectional surfaces with a markedly flattened portion, in which the staple fibers contained therein have broken ends comprising mainly portions flat-

tened to a lesser degree, a plurality of fibers having this structure uniformly and alternately forming the surface and inner





layers of the yarn and being intertwined at fluffs formed of the broken ends of the individual fibers.

3,967,442
ELECTRIC WATCH HAVING AN ELECTROMECHANICAL MOVEMENT INCLUDING A CORRECTION MECHANISM FOR SMALL ERRORS

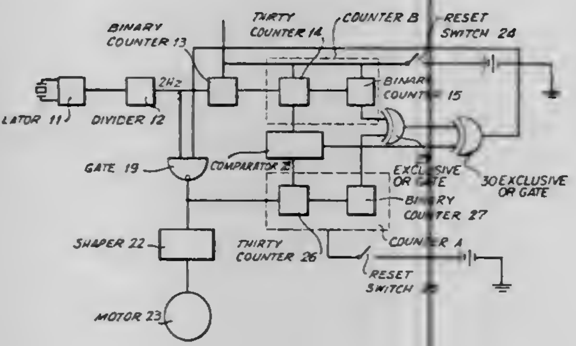
Jean-Claude Berney, Chemin de la Croix-Rouge 2, Lausanne, Switzerland

Continuation of Ser. No. 438,455, Jan. 31, 1974, abandoned. This application July 14, 1975, Ser. No. 595,687

Claims priority, application Switzerland, Feb. 1, 1973, 1418/73

Int. Cl.^{2} G04C ***3/00***

U.S. Cl. 58—23 R **7 Claims**



1. An electric watch comprising a precise resonator, an oscillator coupled to said resonator, a frequency divider connected to the oscillator, a watch movement including drive means therefor and means coupled to the frequency divider and the drive means of the watch movement for controlling the operation thereof to eliminate errors in indicated time, the latter means comprising a first counter coupled for synchronized operation with said drive means of the watch movement, a second reference counter connected to said divider, comparison means connected to said counters for comparing the states thereof and coupled to said drive means of the watch movement for maintaining the counters in phase while varying the speed of the watch movement, and first and second reset means for respectively setting the said first and second counters independently of each other from outside the watch.

3,967,443
TURBOFAN ENGINE WITH FLEXIBLE, VARIABLE AREA NOZZLE

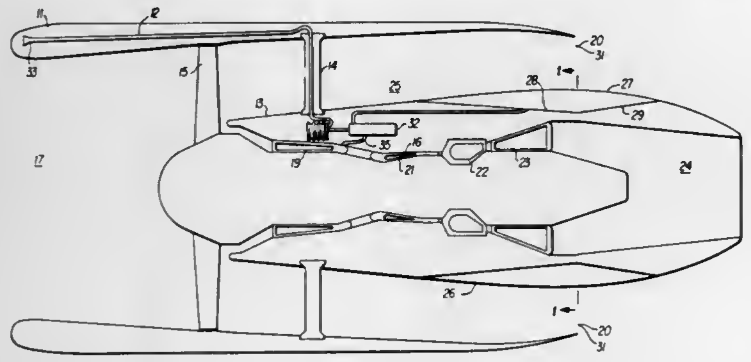
Davis Roberts McMurtry, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Division of Ser. No. 352,921, April 20, 1973, Pat. No. 3,913,626. This application Feb. 21, 1975, Ser. No. 551,980

Claims priority, application United Kingdom, Apr. 27, 1972, 19605/72

Int. Cl.^{2} F02K ***1/10, 3/06***

U.S. Cl. 60—226 R **5 Claims**



1. A gas turbine engine comprising: an engine casing and a centrebody comprising two walls defining therebetween a main discharge duct for propulsive gases; means for varying the flow area of said duct comprising a flexible flow area varying member, said member having only two operating positions; means for attaching said member to one of said two walls; fluid pressure means for changing the shape of said member between the two operation positions wherein the flow area of said duct is varied; and means defining a recess in said one wall for receiving said member in one of the two operating positions, said member being substantially unstretched in both the operating positions.

3,967,444
TECHNIQUE FOR PREVENTING AFTERBURNING OF THE INERT COMPONENTS OF SOLID-PROPELLED ROCKET MOTORS BY USING FORMAMIDINESULFINIC ACID IN THE BINDER OF THE INERT COMPONENTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,517

Int. Cl.^{2} F02K ***9/04***

U.S. Cl. 60—255 **9 Claims**

1. In combination: a solid propellant rocket motor comprising a rocket motor case; one or more solid propellant grain increments disposed within said case; and an inert rocket motor component comprised of formamidinesulfinic acid with a binder and a curing agent for said binder, said inert rocket motor component being in the form of a thermal barrier-liner composition for bonding to said solid propellant grain increment, said formamidinesulfinic acid when in said component being effective in preventing afterburning of said inert rocket motor component.

3,967,445
EXHAUST PURIFIER SYSTEM

Frank A. Manfredi, 2026 W. 95th St., Cleveland, Ohio 44102

Continuation of Ser. No. 281,542, Aug. 17, 1972, abandoned. This application June 21, 1974, Ser. No. 481,489

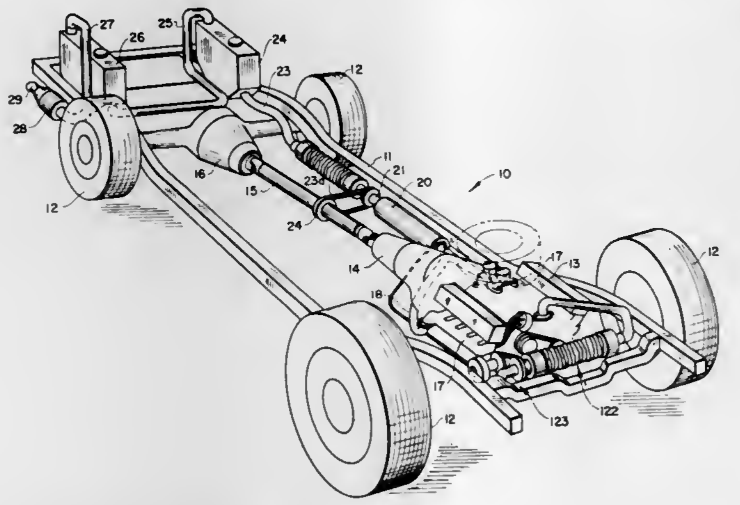
Claims priority, application Italy, Dec. 24, 1972, 32916/72; Feb. 22, 1972, 20889/72

Int. Cl.^{2} F01N ***3/10***

U.S. Cl. 60—279 **11 Claims**

1. In a motor vehicle of the type including a fuel burning engine from which exhaust gases are discharged, the engine driving a shaft, the improved exhaust purification system comprising:

- a. conduit means connected at one end to the engine for receiving exhaust gases discharged by the engine and discharging exhaust gases to the atmosphere through the other end;
- b. burner means interposed between said conduit ends to burn hydrocarbon agents present in the exhaust gases;
- c. heat exchanger means interposed between said conduit ends in series with said burner means for cooling the exhaust gases prior to their discharge to the atmosphere;
- d. said heat exchanger means comprising a rotating structure including an input at one end and an output at the other end with a plurality of longitudinally extending tubes forming a path through which the exhaust gases are passed which extends back and forth between said ends of said heat exchanger means a plurality of times enabling efficient heat transfer between said exhaust gases and said heat exchanger means;
- e. and means connecting said heat exchanger means to the driven shaft of the engine for rotating said heat exchanger means to direct ambient air currents across said tubes to cool said tubes and to thereby cool the gases being passed through the tubes.



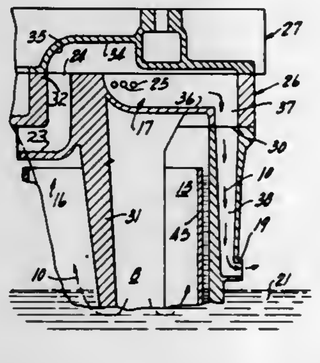
3,967,446
EXHAUST RELIEF SILENCING APPARATUS FOR MARINE PROPULSION SYSTEMS

Joseph H. Harralson, and William F. Wurzbach, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 26, 1974, Ser. No. 500,634

Int. Cl.^{2} F02B ***27/02;*** **B63H** ***5/13;*** **F01N** ***7/12***

U.S. Cl. 60—312 **21 Claims**



1. In an outboard propulsion unit including an exhaust housing means having a main exhaust passageway means terminating in a main exhaust nozzle means for discharging of exhaust gases, said main exhaust nozzle means being below the idle water line whereby water moves into the main exhaust passageway means and creates a back pressure condition in said exhaust passageway means at idle, an idle exhaust passageway means communicating with the main exhaust passageway means and terminating in exhaust port means to provide essentially unrestricted flow therefrom, said idle exhaust passageway means including silencing means having a resonator cavity means located adjacent to said idle exhaust passageway means and connected thereto by at least one opening and operable to modify the flow of exhaust gases through the idle exhaust passageway means and limit the pressure waves therein caused by engine operation.

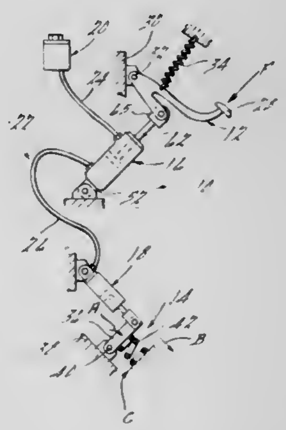
3,967,447
HYDRAULIC MASTER-SLAVE CLUTCH SYSTEM

Robert W. Hegel, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Oct. 25, 1974, Ser. No. 517,867

Int. Cl.^{2} F15B ***7/10***

U.S. Cl. 60—572 **15 Claims**



1. A hydraulic actuating system comprising,

a first piston and cylinder assembly including means for causing a first piston to move within a first enclosure in response to actuation of a controller member,

a second piston and cylinder assembly including a second piston movable within a second enclosure from a non-actuated position to an actuated position to operate a controlled member,

said first and second piston and cylinder assemblies being of substantially identical construction,

means for causing said first piston to move toward one end of said first enclosure and yieldable to permit said first piston to move toward the opposite end of said first enclosure upon actuation of said controller member.

fluid circuit means including conduit means communicating fluid from said one end of said first enclosure to said second enclosure for biasing said second piston from said nonactuated position towards said actuated position,

a fluid reservoir communicable with said fluid circuit,

normally closed valve means operative in response to preselected movement of said pistons within the associated of said enclosures toward said non-actuated positions to open and thereby communicate said reservoir with said circuit means, and

spring means associated with said system and operable to cause said pistons to move toward said non-actuated positions and thereby effect automatic opening of said valve means upon de-actuation of said controller member.

3,967,448
GEOTHERMAL ENERGY WELL CASING SEAL

Hugh B. Matthews, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,630

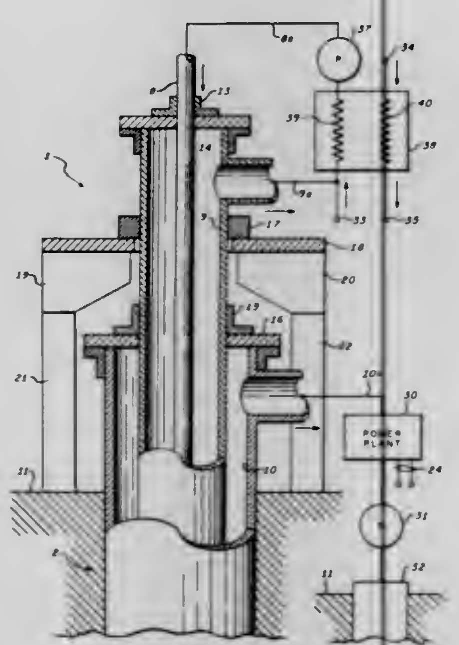
The portion of the term of this patent subsequent to July 23, 1991, has been disclaimed.

Int. Cl.^{2} F03G ***7/00;*** **F01K** ***23/00***

U.S. Cl. 60—641 **9 Claims**

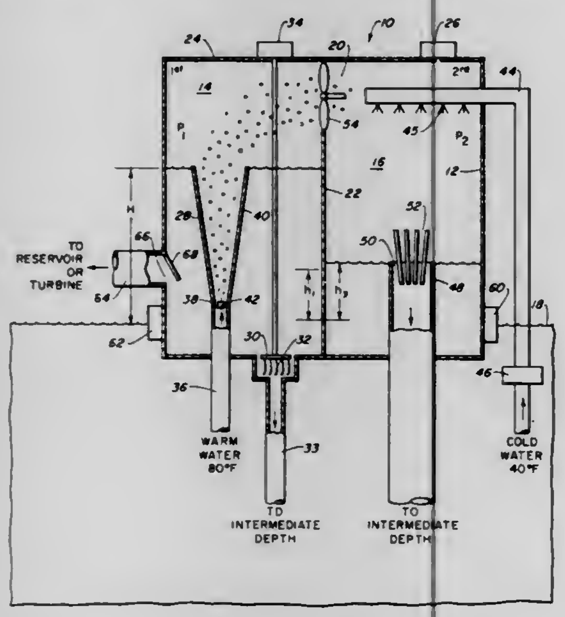
1. In geothermal deep well pump apparatus of the kind including deep well pump means having input means for pumping a first fluid always in liquid state through well casing means in cooperative energy exchanging relation with respect to a second fluid for producing a working fluid:

turbine means at said deep well pump means for driving said deep well pump means in response to said working fluid,
conduit means for passage of said working fluid residue to the earth's surface from said turbine means,



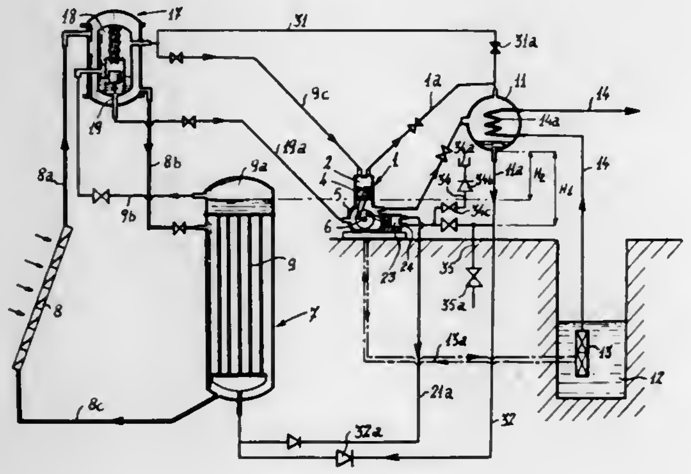
said turbine means being suspended within said deep well by said conduit means, and
resilient seal means disposed in sliding relation between said pump means input means and said well casing means.

3,967,449
OCEAN THERMAL GRADIENT POWER PLANT
Earl J. Beck, 3045 Grove St., Ventura, Calif. 93003
Filed May 29, 1975, Ser. No. 582,017
Int. Cl.² F03G *7/04*
U.S. Cl. 60—641 **50 Claims**



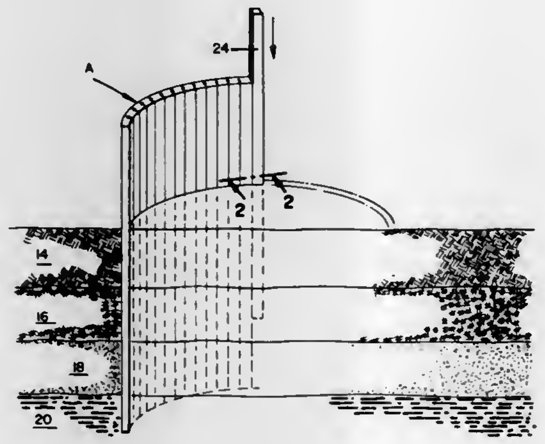
1. An ocean thermal gradient hydraulic power plant comprising:
- a. a hull having interconnecting first and second air-evacuated, barometric compartments, each said compartment being partially submerged below the surface of the ocean and having a static hydraulic head therein;
- b. a steam lift pump disposed in said first compartment for creating a working hydraulic head above said static hydraulic head in said first compartment, the interconnection between said first and second compartment being located above the level of said working hydraulic head;
- c. means located in said second compartment for maintaining said working hydraulic head created in said first compartment; and
- d. means located in said first compartment for translating the available energy of said hydraulic working head into mechanical energy.

3,967,450
POWER-GENERATION SYSTEM COMPRISING AN ENGINE ACTUATED BY THE EXPANSION OF A LIQUEFIABLE GASEOUS FLUID
Jean-Pierre Girardier, Montargis, France, assignor to Sofretes-Societe Francaise d'Etudes Thermiques et d'Energie Solaire, France
Filed May 28, 1974, Ser. No. 474,090
Claims priority, application France, June 14, 1973, 73.21679
Int. Cl.² F01K *25/08*
U.S. Cl. 60—657 **1 Claim**



1. In a power generating system operating under a low-gradient thermal cycle, such as in a power plant using solar or geothermal heat, said system comprising a liquefiable driving fluid at least partly usable for lubrication in its liquid form, a low-gradient evaporator associated with a heat source such as a solar or geothermal heat collector, for evaporating said driving fluid, an engine impervious to the surrounding atmosphere and having an inlet connected through an admission line to a drawing-off dome of said evaporator, and actuated by the expansion of said driving fluid within a cyclic-variation volume device attached to a casing of said engine, a condenser associated with a cold source and connected through a discharge line to an exhaust of said engine, a re-injection pump for feeding the driving fluid condensed in the condenser back into the evaporator in a closed circuit, a separator arranged on the admission line to the engine inlet for collecting the liquid elements entrained by the evaporated driving fluid that leaves said evaporator, and a drawing-off line connecting said separator to the engine casing for conveying the liquid elements to the engine casing, said separator being connected to the condenser through an overflow line; the improvement wherein said separator comprises heating means supplied from said heat source of the evaporator, and comprising an inner closed vessel connected to the drawing-off line by means of an obturable outlet, and a floatvalve for temporarily opening said outlet each time the level of liquid collected within the vessel reaches a predetermined height, said heating means comprising a jacket arranged at least partly around said vessel and having an inlet connected to an outlet of the fluid from said heat source of the evaporator, said jacket also having an outlet for said fluid connected to an inlet of the evaporator.

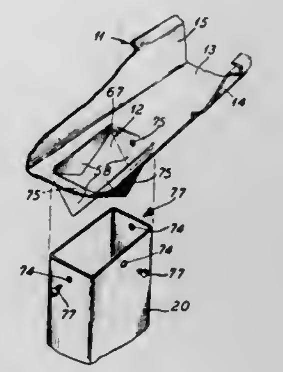
3,967,451
STORAGE FACILITY WITH INTEGRAL FOUNDATION
Carl W. Garbe, San Carlos, Calif., assignor to Dames & Moore, San Francisco, Calif.
Filed Sept. 11, 1974, Ser. No. 505,184
Int. Cl.² B65G *5/00*
U.S. Cl. 61—.5 **12 Claims**



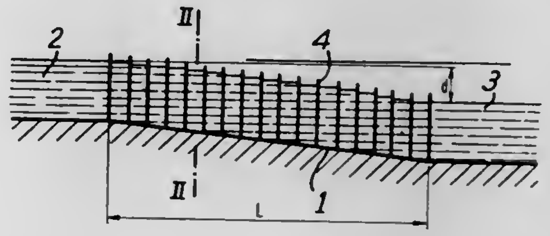
1. A process of constructing a storage facility interiorly of the ground below ground level for storing liquid products comprising the steps of: driving piles into the earth around the storage facility perimeter to form a substantially circular closed pile perimeter around a first diameter; said piles penetrating into the earth and extending above the earth a preselected distance in contiguous side-by-side relation to form said closed perimeter; after forming said closed pile perimeter, excavating below existent ground level interiorly of said closed pile perimeter to said intended storage facility depth to cause soil pressure from the exterior of said pile perimeter toward the interior of said pile perimeter to urge said piles into contiguous side-by-side relation; before and during said excavating step placing at least one substantially circular wale extending horizontally at an elevation between the top of said facility and the bottom of said facility having a second outside diameter less than said first diameter whereby said piles are urged into contiguous side-by-side relation by soil pressure from the exterior of said piles toward the interior of said pile perimeter; placing said excavated spoils immediately exterior of said closed pile perimeter on said ground; and, compacting said excavation spoils to form about that portion of the closed pile perimeter above the earth an embankment having an inward force on said closed pile perimeter having a static force on the exterior of said closed pile perimeter in excess of the static pressure from said liquid product on the interior of said closed perimeter.

3,967,452
RAIN GUTTER AND DOWNSPOUT CONNECTION
John E. Maloney, Jr., Addison, and Richard F. Zaccagni, Lombard, both of Ill., assignors to ZMC, Inc., Addison, Ill.
Division of Ser. No. 341,519, March 15, 1973, Pat. No. 3,821,890. This application June 5, 1975, Ser. No. 584,149
Int. Cl.² F16L *21/00*; E02B *9/04*; E04D *13/08*
U.S. Cl. 61—15 **7 Claims**

1. In a rain gutter formed from sheet material and having a flat bottom wall prepared for connection of a downspout thereto:
a downspout opening in said bottom wall having a continous downturned lip flange around the edge of the opening derived from material displaced from the area of the opening; and
a plurality of depending attachment tabs at spaced intervals on said flange and also derived from the material displaced from said area;
said tabs having screw holes therethrough; whereby the lip flange and the tabs can be engaged within the upper end of a downspout and the downspout secured to the tabs by screws engaged in said screw holes and the bottom wall remaining solid and free from any other openings in the area about said downspout opening.



3,967,453
CONNECTING CHANNEL BETWEEN TWO DIFFERENT WATER LEVELS
Vincent Bauzil, 4, rue Sall l'Eveque, 34-Montpellier, France
Filed Sept. 18, 1973, Ser. No. 398,472
Int. Cl.² E02B *3/10, 7/00*
U.S. Cl. 61—30 **32 Claims**

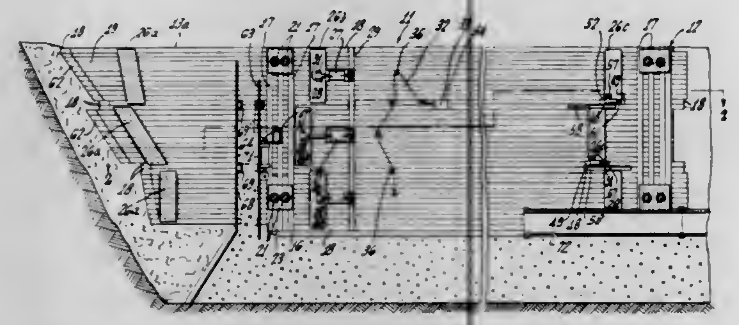


1. A connecting channel arrangement for connecting two different water levels; said arrangement comprising:
a channel means extending between said two different water levels,
a plurality of flexible finger-like means arranged in said channel means for obstructing free flow of water in order to obtain a reduction in the water flow rate and velocity through said channel means, said flexible means being sufficiently deflectible to permit passage therebetween of floating articles such as boats and debris, and
means for controlling the flexibility of each of said plurality of flexible finger-like means such that the deflection of each of said plurality of flexible finger-like means is regulated between a maximum rigidity obstructing free flow of water through said channel means and a minimum rigidity permitting said passage of floating articles therethrough.

3,967,454
TRENCH SHORING APPARATUS
Miles W. Barnes, 315 Third St., Long Beach, Calif. 90802
Filed Feb. 3, 1975, Ser. No. 546,274
Int. Cl.² E02D *5/02, 5/06*
U.S. Cl. 61—41 A **10 Claims**

1. A self propelled trench shoring apparatus comprising:
a frame supported on a lower supporting surface of said trench and adapted for travel therealong, said frame defining opposed, transversely spaced apart sides, each side comprising a plurality of longitudinally spaced uprights and a plurality of longitudinally extending supports carried by said uprights in spaced relationship to each other;
panel members disposed between pairs of said supports for longitudinal movement with respect thereto;
locking means carried by each of said panel members for engagement with locking means on adjacent panel members for cooperative engagement therebetween to lock

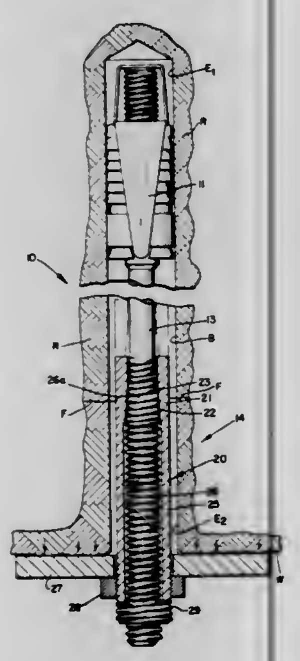
adjacent panel members together for movement in unison;
means for disengaging said locking means for longitudinal movement of said panel members with respect to at least one of said adjacent panel members;



reversible drive means for urging said panel members longitudinally between a retracted position and an extended position with respect to said frame; and
means controlling said drive means for the extension of said panel members and for reversing said drive means responsive to the position of said panel members for the simultaneous retraction thereof in cooperation with said locking means.

3,967,455
CONTROLLED YIELDING ROCK BOLT

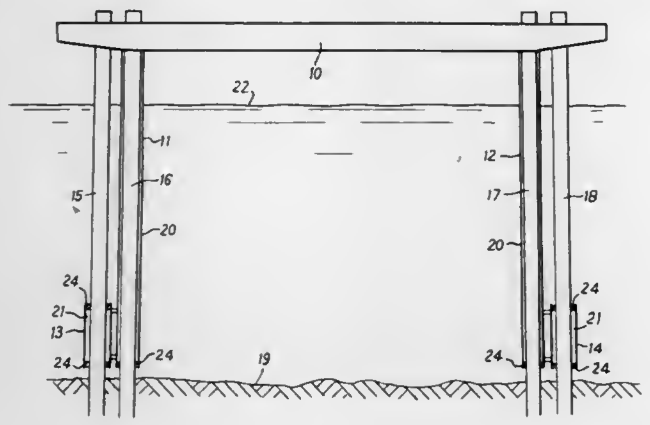
John P. Conway, Spokane, Wash., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Feb. 3, 1975, Ser. No. 546,641
Int. Cl.^{2} E21D *21/02*
U.S. Cl. 61—45 B **8 Claims**



1. A yielding fastener assembly comprising
a rod extending between two areas to be fastened together,
anchor means at one end of said rod for connection to the adjacent area, and
yieldable coupling means at least at the other end, said coupling means including a means movable along said rod and deformable holding means interacting between said rod and said movable means to allow substantially constant tension movement over an extended distance, and means for connecting the movable means to the area to be fastened adjacent said other end, whereby upon application of a predetermined force between said two areas, controlled relative movement is permitted to prevent exceeding the elastic limit of said rod.

3,967,456
SEALING DEVICES

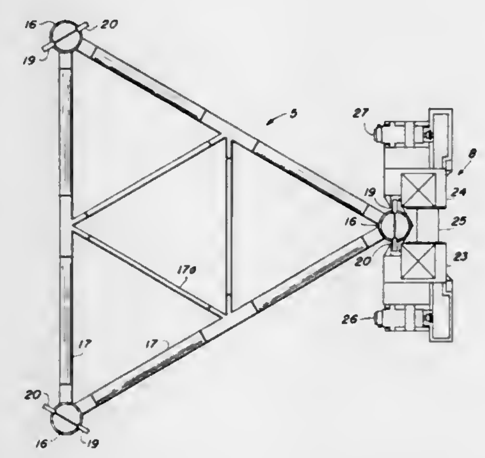
William Bundy Stone, Norwich, England, assignor to Deep Sea Grouting Packers, Inc., Houston, Tex.
Filed Nov. 14, 1974, Ser. No. 523,803
Claims priority, application United Kingdom, Nov. 19, 1973, 53645/73; Mar. 5, 1974, 9886/74
Int. Cl.^{2} E02D *5/34;* **F16J** *15/40*
U.S. Cl. 61—46 **22 Claims**



1. A sealing device for sealing an annular space disposed between a tubular supporting leg or a tubular piling can and a pile which passes through either of said tubular supporting legs or said tubular piling can, said tubular supporting leg and tubular piling can supporting a permanent platform disposed above the sea, said sealing device comprising an annular housing which includes an annular protective guard, said annular housing containing an annular sealing element and said annular protective guard being disposed between said annular sealing element and said pile before a seal is made with said pile, and actuating means for causing relative axial movement between the annular protective guard and the annular sealing element, said axial movement releasing the annular sealing element whereby the annular sealing element moves into direct sealing contact with the pile.

3,967,457
SELF-ELEVATING OFFSHORE DRILLING UNIT LEGS

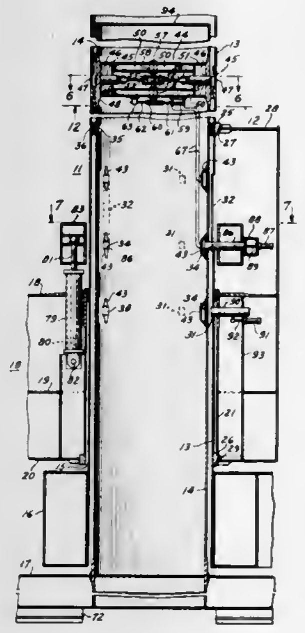
Peter M. Lovie, Houston, Tex., assignor to Engineering Technology Analysts, Inc., Houston, Tex.
Filed July 11, 1974, Ser. No. 487,574
Int. Cl.^{2} E02B *17/00;* **F16H** *19/04*
U.S. Cl. 61—46.5 **17 Claims**



4. An offshore drilling unit of the self-elevating type having a floatable hull and a plurality of legs movable from a raised position, in which said legs are supported by said hull in a body of water, to a lowered position, in which the hull is supported by said legs on the floor of said body of water; said legs comprising a plurality of mutually parallel tubular chord members rigidly interconnected by structural bracing members, said tubular chord members comprising elongated tubular body means and elongated plate means, lying in a plane including the longitudinal axis of said tubular body means, rigidly connected to and spanning the interior of said tubular body means, said chord members comprising a pair of rack members, each of which is provided with a set of rack teeth, one rack member being on one side of said tubular body means and the other on the opposite side of said tubular body means and projecting radially away from said tubular body means in a plane substantially corresponding with the plane of said plate means.

3,967,458
MARINE APPARATUS HAVING TELESCOPIC LEGS

Ralph E. Scales, Beaumont, Tex., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed Nov. 14, 1974, Ser. No. 523,934
Int. Cl.^{2} E02B *17/00*
U.S. Cl. 61—46.5 **26 Claims**

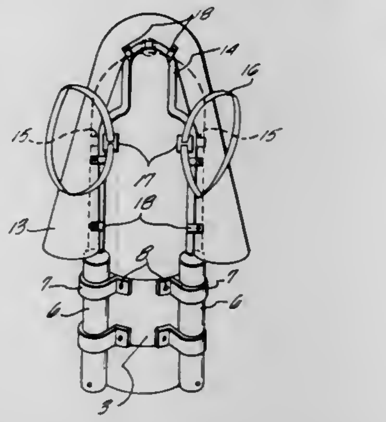


1. Marine apparatus comprising
a. a platform,
b. a plurality of telescopic legs for supporting said platform, each leg including an inner section slidably mounted within an outer section,
c. guide means on said platform mounting each outer section for substantially vertical movement in either direction relative to said platform,
d. a frame member attached to the lowe ends of each outer section,
e. locking means carried by one of said sections and releasably engageable with the other section for restraining relative, substantially vertical movement therebetween in either direction, and
f. jacking mechanism mounted solely on said platform and including vertically spaced and relatively vertically movable upper and lower holding means selectively engageable with said outer section and with said inner section for selectively effecting or restraining relative, substantially vertical movement in either direction between said platform and said sections and between said sections.

3,967,459
INDEPENDENT WEIGHT SYSTEM

David R. Denis, Azusa, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.
Filed Jan. 23, 1975, Ser. No. 543,634
Int. Cl.^{2} B63C *11/02*
U.S. Cl. 61—70 **8 Claims**

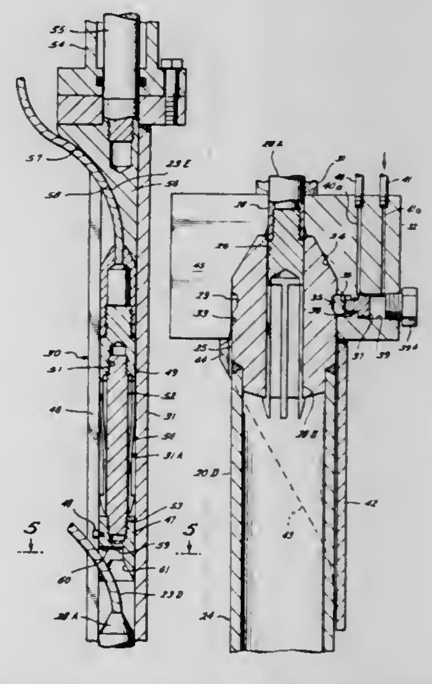
1. An independent weight system for underwater breathing equipment having a compressed air tank and a flotation device attached to a supportive backpack assembly, said weight system comprising:
a weight assembly having;
at least one weight receptacle;
a plurality of weights positioned within said weight receptacle;



restraining means located at the base of said weight receptacle, said restraining means being manually activatable to release said plurality of weights; and
a clamping means securing said weight receptacle to said tank, said clamping means mounting said weight to said tank whereby the center of gravity of said underwater breathing equipment and attached weight assembly is below the center of buoyancy of said underwater breathing equipment and weight assembly.

3,967,460
APPARATUS FOR USE IN REPLACING BROKEN GUIDELINES

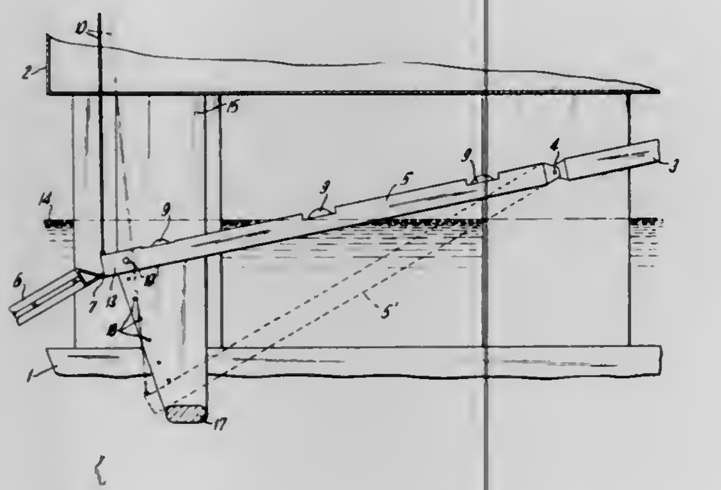
Thomas G. Cassity, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Mar. 21, 1975, Ser. No. 560,984
Int. Cl.^{2} F16L *1/00;* **E21B** *7/12*
U.S. Cl. 61—72.3 **14 Claims**



1. Apparatus for use in replacing a broken guideline which is anchored at its lower end to an underwater guidepost, comprising a body lowerable into supported position on the guidepost, cutting means carried on the body, a replacement guideline having its lower end carried on the body, and remotely controllable means carried by the body for operating the cutting means to cut the broken guideline close to the guidepost and for moving the lower end of the replacement guideline into anchored position on said guidepost, said body being separable from the cutting means and the replacement guideline to permit it to be raised from supported position upon anchoring of the lower end of the replacement guideline.

3,967,461
RAMP FOR SLIDABLY SUPPORTING A PIPELINE TO BE LAID ON A SUBMERGED BED

Giovanni Rosa, and Pasquale Brando, both of San Donato Milanese, Italy, assignors to Saipem S.p.A., San Donato Milanese, Italy
Filed July 19, 1974, Ser. No. 489,920
Claims priority, application Italy, July 20, 1973, 26817/73
Int. Cl.² B63B *35/04*
U.S. Cl. 61—72.3 **3 Claims**



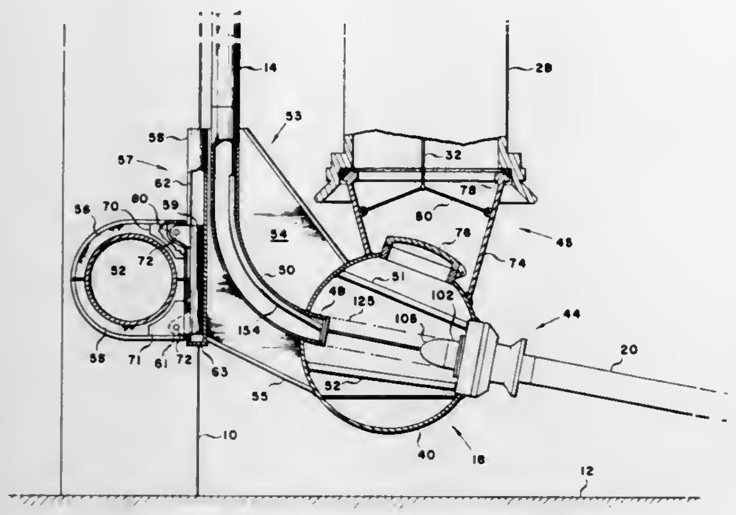
1. Apparatus for laying a pipeline on a submerged bed, including a catamaran having an awning deck, a stern end and a bow end, and means for slidably supporting said pipeline on the catamaran including a slightly inclined fixed ramp integral with the awning deck of the catamaran upon which the operations for building the pipeline to be laid are carried out and a movable stinger extending from the stern of the catamaran, wherein the improvement comprises, an intermediate pipeline-supporting element hinged at its bow to the stern end of said slightly inclined ramp and having its stern end pivotally hooked to the bow end of said stinger, means for raising and lowering the stern end of said intermediate pipeline-supporting element so that its angle of inclination with respect to a horizontal plane may be varied, a castle-shaped structure located abaft the catamaran and constituted by two side frame members fixed to the awning deck of the catamaran so as to straddle the intermediate pipeline-supporting element with their lowest ends submerged and having a bar connecting said submerged ends, and a pair of check pins, said intermediate pipeline-supporting element having a pair of sides each provided with a hole at its stern end adapted to receive one of said check pins so that it projects outwardly therefrom, the side frame members having aligned pairs of spaced holes adapted respectively to receive the outer ends of the check pins projecting from the holes in the sides of the intermediate pipeline-supporting element to lock it in the position in which it has a selected angle of inclination with respect to a horizontal plane.

3,967,462
METHOD AND APPARATUS FOR JOINING A SUBSEA PIPELINE TO AN OFFSHORE PLATFORM RISER

Jan DeJong, Delta, Canada, assignor to Lockheed Petroleum Services Ltd., New Westminster, Canada
Filed Mar. 10, 1975, Ser. No. 557,121
Int. Cl.² F16L *35/00*
U.S. Cl. 61—72.3 **6 Claims**

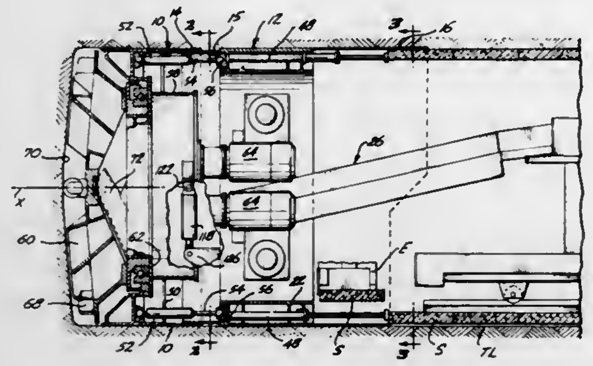
1. Apparatus for joining a subsea pipeline to an offshore platform riser, said apparatus comprising:
- a riser having a seabed end;
- a joint chamber enclosing a portion of the seabed end;
- port means in said chamber for receiving a pipeline end for connection to said seabed end;
- means for pulling an end of the pipeline into the chamber;
- means for supporting said riser end and said chamber on the platform, said means including means providing for relative movement of the riser end and chamber with respect to the platform to accommodate service conditions;

and access means in said chamber.



3,967,463
CONTINUOUS TUNNEL BORING MACHINE AND METHOD

Carlo Grandori, Rome, Italy, assignor to The Robbins Company, Seattle, Wash.
Filed Aug. 5, 1974, Ser. No. 494,390
Int. Cl.² E01G *3/02*
U.S. Cl. 61—85 **5 Claims**

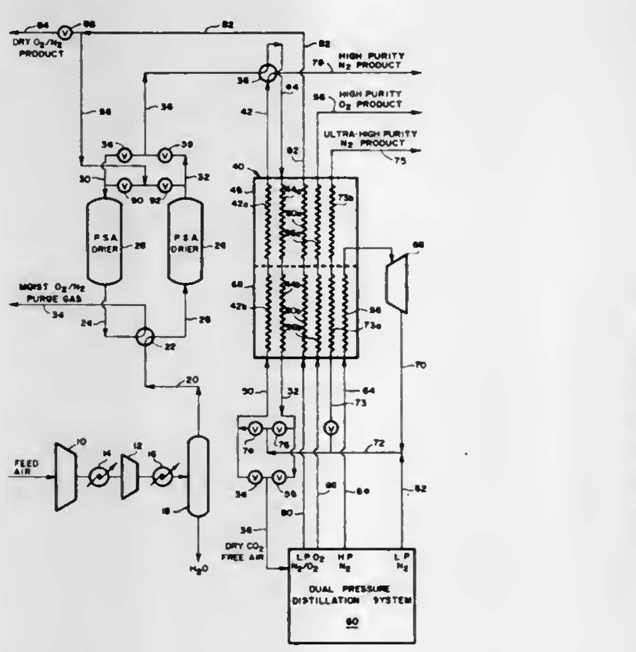


1. In a tunneling machine comprising end-to-end front and rear tubular shields, said rear shield including a tail section which extends rearwardly and provides space under cover within which a tunnel lining is constructed, main thrust ram means interconnected between the front and rear shields, for shoving the front shield forwardly relative to the rear shield and for steering said front shield relative to said rear shield; auxiliary thrust rams mounted on said rear shield and extendable rearwardly to contact the tunnel lining, the improvement comprising:
- said auxiliary thrust ram means comprising a plurality of groups of thrust rams, with each such group comprising circumferentially adjacent thrust rams in a continuous peripheral zone of the rear shield, extendable rearwardly in unison a distance at least slightly larger than the axial length of a tunnel lining segment;
- said main thrust rams means being extendable rearwadly in unison a distance which is substantially $1/x$ of the stroke of the auxiliary thrust rams, where x is the number of groups of auxiliary thrust rams; and
- said groups of auxiliary thrust rams being progressively offset an amount substantially equal to the stroke of said main thrust ram means,

whereby one group of the auxiliary thrust rams means can be retracted and tunnel lining installed between them and a previously installed portion of tunnel lining while the other groups of auxiliary thrust rams are extended against previously installed portions of the tunnel lining and the main thrust rams are being used for moving the front shield relative to the rear shield.

3,967,464
AIR SEPARATION PROCESS AND SYSTEM UTILIZING PRESSURE-SWING DRIERS

Thomas E. Cormier, Allentown, and William J. McAuley, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed July 22, 1974, Ser. No. 490,639
Int. Cl.² F25J *3/02*
U.S. Cl. 62—13 **12 Claims**

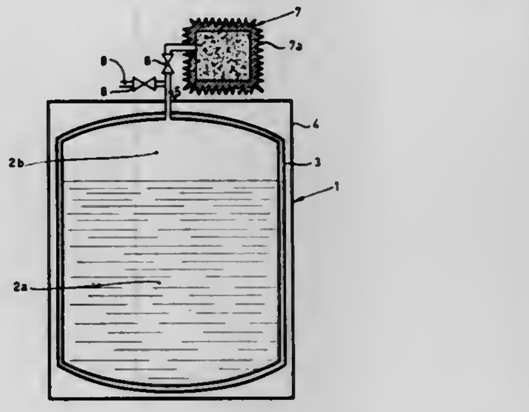


1. A cryogenic air separation process for increasing the recovery of gaseous product nitrogen from an air feed stream comprising the steps of:

a. drying a compressed feed air stream by passing said feed stream through a pressure-swing adsorption drier,
b. cooling said dried feed air stream and removing carbon dioxide from said dried feed air stream by passing said dried feed air stream through a reversing passage of a heat exchanger in countercurrent heat exchange with at least one product stream colder than said feed air stream,
c. separating said cooled feed air stream in a dual pressure distillation system including high and low pressure distillation columns to produce at least one low pressure product nitrogen stream, and at least one other low pressure stream,
d. passing at least a portion of said other low pressure stream through said pressure-swing adsorption drier so as to regenerate said adsorption drier at a pressure lower than that of said compressed feed air stream,
e. passing at least a portion of said product nitrogen stream through said reversing heat exchanger passage so as to regenerate said reversing heat exchanger passage by subliming said removed carbon dioxide, and
f. recovering said nitrogen stream after passage through said reversing heat exchanger passage as a product nitrogen stream having a nitrogen purity of at least 99.5%.

3,967,465
CONTAINER FOR STORING AND TRANSPORTING A LIQUEFIED GAS

George Albert Apolonia Asselman; Harmannus Hinderikus Van Mal, and Andries Mijnheer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 27, 1974, Ser. No. 483,613
Claims priority, application Netherlands, July 4, 1973, 7309295
Int. Cl.² F17C *11/00*
U.S. Cl. 62—48 **7 Claims**



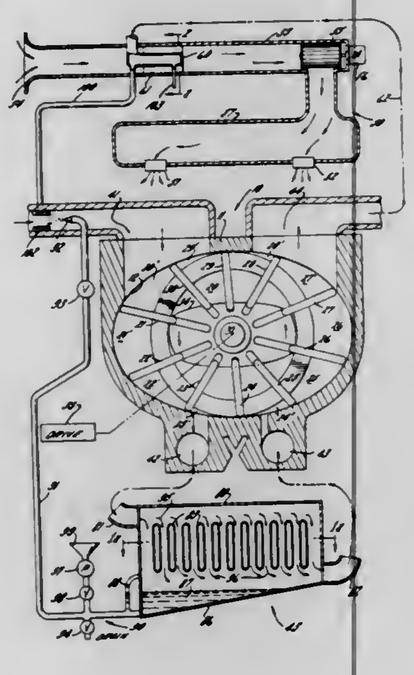
1. In a storage container for storing a liquefied gas, the container including a liquid space for containing said liquefied gas, and a gas space for containing vapor of said liquefied gas, the improvement in combination therewith comprising an auxiliary container external of said storage container, duct means for communicating said vapor between said containers, a material in said auxiliary container capable of adsorbing a portion of said gas with a resulting evolution of sorption heat, heat transfer means operable with said auxiliary container for dissipating said sorption heat.

3,967,466
AIR CONDITIONING SYSTEM HAVING SUPER-SATURATION FOR REDUCED DRIVING REQUIREMENT

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.
Continuation-in-part of Ser. No. 465,841, May 1, 1974, Pat. No. 3,913,351. This application Mar. 17, 1975, Ser. No. 559,063
Int. Cl.² F25D *9/00*
U.S. Cl. 62—402 **30 Claims**

1. In an air conditioning system, an air conditioning unit including a compressor and an expander having rotor means driven by a common shaft, the rotor means having vanes defining enclosed compartments which become smaller and larger as the shaft rotates, the compressor and expander each having an inlet port and an outlet port, a first heat exchanger connected between the compressor outlet port and the expander inlet port, a second heat exchanger coupled to the expander outlet port, the heat exchangers being isolated from one another, means for conducting to the compressor inlet port a gas which is non-condensing at the temperatures and pressures encountered in the unit so that upon driving of the rotor means the gas (1) is positively compressed and heated in the compressor, (2) releases heat in the first heat exchanger, (3) is positively expanded and cooled in the expander, and (4) absorbs heat in the second heat exchanger, an additive fluid in the gas in the form of a fluid having a high heat of vaporization capable of evaporation in the compressor and condensation in the expander, and means for injecting droplets of the additive fluid into the gas entering the compressor inlet port at a sufficient rate to super-saturate the gas for evaporation of the fluid by the heat of compression with the change of state partially counteracting the heating of the compressed gas and consequently reducing the work required to compress it, with at least a portion of the evaporated fluid being condensed in

the first heat exchanger, the gas flowing into the expander being at least substantially saturated with the additive fluid resulting in condensation in the expander to form particles with the change of state partially counteracting the cooling of



the expanding gas resulting in an increase in the work of expansion thereby further reducing the work required to drive the rotor, and means for disposing of the additive fluid condensed in the first heat exchanger.

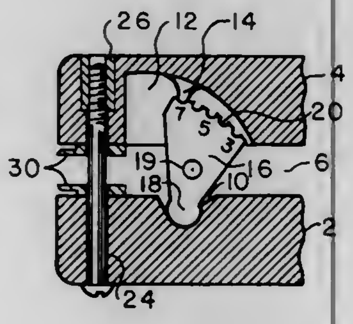
3,967,467
MANUAL KNITTING FRAME

Clifford Leach, Sr., 1947 Woodglen Lane No. 1, Vacaville, Calif. 95688

Filed Mar. 3, 1975, Ser. No. 554,930

Int. Cl.² D04B *3/00*

U.S. Cl. 66—4 **3 Claims**



1. A manual knitting frame comprising two parallel elongated frame members, connecting means joining said frame members in such a manner as to leave an elongated slot between them, said members having upper surfaces defining a plane, a row of spaced pins on each frame member, said pins being of substantially uniform height and substantially perpendicular to said plane and said rows being parallel to said slot, the height of said pins being of the same order of magnitude as the spaces between them in the rows, said connecting means comprising variable spacing means holding said elongated members apart by any one of several fixed but selectable distances, such that the rows are spaced apart by a distance in the approximate range of twice the height of said pins to six times said height, said connecting means comprising clamping means urging said elongated members toward each other and at least one movable stitch selector holding said members apart, said stitch selector being journaled for partial rotation about an axis in one of said elongated members and having a curved edge spaced from said axis of rotation, said curved edge being provided with a series of notches, the bottoms of said notches lying on a curve eccentric to said axis of rotation, and a fixed detent on the other of said elongated members positioned to engage in any one of said notches.

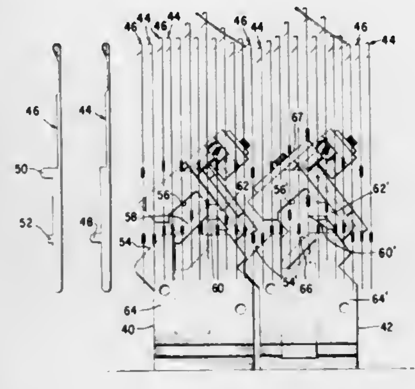
3,967,468
CIRCULAR KNITTING MACHINE FOR PRODUCING INTERLOCK FABRIC

John Christopoulos, Charlotte, N.C., assignor to The Singer Company, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,927

Int. Cl.² D04B *9/08*

U.S. Cl. 66—20 **3 Claims**



1. In a multi-feed cylinder and dial circular knitting machine, a plurality of like multi-butt cylinder needles, a plurality of like single-butt cylinder needles which alternate in space with the multi-butt needles, a first butt on each of the multi-butt needles and the single butt on each of the other needles being correspondingly located with respect to yarn engaging ends of the respective needles, needle actuating cam means relatively movable with respect to the cylinder needles including a cam to engage the butt on each of the single-butt needles and raise such needles for the taking of yarn at the first of a pair of successive yarn feeds, whereby the single-butt needles may knit at said first feed, the said first butt of the multi-butt needles being shorter than the one butt of the single-butt needles such that said cam is missed by the shorter butts of the multi-butt needles and the multi-butt needles welt at said first yarn feed, said needle actuating cam means also including camming causing the multi-butt cylinder needles to knit at the second of the successive yarn feeds and the single-butt needles to welt at the second yarn feed, a plurality of like multi-butt dial needles aligned with the single-butt cylinder needles, a plurality of other like multi-butt dial needles, aligned with the multi-butt cylinder needles, and needle actuating dial camming relatively movable with respect to the dial needles for causing the dial needles aligned with the single-butt cylinder needles to welt at the first feed and knit at the second and for causing the dial needles aligned with the double-butt cylinder needles to knit at the first feed and welt at the second.

3,967,469
WARP KNITTING MACHINE WITH IMPROVED THREAD FEEDING APPARATUS

Phillip Hepperle, Jugesheim, Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed July 25, 1975, Ser. No. 599,310

Claims priority, application Germany, July 29, 1974, 2436452

Int. Cl.² D04B *23/06, 23/08, 23/10, 23/12*

U.S. Cl. 66—84 A **4 Claims**

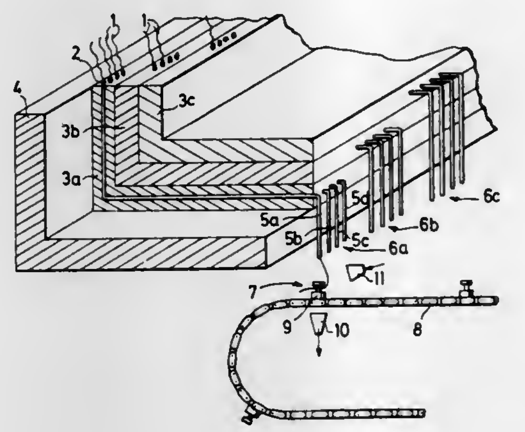
1. A warp knitting machine having an improved thread feeding apparatus, said machine comprising:

a source of threads;

a thread transfer chain, said chain having thread pick-up clamps attached thereto;

a thread feeding means for transferring the threads to the pick-up clamps of the thread transfer chain, said thread feeding means including a plurality of thread guides connected together in groups, said groups being adapted to move in different planes parallel to one another;

a driving means for moving said groups of guides past each other without mutual interference; and,



a thread inserter apparatus oriented to pick up one end of a weft thread from the transfer chain and the other end from the thread feeding means and adapted to present said thread to said knitting machine.

3,967,470
APPARATUS FOR NAPPING A CIRCULAR KNITTED FABRIC

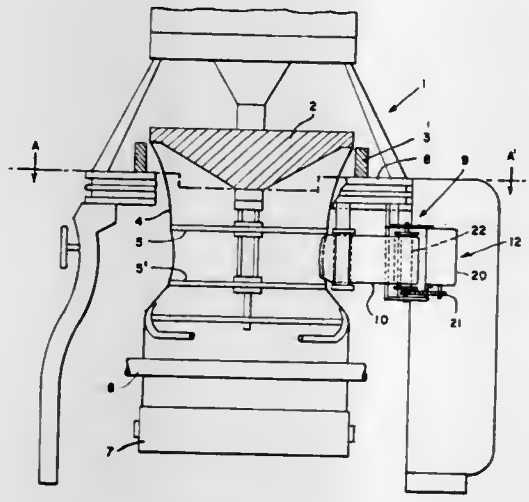
Toshiaki Miura; Tatsuya Ugajin, both of Aichi, and Masayoshi Inoue, Ichinomiya, all of Japan, assignors to Toray Textiles, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 428,371, Dec. 26, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 545,999

Claims priority, application Japan, Dec. 29, 1972, 48-1124

Int. Cl.² D04B *35/00*

U.S. Cl. 66—147 **8 Claims**



1. In an apparatus for napping a circular knitted fabric between the knitting portion and winding portion of a circular knitting machine, the combination which comprises means for stretching said fabric coursewise at a predetermined location, filament severing means positioned at said location and having emery in a beltlike form for severing filaments of said circular knitted fabric, said severing means including a supporting base for causing said emery to contact said circular knitted fabric, a supporting frame provided with yieldable means for yieldably supporting said supporting base, and driving means arranged to move said emery in a coursewise direction relative to said circular knitted fabric.

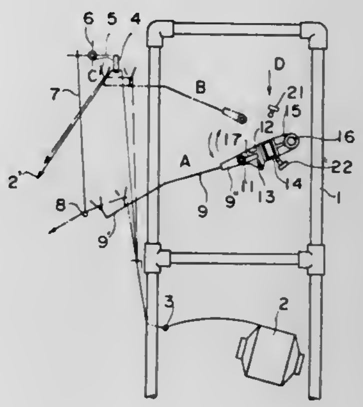
3,967,471
AUTOMATIC KNITTING YARN REPLACING APPARATUS

Fukuo Matsumoto, Heiwa, and Teizi Okada, Aichi, both of Japan, assignors to Toray Textiles Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 437,352, Jan. 28, 1974, abandoned. This application Aug. 12, 1975, Ser. No. 604,068

Int. Cl.² D04B *35/18*

U.S. Cl. 66—161 **7 Claims**



1. On a knitting machine having yarn engaging means which releases engaged yarn and stops the knitting machine when the yarn is subjected to abnormal tension, an improved automatic yarn replacing apparatus comprising at least one yarn receiving means disposed below the yarn engaging means under normal condition without contacting the yarn, and means (a) for moving said yarn receiving means upwardly when the yarn engaging means releases the yarn such that said yarn is captured and is brought into reengagement with said engaging means and returning said yarn receiving means downwardly after said reengagement is completed, and (b) for actuating yarn support elements of said yarn engaging means when the yarn receiving means is raised to a position that is suitable for said reengagement of the yarn with the engaging means.

3,967,472
STITCH BONDED FABRICS

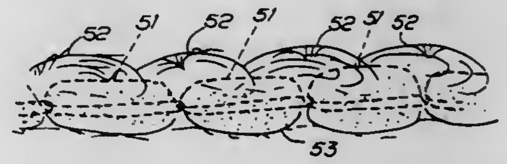
Arno Edgar Wildeman, Aurel House, Blueberry Road, Altrincham, Chester, and David Brunnschweiler, 515 Preston New Road, Blackburn, Lancaster, both of England

Filed Dec. 10, 1973, Ser. No. 423,425

Claims priority, application United Kingdom, Dec. 16, 1972, 58206/72

Int. Cl.² D04B *7/12, 7/14, 9/14, 13/00*

U.S. Cl. 66—191 **18 Claims**



1. A method for producing a fleece fabric comprising the steps of:

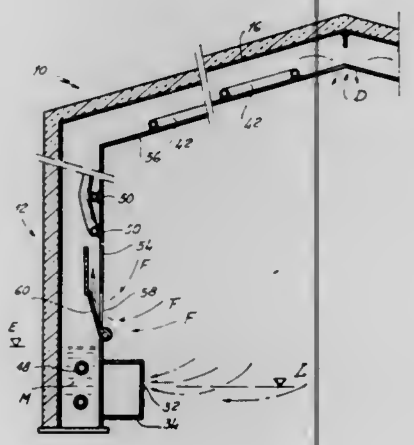
a. consolidating a fleece into a primary fabric by fleece knitting said fleece with a first set of stitches formed solely from groups of fibers of said fleece; and

b. subsequently stitch bonding the primary fabric with a second independent set of stitches of warp yarn.

3,967,473
EQUIPMENT FOR SELECTIVE STEAM TREATMENT OF CONTINUOUS FABRIC PIECES

Roberto Arioli, 15, via Cristoforo Colombo; Ameda Arioli; Lorenza Arioli, both of 20, via Cristoforo Colombo, all of Gerenzano, Varese, and Carlo Rezzonica, 7, via Manetti, Saronno, Varese, all of Italy

Filed Apr. 17, 1974, Ser. No. 461,736
Claims priority, application Italy, Apr. 20, 1973, 23294/73
Int. Cl.² D06B *3/12*
U.S. Cl. 68—5 D **9 Claims**



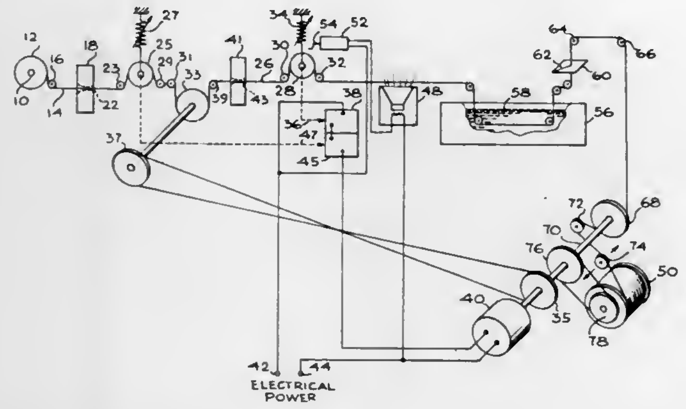
4. Apparatus for steam-treating fabrics, particularly printed fabrics, comprising a steamer housing having a treatment chamber including a pair of spaced upstanding side walls, an open bottom portion, and an upper wall comprising a pair of V-shaped inclined wall portions which converge in direction away from said bottom portion; a steam inlet communicating with said chamber and being centrally located at the point of convergence of said inclined wall portions of said upper wall; means for conveying a fabric to be steamed through said chamber; means for generating steam at a first saturated temperature and for admitting the steam in a flow path towards said inlet and into said chamber so that any steam condensate droplets which are formed on said inclined wall portions of said upper wall slide downwardly towards said side walls; and means intermediate said steam-generating means and said steam inlet for selectively heating said saturated steam to a second over-heated temperature higher than said first temperature to permit the steam-treating of the fabric at different temperatures at the option of a user.

3,967,474
APPARATUS AND METHOD FOR MANUFACTURING LEATHER BEADING LINE AND THE NOVEL PRODUCT MADE THEREBY

Hans Alexander Edwards, 2118 3rd St., Santa Monica, Calif. 90405

Filed May 19, 1975, Ser. No. 578,407
Int. Cl.² C14B *5/00*
U.S. Cl. 69—21 **14 Claims**

1. The process for forming, from leather lacing of rectangular cross-section, beading line of smooth and uniform surface and consistent circular cross-section, including the steps of:
   soaking the lacing in a liquid which is compatible with the lacing;
   drawing the lacing through at least one forming die having an opening of predetermined shape and dimensions to form a leather beading line;

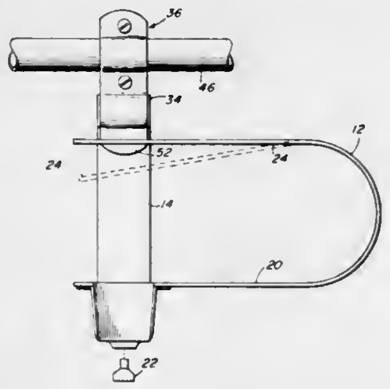


   drying the beading line; and
   applying an emollient to the beading line.

3,967,475
COMBINATION BICYCLE LOCK AND MOUNTING BRACKET

Michael S. Zane, 85 Dean Road, Brookline, Mass. 02146

Filed Apr. 4, 1975, Ser. No. 565,131
Int. Cl.² E05B *73/00;* **B62J** *7/00*
U.S. Cl. 70—18 **3 Claims**



1. A bicycle locking system, comprising,
   a. a lock, said lock including a U-shaped shackle formed with a slot near the end of each leg thereof,
   b. a bolt detachably connected to said shackle and dimensioned to pass through said slots to close the end of said shackle, and,
   c. locking means operatively associated with said lock for locking one end of said bolt to one shackle leg,
   d. the other end of said bolt being formed with an enlargement to prevent passage thereof through the slot of the other shackle leg, in combination with
   e. a bracket, said bracket including a frame-engaging clamp portion at one end and an integral socket portion extending out from said clamp portion and receiving the enlargement of said bolt,
   f. said bolt being formed with a flat shank portion and cylindrical enlargement and said bracket socket being cylindrical,
   g. said bracket being formed with thin flat tabs adjacent said socket and extending through the slot of the other shackle leg and lying flat against opposite sides of said shank.

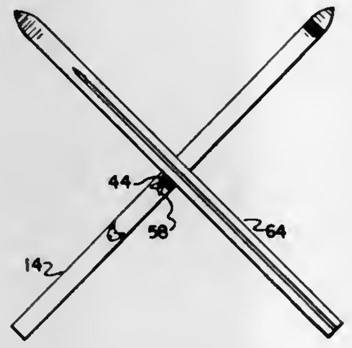
3,967,476
SKI LOCK

Robert A. Look, 8404 W. Mercer Way, Mercer Island, Wash. 98040

Filed Jan. 11, 1973, Ser. No. 322,906
Int. Cl.² E05B *73/00*
U.S. Cl. 70—58 **4 Claims**

1. A locking apparatus for locking together a first member and a second member:

   a. said first member being an elongated member having a length many times the thickness and many times the width;
   b. said second member being an elongated member having a length many times the thickness and many times the width;
said locking apparatus comprising:
   c. a first bracket;
   d. a second bracket;
   e. a means for attaching the first bracket to the first member;
   f. a means for attaching the second bracket to the second member;
   g. said first bracket having a first part of a guide means;
   h. said second bracket having a second part of said guide means;

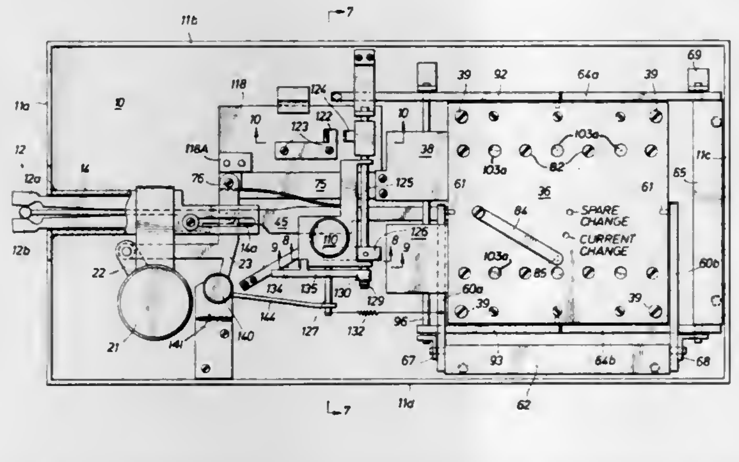


   i. said first part and said second part may be moved relative to each other;
   j. a releasable locking means integral with said brackets and for locking together said first bracket and said second bracket with the first member and the second member being crossed;
   k. said first bracket having a first base having first opposed sides;
   l. each of said first opposed sides bends back on itself to form a groove;
   m. said second bracket having a second base having second opposed sides; and,
   n. each of said second opposed sides bends to form a tongue for sliding into a respective said groove in said first bracket.

3,967,477
MULTIPLE DIAL COMBINATION LOCK

Richard P. Harrington, and Russell J. Harrington, both of P.O. Box 474, Mountainburg, Ark. 72946

Continuation-in-part of Ser. No. 479,168, June 13, 1974. This application June 27, 1975, Ser. No. 591,084
Int. Cl.² E05B *37/12, 37/14*
U.S. Cl. 70—131 **25 Claims**



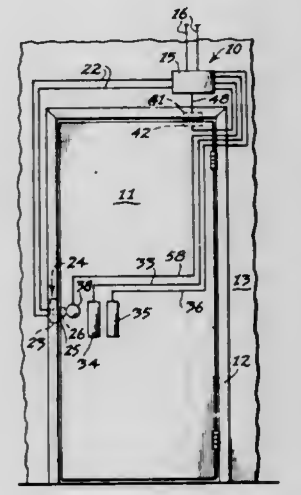
1. A combination lock comprising a bolt, means for moving the bolt between a locked and an unlocked position, a gate plate, means mounting the plate for movement along a line perpendicular to the plate between a first position holding the bolt in its locked position and a second position allowing the bolt to be moved to its open position, a plurality of openings in the gate plate, a plurality of tumblers mounted for rotation in the openings, having exposed dials for positioning the tumblers in accordance with a combination, a fence carried by each tumbler and a gate intersecting each opening in the plate to receive the fence and allow the plate to move along the longitudinal axis of the tumblers only when all of the tumblers are positioned in accordance with the combination of the lock.

23. A combination lock comprising a bolt movable between a locked and an unlocked position, means for holding the bolt in the locked position, a plurality of tumblers having exposed dials for positioning the tumblers in accordance with a first combination, means for releasing the bolt holding means when the tumblers have been so positioned, and means for holding the bolt from moving to its unlocked position until the tumblers have been moved by the dials to a second combination to prevent the combination from being exposed while the lock is open.

3,967,478
DOOR LATCHING APPARATUS ACTUATED BY CLEANSING AGENT SENSOR

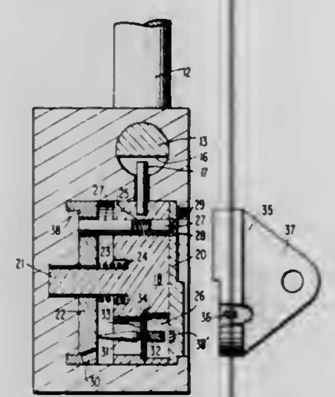
Stanley G. Guinn, 1005 Crown Point Road W., Signal Mountain, Tenn. 37377

Filed June 9, 1975, Ser. No. 585,323
Int. Cl.² E05B *47/04*
U.S. Cl. 70—144 **5 Claims**



1. An apparatus for latching and unlatching a door in a door frame, comprising:
   a. an electromagnetic bolt mechanism adapted to latch said door to said door frame when said bolt mechanism, is de-energized and to unlatch said door from said door frame when said bolt mechanism is energized,
   b. an electrical energy source for said electromagnetic bolt mechanism,
   c. a pair of electrolytically dissimilar electrodes mounted in the vicinity of said door,
   d. said electrodes being spaced apart a distance no greater than the length of the portion of a human limb coated with the electrolytic residue of a cleansing agent spanning and in contact with both said electrodes, whereby an electric current may be established between said electrodes and through said electrolytic residue,
   e. electrical switch means connected to said electromagnetic bolt mechanism and to said energy source, and,
   f. means for actuating said switch means to energize said bolt mechanism, when an electric current is established across said electrodes.

3,967,479
KEY LOCK
Jerome Vick, 801 Lake Charm Drive, Oviedo, Fla. 32765
Filed June 25, 1974, Ser. No. 482,997
Int. Cl.^{2} E05B *47/00*
U.S. Cl. 70—276 **14 Claims**

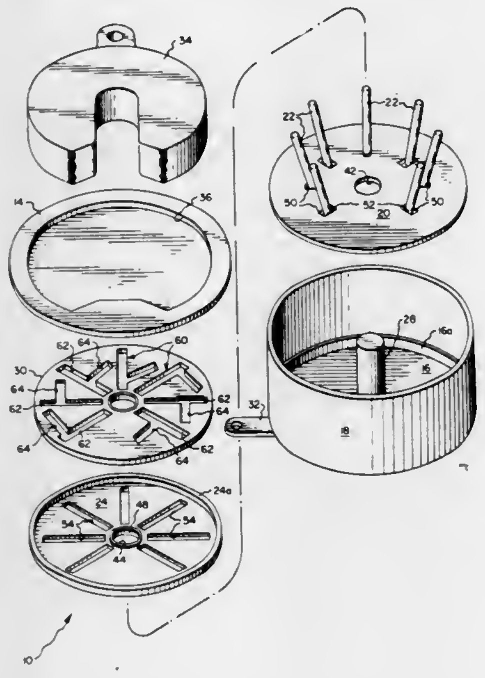


1. A magnetically actuatable lock assembly including a housing, first rotatable means in said housing, second rotatable means having front and rear walls, said front wall being in juxtaposition relative to said first rotatable means, overload release means joining said first and second rotatable means for concurrent rotation serving to prevent unauthorized lock operation, annular means including a plurality of apertures therein spaced from said rear wall, said last named means having further means complemental to means within said housing serving to cause reciprocation of said annular means upon rotation of said annular means, magnetic tumbler pin means associated with said second rotatable means, means drivingly associating said second rotatable means and said annular means for unitary rotary movement said tumbler means normally engaging said second rotatable means and said annular means in such a manner as to prevent said reciprocation and thus prevent said unitary rotary movement, and magnetic key means for aligning said tumbler pin means with at least some of said apertures in said annular means and drivably interlocking with said first rotatable means, whereby upon rotation of said magnetic key means said annular means will advance toward said second rotatable means to cause the tumbler pin means to be received within said apertures in said annular means to permit rotation of said annular means and unlatching of said lock.

3,967,480
ROTARY RELEASE MAGNETICALLY OPERATED LOCK
Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Company, Inc., Jamestown, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,911
Int. Cl.^{2} E05B *47/00*
U.S. Cl. 70—276 **10 Claims**

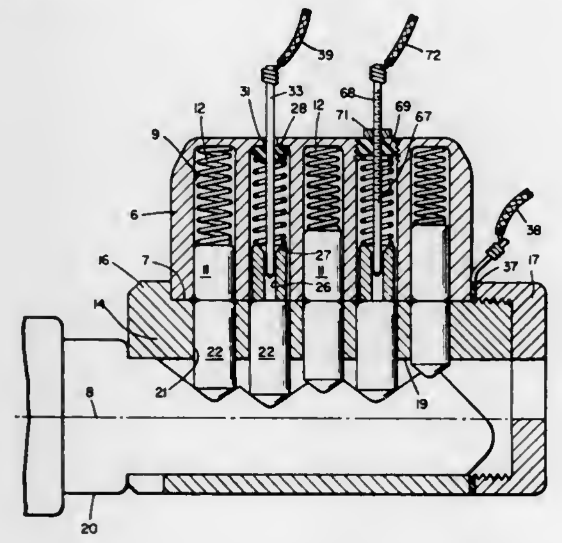
1. In a lock the combination comprising:

a plurality of magnetically attractable tumbler pins supported for pivotal movement one within each of a plurality of planes arranged to extend essentially radially of an axis whereby a portion of each of said tumbler pins may move back and forth along a path of travel disposed essentially radially of said axis, said portion being normally biased towards at least one rest position disposed along its path of travel while being movable into a lock combination setting position spaced from said rest position; a lock release assembly including a release plate supported for rotary movements about said axis between locked and lock release positions, said release plate having a plurality of composite slots each of which is arranged to movably receive said portion of one of said tumbler pins, each of said composite slots including a locking slot portion and an unlocking slot portion, said locking slot portion extending radially of said axis in alignment with said path of travel of said portion of its associated tumbler pin when said release plate is in said locked position and engaging with said portion of its associated tumbler pin in all positions thereof excepting said combination setting position to prevent rotation of said release plate from said locked position towards said lock release position, said unlocking slot portion extending transversely of and intersecting its associated locking slot portion at a position therealong in alignment with said portion of its associated tumbler pin when the latter is in its combination setting position; and



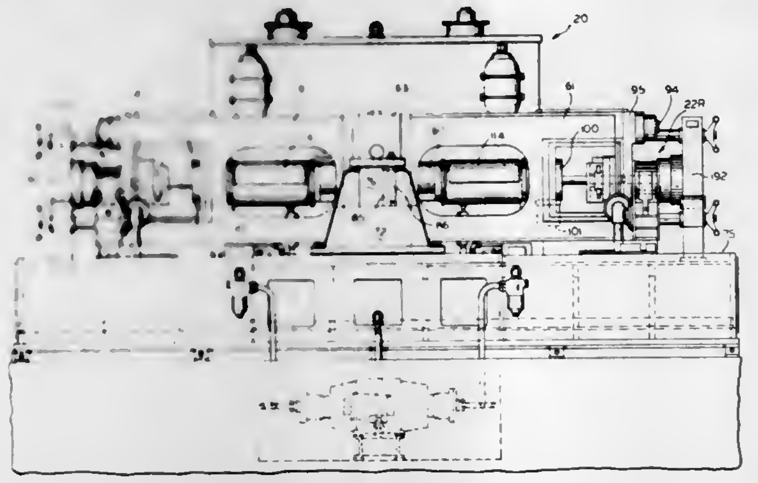
a key to be removably applied to said lock, said key having magnet devices corresponding in number to said tumbler pins and arranged within said key to attract said tumbler pins to effect movement of said portions thereof along their respective paths of travel from their rest positions into their combination setting positions when said key is applied to said lock, thereby to position said portions of said tumbler pins in alignment with their associated unlocking slot portions and free said release plate for rotation towards said lock release position.

3,967,481
DETECTOR CYLINDER
Ernest L. Schlage, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.
Filed Dec. 30, 1974, Ser. No. 537,560
Int. Cl.^{2} E05B *17/00*
U.S. Cl. 70—431 **10 Claims**



1. A detector cylinder comprising a cylinder body having a plug bore therein extending along an axis, means defining a pin bore in said body opening into said plug bore, a plug rotatable in said plug bore, means defining a keyway in said plug, means defining a pin opening in said plug communicating with said keyway and in one rotated position of said plug in said plug bore registering with said pin bore, a first pin slidable in said pin bore and said pin opening, a second pin laterally shiftable and slidable in said pin bore and said pin opening, a spring engaging said second pin and urging said second pin and said first pin toward said plug bore, an electrical contact in said pin bore and spaced laterally of said second pin, and means for establishing an electrical circuit through said electrical contact and said second pin when said second pin is moved laterally in said pin bore into abutment with said electrical contact.

3,967,482
PRODUCTION OF CLOSED BOTTOM SHELLS
Edward F. Kubacki, Arlington Heights; Bengt S. Backe, Dundee; Vance B. Gold, Lombard; Harold J. Jessogne, Arlington Heights; Frederick G. Kudert, Chicago; Harold C. Lemke, Grayslake, and William D. Timmins, Elgin, all of Ill., assignors to American Can Company, Greenwich, Conn.
Filed Mar. 17, 1975, Ser. No. 559,400
Int. Cl.^{2} B21D *22/28*
U.S. Cl. 72—7 **96 Claims**



1. In a machine of the kind described having punch and die means cooperating at a forming station to develop the shell of a can from a blank:

a reciprocal punch body of tube form and a stripper inside the punch body together presenting independent, supplementary punch elements engageable with the blank during a forward stroke of the punch body to move the blank through the die means incidental to forming the shell;

means to advance the punch body and stripper through a forward stroke predetermined as sufficient to complete formation of the shell and to retract the punch body through its reverse stroke after the shell is formed;

the punch element of the stripper being supported by a rod having a piston located within a stripper cylinder presented by the punch body;

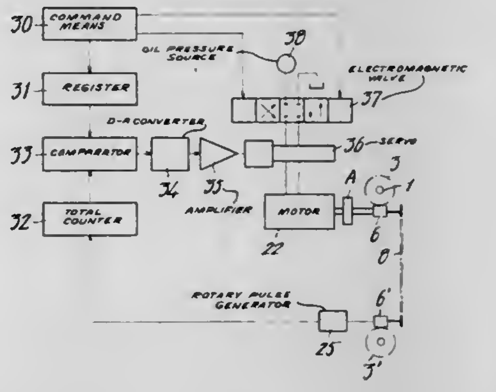
a bushing for supporting and guiding the punch body during its forward and reverse strokes, said bushing having a chamber for receiving fluid under pressure;

a port in the punch body opening into said cylinder, and said port being continuously communicated to said chamber after the punch body has attained a predetermined point of forward travel, short of completion of the forward stroke;

means to deliver fluid under pressure to said chamber after the punch has completed its forward stroke and thereafter to reverse the punch body which retracts while the stripper remains engaged with the bottom of the shell thereby to strip the shell from the punch body;

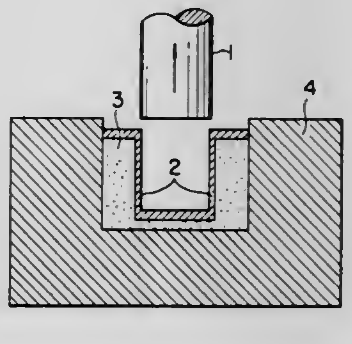
and means to retract the stripper after the shell has been stripped.

3,967,483
DEVICE FOR ADJUSTING A PRELOAD AND ADDITIONALLY COMPENSATING THE SLIDE IN A PRESS
Moritaka Kuroyahagi, Machida; Yoshinobu Kimura, Chiryu; Hirotoku Takeuchi, and Masao Takegami, both of Aichi, all of Japan, assignors to Aida Engineering Kabushiki Kaisha and Zaidan Hojin Kikai Shinko Kyokai, Tokyo, both of, Japan
Filed Aug. 13, 1974, Ser. No. 496,995
Claims priority, application Japan, Aug. 18, 1973, 48-92088
Int. Cl.^{2} B21J *9/20*
U.S. Cl. 72—21 **3 Claims**



1. A device for providing a preload to be applied by the slide in a press and additionally compensating for any deformation of the slide, comprising: a worm mechanism having a worm shaft for moving the vertical position of a die on said slide; an oil pressure motor for driving said worm mechanism through a torque limiter; and a rotary pulse generator with its rotation imparted from the worm shaft of said worm mechanism; the rotation of said oil pressure motor being controlled by a servo valve adapted to be actuated at a value obtainable from the comparison between a pulse amount generated from said rotary pulse generator and a pulse amount corresponding to a predetermined slide deformation compensating amount and by an electromagnetic valve adapted to control the rotation direction of said motor.

3,967,484
METHOD OF MANUFACTURING A LOW ENERGY-LOSS WAVEGUIDE CIRCUIT ELEMENT
Soji Takahashi, and Hiroshi Okada, both of Kodaira, Japan, assignors to Hitachi Electronics, Ltd. and Hitachi, Ltd., both of, Japan
Continuation-in-part of Ser. No. 327,160, Jan. 26, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,474
Claims priority, application Japan, Jan. 26, 1972, 47-9098
Int. Cl.^{2} B21C *23/22, 23/18;* **H01P** *11/00*
U.S. Cl. 72—47 **6 Claims**

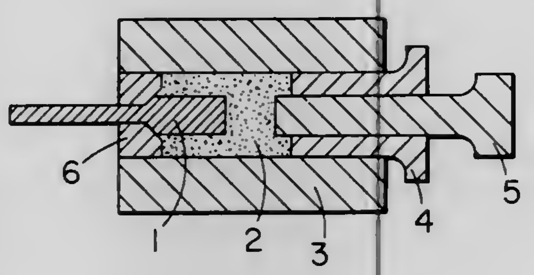


1. A method of manufacturing a low-energy loss waveguide circuit element comprising the steps of:

joining a low resistivity metal film to a base metal structure, wherein the ratio of flow stress of said metal film to flow stress of said base metal is not larger than 1.5, and

forming a conductive internal surface inside a recessed portion within said base metal by
pressing a male die of a predetermined shape into said base metal through said low resistivity metal film by
cold processing at a low processing speed of not higher than 1 mm/sec and an area reduction rate of not larger than 70 percent so as to cause a plastic strain in the base metal, said recessed portion being formed with a thick side wall, said internal surface being formed of a uniform thin layer formed of said low resistivity metal film and said internal surface being formed with a surface finish wherein the difference in height between the highest and lowest portions of said surface is not more than 0.2 μm such that said internal surface of said recessed portion constitutes a conductive surface for transmission of electric waves.

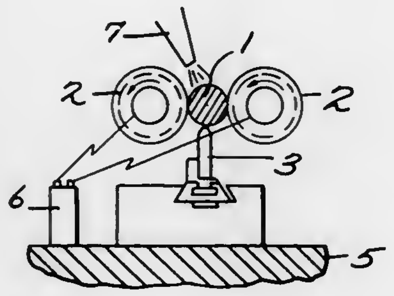
3,967,485
METHOD FOR EXTRUDING BRITTLE MATERIALS
Atsushi Oguchi, Tokyo; Minoru Otsguchi, Hino; Minoru Nobuki, Higashikurume, and Yoshinari Kaieda, Tokyo, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan
Filed Jan. 31, 1975, Ser. No. 545,875
Claims priority, application Japan, Feb. 2, 1974, 49-13306
Int. Cl.² B21C *23/00*
U.S. Cl. 72—60 **12 Claims**



1. A method for extruding a billet consisting of at least one material selected from the group consisting of metals, alloys, intermetallic compounds, ferrites and ceramics using an extruder including an extrusion die, an extrusion plunger and a container adapted to load the billet therein and extrude it therefrom, thereby to shape the billet to the configuration of the extrusion die; characterized in that said extruder further includes means for pressurizing said material loaded in the container as enclosed therein, and said method comprises embedding said billet, made in a smaller dimension in all directions than the dimension of the internal space of said container, in a solid pressure transmitting medium made of a material capable of being plastically deformed by the pressure exerted by said pressurizing means and having the configuration and dimension fitting to those of the internal space of said container, loading said pressure transmitting medium and said billet into the container, pressurizing said pressure transmitting medium and said billet by said pressurizing means, and then extruding said billet by the extrusion plunger while said pressure is maintained.

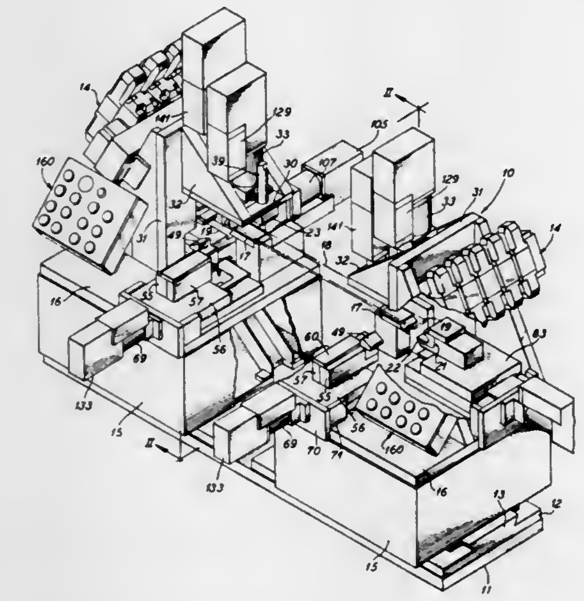
3,967,486
TOUGHENING ROLL DIE WORK METHOD FOR METALLIC MATERIAL
Seiji Takase, and Yoshiki Oshida, both of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 31, 1974, Ser. No. 537,829
Claims priority, application Japan, Jan. 18, 1974, 49-8366
Int. Cl.² B21B *9/00*
U.S. Cl. 72—69 **1 Claim**

1. A method for toughening a work piece made of a metal having at least one transformation point, by roll die working the workpiece, comprising:
a. heating the workpiece to the proximity of a transformation point;
b. subjecting the workpiece to roll die working with sufficiently low stress on the work piece as to permit the generation of super-plastic phenomena, while
c. generating super-plastic phenomena in the workpiece by alternately



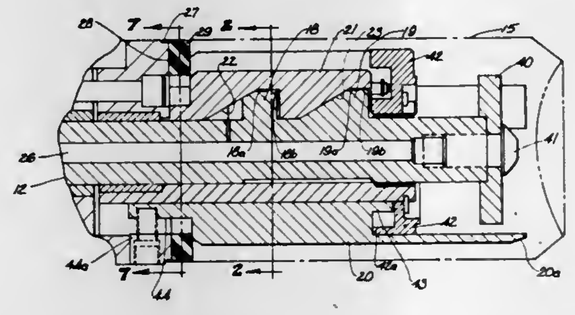
i. heating the workpiece to surpass said at least one transformation point by up to 100°C, and
ii. cooling the workpiece to below said at least one transformation point by up to 100°C,
at frequency of alternation of about 4–5 cycles per minute.

3,967,487
AUTOMATIC APPARATUS AND METHOD FOR SIMULTANEOUSLY FORMING EYES ON EACH END OF A LEAF SPRING BLANK
Dean Stout, Winamac, Ind., assignor to Winamac Steel Products Division McIntosh Corporation, Chicago, Ill.
Filed Dec. 26, 1974, Ser. No. 536,651
Int. Cl.² B21D *7/03*
U.S. Cl. 72—305 **12 Claims**



1. A method of simultaneously forming eyes at each end of a leaf spring blank comprising:
uniformly heating the spring blank to a predetermined uniform working temperature for the length thereof,
passing the heated blank transversely of its length into a working position,
clamping the opposite end portions of the blank in the working position to individual longitudinally spaced anvils,
simultaneously advancing forms beneath each end portion of the blank transversely of the blank into alignment with the underside of the blank,
vertically knocking down the ends of the blank about forms,
then in an additional forming operation forming the end portions of the blank about the forms inwardly toward each other longitudinally of the blank and at the same time scarfing the ends of the blank as formed to conform to the bottom surface of the blank upon completion of the eye forming operation,
simultaneously withdrawing the forms,
continuing the forming of the ends of the blank after the withdrawing and scarfing operation to the form of final eyes by movement of forming dies longitudinally towards the partially formed ends of the blank and moving the partially formed ends of the blank about a stationary forming surface all in a simultaneous operation at both ends of the blank and then unclamping the blank and passing the completed blank laterally of the anvils for quenching.

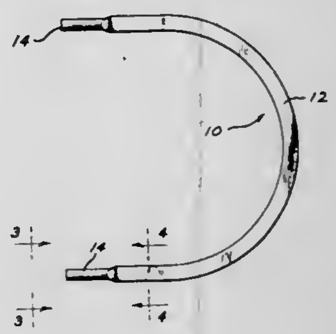
3,967,488
NECKERFLANGER FOR METAL CANS
Richard J. Hasselbeck, Houston, and Clarence E. Stiver, Sidney, both of Ohio, assignors to The Stolle Corporation, Sidney, Ohio
Continuation-in-part of Ser. No. 449,728, March 11, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,571
Int. Cl.² B21D *22/00*
U.S. Cl. 72—355 **6 Claims**



1. Apparatus for simultaneously necking and flanging metal cans, comprising an expansible mandrel adapted in its contracted condition to receive a can to be necked and flanged, a stop associated with said mandrel to determine the axial position of said can with respect to said mandrel, means for expanding said mandrel to grip the interior surface of said can, said mandrel having an annular groove in the region to be necked, and an elastic material in said groove, means for rotating said mandrel, and a rotatable die ring having an inner annular die surface coplanar with said groove, said die ring being larger in diameter than said mandrel to permit a can to be placed on said mandrel and removed therefrom without interference when said die ring is coaxial with said mandrel, and means to move said die ring radially to bring said inner annular die surface into coating relation with said annular groove, to neck and flange a can held on said mandrel simultaneously.

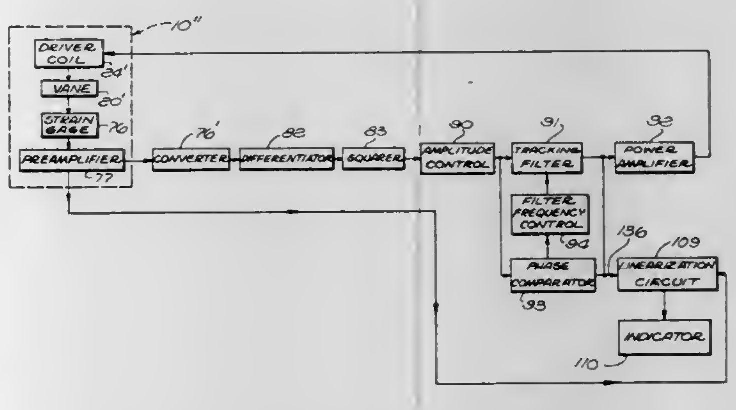
3,967,489
METHOD OF FORMING CONSTRICTION IN TUBING
Walter John Pohl, Anchorage, and Roy W. Abbott, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.
Filed May 15, 1975, Ser. No. 577,710
Int. Cl.² B21B *51/16*
U.S. Cl. 72—367 **2 Claims**

1. The method of forming a capillary tube for connection into a refrigeration system which comprises:
forming a length of tubing longitudinally into a preselected configuration so that the free ends thereof are arranged to connect with said refrigeration system, including at least one portion intermediate said ends being in a single plane;
placing said portion of said tubing intermediate said free ends in a forming means;
connecting at least one of said free ends to a source of constant pressure through a control means having means for measuring said pressure passing through said tubing;
squeezing said portion of the tubing in the forming means at a first speed until the tubing reaches an intermediate predetermined restriction; then



squeezing said portion of tubing at a second slower speed until the tubing restriction causes the medium passing through said tubing to reach a final predetermined pressure; and
terminating said second squeezing operation when said measuring means indicates said predetermined pressure.

3,967,490
VIBRATION DENSITOMETER
Edward R. Brady, deceased, late of Sierra Madre, Calif. (by Barbara Jean Brady, executrix), assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed June 27, 1975, Ser. No. 590,964
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **5 Claims**



1. A vibration densitometer comprising: a structure mounted for immersion in a fluid; a strain gage bonded to said structure; first means connected from said strain gage to vibrate said structure at its resonant frequency f; second means connected from said first means for producing an output signal at said resonant frequency; and third means connected from said strain gage and said second means for producing an output directly proportional to the density d of said fluid where

$$d = \left[\left(\frac{A}{f^2} \right) (1 + K\alpha_t \Delta T)^2 + B \right] \left[f(x) \right],$$

A and B are calibration constants,
K is one of the numbers + 1 and − 1,
α_t is the temperature coefficient of the resonant period, where the resonant period is defined as the reciprocal of the resonant frequency,
ΔT is the change in the temperature of said fluid from a predetermined reference temperature,
$f(x)$ is one of two functions, one of said functions being a constant, the other of said functions being $f(\Delta T)$ where
$F(\Delta T) = 1 - \alpha_d \Delta T$
and
α_d is the temperature coefficient of the volume of said fluid.

3,967,491
CIGARETTE TESTING APPARATUS WITH INCLINED SLIDABLE SEALING MEANS

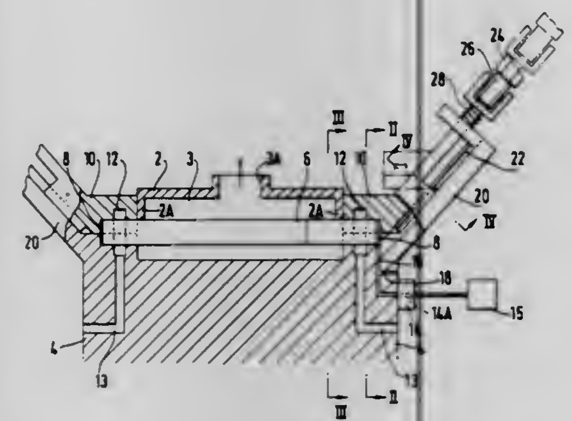
Edward G. Preston, London, England, assignor to Molins Limited, United Kingdom

Filed Jan. 31, 1975, Ser. No. 546,071

Claims priority, application United Kingdom, Jan. 31, 1974, 4464/74

Int. Cl.² G01M *3/04, 15/08*

U.S. Cl. 73—41 **5 Claims**



1. A device for testing the wrappers of cigarettes for leaks by producing a pressure differential between the inside and outside of each cigarette during testing, including a conveyor for carrying cigarettes during testing, a stationary member adjacent to the conveyor arranged to define, together with the conveyor, a chamber extending around each cigarette during testing, and movable sealing means carried by the conveyor adjacent to opposite ends of the cigarette for restricting communication between the chamber and the inside of the cigarette via the ends of the cigarette, the movable sealing means at least at one end of each cigarette comprising a slidable member which is slidably movable in a direction inclined to the axis of the cigarette over the end of the cigarette from a position spaced from the end of the cigarette so as to cooperate with part of the conveyor to surround the end of the cigarette, part of the seal being formed by the conveyor.

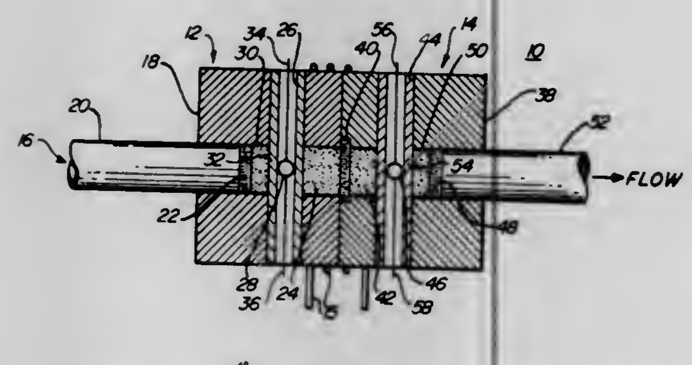
3,967,492
HEAT OF INTERACTION DETECTOR

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed May 9, 1972, Ser. No. 251,712

Int. Cl.² G01K *17/00;* **G01N** *31/06*

U.S. Cl. 73—61.1 C **22 Claims**



1. A method of reducing the flow-rate-dependent temperature error of a heat of interaction detector, comprising the steps of:

- causing a fluid to flow through said heat of interaction detector;
- varying the rate of flow of the fluid through said heat of interaction detector;
- detecting the rate of change of the flow-rate-dependent temperature error with respect to the rate of change of the flow of fluid through the heat of interaction detector; and
- adjusting the flow of heat through the heat of interaction detector until the flow-rate-dependent temperature error is at a relatively low level;
- the step of adjusting the flow of heat through the heat of interaction detector including the step of adjusting the flow of heat until the factors that caused flow-rate-dependent increases are substantially balanced against the factors that caused flow-rate-dependent temperature decreases with the same magnitude of change in the flow rate of the fluid and the step of adjusting the temperature of the fluid entering the heat of interaction detector with respect to the temperature of the body of the heat of interaction detector while the rate of flow is varied and the rate of change of the flow-rate-dependent temperature error is detected until the flow-rate-dependent temperature error is relatively low.

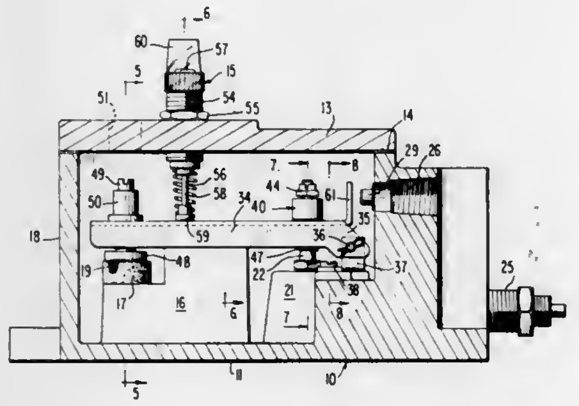
3,967,493
ACCELERATION SENSING MECHANISM

Frank W. Murphy, Jr., Tulsa, and Teddy Howard Cruse, Broken Arrow, both of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed July 25, 1975, Ser. No. 599,138

Int. Cl.² G01P *15/02;* **G05B** *9/00;* **G05D** *19/00*

U.S. Cl. 73—71 **7 Claims**



1. An acceleration sensing device comprising a body portion attachable to a device which is subject to acceleration forces and having a mechanism chamber and a cover plate for such chamber, a control fluid vent valve secured to the body portion within said chamber, control fluid passage means leading to said vent valve and formed in said body portion, a control lever arm within said chamber in opposing relation to the vent valve, means pivoting one end of the lever arm to the body portion near and on one side of the vent valve, an axially adjustable spring-biased vent valve closure stem on said control arm in opposing relation to the vent valve and having a compressible rubber-like closure disc on one end thereof adapted to engage and seal the control fluid vent port of said valve when said lever arm is in a latched position, a permanent magnet latching element fixed to the body portion near the end of the lever arm remote from said pivot means, a latching armature carried by the lever arm in opposed relation to said magnet latching element, a sensitivity adjustment means for said lever arm coupled with said armature and being accessible from the exterior of said device through an access opening in said cover plate, a manual lever arm reset and visual indicator assembly on said cover plate in opposing relation to the pivoted lever arm and including a plunger component which is resiliently biased into contact with a side of the lever arm remote from the magnet element, and a remote reset means for the lever arm responsive to fluid pressure from a remote source and mounted on said body portion.

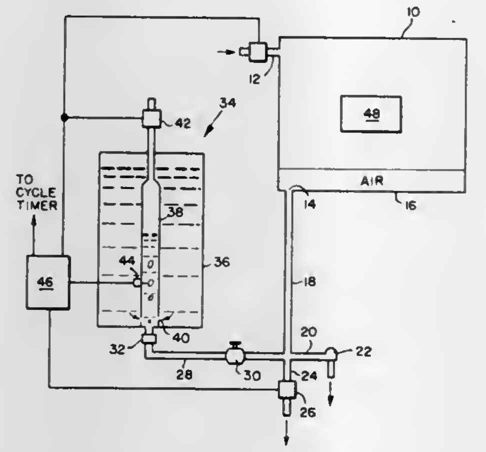
3,967,494
METHOD AND APPARATUS FOR DETECTING ENTRAPPED AIR IN A STEAM STERILIZER

Larry James Joslyn, Walworth, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 28, 1975, Ser. No. 553,974

Int. Cl.² A61L *1/00, 3/02;* **G01N** *7/14*

U.S. Cl. 73—29 **8 Claims**



1. Method for detecting entrapped air in a steam sterilizer wherein steam is introduced into a sterilizing chamber to displace the air therefrom, comprising the steps of:

- a. conducting an air-steam mixture from said chamber and into a water displacement tube wherein the steam component of said mixture condenses while the air entrapped in said mixture displaces water from said tube;
- b. sensing the level of water in said displacement tube;
- c. venting said chamber responsive to the level of water in said tube falling below a predetermined level; and
- d. venting air from said tube to permit refilling of said tube with water.

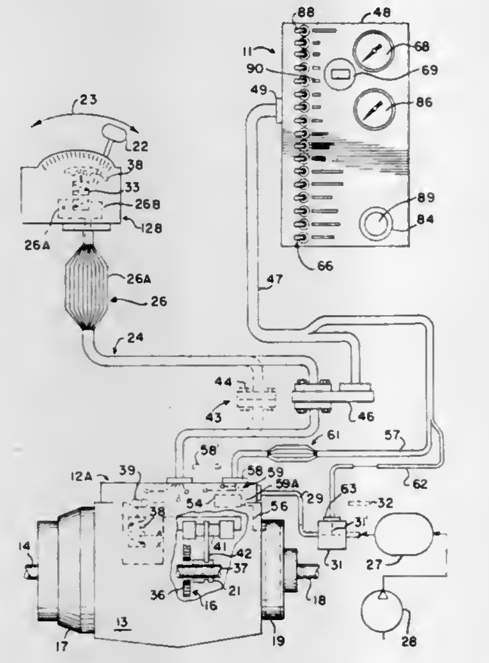
3,967,495
INSTRUMENT FOR TESTING A PNEUMATIC CONTROL SYSTEM OF A VEHICLE TRANSMISSION

Michael D. Wesner, Peoria, and Harold J. Nauman, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1975, Ser. No. 554,935

Int. Cl.² G01M *13/02*

U.S. Cl. 73—118 **8 Claims**



1. Apparatus for testing a pneumatic circuit that has a pressurized fluid supply and a plurality of fluid flow paths which are individually pressurized from said supply in predetermined combinations to control a plurality of pneumatic devices in a transmission, comprising:

- a test pressure conduit,
- pressure sensing means for indicating the presence or absence of a predetermined degree of pressure in said test conduit,
- a plurality of pneumatic signal lines,
- a plurality of test valves each being coupled between said test pressure conduit and an individual one of said pneumatic signal lines,
- connector means for temporarily coupling individual ones of said signal lines with separate individual ones of said flow paths of said circuit which is to be tested,
- a pressurized fluid supply line,
- connector means for selectively coupling said fluid supply line to said pressurized fluid supply independently of said pneumatic circuit to be tested, and
- a pressure test valve connected between said fluid supply line and said test pressure conduit whereby said testing apparatus may be operated to selectively pressurize ones of said pneumatic signal lines.

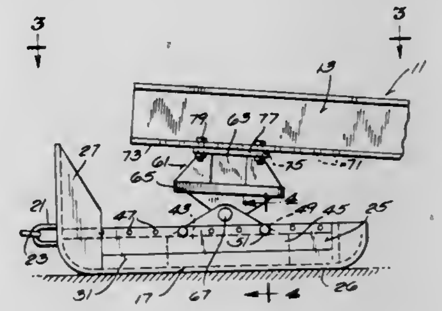
3,967,496
TRACTOR PULL SLED

Lloyd A. Luedtke, P. O. Box 123, Allenton, Wis. 53002

Filed Mar. 13, 1975, Ser. No. 557,916

Int. Cl.² G01L *5/13*

U.S. Cl. 73—141 R **9 Claims**



1. A device adapted to be pulled by a tractor, said device comprising an elongated frame having forward and rearward ends, wheel means supporting said rearward end of said frame for travel along the ground, a mass movable on said frame between said forward and rearward ends, a sled having a ground engaging surface, means on said sled and on said forward end of said frame for adjustable connection therebetween in the direction between said forward and rearward ends, said connection means comprising a way on one of said sled and said forward end of said frame extending in the direction between said forward and rearward ends, an element connected to the other of said sled and said forward end of same frame and movably located on said way, and means releasably and adjustably locating said element on said way, and means on said sled adapted for attachment to the tractor for pulling of the device by the tractor along the ground.

3,967,497
VIBRATING FORCE SENSOR

Horace D. Brown, 9817 SW. 93rd Terrace, Miami, Fla. 33176

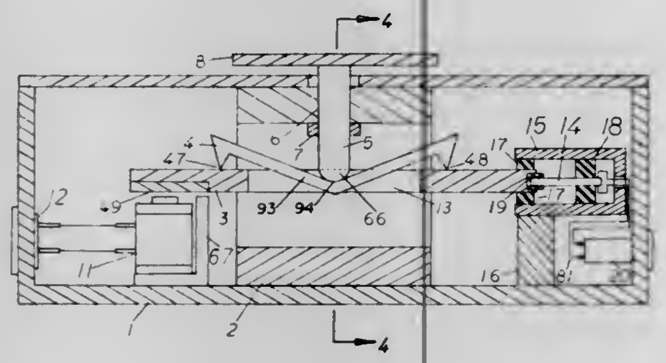
Filed Dec. 16, 1974, Ser. No. 533,345

Int. Cl.² G01L *1/10*

U.S. Cl. 73—141 R **1 Claim**

1. A force measuring mechanism comprising: support means, a vibrator means pivotably secured relative to said support means to vibrate about an axis normal to its longitudinal axis and having an elongated slot centered in and transversing its longitudinal axis, a vibrator exciter means secured relative to said support means in space relation to said vibrator means, a transducer means secured relative to said support means in space relation to said vibrator means, said transducer means being responsive to the oscillating movements of said vibrator means to produce an electric signal, force bearing means comprising a post or the like, a yoke interposed be-

tween said post and said vibrator straddling said slot and engaging said vibrator at equal and opposite points about said slot, said yoke being underslung through its longitudinal center to pass through said slot and having a bearing surface



which coincides in space with said longitudinal axis, said post engaging said bearing surface to bring to bear a force upon said vibrator via said yoke to dampen the vibrating motions of said vibrator.

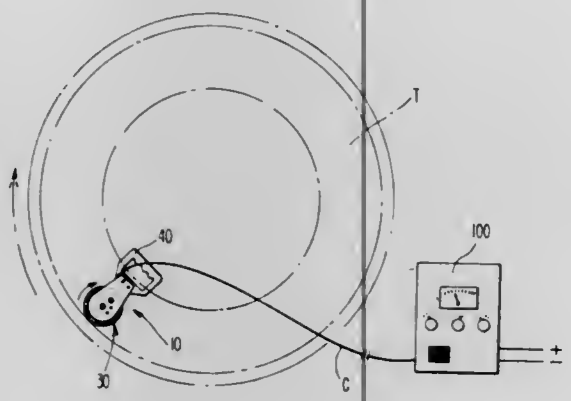
3,967,498
TIRE DEFECT DETECTOR

Rinaldo F. Pezzillo, Levittown, Pa., assignor to Super Tire Engineering Company, Pennsauken, N.J.

Filed Sept. 16, 1975, Ser. No. 613,970

Int. Cl.^{2} G01M *17/02*

U.S. Cl. 73—146 **18 Claims**



1. Apparatus for detecting the presence and location of variations in the density of material having a substantially smooth exterior surface, said apparatus comprising:
a. a roller for engaging the surface of said material;
b. an axle supporting said roller;
c. side frame means supporting said axle;
d. impact hammer means supported on said side frame means;
e. means for causing said impact hammer means to strike and shock said side frame means, axle, and roller;
f. transducer means mounted adjacent said roller and adapted to be energized by sound waves produced by the roller when shocked and to generate electrical signals in response thereto; and
g. electronic circuit means, including comparator means, for detecting differences in said generated electrical signals caused by differences in sound waves for producing an indicator signal in response to differences of a predetermined magnitude.

3,967,499
MEASURING RATE-OF-TURN ON BOARD OF SHIPS

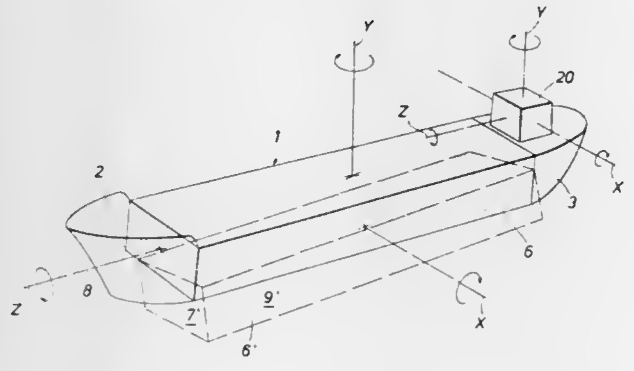
Sydney L. Whipps, Doddinghurst, England, assignor to Shell Oil Company, Houston, Tex.

Filed June 26, 1975, Ser. No. 590,790

Claims priority, application United Kingdom, July 19, 1974, 32094/74

Int. Cl.^{2} G01C *21/00*

U.S. Cl. 73—178 R **9 Claims**



1. An apparatus for measuring the rate-of-turn of a ship comprising:
a rate-of-turn sensor, said sensor being mounted in a fixed position relative to the ship's structure with its response axis parallel to the vertical axis of the ship and generating a signal representative of the rate-of-turn of the ship,
a rate-of-turn display, said display including means for calibrating the display as a 30°/minute full scale range instrument; and
means for feeding the signal from the sensor to the display.

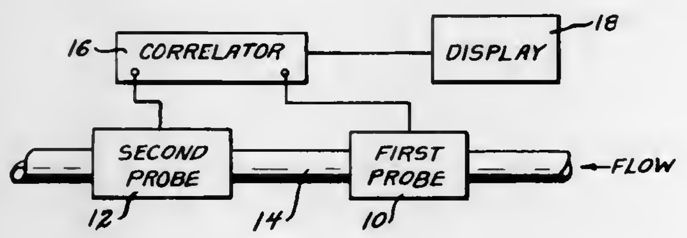
3,967,500
MAGNETIC TRANSIT-TIME FLOWMETER

George A. Forster, Westmont, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,607

Int. Cl.^{2} G01F *1/58*

U.S. Cl. 73—194 EM **8 Claims**



7. A method of measuring the flow of an electrically conducting fluid comprising the steps of disposing a first electromagnetic flowmeter at a first location in the fluid in the flow channel; disposing a second electromagnetic flowmeter at a second location in the fluid in the flow channel; and coupling the outputs of the first and second electrogmagnetic flowmeters to a statistical correlator to determine the time delay between the a-c portions of the signals from the first and second electromagnetic flowmeters that produces maximum correlation between the two signals, which time delay is a measure of the time taken by fluid to flow between the first and second electromagnetic flowmeters.

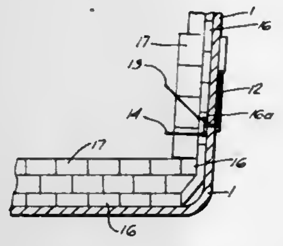
3,967,501
SLAG LEVEL DETECTION SYSTEM

Thomas R. Dishun, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed June 19, 1974, Ser. No. 480,614

Int. Cl.^{2} G01F *23/26*

U.S. Cl. 73—304 C **14 Claims**



1. In a slag level detection system, a bottom pouring ladle having a teening opening in its bottom for discharging molten metal therefrom and an opposing pair of axially aligned trunnions for suspending said ladle in a normally vertically disposed position, the vertical axis of the ladle intersecting the axis of the trunnions, said ladle being tiltable about the axis of its trunnions from its normally vertical position, probe means mounted in the wall of the ladle beneath said trunnions, said probe means lying in the plane defined by the axis of said trunnions and the vertical axis of the ladle, whereby said probe means is positioned to accurately detect the level of molten metal in the ladle irrespective of whether the ladle is in its normally vertical position or in a tilted position.

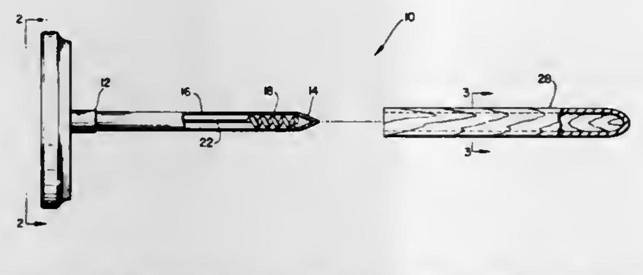
3,967,502
THERMO TIMER

John D. Moran, 1014 W. 15th St., Hazelton, Pa. 18201

Filed Sept. 6, 1974, Ser. No. 503,656

Int. Cl.^{2} G01K *1/16*

U.S. Cl. 73—352 **7 Claims**



1. A thermal measuring device for measuring the heating time of a substance comprising a metallic heat conducting probe insertable into said substance to sense the temperature of said substance, indicating means responsive to said heat conducting probe for indicating the heat content of the substance sensed, and close fitting removable heat insulating jacket means having a shape complimentary to the probe and slidably mountable over said probe to substantially delay the response of said probe to the temperature of said substance for selective use on the probe.

3,967,503
MEASURING BAND BRAKE DEVICE

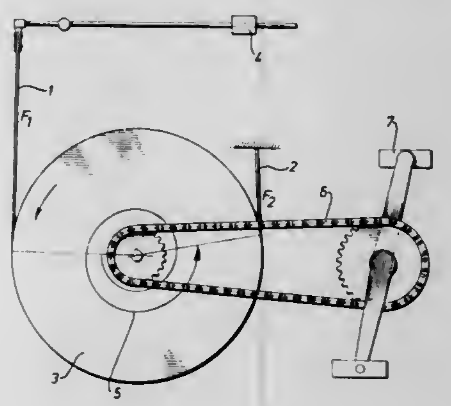
Arne Bejert Svensson, Smyckegrand 14, 126 41 Hagersten, Sweden

Filed Oct. 9, 1974, Ser. No. 513,437

Int. Cl.^{2} G01L *5/02;* A63B *23/04*

U.S. Cl. 73—379 **2 Claims**

1. In a measuring band brake device intended for attaining a defined braking action, a frame, a braking drum mounted on said frame, a braking band having two ends and surrounding said drum at an encircling angle ϕ, the improvment comprising: means for applying an outmeasuring force at one end of the braking band, the other end of the band being affixed to said frame, means allowing movement of at least one end of the braking band, and means to drive the braking drum by a human being in order to out-measure the force exerted by said human being, the braking band surrounding the brake drum



through more than one turn of the drum at an encircling angle ϕ at which the force at the affixed end of the band is negligible thus enabling the force exerted by the human being to be defined solely by the outmeasuring force applied at one end of the braking band.

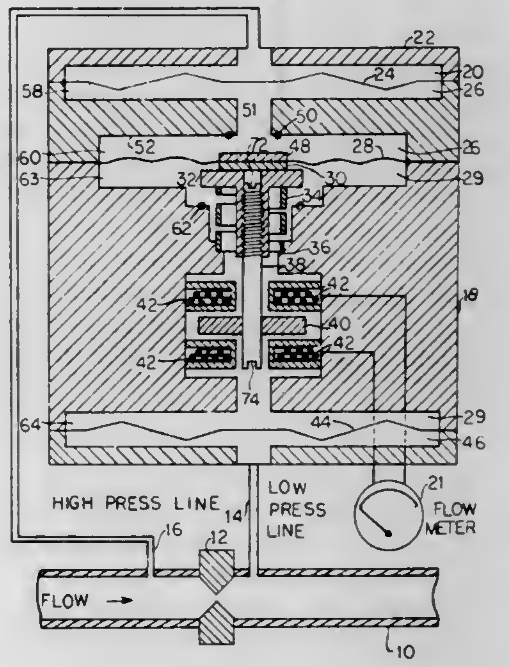
3,967,504
DIFFERENTIAL PRESSURE TRANSMITTER WITH LOW SIDE OVERRANGE PROTECTION

Lloyd T. Akeley, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 3, 1975, Ser. No. 564,689

Int. Cl.^{2} G01L *7/08, 9/10*

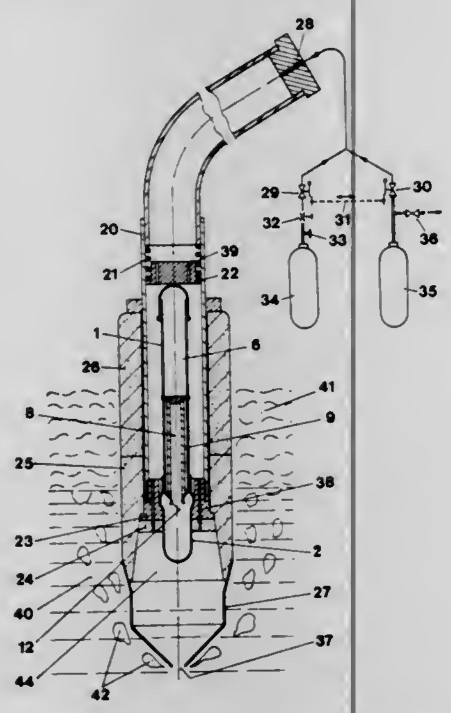
U.S. Cl. 73—407 R **10 Claims**



1. An improved differential pressure transmitter for indicating the difference in pressure between high and low pressure process fluid lines, of the type having a body containing a sensing diaphragm with high and low pressure faces subjected to the pressures in the high and low pressure lines respectively and a first spring affixed at one end to the body and having a free end cooperating with the low pressure face to oppose motion thereof, wherein the improvement comprises:
a central hub mounted on the low pressure face and releasably biased against the free end of the first spring for motion separate therefrom in response to conditions of low side overrange.

3,967,505
METHOD AND MEANS FOR DRAWING SAMPLES FROM MELTS

Heinrich Feichtinger, Schaffhausen, Switzerland, assignor to Leybold-Heraeus-Verwaltung G.m.b.H., Cologne, Germany
Filed Feb. 27, 1974, Ser. No. 446,279
Claims priority, application Switzerland, Feb. 28, 1973, 2875/73
Int. Cl.² G01N *1/14*
U.S. Cl. 73—425.6 **11 Claims**



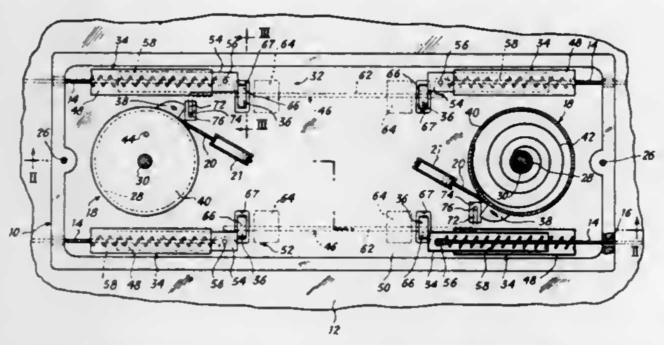
1. An arrangement for drawing a sample from melts comprising, in combination, a tube-shaped evacuated hollow element capable of being heated to a temperature sufficient to degass said element during evacuation, the drawn sample solidifying in said element in the absence of air; the gases emitted by said sample during solidification and cooling being collected quantitatively within said element; an orifice-shaped narrowed portion within the interior of said hollow element and in vacuum-tight communication with said drawn sample, said hollow element having a thin-walled metallic sleeve-shaped member and a covering cap; and metallic sealing means for sealing the exterior wall of said element vacuum tight; insert means within said element for subdividing the interior of said element into an upper chamber and a lower chamber, said insert means passing gases into said upper chamber and inhibiting the passage of melt through said insert means.

3,967,506
CONTROL MECHANISM

Jean Billot, Levallois, France, assignor to Rafaut & Cie, Villeneuve-la-Garenne, France
Filed Feb. 13, 1974, Ser. No. 442,277
Claims priority, application France, Feb. 26, 1973, 73.06671
Int. Cl.² F16H *27/02;* F41F *5/00*
U.S. Cl. 74—2 **9 Claims**

1. In a missile adapted to be carried by an aircraft and having a traction cable extending from the missile to the aircraft, a control mechanism for tripping a system in the missile the control mechanism comprising:

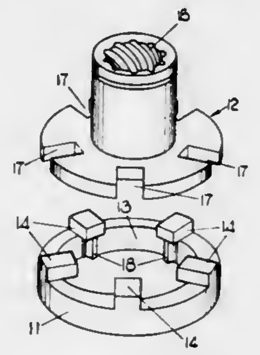
a. a storage pulley on which the traction cable is wound,
b. a trip control element for tripping a system of the missile,
c. energy storage means for actuating said trip control element upon release of the energy in said energy storage means,
d. a locking member movable between a locking position, in which it holds said energy storage means in an energy storing condition, and a release position, in which it permits said energy storage means to actuate said trip control element, and
e. movable means responsive to substantially complete unwinding of the traction cable from said storage pulley



for moving said locking member from its locking position to its release position, whereupon said energy storage means actuates said trip control element to trip the system in the missile.

3,967,507
ROLLER CLUTCH DRIVE COMPONENT

Desmond John Emms, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England
Filed Mar. 13, 1975, Ser. No. 558,161
Claims priority, application United Kingdom, Mar. 29, 1974, 14197/74
Int. Cl.² F02N *11/02;* F16D *41/06*
U.S. Cl. 74—6 **3 Claims**



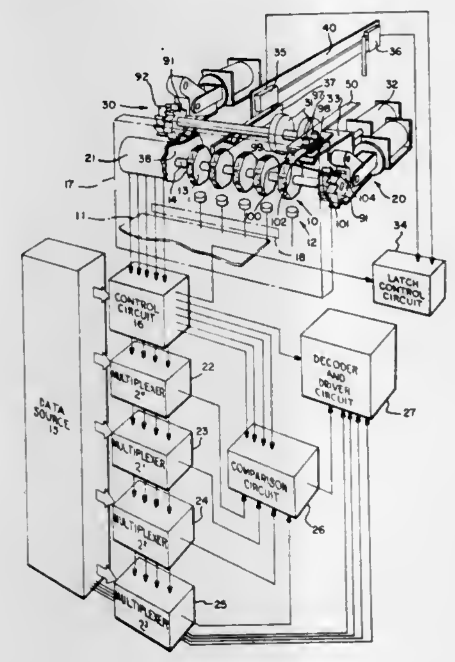
1. A roller clutch drive component including an annulus formed internally with a cam form engaged in use by rollers of the clutch assembly, and, a sleeve formed from non-magnetic material the sleeve having internal splines thereon, said annulus and said sleeve being positioned with their axes coextensive and the sleeve including an integral flange which is apertured, the apertures of the flange receiving projections integral with and extending axially from the annulus, so as to interconnect the annulus and the sleeve for rotation as one, and the annulus including a plurality of circumferentially spaced integral spring abutment portions, each spring abutment portion projecting radially inwardly from the inner periphery of the annulus and extending axially of the annulus in alignment with a respective one of said integral projections of the annulus.

3,967,508
LINE PRINTER WITH ESCAPE MECHANISM DRIVING MEANS

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.
Filed Apr. 25, 1975, Ser. No. 571,617
Int. Cl.² F16H *27/02*
U.S. Cl. 74—128 **9 Claims**

1. A drive mechanism for rotating a shaft mounted on a frame about an axis of rotation in a first direction, said mechanism comprising:

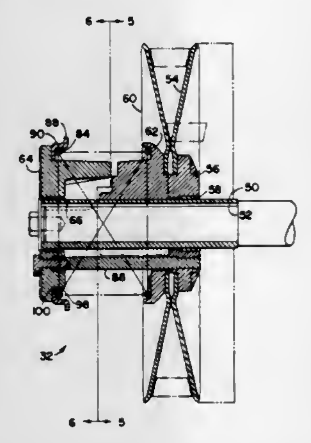
A. a solenoid assembly mounted to the frame and including an armature which has first and second positions along a second axis which is normal to the axis of rotation and which intersects it,
B. a single escapement arm mounted to said solenoid armature and pivoted in the frame for rotation on a third axis parallel to the axis of rotation and spaced from the second axis, said arm including a drive member and a positioning member, and



C. a ratchet assembly with first and second angularly opposed ratchet wheels, said ratchet assembly being affixed to the shaft and positioned so said drive member coacts with said first ratchet wheel to rotate the shaft through a substantially fixed angle in a first direction when said armature moves from the second to the first position, said positioning member, in the first position of said armature, coacting with said second ratchet wheel to accurately position the shaft.

3,967,509
VARIABLE SPEED SECONDARY PULLEY

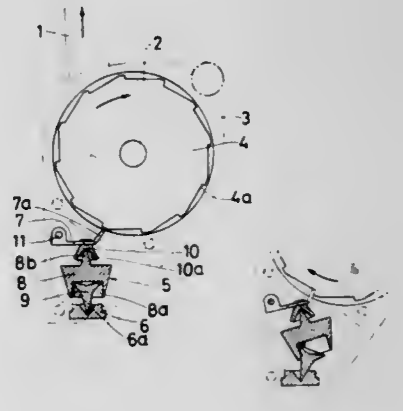
Richard Donald Teal, Janesville, Wis., assignor to Deere & Company, Moline, Ill.
Filed Jan. 21, 1975, Ser. No. 543,013
Int. Cl.² F16H *55/52, 11/06*
U.S. Cl. 74—230.17 M **6 Claims**



6. In a variable speed secondary pulley of a type including first and second pulley halves coaxially mounted adjacent each other on a shaft means such that the first pulley half is immovably fixed on the shaft means for rotation therewith and the second pulley half is rotatably and axially shiftably mounted on the shaft means for movement towards and away from the first pulley half, first and second member portions respectively fixed to the first and second pulley halves and respectively including first and second axially inclined surfaces shaped complimentary to and engaged with each other such that rotation of the second member relative to the first member will cause the second member to be wedged away from the first member by the interaction of the first and second axially inclined surfaces, and biasing means acting both in torsion and compression between the first and second member portions in such a manner as to bias the pulley halves together and to torsionally bias the first and second axially inclined surfaces together, the improvement comprising: said second member portion and said second pulley half being located on opposite sides of the first pulley half and interconnected by connecting member means; said second member portion being rotatably and axially shiftably mounted on the shaft means; and said biasing means being interposed between the first pulley half and the second member portion.

3,967,510
ACTUATION MEANS PREFERABLY INTENDED TO BE USED IN CONNECTION WITH SAFETY BELTS OF VEHICLES

Oskar Lennart Lindblad, Hedasgatan 16, 44020 Vargarda, Sweden
Filed Nov. 21, 1974, Ser. No. 525,985
Claims priority, application Sweden, Nov. 21, 1973, 7315729
Int. Cl.² G05G *5/00;* B60T *7/12*
U.S. Cl. 74—575 **9 Claims**



1. A locking actuation device of the type which is sensitive to acceleration and deceleration, particularly for use in connection with vehicle safety belts, said device comprising:

a fixed frame;
a transmission element which is movable from a first non-locking position to a second locking position, said second position being further spaced from said frame than said first position;
a spacer element assembly positioned between said frame and said transmission element and having first and second ends respectively pivotally bearing against said frame and said transmission element;
said spacer element assembly being formed by at least two separate parts which are pivotally articulated to form a toggle-like joint, said parts being laterally pivotable with respect to each other from a stable rest position with said transmission element in said first position to an unstable pivoted position with said transmission element in said second position; and
one of said parts comprising a body of inertia having an unstable center of gravity and forming means sensitive to acceleration and deceleration for laterally tilting with respect to the remainder of said at least two parts from said stable position to said unstable position and for causing said transmission element to move from said first position to said second position.

3,967,511
WINDOW LIFTER OF A MOTOR VEHICLE

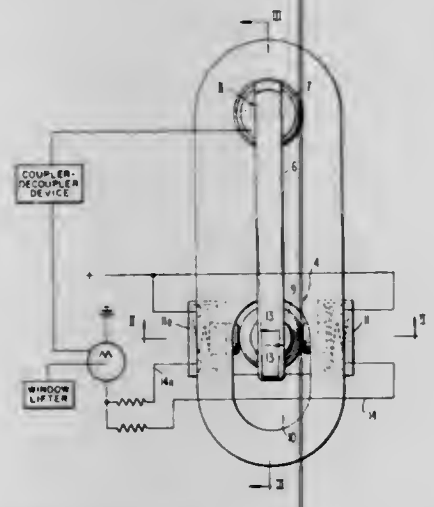
Werner Breitschwerdt, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 4, 1974, Ser. No. 502,941

Claims priority, application Germany, Sept. 6, 1973, 2344862

Int. Cl.^{2} E05F *1/00*

U.S. Cl. 74—625 **14 Claims**



1. A window lifter for vehicle windows comprising window lifter means for moving a window of a vehicle in respective up and down directions;

- drive means including a drive motor operatively connected to said window lifter means for driving said window lifter means in said directions;
- electrical control means including switch means for controlling operation of said drive means; and
- actuating means including an actuating member being engageable with said switch means of said electric control means for actuating operation of said drive means to effect said up and down movement of said window by said window lifter means, said actuating means including crank arm means for manually and mechanically actuating said window lifter means in an emergency.

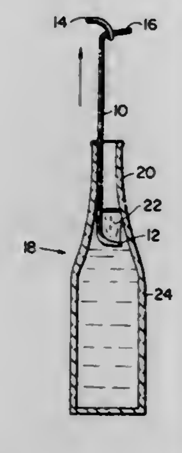
3,967,512
CORK REMOVER

Michael J. Soldano, Monsey, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 19, 1975, Ser. No. 579,038

Int. Cl.^{2} B67B *7/10*

U.S. Cl. 81—3.34 **2 Claims**



1. Apparatus for removing stoppers pushed down through the neck and into the chamber of a container which comprises elongated probe means of sufficient length for insertion into a necked container to reach through the neck of and into the chamber of such container, said probe comprising shaft means terminating in end means, said end means comprising a flat surface projecting from said probe at an angle substantially normal to said probe, said surface pointing in a direction substantially toward the top of said probe, handle means mounted on the top of said probe for gripably receiving fingers comprising two loop means extending from the top of said probe and thumb rest means extending in the same direction as said flat surface and at an angle to said shaft sufficient to allow upward pressure applied by fingers in said loop means and downward pressure applied by a thumb on said thumb rest for one handed control of said shaft and said flat surface under a stopper in the chamber of a necked container.

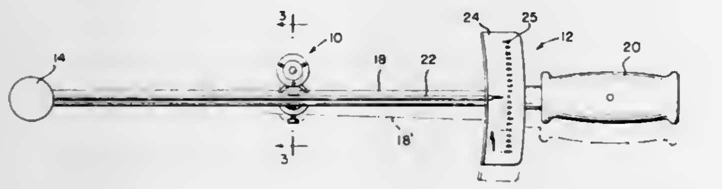
3,967,513
TORQUE SIGNALING ATTACHMENT FOR TORQUE WRENCH

Jack L. Myrdal, 1260 Roy Road, Bellingham, Wash. 98225

Filed Aug. 29, 1975, Ser. No. 608,848

Int. Cl.^{2} B25D *23/142*

U.S. Cl. 81—52.5 **7 Claims**



1. In a torque wrench having a metal torsion head adapted to engage a mechanical element, a resilient metal torque beam extending radially from said torsion head and terminating in a handle, a metal indicating pointer extending radially from said torsion head at a pointer axially spaced from said torque beam, and a torque indicating plate fastened to said torque beam intermediate said pointer, a torque indicating device comprising:

- fastening means for attaching said device to said torque beam at a plurality of points along the length of said torque beam; and
- signal means for producing a signal when the lateral offset between said indicating pointer and said torque beam at said point of attachment is a predetermined value such that the value of applied torque actuating said signal means is adjusted by varying the location of said device along said torque beam.

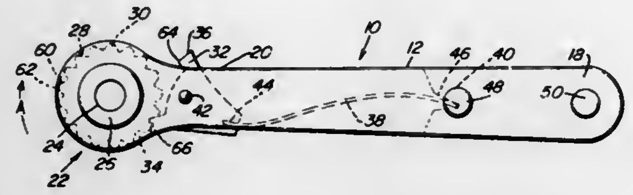
3,967,514
RATCHET WRENCH

Howard E. Deutch, 1216 Holy Cross, Monroeville, Pa. 15146

Filed Jan. 28, 1975, Ser. No. 544,798

Int. Cl.^{2} B25B *13/46*

U.S. Cl. 81—63 **1 Claim**



1. A ratchet wrench comprising, in combination, a pair of substantially identical, flat plates disposed in spaced-apart, overlying, aligned relationship to define a gap therebetween, said plates having opposite end portions forming a gripping segment and a head segment respectively and a neck segment intermediate said head segment and said gripping segment to form a handle, a flat plate member disposed within said gap in sandwiched relationship with said plates and extending throughout said gripping segment, said plate member being provided with a recess at the end adjacent said neck segment, a plurality of longitudinally spaced rivets in said gripping segment extending vertically through said plates and said plate member, said plates having a pair of vertically aligned openings in said head segment, an elongated, tubular adapter having a central bore and an upper end portion extending through said head segment openings with said adapter central bore in coaxial relationship with said openings to form a continuous passage, at least one annular flange on said adapter upper end portion for sliding engagement with one of the plates of said head segment to permit rotation of said adapter relative to said head segment, a ratchet gear having teeth mounted on said adapter upper end portion and disposed within said gap between said plates within said head segment, a plurality of sockets each having a central bore provided at one end with a portion for engaging a nut of a selected size, and an adapter engaging portion at the other end, said adapter having a lower end portion of a cross-sectional shape for accommodation within the adapter engaging portion of each of said sockets selectively with said socket central bore in axial alignment with said adapter central bore to form a continuous passage through said socket, said adaptor and said openings in said head segment thereby accommodating a bolt on which a nut engaged by said socket is mounted, a pawl disposed within said gap at the end of said neck segment opposite said plate member in sandwiched relationship with said plates for pivotal movement within said gap and having one side portion extending within said neck segment, a rivet extending vertically through said plates and said pawl for supporting said pawl for said pivotal movement, said pawl one side portion being provided with a recess, the other side portion of said pawl adjacent said head segment being provided with a pair of spaced-apart teeth engaging surfaces, a substantially S-shaped leaf spring disposed within said gap along said neck portion having opposite ends accommodated with said pawl recess and said plate member recess respectively for yieldingly urging said pawl pivotally in one direction to engage one of said engaging surfaces with said ratchet gear teeth for rotation of said ratchet gear together with said adapter and socket mounted thereon in one direction during the movement of said handle in one direction, the said pawl being pivotally movable by said ratchet gear teeth against the urging force of said spring to engage the other of said engaging surfaces on said pawl with said ratchet gear teeth for rotation of said ratchet gear together with said adapter and socket mounted thereon in the opposite direction during the movement of said handle in the opposite direction.

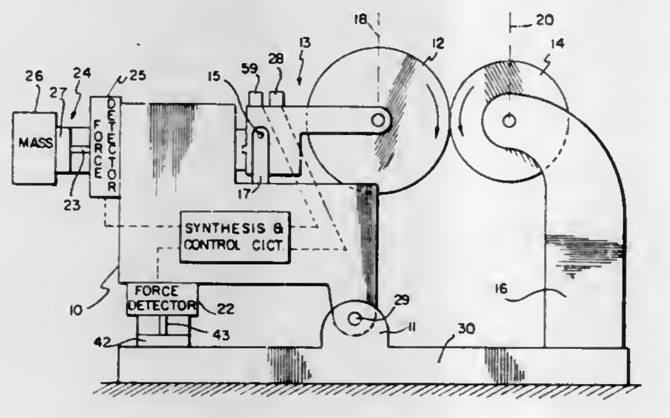
3,967,515
APPARATUS FOR CONTROLLING VIBRATIONAL CHATTER IN A MACHINE-TOOL UTILIZING AN UPDATED SYNTHESIS CIRCUIT

Chester L. Nachtigal, West Lafayette, Ind.; Richard G. Klein, Hudson, and Kenneth C. Maddux, Terrace Park, both of Ohio, assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 469,356, May 13, 1974, abandoned. This application June 13, 1975, Ser. No. 586,572

Int. Cl.^{2} B23B *7/00, 25/06*

U.S. Cl. 82—2 B **9 Claims**



1. An apparatus for controlling a machining operation wherein a workpiece and a machining tool are mounted in a machine structure and one of said workpiece and tool is moved with respect to the other to cause said tool to exert a machining force on said workpiece and to remove material therefrom, comprising first transducer means connected to the machine structure at a position spaced from said tool and workpiece for detecting a force representative of the machining force and for generating a first electrical signal corresponding thereto; second transducer means connected to the machine structure for detecting the actual motion of one of said tool and workpiece in response to the machining force and for generating a second electrical signal corresponding thereto; a synthesis circuit electrically coupled to said first and second transducer means for generating a synthesized electrical signal representative of the motion in response to the maching force of the one of said tool and workpiece not connected to said second transducer means, said synthesis circuit having updating circuit means responsive to said first and second electrical signals for continuously altering parameters of said synthesis circuit in accordance with changes in the machine static and dynamic characteristics; comparison means for comparing said second electrical signal with said synthesis signal and for generating an error signal in accordance therewith; and compensatory force means electrically coupled to said comparison means and having mechanical means for delivering compensatory forces to the machine structure in response to said error signal for maintaining said tool and workpiece in predetermined spatial relationships during the machining process irrespective of vibratory movements of said workpiece, tool, or machine structure.

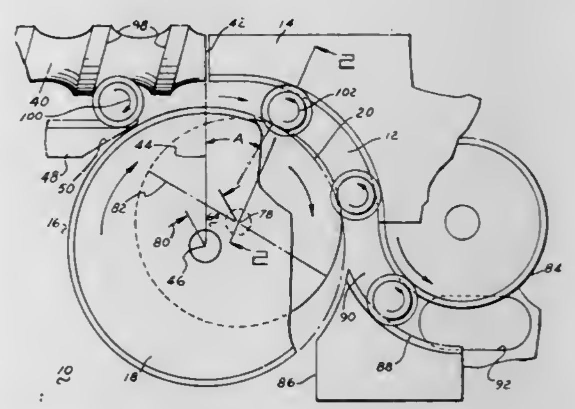
3,967,516
TRIMMING BLOW MOLDED PLASTICS ARTICLES

John E. Griesing, East Granby, and Dan Weissmann, Bloomfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 30, 1974, Ser. No. 510,296

Int. Cl.^{2} B23B *5/14;* B29C *17/10*

U.S. Cl. 82—47 **12 Claims**



1. In apparatus for trimming flash from blow molded articles of thermoplastic material as they move along a path of travel which includes:

- curvilinear fixed guide means and laterally spaced moving guide means including a drive wheel having a circumference matching the curvilinear contour of the fixed guide means forming said path between them; and
- a rotary blade adjacent said path for severing the flash from the articles as they traverse said path;
- the improvement in said apparatus whereby said articles are well supported before engagement with said rotary blade, which improvement comprises, in combination
- means for mounting said blade below and eccentrically offset with respect to the axis of said wheel toward said path; and
- means for rotating the blade at a peripheral speed different from that of said drive wheel.

5. In a method of trimming flash from blow molded articles of thermoplastic material which includes:

- cutting through the thermoplastic material at the joint between the flash and the remainder of each article with a blade rotating within a path of travel of the articles as they are advanced along said path between fixed and moving guide members;

the improvement in said method whereby the variability in vertical position and horizontal planarity of the cut is reduced, which improvement comprises, in combination, the step of:

engaging the flash area of said articles with said guide members for a distance of at least ten degress of a circular arc before commencing the cutting, the thermoplastic material in the region of the cut being at elevated temperature within a range defined with aspect to the glass transition temperature of the thermoplastic material as from about 70°F. less than to about 70°F. greater than said glass transition temperature, the peripheral speed of said rotating blade during cutting being greater than the speed of said moving guide member.

3,967,517

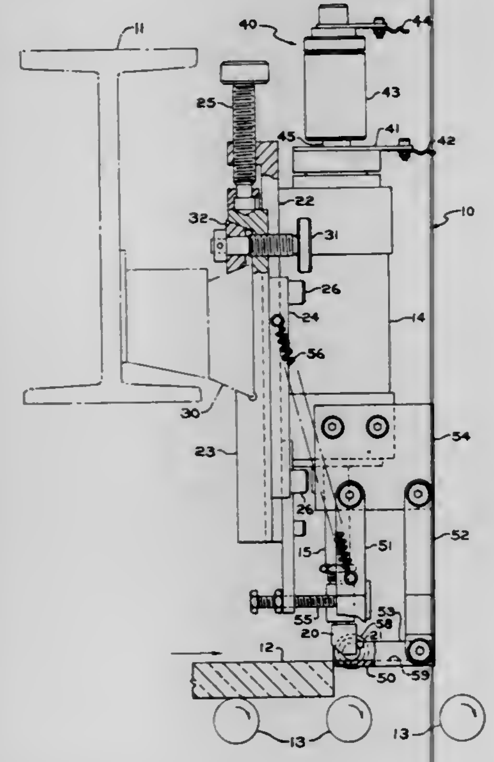
GLASS SCORING HEAD AND METHOD

Robert M. Bonaddio, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,154

Int. Cl.^{2} B26D *3/08*

U.S. Cl. 83—7 **15 Claims**



1. A method for scoring a piece of flat glass comprising the steps of:

pressing a scoring wheel under scoring force against a platform surface;

bringing a piece of glass to be scored into edge-to-edge abutment with said platform, with a major surface of the glass at substantially the same elevation as said platform surface along the line of abutment therebetween;

rolling the scoring wheel along said platform surface and directly onto said major surface of the glass so as to score the glass.

3,967,518

CAMERA FILMSTRIP PROCESSOR CONTROLLED BY FILM MARKS

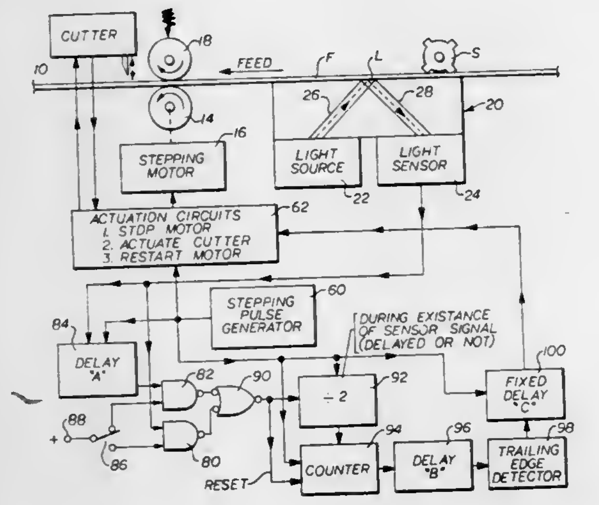
Gerald L. Edwards, Seattle, Wash., assignor to CX Corporation, Seattle, Wash.

Filed Mar. 31, 1975, Ser. No. 563,296

Int. Cl.^{2} B26D *5/32, 5/34*

U.S. Cl. 83—210 **7 Claims**

1. Apparatus for processing an elongated filmstrip and the like at selected locations spaced lengthwise of the filmstrip during advancement thereof along a path extending past an operating device, wherein the filmstrip has control marks that are centered precisely at predetermined interval locations spaced along the length of the filmstrip but of varied width measured lengthwise of the filmstrip, said apparatus comprising sensor means having a mark detector at a station spaced a predetermined distance from said operating device lengthwise of said path, and operable to sense passage of the respective leading and lagging edges of each mark as a point along each such edge passes said station, said sensor means being thereby operable to measure a first advancement interval corresponding to the width of each mark between the sensed edge points thereof passing such station, said sensor means being operable to time actuation of the operating device after advancement of the filmstrip following one such edge point passing said mark detector by a distance corresponding to half said first interval added to a predetermined second interval, thereby resulting in actuation of the operating device each time the filmstrip advances by a fixed distance in relation to the mark detector independently of differences that may occur from one mark to the next in their respective measured mark width intervals.



3,967,519

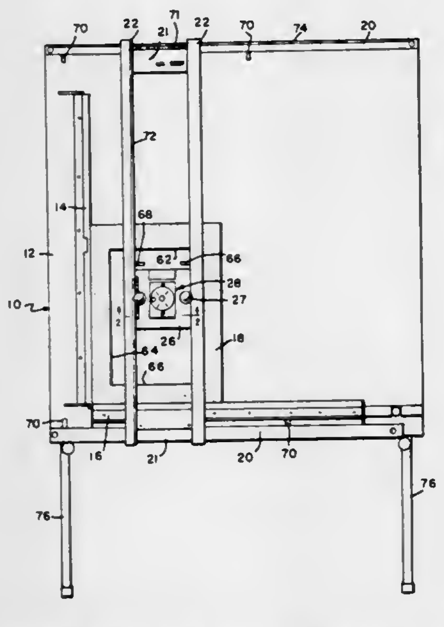
MULTI DIRECTIONAL WEB CUTTER

Harry F. Esterly, 47 Rowley Road, Topsfield, Mass. 01983

Filed July 16, 1974, Ser. No. 488,962

Int. Cl.^{2} B26D *1/02*

U.S. Cl. 83—455 **19 Claims**



1. A web cutting apparatus comprising means for holding the web on a support surface; a pair of spaced tracks mounted on said support surface; at least one other cross-track positioned across said pair of tracks and moveably mounted thereon to slide laterally along said pair of tracks to and fro; a knife carriage moveably mounted on said cross track; a rotatable blade assembly rotatably mounted on said carriage; (a blade mounted on said blade assembly and positioned to contact the web thereunder to cut the same;) means for rotating said blade assembly to cut said web in a plurality of directions; said blade assembly having resiliently mounted at the base thereof a blade guide means, said guide means terminating in a smooth surfaced foot for riding over the web, said guide means having a blade mounted thereon and penetrating beyond said foot and means for adjusting the depth of penetration of said blade beyond said foot; means for moving said knife carriage along said cross-track and means for moving said cross-track along said pair of tracks so as to move said blade a plurality of directions over said web to cut the same.

3,967,520

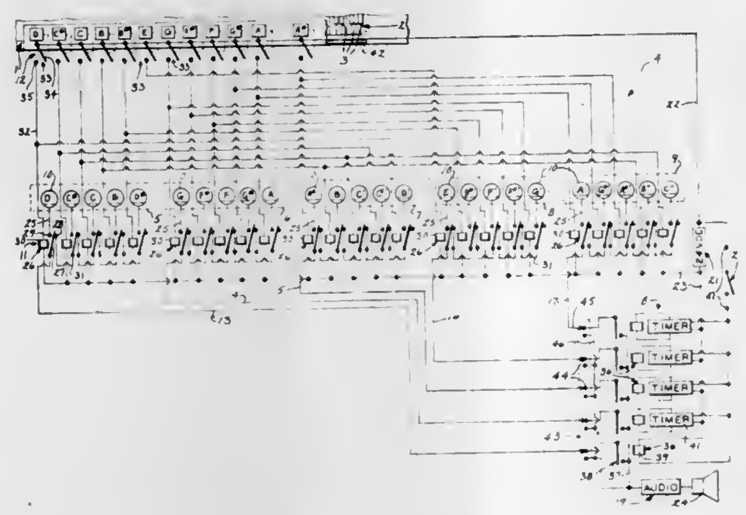
GUITAR CHORDING DEVICE FOR KEYBOARD INSTRUMENTS

Lawrence A. Drydyk, 13010 W. Park Ave., New Berlin, Wis. 53151

Filed Nov. 18, 1974, Ser. No. 524,982

Int. Cl.^{2} G10H *1/02, 5/02*

U.S. Cl. 84—1.01 **19 Claims**



1. An apparatus comprising a plurality of individual tone generating sections, a plurality of output connecting means, one for each section, each of said sections including a plurality of tone source means each operable to form an audio frequency signal for a selected musical note and each section defining a different combination of notes from that of the other sections with selected notes repeated in different sections, a preferential switch and circuit means including switch means in each section for each of said note source means, each of said sections having circuit means connecting said switch means in each section to each other and to said output connecting means for connecting of said tone source means of a section to a corresponding output connecting means for that section, said switch means in each section being connected in a preferential order with said switch means completing the circuit from the connecting means to the one tone source means and breaking the circuit to the other tone source means of the same section and whereby with two switch means activated in one section only one preferred tone source means is connected to the output connecting means of said section to define a preferential order of notes in each section, said sections having a tone source means operable to develop the note which was disconnected in a different section by said switch means and connected to the related connecting means as a preferential note, and common means for operating of the switch means for all tone source means for the same note in said sections whereby simultaneously activating one or more of the switch means in said sections generates a selected note at each of said output connecting means, said preferential order controlling the particular note impressed on the output connecting means in each section and generates an audibly pleasing voicing sequence.

3,967,521

HAMMER FOR PIANOS AND SIMILAR INSTRUMENTS

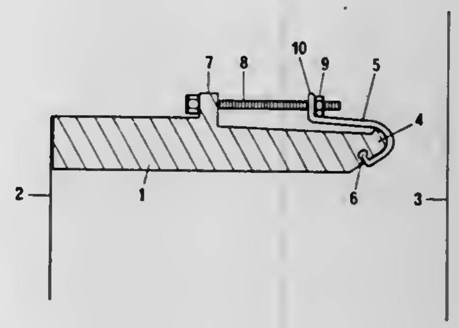
Gunnar Sjöstrand, Atvidaberg, Sweden, assignor to Incentive AB, Stockholm, Sweden

Filed Apr. 30, 1975, Ser. No. 573,133

Claims priority, application Sweden, May 15, 1974, 7406462

Int. Cl.^{2} G10C *3/18*

U.S. Cl. 84—254 **7 Claims**



1. Hammer for pianos or similar instruments having a stringed or tuned plate to be struck by the hammer, comprising a core having a surface facing said string or plate, and a cover disposed on said surface consisting of a band made of elastic material, one end of said band being fixedly attached to said core, the other end of the band being attached to the core by an adjustable tensioning device for varying the tone by adjusting the tension of the band.

3,967,522

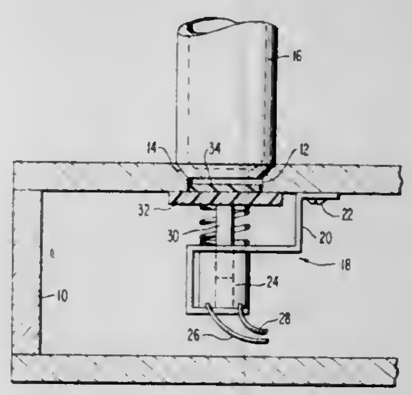
VALVE FOR PIPE ORGANS

Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980

Filed Apr. 28, 1975, Ser. No. 572,579

Int. Cl.^{2} G10B *3/06*

U.S. Cl. 84—334 **1 Claim**

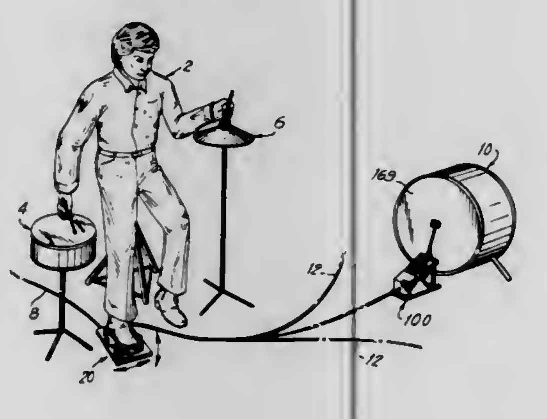


1. In a wind chest for a pipe organ of the type having a plurality of cylindrical apertures in the upper surface thereof adapted to be in communication with the pipes of said organ and a valve means associated with each aperture to control the flow of air from the chest to the pipes, the improvement comprising each of said valve means having a valve member and means for moving said valve member into and out of engagement with the interior of the wind chest about the entire circumference of the respective aperture; said valve member being comprised of a circular disc-like member having a cylindrical projection concentrically located on and extending outwardly from one surface so as to be located within the circular aperture in the wind chest when the valve member is in engagement with the wind chest to prevent a pipe from speaking if the valve member should bounce slightly during closing.

3,967,523
POWER DRIVEN DRUM BEATER

George T. Currier, 470 Gregory Ave., Weehawken, N.J. 07087, and Dennis M. Canavan, 242 River Road, North Arlington, N.J. 07032

Filed June 3, 1975, Ser. No. 583,426
Int. Cl.² G10D *13/00*
U.S. Cl. 84—422 R **37 Claims**

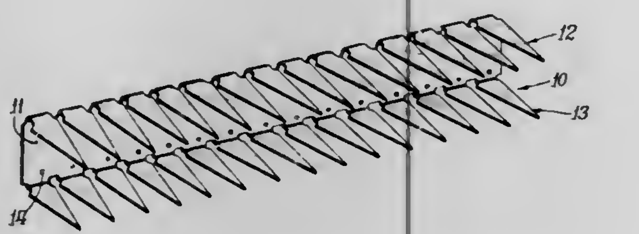


1. A foot pedal control device for use in controlling an electric drum beater, comprising: base means, a foot rest mounted on said base means so as to be movable about a pair of axes; a plurality of first electrical contact means on said base means and second electrical contact means on said foot rest; biasing means maintaining a separation between said first and second contact means; and electrical circuit means including variable resistance means connected to each of said first contact means and to said drum beater for actuating same upon contact of said second contact menas with any one of said first contact means.

3,967,524
INSULATION BLOCK FASTENER

Kenneth T. Snow, 1303 N. Cross St., Wheaton, Ill. 60187, and Kenneth T. Snow, Jr., 317 Shagbark Court, Schaumburg, Ill. 60172

Filed May 1, 1975, Ser. No. 573,780
Int. Cl.² A43B *23/20;* **F16B** *15/00*
U.S. Cl. 85—13 **2 Claims**

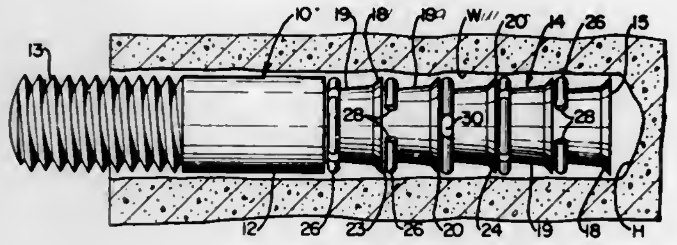


1. A metal fastener made of relatively thin metal for holding an insulation block to a rigid surface, said fastener having a flat back adapted to lie flush against the rigid surface, means fastening said flat back to the rigid surface, said fastener including tapered spikes bent at right angles from both sides of said flat back and extending in the same direction and lying generally parallel to each other, the thickness of said spikes being only the thickness of the metal and having a sharp point at their outer ends and being broad near their inner ends, whereby when said spikes are covered with an adhesive and an insulating block is pressed onto the spikes the insulating block is fixedly and firmly attached to said rigid surface.

3,967,525
SPRING ACTION EXPANSION BOLT

Lester Lerich, Broomfield, Colo., assignor to Wej-It Expansion Products, Inc., Broomfield, Colo.

Filed Jan. 2, 1974, Ser. No. 422,537
Int. Cl.² F16B *13/04*
U.S. Cl. 85—79 **2 Claims**

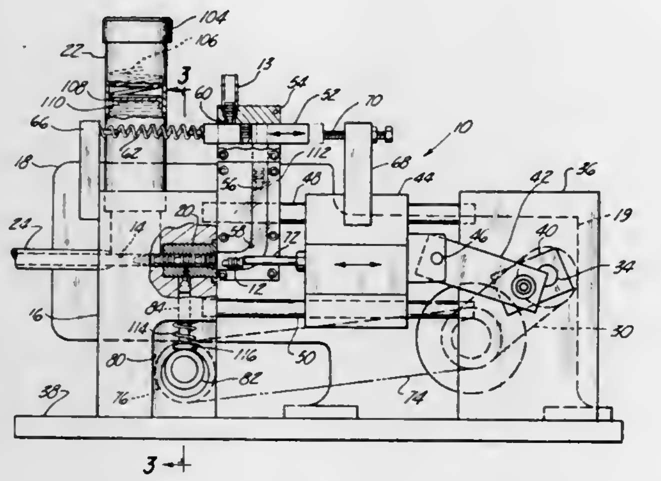


1. A masonry expansion bolt for attachment within a bolt hole comprising:
- a generally cylindrical shank portion adapted for insertion in a bolt hole and having a diameter equal to or slightly less than the bolt hole;
- a wedging section extending at least along a portion of said shank including a plurality of annular ridge portions spaced apart along the length of the wedging section and separated by forwardly divergent annular grooves, the annular grooves each provided with a first relatively deep, wire-receiving surface portion diverging forwardly at a low gradual angle and a second bearing surface portion at the leading end of each groove diverging forwardly at a steeper angle than the first portion and merging into a ridge portion each ridge portion having an annular shoulder portion which merges into the next first wire-receiving surface portion; and
- resilient wire wedging means normally disposed in the deeper portions of each of the grooves when said shank is inserted into a bolt hole, said spring wire means each being selectively expansible in an outward radial direction by riding up the first and second diverging surface portions into wedging engagement with the wall of the hole after the shank is fully inserted into the bolt hole and urged in the direction of withdrawal from the bolt hole.

3,967,526
APPARATUS FOR LUBRICATING AND SIZING SLUGS

Robert A. Leich, Southfield, Mich., assignor to Camdex, Inc., Warren, Mich.

Filed June 10, 1974, Ser. No. 477,651
Int. Cl.² F42B *31/02*
U.S. Cl. 86—19 **12 Claims**



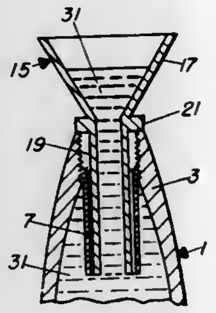
1. Apparatus for lubricating and sizing slugs for use in manufacturing ammunition comprising: a source of semifluid lubricating material, a body having a first presized passage for receiving slugs for intermittent movement therethrough and a second passage communicating with the source of lubricating material, first means for metering slugs through the first passage, second means for metering lubricant from the second passage to the first passage, and power means for cyclically operating the first and second means in a predetermined timed relationship whereby the lubricating material is applied to the exterior of each of said slugs while in said first passage, the second means including a plunger cylinder formed in said body and intersecting the first and second passages, a lubricating pump plunger reciprocally carried in the cylinder, and drive means mechanically driving the pump plunger and interconnected with the power means to be driven thereby, means associated with said source for pressurizing the lubricating material to urge the material into the second passage, the plunger operating to discommunicate the source from the second passage when in a position which applies additional pressure to the lubricating material in the plunger cylinder, a third passage interconnecting the first passage with the second passage, and check valve means in the third passage for allowing the flow of excess lubricating material from the first passage to the second passage when the pressure applied by the plunger exceeds the pressure of the source.

11. Apparatus for lubricating and sizing slugs for use in manufacturing ammunition comprising: a body defining a slug passage and a lubricant passage intersecting the slug passage, a source of lubricant under pressure connected to the lubricant passage, a sizing die removably disposed in said body and forming part of the slug passage, means for intermittently metering slugs into the slug passage and comprising means forming a substantially vertical passage having a smooth curve which terminates into the sizing die such that slugs falling through the vertical passage carry around the curve and into the sizing die, intermittently operated ram means extending into the curved portion of the passage for pushing slugs into and through the sizing die, transfer means for metering slugs, one at a time, from a supply tube into the passage, a cover plate removably mounted on and over at least a portion of the vertical slug passage and forming a wall of the passage, plunger means reciprocally disposed in the lubricant passage for applying additional pressure to the lubricant in the lubricant passage and power means for driving the transfer means, the ram and the plunger means.

3,967,527
METHOD OF PRODUCING A CAVITY IN THE BURSTING CHARGE OF A HIGH EXPLOSIVE PROJECTILE

John A. Dunn, Parsippany, and Leonard Frank, Hackettstown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,194
Int. Cl.² C06B *21/00;* **F42B** *3/00*
U.S. Cl. 86—20 B **5 Claims**

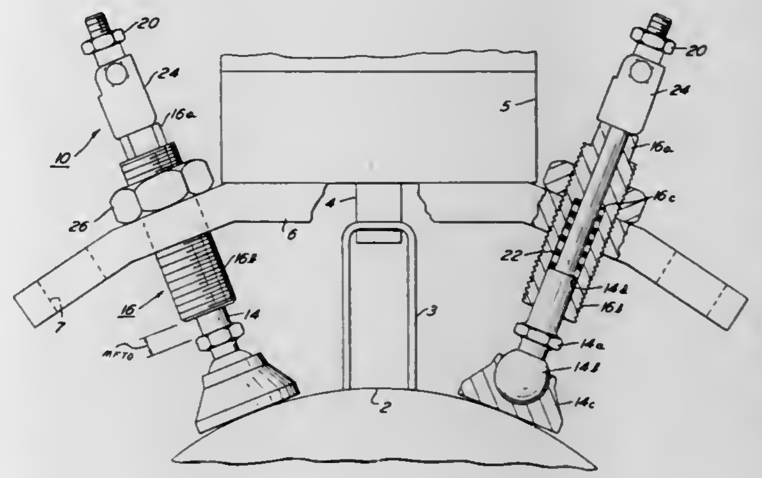


1. A method of making a high explosive projectile comprising a hollow metal housing containing a bursting charge having a metal liner embedded therein, comprising the steps of:
- forming an axial bore in one end of said hollow projectile housing;
- inserting an elongated open-ended tubular liner through said bore and rigidly securing the outer end of said liner to said projectile housing in said bore, with the liner extending axially into said housing;
- supporting said projectile housing with its longitudinal axis vertical and said one end up;
- inserting the tubular stem of a pouring funnel into said liner until the lower ends of said liner and funnel are flush with each other;
- providing a liquid-tight seal between said lower ends;
- pouring sufficient molten explosive material into said funnel to fill said projectile housing and said tubular stem to a level above said liner;
- cooling said explosive material to a substantially solid cast state;
- rotating said funnel relative to said liner and said housing to shear the cast material at said lower end of said funnel stem; and
- removing said funnel from said liner and projectile.

3,967,528
BOMB RACK SWAY BOLT ASSEMBLY

Curtis K. Baker, 25 Tally Ho Drive, Warminster, Pa. 18974, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1974, Ser. No. 458,141
Int. Cl.² F41F *5/02;* **F16B** *39/02*
U.S. Cl. 89—1.5 B **3 Claims**



3. A sway bolt assembly for securing a store suspended in a rack, comprising:
- sleeve means formed to be supported by the rack;
- rod means slidably extending through said sleeve means along an axis approximately normal to the surface of the store and having one end formed to abut the surface of the store;
- first spring means interposed between said sleeve and said rod means for urging said rod means outward from said sleeve means toward the store;
- first stop means secured adjacent to the other end of said rod means for limiting the outward movement of said rod means relative to said sleeve means; and
- indicator means affixed to said rod means for indicating the compression force of said first spring means at a predetermined position of said rod means relative to said sleeve means, including a release tab pivotally connected to said other end of said rod means having distal planar surfaces formed to abut corresponding surfaces of said first stop means and said sleeve means, and second spring means interposed between said release tab and said rod means for urging the free end of said release means out of abutment when the compression force of said first spring means is above a predetermined level.

3,967,529

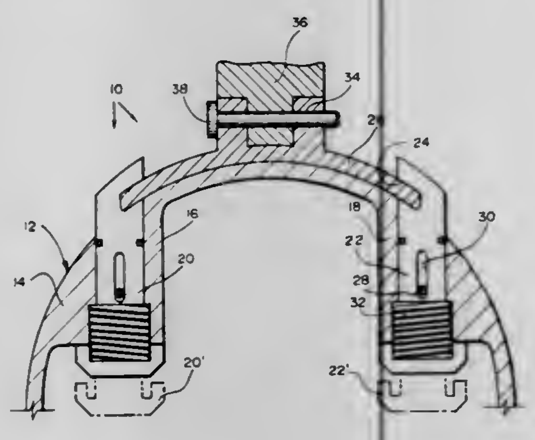
RAIL LAUNCHED MISSILE

Colburn L. Ingle; Robert D. Cook, and Joseph E. Hibbs, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,092

Int. Cl.² F41F *7/00*

U.S. Cl. 89—1.819 **6 Claims**



1. In a missile system including a missile having an outer skin and a plurality of bulkheads, the combination comprising:

a launcher rail;

at least two bulkheads each including a pair of spaced bosses integral therewith;

each said boss having a bore and receiving therein a launcher rail engaging lug closely fitted for sliding movement within said bore from a first launcher rail engaging position to a second retracted position;

confining means associated with each said lug restricting movement of said lug;

biasing means acting on each said lug in a direction to cause said lug to retract from said first position to said second position within said boss with the outboard end of said lug flush with the skin of said missile at the inward limit of travel;

launcher rail engaging means on each said lug;

said launcher rail being attached to said missile by means of said lugs; and

attachment means on said launcher rail for attachment of the launcher rail to an aircraft stores rack or the like.

3,967,530

DEVICE FOR CONTROLLING THE FIRING CURRENT OF A QUICK-FIRING WEAPON

Ludwig Vorgrimler, Oberndorf (Neckar), and Klaus Vorgrimler, Grunwettersbach, both of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

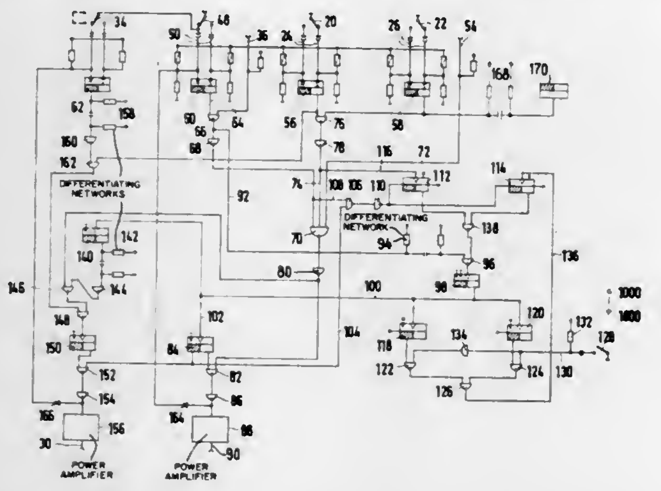
Filed Oct. 9, 1973, Ser. No. 405,626

Claims priority, application Germany, Jan. 4, 1973, 2300260

Int. Cl.² F41D *11/08, 11/10*

U.S. Cl. 89—135 **5 Claims**

1. A device for controlling the firing current of a blow-back operated, electrically fired quick-firing weapon, comprising a signal transmitter signalling the closed position of the slider of said weapon, said device comprising, in combination, a first circuit means for producing a firing current pulse; a second circuit means responding to the movement of said slider away from and back to its closed position and producing a first control signal only after completion of such an away from and back movement of said slider; a third circuit means triggered by said firing control pulse through an electric time delay element and producing a second control signal; and a logic circuit having two inputs, to which said first and second control signals are applied, and having an output connected to said first circuit means to trigger a firing current control pulse.



3,967,531

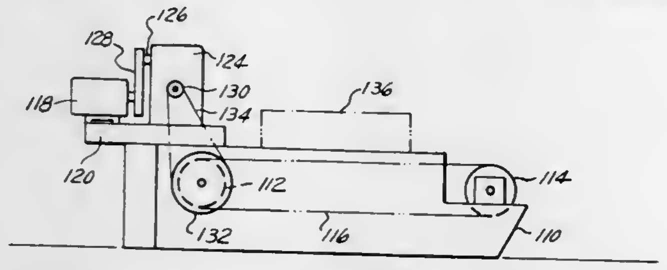
CONTINUOUS OR CHAIN BROACHING MACHINE

David J. Cartner, Royal Oak, Mich., assignor to Swift Engineering Company, Inc., Royal Oak, Mich.

Filed Nov. 18, 1974, Ser. No. 524,734

Int. Cl.² B23D *37/18, 41/00*

U.S. Cl. 90—78 **14 Claims**



1. A continuous or chain broaching machine comprising an elongated frame, a fixture drive shaft having fixture drive sprocket means adjacent one end of the frame, an idler shaft having driven sprocket means adjacent the other end of said frame, fixture drive chain means trained over said sprockets, a tunnel extending longitudinally of said frame through which one run of said chain means extends, driven sprocket means on said fixture drive shaft, a separate, self-contained power input assembly having a unitary support structure separate from said elongated frame but connected thereto in a selected position, said assembly comprising motor means, speed reducer means connected to said motor means, said speed reducer means having output sprocket means, the output sprocket means of said speed reducer means being aligned with the driven sprocket means on said fixture drive shaft when said unitary support structure is connected to said broaching machine frame in said selected position, and input chain means connecting the output sprocket means of said speed reducer means to the driven sprocket means on said fixture drive shaft.

3,967,532

FORWARD-REVERSE VALVE FOR ELEVATING SCRAPER DRIVE

Joseph Kokaly, Buckeye, Ariz., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 7, 1974, Ser. No. 431,384

Int. Cl.² F15B *11/08, 13/042*

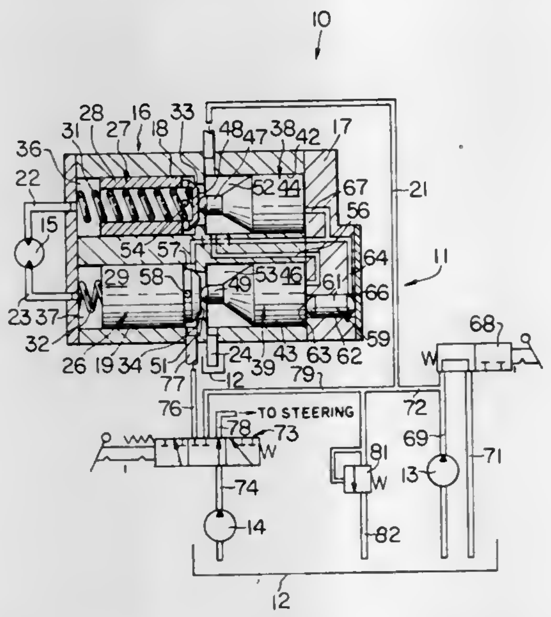
U.S. Cl. 91—420 **5 Claims**

1. In a hydraulic system comprising a fluid flow circuit having a fluid supply source including a pump and a tank, a reversible hydraulic motor, conduit means for communicating between said source and said motor, inlet control valve means

for directing fluid through said conduit means in a forward or reverse direction for operating said motor in a forward or reverse direction, and exhaust valve means for communicating return fluid from said motor to said tank, the improvement comprising:

a valve housing having first and second bores therein, said valve housing being disposed in said circuit between said supply source and said motor so that forward fluid flow within said circuit is sequentially directed from said supply source, through said first bore, through said motor, and through said second bore to said tank, and so that reverse fluid flow within said circuit is sequentially directed from said fluid supply source, through said second bore, through said motor, through said first bore through said exhaust valve means and to said tank;

first pilot operated check valve means disposed within said first bore for regulating forward fluid flow from said supply source to said motor, said first check valve means opening in response to accumulated fluid pressure when fluid is flowing in a forward direction to permit fluid flow from said fluid supply source, through said first bore, to said motor, and pilot means responsive to pressure in said second bore for opening said first check valve means when fluid is flowing in a reverse direction; and,



second pilot operated check valve means disposed within said second bore for regulating return fluid flow between said motor and said tank, said second check valve means including pilot means for opening said valve in response to accumulated pressure within said first bore to permit fluid flow from said motor, through said second bore, to said tank, when fluid is being supplied in said forward direction, and said second check valve means being responsive to a drop in pressure in said conduit means between said second check valve means and said motor to provide direct flow of fluid from said tank to said motor, and including relief means responsive to an excess of pressure in said conduit means between said second check valve means and said source to open said second check valve means to relieve said excess pressure to said tank via said second check valve means.

3,967,533

SERVO VALVE CONTROL APPARATUS

Henry P. Tyler, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 23, 1974, Ser. No. 535,904

Int. Cl.² F15B *9/10, 15/17*

U.S. Cl. 91—49 **10 Claims**

1. In a servo system the combination of:

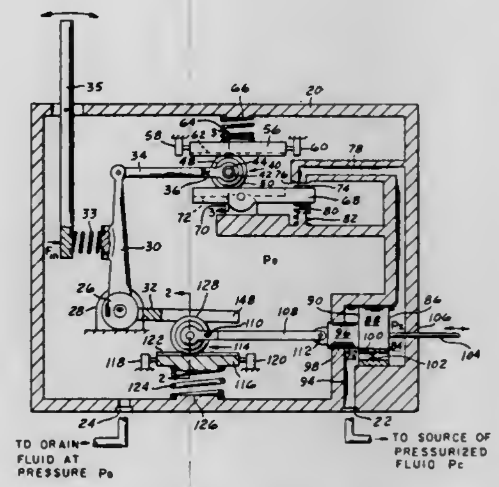
conduit means connecting a source of pressurized fluid with a relatively lower pressure source;

valve means having a characteristic force unbalance imposed thereon operatively connected to said conduit means for controlling fluid flow therethrough to generate a controlled fluid pressure;

movable output means responsive to said controlled pressure for producing an output signal;

first lever means pivotally mounted on a first axis and responsive to an input force imposed thereon;

feedback means including a first reference force generating means operatively connected to said movable output means and said first lever means for imposing a force against said first lever means in opposition to said input force in response to movement of said movable output means to establish a balanced condition of said first lever means;



second lever means pivotally mounted on a second axis and operatively connected to said valve means for actuating the same in opposition to said characteristic force unbalance imposed thereon;

second reference force generating means; and

force transmitting means operatively connected to said first lever means and said second reference force generating means and said second lever means for imposing said second reference force at various points along said second lever means in response to the position of said first lever means to establish a balanced condition of said second lever means.

3,967,534

HYDRAULIC CONTROL SYSTEM WITH SEQUENCE HYDRAULIC JACKS

John R. Cryder, and Edward A. Wirtz, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 25, 1974, Ser. No. 517,946

Int. Cl.² F15B *11/20, 13/07*

U.S. Cl. 91—189 R **8 Claims**

1. A control system for sequential operation of a plurality of hydraulic motors, said system comprising:

at least a first and a second hydraulic motor;

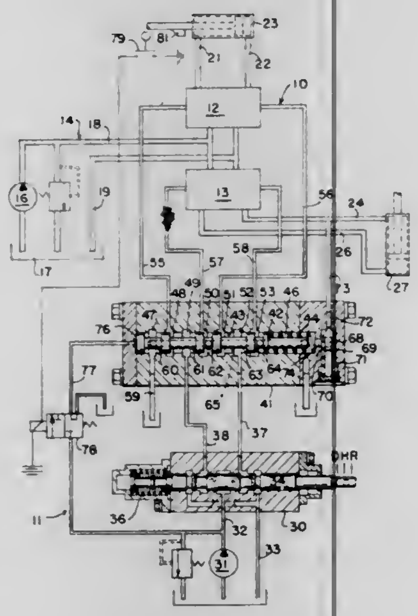
a source of motive fluid for operation of said hydraulic motors;

sequence control means including a first and a second pilot-operated control valve for directing said motive fluid to and from said first and said second hydraulic motors for sequential operation thereof;

a source of pilot fluid for shifting said valves;

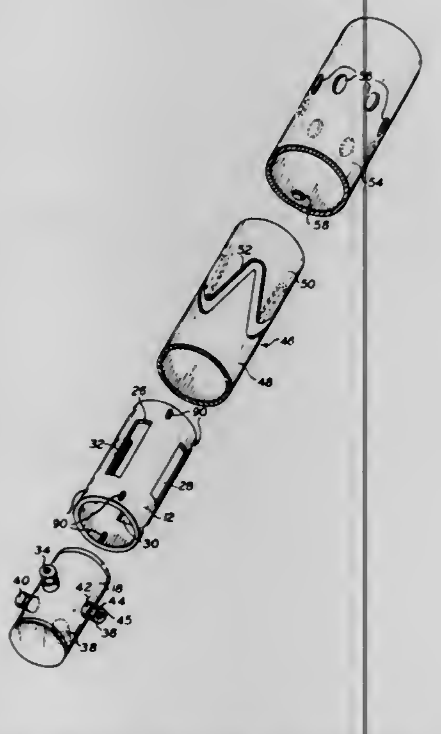
a pilot selector valve for selectively directing pilot fluid for shifting said first and said second control valves; and,

said sequence control means further including a sequence control valve intermediate said pilot selector valve and said first and second control valves and responsive in a first position for communicating pilot fluid upon movement of said pilot selector valve in a first direction for shifting said first of said control valves first for extension of said first hydraulic motor, and pilot means responsive to extension of said first motor for shifting said sequence control valve to a second position for communicating pilot fluid for shifting the second of said control valves for operation of said second motor in a first direction after said first motor is extended a predetermined amount activating said pilot means, and



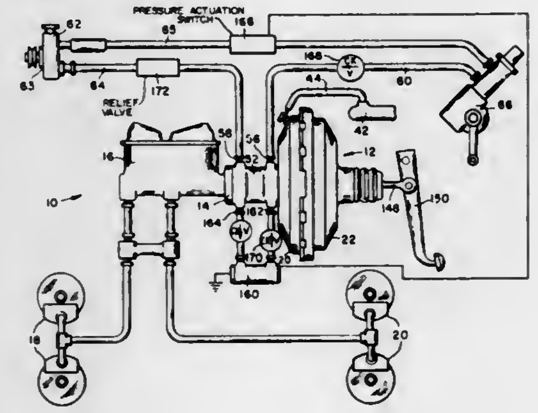
said sequence control valve in said second position communicating fluid upon movement of said pilot selector valve in a second direction for communicating fluid for shifting said second of said control valves for retraction of said second motor and means responsive to full retraction of said second motor for shfting said sequence control valve to said first position for actuating said first control valve for retraction of said first motor.

3,967,535
UNIFLOW STEAM ENGINE
Murry I. Rozansky, 117 Joyce Kilmer Ave., New Brunswick, N.J. 08902
Filed Feb. 21, 1974, Ser. No. 444,540
Int. Cl.² F01B *13/04*
U.S. Cl. 91—197 14 Claims



1. A uniflow engine-compressor comprising:
a. a hollow cylinder having a longitudinally extending slot therein;
b. a piston reciprocably movably disposed within said cylinder;
c. a cylindrical cam member in surrounding relation with said cylinder and having a circumferentially extending sinusoidal cam track therein, said cylinder being rotatable within said cam member;
d. a cam follower mounted on said piston and extending radially outward therefrom through said longitudinal slot in said cylinder and into said cam track, whereby reciprocable movement of said piston within said cylinder will cause said piston and cylinder to rotate relative to said cam member;
e. a cylinder head at each end of said cylinder, said longitudinal slot in said cylinder being proportioned to prevent said piston from engaging either of said cylinder heads, whereby to define a clearance space at each end of said cylinder;
f. said cylinder having an aperture therethrough at each end thereof leading into said clearance spaces; and
g. means for periodically passing compressible fluid through said apertures in said cylinder between said clearance spaces and outside of said cylinder comprising;
  i. a pair of superposed bands at each end of said cylinder in overlying relationship with said cylinder and being relatively movable with respect to said cylinder apertures and with respect to each other;
  ii. said bands each having an aperture therein registrable with said cylinder aperture at the corresponding end of said cylinder; and
  iii. means for moving said bands whereby to adjust the amount of register of said band apertures and said cylinder aperture and the point of such register, whereby to adjust the amount of compressible fluid passing through said cylinder apertures and the timing of such passage.

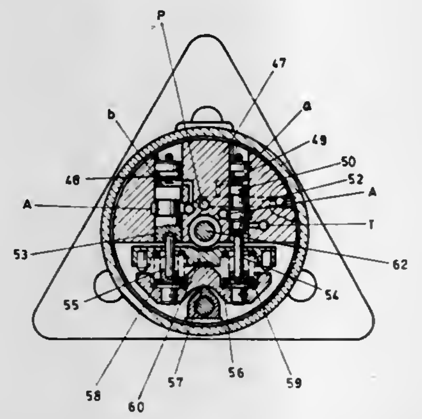
3,967,536
PNEUMATIC AND HYDRAULIC POWER BRAKE APPARATUS
Lloyd Gene Bach, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed May 29, 1975, Ser. No. 582,052
Int. Cl.² F15B *9/10*
U.S. Cl. 91—371 12 Claims



8. A power braking apparatus for use in a vehicle comprising:
a housing having an axial bore therein with an inlet port and an outlet port, said inlet port being connected to a first conduit containing a source of fluid under pressure, said outlet port being connected to a second conduit returning said fluid under pressure to reservoir;
piston means located in said axial bore for establishing an inlet chamber adjacent said inlet port and an outlet chamber adjacent said outlet port, said piston means having a first passageway therethrough for connecting said inlet chamber with said outlet chamber;

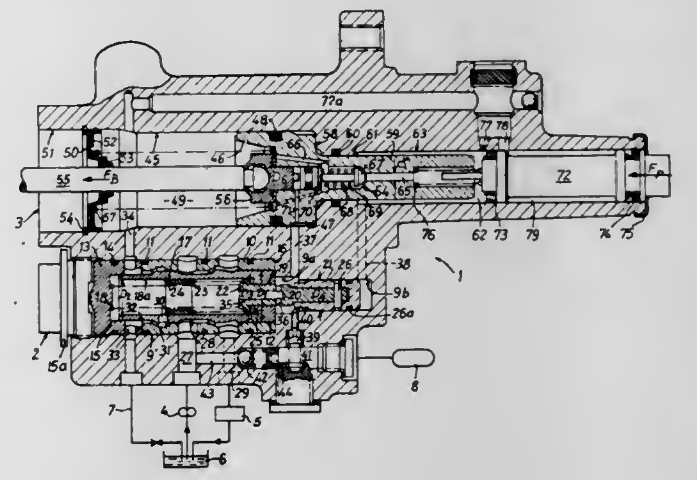
valve means for regulating the flow of said fluid under pressure through the first passageway from the inlet chamber into the outlet chamber;
disc means located in said first passageway for establishing a control chamber and a reaction chamber, said control chamber being in direct communication with said inlet chamber and said reaction chamber being in connection with said outlet chamber;
stem means extending through said disc means and having a head on a first end and a second end, said first end being located in said control chamber, said first end having an axial slot therein through which the outlet chamber is communicated with the reaction chamber;
input means connected to said piston means and responsive to an operational input force for moving said valve means toward a seat in said first passageway to restrict the flow of said fluid under pressure from the inlet chamber to the outlet chamber to establish a pressure differential therebetween, said pressure differential moving said piston means to establish an output force;
resilient means located in said first passageway and connected to said valve means to limit the restriction of the flow of said fluid under pressure to the outlet chamber to avoid an interruption of the flow of the fluid in said second conduit; and
keeper means secured to said second end of said stem means for holding said resilient means against said disc means, said pressure differential acting on said disc means to provide a reactionary force opposing the operational input force.

3,967,537
PRESSURE MEDIUM CONTROL DEVICE
Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Duesseldorf, Germany
Filed Aug. 24, 1973, Ser. No. 391,271
Claims priority, application Germany, Aug. 26, 1972, 2242021
Int. Cl.² F15B *9/10*
U.S. Cl. 91—372 10 Claims



1. A fluid pressure control device for controlling a servomotor, comprising in combination; a servo-motor having at least one working chamber, a power input member, a power output member, said power input member and power output members having relative movement,
a pressure fluid source,
at least one control valve of the closed-center type with blocked ports in a neutral position including means operable through relative movement between said power input and said power output member, flexible coupling means operatively connecting said power input member to said power output member,
said servo-motor being operatively connected to said power output member, said control valve including at least one reaction area including means for reflecting developing fluid pressure to said power input member; and lost motion coupling means operatively connected between said control valve and said power input member for permitting said control valve to move relative to the output number without relative movement between said power input member and power output member.

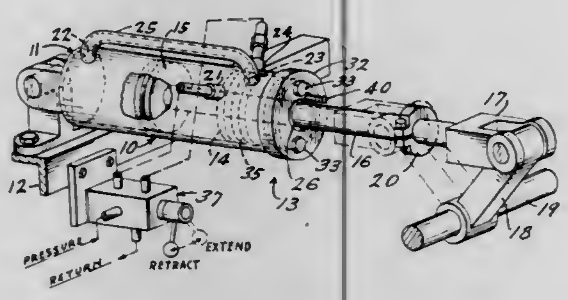
3,967,538
HYDRAULIC BOOSTER
Alfred William Thomas, Saarbrucken, Germany, assignor to Deutsche Bendix Ausrustungs GmbH, Saarbruecken, Germany
Filed Mar. 17, 1975, Ser. No. 559,201
Claims priority, application Germany, Mar. 19, 1974, 2413079; Mar. 19, 1974, 2413080
Int. Cl.² F15B *13/10, 11/08, 13/042*
U.S. Cl. 91—391 R 5 Claims



1. Hydraulic booster comprising:
housing means defining a working chamber and a control chamber therein;
a piston slidably mounted in said working chamber;
valve means responsive to a fluid pressure level in said control chamber to shift from a released position venting said working chamber to communicate successively higher fluid pressure levels into said working chamber as said valve means is shifted from said released position;
an output plunger operatively connected to said piston and slidably received within said control chamber;
operator-actuated means including an input plunger slidably received within said control chamber filled with a hydraulic fluid;
said input plunger having a greater transverse cross sectional area than the output plunger;
said input plunger being so mounted in said control chamber to actuate said output plunger upon failure of fluid control level in said control chamber to permit direct mechanical actuation of said piston;
said valve means having one of its faces exposed to the fluid pressure prevailing in the working chamber and the other of its faces exposed to the fluid pressure level prevailing in the control chamber;
said valve means includes a spool and a control piston cooperating therewith, said control chamber including a portion receiving said control piston, said control piston having a reduced diameter with respect to the spool valve diameter;
the control piston is telescopically mounted in the spool, said spool being sleeve-shaped to define an inner compartment, the control piston being adapted to be displaced in a limited manner with respect to the spool from a rest-abutting position into which said control piston is biased by a return spring, said control piston having a supply passage permitting the fluid under pressure to flow from the inner compartment of the sleeve-shaped spool to the working chammber, said supply passage being closed under the displacement of the control piston into the spool.

3,967,539
VARIABLE STROKE FLUID CYLINDER

Robert E. Williamson, 446 Caldwell St., Bradner, Ohio 43406
Filed Nov. 20, 1974, Ser. No. 525,361
Int. Cl.² F15B *13/042, 15/24*
U.S. Cl. 91—404 **3 Claims**

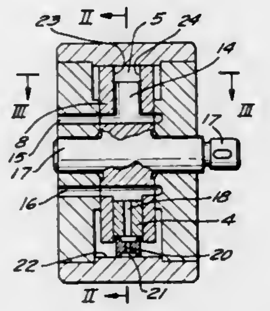


1. A double acting hydraulic cylinder having a piston and rod movable from a fully extended position to a variable retracted position, comprising, in combination, a cylindrical sleeve closed at one end, a cylindrical head coaxially and removably secured within the other end, a piston positioned for reciprocation within the sleeve between the one closed end and the head, a piston rod secured to the piston and extending axially through the head so as to reciprocate with the piston, a stop member adjustably secured to said piston rod, said cylindrical head including first and second external grooves defining, with the interior sleeve surface, first and second passages, an axial bore within said head communicating with each of said passages, and a valve member positioned in the bore with a stem extending beyond said head and movable between an open position wherein the passages are in communication and a closed position wherein the passages are isolated from each other, and said sleeve further including a first connection adjacent the head and leading to an external fluid source for applying fluid pressure to the side of the piston adjacent the head, a second connection adjacent said one closed end of the sleeve, a third connection in communication with said first external groove in the head, a fluid line connecting said second and third connections, and a fourth connection in communication with said second external groove in the head and leading to an external fluid reservoir, whereby, when said valve member is in the open position, pressurized fluid from the external source can flow into the first connection to retract the piston and rod, sequentially moving fluid outwardly through the second connection, through said fluid line and into the third connection, through said first passage and said axial bore to said second passage, and out the fourth connection, and whereby, when said valve member is moved to closed position by said stop member on said retracting piston rod, outward fluid flow through the second connection is stopped, thereby preventing further movement of the piston and rod.

3,967,540
ROTOR, PISTONS, PISTON SHOES AND ASSOCIATED MEANS IN FLUID HANDLING DEVICES

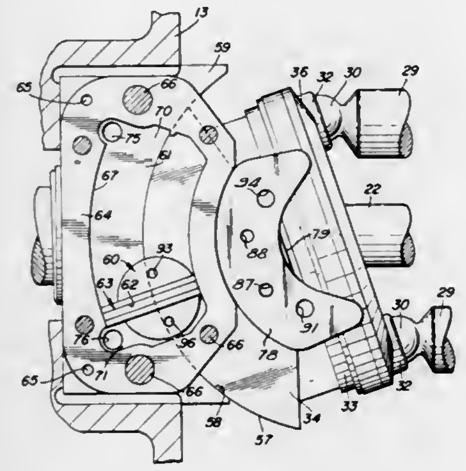
Karl Eickmann, 2420 Isshiki, Hayama, Kanagawa, Japan
Filed Jan. 8, 1973, Ser. No. 321,854
Claims priority, application Austria, Jan. 7, 1972, 138/72
Int. Cl.² F01B *13/06*
U.S. Cl. 91—488 **7 Claims**

1. In a fluid-handling machine of the type having a housing formed with a cavity having an inner circumference, a rotor body rotatably mounted in said cavity and having an outer periphery and a plurality of radial cylinder bores extending inwardly thereof, and a plurality of pistons each slidably accommodated in one of said cylinder bores, the improvement comprising a plurality of recesses formed in said outer periphery of said rotor body, each intersecting the outer end of one of said cylinder bores and extending from the associated cylinder bore in one circumferential direction of said rotor body; a plurality of piston shoes each located adjacent the outer end of one of said cylinder bores and pivotably connected to the piston accommodated therein, said piston shoes each having an outwardly directed face in sliding engagement with said inner circumference and an extension projecting transversely of and beyond the associated cylinder bore in said one circumferential direction of said rotor body, said cylinder bores, recesses and piston shoes being configurated so that in the fully retracted position of the respective piston shoe the same is located substantially entirely within the associated recess and outer end of the associated cylinder bore without projecting beyond the outer periphery of said rotor body; and wall means on said rotor body, projecting radially of said outer periphery thereof toward said inner circumference at opposite axial sides of the respective piston shoes for preventing displacement of the same in axial direction of said rotor body.



3,967,541
CONTROL SYSTEM FOR AXIAL PISTON FLUID ENERGY TRANSLATING DEVICE

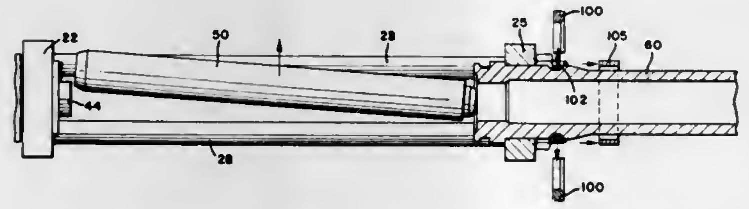
Ellis H. Born; William H. Meisel, and Alan H. Viles, all of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.
Filed Aug. 2, 1974, Ser. No. 494,677
Int. Cl.² F01B *13/04*
U.S. Cl. 92—12.2 **51 Claims**



1. In a variable displacement fluid energy translating device having a housing, a barrel rotatably supported in the housing, a plurality of cylinders formed in the barrel and aligned parallel with the axis of rotation thereof, a piston mounted for reciprocation in each cylinder, a port plate at one end of the barrel in communication with the inlet port and outlet port of the device, a shoe connected to the end of each piston projecting from a cylinder, a rocker cam support, a rocker cam pivotally mounted in the support for movement about an axis perpendicular to the axis of rotation of the barrel, a surface on the rocker cam for engaging the piston shoes, and means for retaining the piston shoes against the rocker cam surface such that the pistons are caused to reciprocate within the cylinders when the cam surface is inclined, the improvement comprising fluid motor means for pivoting the rocker cam to change the inclination of the rocker cam for varying the displacement of the device including a first fluid motor member rigidly secured to the rocker cam, a second fluid motor member which is secured to said housing and overlies a portion of the rocker cam and the second fluid motor member is cooperative with the first fluid motor member, and the rocker cam to define first and second sealed fluid receiving chambers, and valve means for selectively supplying pressure fluid to one of said chambers and simultaneously exhausting fluid from the other of said chambers to effect movement of said first fluid motor member to selectively position the rocker cam.

3,967,542
HYDRAULIC INTENSIFIER

Richard W. Hall; Daniel A. Schutte, and Sven Sonnenberg, all of Springfield, Ohio, assignors to Kelsey-Hayes Company, Springfield, Ohio
Filed Nov. 20, 1974, Ser. No. 525,568
Int. Cl.² F01B *11/02*
U.S. Cl. 92—85 B **5 Claims**



1. An improved hydraulic intensifier for oil well fracturing, erosion drilling or the like having a bed and at least two intensifier units mounted on said bed in which the intensifier units each include a hydraulic piston motor connected in direct driving relation to a working ram, the improvement in intensifier structure providing for ease of maintenance in the field comprising means defining a back wall, an intermediate wall spaced from said back wall and a front wall spaced from said intermediate wall, the cylinder of said hydraulic piston motor positioned between said back wall and said intermediate wall, the working ram including a ram cylinder supported in an opening formed on said front wall, said front wall, intermediate wall and back wall being joined by a plurality of tension rods, spacer sleeves on said rods between said intermediate wall and front wall and defining therebetween a generally open clearance space, a piston rod assembly in said cylinder having a forward end extending into said space, a working ram received in said ram cylinder and having a rear end received in said space, removable coupling means in said space joining said rod and ram, the axial length and transverse width of said clearance space being greater than the corresponding length and width of either said ram or ram cylinder, said ram and said ram cylinder being removable through said space without distrubing said tension rods.

3,967,543
APPARATUS FOR SHAPING, WHILE TRANSFERRING, UNDERSTRIPS OF HINGE LID CIGARETTE PACKETS

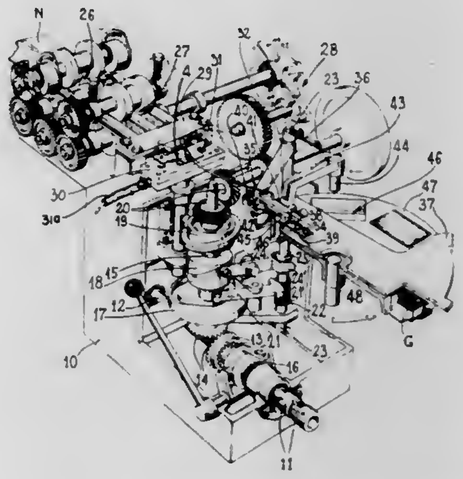
Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa Per Azioni, Italy
Filed Nov. 8, 1974, Ser. No. 522,457
Claims priority, application Italy, Dec. 20, 1973, 3543/73
Int. Cl.² B31B *1/16, 1/52*
U.S. Cl. 93—36.01 **10 Claims**

1. Apparatus for supplying understrips of hinge lid packets to a cigarette wrapping machine, comprising;

a conveyor having mutually spaced compartments, each receptive of an understrip to be combined with a body of a hinge lid packet, the conveyor being operable to move successive ones of said compartments thereof in a plane, into a predetermined waiting position in said plane, adjacent an area of production of successive flat understrip blanks, and subsequently away from said position for use in a cigarette wrapping machine;

a stationary plate structure overlying a portion of the conveyor corresponding to said position and having an aperture substantially coextensive with one of said compartments;

an arm extending in a plane parallel to that of the conveyor and swingable in its plane to individually transfer the successive flat understrip blanks from the area of production thereof toward said adjacent position, one for each compartment;

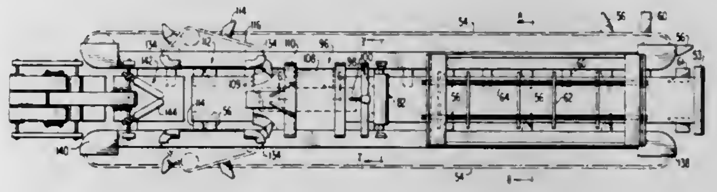


means for moving the arm transversely of said planes to move each of the successive, transferred blanks into a respective one of said compartments; and

means in said aperture in the plate structure for cooperating with the arm in shaping each understrip blank, while it is moved into and at least partly through said aperature, to provide a U-shaped understrip insertable in said body.

3,967,544
GROCERY SACK PROCESS AND MACHINE

Herbert Brock, Sheboygan; Glenroy G. Blatz, Kiel, both of Wis., and James B. Honn, Arcola, Ill., assignors to National Petro Chemicals Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 413,014, Nov. 5, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,836
Claims priority, application United Kingdom, May 1, 1973, 20676/73
Int. Cl.² B31B *33/26*
U.S. Cl. 93—35 SB **21 Claims**



21. A process of automatically and continuously making folded bottom gusseted grocery sacks at high speed from a travelling web of gusseted thermoplastic film, the process comprising:

a. controllably feeding the web to a sealing zone;
b. continuously sealing the moving web across the width of the web while heating it, the speed of the moving web during sealing being slightly less than the feeding speed so the seals are not torn apart;
c. cutting the web transversely in synchronism with and adjacent the seals to create individual sacks;
d. moving the individual sacks at the speed of the web though airing opening, bottom folding, and deairing zones;
e. blowing a controlled amount of air into the individual sacks as they move through the airing zone to open the sacks;
f. folding the bottom of the individual sacks as they move through the folding zone by gripping the upper side of the sack gusset and moving it at a slower speed from the bottom sack gusset;

g. removing the air from the individual rough folded bottom sacks as they move through the deairing zone;
h. taking away the individual folded bottom sacks from the deairing zone and simultaneously pressing the fold therein.

3,967,545
CONTROLLING THE SUPPLY OF ELECTRIC CURRENT TO A ROOM

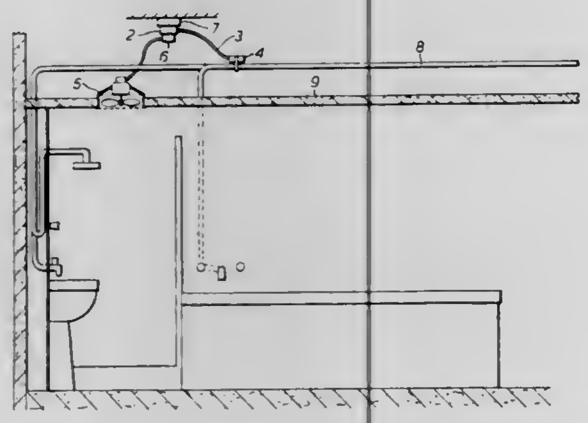
John Baker, 1 Stewart Ave., Parkdale, Victoria, Australia

Filed Feb. 10, 1975, Ser. No. 548,613

Claims priority, application Australia, Feb. 14, 1974, 6599/74; Feb. 18, 1974, 6638/74; Mar. 22, 1974, 6992/74; Mar. 27, 1974, 7056/74; May 14, 1974, 7556/74; May 31, 1974, 69678/74; Nov. 7, 1974, 9530/74

Int. Cl.^{2} F24F *7/00*

U.S. Cl. 98—43 A **17 Claims**



7. An installation comprising electrical power supply wiring connected to an electrically powered fan disposed in a room, a water supply pipe having a water outlet in the room, and means to control the supply of electric current by the wiring to the electrical fan in response to variations in the temperature of the water supply pipe.

17. An installation comprising electrical power supply wiring connected to an electrically powered steam exhaust fan mounted in a wall of a room, a water supply pipe having a water outlet in the room, the pipe being connected to supply hot water to the outlet, and means to control the supply of electric current by the wiring to the fan in response to variations in the temperature of the water supply pipe.

3,967,546
METHOD AND APPARATUS FOR MAKING COFFEE

Serge Cailliot, 38, Rue du Bois de Boulogne, 92200 Neuilly-sur-Seine, France

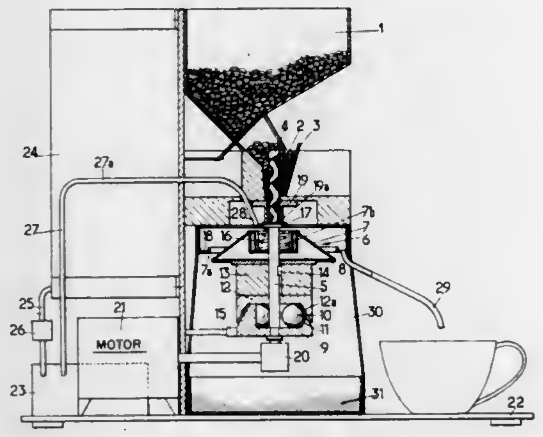
Filed June 27, 1974, Ser. No. 483,516

Claims priority, application France, July 9, 1973, 73.25085; May 30, 1974, 74.18815

Int. Cl.^{2} A47J *31/00*

U.S. Cl. 99—286 **7 Claims**

1. In a device for infusing ground coffee into hot water at a temperture near its boiling point by utilizing centrifugal force, said device comprising
a shaft mounted to rotate about a substantially vertical axis,
a centrifugal chamber adapted to receive ground coffee and hot water, said chamber being defined by coaxial upper and lower members, said upper members having a frustoconical peripheral portion, and said members having registering peripheral edges which define a gap when separated and being slidably mounted on said shaft for vertical movement between locations maintaining said chamber in upper and lower positions,
means for rotating said shaft and means for rotatably driving at least said lower member from said shaft,
means for feeding ground coffee and water to said chamber,
an annular collecting gutter encircling said chamber when said chamber is in said upper position,
a grounds collecting tank in communication with said chamber through said gap when said chamber is in said lower position, and
means for moving said chamber between said upper and lower positions,
the improvement which comprises resilient means urging said upper member downwardly and thus biasing said chamber toward said lower position, said resilient means being compressed when said chamber is in its upper position so as to exert its maximum downward pressure on said upper member, but expanded when said chamber is in its lower position so as to exert a smaller downward pressure on said upper member,



at least the peripheral portion of one of said chamber-defining members being made of a material which deforms sufficiently in response to the pressure exerted thereon by the contents of said chamber, when said lower member is rotated with said chamber in its upper position and ground coffee and water therein, to open a gap between said peripheral edges wide enough to permit the passage of liquid coffee therethrough, but too narrow to pass grounds,
while the smaller force exerted by said resilient member on said upper member when said chamber is in said lower position permits a larger gap through which said grounds may escape to be opened between said peripheral edges in response to said pressure when said chamber is rotated in said lower position.

3,967,547
APPARATUS FOR COOKING AND SMOKING FOOD

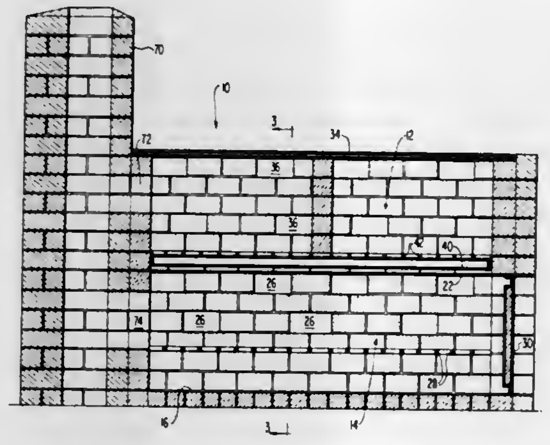
James Max Sykes, and Velma T. Sykes, both of 3227 Bullard St., Paducah, Ky. 42001

Continuation of Ser. No. 478,413, June 11, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 632,122

Int. Cl.^{2} A47J *27/00*

U.S. Cl. 99—421 H **4 Claims**

1. In a barbecue pit of the type including a cooking chamber and a separate fire chamber located below the cooking chamber with the two chambers being interconnected for the passage of heat, air and smoke from the fire chamber to the cooking chamber, and a flue for permitting the escape of gases from the pit, the improvement comprising outer masonry walls defining the side walls and end walls of the barbecue pit, top and bottom walls cooperating with said outer masonry walls to define the interior of said pit, inner masonry walls spaced from said outer side walls, said inner walls extending to said end walls and defining the side walls of said fire chamber and said cooking chamber, a generally horizontal partition wall extending between said end walls and said inner walls separating said fire box and said cooking chamber, a plurality of openings in said inner walls providing communication between said fire chamber and the space between said inner and said outer walls and communication between said space and said cooking chamber, said openings and said space defining duct means connecting said fire chamber and said cooking chamber, adjustable damper means in said duct means for controlling the flow of hot gases from said fire chamber to said cooking chamber, vent means directly connecting said fire chamber to said flue and second vent means directly connecting said cooking chamber to said flue, at least one fire door leading through said masonry walls into said fire chamber, and at least one access door leading through said walls into said cooking chamber.



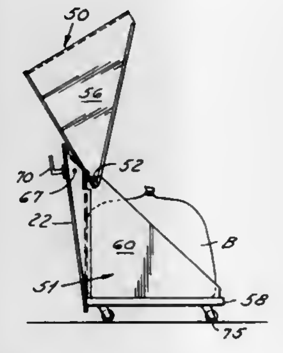
3,967,548
WASTE COMPACTOR

Dario J. Moriconi, Bloomfield Hills, Mich., assignor to McClain Industries Inc., Utica, Mich.

Continuation of Ser. No. 422,422, Dec. 6, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,132

Int. Cl.^{2} B30B *15/32*

U.S. Cl. 100—229 A **7 Claims**



1. In a waste compactor, the combination comprising
a frame,
a cart associated with said frame,
a compactor member mounted on said frame for movement toward and away from said cart,
said cart being removable from said frame,
said cart comprising two sections,
said sections when in one position defining a bottom wall, side walls, and end walls having an open end for receiving a disposable waste container,
one of said sections comprising an end wall and side wall portions,
and the other of said sections comprising said bottom wall, the other end wall fixed to said bottom wall, and side wall portions fixed to said bottom wall,
said other end wall cooperating with said frame to form the front of said compactor,
said sections being pivoted to one another about a horizontal axis adjacent the upper end of said other end wall of said other section,
said cart being removable from said frame such that said one section may be pivoted about said horizontal axis upwardly to move its said end wall out of position whereby the disposable container can be removed by horizontal movement off of said bottom wall.

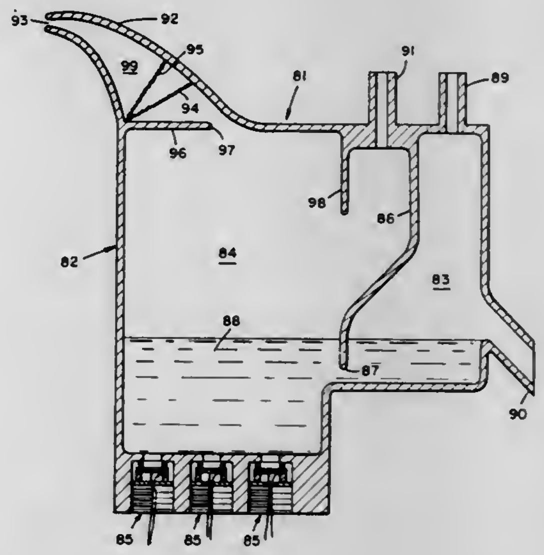
3,967,549
INK SUPPLY SYSTEM FOR AN INK MIST PRINTER

Lester E. Thompson, Los Altos; Enrique J. Klein, Menlo Park, and Myron E. Lee, Palo Alto, all of Calif., assignors to Electroprint, Inc., Cupertino, Calif.

Filed May 11, 1973, Ser. No. 359,286

Int. Cl.^{2} G03G *13/06*

U.S. Cl. 101—1 **10 Claims**



1. Apparatus for delivering a mist of liquid ink mixture to the print region of a print head, and for recovering and recycling unused portions of the mist comprising:
a tank adapted to hold a supply of a liquid ink mixture of ink and solvent;
means for supplying carrier gas;
means for generating a mist of the liquid ink mixture, said generating means having an outlet positioned to deliver the mist to the print region, inlet means for receiving the liquid ink mixture from said tank and for receiving a carrier gas from said carrier gas supply means, means for holding a quantity of liquid ink mixture, means for agitating the liquid ink mixture in said ink holding means to produce droplets of the liquid ink mixture above the surface of liquid in said ink holding means where the droplets become entrained in the carrier gas to form the mist;
means for carrying the liquid ink mixture from said tank to said inlet means;
means for recovering unused portions of the ink mist from the print region;
means for precipitating liquid ink mixture from the recovered mist and for returning the precipitated liquid ink mixture to said tank; and
means for monitoring the density of ink mixture carried to said generating means and for adding density monitor controlled quantities of ink mixture constituents to said tank to adjust the density of the mixture consistency.

3,967,550
SQUEEZE PRINTER FOR PAPERS OR STACKS OF PAPERS OF VARYING THICKNESSES

Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

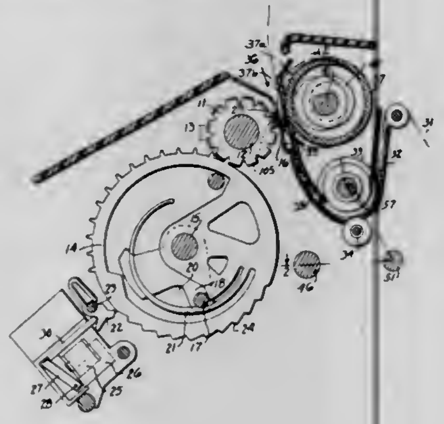
Filed July 25, 1974, Ser. No. 491,871

Int. Cl.^{2} B41J *1/22*

U.S. Cl. 101—93.18 **9 Claims**

1. A data printer comprising
type members,
type characters on said members,
means for differentially setting said type members to position different ones of said type characters at a printing station,
a printing platen,

means for guiding a record medium intermediate said type members and said platen,
cam means for advancing said platen towards said type members a first distance,
yieldable drive means for actuating said cam means to advance said platen toward said type members to engage said record medium, and



positively driven means intermediate said cam means and said platen for advancing said platen toward said type members a second distance in addition to said first distance, and relative to said cam means, the advancement of said platen through said first and second distances causing a printing impression of said record medium against said type characters at said printing station.

3,967,551
PRINT MECHANISM WITH ROCKABLE INTERPOSING LEVER FOR PRINT HAMMER

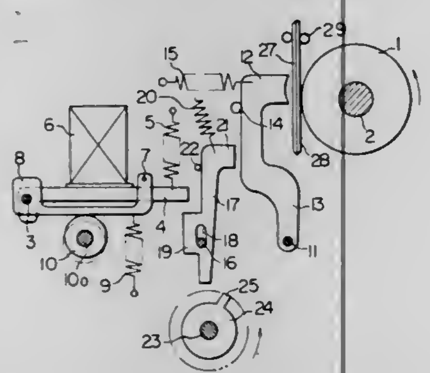
Toru Matsubara, Chofu, and Toshikazu Nakano, Fuchu, both of Japan, assignors to Tokyo Juki Kogyo Kabushiki Kaisha, Chofu, Japan

Filed July 21, 1975, Ser. No. 597,817

Claims priority, application Japan, July 31, 1974, 49-88236

Int. Cl.^{2} B41J *9/10, 9/26*

U.S. Cl. 101—93.31 **4 Claims**



1. A typewriting device comprising a type-carrying drum continuously driven from a drive source, at least one ratchet wheel continuously driven from said drive source in synchronization with said type-carrying drum and having a pawl in the outer periphery, at least one operation lever mounted on a shaft in opposition to said ratchet wheel for rotation about and movement vertically along said shaft, at least one hammer lever pivoted to a second shaft between said drum and operation lever and normally held away from said drum, said hammer lever being adapted to strike against said drum in response to the operation of said operation lever for effecting a typewriting operation, at least one armature pivoted to a third shaft for engaging and disengaging from said operation lever, at least one electromagnet disposed in opposition to said armature for attracting said armature to said electromagnet when the electromagnet is energized, a rocking lever pivoted to said third shaft for assisting said electromagnet in attracting said armature when the electromagnet is energized and for separating the armature from the electromagnet when the electromagnet is deenergized, and at least one intermittently rotatable cam member disposed in contact with said rocking lever, whereby when said electromagnet is deenergized, said armature is separated from said electromagnet with the assistance of said rocking lever to position said operation lever within the locus of rotation of said pawl of the ratchet wheel to thereby cause said hammer lever to effect a typewriting operation and after said typewriting operation has been completed, said operation lever is displaced out of said locus of rotation of the ratchet wheel pawl and said electromagnet is energized to attract said armature thereto as said rocking lever is moved toward the electromagnet by the action of said cam member.

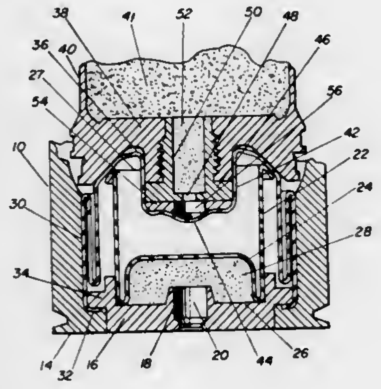
3,967,552
PERCUSSION IGNITION SYSTEM FOR A SMOKELESS, FLASHLESS, LOW NOISE CARTRIDGE

Charles P. Settles, Forest Hill, Md., and Edward R. Evans, Sicklerville, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,438

Int. Cl.^{2} F42B *5/10*

U.S. Cl. 102—38 **5 Claims**



1. A percussion ignition system for a closed combustion cartridge which comprises:
a cartridge case having a forward open end and a rear end;
a base fixedly positioned in the rear end of said case, said base having an axial bore therein and an annular cavity which communicates with said axial bore;
a cartridge impact primer fixedly positioned in said axial bore;
a round slidably positioned in said case;
delay means, axially positioned in the rear end of said round, for actuating said round after said round is expelled from said case;
sealed telescoping means, positioned in said case intermediate said base and the rear end of said round, for propelling said round out of said case toward a target without evidence of smoke or flash;
ignition means, positioned intermediate said telescoping means and said delay means, for initiating said delay means when said round is being propelled from said case; and
propelling means, slidably positioned in the annular cavity of said base, for generating gases which rapidly expand said telescoping means and for impacting against said telescoping means to activate said ignition means.

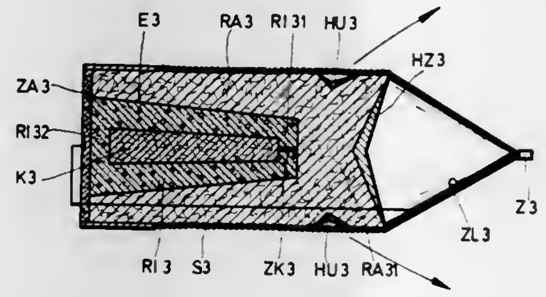
3,967,553
FLAMMABILITY PROMOTING AMMUNITION FOR USE AGAINST AIRBORNE TARGETS

Roman Keraus, Purten; Gerhard Schulz, Frasshausen; Caspar von Munchhofen, Oberhaching, and Heinrich Hofmann, Grobenzell, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed July 23, 1974, Ser. No. 491,165

Int. Cl.^{2} F42B *13/12, 13/14, 13/18*

U.S. Cl. 102—66 **11 Claims**



1. A round of ammunition, particularly for use against airborne targets, such as aircraft and similar targets, said round of ammunition comprising a casing capable of fragmenting into splinters, explosive material in the form of at least one explosive charge located within and capable of fragmenting said casing, oxygen for reaction with fuel or other combustible materials in the target, and material for supporting the flammability of combustible material located on or in the target, wherein the improvement comprises that said casing has a shaped head portion and an axially extending cylindrically shaped portion extending axially rearwardly from said head portion, a core of explosive material located within and extending in the axial direction of the cylindrically shaped portion of said casing, an inner ring-shaped body of oxygen releasing material laterally disposed about said core, an outer ring-shaped body of explosive material laterally enclosing said inner ring-shaped body, first means for igniting said outer ring-shaped body and second means within said casing for providing a delayed ignition of at least said core of explosive material relative to the ignition of said outer ring-shaped body.

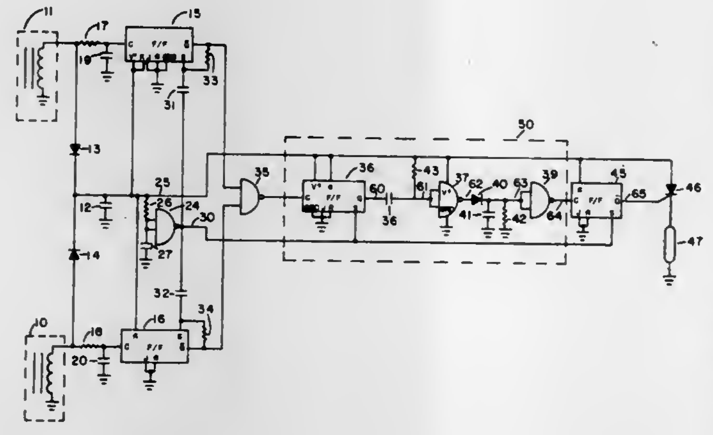
3,967,554
SAFETY AND ARMING DEVICE TIMER

David Emanuel Troyer, Jr., Colonial Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 21, 1975, Ser. No. 597,733

Int. Cl.^{2} F42C *11/06*

U.S. Cl. 102—70.2 R **3 Claims**



1. A safety and arming device for a guided projectile to provide for safe separation of the projectile from the gun before arming comprising:
means mounted on said projectile inductively inducing a plurality of voltage pulses as the projectile is fired from a gun;
a safety and arming coincidence circuit responsive to coinciding voltage pulses produced by the induction means;
a flip-flop responsive to the output of said coincidence circuit;
a compensated monostable multivibrator driven by said flip-flop, said flip-flop and said multivibrator operating as an electronic timer wherein the output of said coincidence circuit is delayed for a predetermined period; and
means for arming a warhead responsive to the output of said timer.

3,967,555
PIEZOELECTRIC FUZE, ESPECIALLY FOR PROJECTILES

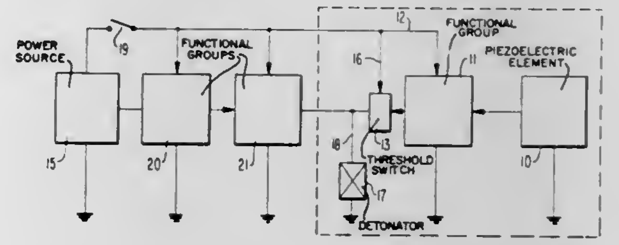
Heinz Gawlick, Furth, Bavaria, and Uwe Brede, Schwaig, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Mar. 15, 1974, Ser. No. 451,675

Claims priority, application Germany, Mar. 15, 1973, 2312793

Int. Cl.^{2} F42C *11/02*

U.S. Cl. 102—70.2 GA **22 Claims**



1. A piezoelectric fuze, especially for projectiles, comprising power source means, detonator means, threshold switch means having a threshold value, piezoelectric element means for converting the mechanical shock wave produced upon impingement of the fuze onto a target into an electrical output signal for at least aiding in overcoming the threshold value of the threshold switch means, and at least a first control means for controlling the ignition of said detonator means, said first control means providing an electrical output signal for overcoming the threshold value of the threshold switch means, said threshold switch means being responsive to the output signals of said piezoelectric means and said first control means for establishing a connection between said power source means and said detonator means for igniting said detonator means when the threshold value thereof is exceeded.

3,967,556
PNEUMATIC FUZE FOR SAFING AND ARMING MISSILES

Lloyd D. Post, Mount,Fern; William J. Holley, Sparta, both of N.J.; William K. Clark, and Fredrick R. Hayward, both of Wilmington, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

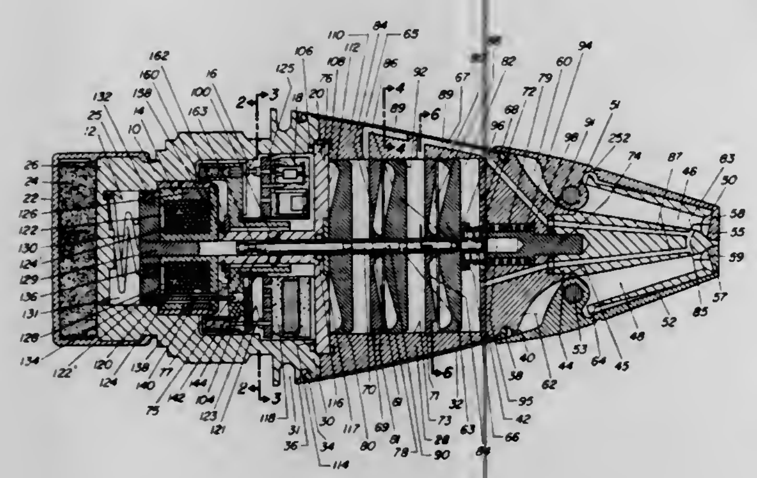
Filed Mar. 31, 1975, Ser. No. 563,766

Int. Cl.^{2} F42C *5/00, 11/02, 15/40*

U.S. Cl. 102—70.2 GA **7 Claims**

1. A pneumatic point detonating fuze for safing and arming a projectile which comprises:
a cup-shaped rear body housing having a partially closed rear end, a front open end, a plurality of progressively sized axially aligned rear body housing counterbores extending from said closed rear end toward said front open end, and a plurality of longitudinally positioned lead explosive bores, said lead bores communicating with said rear body counterbores and exiting from said rear end;

- a plurality of lead explosive charges longitudinally positioned in the lead bores of said rear body housing;
- a booster explosive means fixedly attached to said partially closed end of said rear body housing;
- an ogival front body housing having a rear end section fixedly positioned concentric with and adjacent to said front open end of said rear body housing, a tapered forward section, an axial piston counterbore located in said rear end section having a plurality of annular notched partition grooves therein, an axial guide counterbore communicating with said piston counterbore, an axial nose counterbore located in said tapered forward section and communicating with said guide counterbore, and a plurality of high and low pressure channels pneumatically connecting said nose counterbore with said piston counterbore;
- body cover means for fixedly holding said front body housing attached to said rear body housing;
- torsionally biased rotary arming means for holding said fuze in a "safe" unarmed condition when said fuze has not been subjected to a proper launch environment, and for placing said fuze in an "armed" condition when said fuze has received a proper launch environment;
- biased setback generator-detent-delay means, positioned in said rear body housing counterbores, for providing electrical energy to said arming means, for preventing said arming means from rotating when said fuze in said "safe" condition, and for controllably delaying the redetenting of said arming means for a first interval of time after said fuze has been subjected to said launch environment;
- pneumatic piston detent means, slidably positioned in the piston counterbore of said front body housing, for detenting said rotary arming means until said projectile has obtained a proper velocity and for permitting said rotary arming means to rotate and place said fuze in said armed condition when said projectile has seen said proper velocity; and
- venturi nozzle sensing means for detecting said projectile air velocity and for directing high and low pressure air through said high and low pressure channels into said piston counterbore, wherein the difference in pressure across said piston detent means causes forward translation of said piston detent means and the release of said torsionally biased rotary arming means; and
- a plurality of piezoelectric graze and impact sensors, operatively positioned in the nose end of said nozzle sensing means, are electrically connected to a triggering circuit energized by said generator-detent-delay means when said fuze is in said armed condition, said graze and impact sensors activating said triggering circuit and causing said fuze to detonate upon impact with a target.



3,967,557

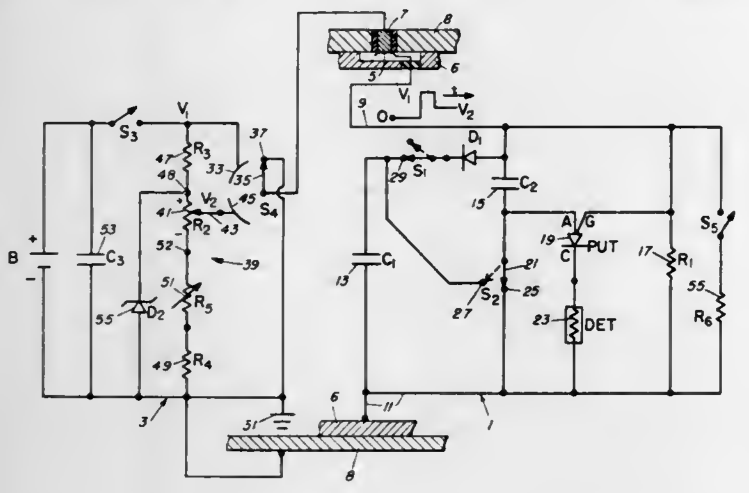
ADJUSTABLE ELECTRICAL TIME DELAY FUZE

Charles G. Irish, Jr., Port Tobacco, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1975, Ser. No. 543,287

Int. Cl.^{2} F42C *11/06*

U.S. Cl. 102—70.2 R **10 Claims**



1. In a system comprising a gun and an explosive projectile launched therefrom, delay fuze means for exploding said projectile during flight at a predetermined time after launch, including a firing circuit carried by said projectile, said firing circuit comprising:

- first and second input terminals;
- a first capacitor, and means connecting said first terminal, through a blocking diode and an initially-closed setback-actuated single-pole-single throw first switch and said capacitor, to said second terminal;
- a second capacitor, and means connecting said first terminal, prior to setback, through said second capacitor and one path of a setback-actuated single-pole-double throw second switch, to said second terminal;
- a timing resistor connected in parallel with said terminals;
- a detonator for exploding the projectile;
- a programmable unijunction transistor including an anode, a gate and a cathode and having its anode connected to the junction of said second capacitor and said second switch, its gate connected to said first terminal and its cathode connected, through said detonator, to said second terminal; and
- means connecting said transistor anode to the junction of said first switch and said first capacitor, through the other path of said second switch, when the latter is actuated by setback;
- whereby the two capacitors can be charged to two different voltages prior to setback by supplying the two voltages successively to the two terminals, and will discharge in series through the timing resistor after setback until the anode of the transistor is sufficiently positive relative to the gate to cause the transistor to discharge through the detonator and thereby explode the projectile.

3,967,558

PROPELLANT GRAIN SUPPORT APPARATUS

Frank A. Brody, Rockaway; Emil K. Merz, Pompton Lakes, and Peter Van den Houten, Dover, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,892

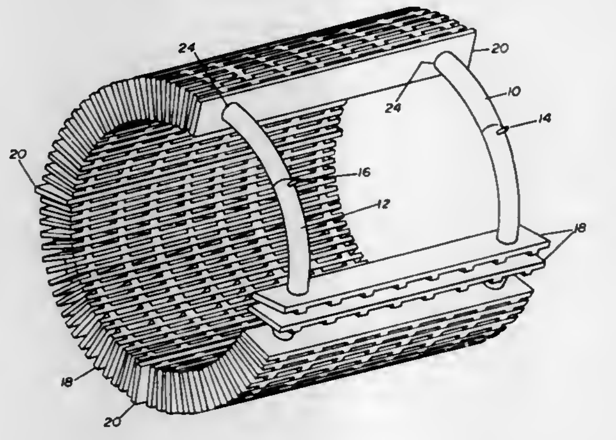
Int. Cl.^{2} C06D *5/04*

U.S. Cl. 102—99 **4 Claims**

1. A propellant grain support apparatus which comprises:

- a plurality of channeled propellant grain strips having a plurality of holes therethrough;
- a plurality of longitudinally equally spaced support blocks positioned intermediate said grain strips, said support blocks having a plurality of holes therethrough which are axially aligned with the holes of said grain strips;

- a plurality of split interlocking support rings which pass through the holes of said grain strips and said support blocks, wherein said rings, blocks and strips form a cylindrically shaped propellant charge assembly which after being placed in the combustion chamber of a recoilless rifle maintains a radial orientation during firing to achieve simultaneous ignition of propellant surfaces, controlled interior ballistics and controlled gas porting.



3,967,559

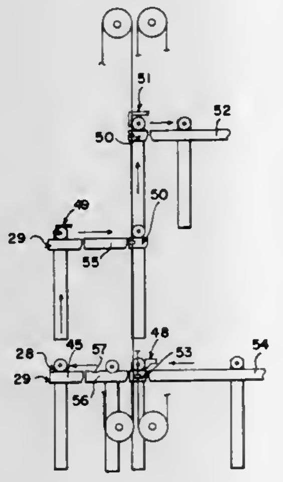
APPARATUS FOR REMOVING MAGAZINES FROM A CLOSED LOOP OF CONTINUOUSLY INDEXED MAGAZINES AND REINSERTING THE MAGAZINES INTO THE LOOP

Charles H. Johnson, and Edward A. Wallace, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,257

Int. Cl.^{2} B61J *3/00*

U.S. Cl. 104—88 **19 Claims**



19. A method of removing a track supported wheeled unit from a closed loop of processing stations through which a plurality of units are being driven step-by-step at predetermined time intervals to a processing station outside the closed loop and of reinserting a unit into the closed loop from the outside processing station, said method including the steps of: transferring a unit from the closed loop to said outside processing station, transferring a unit from said outside processing station to an elevator means, driving said elevator means to a given point along the closed loop, and transferring the unit from said elevator means into said closed loop.

3,967,560

BENDING BEAM AND METHOD OF MAKING SAME

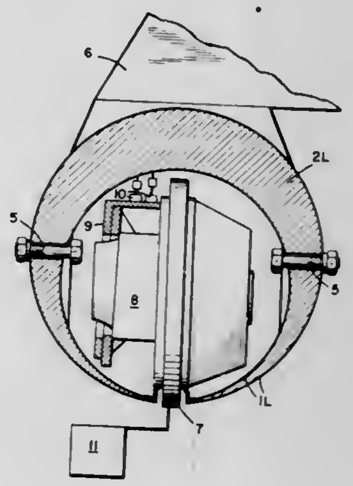
Michael Simon, Munich, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Germany

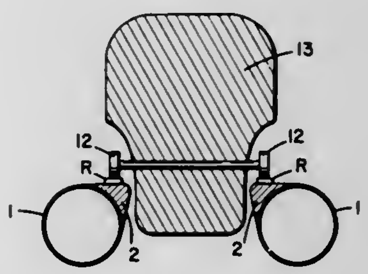
Filed Apr. 3, 1974, Ser. No. 457,499

Claims priority, application Germany, Apr. 3, 1973, 2316462

Int. Cl.^{2} E04C *3/293;* **E01B** *25/22;* **B61B** *3/00, 5/00*

U.S. Cl. 104—94 **24 Claims**





1. Bending rail guiding arrangement for an elevated train vehicle comprising: a bending guide rail formed from an integral metal structural girder, and a plurality of non-metal structural girders connected to said metal girder, said plurality of non-metal girders being constructed from concrete and disposed in a series arranged manner to reinforce those portions of the metal girder subject to compressive forces and buckling stress during use of the rail guiding arrangement, said non-metal girders exhibiting an outwardly facing contact surface for accepting loads on the beam arrangement; and train guiding means mounted on said bending guide rail.

3,967,561

LINEAR-INDUCTION MOTOR ESPECIALLY FOR HIGH-SPEED SUSPENSION VEHICLES

Peter Schwärzler, Furstenfeldbruck, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Feb. 3, 1975, Ser. No. 546,748

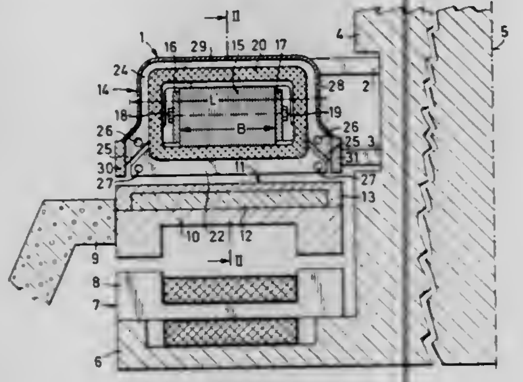
Claims priority, application Germany, Feb. 5, 1974, 2405309

Int. Cl.^{2} B61B *13/08;* **H02K** *41/04*

U.S. Cl. 104—148 LM **9 Claims**

1. A linear-induction motor comprising a flat reaction rail and a stator shiftable along said rail magnetically cooperating therewith, said stator comprising an elongated stator core including a stack of core laminations lying in planes parallel to the direction of movement of said stator transversely to the plane of said rail, a plurality of annular stator coils surrounding said stator core and spaced apart thereon in said direction, and a plurality of elongated comb lamination stacks lying against said stator core between said coils and juxtaposed with said reaction rail, said comb lamination stacks having lengths exceeding the width of said stator core in juxtaposition with said rail and being formed with laminations lying in planes

perpendicular to said direction and to said rail, each of said comb lamination stacks having portions projecting laterally beyond said stator core, said motor further comprising a re-



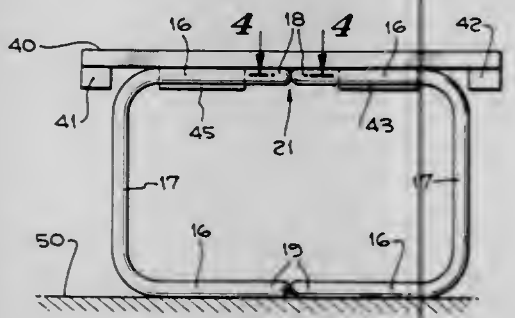
spective U-shaped tension yoke extending around said core and having free ends connected with said portions of the respective comb lamination stack.

3,967,562
MULTI PURPOSE TABLE

Charles D. Anacker, 502 Frenchman St., New Orleans, La. 70116

Filed Nov. 27, 1974, Ser. No. 527,824
Int. Cl.² A47B *9/00, 85/00*

U.S. Cl. 108—12 **8 Claims**



1. In a multi purpose table, the combination comprising
a. two like, symmetrical frame sections having hinged interconnection, so that the sections are relatively swingable between two alternate positions, said sections comprising tubular stretches,
b. and means including a table top alternatively interfitting said sections in each of said positions thereof and characterized in that said sections support said table top at different elevations in said alternate positions,
c. each section including two longitudinal stretches and two U-shaped stretches each defined by two lateral stretches and a cross-piece stretch interconnecting the two lateral stretches, the two lateral stretches merging with adjacent ends of the two longitudinal stretches, the cross-piece stretches defining a common plane in a first of said two positions, and defining two longitudinally spaced parallel planes in a second of said two positions.

3,967,563
PROCESS FOR PRODUCING PRECIPITATED THICKENER SILICA

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 402,927, Oct. 3, 1973. This application Aug. 20, 1975, Ser. No. 606,035
Int. Cl.² C09C *1/28*

U.S. Cl. 106—288 B **6 Claims**

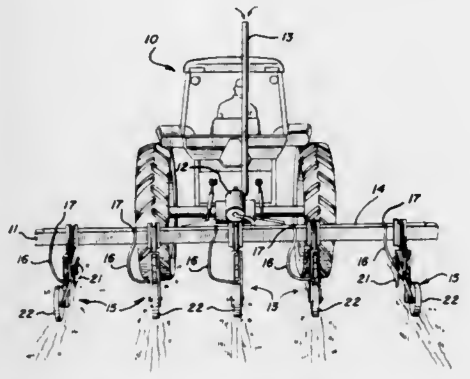
1. A method for producing a unique, amorphous, precipitated silica having very high structure, wet cake moisture in excess of 85%, an oil absorption in excess of 200 cc/100g., a surface area in excess of 250 m²/g, and having improved chemical and physical properties, said method comprising the steps of:
a. providing an aqueous reaction medium containing 10–20% by weight of an alkali metal silicate, said alkali metal silicate having an SiO_2/M_2O weight ratio, x, ranging from 1.0 to 4.0, where M is an alkali metal;
b. heating said reaction medium at a temperature of from 150° to 170°F; and
c. adding to said aqueous reaction medium an acidulating agent comprising a mineral acid at a constant rate ranging from $1x$ to $2/x$ mols of hydrogen ions per minute.

3,967,564
SOIL SHATTERING AND AERATING DEVICE

Leo B. Emling, 477 E. Eugene Drive, Bourbonnais, Ill. 60914

Filed Mar. 3, 1975, Ser. No. 554,614
Int. Cl.² A01C *23/00*

U.S. Cl. 111—7 **3 Claims**



1. A soil shattering device providing forced aeration for the shattered soil comprising a farm tractor having a power takeoff and a tool bar support, an air intake pipe extending high above the ground, a manifold and a pump positioned on said support, said pump operated by the power takeoff for forcing air from the atmosphere into said pipe and down to said manifold, a plurality of aeration gangs spacedly attached to and pulled by said tractor, each of said gangs having a horizontal arm, a rolling coulter rotatably mounted on the front portion of said arm, and a depth cover wheel mounted on the rear portion of said arm, a shank attached to and extending downwardly from said arm, a foot attached to the bottom end of said shank and having a front point extending forwardly and slightly downwardly to cut an opening in the soil, an air tube extending from said manifold to receive forced air from said pipe, and extending downwardly to the lower end of said shank, and then extending rearwardly as a shatter tube to force air into the soil at the opening and an enlarged swedge attached to said air tube adjacent its open outer end, said depth cover wheel and said swedge cooperating to act as a means to close the opening in the soil to prevent fast escape of air from the soil.

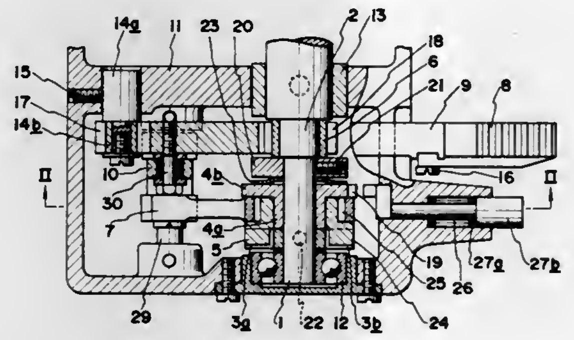
3,967,565
CLOTH FEEDING DEVICE FOR SEWING MACHINE AND METHOD THEREOF

Tetsuro Hirayama, Chofu; Kousuke Yuyama, and Yoshihiko Matsuura, both of Tokyo, all of Japan, assignors to Juki Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,427
Int. Cl.² D05B *27/08*

U.S. Cl. 112—208 **5 Claims**

1. A cloth feeding device for a sewing machine, comprising:
a. a main shaft,
b. a vertically feeding cam fixed to the main shaft,
c. a driving means fixed to the main shaft,
d. a flanged cam frictionally mounted on the main shaft, and being engageable with an external adjusting means,
e. an outer regulating ring having an eccentric inner peripheral surface externally fitted to the outer peripheral surface of the flanged cam, the flanged cam and the ring cooperating to define a double cam, the ring engaging and being driven by the drive means,
f. a cam holding piece embracing the vertically feeding cam,
g. a horizontally feeding arm connected to the ring,



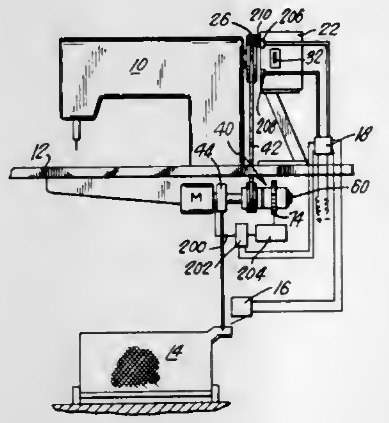
h. a cloth feeding arm having a cloth feeding dog carried by the cam holding piece and being movable with the vertically feeding cam,
i. a pivotally mounted rocker arm, the rocker arm rocking oscillatorily and engaging the cloth feeding arm, and
wherein the horizontally feeding arm is pivoted to the intermediate part of the rocker arm along the longitudinal axis thereof.

3,967,566
SEWING MACHINE ATTACHMENT

Murray Spiegel, 5724 Davies, Cote-St.-Luc, Montreal, and Mitchell Spiegel, 374 Andras Drive, Dollad-des-Ormeaux, Quebec, both of Canada

Filed Aug. 21, 1974, Ser. No. 499,136
Int. Cl.² D05B *69/26*

U.S. Cl. 112—219 A **7 Claims**



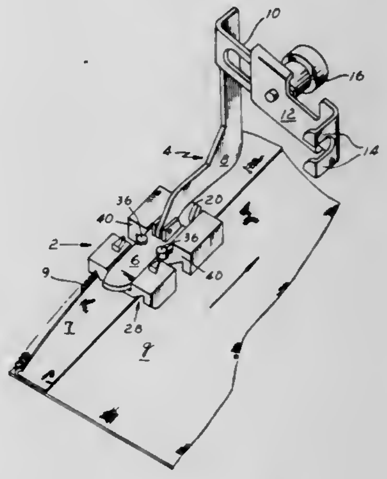
1. A control device for use with a motor driven element in a sewing machine or the like, and comprising an auxiliary motor, a clutch mechanism, a main motor having a drive shaft for driving said element through said clutch mechanism, means to disengage said clutch mechanism from said driven element and to activate said auxiliary motor, said auxiliary motor continuing the drive of said driven element after said main motor drive has been disengaged through said clutching mechanism, means indicating a predetermined position where said driven element is to be stopped, sensing means for sensing said means to indicate a position, a floating brake coupling having a movable plate connected to said drive shaft, means to disconnect said auxiliary motor and to magnetically move said movable plate to brake the drive of said driven element in response to said sensing means and within one complete cycle of operation of said element and substantially at said predetermined position.

3,967,567
UNITARY ADAPTOR FOR PRESSER FOOT ATTACHMENT

John A. Yurkunas, Jr., Ware, and Rhea C. Lathe, Warren, both of Mass., assignors to Wm. E. Wright Co., West Warren, Mass.

Filed Mar. 7, 1975, Ser. No. 556,383
Int. Cl.² D05B *29/00*

U.S. Cl. 112—240 **4 Claims**



1. Adaptor for installing invisible type slide fasteners for use in combination with sewing machine presser foot attachments having a foot portion with spaced opposed recesses in the side edges thereof for accommodating reciprocable movement of a sewing machine needle when installing slide fasteners of non-invisible type without said adaptor, said adaptor being integrally formed of a resilient material and having a pair of laterally spaced, longitudinally extending, downwardly opening guide channels for receiving and guiding the coupling element chain of a slide fastener, said channel including an inclined surface engageable with the coupling chain to orient the same upright with respect to the tape of the slide fastener, and retaining means comprising laterally spaced post members extending upwardly from the adaptor and being laterally spaced apart a distance less than the distance between said opposed recesses, said post members having a cross sectional configuration to fit within said spaced opposed recesses in the side edges of said foot and being deflected apart or releasably fitting into said recesses and thereby resiliently gripping said presser foot to retain said adaptor in fixed position on said attachment.

3,967,568
THREAD CUTTER FOR BLINDSTITCH SEWING MACHINE

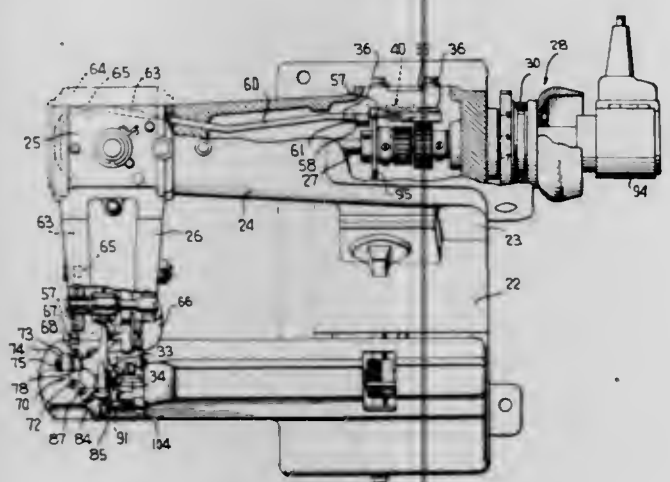
Paul E. Steckenrider, Hoffman Estates, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed May 31, 1974, Ser. No. 475,163
Int. Cl.² D05B *65/02*

U.S. Cl. 112—252 **17 Claims**

1. A thread cutting attachment for use in combination with a single thread blindstitch sewing machine of the type having a needle, a looper and a presser foot with the looper being of the type for isolating a portion of a thread for freedom of access thereto, said thread cutting attachment comprising a pair of blades, means interconnecting said blades for cooperative movement in unison and in opposite directions relative to

an isolated thread portion in a true scissor action with both blades moving towards the isolated thread portion to sever it,



and mounting means mounting said blades relative to a sewing machine to cut such thread.

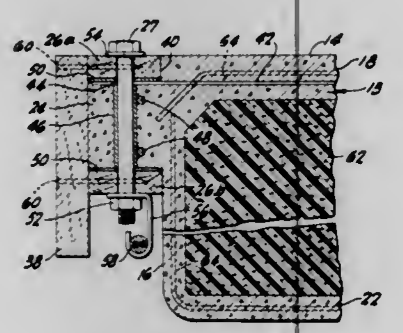
3,967,569
FLOATING DOCK

Myron L. Shorter, Jr., 81 Calypso Shores, Ignacio, Calif. 94947

Filed Dec. 30, 1974, Ser. No. 537,602

Int. Cl.^{2} B63B *35/38*

U.S. Cl. 114—.5 F **12 Claims**



11. A float structure comprising: a plurality of adjacently arranged interconnected float units, each float unit comprising an enclosed, substantially rectangular shell structure with opposed sides with sidewalls and ends with end walls, a top and a bottom; a means of interconnecting said float units, comprising flange structures on said float units having a portion of said sidewalls horizontally projecting from said sidewalls and extending the length of said sidewalls, said flange structures having a horizontal top mounting surface and a horizontal bottom mounting surface spaced from said top surface, connection members for connecting at least two of said float units together with ends abutting, said connection members comprising upper stringers mounted against said top mounting surface of said flange structures and lower stringers mounted against said bottom mounting surface of said flange structures, said stringers extending longitudinally along at least a portion of the flange structures of at least two adjacent float units and fastening means including rod elements each vertically extending through said flange structures between said top mounting surface and said bottom mounting surface and through the upper and lower stringers for securing said upper stringers, said flange structures and said lower stringers together in compression.

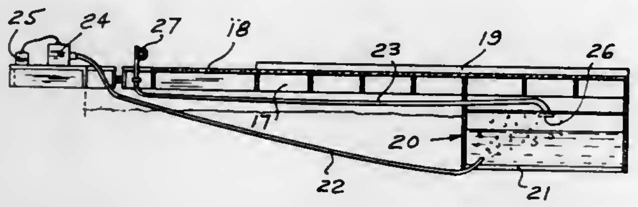
3,967,570
FLOATING DOCK BOAT LIFT

C. C. Bradfield, 175 E. Elmview, San Antonio, Tex. 78209

Continuation-in-part of Ser. No. 455,128, March 27, 1975, abandoned. This application July 7, 1975, Ser. No. 593,329

Int. Cl.^{2} B63C *1/06*

U.S. Cl. 114—45 **6 Claims**



1. A floating dock boat lift comprising:

a. a floating parent structure moored in position on a body of water, said structure including a substantially planar upper surface,

b. multiple hinges operably secured to said parent structure, said parent structure having a length and width greater than a boat dock attached thereto,

c. said boat deck including a substantially planar upper surface and bottom surface operably secured to said multiple hinges in such a manner as to secure said boat deck's upper surface co-planar with said parent structure's upper surface, said boat deck having a length and width greater than the boat to be lifted by the said boat deck,

d. a keel brace securely affixed to said boat deck's upper surface, said keel brace further comprising:

   1. two elongated spaced substantially parallel members secured to the upper surface of the said boat deck adapted to receive and support the keel of a boat and support said boat in an upright position, · ·
   2. an underlying, reinforcing wood member secured to the under surface of said boat deck extending between and in a parallel plane to said elongated spaced parallel members,
   3. a metal reinforcing member securely affixed to said underlying, reinforcing wood member and projecting for the length of said underlying reinforcing wood member and said parallel members secured to the upper surface of said boat deck,

e. an airtight, underlying compartment attached to the under surface of said boat deck, said airtight compartment having an upper surface and a bottom surface,

f. an opening in the bottom surface of said airtight compartment adapted to permit the flow of water to and from said airtight compartment,

g. a source of air under pressure, and

h. multiple valves and air hoses for controlling the flow of air to and from said airtight underlying compartment.

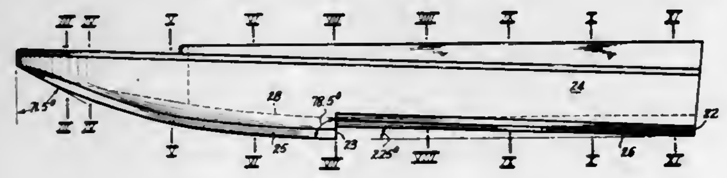
3,967,571
FOUR-POINT TUNNEL HULL FOR A BOAT

Melvin E. Mut, 5225 Adams Ave., Baton Rouge, La. 70806

Filed Mar. 13, 1975, Ser. No. 558,151

Int. Cl.^{2} B63B *1/20*

U.S. Cl. 114—66.5 S **9 Claims**



1. In a boat hull of the type comprising two longitudinally extending, downwardly projecting sponsons having inner walls defining therebetween a longitudinal tunnel, said hull being designed to "plane" at a predetermined operating speed, the improvement according to which the lowermost surface of each sponson slopes upwardly and outwardly for at least the greater portion of its length and each sponson is interrupted forwardly of the center of said boat by a step extending in a direction having a vertical component and dividing said sponson into front and rear parts, with the bottom of the front part of each sponson lying at an angle of less than 90° with respect to the inner wall of the same sponson, and the entire bottom of the forward end of the rear part of each sponson substantially closer to the bottom of said tunnel than the lowermost portion of the rear end of the bottom of the front part of said sponson, while the rear ends of both the front and rear parts of said sponson lie at about the same distance below said tunnel bottom, said tunnel being free from any obstruction substantially inhibiting and said step being deep enough to permit transverse venting of the full width of said tunnel beneath either of the forward ends of the rear parts of said sponsons when said boat is planing.

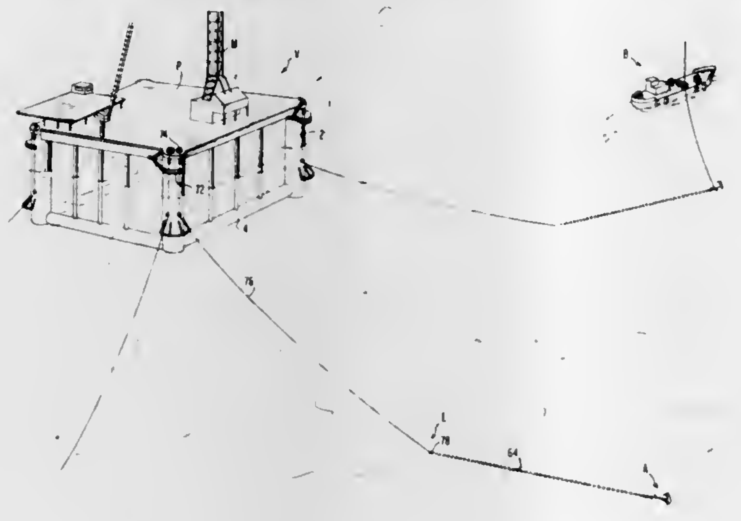
3,967,572
ANCHORING SYSTEM AND CHAIN STOPPER THEREFOR

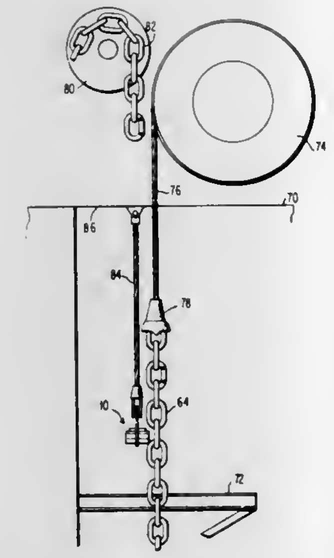
Freeman Roderick Lea, Orange, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Aug. 13, 1974, Ser. No. 497,114

Int. Cl.^{2} B63B *21/50*

U.S. Cl. 114—206 R **27 Claims**





6. Apparatus for handling a combination cable and chain anchor line onboard a vessel comprising:

support structure forming a part of the vessel, a chain stopper carried by said support structure, means carried by the vessel defining a path movement for the combination cable and chain anchor line relative to the vessel during anchor shipping and unshipping operations, and means connecting said chain stopper and said support structure one to the other to enable movement of said chain stopper relative to said support structure between a first position engageable about the chain portion of said anchor line along its path of movement and a second position spaced from the anchor chain and the path of movement of the anchor line, said chain stopper including a pair of support members movable toward and away from one another between positions engaging about and spaced from the anchor chain;

cooperating means carried by said support members for confining at least a portion of a link of said chain when said stopper lies in said first closed position whereby during anchor shipping operations said stopper will positively engage said line at a link of said chain against movement of said link relative to said stopper so that said chain may be disengaged from said cable.

3,967,573
APPARATUS FOR STABILIZING UNDERWATER DEVICES

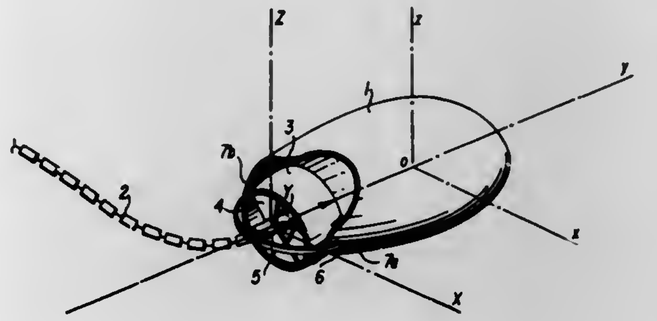
Joel M. Charles, La Valette, and Maurice Roger Fourtier, Cros-de-Cagnes, both of France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, France

Filed July 18, 1975, Ser. No. 597,078

Claims priority, application France, Aug. 1, 1974, 74.26704

Int. Cl.^{2} B63B *21/56*

U.S. Cl. 115—6 **9 Claims**



1. Apparatus for stabilizing a self-propelled underwater device connected to a control base by a control cable, comprising:

a support located at the rear portion of said underwater device and including a universal joint to which said cable is coupled;

an auxiliary propeller mounted on said universal joint for movement in two orthogonal directions;

means for measuring forces applied to said underwater device by said universal joint; and

means coupled to said measuring means for adjusting said auxiliary propeller to offset said forces applied by said universal joint.

3,967,574
MANUALLY CONTROLLED SCULLING MECHANISM

William Donald Golden, 6258 Ruthland Road, Oakland, Calif. 94611

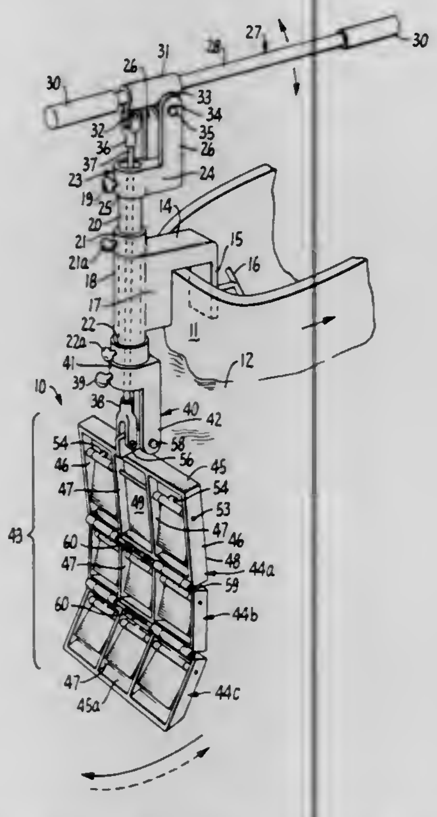
Filed Nov. 14, 1975, Ser. No. 632,159

Int. Cl.^{2} B63H *1/32*

U.S. Cl. 115—29 **5 Claims**

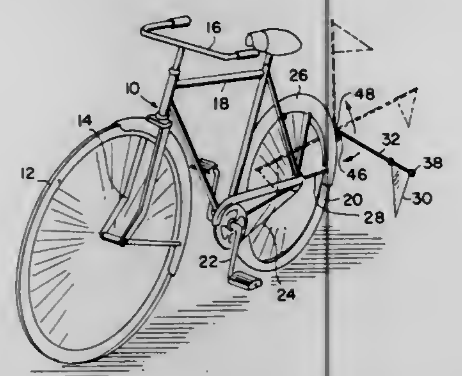
1. Apparatus for manually propelling and steering a water craft comprising in combination, a steering post rotatable 360° axially in a horizontal plane, a tiller for rotating said steering post and mounted thereon for pivotal movement up and down to provide a pumping stroke, a plurality of blades mounted on the lower end of said steering post at right angles to the vertical plane of said tiller and for movement with said steering post, said blades being hinged together horizontally for flexing in one direction only which direction is the return stroke, means on said blades for preventing flexing in the other direction which is the power stroke, said blades also having a plurality of windows therethrough and hinged cover plates for covering and closing said windows on the power stroke and

opening on the return stroke, linkage means connecting said blades to said tiller to move said blades alternately rearward



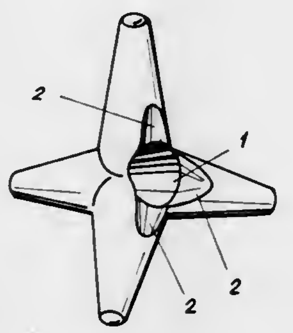
on the power stroke and forward on the return stroke for propelling said craft forwardly.

3,967,575
BICYCLE SAFETY WARNING FLAG
Barbara Coutts, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Apr. 15, 1974, Ser. No. 460,822
Int. Cl.^{2} B60Q *1/34*
U.S. Cl. 116—35 A **1 Claim**



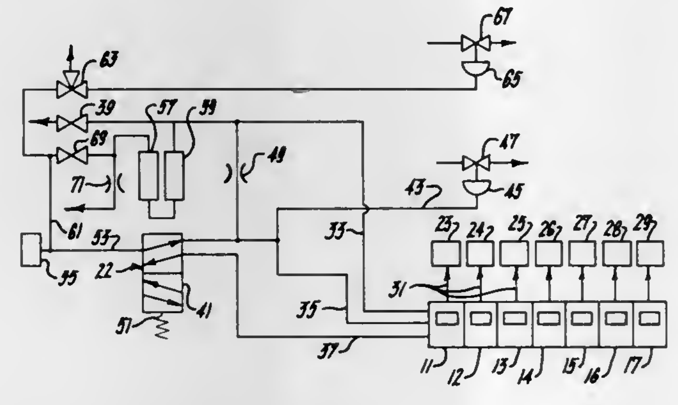
1. A signal and flag device for use on wheeled vehicles such as bicycles, tricycles, minibikes and the like having at least one rear traction wheel carried by a vehicle frame portion, said signal and flag device comprising flag means, flag pole post means engaging said flag means for supporting the same, flag pole post support base means engaging said post means for supporting the same, said flag means carried jointly by said support base means and said flag pole post means for swiveling said flag pole means into any of a plurality of possible angularly oriented and stationary positions about said support base means for displaying said flag means in any of said angular and stationary positions, said vehicle frame portion comprising a mudguard fender means extending over a portion of said rear traction wheel for movement with said frame portion, connecting means for connecting said flag pole post support base means to said mudguard fender means for support thereon such that said flag pole post means is angularly orientable about said support base means to display said flag means in a direction oriented to the left, right, upright, rearwardly and in any other selected direction about said support base means on related movement of said flag pole post means, said flag pole post support base means comprising a base plate portion secured to said mudguard fender means, flange means formed integrally with said base plate portion and extending outwardly therefrom, said connecting means being carried jointly by said support base means and said mudguard fender means for supporting said flag pole post means thereon, said flag pole support base means comprising an upwardly open hollow ball joint cup member, said flag pole post means comprising a lower spherical seating end swivel portion seated in said hollow ball joint cup member, whereby said flag pole post means is movable angularly about the center of said lower spherical seating end swivel portion for moving said flag means from a neutral position to any desired angular position related to the safety of the cyclist in traffic, supplementary indicating directional means constructed and arranged for being removably carried on an outer end portion of said flag pole post means for movement therewith and comprising a direction indicating body portion formed of lightweight material and bearing a light responsive and luminescent pigment material for becoming highly visible to onlookers, traffic, other vehicles and pedestrians, under ambient lighting conditions and on impingement of motor vehicle lights thereon for giving a visual direction signal to others, said supplementary indicating means comprising said indicating body portion construction in the form of a solid conical arrow shaped body and formed from a highly visible material for pointing as an arrow to indicate desired directional movement of the cyclist, and a flexible wirelike tie and directing means engaged at one end to said flag pole post means and engaged at its other end in loosely secured relationship to a portion of said vehicle, and said wirelike tie being within reach of the hands of the cyclist so that pulling or pushing of said tie causes the angular orientation of said flag pole means to be varied without necessitating dismounting by the cyclist from the cycle.

3,967,576
TETRAPODE FOR MARKING OFF PURPOSES
Erik Boerge Soerensen, 68 Langelinie, 7100 Vejle, Denmark
Filed Mar. 13, 1975, Ser. No. 557,950
Claims priority, application Denmark, Apr. 1, 1974, 1786/74
Int. Cl.^{2} E01F *9/00;* G08B *5/00*
U.S. Cl. 116—63 P **2 Claims**



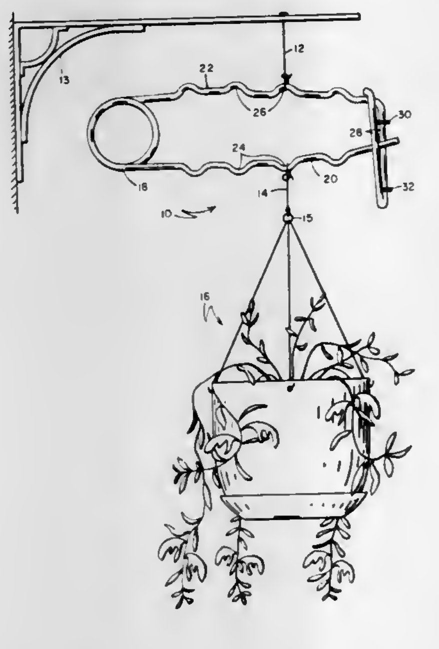
1. A tetrapode for marking-off purposes, comprising four frustoconical legs substantially symmetrically joined to each other at the wider portion of said legs, at least one of said legs being hollowed out sufficiently to receive a portion of a leg of a similarly dimensioned tetrapode, and the other three legs adjoining said one of said legs being provided with generally parabolic depressional interruptions in their frustoconical shapes beginning at points adjoining the hollowed out portion of said of one said legs extending along each of the said other three legs toward the unattached ends thereof, said depressional interruptions being contoured to abut on a major portion of their surfaces, portions of frustoconical legs of a similarly dimensioned tetrapode having a leg inserted into said one of said legs.

3,967,577
PNEUMATIC CONTROL SYSTEM
Robert A. Bilbrey, Orinda, Calif., assignor to California Controls Company, Berkeley, Calif.
Filed May 15, 1975, Ser. No. 577,757
Int. Cl.^{2} G08B *1/04*
U.S. Cl. 116—65 **12 Claims**



1. A pneumatic control system comprising, a plurality of annunciators, each having a shuttle element therein responsive to a sensed condition to move between a first position at which a sensed normal condition is indicated and a second position at which a sensed abnormal condition is indicated, each of said annunciators having spring means therein biasing said shuttle element toward said second position, each of said annunciators having brake means therein responsive to a bias pressure to retain said shuttle element against movement, and means for applying a bias pressure to all of said brake means upon movement of any one of said shuttle elements from the first position to the second position upon sensing an abnormal condition, whereby those of said annunciators for which a sensed normal condition exists continue to indicate a normal condition.

3,967,578
MOISTURE GAUGE FOR A HANGING POTTED PLANT
Joseph Sebato Gallo, 58 Peach St., Walpole, Mass. 02081
Filed May 12, 1975, Ser. No. 576,885
Int. Cl.^{2} G01G *3/08;* G01D *18/00;* G01N *5/00*
U.S. Cl. 116—114 R **4 Claims**



1. A moisture weight gauge for insertion between two adjacent segments, of a pendant support for a hanging potted plant, having, in combination,

a generally U-shaped spring wire support element including a spring coil,

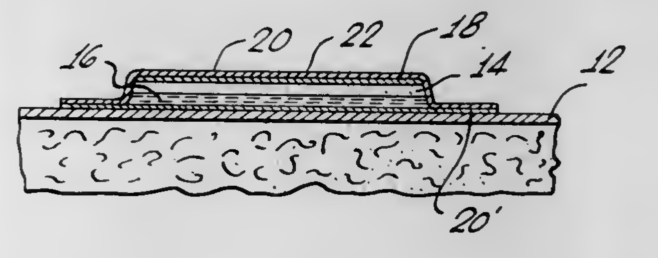
two arms extending from said spring coil in approximately parallel relation,

one of said arms terminating in a pointer,

the other of said arms having a calibrated extension crosswise of said arms providing a guideway for directing relative movement of the guideway and said pointer arm toward and away from one another, and

means for maintaining substantially constant limits of movement of said pointer arm relative to said guideway compensating for differences in plant weight which comprises a plurality of means for selective attachment of said segments at spaced points or intervals along the length of each arm, said means of attachment being paired, one of a pair on each arm, and equally distant from said spring coil.

3,967,579
TELLTALE DEVICE
Charles Seiter, Los Angeles, Calif., assignor to Stanton H. Kaye, Venice, Calif., a part interest
Filed Oct. 29, 1975, Ser. No. 627,021
Int. Cl.^{2} G01K *11/08*
U.S. Cl. 116—114.5 **9 Claims**



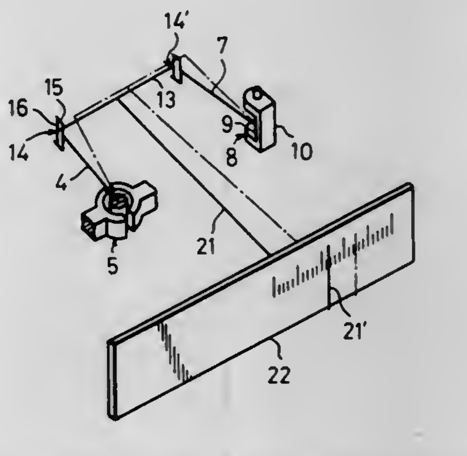
1. A telltale device for indicating deterioration of perishable goods and the like, said device including:

a first layer comprising a fusible carrier material having a clearly defined melting point substantially at a preselected critical temperature;

a second layer comprising an indicator for visually indicating contact with said carrier material;

a gel diffusion barrier disposed between said first and second layers for the diffusion of said carrier material therethrough at a preselected rate at and above the critical temperature for contact with said indicator thereby to visually indicate that said device has been maintained above the critical temperature for at least a preselected period of time as determined by the diffusion rate of the said carrier material in said barrier.

3,967,580
POINTER DEVICE FOR MEASURING APPARATUS
Isamu Yaoita, Kawasaki, Japan, assignor to Eiwa Denki Co., Ltd., Tokyo, Japan
Filed Sept. 19, 1974, Ser. No. 507,361
Int. Cl.^{2} G01D *7/00*
U.S. Cl. 116—115 **2 Claims**



1. In a pointer device for use in a measuring apparatus, in combination:

a. a rotary shaft (6) which rotates in response to an external change;
b. parallelogram means coupled to said rotary shaft (6) including an elongated straight first needle with inner and outer ends, said inner end being coupled to said rotary shaft extending radially therefrom so as to move in response to the rotation of said rotary shaft, an auxiliary straight second needle (7) equal in length to said first needle also with inner and outer ends, set parallel to said first needle a preset distance, a straight third needle with ends disposed between the outer ends of said first and second needles;
c. first and second moveable bearings, holding said third needle ends to the outer ends of said first and second needles, said bearings each having a U-shaped bracket with two arms having an extremely thin twistable band stretched between said arms, a third fixed bearing of the same construction as said first and second bearing, said second straight needle inner end being connected thereto; and,
d. scale means and pointer means coupled to said parallelogram means, said scale means being disposed adjacent said pointer means and being incremented in units corresponding to a unit value of the rotation of said shaft said pointer means outer end being disposed at right angles to said straight first needle to define said pointer means and so disposed adjacent to said scale as to move along said scale.

3,967,581

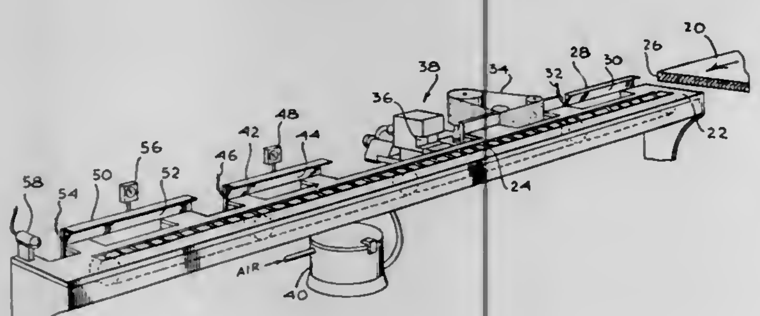
APPARATUS FOR APPLYING A COATING TO A WORKPIECE EDGE

Irvin Edward Zirbel, 11727 W. Dorothy St., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 159,783, July 6, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,907

Int. Cl.² B05C ***5/02***

U.S. Cl. 118—2 22 Claims



1. Apparatus for applying a thin coating of fast-drying filler material to a workpiece edge comprising:

means for defining a confined space adjacent the workpiece edge in which the workpiece edge is removably and movably included as a wall thereof, said confined space having a dimension aligned with the thickness dimension of the workpiece which is equal to said thickness dimension and wherein said defining means include means adjustably variable in the direction of the thickness dimension for establishing said aligned dimension to correspond to the thickness dimension of different workpieces;

means for placing said workpiece adjacent said confined space and developing relative movement between the two;

means for controllably applying the filling material to the confined space including a valve housing and a rotary valve member mounted therein, both being configured in mating relationship to correspond to a selected curved edge of the workpiece and both acting with the defining means to establish said confined space; and

means for activating the applying means when the workpiece edge is adjacent the confined space.

3,967,582

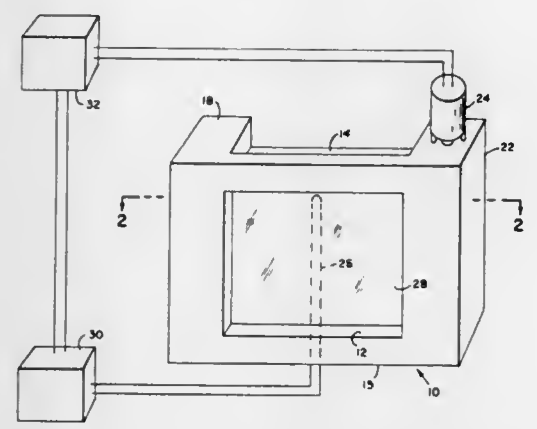
OPTICAL RADIATION PROTECTION MECHANISM

Thomas G. Roberts, and Thomas A. Barr, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,296

Int. Cl.² B05C ***3/12***

U.S. Cl. 118—5 2 Claims



1. A mechanism for protection of optical glass plates against high energy laser radiation and absorbing such radiation comprising: a film container including a water impregnated or coated film having one end connected to a supply spool and the opposite end connected to a take-up reel, said container having means for housing said spools and being provided with an opening for said film to extend across; said housing opening and film thereacross being operatively associated with a window; a thermal sensor mounted on said container and disposed close to said window; a resistance bridge and differentiator connected to said thermal sensor; a stepping motor connected to said take-up spool; and a power supply connected to said motor and said bridge to control movement of said take-up spool when actuated by said resistance bridge.

3,967,583

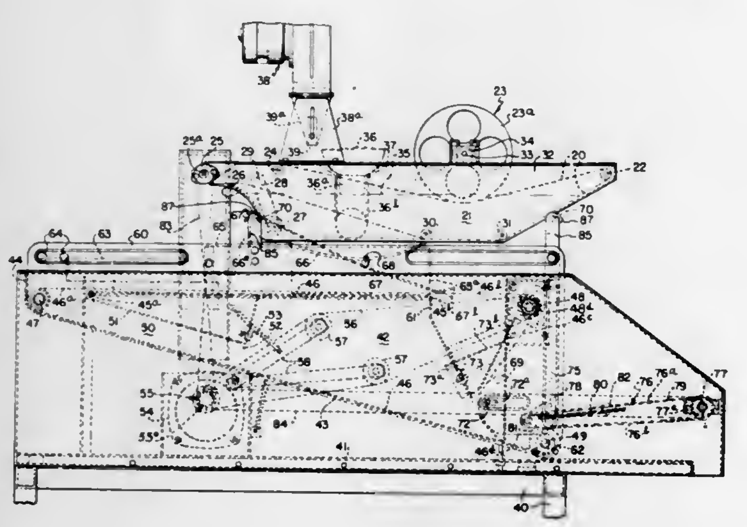
COMPACT IN-LINE BREADING MACHINE

Raymond E. Booth, Sandusky, Ohio, assignor to Sam Stein Associates, Inc., Sandusky, Ohio

Continuation-in-part of Ser. No. 459,567, April 10, 1974, Pat. No. 3,915,116. This application Jan. 27, 1975, Ser. No. 544,323

Int. Cl.² A21C ***9/04***

U.S. Cl. 118—16 3 Claims



1. Means for coating a food product with a finely divided particulate coating material comprising a frame, a conveyor belt movably mounted in said frame and having an inlet end and a discharge end, means for moving said belt, means for providing a flow of said coating material to said inlet end of said conveyor belt forming a product path centrally thereof, said last means comprising a coating material storage hopper in the lower portion of said frame having parallel vertical side walls and having a bottom wall which is a flat plate inclined upwardly from a low point spaced below said discharge end to a point immediately below said inlet end and having one end wall at the higher end of said bottom wall; an open mesh conveyor belt having a linear breading material elevating run in said hopper and traveling between said vertical side walls and close to said inclined bottom wall, said elevating run supported by a pulley equivalent at said low point and by a downstream pulley equivalent near said higher end of said bottom wall; said means also comprising a flat roof plate fixed in said hopper parallel to said bottom wall and spaced thereabove at approximately the level of the top of the breading material being elevated by said conveyor belt, said roof terminating at approximately said product-inlet end of said conveyor belt, said roof plate extending between said vertical side walls and with said hopper bottom wall forming a slot which with said belt conveyor elevating run serves to pump said breading material forward and upward through said inlet end of said conveyor belt, means for splitting said flow and providing a bed of said material of predetermined thickness on said product path, means for placing a food product on said bed at a product input point near said inlet end of said conveyor belt whereby said product is moved down said path by said belt, and discharged in a coated condition at the end of said path.

3,967,584

SELF-RUNNING AND AUTOMATIC CLEANING COATING MACHINE FOR INTERNAL WALL OF PIPE

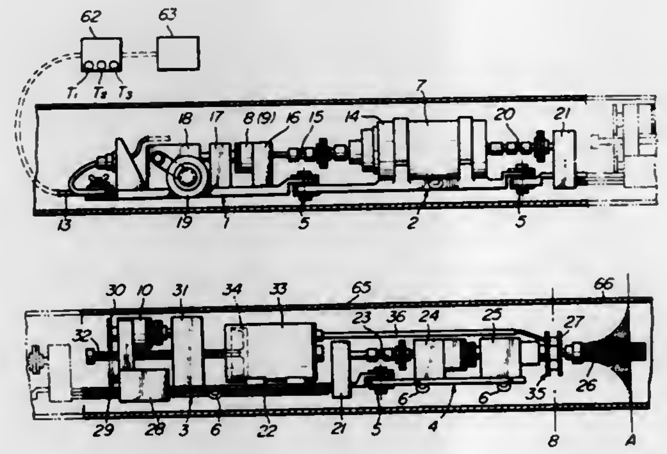
Akira Hasegawa, Tokyo, and Hiromichi Ozoe, Nishinomiya, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,889

Claims priority, application Japan, Sept. 19, 1973, 48-104884; Sept. 19, 1973, 48-108751[U]

Int. Cl.² B05C ***7/08***

U.S. Cl. 118—72 2 Claims



1. A line of trucks as a machine for working within a small diameter pipe, comprising, in line:
a. a travel-driving truck (1) at the rear of the line, having a drive force transmission mechanism (17, 18);
b. a motor carrying truck (2) connected to said travel-driving truck having a motor (7) including high and low speed clutch means (8, 9);
c. a coating material supply truck (3) connected to said motor carrying truck, having coating material storage and feeding means (33, 34) and front and rear drives (21) coupled at one of said drives to said motor (7) and a reduction mechanism coupled to said coating material storage and feeding means (33, 34); and,
d. a working truck (4) at the front of the line having first and second transmission means (25, 24), and cleaning and coating means (35) having a brush (26) and a rotary blade (27) operatively coupled with said second transmission means, said second transmission means (24) being coupled to said first transmission means 25.

3,967,585

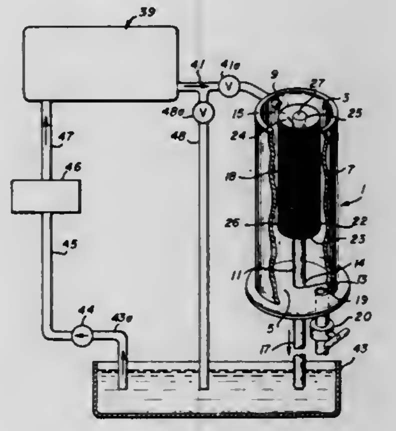
LARVAE COLLECTION SYSTEM

George Monaco, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 2, 1975, Ser. No. 564,237

Int. Cl.² A01K ***61/00***

U.S. Cl. 119—2 16 Claims



1. A small, aquatic animal-collecting apparatus which comprises
a container suitable for retaining water being open at the upper end and closed at the other;
a fluid inlet means to said container;
a fluid conduit positioned within and extending about the vertical length of said container and passing through a lower portion of said container;
a fluid outlet means positioned in the upper portion of said conduit; and
a screening means positioned between the side walls of the container and said fluid outlet means so that said small aquatic animals are retained in said container in a life sustaining amount of water, while excess water is allowed to pass through said screening device and out said outlet means, said screening means comprising
a first plate;
a second plate parallel to, spaced from, and about the same size as said first plate;
said conduit passing through an apperture centrally located in said first plate, the end of said conduit being attached to a face of said second plate, the corresponding edges of said plates being the same distance from the outer wall of said conduit; and
a fluid permeable material extending between the edges of said plates and enclosing a portion of said conduit and said fluid outlet means positioned on the upper portion of said conduit by being snugly fitted at least around the periphery of said first plate.

3,967,586

DIAPHRAGM TEAT CUP ASSEMBLY FOR MILKING

Daniel O. Noorlander, 1864 S. 568 East, Orem, Utah 84057

Filed Feb. 5, 1973, Ser. No. 329,667

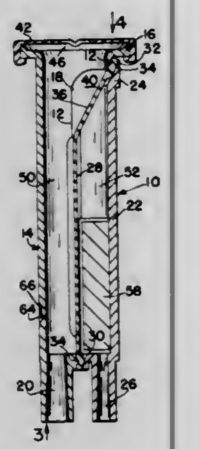
Int. Cl.² A01J ***5/04***

U.S. Cl. 119—14.53 3 Claims

1. Diaphragm teat cup comprising a generally cylindrical two-part elongated housing, a first part including a head at one end and a milk tube at the opposite end and being open at a side thereof between the head and milk tube,

the second part being open at one side complementary to the open side of the first part and being open at the end corresponding to the head end of the first part and having a tube at its opposite end,

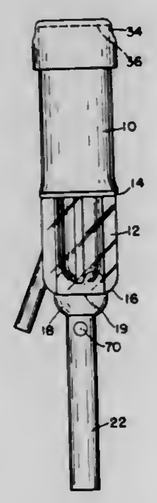
an elongated diaphragm between said parts, said diaphragm separating the housing into two chambers one of which is in the first part of the housing, the other chamber being formed by the second part and the diaphragm, elongated slidable channel-shaped connectors along the length of the parts at corresponding edges thereof securing the two parts together and the diaphragm between the two parts.



3,967,587

TEAT CUP INFLATION

Daniel O. Noorlander, 1864 S. 568 East, Orem, Utah 84057
Filed Dec. 13, 1972, Ser. No. 314,775
Int. Cl.² A01J *5/04*
U.S. Cl. 119—14.49 **4 Claims**



1. A teat cup assembly comprising a shell and an inflation, the shell including two interconnected sections, one of which is of stainless steel and the other being transparent, the stainless steel section being at the proximate end of the shell and the transparent section being at the distal end thereof,

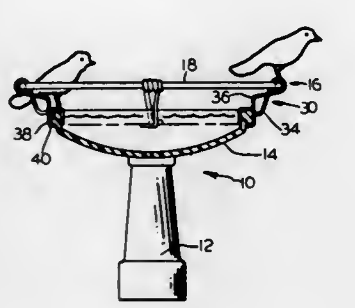
the inflation comprising a one-piece elastomeric member including a liner and a milk tube extending therefrom and through the shell, means on the inflation engaging the shell at the proximate end of the stainless steel section, and there being an abutment on said inflation between the liner section and the milk tube against which the distal end of the transparent section of the shell abuts.

3,967,588

ACCESSORY FOR A BIRD BATH

William E. Brown, 214 Park Ave., Pewaukee, Wis. 53072
Filed Jan. 26, 1970, Ser. No. 5,767
The portion of the term of this patent subsequent to July 6, 1991, has been disclaimed.
Int. Cl.² A01K *45/00*
U.S. Cl. 119—26 **8 Claims**

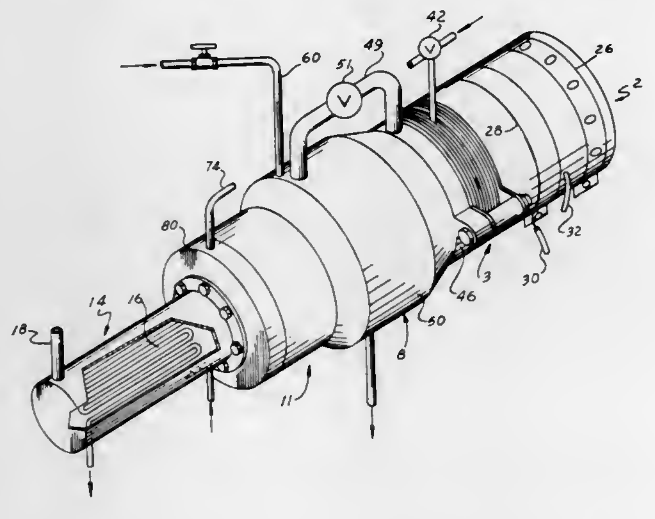
1. In combination; a vessel, a perch, said perch being of substantially the same geometric configuration in horizontal plan as the peripheral edge of the vessel and defining an area greater than the area defined by said edge and legs for connecting said perch to said vessel in spaced circumscribing relationship to said vessel edge in a horizontal plane parallel to and spaced above the horizontal plane of said vessel edge.



3,967,589

ENERGY GENERATING SYSTEM

Ronald I. Papineau, Chesterfield Road, Goshen, Mass. 01032
Filed Jan. 27, 1975, Ser. No. 544,400
Int. Cl.² F22B *1/00*
U.S. Cl. 122—4 R **6 Claims**



1. Energy generating system comprising a steam generator, a combustion chamber, fuel supply means for introducing a combustible mixture into said chamber, means for supplying water to said generator for conversion to steam by combustion of said mixture, feed means for supplying said steam to an asymmetric microporous membrane which produces hydrogen by chemical disassociation of said steam, and conduit means for supplying at least part of the hydrogen gas so produced to said combustion chamber for maintaining combustion therein.

3,967,590

HEAT EXCHANGE CONTROL SYSTEM

Herbert G. Hays, Amana, and Richard D. Maxwell, Cedar Rapids, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa
Continuation of Ser. No. 436,231, Jan. 24, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,951
Int. Cl.² F22B *21/06*
U.S. Cl. 122—4 R **7 Claims**

4. A heat exchange system comprising:

a heat exchanger comprising a solid structure surrounding a central plenum;

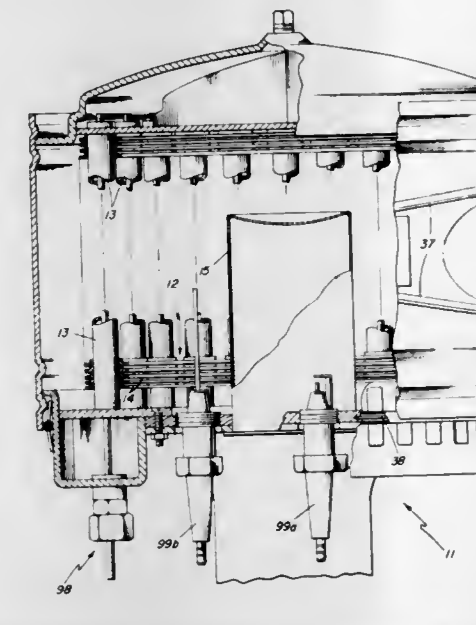
means for supplying the products of combustion to said central plenum comprising a burner having an apertured surface and means for supplying a fuel-air mixture through the apertures in said surface at a rate providing a flame front substantially spaced from said surface and extending across regions between jets of said fuel-air mixture issuing from said ports;

conduit means for directing a fluid to be heated through said heat exchanger; and

electrical heater means adjacent to and in heat exchange relationship with said conduit means and means for energizing said heater when said burner is not in operation for maintaining said fluid in said heat exchanger and the walls surrounding said central plenum above a predetermined temperature during periods when said products of combustion are not being supplied to said heat exchanger.

6. A package heat exchange system comprising:

a fluid heater having a central plenum comprising a plurality of tubular members surrounding said central plenum and rigidly interconnected by a plurality of fins;



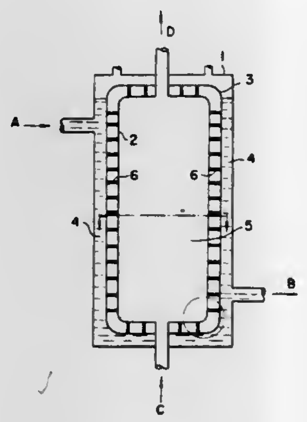
a sheet metal burner having a plurality of ports positioned in said plenum and supplied with a gaseous fuel-air mixture through a blower to produce a flame front extending across regions between jets of fuel issuing from said ports and producing combustion of said fuel-air mixture in a region spaced from the sheet metal wall of said burner, said fuel being supplid to the input of said blower through a gas pressure regulator; and

means responsive to an electrical control system controlling actuation of said blower for changing the total aperture area in the input of said blower through which said gaseous fuel and said air are supplied to said blower.

3,967,591

STEAM GENERATOR FOR FAST BREEDER REACTOR

Shoji Iida, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 30, 1973, Ser. No. 346,330
Claims priority, application Japan, Mar. 31, 1972, 47-32211
Int. Cl.² F22B *1/16*
U.S. Cl. 122—32 **7 Claims**



1. A steam generator for a fast breeder reactor which comprises:

an enclosure-type outer shell;

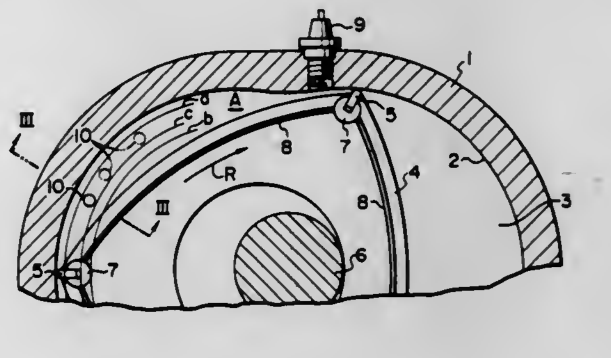
a substantially endless partition wall disposed within said shell in spaced relation with the inner wall of said shell so as to define an endless outer chamber between said shell and said partition wall and surrounding said partition wall for a hot fluid, and defining a substantially enclosed inner chamber centrally therewithin for a cold fluid, and having a plurality of closed, separated cells serially and continuously disposed in an endless fashion therein for separating the hot fluid from the cold fluid and for preventing fluid communication between said cells; and

a thermal medium sealed within said cells.

3,967,592

ROTARY PISTON ENGINE EQUIPPED WITH AN IMPROVED AIR OR FUEL INJECTION OPENING

Yoshio Sasaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Nov. 5, 1974, Ser. No. 521,060
Claims priority, application Japan, July 22, 1974, 49-83908
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 **5 Claims**



1. In a rotary piston engine comprising a casing composed of a center housing having a trochoidal inner peripheral surface and side housings closing opposite ends of said center housing, and a polygonal rotor rotatably disposed for eccentric rotation in said casing, said rotor being provided with apex seals disposed at the apex edge portions thereof and contacting said inner peripheral surface of said center housing with corner seals provided at the apex side portions thereof and with side seals provided to extend between two adjacent apex portions of the rotor and contacting the inner walls of said side housings so that the volume variation of the operating chambers defined by said casing and said rotor effect suction, compression, combustion, expansion and exhaustion strokes of the operating fluid, wherein the improvement comprises providing at least one injection opening which opens in said inner wall at a portion which defines said operating chambers while they are performing suction and compression strokes, said opening being disposed outside the outer envelope of traces of said side seal and inside the outer envelope of traces of said corner seal, said opening having a cross-sectional shape which is covered by the cross-sectional shape of said corner seal.

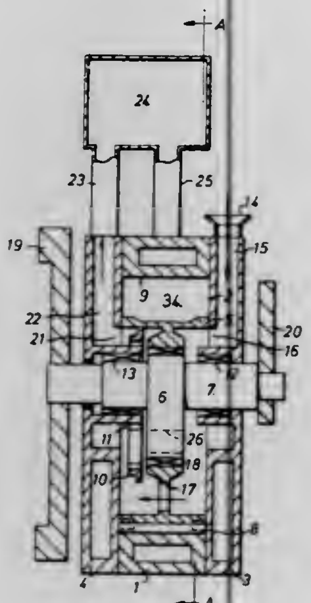
3,967,593

ROTARY PISTON INTERNAL COMBUSTION ENGINES

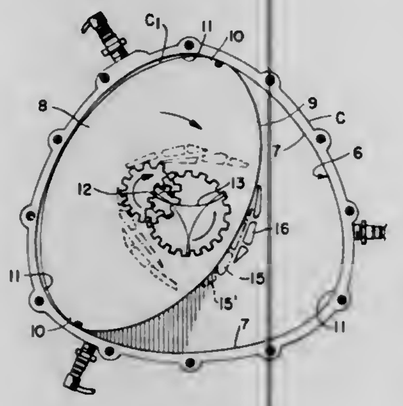
David Walker Garside, Solihull, England, assignor to Birmingham Small Arms Company Limited, Birmingham, England
Filed Oct. 29, 1974, Ser. No. 518,876
Int. Cl.² F02B *55/06*
U.S. Cl. 123—8.45 **15 Claims**

1. A rotary piston internal combustion engine comprising housing means, at least one cavity formed within the housing means, a rotor rotatably mounted within the cavity, the peripheral wall of the cavity and the rotor being so shaped that working chambers are formed therebetween which vary in volume as the rotor rotates, an inlet port and an exhaust port in the housing means whereby gases may be respectively admitted to and exhausted from the working chambers, an air

passageway in the housing means, at least one air passageway through the rotor which communicates with the air passageway in the housing means, and means secured to the housing means providing air reservoir chamber means with an internal volume which is greater than the volumetric displacement of the engine and which communicates with the air passageway in the housing means and with the inlet port whereby air inducted into the working chambers passes in sequence through the passageway in the rotor, the passageway in the housing means, the air reservoir chamber means and the inlet port.

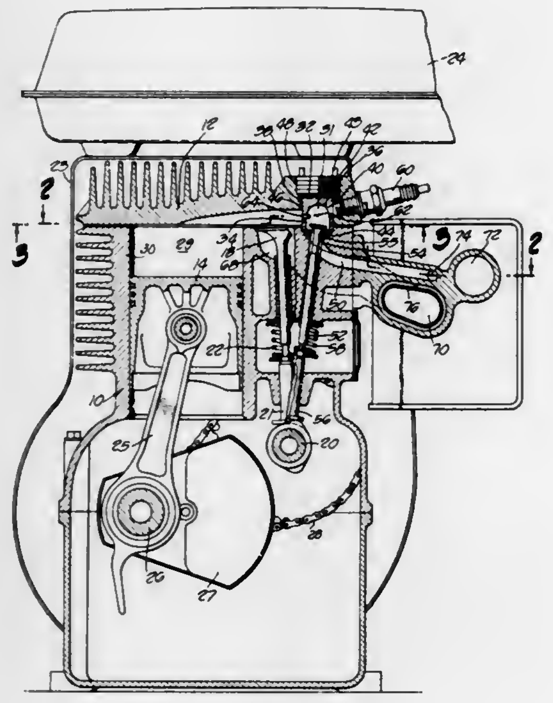


3,967,594
ROTARY POWER UNIT
Donald K. Campbell, Underwood, Wash. 98651
Filed Jan. 27, 1975, Ser. No. 544,397
Int. Cl.^{2} F02B *55/14*
U.S. Cl. 123—8.45 **8 Claims**



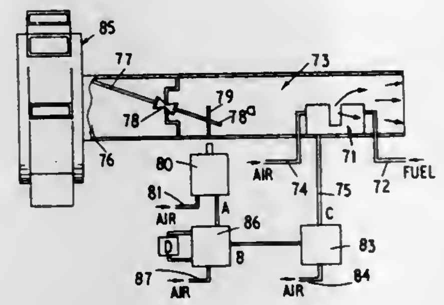
1. A rotary engine including, a housing having a casing provided with a tri-lobular interior wall, a substantially elliptical piston disposed within said casing and having two curved faces terminating to provide a nose at the two distal portions of the major axis of said piston, planar side faces on said piston, said major axis of a greater length than a chord subtending any two adjacent lobes of said tri-lobular casing interior wall, said housing including two side plates having planar inner faces enclosing said piston and casing interior wall, said piston provided with a central bore bounded by a circular bearing surface, a female piston position gear formed on each side of said piston bearing surface, a center drive cam journaled within said piston bore, each said side plate including a central opening having a surrounding circular female bearing surface adjacent said piston sidewall and a cam drive outer gear outside said female bearing surface, support means including a cylindrical head journaled in each said female bearing surface and each having a planar inner face coplanar with said respective side plate face, said drive cam including integral eccentric end drive means extending laterally from both sides thereof and projecting respectively through each said support means, an eccentrically disposed male piston position gear on each said support means each journaled about one said end drive means and engaging one said female piston position gear, a cam drive inner gear carried by the projecting portion of each said end drive means on the side of said support means away from said piston and engaging said cam drive outer gear, three firing chambers defined between said casing interior wall and one of said piston faces adjacent said casing lobes, said male and female piston position gears defining a ratio of 1:2 whereby, as said piston rotates 60° from one firing chamber to another the center axis thereof is displaced 120° relative said side plate openings.

3,967,595
SIDE VALVE INTERNAL COMBUSTION ENGINE
Shizuo Yagi, Asaka; Toshio Shioya, Urawa, and Yukio Tada, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1974, Ser. No. 460,800
Int. Cl.^{2} F02D *19/10, 19/16*
U.S. Cl. 123—32 SP **12 Claims**



1. In an internal combustion piston engine having a engine block and an engine head secured thereto, the block having a piston reciprocable in a cylinder, the block, head and piston cooperating to define a main combustion chamber having a portion extending laterally from said cylinder, and intake and exhaust valves mounted in the block at one side of the cylinder and communicating with the laterally extending portion of the main combustion chamber, the improvement comprising, in combination: means in the head forming a prechamber provided with three openings, a prechamber intake valve mounted in the block and communicating with one of the openings, a spark plug mounted in the head and communicating with another of the openings, and the third opening comprising a torch nozzle establishing communication between the prechamber and the main combustion chamber.

3,967,596
ENGINE CONTROL SYSTEMS
Peter Nigel Comley, Torquay, England, assignor to The Lucas Electrical Company Limited, Birmingham, England
Filed Apr. 9, 1974, Ser. No. 459,398
Claims priority, application United Kingdom, Nov. 28, 1973, 55116/73; Apr. 12, 1973, 17610/73
Int. Cl.^{2} F02B *3/00*
U.S. Cl. 123—32 EA **3 Claims**



3. An engine control system for an internal combustion engine, comprising:

an acoustic signal generator for producing an acoustic signal the frequency of which varies in accordance with the rate of mass flow of air passing through an induction manifold of an internal combustion engine;

an acoustical transducing means proximate to said acoustic signal generator, for converting said acoustical frequency to a first analog signal having qualities which are a function of said acoustic signal frequency;

a speed transducing means connected to a rotating member of the internal combustion engine, for converting the rate of rotation of said engine to a second analog signal having qualities which are a function of said rate of rotation;

a modulating means having a first input connected to said acoustical transducing means and a second input connected to said speed transducing means, for generating a modulated control signal having qualities which are proportional to the ratio of said acoustic signal frequency to said rate of engine rotation;

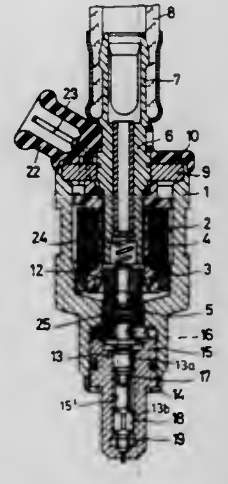
a fuel metering means mounted to introduce fuel into the induction manifold in response to said control signal on a control input connected to the output of said modulating means;

whereby the fuel introduced into the induction manifold per revolution of the engine, is proportional to the ratio of said acoustic signal frequency to said rate of engine rotation.

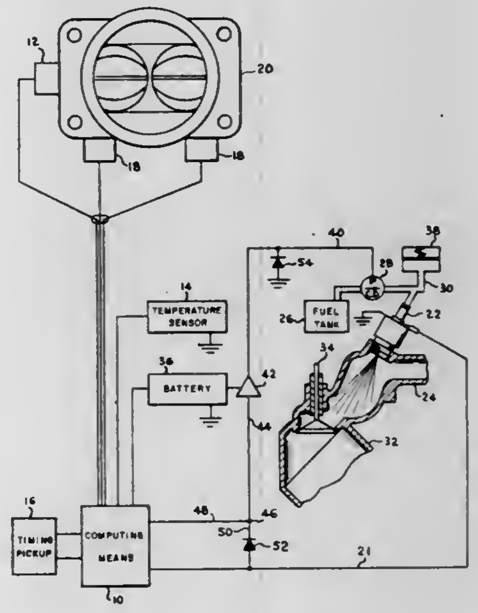
3,967,597
ELECTROMAGNETICALLY ACTUATED FUEL INJECTION VALVE
Walter Schlagmüller, Schwieberdingen, and Herbert Wagner, Bamberg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Sept. 23, 1974, Ser. No. 508,719
Claims priority, application Germany, Oct. 3, 1973, 2349584
Int. Cl. F16k *31/06;* **B05b** *1/30*
U.S. Cl. 123—32 JV **3 Claims**

1. An electromagnetically actuatable fuel injection valve, comprising:

a. a housing;
b. a magnetic core, affixed coaxially to and within the housing;
c. a magnetic winding, fixedly surrounding said magnetic core within said housing;
d. a magnetic armature, movably disposed within said housing, coaxial with said magnetic core and separated therefrom by an air gap, said magnetic armature being provided with a central, longitudinal bore; and
e. a valve needle, disposed and guided within a bore of said housing, coaxial with said armature and said core, said valve needle being provided at one of its ends with a series of generally parallel lands and interposed grooves, said end being received within the bore of the armature so that said series of lands and grooves cooperate with the inner wall of the bore to form a press-fit connection of the valve needle and armature, and at the other of its ends with at least one groove formed in its outer surface which establishes a passage between that valve needle and the housing bore for the flow of fuel through the housing bore.



3,967,598
COMBINED ELECTRIC FUEL PUMP CONTROL CIRCUIT INTERMITTENT INJECTION ELECTRONIC FUEL CONTROL SYSTEMS
Todd L. Rachel, Yorktown, Va., assignor to The Bendix Corporation, Southfield, Mich.
Continuation of Ser. No. 158,350, June 30, 1971. This application Dec. 14, 1973, Ser. No. 425,000
Int. Cl.^{2} F02G *3/00;* **F02M** *39/00*
U.S. Cl. 123—32 EA **2 Claims**



1. A non-return fuel supply system for a fuel injection system having an electronic control unit generating intermittent control pulses and one or more fuel injector valves adapted to be actuated in timed duration by said control pulses, the improvement comprising:

a fuel supply tank;

fuel pump means connected to said supply tank for pressuring fuel received therefrom in response to energization of the fuel pump means;

fuel delivery conduit means for receiving the entire pressurized fuel output of the fuel pump means and adapted to supply said entire fuel output to the injectors;

fuel accumulator means connected to said fuel delivery conduit means for regulating pressure and storing fuel therein;

first control means coupling said electronic control unit and both said fuel pump means and said injector means operative to normally energize said fuel pump means and provide said control pulses to said injector valves.

second control means coupling electronic control unit and said pump means operative for a predetermined duration commenced when said system is first energized to energize said fuel accumulator means to a fluid pressure and volume sufficient for initial injection; and

means connecting said first and second control means for preventing said second control means from energizing said injector valves during said predetermined duration.

3,967,599

ROTARY INTERNAL COMBUSTION ENGINE AND METHOD OF COOLING THE SAME

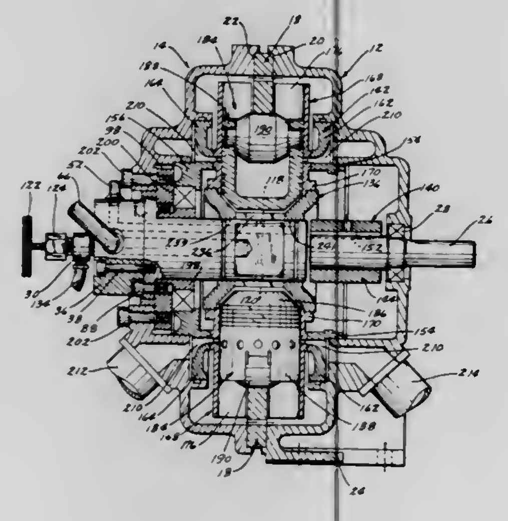
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation of Ser. No. 351,606, April 16, 1973, Pat. No. 3,828,740, and a continuation-in-part of Ser. No. 286,189, Sept. 5, 1972, abandoned. This application July 15, 1974, Ser. No. 488,781

The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² F02B *57/00*

U.S. Cl. 123—44 D **2 Claims**



1. The method of cooling a internal combustion enging having a frame means, an output shaft, a plurality of cylinders each having a reciprocating piston operatively secured to said output shaft, comprising,

introducing combustible fuel into said cylinders and combusting said fuel to force said pistons to move through an expansion stroke in said cylinders,

and introducing ambient air directly into said cylinders for a period of time greater than the time period consumed by the power portion of the expansion stroke of said pistons after combustion of said fuel to purge the exhaust gases resulting from combustion, to recharge said cylinders with fuel, and to cool the pistons and the ineriors of said cylinders.

3,967,600

CARBURETOR CHOKE CONTROL DEVICE

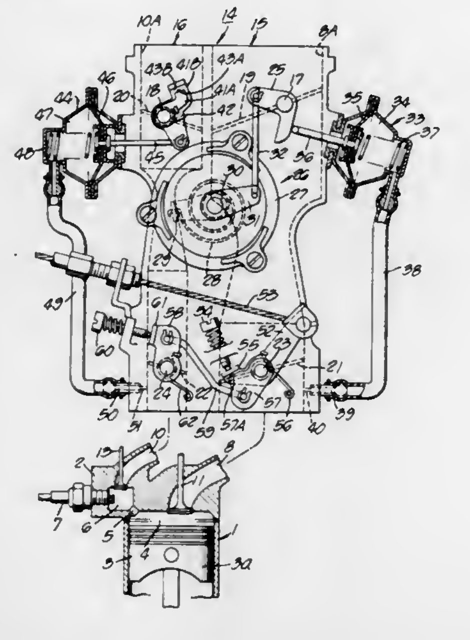
Masahiko Iiyama, and Takashi Kamezaki, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 520,006

Claims priority, application Japan, Nov. 7, 1973, 48-125212

Int. Cl.² F02M *25/06*

U.S. Cl. 123—75 B **13 Claims**



1. In a carburetor choke control device for an internal combustion engine into which a rich air-fuel mixture and a lean air-fuel mixture are inducted, the improvement comprising, in combination: a main carburetor for producing a lean mixture, an auxiliary carburetor for producing a rich mixture, a main choke valve in the main carburetor, an auxiliary choke valve in the auxiliary carburetor, a main choke valve closing device connected to said main choke valve to move it toward closed position, an auxiliary choke valve closing device connected to said auxiliary choke valve to move it toward closed position, a main choke valve opening device responsive to engine operation and connected to open said main choke valve to a pulldown angle predetermined by the main choke valve closing device, and an auxiliary choke valve opening device responsive to engine operation and connected to open said auxiliary choke valve fully against the action of said auxiliary choke valve closing device.

3,967,601

VALVE CONTROL

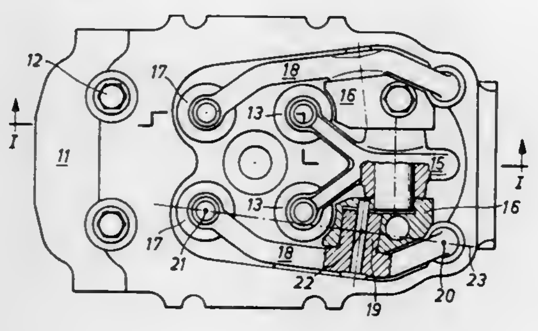
Hansjorg Heberle, Ludwigshafen, Germany, assignor to Motoren- und Turbinen-union Friedrichshafen GmbH, Friedrichshafen, Germany

Filed Aug. 7, 1975, Ser. No. 602,786

Claims priority, application Germany, Sept. 7, 1974, 2442969

Int. Cl.² F01L *1/18*

U.S. Cl. 123—90.4 **4 Claims**



1. A valve control for internal combustion engines with several valve means per cylinder arranged in the cylinder head which are actuated from a cam shaft by way of push rod means and rocker arm means supported in bearing bracket means, each valve means disposed nearer the actuating side being actuated by way of first rocker arm means, characterized in that each valve means disposed more remote from the actuating side is actuated by a further rocker arm means, each further rocker arm means extending arcuately shaped about a corresponding bearing bracket means and a first valve means, each of said further rocker arm means including a bearing pin means for pivotally supporting a further rocker arm means in a corresponding bearing bracket means, and the centers of the bearing points of the push rod means and valve stem means of said further rocker arm means and the center of the bearing place in the rocker arm bearing bracket means being arranged in a common plane disposed perpendicular to the axis of the bearing pin.

3,967,602

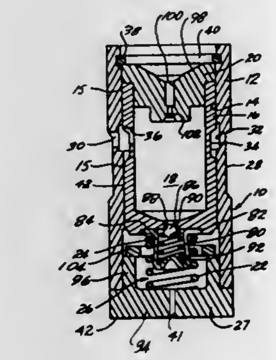
HYDRAULIC VALVE LIFTER FOR RECIPROCATING INTERNAL COMBUSTION ENGINES

William G. Brown, 601 E. Angeleno Ave., Apt. O, Burbank, Calif. 91501

Continuation-in-part of Ser. No. 477,615, June 10, 1974. This application Sept. 23, 1974, Ser. No. 508,145

Int. Cl.² F01L *1/14*

U.S. Cl. 123—90.55 **4 Claims**



1. An improved hydraulic valve lifter of the type having a lifter body with an axial bore, a base of the lifter body, a cam following face on the base for engagement by the lobe of a cam, a plunger axially displaceable within the axial bore of the lifter body between a first position close to the base of the lifter body and a second position remote from the base, the plunger being for acting on a push rod, a fluid receiving cavity in the axial bore of the lifter body and in series force relationship between the lifter body base and the plunger, and means for providing fluid to the fluid receiving cavity to lift the plunger in the axial bore of the lifter body, the improvement which comprises;

a leak path means between the fluid receiving cavity and the outside of the valve lifter through the base of the lifter body and the cam following face, the leak path means being sufficient to prevent the cavity from filling with fluid from the fluid providing means during low to moderate engine speeds and thereby preventing the plunger from reaching its second position, but being restricted enough to allow the cavity to fill with fluid from the fluid providing means at a predetermined, greater engine speed and to thereby force the plunger into its second position.

3,967,603

SPEED SENSITIVE SWITCHING DEVICE

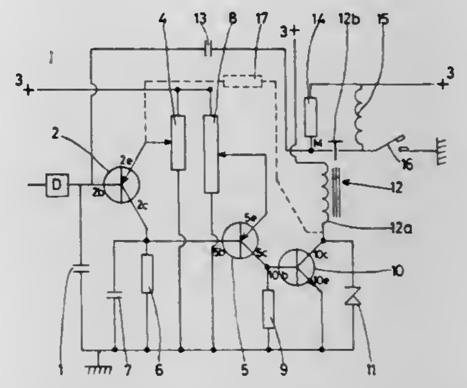
Roger Jean Habert, 73 Avenue de la Republique, 93800 Epinay-sur-Seine, France

Filed May 16, 1974, Ser. No. 470,439

Claims priority, application France, May 22, 1973, 73.18511

Int. Cl.² F02P *9/00, 1/00*

U.S. Cl. 123—118 **7 Claims**



1. A speed sensitive switching device for controlling the speed of rotation of an engine, comprising: a tachometric generator for supplying a voltage which is a function of the speed of the engine, a comparator connected to said generator and a battery for comparing the voltage supplied by the tachometric generator with a reference voltage which is a fraction of the voltage of the battery, a switching component, a first and a second dividing bridge, the comparator having a first and second stage of comparison, said first stage comparing the voltage supplied by the tachometric generator with a reference voltage fixed by said first dividing bridge and determining a comparison threshold, in such a way that, when the voltage supplied by the tachometric generator exceeds this threshold, the first stage triggers said second stage of comparison for comparing the voltage from the first stage with another reference voltage fixed by said second dividing bridge, to thereby cause triggering of said switching component, and a dipole, connected in parallel between said switching component and said first stage and conditioned thereby upon triggering of said switching component to take a part of the voltage from the switching component and to return it to said first stage of comparison in such a way as to cause the response of this first stage and thereby of the whole of the device to vary.

3,967,604

DEVICE FOR PREVENTING AN INTERNAL COMBUSTION ENGINE FROM REVOLVING AT MORE THAN THE PREDETERMINED SPEED

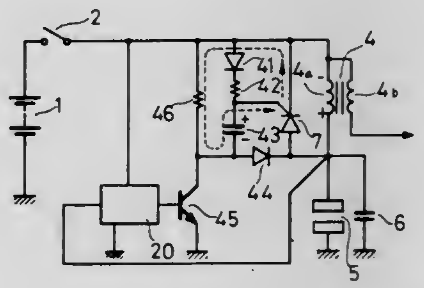
Tetsuya Kondo, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Japan

Filed June 13, 1974, Ser. No. 478,900

Claims priority, application Japan, June 14, 1973, 48-67243; Oct. 2, 1973, 48-115038[U]; Oct. 4, 1973, 48-115155[U]; Oct. 4, 1973, 48-115156[U]

Int. Cl.² F02P *1/00*

U.S. Cl. 123—118 **2 Claims**



1. A device for preventing an internal combustion engine from revolving at more than the predetermined speed in com-

bination with an ignition system for the engine comprising a power source, an ignition coil including a primary coil portion and a secondary coil portion with said primary coil portion supplied with a primary current from said power source and switching means to interrupt the primary current through said primary coil portion of said ignition coil, said device including a semi-conductor controlled switching element connected in parallel to said primary coil portion of said ignition coil; and a control circuit comprising a transistor to control triggering of said semiconductor switching element, an r.p.m. detector to control said transistor in response to the r.p.m. of said engine, a series connection of a first diode, a first resistor, a capacitor and a second diode with said series connection connected in parallel to said primary coil portion and wherein said transistor has the emitter grounded, the base connected to the output of said r.p.m. detector and the collector connected through a second resistor to said first diode at the end adjacent to said power source, said transistor at the collector further connected to the point between said capacitor and said second diode and said semiconductor controlled switching element having the gate connected to the point between said first resistor and said capacitor, said control circuit connected to control said semiconductor controlled switching element so that it is non-conductive upon said engine revolving at less than the predetermined r.p.m. and so that said semiconductor controlled switching element is conductive upon said engine revolving at more than the predetermined r.p.m. whereby when said semiconductor controlled switching element is non-conductive it allows said ignition coil to induce a high voltage across said secondary coil portion for normal operation of the ignition system and when said semiconductor controlled switching element is conductive said semiconductor controlled switching element shorts a primary voltage across said ignition coil established upon opening of said switching means for non-operation of the ignition system.

3,967,605

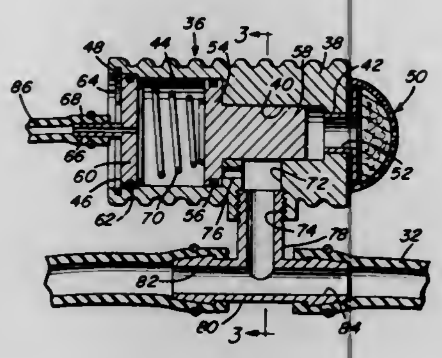
INTAKE VACUUM CONTROLLED MANIFOLD VACUUM SPOILER

James J. Dolfi, Sr., P.O. Box 434, Torrance, Calif. 90508

Continuation-in-part of Ser. No. 284,271, Aug. 28, 1972, Pat. No. 3,820,518. This application May 21, 1974, Ser. No. 471,962

Int. Cl.² F02M *33/00*

U.S. Cl. 123—119 B **7 Claims**



1. In combination, an elongated valve body having a longitudinal bore formed therethrough defining an ambient air inlet at one end and including a diametrically enlarged counterbore at the other end, means closing the outer end of said counterbore and including a small diameter bleed passage formed therethrough, a piston reciprocal in said counterbore and including a shank portion snugly slidable in said bore, said body including a lateral passage whose inner end opens into said bore intermediate its opposite ends and whose outer end opens outwardly of said body, spring means operatively connected between said body and piston yieldingly biasing the latter toward the inner end of said counterbore, said shank being shiftable between a first position with the free end thereof remote from said piston extending completely across and closing the inner end of said lateral passage and a second position with the free end thereof uncovering and thus opening said inner end in response to movement of said piston inward and outward in said counterbore, the outer end of said lateral passage including means for sealed communication with the interior of a PCV valve line of an associated combustion engine, and means adapted to sealingly communicate the outer end of said bleed passage with a source of intake vacuum.

3,967,606

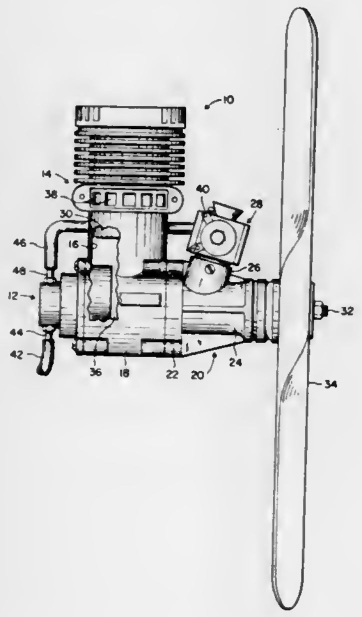
FUEL PUMP FOR INTERNAL COMBUSTION ENGINES

John C. Perry, 971 Mira Mar Drive, Vista, Calif. 92083

Filed June 19, 1974, Ser. No. 480,952

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AJ **20 Claims**



4. In combination:

an internal combustion engine having a cylinder opening at one end to a crankcase chamber and a piston movable in said cylinder with a reciprocating motion which produces cyclic pressure fluctuations within said chamber;

a fuel pump including a housing mounted directly on said engine, a fuel inlet and fuel outlet on said housing, a fuel passage in said housing communicating said fuel inlet and outlet, pumping means in said housing including a pumping pulsator in said passage exposed directly to said crankcase chamber and movable in a pulsating pumping motion by said chamber pressure fluctuations for pumping fuel through said passage from said inlet to said outlet; and

a fuel pressure regulating valve means within said housing and in said passage for maintaining a relatively constant fuel pressure at said pump outlet.

3,967,607

FUEL INJECTION SYSTEM

Konrad Eckert, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 23, 1974, Ser. No. 508,563

Claims priority, application Germany, Oct. 3, 1973, 2349688

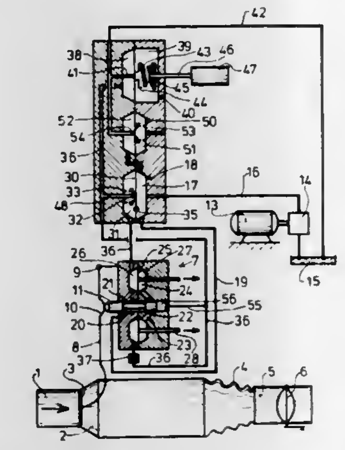
Int. Cl.² F02D *1/00*

U.S. Cl. 123—139 AW **11 Claims**

1. In a fuel injection system for mixture compressing, externally ignited internal combustion engines which include an engine induction manifold and means for continuous injection of fuel into the engine induction manifold, the system comprising: an air-flow measuring element and an arbitrarily actuatable butterfly valve mounted in series within the induction manifold, with the air-flow measuring element being mounted for displacement in proportion to the air-flow in the induction manifold; a metering valve assembly including a movable part and metering valve apertures operatively associated with each engine cylinder and with the movable part, the movable part being connected to the air-flow measuring element and is thereby movable in response to the displacements of the air-flow measuring element; and means exerting a resetting force against the movable part in opposition to the displacement of the air-flow measuring element wherein the metering valve assembly, due to the movement of its movable part relative to the metering valve apertures, meters out fuel through the metering valve apertures in proportion to the air quantity flowing through the induction manifold while a constant pressure difference prevails at the metering valve apertures, the improvement comprising:

a differential pressure control valve, connected to said metering valve assembly; and

a plurality of equal pressure valves connected with said metering valve assembly downstream of the metering apertures and with said differential pressure control valve; whereby the differential pressure control valve and the equal pressure valves cooperate with the metering valve assembly so as to maintain a constant pressure difference across the metering valve apertures.



3,967,608

FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

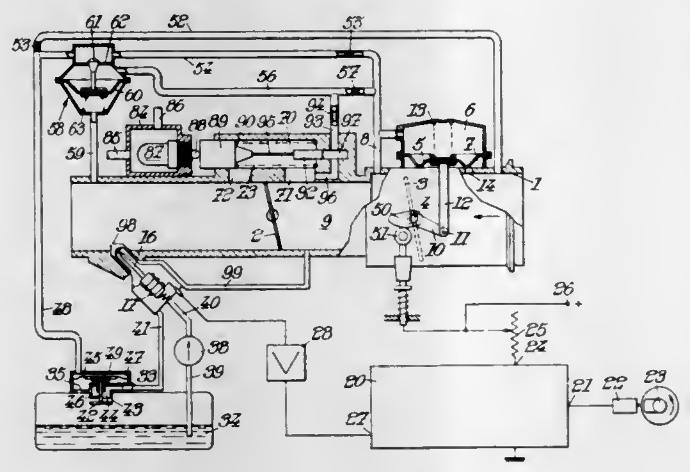
Francois Mennesson, Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Mar. 24, 1975, Ser. No. 561,183

Claims priority, application France, Mar. 25, 1974, 74.10141

Int. Cl.² F02M *51/02*

U.S. Cl. 123—139 AW **6 Claims**



1. A fuel feed device for an internal combustion engine having an air intake passage comprising: auxiliary throttle means which opens automatically and progressively in proportion to the increase in the flow rate of air in the air intake passage, said auxiliary throttle means being disposed in said air intake passage upstream of driver actuatable main throttle means; a source of fuel under pressure having a delivery pipe which terminates in a portion of the air intake located downstream of the main throttle means and is controlled by at least one solenoid actuated valve; and a metering system sensitive to the position of the auxiliary throttle means, provided with means which, in operation, delivers a succession of pulses at time intervals and adapted to supply the solenoid valve with an energisation signal during a fraction of each time interval, the fraction being adjusted by the metering system, the delivery pipe being provided with a pressure regulator comprising a relief valve biased toward opening by the pump delivery pressure and toward closure by the under-pressure in that part of the air intake between the two throttle means, said under-pressure being transmitted by a first connecting pipe to a valve control chamber, wherein said valve control chamber is also connected to the inlet of the air intake by a second pipe and is connected to that part of the air intake between the main and auxiliary throttle means by a third pipe provided with means which opens and close it depending on whether the amount of under-pressure in that part of the air intake downstream of the main throttle means is lower or higher than a threshold and a connecting pipe is provided between the third pipe and that part of a cold start additional air duct which is disposed upstream of a cross-section thereof of adjustable area, means sensitive to the engine temperature being provided for closing the connecting pipe when the engine temperature exceeds a limit value.

3,967,609

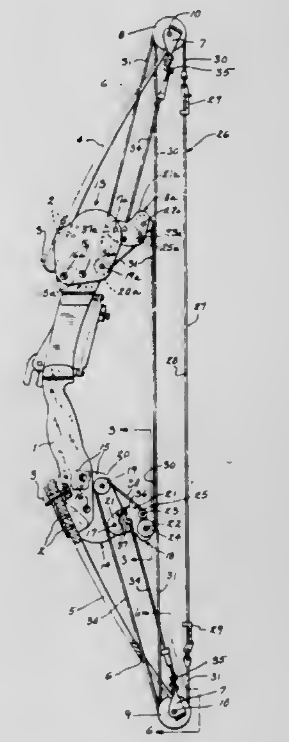
COMPOUND BOW

Arthur J. Frydenlund, 533 N. Marquette Road, Prairie du Chien, Wis. 53821

Filed Apr. 10, 1975, Ser. No. 566,724

Int. Cl.² F41B *5/00*

U.S. Cl. 124—24 R **7 Claims**



1. An archer's bow comprising:

a. a handle,

b. a pair of limbs extending outwardly from the handle ends with said limbs having tip portions,

c. a sheave mounted on each of said limb tip portions,

d. a lever assembly including a lever arm mounted to said handle adjacent each said limb,

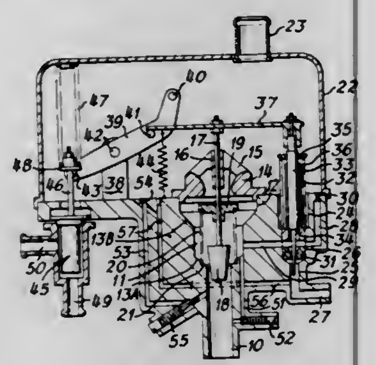
e. a fixed pivot shaft on each said assembly and mounting an associated arm for pivoting therearound,

f. bowstring means trained about said sheaves and said lever assemblies with drawing of said bowstring means causing

said lever arms to pivot about their respective said pivot shafts when a draw force is applied,
g. and means connecting each said limb tip portion with the adjacent lever arm,
h. each said pivot shaft being engaged by said last-named means at maximum draw of said bowstring means to form a stop for the lever arm which mechanically limits the maximum draw distance.

3,967,610
COLD STARTING DEVICES

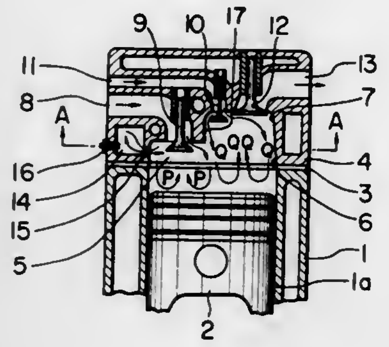
Gray Ernest Donald Ross, Stanmore, England, assignor to The Zenith Carburetor Company Limited, Stanmore, England
Filed Sept. 12, 1974, Ser. No. 505,227
Claims priority, application United Kingdom, Sept. 12, 1973, 42888/73
Int. Cl.² F02N *17/00*
U.S. Cl. 123—179 G **24 Claims**



1. A cold starting device for an internal combustion engine, the cold starting device comprising an auxiliary air supply passage; a first valve member within said auxiliary air supply passage; first biasing means which bias said valve member into an open position at least when the cold starting device is in use, the valve member being arranged so as to tend to be moved when the device is installed on an internal combustion engine by engine suction into a closed position in which it minimizes the flow of air past it to the engine; guide means which guide said valve member for rectilinear movement within said auxiliary air supply passage between said open and closed positions; a fuel metering orifice; conduit means which place said fuel metering orifice in communication with the auxiliary air supply passage upstream of said closed position of said valve member so that metered quantities of fuel can be drawn therethrough into said auxiliary air supply passage by engine suction when said valve member is in the open position; and a thermostatically controlled movable stop for limiting the movement of the valve member towards said closed position, the position of said stop being related to engine temperature so that movement of said valve member is minimized by said stop when the engine is cold and is allowed to increase as the engine warms up towards normal operating temperature whereby movement of said valve member to said closed position is permitted, wherein the improvement comprises a second valve member; a cooperating valve seat positioned within said auxiliary air supply passage upstream of that part of the auxiliary air supply passage with which the fuel metering orifice communicates; second biasing means which urge the second valve member into engagement with said valve seat; the arrangement being such that the second valve member can be seated on said valve seat during the engine cranking period and moved by the depression which is established within said part of the auxiliary air supply passage against the action of the biasing load and away from said valve seat when the engine commences to run under its own power so that the constitution of fuel/air mixture supplied to the engine during starting from cold and warming up of the engine is changed firstly at the termination of the cranking period as well as being further changed progressively once the engine is running under its own power and until it has attained its normal operating temperature.

3,967,611
STRATIFIED-COMBUSTION TYPE INTERNAL COMBUSTION ENGINE WITH PRE-COMBUSTION-CHAMBER

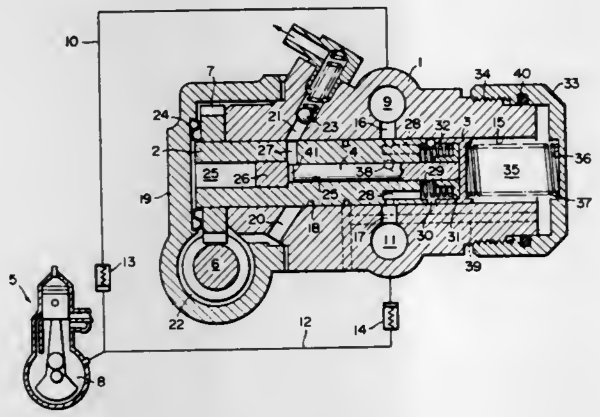
Kenji Goto, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jan. 2, 1974, Ser. No. 429,891
Claims priority, application Japan, Aug. 9, 1973, 48-93113
Int. Cl.² F02B *19/00*
U.S. Cl. 123—191 S **3 Claims**



1. In a combustion chamber structure for a stratified combustion-type internal combustion engine having a cylindrical bore with a piston slidably disposed therein, comprising a main combustion chamber defined by wall means and precombustion chamber which is separate from said main combustion chamber and communicates therewith by means of a small connecting port, the precombustion chamber being free of any intake valves, the main combustion chamber including a first substantially cylindrical combustion region which is defined by an axial end wall and a cylindrical sidewall which is substantially aligned with and effects an extension of said bore, said connecting port being formed in said cylindrical sidewall, a first passage communicating directly with said combustion region at a location closely adjacent said connecting port, said first passage terminating in a first port formed in said end wall and positioned closely adjacent said connecting port, first intake valve means associated with said first passage for controlling flow of a rich fuel-air mixture as supplied through said first passage to said main combustion chamber, said main combustion chamber including a second combustion region disposed in continuous communication with said first combustion region and projecting axially thereof in a direction opposite from said bore, said second combustion region having a cross-section substantially smaller than said first combustion region and communicating with said first combustion region adjacent a side thereof which is diametrically opposite from the location of said connecting port, a second passage communicating with said main combustion chamber for supplying air thereto, said second passage terminating in a second port which communicates directly with said second combustion region, said first port being located between said connecting port and said second port, second intake valve means associated with said second passage for controlling the flow of air therethrough to said main combustion chamber, a third passage communicating with said main combustion chamber and having exhaust valve means associated therewith for controlling the flow of exhaust gases from said main combustion chamber through said third passage, and an ignition device associated directly with said precombustion chamber for igniting the rich fuel-air mixture therein.

3,967,612
LUBRICATING OIL PUMP FOR USE IN AN INTERNAL COMBUSTION ENGINE

Seiichiro Yamada, Shizuoka, Japan, assignor to Yamaha, Hatsudoki Kabushiki Kaisha, Japan
Filed Mar. 12, 1974, Ser. No. 450,359
Claims priority, application Japan, Mar. 14, 1973, 48-29774
Int. Cl.² F01M *1/00*
U.S. Cl. 123—196 CP **11 Claims**

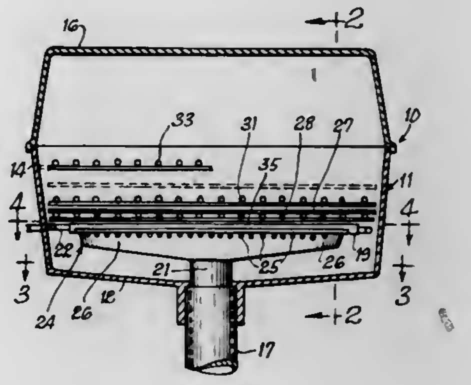


1. In combination with an internal combustion engine having a crank chamber, a lubricating oil pump comprising:
a casing having a first cavity defined therein;
a distributor coupled to said internal combustion engine, said distributor being rotatably disposed within said first cavity of said casing, and having an axial cavity defined in said distributor;
pump means for drawing oil within a second cavity defined in part by said distributor and by said pump means, and for forcing oil from at least part of said second cavity, said pump means being disposed in said axial cavity of said distributor;
reciprocating means for imparting a reciprocating force to said pump means, said reciprocating means disposed within said first cavity of said cavity, said reciprocating means, casing and distributor defining a gas chamber;
passage means extending between the crank chamber of the engine and said gas chamber for communicating variations in magnitude of the crank chamber pressure to said gas chamber, said distributor selectively controlling communication of said passage means with said gas chamber; and
one-way valve means disposed in said passage means for controlling the flow of gas within said passage means.

3,967,613
BARBECUE TYPE COOKING GRILL

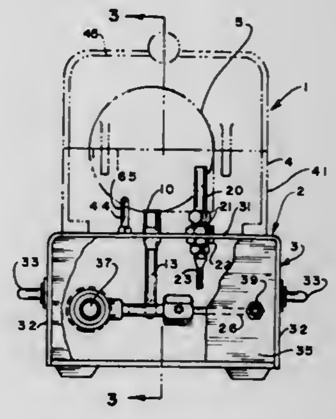
Joseph F. Rybak, 5015 S. Lawler Ave., Chicago, Ill. 60638; Eugene C. Chamberlain, 1623 Lisbon Road, Morris, Ill. 60450; Paul E. Rybak, 138 Inner Court, New Lenox, Ill. 60451, and Stanley W. Rybak, Rte. 3, Heatherfield, Morris, Ill. 60450
Filed Jan. 16, 1975, Ser. No. 541,453
Int. Cl.² A47J *37/07*
U.S. Cl. 126—41 R **2 Claims**

1. A cooking grill comprising, an enclosure, a heat source, a pair of elongated pans each extending longitudinally of said enclosure and containing a body of water and adapted to be heated by said heat source to generate moist heat, a foraminous member disposed above said heat source, and a cooking grid disposed above said foraminous member for supporting a food product to be cooked, the foraminous member being of such character so as to preclude the passage of flame therethrough while permitting the passage of moist heat to effect cooking of the food product.



3,967,614
GAS FIRED FUSION FURNACE AND FUSION HEAD ASSEMBLY

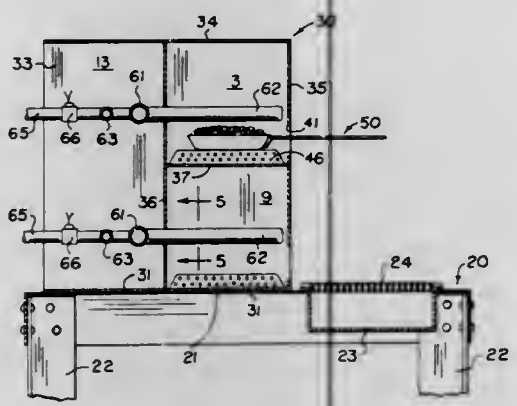
Dale E. Stroud, Elyria, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 2, 1975, Ser. No. 538,187
Int. Cl.² F24C *3/12*
U.S. Cl. 126—229 **7 Claims**



1. In an assembly of fusion furnace and mountable and demountable fusion head for applying heat to plastic pieces to be fused, said fusion head including a fusion head block and said furnace being fired with gaseous fuel conducted, by means of a gas supply conduit, from a source to a burner having a burner head projecting upwardly into said furnace, the improvement comprising a temperature sensing probe projecting upwardly into said furnace parallel to said burner head, gas flow control means operatively connected to said temperature sensing probe and to said gas supply conduit for changing the flow rate of gaseous fuel to said burner from a rapid flow to a relatively low but continuous flow and vice versa, said low flow being insufficient to raise the temperature of said fusion head beyond a predetermined level; and said fusion head block having at least one open-ended passage therethrough, one end of said passage having a burner head receiving chamber, and a well in said fusion head block receiving said temperature sensing probe when said fusion head block is mounted in said fusion furnace with the said burner head in said burner head receiving chamber, said well being spaced from, parallel to and physically separated from said burner head receiving chamber.

3,967,615
COOKING APPARATUS

Victor Petta, Jr., Arlington, Tex., assignor to The Spaghetti Importing & Warehouse Co., Dallas, Tex.
Filed Mar. 5, 1975, Ser. No. 555,426
Int. Cl.² F24D *1/02*
U.S. Cl. 126—369.2 **10 Claims**

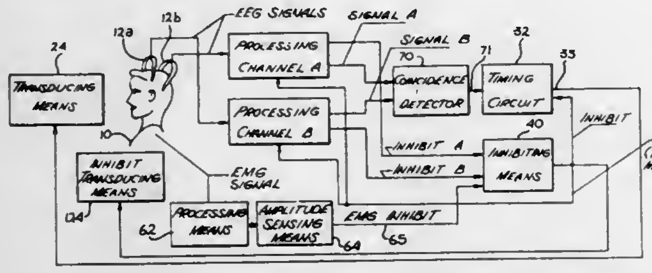


1. Finish cooking apparatus comprising
a steam cabinet including a plurality of individual cooking compartments opening to a front wall thereof; said steam cabinet having walls and partitions defining said plurality of cooking compartments of uniform size, each being substantially closed except for a continuously open access opening in said front wall; said access opening being just sufficiently large to pass a loaded cooking vessel;
a removable floor member supported in each compartment, providing a discontinuous support surface spaced from the compartment bottom wall and disposed in a plane adjacent to the lower edge of the access opening;
steam dispensing nozzle means disposed in each compartment generally within in a plane adjacent to the upper edge of its access opening, each nozzle means including downwardly directed steam jet apertures for directing steam toward a cooking vessel disposed on said support surface;
and a plurality of cooking vessels of uniform size each comprising a body having sidewalls and a planar bottom wall, and a laterally projecting handle; said vessel body being dimensioned to pass readily into and out of said access openings with a food portion therein; and said body bottom wall having perforations for coaction with the compartment discontinuous floor member, to permit passage of steam and moisture through the cooking vessel and its contents;
means for draining liquid from the bottom wall of each compartment.

3,967,616
MULTICHANNEL SYSTEM FOR AND A MULTIFACTORIAL METHOD OF CONTROLLING THE NERVOUS SYSTEM OF A LIVING ORGANISM

Sidney A. Ross, 6901 Katherine Ave., Van Nuys, Calif. 91405
Continuation-in-part of Ser. No. 299,842, Oct. 24, 1972, Pat. No. 3,837,331. This application Sept. 5, 1974, Ser. No. 503,468
Int. Cl.² A61B *5/05, 19/00*
U.S. Cl. 128—1 C **41 Claims**

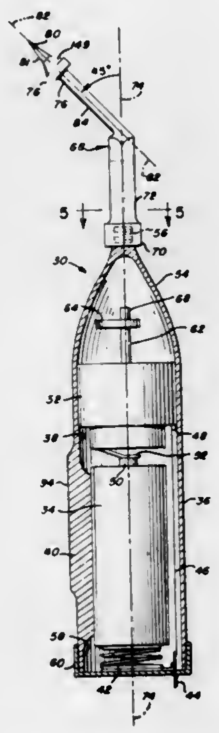
1. A method of controlling the nervous system of a living organism comprising the steps of:
a. detecting one or more bioelectrical signals from one or more topological locations in said organism's nervous system;
b. passing said one or more bioelectrical signals through a plurality of electronic means responsive to the presence of at least one electrical characteristic of interest in the waveform of a bioelectrical signal, each of said responsive means being adapted to provide a first output signal whenever said electrical characteristic of interest is present;
c. determining by electronic logic means when said plurality of first output signals, or any subset thereof, is present or absent in a predetermined manner indicative of a desired condition of said organism's nervous system, said logic means being adapted to provide a second output signal when said desired condition is indicated;
d. transducing said second output signal into a discrete sensory stimulus capable of stimulating at least one of the senses of said organism; and



e. causing said organism to concentrate mentally so as to produce or change the state of said discrete sensory signal;
whereby said organism is trained to alter the waveform pattern of said one or more bioelectrical signals, said discrete sensory stimulus being presented to said organism as a reward for producing our suppressing said electrical characteristics of interest in said one or more signals, thereby achieving said desired condition of said nervous system.

3,967,617
MECHANICAL GUM MASSAGER

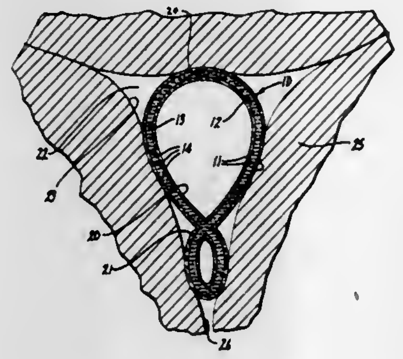
Paul P. Krolik, Chicago, Ill., assignor to Alston, Inc., Elmhurst, Ill.
Continuation-in-part of Ser. No. 526,740, Nov. 25, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,816
Int. Cl.² A61H *1/00, 7/00*
U.S. Cl. 128—36 **23 Claims**



1. A mechanical gum massaging device which comprises:
a vibratory mechanism suitable for holding in the user's hand and adapted to produce cyclical movement about the longitudinal axis of said mechanism when thus held;
a vibrating shank free at one end and attached at the other end to said vibratory mechanism with a portion of its longitudinal axis generally coinciding with the longitudinal axis of the vibratory mechanism, the transverse cross sectional dimensions of said vibrating shank being smaller than those of said vibratory mechanism, the free end of said shank tracing a generally elliptical path in a first plane perpendicular to the longitudinal axis of said vibratory mechanism when said device is held in the user's hand during operation of the device, said elliptical path having a major axis and a minor axis;
a resilient stimulator element mounted at the free end of said shank, the longitudinal axis of the operative portion of said stimulator element extending outwardly from said vibratory mechanism in a direction such that a second plane containing said direction and the longitudinal axis of said vibratory mechanism is substantially perpendicular to the major axis of said elliptical path, said shank being free of any other stimulator element facing said first mentioned stimulator element in opposed relationship thereto; and
means for actuating said vibratory mechanism.

3,967,618
DRUG DELIVERY DEVICE

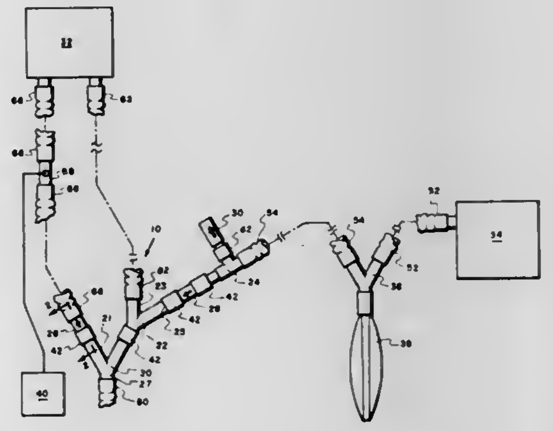
Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 185,208, Sept. 30, 1971, Pat. No. 3,896,819, which is a continuation-in-part of Ser. No. 42,786, June 2, 1970, Pat. No. 3,854,480, which is a continuation-in-part of Ser. Nos. 812,116, April 1, 1969, Pat. No. 3,598,122, and Ser. No. 864,175, Oct. 6, 1969, abandoned. This application Mar. 6, 1975, Ser. No. 555,840
Int. Cl.² A61F *5/46;* **A61M** *31/00*
U.S. Cl. 128—130 **7 Claims**



1. A method of interfering with the reproductive process of a female mammal comprising continuously administering a contraceptive agent within the uterine cavity of said female over a prolonged period of time by:
A. inserting into the uterine cavity an intrauterine device comprising:
   a. a reservoir comprising an agent in a liquid carrier material permeable to the passage of the agent, said agent comprising a dissolved portion and an undissolved portion that serves to replace said dissolved portion, the reservoir being confined within;
   b. an enveloping shaped membrane comprised of a biologically acceptable material insoluble in mammalian body fluid, capable of keeping its integrity during said prolonged period and formed at least in part of a material permeable by diffusion to passage of said agent at a rate which is lower than the rate of permeability of said agent through said carrier;
B. releasing said agent from said reservoir into the uterine cavity at a controlled, continuous, contraceptively effective rate by diffusional passage through said shaped membrane; and;
C. continuously replacing the dissolved agent released from the reservoir by continuously dissolving said undissolved agent in the carrier material.

3,967,619
APPARATUS AND METHOD FOR INTERMITTENT MANDATORY VENTILATION

Eddie W. Story, Rte. 2, Box 4, La Center, Wash. 98629, and Jerald L. Liskey, 23300 W. Arata Road, No. 92, Troutdale, Oreg. 97060
Filed Nov. 15, 1974, Ser. No. 523,966
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **11 Claims**



1. A device for connecting to a patient the components of an intermittent mandatory ventilation system of the type including an intermittent source of pressurized air having inspiration and expiration tubes respectively, a volume measuring means connected to said expiration tube for measuring the volume of air exhaled by said patient and a continuous separate source of pressurized air, said device comprising:
a. a tubular assembly having means defining five interconnected ports, a first port of which is for connecting to the respiratory system of a patient, a second port of which is for connecting to the inspiration tube of said intermittent source of pressurized air, a third port of which is for connecting to the expiration tube of said intermittent air source, and a fourth port of which is for connecting to said continuous air source;
b. first one-way valve means mounted within said tubular assembly between said first and third ports for permitting air to flow from said first port to said third port while preventing a reverse flow of said air;
c. second one-way valve means mounted within said tubular assembly separating said first, second and third ports respectively from said fourth port and responsive to the differential-pressure on either side of said second valve means permitting air to flow from said fourth port toward said first, second and third ports when patient-generated inspiration pressure is less than the pressure at said fourth port by a predetermined amount, and for preventing a reverse flow of said air;
d. said fifth port of said tubular assembly being positioned on the same side of said second one-way valve means as said fourth port and having a third one-way valve means associated therewith responsive to the pressure at said fourth port for permitting air to flow from within said tubular assembly outwardly through said fifth port during patient expiration so as to prevent the pressure at said fourth port from exceeding patient-generated expiration pressure by said predetermined amount, and thereby prevent air flow from said fourth port through said second valve means toward said first, second and third ports during patient expiration, said third one-way valve means also including means for preventing a reverse flow of said air through said fifth port.

3,967,620

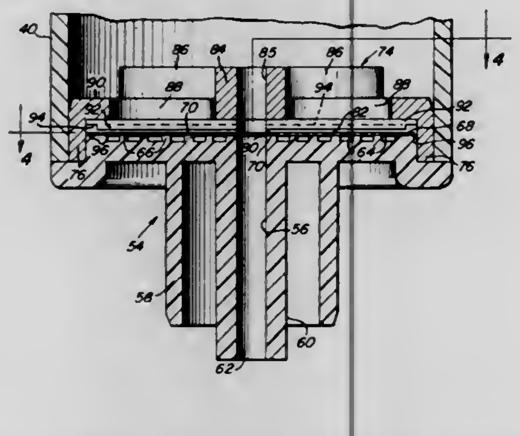
VOLUME LIMITING CHAMBER

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, New York, N.Y.

Filed Sept. 10, 1974, Ser. No. 504,733

Int. Cl.^{2} A61M *5/14*

U.S. Cl. 128—214 C **36 Claims**



1. A volume limiting chamber for use in an intravenous set comprising a chamber having a top and a bottom and side walls connecting said top and bottom, an inlet passageway in said top for placing said chamber in fluid communication with a source of parenteral solution, an outlet passageway in said bottom for placing said chamber in fluid communication with an intravenous needle, indicia on said chamber for indicating the amount of parenteral solution in said chamber, a membrane valve positioned in said chamber and cooperating with said outlet fluid passageway so that all parenteral solution in said chamber flows through said membrane valve, said membrane valve comprising a material which when wet will pass parenteral fluid but will not pass air at normal intravenous administration pressures, and means for bypassing said membrane valve, said means allowing air to enter said chamber through said bottom from underneath said membrane valve when said membrane valve is wet.

3,967,621

NEEDLE HOLDER FOR MEDICAL SYRINGES, VIALS, OR THE LIKE

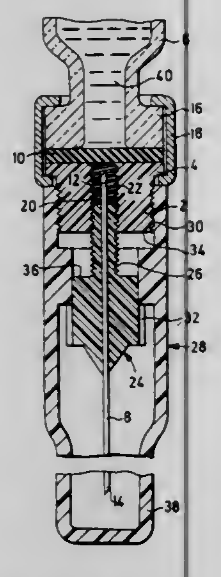
Lothar Schwarz, Belchenstrasse 1, 75 Karlsruhe 51, Germany

Filed July 14, 1975, Ser. No. 595,634

Claims priority, application Germany, July 16, 1974, 2434046

Int. Cl.^{2} A61M *5/00*

U.S. Cl. 128—216 **15 Claims**



1. A needle holder for medical syringes, in particular injection syringes and syringes for the removal of body fluids, and for vials and the like with a base body for the closure of the end of a preparation holder that presents a closure puncturable by a hollow needle, a hub part fastened to the hollow needle which is screwed by means of a first threaded connection with a base body to a work position in which an end of the needle punctures the closure of the preparation holder, a protective sleeve having an open end which is rotatably and detachably mounted on the base body and which surrounds the hub part and the therewith affixed hollow needle, and an axial gear tooth system provided between the hub part and the protective sleeve which connects and provides for common rotation of these parts while permitting relative axial movement between an initial threaded position of the hub part and the work position of the hub part; characterized in that between the body (2) and protective sleeve (28) a second threaded connection (30) is provided with a thread direction opposite the first threaded connection (22, 26) so that with the unthreading of the protective sleeve (28) from the base body (2) the hub part (24) which is drivingly connected to the protective sleeve (28) by the axial gear tooth system (32) is threaded to a work position.

3,967,622

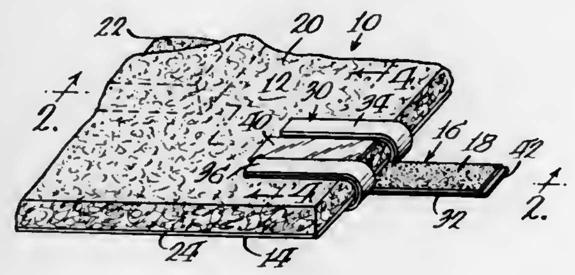
DISPOSABLE DIAPER WITH DIVARICATED ADHESIVE TABS

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 7, 1975, Ser. No. 575,280

Int. Cl.^{2} A41B *13/02*

U.S. Cl. 128—287 **11 Claims**



1. A disposable diaper having an inside surface for direction toward an infant, a moisture-impervious backing sheet defining a diaper outside surface, and an adhesive tab means comprising:

an elongated tape segment provided with a pressure-sensitive adhesive coating on one face thereof and having first and second end portions,

said first end portion of said tape segment being permanently attached by means of said adhesive coating to said outside surface at a marginal location thereon and said second end portion being divided longitudinally into at least three separate strips comprising a central strip and a pair of marginal strips on opposite sides of said central strip,

said central strip providing securement means for fastening the diaper about said infant and said marginal strips being adhesively attached to said diaper inside surface at a marginal location thereon, and

release means providing a release surface releasably adhered to the adhesive coating on said central strip and removable therefrom.

3,967,623

DISPOSABLE ABSORBENT PAD

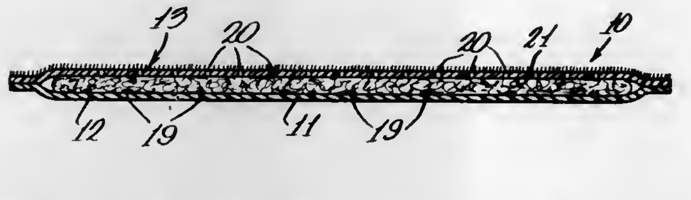
George A. M. Butterworth, Western Springs, and Robert T. Elias, Downers Grove, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed June 30, 1975, Ser. No. 591,747

Int. Cl.^{2} A41B *13/02;* **A61F** *13/16*

U.S. Cl. 128—287 **12 Claims**

1. An absorbent pad comprising a flexible, body fluid-impermeable backing sheet, a layer of absorbent material on said backing sheet, and a soft, body fluid-permeable facing sheet overlying said absorbent material; said facing sheet being a perforate, substantially hydrophobic thermoplastic web having an integral fibrous outer surface made up of elementary fibers carried by said web.



3,967,624

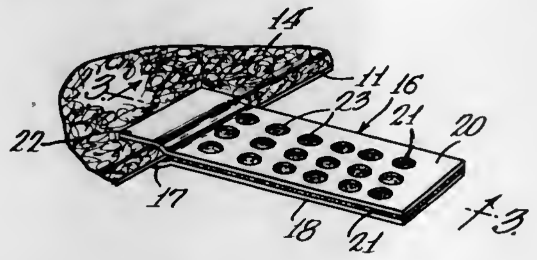
DISPOSABLE DIAPER WITH TAB FASTENERS HAVING A PERFORATED COVER STRIP

John P. Milnamow, Barrington, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 4, 1975, Ser. No. 565,295

Int. Cl.^{2} A61F *13/16*

U.S. Cl. 128—287 **6 Claims**



1. A disposable diaper which comprises a moisture-impermeable backing sheet forming a diaper outside surface for direction away from an infant when the diaper is worn by that infant, a moisture-retaining layer adhered to the backing sheet and having a facing which forms a diaper inside surface for direction toward the infant, tab fastener means having a fixed end secured to said diaper backing sheet and a free working end provided with a layer of pressure-sensitive adhesive presenting a tacky surface facing in the same direction as the diaper inside surface, a means for removably holding said free working end in contact with said inside surface comprising a perforated cover strip releasably held on said tacky surface; said free working end being folded over the edge of the diaper in abutment with said diaper inside surface and said tacky surface defining a limited adhesive contact with said facing at a plurality of attachment points through the perforations in said cover strip.

3,967,625

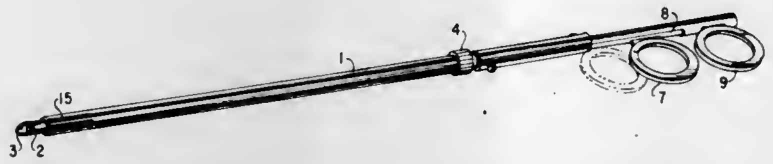
DEVICE FOR STERILIZING THE HUMAN FEMALE OR MALE BY LIGATION

In Bae Yoon, 9508 Falls Bridge Lane, Potomac, Md. 20854

Division of Ser. No. 383,475, July 30, 1973, Pat. No. 3,870,048. This application Dec. 23, 1974, Ser. No. 535,942

Int. Cl.^{2} A61B *17/12*

U.S. Cl. 128—326 **21 Claims**



1. A ring applicator device for use in the sterilization of a human being which comprises an inner tube and an outer tube, said inner tube being slidably disposed within said outer tube, said inner and outer tubes having corresponding cutaway sections at their respective proximal end portions, a conduit means disposed in the lower portion of the inner tube, forceps means slidably disposed within said conduit means, means for moving said forceps means into and out of the conduit means, an optical viewing device slidably disposed within the inner tube and means for axially displacing said outer and inner tubes relative to each other, thereby removing an elastic ring from the end of said inner tube.

3,967,626

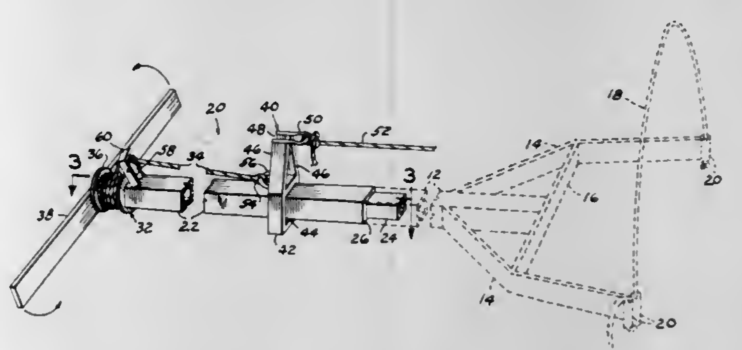
CALF EXTRACTOR

Wendell L. Hedges, P.O. Box 67, Seiling, Okla. 73663

Filed Mar. 12, 1975, Ser. No. 557,851

Int. Cl.^{2} A61D *1/08;* **A61B** *17/42*

U.S. Cl. 128—352 **1 Claim**



1. In combination with a parturificient breeching bar of general U-shape having a bar portion adapted to transversely engage the rump of a cow and having legs adapted to extend forwardly along the haunches of a cow and having a socket opening opposite said legs and projecting therefrom a plane common with said legs, the improvement comprising:

an elongated shaft having means at one end portion for axial connection with the socket;

windlass means including a reel axially journalled by the other end portion of said shaft;

handle means for rotating said windlass means;

friction grip means including a sleeve-like frame transversely and loosely surrounding said shaft intermediate its ends and being slidable therealong when disposed in a plane normal to the longitudinal axis of said shaft, said sleeve-like frame having an arm projecting laterally of said shaft;

an elongated flexible obstetrical member;

loop means connected with said frame arm for connection with one end portion of said obstetrical member, said windlass means including a windlass line connected with said friction grip means generally opposite its connection with said obstetrical member and said shaft; and,

pully means including a pulley mounted on said shaft adjacent

said reel for guiding said windlass line toward and away from said reel when the latter is rotated in a windlass line reeling in and paying out direction, respectively,

whereby tension simultaneously applied to said obstetrical member and said windlass line permits movement of said friction grip means relative to said shaft and release of tension on either said obstetrical member or said windlass line tilts the plane of said friction grip means toward the axis of said shaft to a friction gripping and binding position thereon.

3,967,627

HOT/COLD APPLICATOR SYSTEM

Billy E. Brown, Indianapolis, Ind., assignor to Moore-Perk Corporation, Indianapolis, Ind.

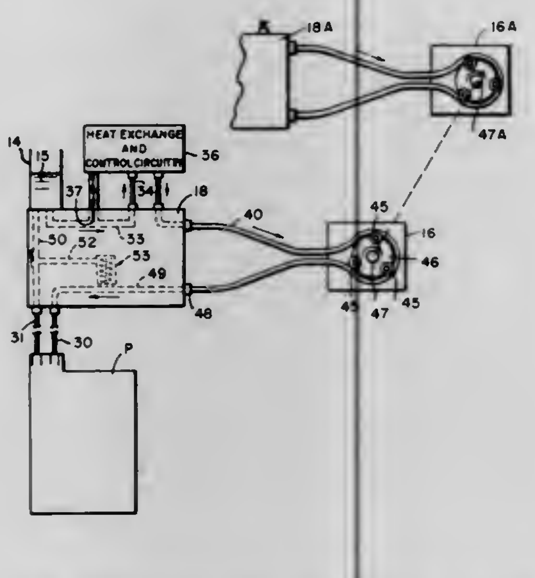
Filed Nov. 18, 1974, Ser. No. 524,572

Int. Cl.^{2} A61F *7/00*

U.S. Cl. 128—400 **13 Claims**

1. Apparatus for selectively heating or cooling a local area of the body comprising: a source of heat transferring liquid; an applicator pad adapted to be applied to said local area and including means defining a conduit for carrying said liquid through said pad; heat exchanger means receiving said liquid

and including thermoelectric diode means for producing heat when an electrical potential of one polarity is applied thereto and for absorbing heat when an electrical potential of the opposite polarity is applied thereto; pump means for pumping said liquid from said source through said heat exchanger means and said applicator pad; and control circuit means including temperature-sensitive means responsive to the temperature of said liquid for controlling the polarity and duration of application of an electrical potential to said thermoelectric diode means under operator control.



3,967,628
SKIN ELECTRODE

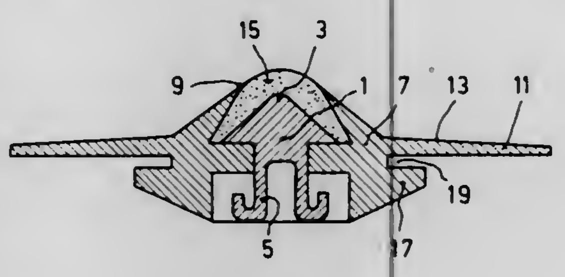
Jakob Vredenbregt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,795

Claims priority, application Netherlands, Feb. 21, 1974, 7402355

Int. Cl.^{2} A61N *1/04*

U.S. Cl. 128—417 **4 Claims**



1. A skin electrode comprising
a jacket of flexible insulating material having a central portion and a peripherally extending flat edge portion about said central portion for non-slipping contact with skin;
an electrically conductive core extending through the central portion of said jacket and held thereby, said core having at one end a generally conically shaped pointed portion, an apical portion thereof protruding out of the plane of said flat edge portion of said jacket and pointing perpendicularly away therefrom, said core having means for making electrical contact thereto at the other end thereof; and
spongy absorbent material covering at least said apical portion of said core, said jacket having a tapered annular flange extending from said central portion and surrounding said conically shaped portion of said core to leave a space therebetween, the peripheral region of said spongy material being received and held in said space between the flange and the conically shaped portion of said core, said annular flange forming a hole through which said spongy material covering said apical portion protrudes for contact with skin.

3,967,629
BICYCLIC FRAGRANCE MATERIALS AND PROCESSES THEREFOR

Robert L. Chappell, East Windsor, N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, and Manfred H. Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,157

Int. Cl.^{2} A24B *13/00, 15/04*

U.S. Cl. 131—144 **2 Claims**

1. A process for treating a tobacco which comprises adding thereto a small but effective amount of 1,2,3,3,4,5,6-heptamethyl bicyclo-[2.2.2]-oct-5-en-2-ol to alter the organoleptic properties of the tobacco.

3,967,630
BRISTLE HAIR CURLER AND HAIR CURLER MAGAZINE

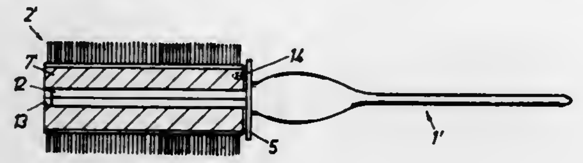
Klaus Peter Zuhlsdorff, Cologne, Germany, and Paul Schenk, Neuchatel, Switzerland, assignors to Fa. TONDO-Werk Adolf Noss, Solingen, Germany

Filed Mar. 8, 1974, Ser. No. 449,388

Claims priority, application Switzerland, Mar. 9, 1973, 3559/73; Germany, June 29, 1973, 2333101; Jan. 12, 1974, 2401398

Int. Cl.^{2} A45D *2/00*

U.S. Cl. 132—40 **14 Claims**



1. A bristle hair curler combination comprising:
a generally cylindrical hair curler element having an elongated core with radially oriented bristles attached thereto in the manner of a brush roll, the curler core including a plurality of axially parallel longitudinal engagement surfaces;
a detachable curler handle engaging the hair curler element from one axial end thereof so as to form an axial extension of the curler element;
means defined by the curler handle for frictionally engaging the curler core on several of its engagement surfaces in such a manner that the disengagement of the curler element from the handle requires a predetermined axial pull which is considerably in excess of the weight of the hair curler element; and
wherein said core engaging means of the handle includes at least one axially extending retaining member on the handle defining several axially parallel engagement surfaces which are adapted to cooperate with said engagement surfaces of the curler core.

3,967,631
FINGERNAIL CAP

Kathleen M. Kosal, 8900 E. Jefferson, Apt. 612, Detroit, Mich. 48214

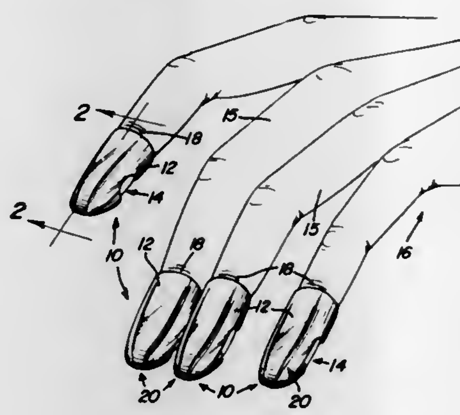
Filed Jan. 17, 1975, Ser. No. 541,942

Int. Cl.^{2} A45D *29/00*

U.S. Cl. 132—73 **1 Claim**

1. A fingernail and finger tip cap, comprising, in combination:

a. a longitudinally elongated, generally tubular shell constructed of generally rigid but resilient material and having a longitudinal slit defining means therein, said shell being provided with a cavity extending throughout the length thereof and having an open end and a closed tip end, said shell being arranged in telescopic relation over a nail and adjacent tip of a finger for encasing and protecting same, the slit defining means extending from the open end of the shell to enable frictional gripping engagement of the shell with the finger on which it is mounted, the tip end of the shell tapering to conform with the contour of the tip end of the finger with the remainder of the shell conforming with the contour of the fingernail and adjacent portions of the finger; and



b. said shell including an imperforate top wall disposed in overlying spaced relation to the fingernail throughout its entirety, the bottom wall of the shell including an opening defining a window exposing the pad of the finger encased by the shell, said opening having a forward edge spaced inwardly from the tip end of the shell for completely encasing the nail and tip of the finger and preventing the tip end of the shell from moving upwardly in relation to the tip of the finger.

3,967,632
ARRANGEMENT FOR THE FLUID TREATMENT, ESPECIALLY ETCHING, OF OBJECTS IN ASSEMBLY-LINE-LIKE FASHION

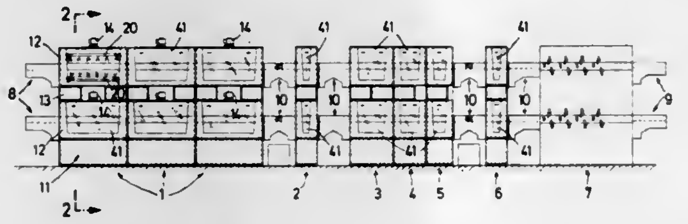
Günther Herrmann, Furth, and Adam Pill, Auenwald-Mittelbruden, both of Germany, assignors to Adam Pill, Auenwald-Mittelbruden, Germany

Filed June 17, 1974, Ser. No. 479,994

Claims priority, application Germany, June 27, 1973, 2332547

Int. Cl.^{2} B08B *3/02*

U.S. Cl. 134—83 **14 Claims**



1. An arrangement for the fluid treatment, particularly etching, of objects, particularly printed circuits, mold sections, and the like, in assembly-line-like fashion, comprising, in combination, a closed treatment fluid supply chamber; a first treatment chamber located above said treatment fluid supply chamber; at least one additional treatment chamber located above said first treatment chamber, said treatment chambers being separated from each other by separating walls, each of said treatment chambers having a side wall; an intermediate chamber between said treatment chambers and partly bounded by said separating walls, said intermediate chamber spacing said treatment chambers from one another; conveyor means for conveying objects along a first predetermined path leading through said first treatment chamber at a first speed, and along a second predetermined path leading through said additional treatment chamber at a second speed; treatment fluid pumping and emitting means operative for pumping treatment fluid up from said treatment fluid supply chamber and for discharging the thusly pumped treatment fluid onto objects in both said first and said additional treatment chambers; control equipment in said intermediate chamber for controlling the operation of the arrangement; and at least one observation and access window of trapezoidal shape mounted in each respective side wall for sliding with respect thereto in a predetermined direction between a closed and an open position and having marginal portions diverging in said direction and engaging said side wall when said window is in said closed position thereof, whereas a slight movement of said window in said direction dissociates said marginal portions from said side wall so that movement of said window towards said open position is facilitated even when said window is jammed in said side wall.

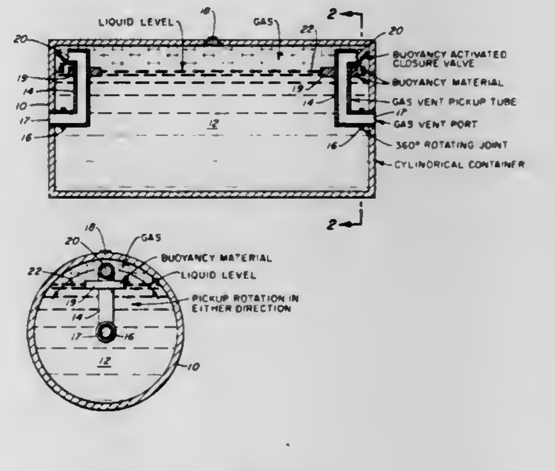
3,967,633
GAS VENT SYSTEM FOR OPERATION IN ANY ARBITRARY SPATIAL ORIENTATION

Lawrence W. Hallanger, Oxnard, and Leroy W. Tucker, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1975, Ser. No. 580,078

Int. Cl.^{2} F16K *17/36*

U.S. Cl. 137—43 **9 Claims**



1. A vent system operable for exhausting accumulated gas from above a liquid in an enclosed liquid container regardless of the arbitrary spatial orientation the container may be positioned, comprising:

a. an enclosed container for liquid;
b. a gas vent port located centrally in each of at least two opposite far walls of said container;
c. a floatable gas venting tube for each said vent port respectively; each venting tube having one end attached to a respective gas vent port by means of a leakproof rotating joint and being operable to rotate radially 360° in either direction about said vent port, the opposite end of each said venting tube being the gas intake end thereof;
d. buoyant means for maintaining the gas intake end of each said gas venting tube above the level of any liquid in said container, within the limitation of the length of each said tube as the orientation of said container changes;
e. valve means on the gas intake end of said respective venting tubes operable to close and prevent the intake of any liquid into said tubes whenever the intake end is below the level of any liquid in said container.

3,967,634
FLOW RATIO CONTROL SYSTEM

William C. Scherer, Minneapolis, and Michael Dwain Jines, Owatonna, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

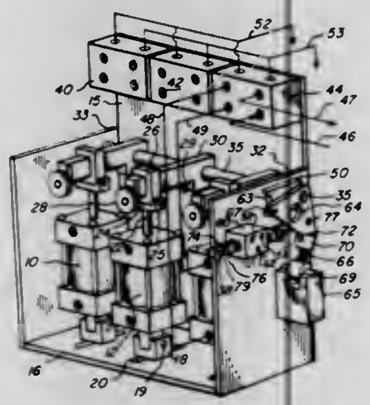
Filed Nov. 6, 1975, Ser. No. 629,378

Int. Cl.^{2} G05D *11/035*

U.S. Cl. 137—99 **16 Claims**

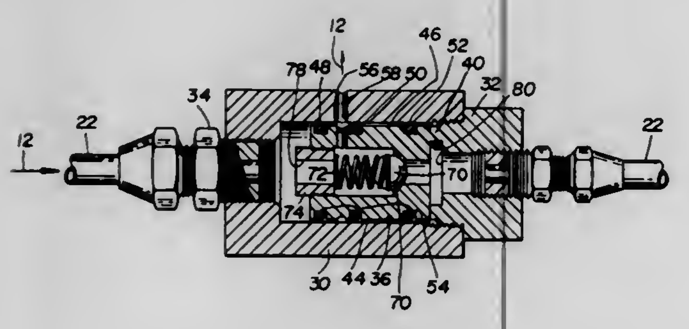
1. An apparatus for delivering an adjustable fluid flow ratio of two or more fluids from respective fluid supply sources, comprising,

- a. a plurality of cylinder and piston assemblies, each pivotally anchored at one end and having a reciprocable piston rod attached to its piston and projecting from its other end;
- b. a plurality of levers pivotally attached, each to a respective piston rod, by means of an attachment link which is slideable along said lever;
- c. a rotatable shaft rigidly attached to all of said levers, and having a projecting arm for translating its angular motion to arcuate motion of said arm end;



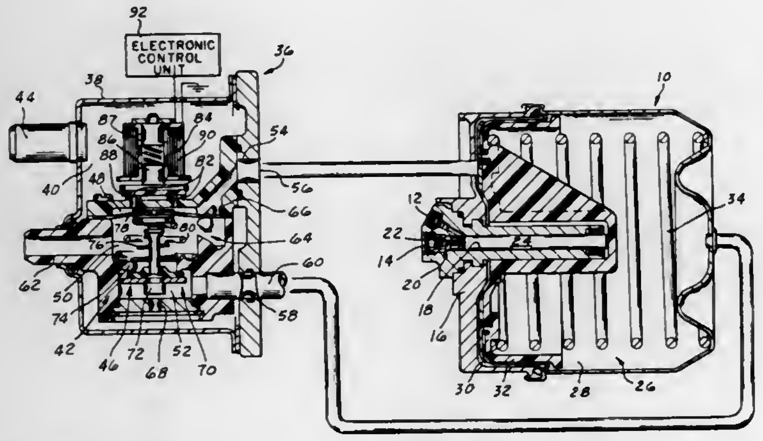
- d. a plurality of air-actuated valves, each coupled to a cylinder and piston assembly, for controlling the fluid flow direction into and out of said cylinder and piston assemblies;
- e. an air valve connected in actuating air coupling to said plurality of air-actuated valves, said air valve having an actuating arm for selectively directing air flow through said valve, and said air valve being connectable to a source of pressurized air; and
- f. toggle lever means, connected between said rotatable shaft projecting arm and said air valve actuating arm, for toggling said air valve in response to angular position of said rotatable shaft.

3,967,635
VALVE FOR CARBONATOR
Andrew I. Sealfon, 305 W. 13th St., New York, N.Y. 10014, and Paul Rosenbaum, 84-57 Goldington Court, Rego Park, N.Y. 11374
Filed Nov. 7, 1974, Ser. No. 521,654
Int. Cl.² F16K *45/00*
U.S. Cl. 137—102 **1 Claim**



1. A valve for use in a carbonator to selectively permit the flow of water to a source of carbon dioxide, and during intervals of non-flow of said water, to minimize back-up of said carbon dioxide into said source of water, said valve comprising a valve body having at opposite ends a water inlet and a water outlet, said valve body having between said inlet and outlet a cylindrically shaped internal wall bounding a piston chamber of a prescribed diameter, a piston disposed for sliding movement in said chamber between first and second positions of movement respectively reflecting minimum and maximum pressures of said water and having a corresponding external shape and of a diameter size defining a minimum sliding clearance between said piston and said valve body internal chamber wall, an internal check valve including a valve seat and a ball valve in facing relation therewith in said piston between said water inlet and outlet, a cooperating pair of first and second passageways, said first venting passageway being formed in said piston in communication with, and oriented transversely of, said internal check valve, one end of said first venting passageway opening into said minimum sliding clearance between said piston and said valve body internal chamber wall and said other end of said first venting passageway opening into said internal check valve in the area thereof adjacent said ball valve when in said closed position in said valve seat, said second venting passageway being formed with a radial orientation in said valve body, said venting passageways being so located relative to each other as to have an aligned relation only in said first position of movement of said piston reflecting said minimum pressure condition of said water, at least one sealing ring being in circumferential position about said piston projecting through said minimum clearance provided for said sliding movement thereof into sealing contact against said valve body internal wall, said sealing ring being located between said second venting passageway and said valve seat of said check valve so that said sealing ring assumes an interposed position between said cooperating first and second venting passageways in said second position of movement of said piston and when said internal check valve is open preparatory to water flow therethrough to thereby minimize the leakage of said flowing water through said venting passageways, but when said check valve is closed and said water is not flowing therethrough should any carbon dioxide then flow into said valve through said water outlet said carbon dioxide is vented to atmosphere through said aligned venting passageways.

3,967,636
VALVE FOR FORCE-REVERSING MODULATOR
Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Division of Ser. No. 415,264, Nov. 12, 1973, Pat. No. 3,840,279. This application July 24, 1974, Ser. No. 491,600
Int. Cl.² F15B *13/044*
U.S. Cl. 137—106 **5 Claims**



1. In a valve:

a housing defining a bore therewithin divided into a first section, a second section, and a third section;

first restricting means permitting communication at a controlled rate between said first and second sections;

second restricting means permitting communication at a controlled rate between said third section and a higher pressure source;

passage means permitting unrestricted fluid communication between said second section and a lower pressure source;

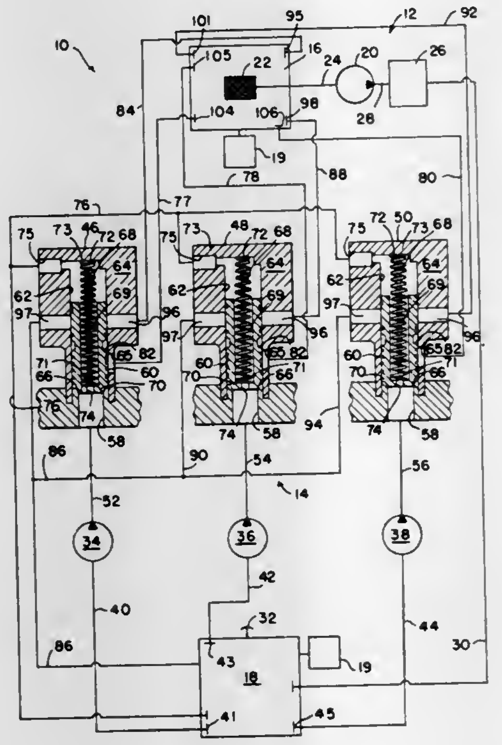
first and second outlet ports communicating with said first and third sections respectively, whereby said first outlet port is normally communicated to said lower pressure source through said first restricting means and said second section and said second outlet port is normally communicated to said higher pressure source through said thrid section and said second restricting means;

valve means actuable to communicate said first section to said higher pressure source and said third section to said lower pressure source whereby, upon actuation of the valve means, the first outlet port is communicated to said higher pressure source and said second outlet port is communicated to said lower pressure source;

said valve means including an electrically actuated first valve member controlling communication between said first section and said higher pressure source;

said valve means further including movable means dividing said housing into said first and second sections, said movable means being responsive to the increase in the fluid pressure level in said first section to actuate in response thereto, and a second valve member normally preventing communication between said second and third sections, said second valve member being responsive to actuation of the movable means to open to thereby initiate communication between said second and third sections.

3,967,637
APPARATUS FOR DEAERATING FLUIDS
George James Jackson, Peoria County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 525,538, Nov. 20, 1974. This application Apr. 11, 1975, Ser. No. 567,170
Int. Cl.² F16K *24/00*
U.S. Cl. 137—110 **2 Claims**



1. A lubricating system including means for reducing the amount of air contamination therein, comprising:

a non-vented primary reservoir;

a vented sump adapted to receive fluid pumped from said reservoir;

a frame to which said reservoir and said sump are affixed in rigidly-fixed relationship to one another;

a plurality of valves, each of which comprises a body including a bore longitudinally therethrough ending in a seat adjacent one end thereof, a port communicating the other end of said bore with the exterior of said body, a hole through said body communicating with said bore intermediate said port and said seat, a fluid-flow entrance communicating with said seat, an opening therethrough communicating with said bore intermediate said port and said hole, and a fluid-flow entrance communicating with said seat;

a poppet-type spool slidably disposed in said bore, one end of said spool being adapted to sit against said seat, said spool including a restricted orifice communicating said one end thereof with said bore and a passageway therein intermediate the end thereof; and

means for biasing said one end of said spool to sit against said seat;

said entrance being adapted to receive fluid flow including entrapped air from said sump and direct said flow against said one end of said spool in opposition to the force exerted by said biasing means, said orifice being adapted to conduct air and fluid therethrough into said bore and out of said port and therefrom to said reservoir when said spool is not displaced against the force exerted by said biasing means sufficiently to allow said fluid to flow along said bore and out said hole, said hole being adapted to conduct said fluid therethrough when said spool is displaced by the force of said flow acting against the force of said biasing means sufficiently to allow said fluid to flow along said bore and out said hole and therefrom to said reservoir, said passageway being adapted to communicate said opening with said sump when said spool is displaced against the force exerted by said biasing means sufficiently to allow said fluid to flow out said hole whereby air entrapped in said reservoir escapes therefrom via said opening and said passageway and into said sump;

a port-sump communicating conduit;

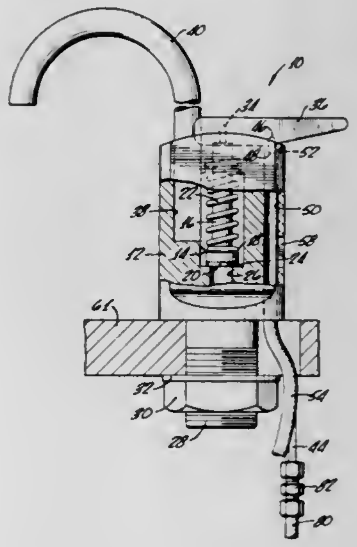
a reservoir-opening communicating conduit;

a hole-reservoir communicating conduit; and

a sump-entrance communicating conduit;

each of said sump-entrance conduits of said valves terminating at spaced-apart regions of said sump and each of said reservoir-opening conduits of said valves terminating at spaced-apart regions of said reservoir so that irrespective of the rotation of said frame at least one of said valves is directing fluid flow from said sump to said reservoir and directing air entrapped in said reservoir to said sump.

3,967,638
COMBINATION FAUCET AND AIR GAP
Raymond A. Tondreau, San Marcos, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.
Filed Aug. 6, 1975, Ser. No. 602,193
Int. Cl.² F16K *24/00*
U.S. Cl. 137—216 **6 Claims**



1. A combination faucet and antisyphon break fixture which comprises; a metallic body having a valve controlled passage with a spout for dispensing purified water; a second passage in said body for introducing brine from a reverse osmosis purifier upwardly into said body; a third passage in body for releasing said brine downwardly from said body; and means for directing the flow of said brine from said second passage past an antisyphon break into said third passage; in which the improvement comprises:

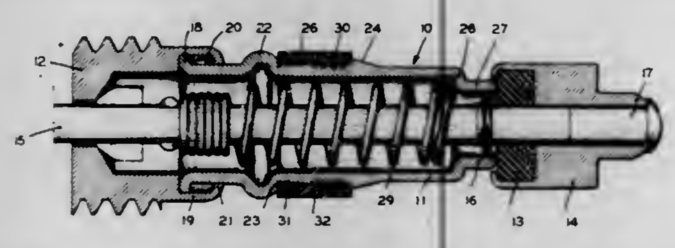
- a. said second passage comprising a plastic tube protecting the adjacent surface of the interior of said body from corrosive effects of said brine;
- b. said third passage comprising a plastic tube protecting the adjacent surface of the interior of said body from corrosive effects of said brine; and
- c. said means for directing said flow of said brine from said second passage into said third passage comprising a plastic channel carrying overflow from said second passage into said third passage.

3,967,639
TIRE VALVE CORE
Charles P. Mottram, Stratford, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,056

Int. Cl.² F16K *15/20*

U.S. Cl. 137—234.5 **3 Claims**



1. In a tire valve core including a tubular barrel and an externally threaded machined head, the tubular barrel terminating at one extremity in an outwardly directed enlarged flange receivable within said machined head and said head being provided with a relatively thin annular wall portion terminating in an inwardly directed extremity to insure retention therein of the annular flange on said tubular barrel, a plastic gasket surrounding said barrel substantially centrally of the length thereof, and valve means extending through said tubular barrel and machined head; the improvement which includes a peripheral bead formed on said barrel, the inner face of said bead being constituted by a substantially perpendicular wall portion creating a sharply defined shoulder at the point of juncture with the outer surface of said barrel, said barrel further being provided with a slightly enlarged annular rib having an inwardly tapered outer surface and providing a sharply defined shoulder at the point of juncture with said barrel, said rib being spaced from said peripheral bead to provide a gasket seat therebetween the extent of said seat being determined by the opposed sharply defined shoulders on said peripheral bead and enlarged annular rib, said gasket seat being provided with a plurality of parallel annular grooves spaced inwardly from the shoulder on said annular rib and extending inwardly from the shoulder on said enlarged annular rib over approximately 50% of the width of said gasket seat, the material of said plastic gasket progressively entering into said spaced annular grooves when said valve core is positioned within a valve stem, said gasket seat also including an inwardly tapered portion beyond the grooved portion thereof said inwardly tapered portion extending from adjacent the groove farthest removed from the shoulder on the annular rib to the bottom of the perpendicular wall portion on the peripheral bead.

3,967,640
HYDRAULIC CONTROL VALVE ASSEMBLY WITH DIVERSE CIRCUIT ADAPTABILITY
Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 419,517, Nov. 28, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 545,889

Int. Cl.² F16K *11/07, 27/04*

U.S. Cl. 137—269 **6 Claims**

4. A pre-cored valve body comprising:

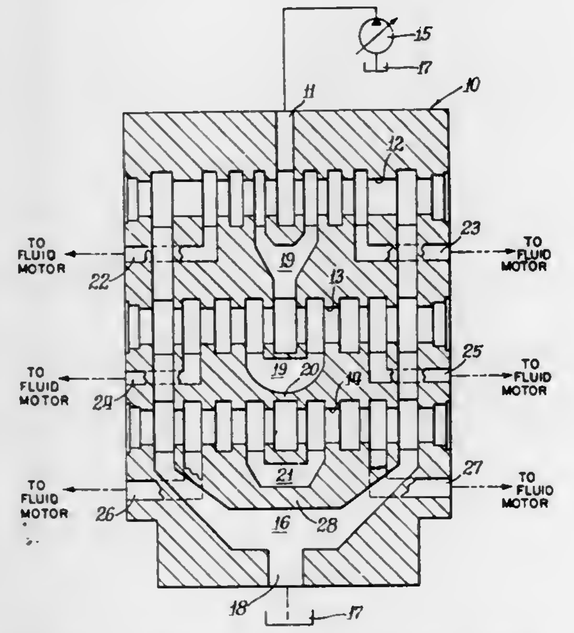
first and second identical, adjacently positioned valve spool receiving bore means for receiving identical valve spool means, each said bore means including first and second motor port means for communicating with a double-acting fluid motor;

said bore means adapted to receive identical valve spool means for cooperating with said bore means for controlling communication of fluid between said bore means and said motor port means;

first and second central bypass passage means for separately communicating respectively with said first and second bore means;

inlet means for communicating one of said bore means with fluid supply source;

substantially U-shaped return passage means having separate legs for communicating with each of said bore means adjacent each end thereof outward of said motor port means for communicating return fluid to a sump;



wall means for completely separating said first and said second bore means between the intersection of said return passage therewith, and including a removable wall portion at said central bypass passage means; and,

said valve body being cast formed into a unitary body constituting means for providing a first valve assembly having one valve circuit by drilling a hole through the body from the exterior thereof for intersecting and removal of said wall portion for communication of said central bypass passages and said bores, and for providing a second valve assembly by retaining said wall portion and by provision of second inlet means by drilling a hole from the exterior of said valve body for communicating fluid to said second bore means and providing second outlet means by drilling a hole from the exterior of said valve body for communicating said first bore means with a sump.

3,967,641
CLUTCH ASSEMBLY
Joseph A. Bedard, and Roger G. Hills, both of Eugene, Oreg., assignors to IRECO Industries, Inc., Eugene, Oreg.

Continuation of Ser. No. 385,969, Aug. 6, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 545,990

Int. Cl.² A01G *25/02;* **B05B** *3/12*

U.S. Cl. 137—344 **3 Claims**

1. In an irrigation line move,

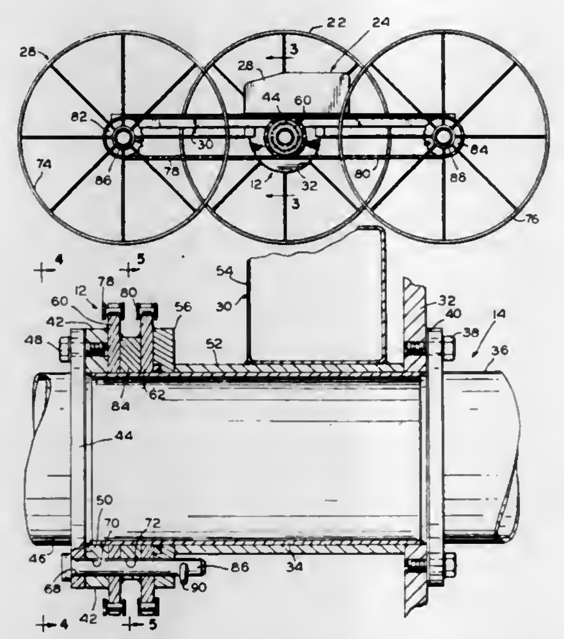
a drive tube having a first pipe coupling flange at one end thereof and a collar on that end portion of the drive tube and keyed to the drive tube,

a bull gear secured rigidly to and sealed to the other end of the drive tube,

a journaling tube rotatably mounting the drive tube,

a sprocket unit mounted rotatably on the drive tube between the flange and the collar and including a pair of sprockets and a spacer between the sprockets and keyed to the sprockets,

the pipe coupling flange and the collar having aligned holes, the sprocket unit having holes adapted to be aligned with the holes in the flange and the collar,



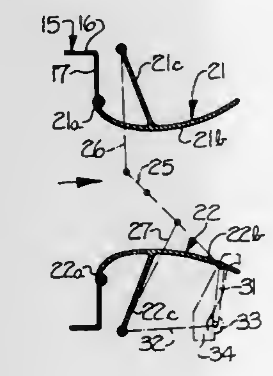
and keying means comprising a removable pin adapted to be inserted through the holes to selectively key the sprocket unit to the drive tube.

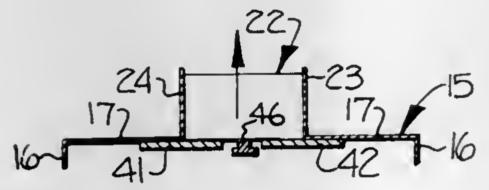
3,967,642
AIR VOLUME REGULATOR FOR AIR CONDITIONING SYSTEMS
Hillard Glenn Logsdon, Charlotte, N.C., assignor to Aeronca, Inc., Pineville, N.C.

Filed July 25, 1974, Ser. No. 491,696

Int. Cl.² F16K *31/12*

U.S. Cl. 137—499 **18 Claims**





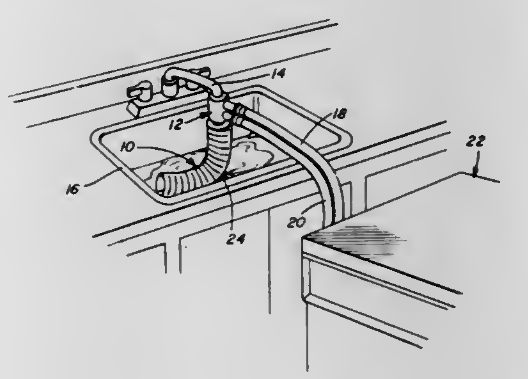
1. An air distribution unit for use in air conditioning systems for controlling the flow of conditioned air into an air-conditioned room or zone and comprising a regulator housing adapted for receiving therethrough a flow of conditioned air supplied to the housing, and an air volume regulator mounted in said housing and operable for maintaining the flow of air through the housing at a substantially constant volumetric flow rate regardless of fluctuations in the supply pressure thereof, said regulator comprising a pair of airfoils positioned in said housing in spaced apart relation to one another so as to receive therebetween the flow of air passing through the housing, said airfoils having generally parallel spaced apart leading edges and having facial surfaces extending downstream from the leading edges of the airfoils and exposed to the flow of air thereacross, means mounting said airfoils along the leading edges thereof for pivotal movement in said housing and in inwardly spaced relation from the walls of the housing, and linkage means interconnecting said pivotally mounted airfoils for effecting unison movement of the airfoils toward or away from each other, the flow of air across the facial surfaces of the airfoils exerting a force thereon to pivotally move the airfoils toward or away from each other in response to fluctuations in upstream pressure to vary the spacing between the airfoils through which the air flows and thereby maintain the flow of air from the regulator substantially constant.

3,967,643
SPLASH GUARD
Cleo Margaret Lutringer, Rte. 1, Box 180, El Campo, Tex. 77437

Filed Aug. 26, 1974, Ser. No. 500,901

Int. Cl.² E03C *1/00*

U.S. Cl. 137—562 **3 Claims**



1. In combination, a sink construction including a lower drain and a water faucet spaced above the sink, a combined filling and draining attachment for a water using domestic cleaning apparatus, said attachment being connected to said faucet for receiving water therefrom and including a water outlet in generally vertical registry with and opening downwardly toward said drain, an upstanding elongated flexible tube member of generally circular cross-sectional shape, said tube member being axially compressible and including means yieldingly biasing the tube member toward its maximum length fully extended condition, a fitting secured in, reinforcing and closing the upper end of said tube member and including means defining an inlet opening through said fitting into the upper end of said tube member and of a cross sectional area considerably smaller than the effective internal cross sectional area of said tube member, said fitting being sealingly connected to the outlet of said attachment for receiving the discharge of water from said cleaning apparatus, said tube member being of an effective length, when expanded toward its maximum length condition, greater than the spacing of said water outlet of said attachment above said drain, whereby the lower end of said tube member made be inserted into or rest over the drain.

3,967,644
COMPRESSOR CONTROL
Arthur St. Laurent, Minoa, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 384,774, Aug. 1, 1973, Pat. No. 3,855,813. This application July 5, 1974, Ser. No. 485,879

Int. Cl.² F16K *15/02*

U.S. Cl. 137—512.1 **1 Claim**

1. A combination equalizer and over pressure control for use with fluid compressors comprising:

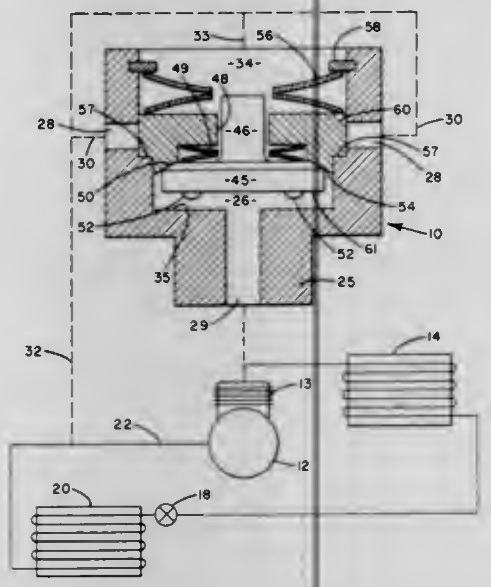
- a. a housing defining a chamber with a flange-like wall at one end thereof;
- b. means forming a passage adapted to conduct pressure fluid, and including a first piston-like member having a

first relief port therethrough, and when in a first position preventing any flow of fluid through a second relief port;

c. means for closing said relief port including a second piston-like member disposed upstream of said first piston-like member, said first and second members being movable relative to one another;

d. control means including first force supplying means disposed between said first and second piston-like members to bias said second member away from said first member, said second member moving into sealing abutment with said first member to close said first relief port when fluid pressure acting on said second member exceeds a predetermined value, and second means providing a force to maintain said first and second members in position relative to said second relief port to prevent any fluid flow therethrough, said first and second members moving jointly at a predetermined over pressure condition to open said second relief port; and

e. said first force supplying means moving said second member relative to said first member to bias said second piston-like member toward said wall of said housing when the fluid compressor becomes inoperable thereby opening said first relief port, said second member including abutment means contacting said wall to maintain said passage means in an open state when said first relief port is opened to relatively quickly equalize pressure across said control.



3,967,645

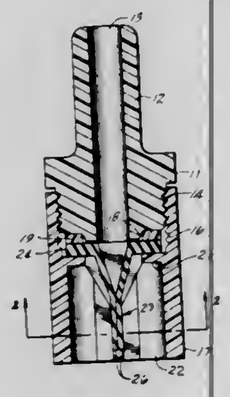
CHECK VALVE FOR URINE COLLECTION DEVICE

Roy Gregory, Sierra Madre, Calif., assignor to Urocare Products, Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 436,442, Jan. 25, 1974, abandoned. This application Jan. 3, 1975, Ser. No. 538,460

Int. Cl.² F16K *15/14*

U.S. Cl. 137—525.1 **14 Claims**



1. A liquid check valve having no back leakage and capable of draining substantially dry in the forward direction comprising:

a rigid body having a passage therethrough;

an elastomeric sealing member mounted within the body, said sealing comprising:

a pair of flat, parallel, normally spaced apart, sealing leaves;

a web among each lateral edge of the sealing leaves and integral therewith for joining the adjacent edges of the leaves together, said leaves and webs collectively defining a flat tube having a flat, normally open, passage therethrough; and

a peripheral end flange integral with the leaves for mounting the sealing member in the body; and

means for pressing on the lateral edges of the leaves for forcing the lateral edges of the flat passage closed, comprising spaced apart wall portions extending longitudinally in the rigid body for receiving the lateral edges of the sealing leaves, said wall portions being spaced apart no more than the thickness of the elastomer portion of the sealing member therebetween.

3,967,646

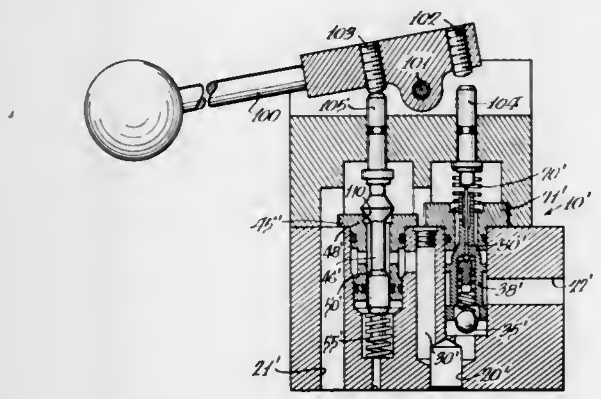
THREE-WAY CONTROL VALVE

James C. Solie, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Division of Ser. No. 469,424, May 13, 1974, Pat. No. 3,934,610. This application Aug. 15, 1975, Ser. No. 605,032

Int. Cl.² F15B *13/04, 13/14*

U.S. Cl. 137—596.12 **4 Claims**



1. A three-way control valve for use with a single-acting cylinder or the like in control of advance, return or hold operation thereof comprising, a valve body having an inlet port, a control port and a tank port, a first bore in said body in communication with all three of said ports, a first poppet check valve in said first bore and having a valve seat whereby, when seated, flow from the control port to the inlet port is blocked, a second poppet check valve in said first bore and having a valve seat whereby, when seated, flow from the control port to the tank port is blocked, a second bore in said body in parallel adjacent relation to said first bore and in communication with said inlet port and the tank port, a spool valve in said second bore with spaced opposed lands and one of said lands defining a poppet valve member coacting with a valve seat to control flow to the tank port, a passage connecting said first bore with said second bore intermediate said spaced opposed lands of said valve spool for fluid flow from the inlet port to the tank port, the poppet valve member in said second bore having an open position to permit flow from the inlet port to the tank port in hold and return operations and to block said flow in an advance operation whereby fluid flows past said first check valve to said control port, means for positioning said poppet valve member, both of said check valves being held on their respective valve seats by fluid pressure in a hold operation, means for opening said second check valve and holding said first check valve closed in a return operation to permit fluid flow from the control port to the tank port, and decompression valve means operable to bleed fluid from the control port to the tank port to reduce said fluid pressure and reduce the force required to open said second check valve, said decompression valve means including a relatively small poppet valve carried by said second check valve, spring means acting between said first check valve and said small poppet valve, a movable pin for opening said small poppet valve, and a movable member for sequentially engaging said pin and said second check valve, said spaced opposed lands of said spool valve being of unequal area with the land defining said poppet valve member being of a greater area to render said valve member pressure-sensitive as moved toward said valve seat for the poppet valve member to initiate said advance operation.

3,967,647

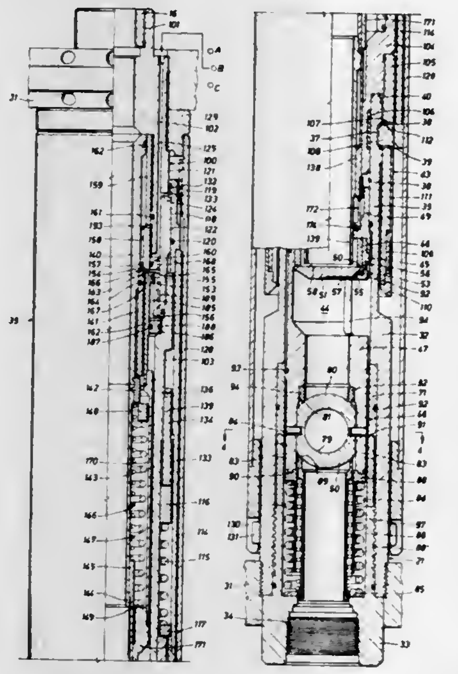
SUBSEA CONTROL VALVE APPARATUS

David E. Young, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,829

Int. Cl.² E21B *43/12, 33/00*

U.S. Cl. 137—614.11 **21 Claims**



10. Apparatus adapted to be positioned in a subsea blowout preventer stack or the like for controlling the flow of fluid from an offshore well, comprising: a valve body having a flow passage; a mounting sleeve movable upwardly and downwardly within said flow passage and with respect to said valve body between upper and lower position; first and second valve assemblies carried by said mounting sleeve, one of said valve assemblies including a ball valve element rotatable between open and closed positions with respect to said flow passage; means on said valve body for rotating said ball element to open position in response to downward movement of said mounting sleeve and for rotating said ball element to closed position in response to upward movement of said mounting sleeve; and means for urging said mounting sleeve toward said upper position where said ball valve element is closed.

3,967,648

HYDRAULIC VALVES DIRECTLY CONTROLLED BY EITHER DIRECTOR ALTERNATING CURRENT

Paolo Tirelli, Cinisello Balsamo (Milan), Italy, assignor to Atos Oleodinamica S.p.A., Milan, Italy

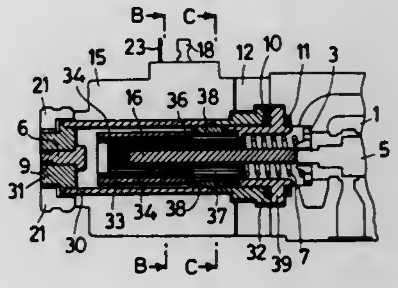
Filed May 9, 1974, Ser. No. 468,264

Claims priority, application Italy, Jan. 2, 1974, 19002/74

Int. Cl.² F16K *31/06*

U.S. Cl. 137—625.65 **22 Claims**

1. A hydraulic valve actuated directly by at least one electromagnetic apparatus and comprising a valve body having a plurality of channels for the flow of hydraulic fluid, at least one of said channels being normall filled with the fluid; a slider which axially slides within said valve body and controls the outflow of hydraulic fluid; springs arranged axially with said slider and acting thereon; at least one round magnetic counter-armature disposed coaxial with said slider, said counter-armature having a radially outwardly extended flange which rests against said valve body, a coaxial round cavity facing said slider and having a coaxial bore; a tubular member coaxial with said counter-armature and surrounding said counter-armature, said tubular member having selected magnetic properties and having at one of its ends a portion extending radially outwardly an at the other of its ends a thick wall plug; a prismatic movable magnetic armature slidable in said tubular member; a rod-like pusher passing through said bore of said counter-armature and connecting said movable armature with said slider; a manual pusher slidably mounted in an axial bore of said thick wall plug coaxial with and protruding inwardly of said tubular member; an electric coil mounted on said tubular member in coaxial relationship; a magnetic tube portion surrounding said coil in coaxial and radially spaced relationship with said coil, said magnetic tube portion being axially slotted; at least two superposed magnetic metal disk packs disposed coaxial with said tubular member and extending radially at both ends of said magnetic tube portion between said magnetic tube portion and said tubular member; a molded plastic casing enclosing said magnetic tube portion, said superposed magnetic metal disk packs and said coil; means for connecting said electric coil to an electric source; means for fastening said tubular member and said counter-armature to said valve body; means for fastening said molded plastic casing to said tubular member; sealing means for preventing oozing of hydraulic fluid between said valve body, said counter-armature and said tubular member; and sealing means for preventing oozing of hydraulic fluid between said thick wall plug and said manual pusher.



3,967,649

MIXING VALVE ASSEMBLY

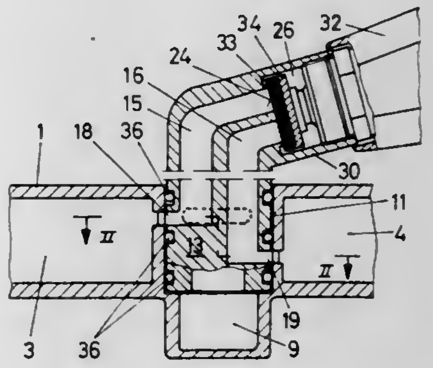
Robert Amblank, Beinwil, Switzerland, assignor to Aktiengesellschaft Oederlin & Cie, Baden, Switzerland

Filed Feb. 10, 1975, Ser. No. 548,574

Claims priority, application Switzerland, Feb. 21, 1974, 2405/74; Dec. 30, 1974, 17363/74

Int. Cl.² F16K *11/18*

U.S. Cl. 137—636.3 **8 Claims**



1. A mixing valve assembly comprising

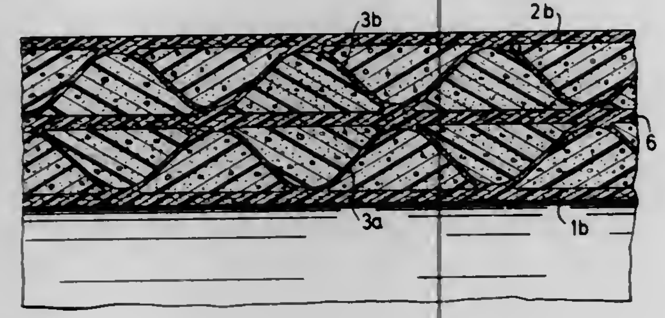
A. a body portion having

1. a cylindrical bore extending therethrough,

2. a pair of entrance channels for the admission of two dissimilar fluids,
3. a discharge spout,
   - a. said channels communicating with said bore through separate openings in the wall of said bore,
   - b. said openings being axially spaced,

B. a mixing control member including
1. a cylindrical plug mounted and rotatable in said bore,
   - a. and a fluid tight circumferential seal disposed between said plug and the wall of the bore intermediate the axially spaced openings therein,
2. said control member having therein
   - a. a mixing chamber,
   - b. two separate inlet passages discharging into the mixing chamber, and
   - c. an outlet passage extending entirely through said mixing control member and discharging from the mixing chamber to said discharge spout in side-by-side relation with said inlet passages from the mixing chamber.
     - i. each inlet passage being movable with rotation of the plug in the bore from a closed position to an open position with respect to a corresponding one of the openings in the wall of the bore, one of said openings becoming increasingly closed as the other becomes increasingly opened,
   - d. a valve seat at the discharge of the inlet passages into the mixing chamber, and
   - e. a valve engageable with said seat, whereby rotation of the plug in the bore regulates the relative amounts of fluids flowing from the entrance channels to the mixing chamber, and movement of the valve from and toward its seat regulates the total volume of flow discharged through the outlet passage.

3,967,650
PIPES
Kjell S. Borge, Stokke, Norway, assignor to Vera Fabrikker A/S, Sandefjord, Norway
Filed Nov. 29, 1973, Ser. No. 420,094
Claims priority, application Norway, Dec. 5, 1972, 4460/72
Int. Cl.^{2} F16L *9/06, 9/16*
U.S. Cl. 138—144 3 Claims

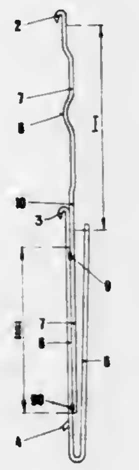


1. A pipe having a wall comprising spaced apart concentric first and second cylindrical shells of a laminate of helically wound plastic-impregnated fibers, and an intermediate layer between said first and second shells comprising two helically wound strips of filler material, the windings being spaced apart along the axis of the pipe and the convolutions of one strip lying between the convolutions of the other strip; and a helically wound layer of plastic impregnated fiber disposed between and engaging the two windings thereby forming a corrugated layer having helical corrugations, said layer being anchored to the innermost shell along a path corresponding to one of the filler strip windings and anchored to the outermost shell along a path corresponding to the other filler strip winding.

3,967,651
ADHESIVES COATINGS AND LAMINATES UTILIZING ETHYLENE COPOLYMERS AND COAL-TAR PITCH
George F. Snyder, Franklin Township, Westmoreland County, and Robert M. Stewart, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 201,861, Nov. 24, 1971, Pat. No. 3,814,712, which is a continuation-in-part of Ser. No. 692,295, Dec. 21, 1967, abandoned. This application Jan. 30, 1974, Ser. No. 438,141
Int. Cl.^{2} F16L *9/14*
U.S. Cl. 138—145 4 Claims

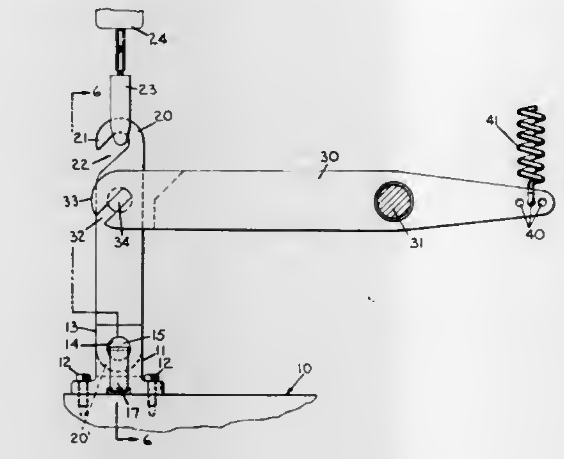
1. A coated culvert pipe comprising a steel substrate bonded to a 10 – 30 mil thick protective film of a composition comprising:
- a. from about 10 to about 75 weight percent coal-tar pitch;
- b. from about 25 to about 90 weight percent of a polymeric ethylene composition selected from the group consisting of
  1. a terpolymer of ethylene, vinyl acetate, and an ethylenically-unsaturated carboxylic acid containing from 3 to 8 carbon atoms, and
  2. a mixture of copolymers of ethylene and vinyl acetate and ethylene and an ethylenically-unsaturated carboxylic acid containing from 3 to 8 carbon atoms wherein the ethylene-vinyl acetate copolymer and the ethylene-carboxylic acid copolymer each comprise from about 5 to about 85 weight percent of the total composition.

3,967,652
SPRING HOOK FOR THE HARNESS PULL OF A DOUBLE-LIFT OPEN-SHED JACQUARD MACHINE
Wolfgang Seiler, Rheydt, Germany, assignor to Staubli Ltd., Horgen-Zurich, Switzerland
Filed July 3, 1974, Ser. No. 485,601
Claims priority, application Switzerland, July 6, 1973, 9917/73
Int. Cl.^{2} D03C *3/00, 3/08*
U.S. Cl. 139—59 9 Claims



1. A single-shank, resiliently flexible, hook for use in a double-lift, open-shed Jacquard machine, said hook having a body part with two vertically spaced connecting noses and a support nose mounted thereon, said support nose being arranged on the hook below said two connecting noses and a spring portion extending away from said support nose in the form of a resilient extension which is bent backward at 180° relative to said body part, comprising the improvement wherein said body part of said hook has a first zone (I) between said two connecting noses, a second zone (II) located between the lower one of said two connecting noses and said support nose and an immediate third zone between said lower one of said two connecting noses and said second zone (II), said body part in said third zone being more resilient than is said body part in said second zone (II).

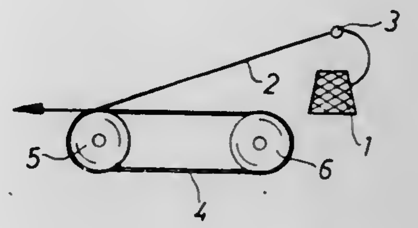
3,967,653
HARNESS SUPPORT AND LINKAGE
Merton C. Lyman, Jr., Woodstock, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed June 23, 1975, Ser. No. 589,440
Int. Cl.^{2} D03C *13/00*
U.S. Cl. 139—88 6 Claims



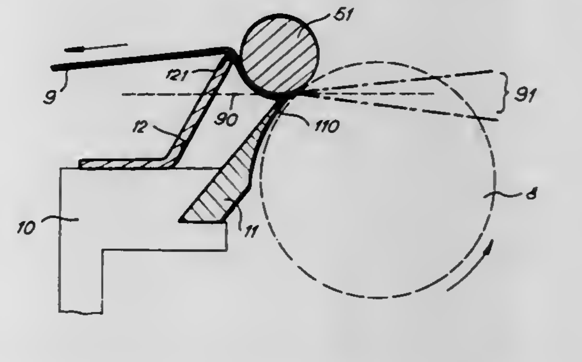
1. An improved support for harness frames on a loom in which the harnesses controlling the warp yarns are actuated by a loom dobby, said support comprising:
- a. a mounting base secured to the upper rail of the harness frame, said base including an upwardly extending flange having a circular opening extending therethrough.
- b. a connecting link having
  - i. means at one end to mate with the said flange of said mounting base and having a circular opening extending therethrough which can be brought into registry with the opening in said flange,
  - ii. means at the other end for connecting said link to the loom dobby; and,
  - iii. means intermediate the ends of said link defining an opening adapted to receive a rotatable connecting pin.
- c. a pivot pin mounted within said circular openings in said mounting base flange and in said one end of said connecting link to join said link to said base and to provide a pivot axis for said link.
- d. means mounted on the loom to provide a pivot axis extending in a direction substantially parallel to the warp yarn.
- e. a harness return bar mounted intermediate its inner and outer ends on said pivot axis means so that its inner end overlaps said connecting link, said return bar including:
  - i. means at its inner end defining an opening that is in registry with said opening intermediate the ends of said link.
- f. a pivot pin connecting said link with said harness return bar, and
- g. biasing means attached to the outer end of said harness return bar and to the loom for continuously urging said outer end in an upward direction.

3,967,654
YARN FEED MECHANISM FOR A WEAVING MACHINE
Jakob Müller, Zwidellen, Switzerland, assignor to Jakob Muller, Forschungs-und Finanz AG, Frick, Switzerland
Filed Oct. 30, 1974, Ser. No. 519,109
Claims priority, application Switzerland, Nov. 27, 1973, 16646/73
Int. Cl.^{2} D03D *47/34*
U.S. Cl. 139—452 1 Claim

1. A yarn transport mechanism for a needle band weaving machine, said yarn transport mechanism comprising a pair of spaced rollers, a single endless transport belt entrained over said rollers, said belt having an inner surface engaging said rollers and an outer surface for engagement by yarn to be transported, said belt outer surface having a friction coating for facilitating the gripping or yarn, and drive means for at least one of said rollers, said drive means being of the infinitely variable speed type and being the sole means for driving said belt, said belt at all times having a portion thereof engaging one of said rollers to an extent to substantially reverse the direction of movement of said belt, and said yarn extends substantially entirely around said belt portion with the direction of movement of said yarn being at least substantially reversed, and said belt forming the sole means for driving said yarn.



3,967,655
APPARATUS FOR STABILIZING THE FABRIC WITHIN THE WEFT BEAT-UP AREA IN WAVE WEAVING LOOMS
Dalibor Sejbal; Josef Holub; Zbyněk Mikš, and Vitězšlav Vasek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia
Filed June 1, 1973, Ser. No. 366,127
Claims priority, application Czechoslovakia, June 12, 1972, 4051-72
Int. Cl.^{2} D03D *49/00;* **D03J** *1/22;* **D03D** *47/26*
U.S. Cl. 139—291 R 3 Claims



1. An apparatus for stabilizing the fabric within the weft beat-up area in a travelling-wave shedding loom, wherein the beat-up is effected by means of a rotary reed, the improvement which comprises means forming a stabilization slot, and a deflection rail downstream of said means, the top portion of said deflection rail lying above the level of the weaving plane, the means for forming the stabilization slot comprising delimitation rail having a top edge and fixed on a through bar along the weaving plane, and a lower rail.

3,967,656
METHOD OF AND DEVICE FOR CONTROLLING A WEAVING LOOM
Miyuki Gotoh, Tokorozawa, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Feb. 25, 1975, Ser. No. 553,032
Claims priority, application Japan, Mar. 7, 1974, 49-26622; May 20, 1974, 49-56408
Int. Cl.^{2} D03D *51/38*
U.S. Cl. 139—370.2 13 Claims

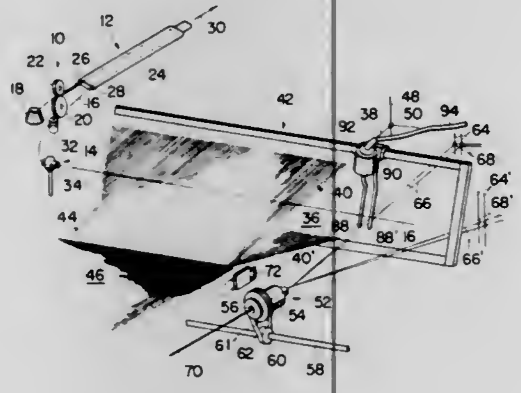
1. A method of controlling a weft inserting motion of a weaving loom for stopping the loom in response to failure in the weft inserting motion, comprising the steps of:

monitoring the operation of the loom and producing a train of first signals at time intervals each representative of a predetermined length of a fabric produced;

monitoring picks of a weft yarn shot into a shed of warp yarns and producing a second signal responsive to a pick of the weft yarn improperly shot into the shed;

storing the second signals produced;

producing a control signal responsive to a predetermined number of the second signals produced within a time interval between consecutive two of the first signals for stopping the loom;



clearing the stored second signals if the stored second signals are short of said predetermined number at the end of said time interval; and

developing and storing a predetermined number of third signals prior to re-starting of the loom, said predetermined number of the third signals being smaller by at least one than said predetermined number of said second signals, thereby to produce said control signal in response to the second signal firstly produced in a subsequent operation of the loom which is re-started.

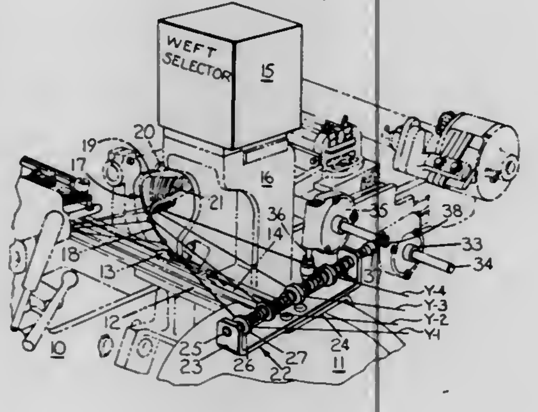
3,967,657
WEFT CONTROL DEVICE

John A. Cuglni, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1976, Ser. No. 651,444

Int. Cl.^{2} D03D *47/34*

U.S. Cl. 139—450 **4 Claims**



1. A weft control device for looms of the shuttleless type wherein weft from a stationary source is presented to an inserting member and inserted into sheds of warp threads, said device comprising:

a. a support means fixed on the loom;
b. means defining a pair of disc elements rotatably mounted in said support means to receive the weft therebetween;
c. biasing means for continually urging at least one of said disc elements into yielding contact with the other and the weft associated therewith; and
d. drive means for rotating said disc elements in a direction to apply tension to the weft in the area intermediate said disc elements and the edge of the fabric being formed.

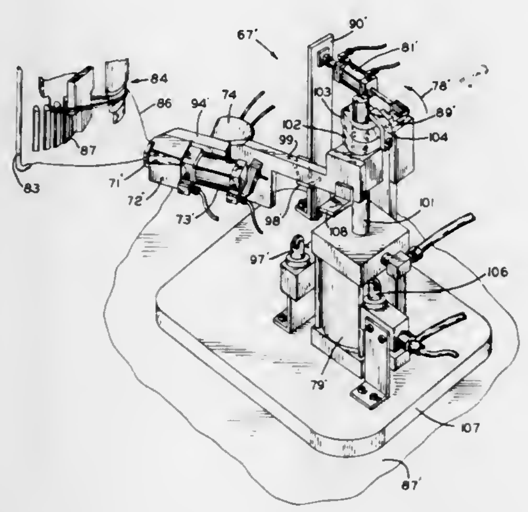
3,967,658
APPARATUS AND METHOD FOR USE IN WINDING COILS

Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 5, 1975, Ser. No. 555,370

Int. Cl.^{2} B21F *3/00*

U.S. Cl. 140—92.1 **26 Claims**



1. A method of developing at least first and second wound coils, and establishing and maintaining a slack intercoil wire segment that extends between and interconnects first and second spaced apart coils in a winding receiver, said method comprising: initiating operation of a winding mechanism assembly that includes at least one magnet wire dispensing means, at least one winding turn size determining means, at least one winding turn receiver that is movable about a longitudinal axis, and at least one wire clamp; relatively moving the at least one winding turn size determining means and the at least one magnet wire dispensing means and generating a plurality of winding turns for the first coil while retaining the at least one wire clamp in a first position remote from the at least one wire dispensing means; moving the at least one clamp to a second position adjacent to a winding plane while generating a final turn of the first coil, then moving at least a portion of the at least one clamp to an intercept position for intercepting a final wire segment of the first coil, and intercepting a final wire segment of the first coil with the at least a portion of the at least one clamp; clamping the intercepted final wire segment with the at least a portion of the at least one clamp; moving the at least a portion of the at least one clamp and the clamped wire segment from the intercept position to a final hold position adjacent the winding plane substantially concurrently with movement of the at least one winding turn receiver about the longitudinal axis while the first coil is retained therein; generating turns of wire for a second coil by relatively moving the at least one winding turn size determining means and the at least one wire dispensing means while continuing to hold the clamped wire segment in the final hold position; releasing the clamped wire segment; and returning the at least one clamp to the first position remote from the at least one wire dispensing means; the substantially concurrent movement of the at least one winding turn receiver and clamped wire segment maintaining a slack intercoil wire segment between the first coil and the at least one wire clamp.

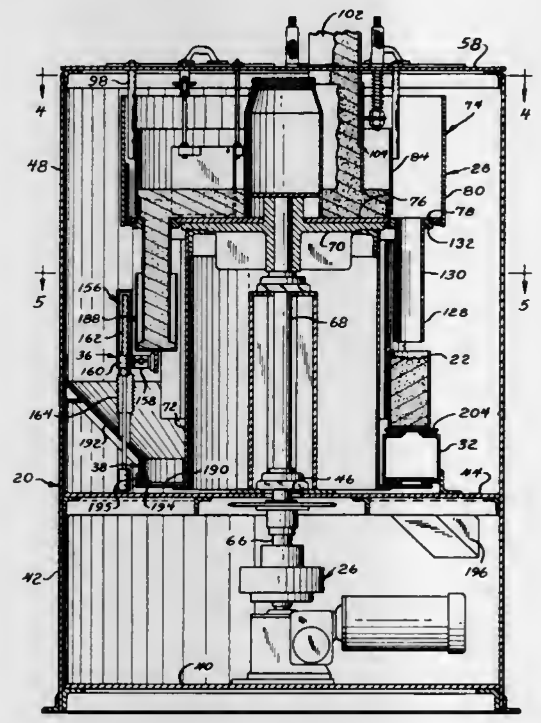
3,967,659
CONTAINER FILLING APPARATUS

Graeme W. Warner, Hinsdale; Victor M. Svagdis, Palos Park; James W. Petrzelka, Cicero, and John C. Nalbach, La-Grange Park, all of Ill., assignors to John R. Nalbach Engineering Company, Inc., Chicago, Ill.

Filed May 16, 1975, Ser. No. 578,278

Int. Cl.^{2} B65B *1/22*

U.S. Cl. 141—79 **20 Claims**



1. An apparatus for filling like containers with a like measured amount of divided matter including; a housing; a drive connected to said housing; a filling turret in said housing having a rotatable portion connected to said drive and said portion being rotated by said drive at a prescribed rate, said filling turret including a filling tank having a rotatable base connected to said drive and said rotatable base rotated with said portion of the filling turret, a plurality of measuring flasks arranged in a circle concentric with the circle of rotation of said portion of the filling turret connected to said rotatable base of the filling tank for receiving divided matter therefrom and measuring the amount of said matter, said plurality of measuring flasks moving in a circular path having a center concentric with the center of the circle of the plurality of measuring flasks, and a container pocket positioned adjacent to each of the measuring flasks and moving therewith for carrying a container; an input conveyor positioned adjacent to the housing for delivering empty containers to the filling turret, said input conveyor moving in a straight-line path toward the filling turret intersecting the circular path of the container pockets at a point where the velocity of a container pocket at that point includes a vector at substantially a right angle to the direction of movement of a container on the input conveyor, said input conveyor urges the empty containers into the respective container pockets; a container elevator in said housing positioned adjacent to the point where the straight-line path of the input conveyor intersects the circular path of the container pockets for raising empty containers in the respective container pockets into a telescoping relationship with the respective measuring flasks; an arcuate container support in said housing positioned below a portion of the measuring flasks for holding the containers in telescoping relationship with the measuring flasks and then allowing the containers to move downward relative to the measuring flasks through a given portion of the circular path of the measuring flasks; and an output conveyor positioned adjacent to the container pocket path for receiving filled containers from the container pockets and carrying the filled containers away from the filling turret, said output conveyor having a straight-line path moving away from the filling turret and being substantially tangential to the circular path of the measuring flasks at the point of contact of the straight-line path and the circular path.

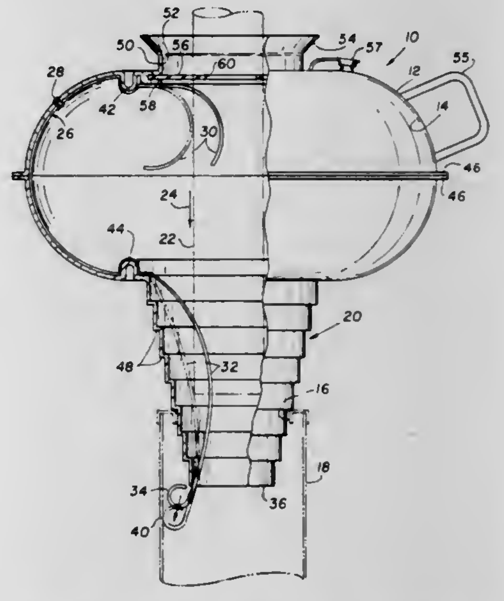
3,967,660
FUEL OVERFLOW CONTROL DEVICE FOR BOATS

James E. Russell, One Tom's Point Lane, Port Washington, N.Y. 11050

Filed Oct. 15, 1974, Ser. No. 514,471

Int. Cl.^{2} B65B *3/26*

U.S. Cl. 141—95 **5 Claims**



1. A fuel overflow control device for use with a fueling nozzle and a filler pipe communicating with a boat fuel tank comprising a see-through plastic body bounding an overflow chamber having an operative position projected into said filler pipe so as to visually signal termination of the fueling procedure when said plastic body fills with fuel overflowing from said boat fuel tank, said body having an inlet opening thereinto and a depending funnel having an exit opening into said filler pipe, and intermediate said inlet and exit openings there being defined centrally of said body a fueling nozzle access path to said filler pipe, and a static electricity grounding means supported on the interior of said plastic body having upper and lower contacts extending into said fueling nozzle access path so as to establish grounding contact with said fueling nozzle in its operative position projected into said plastic body and along said access path thereof, said lower contact being constructed of a springy metal formed in a bowed configuration with a depending movable contact end, whereby in response to the flattening of said lower contact by said inwardly projected fueling nozzle said contact end thereon is urged into grounding contact with said filler pipe.

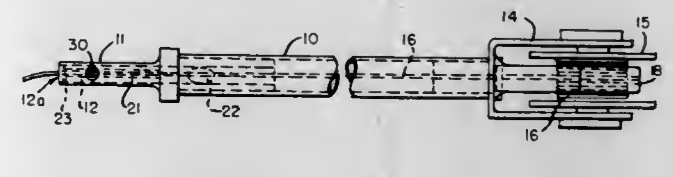
3,967,661
INSULATION SLITTING AND WIRE WRAPPING TOOL

Ray R. Scoville, La Canada, and Harold F. Tipton, Burbank, both of Calif., assignors to Vector Electronic Company, Sylmar, Calif.

Filed Sept. 17, 1975, Ser. No. 614,098

Int. Cl.^{2} B21F *15/00;* **B25F** *1/00;* **H02G** *1/12*

U.S. Cl. 140—124 **19 Claims**



1. A wire wrap tool for wrapping insulated conductor wire on a terminal, comprising an elongated tubular member having a tip end which defines a central axial bore for the reception of a terminal to be wrapped, said central bore opening into an outermost face of said tip end which face is disposed

nonorthogonal to the axis of said tubular member, a supply of insulated conductor wire mounted on said tubular member in longitudinally spaced relation to said tip end of said member, an elongated first interior channel within said tubular member extending in a direction generally parallel to and radially displaced from the axis of said tubular member for guiding a length of said insulated conductor wire from said supply to said tip end of said member, a second comparativey short interior channel extending at an angle to the axis of said member from said first channel to said outermost face of said tip end at a position on said face radially spaced from the opening of said central axial bore, and slitting means within said tubular member for cutting a longitudinal slot in the insulation of said wire along a line angularly displaced from the bottom of the wire in said first channel as said wire passes from said first channel into said second channel and toward said outermost face, the inclination of said nonorthogonal outermost face being operative to twist said wire as it passes from said second channel toward said bore to position the longitudinal slot in said insulation in facing relation to a terminal in said central bore thereby to bring the portion of said conductor wire which is exposed through said slot into electrical contact with the terminal.

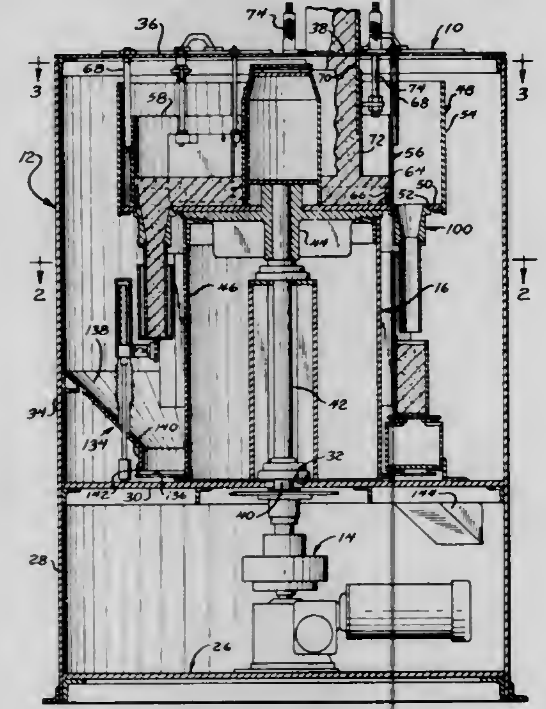
3,967,662
CONTAINER FILLING APPARATUS

Graeme W. Warner, Hinsdale, Ill., assignor to John R. Nalbach Engineering Company, Inc., Chicago, Ill.

Filed June 20, 1975, Ser. No. 588,824

Int. Cl.^{2} B65B *43/50, 43/58*

U.S. Cl. 141—148 **9 Claims**



1. An apparatus for filling like containers with a like measured amount of divided matter, including; a housing; a drive connected to said housing; a filling turret in said housing having a rotatable portion connected to said drive, said rotatable portion being rotated by said drive at a prescribed rate, said filling turret including a filling tank having a rotatable floor connected to said drive, said rotatable floor rotated with said rotatable portion of the filling turret, a plurality of measuring flasks arranged in a circle concentric with the circle of rotation of said rotatable portion of the filling turret, said plurality of measuring flasks connected to said rotatable floor of the filling tank for receiving divided matter therefrom and measuring the amount of said matter, said plurality of measuring flasks moving in a circular path having a center concentric with the center of the circle of the plurality of measuring flasks, each of said measuring flasks having an open tapered mouth adjacent to the filling tank and a cylindrical body connected to the mouth, said tapered mouth having its wider end adjacent to the filling tank, and a container pocket positioned adjacent to each of the measuring flasks and moving therewith for carrying a container; and an arcuate container support mounted in said housing positioned below a portion of the measuring flasks for holding the containers in telescoping relationship with the measuring flasks.

3,967,663
STRIPING DEVICE

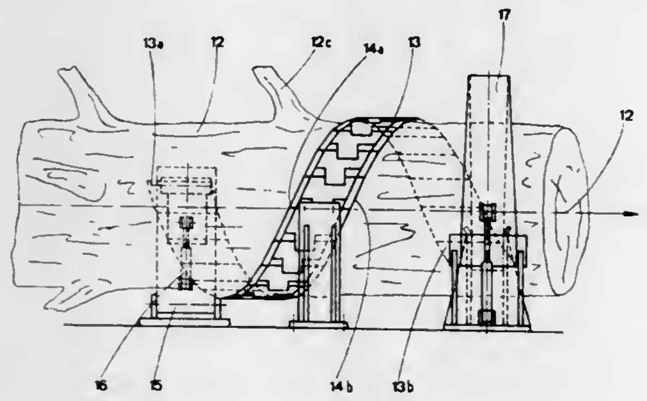
Jean Loigerot, Paris, France, assignor to Association pour la Rationalisation et la Mechanisation de l'Exploitation Forestiere, Paris, France

Filed Oct. 21, 1974, Ser. No. 516,180

Claims priority, application France, Oct. 22, 1973, 73.37631

Int. Cl.^{2} A01G *23/08*

U.S. Cl. 144—2 Z **7 Claims**



1. A device for stripping the limbs from a tree trunk comprising:
- a frame;
- means for effecting advancement of a tree along its longitudinal axis with respect to said frame;
- an elongate cutting chain having two ends and being formed from a plurality of articulated links pivotally connected to each other, one end of said cutting chain being connected to said frame, said chain being constructed and arranged so that its opposite end is spaced longitudinally from said first mentioned end of said chain to enable said chain to be wrapped about said trunk in a continuous, helical configuration;
- a lever arm mounted to the frame and having a free end connected to said opposite end of the cutting chain, the lever arm being mounted for movement between positions in which it wraps and unwraps the chain helically about the trunk;
- the length of the chain being such as to enable it to be wrapped about the trunk more than 360°.

3,967,664
POWER DRIVEN SCREW DRIVER WITH A SCREW HOLDING NOSEPIECE

Richard S. Lesner, and Murdo A. MacDonald, both of Bloomfield Hills, Mich., assignors to Chicago Pneumatic Tool Company, New York, N.Y., a part interest

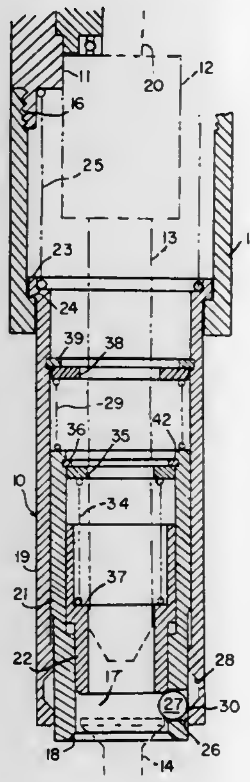
Filed Feb. 14, 1975, Ser. No. 550,150

Int. Cl.^{2} B25B *23/00*

U.S. Cl. 144—32 R **38 Claims**

1. A screw holding nosepiece for a screw driving tool having a screw driving bit, comprising inner and outer sleeve members having an axial slidable relation to one another, the inner sleeve having a normal position projecting axially out of a front end of the outer sleeve under the bias of a spring load, a coupling for supporting the sleeves to the housing of the tool for relative axial movement in coaxial relation to the driving bit of the tool, releasable blocking means carried by the inner sleeve normally blocking entry of the head of a screw into the inner sleeve, said inner sleeve being retractible into said outer

sleeve against the bias of the spring load in response to axial force against said blocking means of a screw head seeking entry into said inner sleeve, means carried by the outer sleeve having response to a predetermined extent of said relative retraction of the inner sleeve to effect release of the blocking means from its blocking condition so as to allow entry of the head of a screw into the inner sleeve beyond the blocking means, and the spring load having response to said predetermined retracted relation of the inner sleeve to return the inner sleeve and the blocking means to their normal position so as to block the head of a screw previously entered into the inner sleeve beyond the blocking means from escaping in the opposite direction out of the inner sleeve.



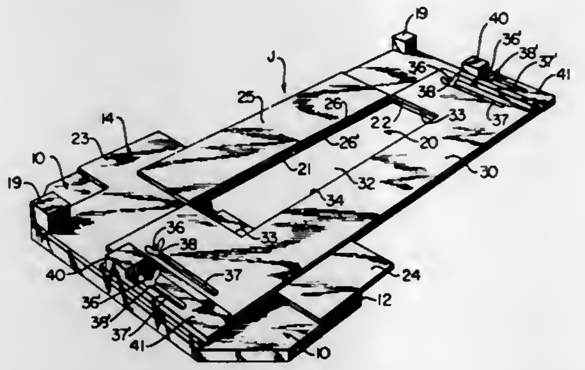
3,967,665
ADJUSTABLE ROUTING TEMPLATE

Allan M. Lund, 515 E. Adams, Riverton, Wyo. 82501

Filed Oct. 2, 1974, Ser. No. 511,446

Int. Cl.^{2} B27G *23/00*

U.S. Cl. 144—144.5 R **6 Claims**



1. In apparatus for routing elongated slots in a workpiece in which a router bit is adapted to be inserted through a guide bushing, the combination comprising:
- a stationary frame including a workpiece-receiving area and a stationary guide in overlying relation to the workpiece-receiving area in which the guide edge extends in a direction parallel to the intended length of the slot to be formed;
- adjustable template means mounted on said stationary frame including a second adjustable guide edge disposed in coplanar spaced parallel relation to said stationary guide edge, said stationary and adjustable guide edges defining guide opening means therebetween in overlying relation to the workpiece for guiding the router guide bushing along the guide edges to form a slot or predetermined width in the workpiece; and
- adjustment means between said adjustable template and said stationary frame to position said adjustable guide edge with respect to said stationary guide edge at a spacing corresponding to the intended width of the slot to be formed in the workpiece plus the diameter of said guide bushing less the diameter of said router bit, said adjusting means including adjustable sizing means between said adjustable template means and said frame movable a first distance independently of said adjustable template means and being further movable a second distance in the same direction as the direction of movement for the first distance to cause movement of said adjustable template means over a distance corresponding to the second distance

6. The method of routing a slot in a shelf unit and the like, comprising the steps of:
- a. placing a template having an adjustable guide opening therein over a workpiece in which a slot of the desired width is to be formed;
- b. setting the width of the slot in one direction of movement between the guide edges to conform to the diameter of the guide bushing for a router bit to be employed in forming the slot;
- c. increasing the width of the slot in the same direction of movement as in step (b) an additional distance to conform to the width of the shelf to be inserted into the slot less the width of the router bit;
- d. fixing the spacing between the guide edges; and
- e. advancing the router within the guide bushing along each guide edge with the router bit extending through the opening formed therebetween to form a resultant slot of the desired width in the workpiece.

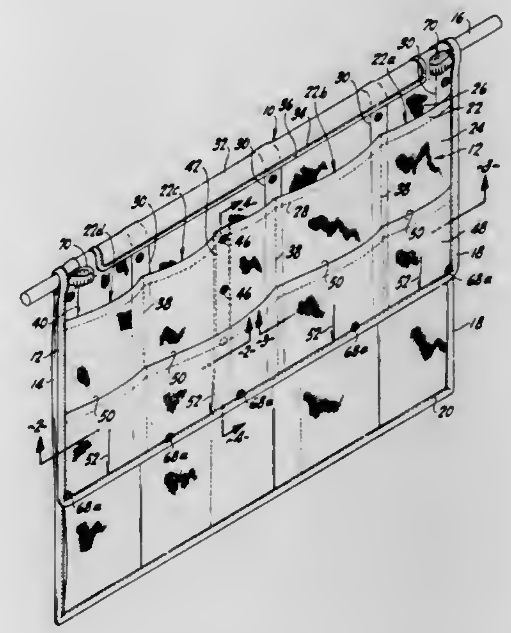
3,967,666
BEDSIDE ARTICLE BAG

Sophia M. Farrar, 771 Douglas Drive, San Leandro, Calif. 94577

Filed Feb. 21, 1975, Ser. No. 551,824

Int. Cl.^{2} B65D *33/14*

U.S. Cl. 150—1 **7 Claims**

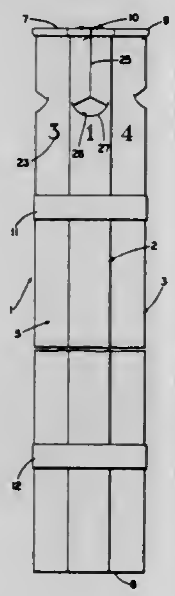


1. An article bag for attachment to a bed rail comprising a first cloth flap and a second cloth flap said flaps having a common top portion adapted to be supported in saddle fashion over a rail with said flaps depending from each side of the rail, first fastening means having first and second cooperating fastening elements on said first and second flaps adjacent said top portion for fastening said article bag together under the rail, second fastening elements on said first and second flaps displaced from said top portion for fastening said first flap to said second flap, a plurality of first pockets on said first flap

and a plurality of second pockets on said second flap; wherein said first and second flaps and said common top portion are formed of a continuous backing panel, and at least one first overlay panel across the backing panel having sides and a bottom attached to said backing panel on said first flap and at least one second overlay panel across the backing panel having sides and a bottom attached to said backing panel on said second flap, said overlay panels and backing panel having means for dividing said backing panel and said overlay panels into said plurality of pockets, said means for dividing said overlay panels into said plurality of pockets comprising a series of parallel pleats in said backing panel running the length of said panel from said first flap to said second flap, and a series of stitchings interconnecting said overlay panels with said backing panel along said pleats.

3,967,667
GOLF CLUB COVER-HOLDER CONSTRUCTION

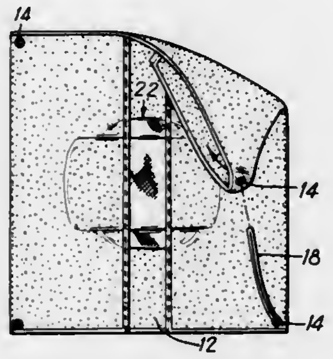
Joseph J. Robinson, 1224 E. Front St., Dover, Ohio 44622
Filed June 23, 1975, Ser. No. 589,445
Int. Cl.² A63B ***55/00***
U.S. Cl. 150—1.5 R **8 Claims**



1. Golf club cover-holder construction including:
- a. four tubular plastic members, each formed with a top end opening and being adapted to receive a golf club inserted through said top end opening;
- b. means securing the tubular members together in a clustered, abutting parallel relationship;
- c. each of the tubular members being formed with a longitudinally extending side opening, said side opening facing outwardly from the cluster and oriented approximately 90° **with respect to the adjacent tubular members side openings;**
- d. each of said side openings extending from the top end opening over a relatively short distance with respect to the length of the tubular member and terminating in generally transversely extending slot means also formed in said tubular member;
- e. the side opening, transverse slot means and top end opening forming a pair of curved resilient flap means, said flap means extending generally between the top end opening and transverse slot means on each tubular member, and are formed as an integral part of said tubular member;
- f. the flap means being biased toward a closed position due to the resiliency of the tubular plastic members; and
- g. said flap means being adapted to extend along and conform to portions of a golf club head to retain the club within the tubular member and to protect the club head from contacting adjacent club heads when a golf club is inserted through the top end opening of the tubular member.

3,967,668
CARRIER FOR LOOSE ARTICLES

Jack D. Franco, c/o Franco Mfg. Co., 309 5th Ave., New York, N.Y. 10001
Filed Dec. 5, 1974, Ser. No. 529,949
Int. Cl.² B65D ***65/10***
U.S. Cl. 150—52 R **5 Claims**



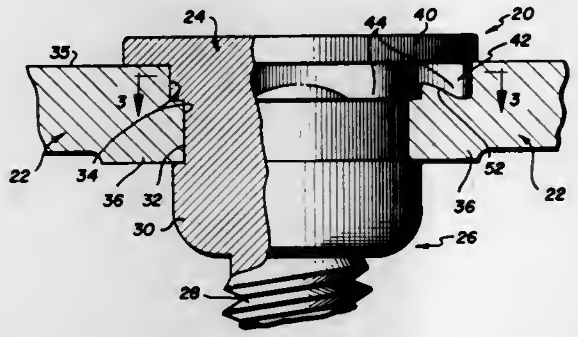
5. A carrier for loose articles, comprising sheet material means of a predetermined configuration capable of being spread out to receive one or more loose articles at a substantially central region of said sheet material means, a plurality of opening-forming means carried by said sheet material means at spaced parts thereof beyond said central region and respectively defining openings, and a single filamentary means fixed to and extending from said sheet material means at a location beyond said central region thereof and spaced from said plurality of opening-forming means, whereby said single filamentary means can be passed through said openings of said plurality of opening-forming means to gather them together for forming from said sheet material means a pouch-like enclosure capable of hanging down from the gathered plurality of opening-forming means with one or more articles therein while filamentary means facilitates carrying the enclosure, said sheet material means having an elongated substantially rectangular configuration and said plurality of opening-forming means including one pair of opening-forming means carried by said sheet material means inwardly of one end thereof and adjacent opposed side edges thereof while a third opening-forming means and said filamentary means are carried by said sheet material means inwardly of an opposed end thereof and respectively adjacent said opposed side edges thereof, whereby beyond said pair of opening forming means and beyond said third opening-forming means and said filamentary means there are free end regions of said sheet material means which can be folded inwardly towards its central region prior to passing said filamentary means through said openings of said three opening-forming means.

3,967,669
CLINCH TYPE FASTENER

Ronald J. Egner, Birmingham, Mich., assignor to Textron, Inc., Providence, R.I.
Continuation-in-part of Ser. No. 467,213, May 6, 1974, abandoned. This application Oct. 29, 1974, Ser. No. 518,522
Int. Cl.² F16B ***39/282***
U.S. Cl. 151—41.73 **13 Claims**

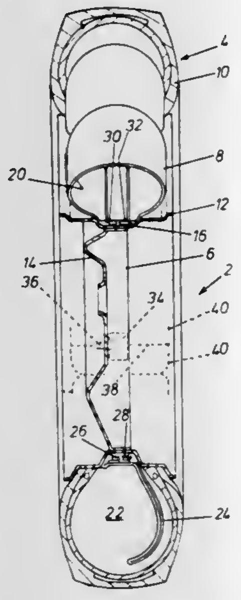
1. A self-clinching fastener of the type for connection to a section of sheet material, or the like, having an aperture formed therein, said fastener including a head and a shank portion, with a groove formed in said shank, with said head being embeddable in said sheet material to displace material into said groove to form a mechanical interlock between said material and said fastener, said shank including a tapered extruding portion having a surface converging in a direction away from said head, said surface merging with a cylindrical surface which provides a smooth, cylindrical, relatively elongate, continuous periphery for said extruding portion and which also defines the maximum diameter thereof, said maximum diameter selected to be **greater than the** diamter of said

aperture whereby upon engagement of said extruding portion with said sheet material, said aperture will be resized to approximately said maximum diameter, said groove in said shank being disposed adjacent said head, and intermediate said head and said extruding portion, with the outer radial dimension of said groove, axially remote from said head being defined by said cylindrical surface of said extruding portion whereby the inner peripheral wall of said resized aperture, subsequent to engagement by said extruding portion, but prior to the embedding of said head in said sheet material, will closely overlie said groove, said head including a plurality of radially disposed projections, said projections being sized such that the volume thereof is approximately equal to the volume of said groove, whereby the volume of the material displaced upon embedding of said head in said sheet material is equal to or greater than the volume of said groove, whereby, due to the close overlying of said inner periphery of said aperture with said groove, it is assured that the material displaced will completely fill said groove upon the embedding of said head in said sheet material.



3,967,670
TIRES

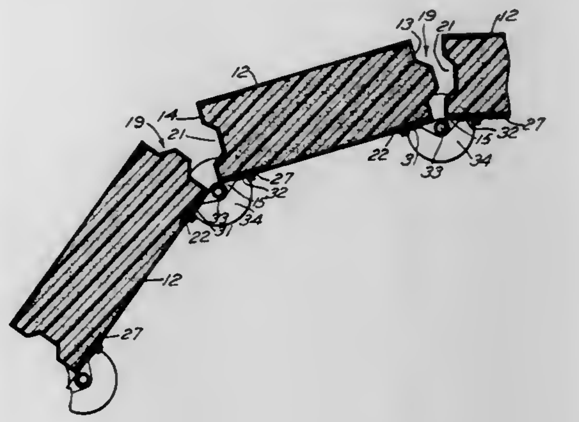
Alan J. Brickwood, Loughborough, England, assignor to Molehurst Limited, Leicester, England
Filed Apr. 3, 1975, Ser. No. 564,676
Claims priority, application United Kingdom, Aug. 20, 1974, 36491/74
Int. Cl.² B60C ***5/06***
U.S. Cl. 152—337 **7 Claims**



1. Multi-compartment tire comprising:
- A. a plurality of compartments arranged in succession around the periphery of the tire;
- B. a first annularly extending passage, and first one-way valve means located between the first passage and each of said compartments and adapted to block flow of air from each of said compartments to the first passage;
- C. a second annularly extending passage, and second one-way valve means located between the second passage and each of said compartments and adapted to block flow of air from the second passage to each of said compartments;
- D. a main valve housing connected to the first passage and to the second passage, an external port for supplying air to or venting air from the housing, a valve chamber in the main valve housing continuous with the external port, a first internal port continuous with the valve chamber and connected to the first passage, a second internal port continuous with the valve chamber and connected to the second passage; and
- E. a first valve member located at least in part in the chamber movable into a first position in which the external port is open and the internal ports are in direct intercommunication and biassed to a second position in which the external port is closed and in which the first valve member separates the internal ports to restrict communication between them.

3,967,671
UPWARDLY-ACTING SECTIONAL DOOR

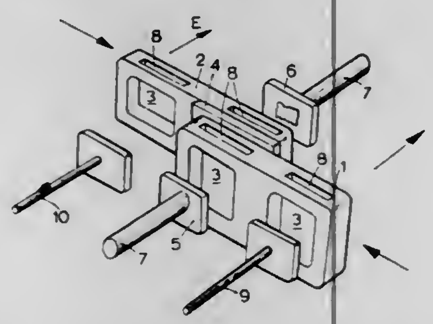
Ralph W. Stanley, 30 Sutherland Road, North Attleboro, Mass. 02760; Norman G. Compton, 856A Oakridge Ave., North Attleboro, Mass. 02760, and Lionel J. Bibeault, Eaton St., Cumberland, R.I. 02864
Filed Jan. 6, 1975, Ser. No. 538,598
Int. Cl.² E06B ***3/16, 3/48***
U.S. Cl. 160—232 **4 Claims**



1. An upwardly-acting sectional door or the like comprising a plurality of elongated horizontally extending sections in edge to edge adjacency, each section comprising opposite sheet material face skins of a relatively dense material over substantially the entire area of the section faces with a filling of a relatively porous material between said skins, edge closure means between said skins at the edge of each section, the closure means being formed to define a tongue at one edge and a mating groove at the other, continuous reinforcing means adjacent the opposite longitudinal edges of at least one of said skins and in contact with the skin over a substantial width thereof, said closure means and reinforcing means being of the same piece of material and hinge means contacting the face of the skin at opposite edges of said section at the location of said reinforcing means for hingedly connecting the longitudinal edge portions of adjacent sections, and means passing through said hinge means, said skin and into said reinforcing means to attach said hinge means to the face of said section.

3,967,672
MAKING FOUNDRY MOULDS

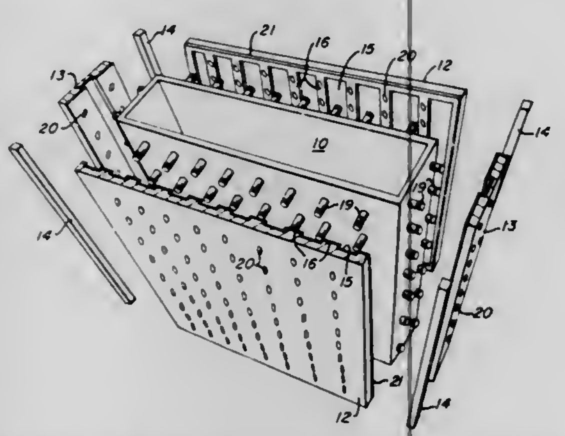
Charles Michael Geoffrey Wallwork, Church Cottage, Birtles Lane, Over Alderley, Cheshire, England
Filed June 26, 1975, Ser. No. 590,713
Claims priority, application United Kingdom, June 26, 1974, 28261/74
Int. Cl.^{2} B22C *15/02*
U.S. Cl. 164—181 **9 Claims**



8. A machine for automatically producing flaskless foundry moulds, said machine comprising a first slider having a first aperture therethrough, a second slider having a second aperture therethrough, a bolster plate, said first and second sliders each being reciprocable on parallel paths on opposite sides of said bolster plate between first positions in which said apertures are aligned with said bolster plate and second positions in which said apertures are clear of said bolster plate, opposed aligned power-operated first and second pattern plates movable towards opposite sides of said bolster plate and adapted to enter said apertures respectively to define moulding chambers, sand-blowing means adapted to blow sand into said moulding chambers to form therein single-sided moulds back to back, and ejector means aligned with said second positions of said apertures to eject moulds therefrom.

3,967,673
CONTINUOUS-CASTING MOLD WITH MINIMAL THERMAL RESTRAINT AND METHOD OF MAKING

John E. Bower, Jr., Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Dec. 11, 1974, Ser. No. 531,652
Int. Cl.^{2} B22D *11/04*
U.S. Cl. 164—82 **10 Claims**

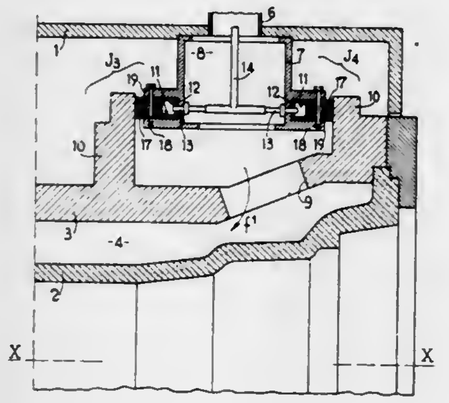


6. A method of minimizing the thermal restraint in a continuous-casting mold having an open-ended liner of a metal of high heat conductivity, backing plates including side and end plates of a different metal for providing mechanical strength secured to said liner by means of rows of vertically spaced studs secured to said liner with vertically spaced matching openings in said backing plates and means including a plurality of channels on the inside faces of said side and end plates for circulating fluid between said backing plates and said liner, the static and dynamic coefficients of friction opposing relative movement between metals of said liner and said backing plates when their surfaces are in direct contact being at least 0.3; said method comprising the step of:

applying a coating selected from the group consisting of Teflon, graphite and molybdenum disulfide to one of said liner and said backing plate to lower the coefficient of friction opposing relative movement to a maximum value of about 0.1, whereby the liner can move readily with respect to said backing plates in response to differential thermal expansion to minimize the restraint of said thermal expansion and thereby minimizing permanent distortions and thermal stresses in said liner.

3,967,674
SEALING STRUCTURE FOR A MACHINE FOR CENTRIFUGALLY CASTING PIPES AND MACHINE INCLUDING SAID STRUCTURE

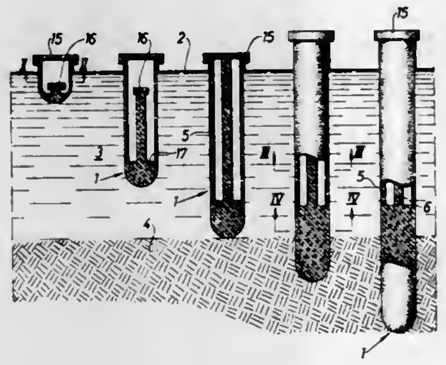
Pierre Henri Marie Fort, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France
Filed Feb. 10, 1975, Ser. No. 548,836
Claims priority, application France, Feb. 20, 1974, 74.05757
Int. Cl.^{2} B22D *13/02;* **F16J** *15/00*
U.S. Cl. 164—297 **2 Claims**



1. In a centrifugal casting machine comprising a rotary mould, a non-rotating casing surrounding the mould, means defining a cooling water circuit for containing water for cooling the mould, the water circuit comprising means defining a water jacket adjacent and surrounding the mould, an annular radial flange integral with the mould, a ring axially spaced from and coaxial with the flange and integral with the casing, the ring and flange being part of the means defining the water circuit; the improvement comprising an annular sealing structure axially interposed between the flange and the ring and consisting of an annular recess which is formed in the ring and defined by two coaxial annular walls radially spaced apart and a transversely extending inner end wall, an inflatable elastically yieldable annular tubular chamber located in the recess in adjoining relation to the inner end wall, means for inflating the annular chamber, a rigid annular sealing member having two coaxial cylindrical surfaces and a planar outer end surface terminating the cylindrical surfaces, the sealing member being mounted in the recess so that said cylindrical surfaces are respectively in close axially slidable contact with said two annular walls and the sealing member is in axially adjoining relation to the chamber, and means for precluding rotation of the sealing member relative to the ring, the sealing member having a portion which extends axially beyond the ring and is defined by a part of said cylindrical surfaces and said outer end surface, which outer end surface is in axially abutting sliding relation to the flange.

3,967,675
METHOD AND DEVICE FOR EXPLOITING THE GEOTHERMAL ENERGY IN A SUBMARINE VOLCANO

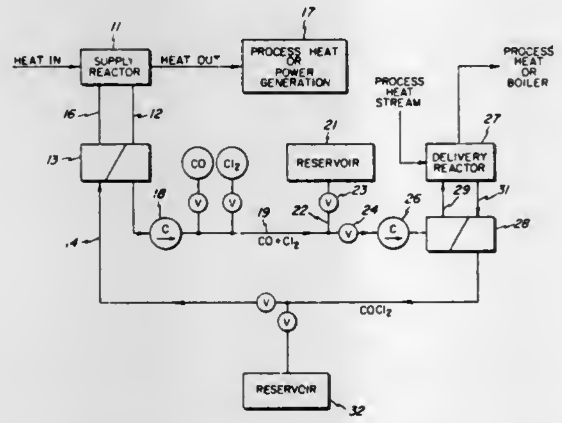
Hans Christer Georgii, Stockholm, Sweden, assignor to AB Hydro Betong, Stockholm, Sweden
Filed Apr. 7, 1975, Ser. No. 565,611
Claims priority, application Sweden, Apr. 8, 1974, 7404701
Int. Cl.^{2} E21B *43/24*
U.S. Cl. 165—1 **11 Claims**



1. A method for exploiting the geothermal energy in a submarine volcano, comprising the steps of arranging an elongated, substantially vertical, columnar concrete body in the orifice of the volcano in such a manner that said concrete body has its lower end submerged in the magma in the orifice of the volcano and extends vertically upwards from the surface of the magma through the water to the water surface above, said concrete body having such a displacement and such a weight that it floats in a balanced position in the magma and the water, and conveying a coolant through internal cooling ducts in said concrete body from the upper end of the body downwards into the lower portion of the concrete body, which is submerged in the magma and where the coolant is heated by heat transfer from the surrounding magma, and returning the heated coolant through internal ducts in the concrete body to the upper end thereof, where the heat content in the heated coolant is utilized.

3,967,676
TRANSPORT OF HEAT AS CHEMICAL ENERGY

Henry S. Spacil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed July 1, 1974, Ser. No. 484,801
Int. Cl.^{2} F28C *3/00*
U.S. Cl. 165—2 **6 Claims**

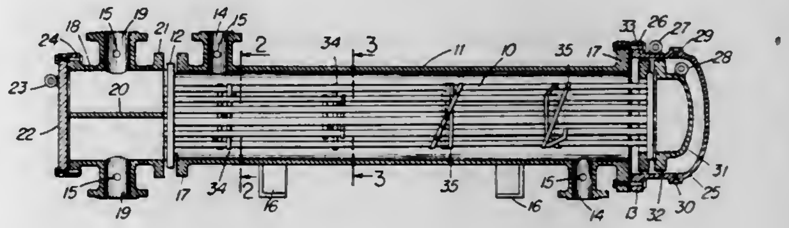


1. The process for transporting energy from a source of heat to an energy use area comprising the steps of:

- a. decomposing phosgene adjacent said heat source at a temperature in excess of about 700°C to produce a gas mixture consisting principally of carbon monoxide and chlorine,
- b. cooling said gas mixture to a temperature below about 40°C,
- c. pressurizing and transporting said gas mixture through a first conduit to said energy use area,
- d. heating said gas mixture,
- e. reacting said gas mixture in the presence of a catalyst at a temperature of at least about 250°C and a pressure of at least one atmosphere to release heat and yield principally phosgene gas,
- f. cooling the phosgene gas to a temperature in the range of from about 10°C to about 40°C,
- g. conducting said phosgene gas through a second conduit to said heat source,
- h. heating said phosgene gas and
- i. repeating the series of steps set forth above.

3,967,677
HEAT EXCHANGER BAFFLES

Paul Heinze Mohlman, Lawndale, Calif., assignor to Mobil Oil Corporation, New York, N.Y.
Filed May 28, 1975, Ser. No. 581,457
Int. Cl.^{2} F28F *9/00*
U.S. Cl. 165—162 **3 Claims**



1. In a shell and tube square pitch heat exchanger having a longitudinal shell, tube sheets at opposite ends of said shell, a plurality of parallel tubes in a bundle of generally cylindrical form extending between said tube sheets and arranged in a pattern such that the center lines of any four adjacent tubes are at the corners of a square, means to introduce fluid to said tubes and withdraw fluid from said tubes at the faces of said tube sheets, means to introduce fluid to the interior of said shell external of said tubes and to withdraw fluid therefrom;

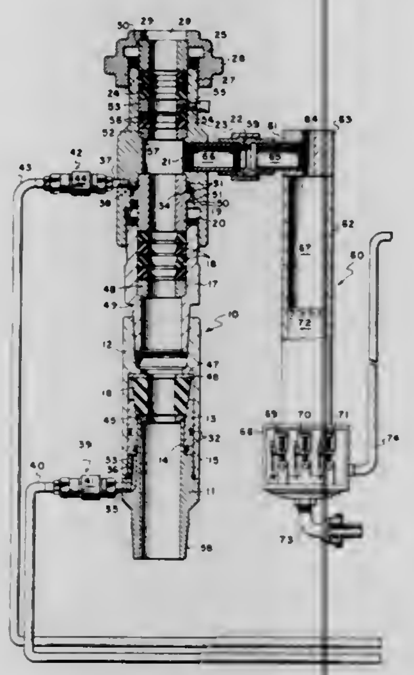
the improved structure for baffling flow of shell side fluid and for supporting and stabilizing said tubes which comprises a first set of parallel rods extending between said tubes across said shell positioned in alternate spaces between tubes, a second set of parallel rods extending parallel to rods of said first set between said tubes across said shell in the spaces not so occupied by rods of said first set, third and fourth such sets arranged in like manner to said first and second sets, respectively, but at right angles to said first and second sets, successive rods of each set being spaced along the length of the exchanger to define a plane at an acute angle to the axis of said exchanger, whereby the ends of the rods in any said set define an ellipse, the rods being disposed parallel to the minor axis of said ellipse.

3,967,678
STUFFING BOX CONTROL SYSTEM

Henry Wayne Blackwell, Venus, TX, assignor to Dresser Industries, Inc., Dallas, Tex.
Filed June 2, 1975, Ser. No. 583,146
Int. Cl.^{2} E21B *43/00*
U.S. Cl. 166—53 **15 Claims**

1. A rod-pump stuffing box system for attachment to a wellhead having a rod pumping unit; said system comprising:

housing means adapted to encircle a rod-pump polished rod and attached to a wellhead;
seal means in said housing means adapted to be urged into sealing engagement with said housing means and a polished rod passing therethrough;
piston means mounted slidably in said housing means, having a pressure response surface thereon, and arranged to abut said seal means;



pressure source means adapted for communicating pressurized fluid to said pressure response surface;
leak detection means communicating with said housing means and arranged for detecting well fluid leakage past said seal means; and,

actuator means operably connected to said detection means and said pressure source means and arranged to actuate said pressure source means upon detecting a predetermined amount of well fluid leakage.

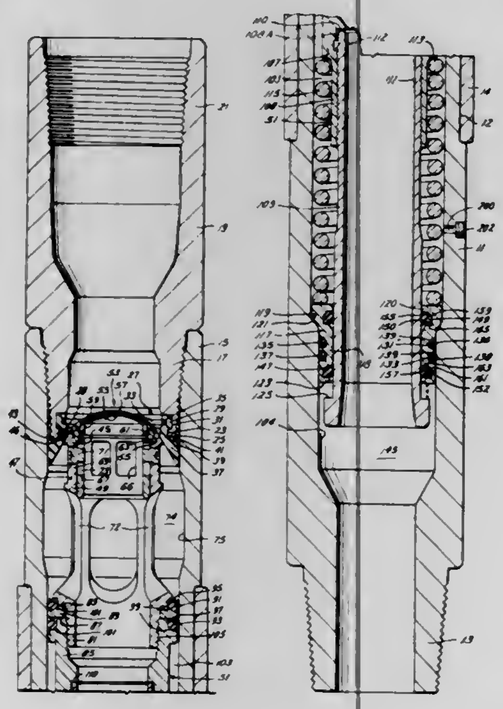
3,967,679
MUD SAVER VALVE

Walter Emanuel Liljestrand, Midland, Tex., assignor to Smith International, Inc., Houston, Tex.

Filed Feb. 21, 1975, Ser. No. 551,898

Int. Cl.² E21B *21/00, 41/00*

U.S. Cl. 166—224 A **15 Claims**



1. Mud saver valve adapted for connection between a kelly and a string of drill pipe comprising

a tubular valve body having means at its lower end for making connection to a string of drill pipe and tapered threaded and shouldered means at its upper end for making a rotary shouldered connection to a top sub,
a tubular top sub having means at its upper end for making connection to a kelly and tapered threaded and shouldered means at its lower end for making a rotary shouldered connection to said tapered threaded and shouldered means on the valve body,
said top sub having a downwardly facing valve seat forming part of a poppet valve,
closure means for said poppet valve including a seating portion adapted to engage and seal with the poppet valve seat,
said closure means including a stem extending downwardly from said seating portion,
said stem including an upper part and a lower part,
screw thread means connecting said upper and lower parts of the stem,
said stem having a downwardly facing shoulder on the upper part thereof and an upwardly facing shoulder on the lower part thereof,
an annular chamber between the stem and body,
said chamber having an upwardly facing shoulder,
bridge means around said stem overlying said chamber shoulder and said upwardly facing stem shoulder, and
spring means disposed around said stem in said chamber and under compression, bearing at its lower end against said bridge and at its upper end against the downwardly facing shoulder on the stem,
said bridge being separated from the upwardly facing stem shoulder when the valve is in use but engageable with said shoulder when the top sub is unscrewed.

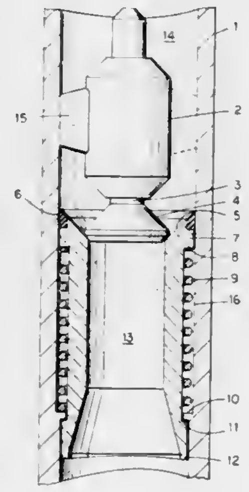
3,967,680
METHOD AND APPARATUS FOR ACTUATING A DOWNHOLE DEVICE CARRIED BY A PIPE STRING

John Doise Jeter, Dallas, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed Aug. 1, 1974, Ser. No. 493,712

Int. Cl.² E21B *23/04, 3/12*

U.S. Cl. 166—250 **18 Claims**



1. A method for selectively actuating downhole devices carried by a pipe string comprising; the establishment of a preselected rotation rate of said pipe string to select the function, for subsequent execution, to be carried out down hole, then changing the rate of flow of fluid through said pipe string from one preselected rate to another to cause execution of the function, then changing at least one of said rates to another value to secure the selected function against further change.

3,967,681
REPAIR OF CEMENT SHEATH AROUND WELL CASING

James E. Curzon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 30, 1975, Ser. No. 618,194

Int. Cl.² E21B *33/138, 33/14*

U.S. Cl. 166—277 **3 Claims**

1. A method for repairing a cement sheath around a casing in a well bore comprising:
a. inserting a retainer within the casing below perforations in the casing adjacent an area requiring cement sheath repair;
b. inserting a packer within the casing above perforations in the casing adjacent an area requiring cement sheath repair;
c. injecting a gellable polymer composition from the casing through the perforations into the adjacent underground formation;
d. allowing the polymer to gel;
e. thereafter injecting sufficient cementitious material into the well bore around the casing with application of sufficient pressure to squeeze gel from the well bore into the formation and replace the gel with cementitious material;
f. allowing the cementitious material to set under pressure; and
g. removing the packer, cementitious material and retainer from the casing interior.

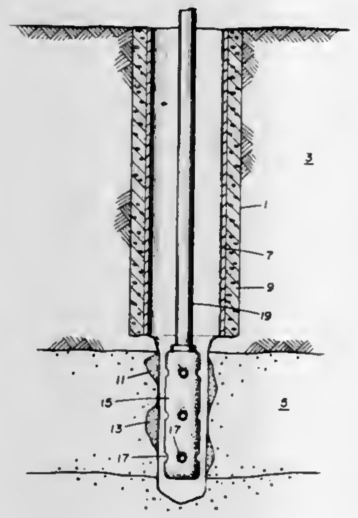
3,967,682
METHOD OF PRODUCING HYDROCARBONS FROM AN UNCONSOLIDATED FORMATION

Nathan Stein, and John P. Heller, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York City, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,663

Int. Cl.² E21B *43/04*

U.S. Cl. 166—278 **6 Claims**



5. A method of producing hydrocarbons from an unconsolidated hydrocarbon-bearing formation that is penetrated by a cased well having openings through the casing that provide an open production interval communicating with said formation, comprising:
a. positioning within said casing in said well adjacent said open production interval a packer having a plurality of lateral passageways extending therethrough to provide fluid communication intermediate the inside of said casing and the inside of said packer;
b. positioning water-wet granular particles in said casing to essentially fill the annulus formed intermediate said packer and said open production interval;
c. applying pressure via said packer to said water-wet granular particles in said annulus to stabilize said water-wet granular particles; and
d. forming sand arches in said water-wet granular particles to further stabilize said water-wet granular particles.

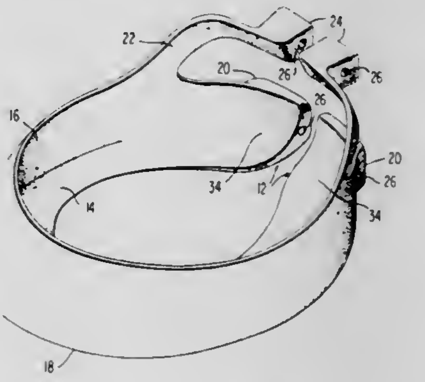
3,967,683
EQUINE HOOFWEAR

Juan Saavedra Ensinozo, Primera Calle del Casquillo, Edificio "Maitena", Apartment No. 7, Urbanizacion Avila, Caracas, Venezuela

Filed Sept. 27, 1974, Ser. No. 509,816

Int. Cl.² A01L *3/00*

U.S. Cl. 168—4 **8 Claims**



1. Equine footwear comprising a split ring of a configuration approximating the configuration of a hoof and having the split at the heel portion thereof, said ring having an acute angle cross-section including a lower flange for underlying the bottom of a hoof and an upper flange for overlying the outer sides and front of a hoof, said lower flange being inclined upwardly to conform to the normal concavity of the bottom of a hoof, and said upper flange being inclined inwardly to conform to the normal slope of the outer surfaces of the front and sides of a hoof, said ring constituting a resilient material enabling expansion and contraction thereof for mounting and dismounting said ring relative to a hoof and for enabling said hoof to expand and contract during movement of the animal, and means for adjustably and releasably securing the ring ends at the split to positively mount the ring on the hoof, said securing means comprising a strap extending at an angle upwardly and rearwardly from each side of said ring with the ends of said straps curved inwardly toward each other and overlying said ring ends, and releasable, adjustable fastener means joining said strap ends and said ring ends, said straps being integral with said ring.

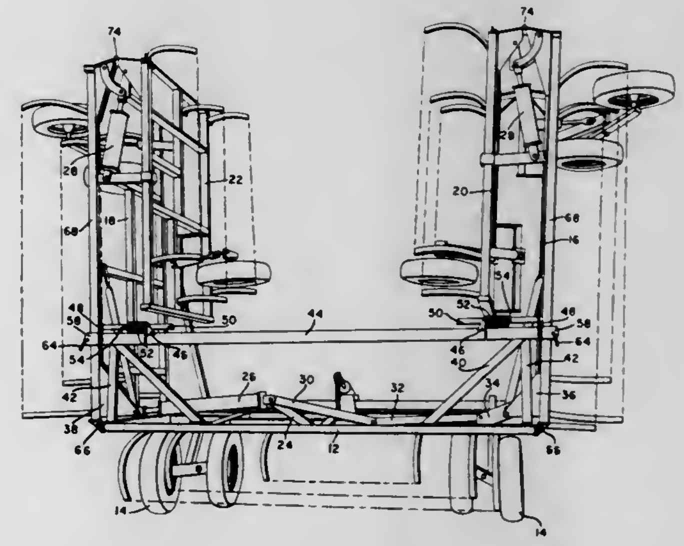
3,967,684
WINGFOLD POSITIONING DEVICE

Virgil Dean Haverdink, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 1, 1974, Ser. No. 493,539

Int. Cl.² A01B *63/14, 49/00*

U.S. Cl. 172—311 **1 Claim**



1. In a foldable multiple sectioned farm implement having a center section having ground wheels; outer sections in substantial transverse horizontal alignment with said center section; fore-and-aft pivotal connections joining the center and outer sections; the improvement residing in outer section positioning means comprising: a transverse brace member positioned above, substantially abridging the transverse expanse of, and secured to the center section; an outwardly opening U-shaped stop means secured to each end of the brace member above each pivot formed by said pivotal connections; at least one single-acting hydraulic cylinder connected to and for moving the outer sections by its power stroke upwardly to an inboard position whereat the outer sections engage their respective stop means and in which position the outer sections'to centers of gravity are located inboard of the pivots; latch means operatively connected with the center section to disconnectibly engage the raised outer sections and secure them in their inboard positions; and biasing means carried by said brace member for abutting said outer sections to exert outward forces against the outer sections when their respective centers of gravity shift inboard of the respective pivots, said biasing means including two pairs of transversely spaced apart support mounts, each of said pairs being secured to a different end portion of the brace member from the other of said pairs, a pair of rods, each of said rods being slidably supported in a different pair of mounts from the other of said rods, said rods being slidably supported in said mounts for transverse movement, each of said rods having a stop secured thereto, a pair of helical springs, each of said helical springs coaxially surrounding one of said rods and extending between one of said support mounts and said stop of said one of said rods.

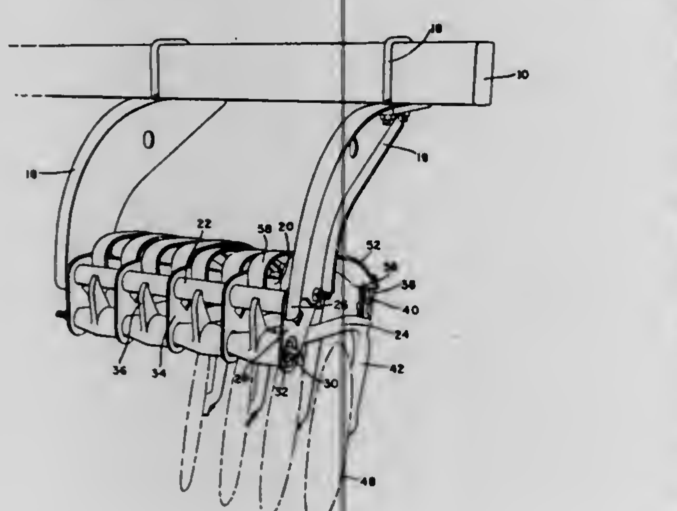
3,967,685
INDEPENDENT AND BIASED CULTIVATOR SUPPORT

David August Siekmeier, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 5, 1974, Ser. No. 485,933

Int. Cl.² A01B *35/28, 21/04, 15/16, 5/04*

U.S. Cl. 172—573 **2 Claims**



1. A rotary cultivator implement comprising: a main frame including a toolbar extending transversely across an expanse of a plurality of row crops; a plurality of transversely spaced fore-and-aft extending subframe members mounted in pairs on the toolbar, some pairs of which extend from rear portions fixed to the toolbar to forward end portions spaced in front of the toolbar, and some pairs of which extend rearwardly from front portions fixed to the toolbar to rear end portions spaced to the rear of the toolbar; transversely extending upper and lower vertically spaced-apart and horizontal pivot support members mounted between the aforesaid subframe end portions of the respective pairs of subframe members; a plurality of T-shaped cultivator-carrying arms each having a horizontal stem portion extending rearwardly from and supported on the lower pivot support member for vertical swinging movement thereabout and a rear vertical portion projecting above and below the horizontal portion at its rear end; a plurality of leaf springs supported on the upper pivot support member for vertical swinging movement thereabout, each spring vertically offset above a horizontal arm portion and extending rearwardly from and supported to swing vertically on the upper of the pivot support members; means connecting each spring with the vertical portion above the horizontal portion whereby each spring will yieldably resist upward vertical movement of its respective arm; and rotary cultivator members supported on rear portions of the arms below their respective horizontal portions.

3,967,686
DEVICE FOR GUIDING A DRILL TOOL

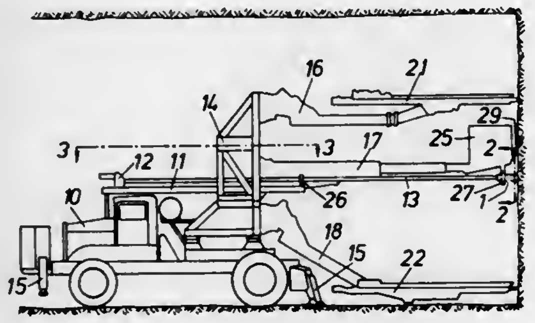
Gosta Fögelström, 9 Nackanasparken, 131 00 Nacka, Sweden

Continuation of Ser. No. 423,002, Dec. 10, 1973. This application May 19, 1975, Ser. No. 578,609

Claims priority, application Sweden, Dec. 13, 1972, 16242/72

Int. Cl.² E21C *11/02, 5/00*

U.S. Cl. 173—22 **3 Claims**



1. In a drill rig supporting vehicle including a frame supporting a drilling machine having a feed beam mounted on the vehicle frame, a drill tool connected to the drilling machine and displaceably carried on the feed beam, the feed beam being movable relative to the vehicle frame and a drill guide means for guiding the drill tool, the improvement in the drill guide means enabling guiding of the tool at a substantial distance from the feed beam during collaring of a drill hole comprising a maneuverable arm mounted on the vehicle frame independent of the feed beam, the maneuverable arm being arranged to move separately relative to the feed beam, and a drill guide connected to the maneuverable arm at a location extending a distance from the feed beam, the drill guide being cooperatively arranged to selectively guide the drill tool proximate its drilling end during collaring of a drill hole and being mounted on a platform carried by said maneuverable arm; at least one drilling aggregate carried on the vehicle frame, the drilling aggregate having a drilling machine operatively associated therewith and the drilling aggregate being structurally adapted to drill in proximity to the drill tool after the drill hole has been collared without interferance of the feed beam.

3,967,687
CURB DRAIN HOLE DRILL

Dwight W. Fowler, 705 SW. 206th Ave., Aloha, Oreg. 97005

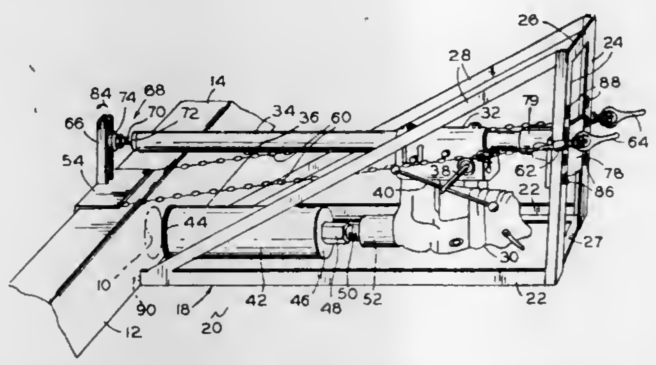
Filed July 29, 1974, Ser. No. 492,460

Int. Cl.² E01C *23/00*

U.S. Cl. 173—32 **5 Claims**

1. Apparatus for drilling a drain hole in a curb forming the edge of a street, said apparatus comprising:

- a horizontal support frame adapted to be placed in the street next to the curb in which the drain hole is desired, said frame including horizontally extending legs for abutting the curb on either side of the location of the desired hole, and adapted for supporting a horizontally disposed core drill extending longitudinally of said frame,
- a hooking member for placement over the top edge of said curb and including a downwardly extending portion for engaging the rear of said curb, wherein said hooking member is provided with a leg extending above the level of said curb and horizontal post means interposed between said frame and said leg for applying force toward said leg from the direction of said frame,



- and a pair of chains attached to said hooking member for urging said frame toward said curb including a pair of tightening means for securing said chains relative to said frame.

3,967,688
FUEL INJECTION DEVICE FOR AN IMPACT ATOMIZATION-TYPE DIESEL PILE HAMMER

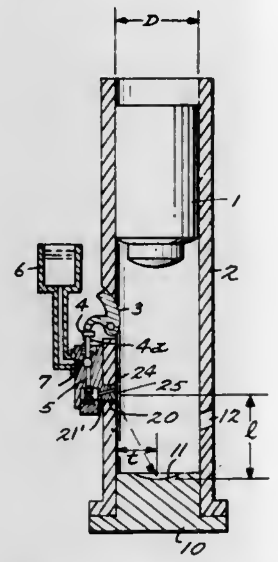
Noriyasu Inenaga, and Mataji Tateishi, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 497,118, Aug. 12, 1974. This application June 2, 1975, Ser. No. 582,932

Claims priority, application Japan, Aug. 14, 1973, 48-90527

Int. Cl.² E02D *7/12*

U.S. Cl. 173—137 **4 Claims**



1. In a diesel pile hammer of the impact atomization type wherein a piston sliding in a cylinder periodically impacts a concave, fuel-receiving saucer provided on an impact block, a fuel injection device for periodically supplying a vertical stream of fuel impinging on the saucer, said fuel injection device comprising:

- a nozzle body having means defining a socket therein, in communication with an upstream end thereof;
- a bar received in the socket from said end for rotation about its own longitudinal axis, and the socket downstream of the bar defining a vortex chamber;
- means for selectively fixing the angular disposition of the bar relative to the nozzle body;
- said bar being relieved from along the length thereof to provide a fuel passage from the upstream end of the nozzle body to the vortex chamber, the outlet of said fuel passage into the vortex chamber being laterally displaced from the longitudinal axis of the bar so that rotation of the bar affects the spatial relation of said outlet to said vortex chamber; and,
- means defining a nozzle opening extending through the nozzle body from the vortex chamber for ejecting fuel from the vortex chamber;
- the bar being so angularly oriented in the socket that both of the following conditions are simultaneously met:

$$\frac{40}{100} D - 20 \leqq t \leqq \frac{60}{100} D \tag{i}$$

$$C \leqq \frac{125}{100} D - 7.5, \tag{ii}$$

wherein:

D is the cylinder diameter (in mm);

t is the distance (in mm) from the injection nozzle to the geometrical point of impingement of the fuel on the saucer, measured in parallel with a horizontal projection of an imaginary straight line connecting the injection nozzle and the geometric center of the saucer; and,

C is the deviation (in mm) of the geometrical point of impingement of the fuel on the saucer from the center of the saucer as represented by the minimum distance from a horizontal projection of an imaginary straight line connecting the injection nozzle and the geometric center of the saucer.

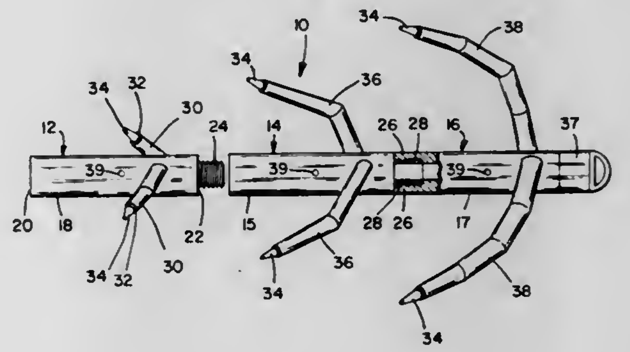
3,967,689
REAMING APPARATUS

Martin D. Cherrington, Sacramento, Calif., assignor to Tidril Corporation, Sacramento, Calif.

Filed Sept. 25, 1974, Ser. No. 508,964

Int. Cl.² E21B *9/22*

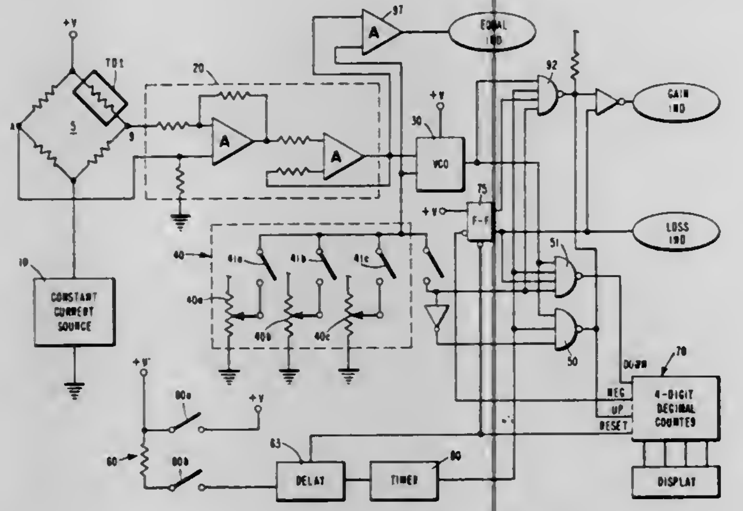
U.S. Cl. 175—391 **8 Claims**



1. A reamer stage comprising a central cylindrical stem having a leading end and a trailing end, said leading end having coupling means of a first type and said trailing means having coupling means of a second type complementary to the first type, and a plurality of circumferential arms extending outwardly from and attached to the cylindrical stem, the free ends of said arms being tubular to provide an axial opening at said free ends, each said arm having a generally arcuate shape so that the free ends of said arms are forwardly and outwardly directed with respect to the stem and the free ends of each of the arms are inclined to the side in a common direction with respect to the axis of the stem so that said arms form a corkscrew configuration, and a plurality of reamer teeth, each reamer tooth having a cutting portion and a shaft portion, said shaft portion adapted to mate with the opening in the free ends of the arms so that the cutting portion of each reamer tooth is coaxial with the free end of each associated arm.

3,967,690
DIGITAL READOUT DIET SCALE

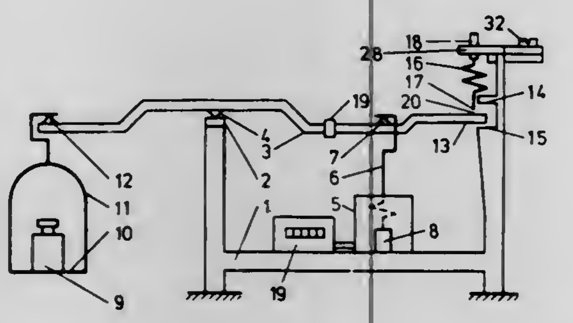
Michael E. Northcutt, Mountain View, Calif., assignor to Aledyne Corporation, Los Altos, Calif.
Continuation-in-part of Ser. No. 445,218, Feb. 25, 1974, abandoned. This application Jan. 7, 1975, Ser. No. 539,109
Int. Cl.² G01G *19/04, 23/14;* **G06F** *7/38*
U.S. Cl. 177—25 **15 Claims**



1. A scale for use in a personal dieting program, comprising:
weight measuring means sensitive to weight increments at least as small as ½ pound for a weight measured by said scale;
means for storing a previous measurement of weight for comparison with a subsequent measurement; and
a digital display capable of displaying both said subsequent weight measured by said scale and the difference between said subsequent weight and said previous weight measured, indicating either weight gain or loss, said digital display providing for display of said subsequent weight measurement and said weight difference in increments at least as small as ½ pound, whereby measured weight gains and losses on the order of ½ pound may be observed by the user of said scale to thereby assist his dieting program.

3,967,691
MASS AND FORCE MEASURING INSTRUMENT

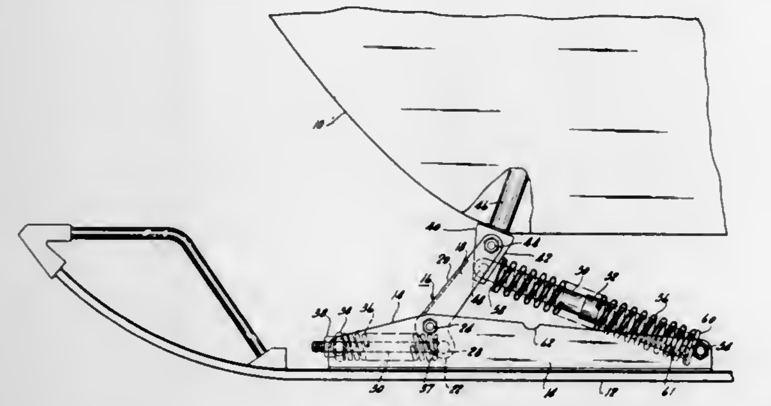
Armin Wirth, Zurich, Switzerland, assignor to Wirth, Gallo and Company, Switzerland
Filed Aug. 13, 1974, Ser. No. 496,953
Claims priority, application Switzerland, Nov. 16, 1973, 16253/73
Int. Cl.² G01G *23/26*
U.S. Cl. 177—230 **4 Claims**



1. In a mass and force measuring instrument comprising a load support, load-compensating means with very small travel, transmission elements transmitting a force depending on the load to the load-compensating means, display means, at least one pair of linearizing springs whose forces vary continuously and act on the load-compensating means in a direction parallel to that of said force depending on the load, said linearizing springs being active each only in a different part of the measuring range.

3,967,692
SNOWMOBILE SUSPENSION SYSTEM

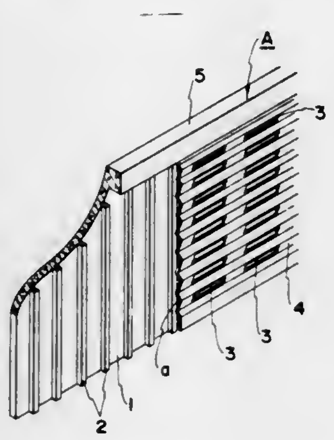
Elmer H. Hoffman, 728 Wilson St., Oconomowoc, Wis. 53066
Filed Sept. 26, 1974, Ser. No. 509,692
Int. Cl.² B62M *27/00*
U.S. Cl. 180—5 R **22 Claims**



1. A suspension system for mounting an elongated ski like member having forward and rear ends below a vehicle comprising:
a link having a lower end including a pivot point rotatably mounted on a central portion of the ski and an upper end pivotally secured in means on the vehicle, the mounting of said link providing movement in the vertical longitudinal plane of the ski;
first compressively resilient means coupled between said lower end of said link and the ski for inclinedly positioning said link relative to the ski and for resisting first relative pivotal movement between the ski and said link about said pivot point exemplified by a raising of the rear end of the ski; and
second compressively resilient means coupled between the rear end of the ski and said means pivotally securing the upper end of said link for resisting rotation of the ski which raises the rear end of the ski.

3,967,693
APPARATUS FOR DISMISSING OR DECREASING SOUND'S ENERGY

Isao Okawa, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 23, 1974, Ser. No. 472,882
Claims priority, application Japan, May 24, 1973, 48-57157[U]
Int. Cl.² E04B *1/82*
U.S. Cl. 181—33 G **3 Claims**

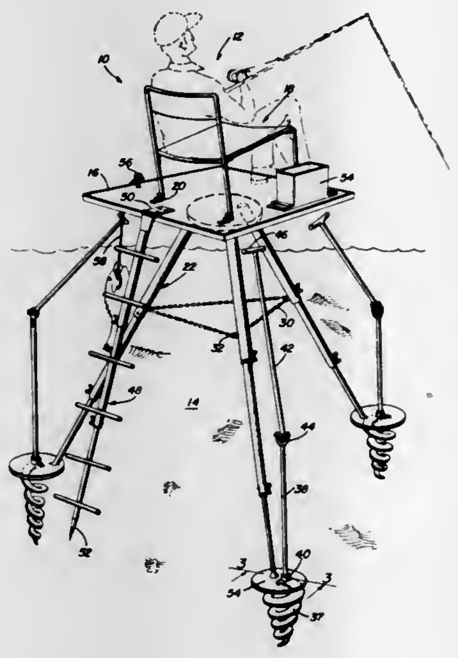


1. A sound decreasing means for decreasing the pressure of sound at a wall surface comprising:
a vertical wall;
a plurality of spaced apart ribs, each attached to said wall;
an edge plate attached to said ribs and to said wall along the top horizontal edge thereof;

a cover coat laminated to each of said ribs and oriented essentially parallel with said wall so that said cover and said wall form with said ribs and said edge plate a plurality of chambers, said cover comprising a porous surface bent into a wave-form having peaks and recesses, said surface having defined therethrough a plurality of holes associated with each chamber and positioned in said recesses of said surface so that air can enter into each chamber through said plurality of holes.

3,967,694
PORTABLE SURF FISHING PLATFORM

Martin Y. Woolfolk, Sr., 3840 Cherry St., Zachary, La. 70791
Filed Aug. 8, 1974, Ser. No. 495,920
Int. Cl.² A47C *7/62*
U.S. Cl. 182—82 **10 Claims**

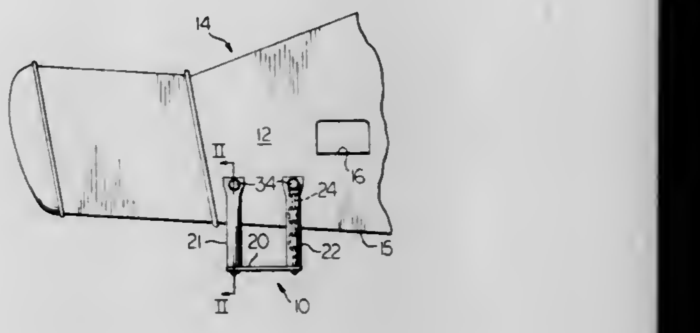


1. A portable platform adapted to be installed in shallow water for surf fishing purposes, comprising a substantially horizontal support, at least three extensible leg assemblies pivotally connected to said support, means connected to said leg assemblies for holding the same in predetermined angular relation to the support, a plurality of bearing plates respectively connected to said leg assemblies in parallel spaced relation to the support, means for anchoring the support, and actuating means connected to the anchoring means and manually operable from the support for embedding the anchoring means in a sandy surface formation below the water, said actuating means including an elongated actuating rod connected to the anchoring means and handle means pivotally connected to the actuating rod above the water for threadedly inserting or withdrawing the anchoring means into or from the sandy surface formation.

3,967,695
YIELDABLE VEHICLE STEP

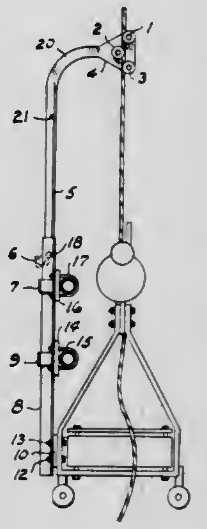
Bennett N. Waddell, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 17, 1975, Ser. No. 614,054
Int. Cl.² B60R *3/00*
U.S. Cl. 182—86 **10 Claims**

1. A yieldable step for a vehicle having a frame portion including a side surface and a lower edge along such side surface, said yieldable step comprising:
an elongated rigid foot supporting portion;
a pair of upright leg portions, each leg portion including a length of steel chain and a tubular stiffener member of resilient material provided about said chain and substantially coextensive therealong;
means for securing one end of each chain to a respective one of the opposite ends of the foot supporting portion; and
means for attaching the other ends of said chains in spaced apart relation on said side surface of the frame so as to pendantly mount the foot supporting portion in a horizontal position below said frame portion, said means being disposed a sufficient distance above said lower edge of the side surface so that the adjacent ends of the stiffener members are supported by the side surface, said stiffener members providing sufficient lateral rigidity to said leg portions so as to keep the foot supporting portion in its proper position for normal mounting purposes while permitting the leg portions to be deflectable when the step encounters an obstacle during movement of the vehicle.



3,967,696
STAGE SAFETY STABILIZER

Donald James Nix, P.O. Box 60396, Oklahoma City, Okla. 73106
Filed July 8, 1974, Ser. No. 462,316
Int. Cl.² E04G *3/10*
U.S. Cl. 182—142 **1 Claim**

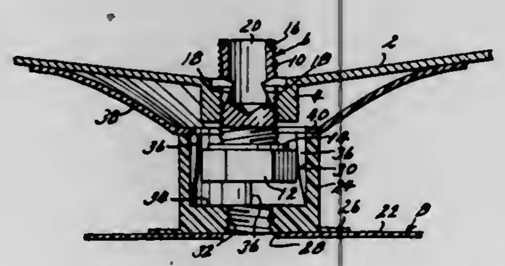


1. A stabilizer for a cable suspended platform of the type in which vertical movement of the platform is achieved by winding and unwinding an intermediate portion of the cable on a reel mounted on the platform, comprising:
a vertically adjustable davit having a generally vertical depending end portion and having its upper off-set end portion flattened and lying in a vertical plane;
clamp means for connecting the depending end portion of said davit with a lateral surface of the platform;
upper and lower wheels journalled on horizontal axes in vertical spaced relation adjacent the end limit of the

off-set end portion of said davit remote from the vertical axis of its depending end portion; and,
an intermediate wheel journalled on a horizontal axis by the offset end portion of said davit intermediate the vertical spacing between said upper and lower wheels and spaced laterally thereof toward the vertical axis of the depending end portion a distance sufficient to permit lateral movement of the platform suspension cable, when in a slackened condition, between confronting arcs of the peripheries of said wheels at their closest approach to each other,
said wheels each having a grooved periphery with the radius of the groove being substantially the same as the radius of the platform suspending cable,
whereby the grooves of said wheels are cooperatively aligned to define a generally vertical substantially circular, in transverse section, guide path diametrically not greater than the diameter of the platform suspension cable so that a platform raising and lowering action moves said wheels in a rolling action along the cable.

3,967,697
CRANKCASE OIL DRAINAGE AND COLLECTION DEVICE

Manfred H. Guenther, Rte. No. 2, Box 290 T, Belton, Mo. 64012
Filed Sept. 23, 1974, Ser. No. 508,512
Int. Cl.^{2} F16N *33/00*
U.S. Cl. 184—1.5 **3 Claims**

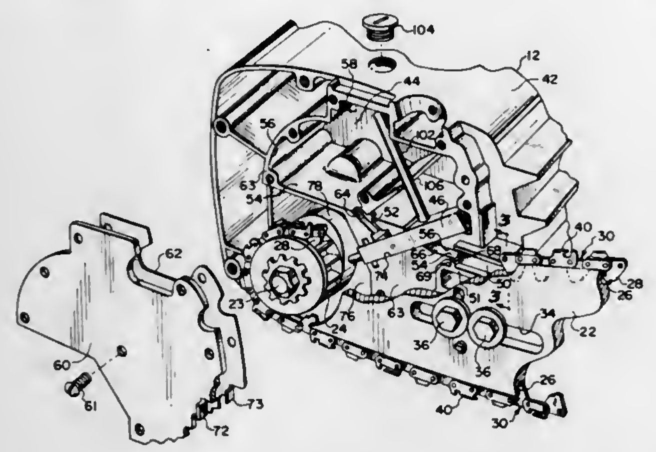


1. A device for use in draining and collecting oil from the crankcase of an automotive engine, the crankcase having a bottom drain opening constituting a tubular, internally threaded neck, said device comprising:

a. a drain plug having an externally threaded shank engageable in said crankcase neck, said plug being provided at its outer end with an enlarged head, and having an internal passage opening through the inner end portion of said shank, and laterally through the threaded surface of said shank in spaced relation from said head and from the inner end of said shank, whereby oil may drain through said passage when said plug is threaded outwardly sufficiently to position the lateral opening of said passage outwardly beyond the outer end of said crankcase neck, but with said plug still engaged in said neck, said plug having an intermediate position wherein said head, but not the lateral opening of said passage, is spaced outwardly from said neck,
b. a sealing gasket encircling said plug shank and operable to be compressed between said enlarged head and the outer end of said crankcase neck,
c. an oil container having a tubular neck positionable over said drain plug to receive oil drained from said crankcase through said plug, and
d. means for connecting said container neck to said drain plug, when said drain plug is in said intermediate position, said connecting means comprising flexible tabs carried internally in said container neck, said tabs being resiliently deflectable to admit said enlarged plug head into said container neck, but elastically recoverable to overlie the surface of said head facing said container neck, whereby to support said container from said plug, whereby when said plug is further advanced outwardly to a fully extended position, but still engaged in said crankcase neck, the transverse opening thereof is advanced outwardly beyond the outer end of said crankcase neck.

3,967,698
OILER FOR POWER CHAIN SAW

Richard Thomas Smith, and Michael T. Lay, both of Columbia, Mo., assignors to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 20, 1975, Ser. No. 560,535
Int. Cl.^{2} F16N *7/14*
U.S. Cl. 184—15 A **7 Claims**



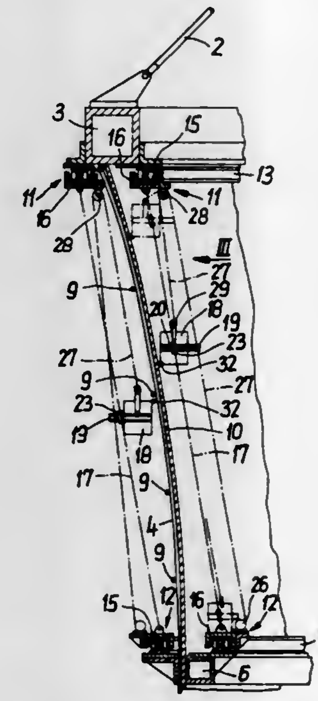
1. In a power chain saw having a cutting bar and a drive sprocket supported to rotate at varying speeds in line with the cutting bar, a cutting chain trained over the cutting bar and sprocket and guide means cooperating between the cutting bar and chain supporting the latter for rotation around the former, and oil distribution means to the cutting bar and chain guide means for lubrication of the same where the back pressure to the lubrication flow is minimal, the improvement comprising the combination therewith of a pump having an expansible pump chamber and having an oil inlet to and an oil outlet from the chamber, means defining an oil reservoir and an oil flow path that is uninterrupted between the reservoir and the pump inlet and between the pump outlet and the oil distribution means, means driving the pump at a speed related to the speed of the drive sprocket, the pump having oil pumping capacity at the lowest expected drive sprocket speed at least equal to a minimum lubrication flow and having oil pumping capacity well in excess of this minimum lubrication flow at full drive sprocket speed, and bypass flow means extending uninterruptedly from the pump outlet to the reservoir for bypassing the excess pumping capacity, and offering minimal resistence to oil flow therethrough and having its oil discharge point to the reservoir at such an elevation above the oil distribution means to develop a head back pressure against flow of the bypassing oil which of a magnitude minimally greater than the back pressure of the minimum lubrication flow, operable to bypass little, if any oil at the lowest expected drive sprocket speed, but to bypass progressively more oil directly into the reservoir automatically at faster speeds toward the full drive sprocket speed.

3,967,699
HOISTING APPARATUS, PARTICULARLY FOR A COOLING TOWER

Erich Jasch, Leeheim, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Jan. 6, 1975, Ser. No. 538,523
Claims priority, application Germany, Jan. 4, 1974, 2400313
Int. Cl.^{2} B66B *9/16;* E04G *3/16*
U.S. Cl. 187—2 **4 Claims**

1. A hoisting apparatus mounted on a cooling tower including a mast; a cable net framing supported by the mast; and a non-self-supporting casing attached to the framing; comprising in combination:

a. an upper and a lower track of circular, horizontal course; said tracks being vertically spaced from one another and extending along said casing substantially concentrically with respect to said mast;
b. an upper traveling block movably mounted on said upper track and a lower traveling block movably mounted on said lower track;
c. two horizontally spaced, parallel guide cables attached to and linearly tensioned between said upper and lower traveling blocks;
d. a hoisting cage situated between said upper and lower traveling blocks;
e. hoisting means secured to at least one of said traveling blocks and said hoisting cage for raising and lowering said hoisting cage between said traveling blocks;

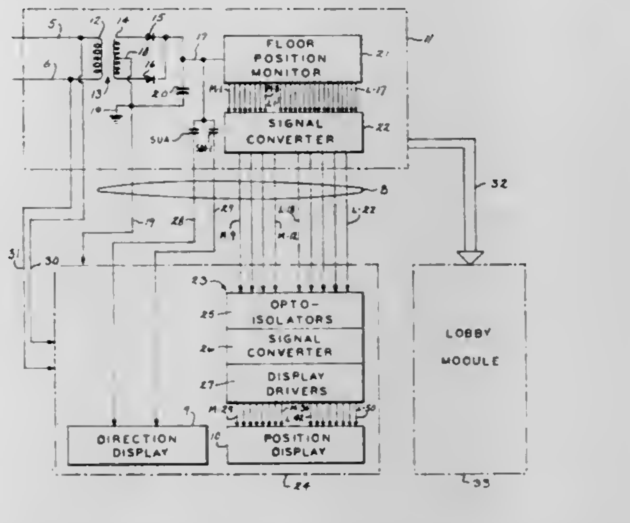


f. an adjusting means connecting each guide cable to said hoisting cage for horizontally displacing said hoisting cage with respect to said guide cables in a direction substantially perpendicular to said casing;
g. a guide sleeve surrounding each said guide cable and being longitudinally slidable thereon;
h. coupling means pivotally attaching said adjusting means to the associated guide sleeve for providing for a pivotal movement of said adjusting means about a horizontal axis perpendicular to the two parallel guide cables; and
i. propelling means for moving said upper and lower traveling blocks on and along the respective upper and lower tracks.

3,967,700
SIGNALING SYSTEM

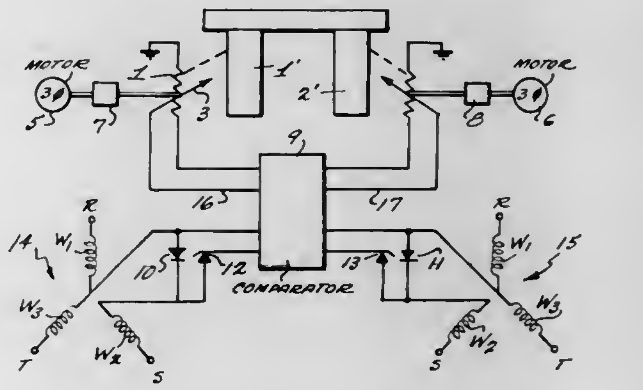
Charles J. Tur, Mequon, and Donald J. Kopydlowski, Milwaukee, both of Wis., assignors to Armor Elevator Company, Inc., Louisville, Ky.
Filed Aug. 5, 1974, Ser. No. 494,722
Int. Cl.^{2} B66B *3/02*
U.S. Cl. 187—29 R **28 Claims**

1. An elevator system connected to a structure having a plurality of floors and comprising an elevator car, means mounting said car for movement relative to the structure to serve said floors, and control means moving said car and stopping said car at floors and including means sensing the relative position of said car with respect to said floors and connected to position indicating means remotely located with respect to said sensing means and selectively displaying at least one of a plurality of characters and indicating the position of said car with respect to said floors, said position indicating means including a plurality of light emitting segments including first, second and third substantially horizontal segments vertically spaced with respect to each other and each including first and second spaced end portions, a fourth substantially vertical segment located adjacent to said second ends of said first and second segments, a fifth substantially vertical segment located adjacent to said second ends of said second and third segments, a sixth substantially vertical segment located adjacent to said first ends of said first and second segments, a seventh substantially vertical segment located adjacent to said first ends of said second and third segments, and an eighth segment having first and second portions with said first portion located adjacent to and in substantial horizontal alignment with said first end of said first segment and located adjacent to said sixth segment and said second portion located adjacent to and in substantial horizontal alignment with said first end of said third segment and located adjacent to said seventh segment, said control means including means operatively connected to said sensing means and selectively energizing one or more of said segments to selectively display a character selected from said plurality of characters including the numbers 0–9 and the letter B for indicating the position of said elevator car.



3,967,701
MULTI-COLUMN LIFTING APPARATUS AND SYNCHRONIZATION CONTROL DEVICE FOR SAME

Horst Hegenbart, Schwanheim, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany
Filed Oct. 9, 1974, Ser. No. 513,512
Claims priority, application Germany, Oct. 29, 1973, 2354064
Int. Cl.^{2} B66B *1/30*
U.S. Cl. 187—29 R **12 Claims**



1. A lifting apparatus comprising
a plurality of columns, a respective carriage vertically movable along each column,
means supported by the carriages for carrying a load to be lifted,
a respective electrical polyphase current motor operable to move each said carriage,
a sensing means operatively associated with each said column and operable to deliver an electrical signal depending on the height of lift of the respective carriage,

comparing means connected to said sensing means for receiving and comparing said signals, and

an electronic polyphase current switch controllable by the comparing means and actuated thereby, when there is a difference between the signals from the sensing means, to supply a reduced current to the respective one of said motors.

3,967,702

CONTROL APPARATUS FOR ELEVATORS

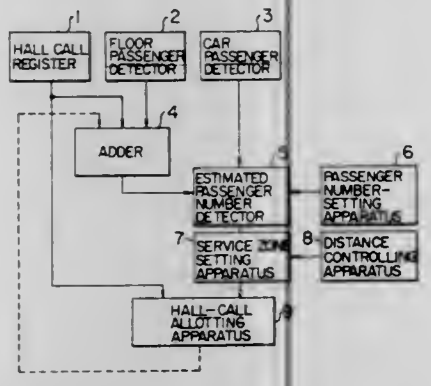
Tatsuo Iwaska; Takeo Yuminaka; Takashi Kaneko, and Hiroshi Kinoshita, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 16, 1974, Ser. No. 533,026

Claims priority, application Japan, Dec. 19, 1973, 48-141213; Feb. 20, 1974, 49-19432

Int. Cl.² B66B *3/00*

U.S. Cl. 187—29 R **20 Claims**


1
HALL CALL REGISTER
2
FLOOR PASSENGER DETECTOR
3
CAR PASSENGER DETECTOR
4
ADDER
5
ESTIMATED PASSENGER NUMBER DETECTOR
6
PASSENGER NUMBER-SETTING APPARATUS
7
SERVICE ZONE SETTING APPARATUS
8
DISTANCE CONTROLLING APPARATUS
9
HALL-CALL ALLOTTING APPARATUS

1. A control apparatus for elevators comprising a registrating means installed at an elevator hall for registrating hall calls for the up-direction and the down-direction to thereby make elevator cars to service in accordance with the directions of the registrated hall calls, characterized by a detection means for detecting the number of passengers awaiting the cars at hall for each of the directions of the registrated hall calls, which detection means comprises means for detecting the number of the car awaiting passengers at the elevator hall, means for detecting the registration of the hall calls for the up- and down-directions at the same hall, means for setting ratios for dividing the number of the car awaiting passengers for each of the up- and down-directions, means for dividing said detected number of the car awaiting passengers for the up-direction and for the down-direction on the basis of said set ratios, when the hall calls for both directions are registrated, and means for imparting said detected number of the car awaiting passengers with one of the directions, when the hall calls for said one direction are registrated.

3,967,703

EMERGENCY BRAKE FOR RACK AND PINION HOIST

Derek John Martin, Ware, England, assignor to D. Wickham and Company Limited, England

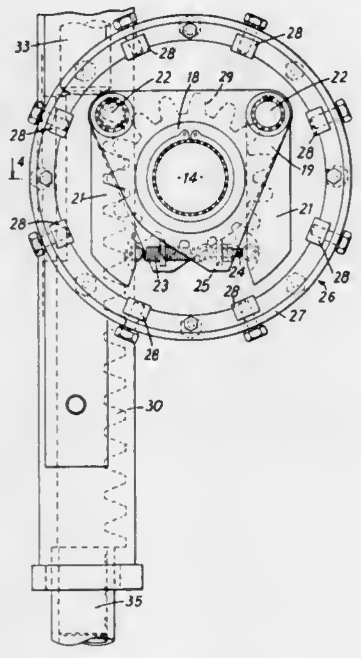
Filed Oct. 24, 1974, Ser. No. 517,616

Claims priority, application United Kingdom, Oct. 24, 1973, 49568/73

Int. Cl.² B66B *5/04, 5/16, 5/28*

U.S. Cl. 187—78 **7 Claims**

1. A rack-and-pinion hoist comprising a mast, a cage adapted to travel along said mast, and containing pinion means, means for driving said pinion means, a first rack extending along the mast and in engaging relationship with said pinion means, a braking apparatus comprising a second, vertically extending rack, a hydraulic piston-and-cylinder buffer means, and a rotatable shaft means carried by said cage, said rotatable shaft being positively engaged with said first rack and thereby driven in rotation by the movement of the cage along said mast, and connecting means for engaging the shaft and the buffer means, said connecting means comprising a centrifugal governor driven by the rotation of the shaft and operating in response to a rotation of the shaft in excess of a predetermined rate of rotation to provide positive drive to said second rack, said second rack being vertically movable and having an upper end which, when the second rack is driven upwardly, contacts and depresses the piston of the buffer means, whereby movement of the second rack is initially opposed and then prevented and a braking force is applied to the shaft and hence to the cage.



3,967,704

VEHICLE DECELERATING MEANS

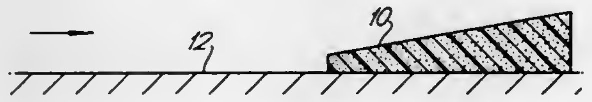
Dennis Henry Ogden, Wolverhampton, England, assignor to British Industrial Plastics Limited, Manchester, England

Continuation-in-part of Ser. No. 863,899, Oct. 6, 1969, abandoned. This application Dec. 14, 1971, Ser. No. 207,947

Claims priority, application United Kingdom, Oct. 7, 1968, 47410/68

Int. Cl.² B60T *1/04*

U.S. Cl. 188—32 **12 Claims**



1. A method of forming a retarding bed of crushable material adjacent to a vehicle track comprising the steps of forming a foam from an aminoplast resin composition, laying down said foam adjacent to the vehicle track and curing the foam in situ to produce a non-resilient, cured foam body having a compressive strength between 15 and 50 p.s.i. and a density of from 0.25 to 10 lb. per cu. f.t.

3,967,705

APPLICATION ADJUSTER FOR DISC BRAKE

Donald D. Johannesen, and James J. Colpaert, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Apr. 2, 1975, Ser. No. 564,511

Int. Cl.² F16D *65/56*

U.S. Cl. 188—71.9 **4 Claims**

1. In a disc brake:

a rotor having a pair of friction faces;

a pair of friction elements, one of said elements being disposed adjacent each of said friction faces;

a fixed support;

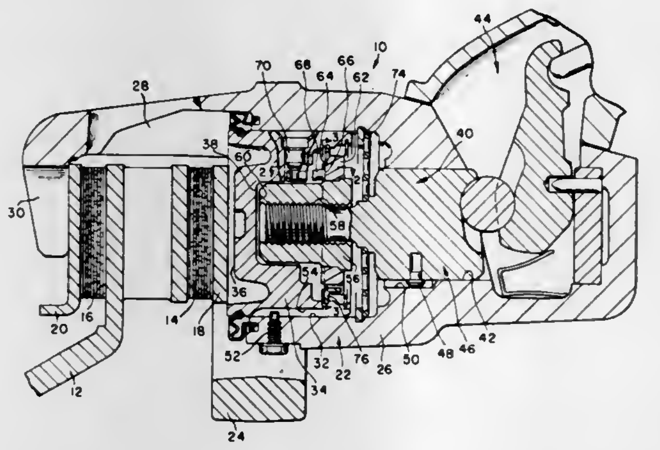
a caliper housing slidably mounted on said fixed support and straddling said rotor, said caliper housing engaging each of said friction elements for urging the latter into braking engagement with their corresponding friction faces when a brake application is effected;

mechanical actuating means within said housing for forcing said friction elements into braking engagement with their corresponding friction faces;

said mechanical actuating means including an axially extensible member slidably mounted in said housing, means for driving said extensible member toward said rotor when a brake application is effected, and ratchet means for extending said extensible member as the extensible member is driven toward said rotor, said extension of the extensible member taking place during brake actuation before substantial braking forces are transmitted through the extensible member;

said caliper housing defining a bore therewithin;

a piston member slidably mounted in said bore and associated with a corresponding one of said friction elements;



said axially extensible member being located between said piston and said means for driving the extensible member toward the rotor, said extensible member engaging said piston during a brake application to urge the latter and the friction element associated therewith toward said rotor, and resilient means operably connected to said extensible member for urging the latter away from the rotor upon brake release;

said ratchet means being carried by said piston member and by said extensible member;

said resilient means urging said extensible member away from said piston upon brake release;

said ratchet means being effective upon release of the brake and movement of the extensible member away from the piston member to index said ratchet means if the extensible member moves away from the piston member by more than a predetermined amount, said ratchet means after indexing upon brake release being effective to extend said extensible member upon a subsequent brake application.

3,967,706

MATERIAL HANDLING APPARATUS WITH IMPROVED FAIL-SAFE BRAKE SYSTEM

Raymond J. King, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed May 22, 1974, Ser. No. 472,215

Int. Cl.² F16D *65/24*

U.S. Cl. 188—170 **1 Claim**

1. In a material handling machine having a drive shaft:

a. a closed housing receiving at least the inner end portion of said shaft,

b. disc brake means extending between said shaft and said housing,

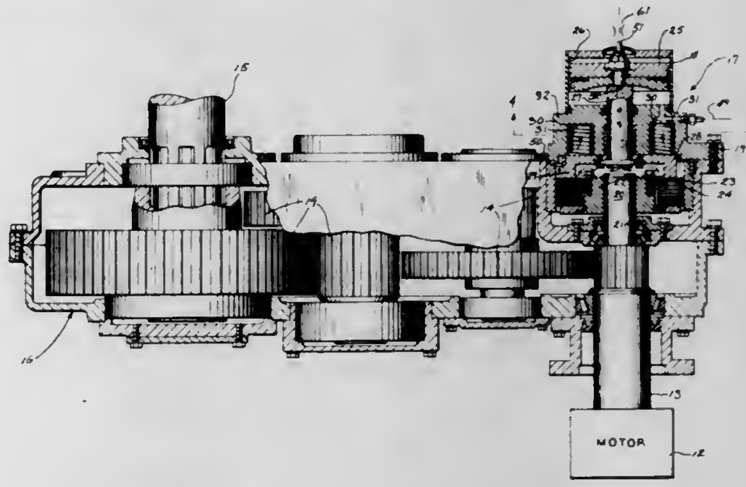
c. a pressure plate disposed within said housing and engaging said brake means,

d. a piston disposed in a chamber disposed at one end of said housing and with said piston having a rod coaxial with said drive shaft and mounted to said pressure plate,

e. a plurality of circumferentially spaced springs with each spring disposed in an independent recess within said housing and with said springs biasing said pressure plate to normally engage said brake means,

f. means to pressurize the inner portion of said chamber to move said piston and pressure plate outwardly to thereby release said brake,

g. and means to purge the interior of said brake housing, said last-named means comprising:



1. an air inlet passage extending through said housing and piston rod,
2. an air discharge passage disposed in said housing and connected with the lowermost of said recesses,
3. and means to provide pressurized air to said inlet passage so that air flows through said disc brake means and recesses and out through said discharge passage.

3,967,707

LIQUID DAMPERS

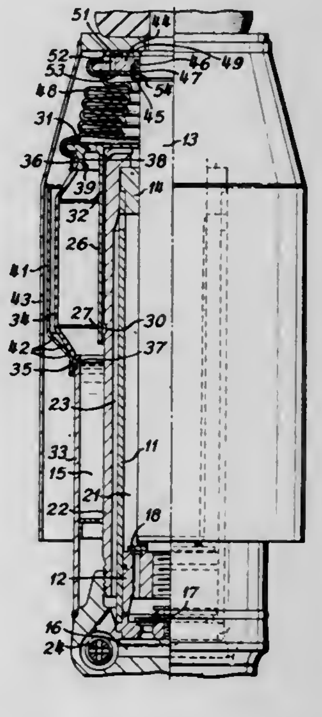
Quinton Healey Carlton, Leamington Spa, England, assignor to Oleo International Holdings Limited, Leamington Spa, England

Filed Nov. 21, 1974, Ser. No. 525,833

Claims priority, application Germany, Nov. 21, 1973, 53938/73

Int. Cl.² F16F *9/19, 9/48*

U.S. Cl. 188—284 **23 Claims**



1. A liquid damper comprising

a first cylindrical housing enclosing a chamber having first and second ends,

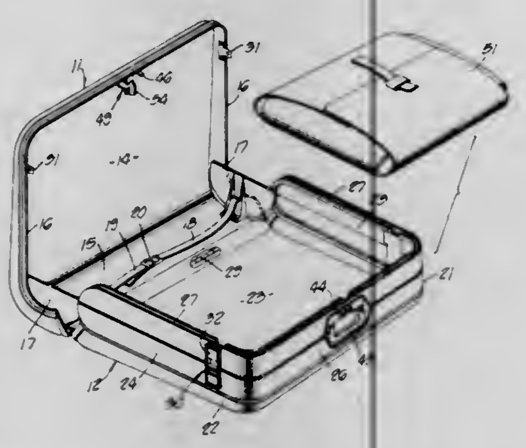
a piston slidably disposed for longitudinal movement in the chamber,

a gland sealing the first end of the chamber,
a piston rod attached to the piston and slidably disposed through the gland,
means for flow of fluid through the piston only towards the gland as the piston moves in the chamber,
a reservoir for storage of fluid adjacent to the second end of the chamber,
means between the reservoir and the chamber comprising a valve which permits flow of fluid only from the reservoir to the chamber,
a tubular member about the first housing spaced radially outwardly from the said housing to provide a first annular space,
a first passageway adjacent to said gland and between the chamber and the first annular space for flow of fluid from the chamber as the piston moves in either direction,
a second passageway for flow of fluid from the first annular space to said reservoir,
a damping valve in said second passageway which resists flow of fluid into the reservoir,
a second housing about said tubular member and radially spaced therefrom to provide a second annular space,
passageway means for flow of fluid from the second annular space into the reservoir,
groove means in said piston rod having a cross-sectional area which varies along said piston rod and is disposed on the piston rod where it will enter the chamber as the piston moves away from said gland, said groove means and second annular space combining to form a by-pass for fluid from the chamber around said damper valve into the said reservoir, and
an annular moveable wall about said piston rod and secured thereto at a point spaced longitudinally from the gland beyond the groove means to form a fluid tight seal and enclose a space about the piston rod.

3,967,708
LUGGAGE CASE

James S. Gregg; Charles J. Scott; Donna A. Suiter, all of Denver, Colo.; James P. Sullivan, Tustin, Calif.; Joseph A. Woodburn, Denver, Colo., and David E. Workman, Orange, Calif., assignors to Samsonite Corporation, Denver, Colo.

Filed Mar. 6, 1975, Ser. No. 555,858
Int. Cl.^{2} A45C *5/00*
U.S. Cl. 190—41 B **8 Claims**

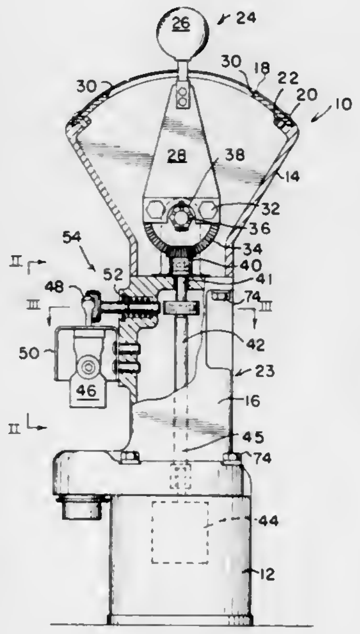


1. A luggage case, comprising:
a first L-shaped rigid case section having a side panel and a bottom panel with open sides and top;
a second rigid case section including,
  a U-shaped shell defining top and end panels, and
  a shallow shell side panel affixed over one side of the U-shaped shell leaving the bottom and other side of the U-shaped shell open; and
means pivotally interconnecting the exposed edge of said shallow shell side panel with the bottom panel of said L-shaped case section such that the L-shaped case section is pivotable to a position such that the side panel of said second case section lies in the same plane with the plane of said L-shaped case section bottom panel.

3,967,709
INTERLOCK SYSTEM FOR PARKING BRAKE AND TRANSMISSION CONTROL

Carroll R. Cole; Richard E. Guhl, and Larry R. Logemann, all of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 10, 1974, Ser. No. 531,266
Int. Cl.^{2} B60K *29/02*
U.S. Cl. 192—4 A **6 Claims**



1. A console attachable to a vehicle to control a transmission thereof, comprising:
an enclosure with a slot therethrough;
a gear shift regulator extending from said enclosure through said slot, said regulator having a handle extending from said enclosure and shaft means within said enclosure, a first end of said shaft means communicating with said handle, said shaft means including a shaft which rotates about its longitudinal axis responsive to movement of said handle in said slot, a second end of said shaft means activating via rotation of said shaft a transmission control switch which controls the transmission of said vehicle and has a neutral setting;
a parking brake actuator located adjacent where said enclosure surrounds said rotating shaft, said actuator serving to control a parking brake of said vehicle; and
an interlocking system comprising a pin within a bore in said enclosure, said pin being holdable within said bore by said actuator contacting one end thereof when said actuator is in position to cause engagement of said parking brake, said rotating shaft including a cavity adapted to receive the other end of said pin only when said regulator is in said neutral setting thereby preventing rotation of said rotating shaft, said interlocking system further comprising biasing means to normally bias said pin away from said cavity, said pin being held with its other end in said cavity by said actuator contacting said one end thereof.

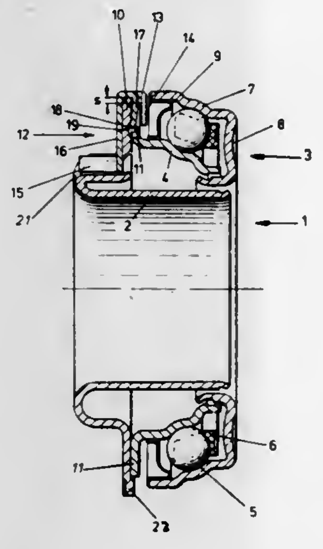
3,967,710
CLUTCH SHIFTER

Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Dec. 6, 1974, Ser. No. 530,309

Claims priority, application Germany, Dec. 21, 1973, 2363840

Int. Cl.^{2} F16D *19/00*
U.S. Cl. 192—98 **9 Claims**



1. A clutch shifter comprisng a sliding sleeve having a radially extending portion and an antifriction bearing having a rotating ring and a nonrotating ring including a flange, fastening means for fastening said nonrotating ring in the sliding sleeve, said fastening means including at least one buckle embracing said radial portion of said sliding sleeve and said flange of said nonrotating ring with a radial play, said buckle including a plurality of extending arms for the reception of a disengaging fork.

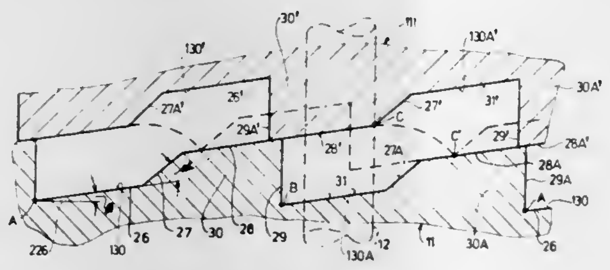
3,967,711
RATCHET TYPE SAFETY CLAW CLUTCH

Reinhold Stroezel, Leinfelden; Alfred Hettich, Stetten, and Manfred Kirn, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 3, 1974, Ser. No. 511,912

Claims priority, application Germany, Oct. 12, 1973, 2351240

Int. Cl.^{2} F16D *11/00*
U.S. Cl. 192—108 **10 Claims**

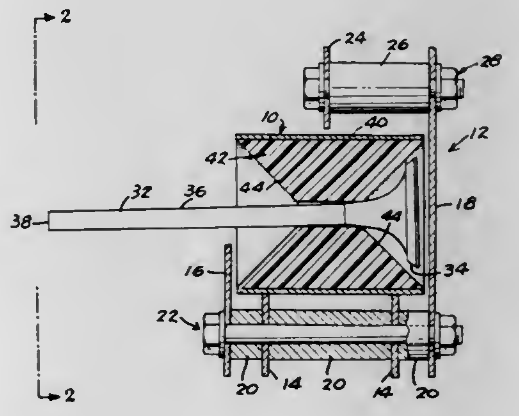


1. A safety claw clutch, comprising coaxial driving and driven clutch elements at least one of which is movable axially toward and away from the other of said clutch elements; means for yieldably biasing said one clutch element toward said other clutch element; and means for rotating said driving clutch element in a predetermined direction, said clutch elements having adjacent end faces provided with annuli of alternating claws and recesses and the claws of said driving clutch element normally extending into the recesses of said driven clutch element and vice versa so that said driving clutch element normally rotates said driven clutch element in said direction, said end faces of said clutch elements having first surfaces constituting the bottom surfaces of the respective recesses and making a first acute angle with a plane which is normal to the common axis of said clutch elements and the claws of said driving and driven clutch elements respectively having front and rear surfaces each making with said plane a second acute angle, each of said front and rear surfaces being adjacent to a first surface of the respective end face and each of said front surfaces abutting against one of said rear surfaces when said driving clutch element rotates said driven clutch element.

3,967,712
WORK CARRIER FOR GRAVITY CONVEYORS

Andrew J. Waitkins, Mount Clemens; Ralph E. Beyer, Fraser, and Lungchuck Wong, Warren, all of Mich., assignors to F. Jos. Lamb Company, Warren, Mich.

Filed Dec. 24, 1974, Ser. No. 536,083
Int. Cl.^{2} B65G *11/00*
U.S. Cl. 193—1 **10 Claims**



1. In combination with a conveyor of the type having a pair of longitudinally extending side rails connected together in transversely spaced apart relation and support means disposed between said side rails and providing a support surface disposed at a level below the upper edges of said side rails, a workpiece carrier comprising a means defining a hollow circular cylindrical metal shell which is open at both ends and nonmetallic insert fixed therein, said shell extending at its opposite ends to at least the ends of said insert so that at its opposite ends the axially outermost portion of the carrier is defined by at least an annular metal surface, each end of said shell lying in a plane perpendicular to the central axis of the shell, said insert having an axial bore extending therethrough which is coaxial with said shell, said shell and said insert being symmetrical both radially and axially about the midpoint of the axis of the bore of said insert, the axially central portion of said bore being cylindrical and of uniform circular shape whereby a workpiece can be supported by the insert by inserting the workpiece into either end of said bore and the carrier can be supported on said support means with its axis extending horizontally or vertically, and support means engaging the metallic outer peripheral surface of said shell forming means when the carrier is supported with its axis extending horizontally and the support means engaging either of said annular metal surfaces when the carrier is supported with its axis extending vertically.

3,967,713
SLIDE ACTUATOR AND MEANS CONTROLLING MOVEMENT OF SAME BETWEEN FULLY RETRACTED AND FULLY ADVANCED POSITIONS

Mitchell A. Hall, Fort Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

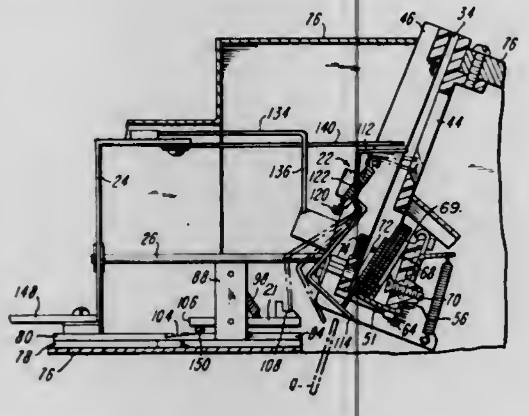
Filed June 18, 1975, Ser. No. 587,902
Int. Cl.^{2} G07F *5/05*
U.S. Cl. 194—92 **27 Claims**

1. A device of the class described, comprising:

an elongate slide actuator reciprocably mounted for movement between fully retracted and fully advanced positions, said actuator including latch means intermediate its length;

an elongate latch member, having front and rear ends, said member pivotally mounted for movement of the rear end thereof between interfering and non-interfering positions relative to the latch means of said slide actuator;

means yieldably urging the rear end of said latch member into engagement with the latch means of the slide actuator for precluding movement thereof from retracted to advanced positions;



an upwardly projecting abutment on said slide in advance of said latch means engaging the undersurface of said latch member when the side actuator is in a fully retracted position for positioning and maintaining the rear end of the latch member out of engagement with the latch means of the slide actuator; and

a latch control member mounted for movement between interfering and non-interfering positions relative to the front end of the latch member, said latch control member, when in interfering relationship with the front end of the latch member, maintaining the rear end of the latch member out of engagement with the latch means of the slide actuator, thereby permitting movement of the slide actuator from retracted to a fully advanced position.

3,967,714
MATRIX PRINTER HAVING DETACHABLE ELEMENTS

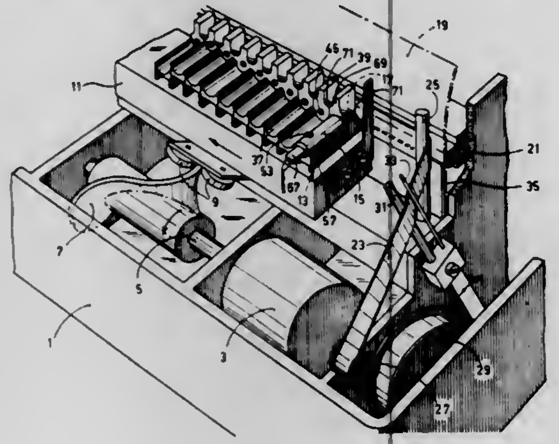
Theodorus Gerhardus Potma, and Wilhelmus Adrianus Henricus Gijzen, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,389

Claims priority, application Netherlands, May 30, 1973, 7307523

Int. Cl.^{2} B41J *3/04*

U.S. Cl. 197—1 R **6 Claims**



1. A matrix printer for cooperation with an associated recording sheet which comprises: an elongated bar-shaped member; means for moving said member across the associated recording sheet; a plurality of holders carried by said member; a plurality of straight mutually parallel recording stylus assemblies each being carried by one of said holders and each including one stylus, each stylus being elongated and disposed in a common plane with the axis thereof at the same predetermined distance from each adjacent stylus, each stylus assembly including means for moving each stylus perpendicular to the recording sheet responsive to electric energization; and means for moving the recording sheet in a direction transverse to the direction of movement of said bar-shaped member; each of said holders comprising a seat and a back surface disposed in orthogonal relationship; each stylus assembly being detachable and having a substantially cylindrical housing; each of said holder seats having an arcuate surface having a cross-section in a plane normal to the axis of the styli which is arcuate; and each of said stylus assemblies including a bearing for support of said stylus at the end of said stylus which is closest to the recording sheet, each of said back surfaces being dimensioned and configured for engagement with the exterior of said bearing of the stylus assembly carried by any one of said holders, said back surface limiting axial movement of the stylus assembly disposed therein toward the associated recording sheet.

3,967,715
INTERMITTENT DRIVE SYSTEM FOR TYPEWRITERS

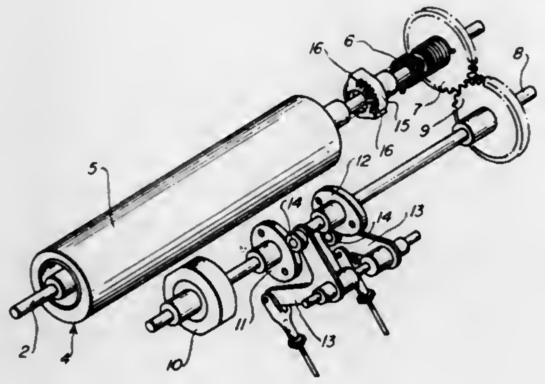
Hermann Kohlhage, Paderborn, and Manfred Link, Nurnberg, both of Germany, assignors to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed May 8, 1975, Ser. No. 575,790

Claims priority, application Germany, May 27, 1974, 2425527

Int. Cl.^{2} B41J *23/08*

U.S. Cl. 197—16 **6 Claims**



1. Apparatus for cyclically driving a single-element printing mechanism comprising;

a drive shaft;

a driven shaft having means disposed thereon for operating the printing element,

a cycle clutch for selectively engaging the drive shaft with the driven shaft,

a friction wheel mounted on the driven shaft for maintaining the speed of the driven shaft constant relative to the drive shaft,

a roll mounted on the drive shaft for frictional engagement with the friction wheel during the clutch cycle, and wherein

said friction wheel is provided with at least one flattened portion disposed at the periphery of the wheel and the wheel is so disposed on the driven shaft that a flattened portion of the wheel faces the roll when the drive shaft is disengaged from the driven shaft.

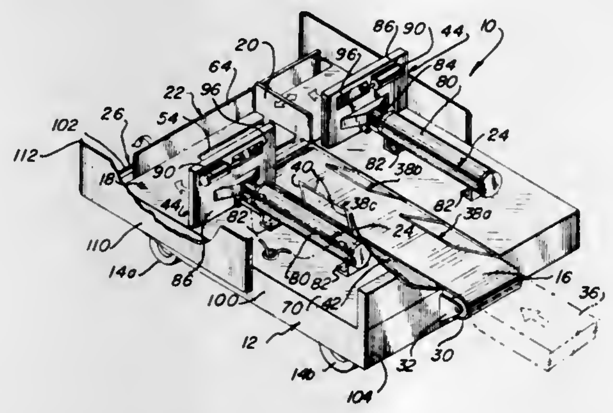
3,967,716
APPARATUS FOR LOADING CARTONS

John S. Smith, 3000 Colorado Ave., Boulder, Colo. 80303

Filed Dec. 9, 1974, Ser. No. 530,809

Int. Cl.^{2} B65G *47/26, 47/24*

U.S. Cl. 198—24 **8 Claims**



1. Apparatus for assembling containers and delivering the containers in rows to a preselected location comprising:

a. conveyor means for advancing containers in a first direction to an assembly location,

b. positioning means at said assembly location for selectively moving said containers in a second direction at an angle relative to said first direction to form a row of said containers, and

c. at least one ram member disposed adjacent to one side of said conveyor means which is selectively operable in engaging the row of containers at the assembly location along the length of the row to push the row as a unit in said first direction, said ram member including a selectively extensible plate means adapted to be extended at least partially across said conveyor to engage a container in said row in alignment with the conveyor.

3,967,717
APPARATUS FOR DISTRIBUTING ARTICLES SUPPLIED ALONG ONE PATH TO SEVERAL PATHS

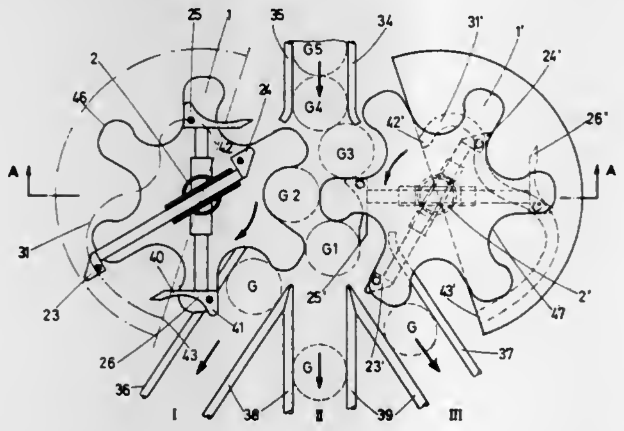
Everhard Bauer, Hudeweg 2, 479 Paderborn, Germany

Filed Jan. 13, 1975, Ser. No. 540,636

Claims priority, application Germany, Jan. 14, 1974, 2401587

Int. Cl.^{2} B65G *47/26*

U.S. Cl. 198—31 AA **5 Claims**



1. Apparatus for uniformly distributing articles arriving in a supply lane uniformly amongst three discharge lanes, comprising juxtaposed first and second similar star wheels mounted for rotation about rotary axes disposed in a common vertical plane, each said star wheel having a number of teeth that are divisible by three, with the teeth being of equal lengths and disposed at regular circumferential intervals to define similar radially outwardly open pockets between one another, in each of which one said article can be received, coupling means operatively connecting the star wheels for rotation in unison in opposite directions, the relative rotary position of the star wheels being set so that the crest of a first tooth on said first wheel when disposed in said common plane lies opposite the pocket formed between first and second teeth of said second wheel, stationary guide means effective to lead said arriving articles to an inlet bight defined by the star wheels, whereby said arriving articles enter successive said pockets offered to said inlet bight during rotation of the star wheels and are urged towards the bottom of the pockets by the crests of the respective opposingly disposed teeth, stationary guide means defining juxtaposed entrances to said three discharge lanes adjacent an outlet bight formed by said star wheels, the central of said entrances being located midway between said star wheels and the outside of said entrances being disposed adjacent respective said star wheels, a pusher member associated with each of said first tooth of said first star wheel, a second preceding tooth of said first star wheel, said first tooth of said second star wheel and a third following tooth of said second star wheel, each of said pusher members being disposed adjacent the trailing edge of its associated tooth and being mounted for reciprocation between a position at which it is retracted radially inwardly behind the crest of the associated tooth when disposed at said inlet bight to a position at which it is projected radially outwardly beyond the crest of the associated tooth when disposed at said outlet bight, whereby said pusher members are effective to urge the articles from opposite pockets into respective said outside entrances, an ejector tongue carried by said pusher member associated with said first tooth of said first wheel and by said pusher member associated with said third tooth of said second wheel, each of said ejector tongues being directed towards the respective preceding pocket and being movable with the pusher member by which it is carried so as to be displaceable from a position at which it is retracted radially inwardly from the bottom of said preceding pocket to a position at which it ejects the article from said preceding pocket towards said central entrance, and control means for synchronizing reciprocation of said pusher members with the rotary motion of said star wheels.

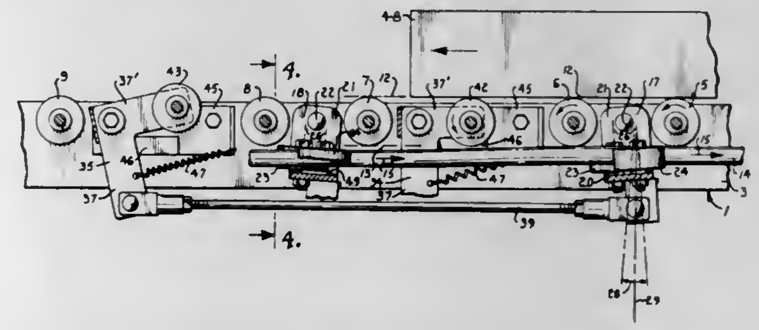
3,967,718
LIVE ROLLER CONVEYOR

Carl M. Monahan, Williamsport, Ohio, assignor to Versa Corporation, Sterling, Ohio

Filed Jan. 17, 1975, Ser. No. 541,856

Int. Cl.^{2} B65G *13/02*

U.S. Cl. 198—127 R **12 Claims**



1. In an accumulating roller conveyor having a plurality of spaced driving rollers forming a conveyor path:

a. an elongated propelling member positioned generally along said path and near said rollers;

b. a pair of spaced-apart tracking wheels each having a peripheral surface and an axis and gripping said propelling member on said surfaces therebetween; and

c. means for selectively tilting said wheels and thereby imparting a transverse force component to said propelling member and selectively urging same along said surfaces in the general direction of said tracking wheel axes into and out of driving engagement with adjacent driving rollers.

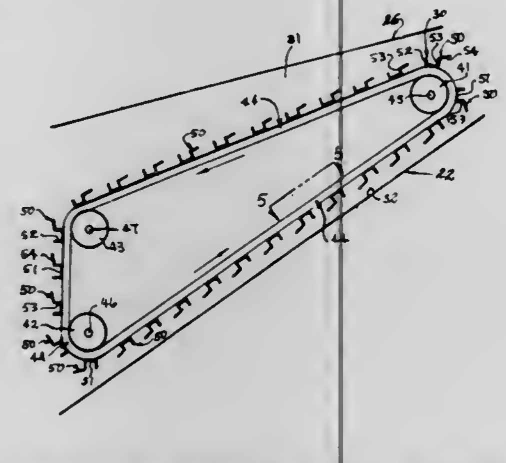
3,967,719
COMBINE CONVEYOR MEANS

Earl W. Kloefkorn, and Melvin L. Kloefkorn, both of Manchester, Okla. 73758

Filed Jan. 4, 1973, Ser. No. 320,999

Int. Cl.^{2} B65G *19/00*

U.S. Cl. 198—175 **7 Claims**



1. In a combine for harvesting grain, a conveyor means mounted in a feeder housing comprising:

- a. sprocket drive wheel means and sprocket driven wheel means rotatably connected to said feeder housing;
- b. said feeder housing having an upwardly inclined bottom pan to receive grain thereon;
- c. a sprocket chain means disposed over and driven by said sprocket drive wheel means and disposed over and carried by said sprocket driven wheel means;
- d. said sprocket chain means having an inclined substantial portion parallel to and adjacent said bottom wall of said feeder housing;
- e. a plurality of transverse slot means connected to and carried by said sprocket chain means at oppositely disposed links thereof;
- f. each of said transverse slot means having first and second parallel legs interconnected by an intermediate leg being of generally U-shape in transverse cross section and a rearwardly extending flange integral with said second leg;
- g. said rearwardly extended flange and said intermediate leg parallel to each other and said bottom pan; and
- h. outer surfaces of said first leg and said rearwardly extending flange cooperate to compress grain against said bottom pan while moving upwardly by said sprocket chain means;

whereby on initiating movement about said sprocket drive wheel means, said outer surface of said rearwardly extending flange first further compresses the grain and then forcefully ejects the fresh cut unthreshed grain therefrom at an increased velocity.

3,967,720
BELT CONVEYORS

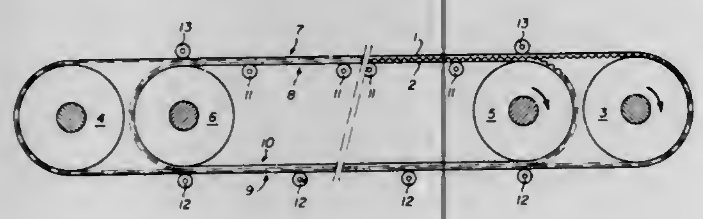
Simon Arieh, Geneva, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed May 15, 1974, Ser. No. 470,290

Claims priority, application Switzerland, May 16, 1973, 6942/73

Int. Cl.^{2} B65G *16/30*

U.S. Cl. 198—193 **9 Claims**



1. A belt conveyor having at least one straight load bearing zone and comprising:

- a. a pair of flexible elementary belts each having a neutral axis and a reinforcing layer embedded in the vicinity of said neutral axis so as to reinforce each belt at least longitudinally;
- b. a regular array of projections and intermediate recesses arranged on one side of each elementary belt so that the projections of one belt fit exactly into corresponding recesses of the other belt thereby to provide positive engagement with rigid interlocking of the elementary belts so as to render them solid with each other, at least longitudinally by their superposition and positive engagement along straight portions thereof; and
- c. belt guide means which define the paths of the elementary belts so as to provide: first curved path portions arranged to bring the elementary belts progressively together into mutual positive engagement and rigidly interlocked relationship at one end of said load bearing zone of the conveyor; a common straight path portion wherein the superposed elementary belts remain positively engaged and rigidly interlocked from said one end to the opposite end of the straight load bearing zone and are thereby made solid with each other at least longitudinally whereby to transmit shear forces due to flexure from one belt to the other, so that the elementary belts thereby form together a straight, rigid composite beam assembly wherein the respective reinforcing layers of the belts of this assembly exert a combined reinforcing action providing substantial rigidification of the composite beam assembly; and second curved path portions arranged to progressively disengage and thereby separate said elementary belts beyond said opposite end of the load bearing zone, whereby said belts may separately undergo a desired directional change along their respective second curved path portions.

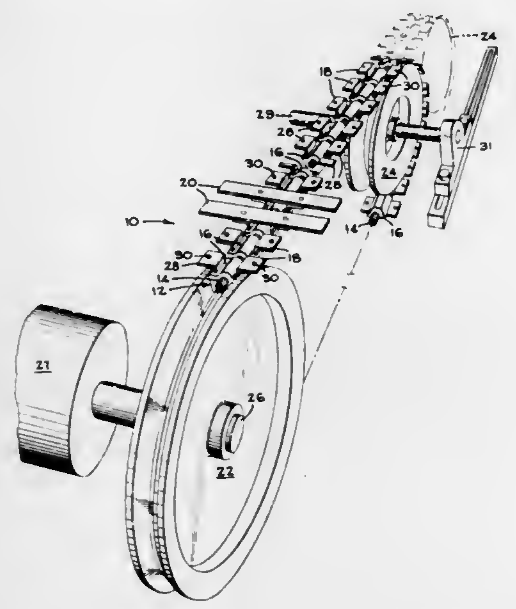
3,967,721
BELT DRIVE CONVEYOR SYSTEM

Ivan E. Rhoden, Plainfield, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed July 8, 1974, Ser. No. 486,552

Int. Cl.^{2} B65G *17/12, 17/42*

U.S. Cl. 198—195 **8 Claims**



1. A low noise level conveyor system comprising a pair of spaced wheels, a flexible longitudinal tensile element, a plurality of resilient driving blocks mounted on said tensile element in spaced apart relation, said driving blocks formed for receipt on said wheels, splicing means to join the ends of said tensile element to form an endless band to be received over said wheels, and a separate load support member secured to each of said resilient driving blocks on said endless band, each said member including a curved portion embedded within said block adjacent said tensile element and in overlying and generally conforming relation to said tensile element when said members are in load-supporting relation.

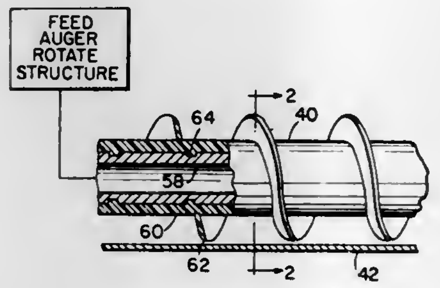
3,967,722
SAMPLE FEED AUGER STRUCTURE

Harry W. Dietert, Kerrville, Tex., assignor to Harry W. Dietert Co., Detroit, Mich.

Division of Ser. No. 260,985, June 8, 1972, Pat. No. 3,808,881. This application May 6, 1974, Ser. No. 467,152

Int. Cl.^{2} B65G *33/00*

U.S. Cl. 198—213 **1 Claim**



1. Sample feed structure comprising feed auger structure including an elongated, rigid, hollow cylinder, annular, exterior, axially spaced apart recesses in the exterior surface of the rigid cylinder, a plastic sleeve secured on the cylinder for rotation therewith having annular interior portions spaced apart longitudinally thereof extending within the recesses in the cylinder for locking the plastic sleeve on the rigid cylinder against axial movement with respect thereto, and a flexible helical auger fin integral with the plastic sleeve progressing axially of the rigid cylinder and tapered toward the outer periphery of the fin whereby on rotation of the rigid cylinder and the plastic sleeve secured thereto the integral, helical auger fin will be rotated, a rigid trough closely surrounding a portion of the rigid cylinder, plastic sleeve and helical auger fin over approximately 180 degrees of the helical auger fin, and means for rotating the cylinder, plastic sleeve and helical auger fin connected to the rigid cylinder whereby granular material positioned in the trough will be moved along the trough on rotation of the cylinder, sleeve and helical auger fin.

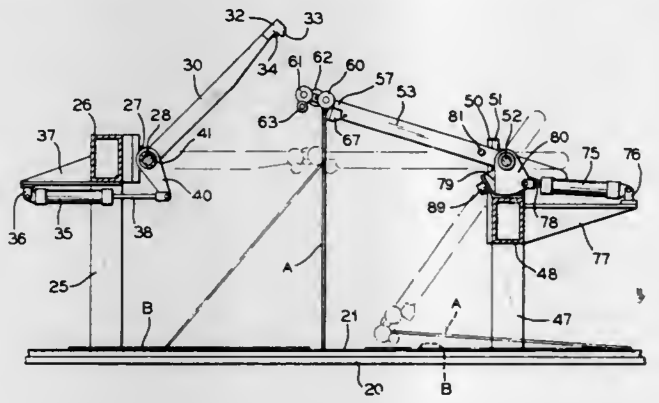
3,967,723
MATERIAL HANDLING APPARATUS

Robert R. Beckham, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed July 14, 1975, Ser. No. 595,555

Int. Cl.^{2} B65G *47/24*

U.S. Cl. 198—235 **19 Claims**



1. A sheet turnover apparatus comprising: a conveyor for supporting and moving horizontally disposed sheets in a horizontal path; means along said path for lifting the leading edge of the sheet upwardly off said conveyor while the trailing edge of said sheet remains in contact and moves with said conveyor to effect pivotal movement of said sheet in an arcuate path about said trailing edge; lowering means along said arcuate path for receiving the lifted edge of said sheet during movement thereof in said arcuate path and subsequently lowering said sheet when advanced past a true vertical onto said conveyor in an inverted position; and power means for disengaging said lifting means from said sheet and quickly moving said lifting means out of said arcuate path allowing said sheet to be supported solely on said lowering means during completion of said movement of said sheet in said arcuate path.

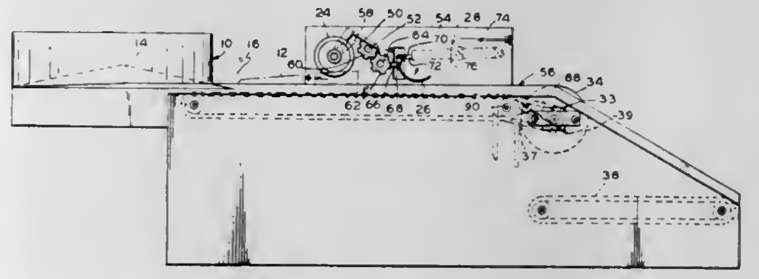
3,967,724
APPARATUS FOR ORIENTING TAPERED ARTICLES

Kenneth M. Allen, and Brian R. Fijalkowski, both of Newberg, Oreg., assignors to Kenneth M. Allen, Newberg, Oreg.

Filed Jan. 14, 1975, Ser. No. 540,802

Int. Cl.^{2} B65G *47/24*

U.S. Cl. 198—268 **16 Claims**



1. In an apparatus for orienting tapered articles,

conveyor means for conveying tapered articles endwise along a predetermined path,

a feeler arm,

means mounting the feeler arm pivotally in the path in a position to be engaged and pivoted by the forward end portion of each article and for pivotal movement out of the path at a predetermined velocity by a small end first article and at a substantially higher velocity when engaged by a butt end first article, and detecting means for differentiating between the higher velocity of movement and the lower velocity of movement of the feeler arm.

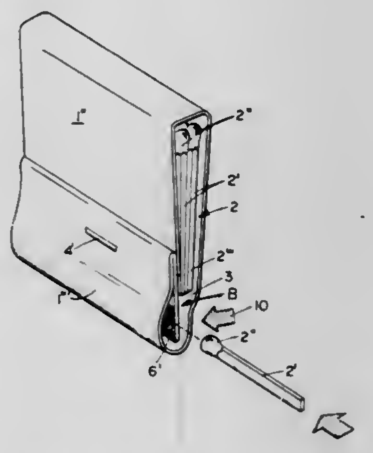
3,967,725
MATCH CONTAINER

Dennis R. Thompson, 8 Charles Plaza, Apt. 1803, Baltimore, Md. 21201

Filed Jan. 17, 1975, Ser. No. 541,994

Int. Cl.^{2} A45F *27/00*

U.S. Cl. 206—108 **1 Claim**



1. A match package having a match element and a cover therefor including a match striking element associated with the said cover, said cover being formed from a single strip of flexible, foldable, paper-like material having a flat central back portion to cover one side of the match element and a foldable portion at one end of the cover to cover the outer free ends and opposite side of the match elements, wherein the match elements consist of at least a single sheet having a base portion and a plurality of individual matches extending outwardly from one side of the base having one end of each of the matches attached to the base portion and an ignitible com-

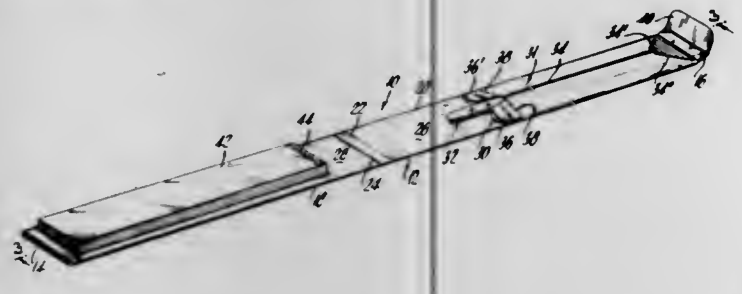
pound in the form of a head carried on the opposite free end of each of said matches, the improvement, which comprises:

a. the opposite end of the cover extending outwardly below the base of the match element and folded to form a pocket outwardly from the bottom of the base portion of the match element, the end of the cover extending outwardly below the base of the match element having a match igniting surface extending across the extreme outer edge thereof and on the same side of the cover as the match element, the outer end of the cover being folded upon itself toward the pocket and of such length as to extend in close proximity of the bottom of the pocket, staple means extending through the folded side of the pocket, the base of the match element and the back portion of the cover to form a single package unit

whereby the pocket is movable towards the folded end portion of the cover carrying the igniting surface without moving the said end to provide a sufficient space between the igniting element and the inner side surface of the pocket to insert a match head for igniting said match head when the head is withdrawn from the said space in contact with the igniting surface.

3,967,726
PACKAGE FOR THERMOMETER AND SHEATHS

Stephen Roeser, Dumont, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed June 9, 1975, Ser. No. 585,003
Int. Cl.² B65D *5/50, 85/38*
U.S. Cl. 206—306 12 Claims



1. A package for a thermometer and a plurality of disposable sheaths comprising:

a longitudinally extending envelope having a closed and an open transverse end and first and second major surfaces;

said envelope being folded about at least one essentially centrally located transverse fold with said first major surface forming the exterior of said folded envelope and said second major surface forming the interior of said folded envelope;

a die cut, cut generally transversely through that portion of said second major surface having the closed transverse end to define the mouth of a pocket in the interior of the envelope, said pocket having a closed bottom defined by said closed transverse end of said envelope, said thermometer being positioned in said pocket; and

said remaining portion of said second major surface presenting a planar surface with said plurality of disposable sheaths being offered thereto and within the folded envelope.

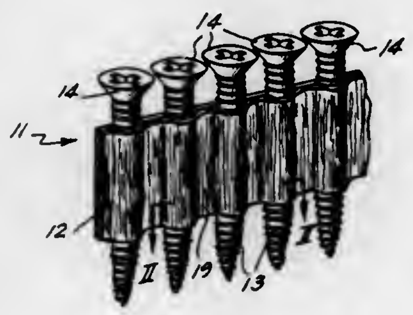
3,967,727
FASTENER PACKAGE

Rudolf Jakesch, Hallstahammar, Sweden, assignor to Bulten-Kanthal Aktiebolag, Sweden
Continuation-in-part of Ser. No. 433,566, Jan. 15, 1974, abandoned. This application Aug. 28, 1974, Ser. No. 501,050
Claims priority, application Sweden, Feb. 7, 1973, 7301678
Int. Cl.² B65D *85/24*
U.S. Cl. 206—344 4 Claims

1. A bundle of fasteners, comprising in combination:

a. a series of headed fasteners arranged in substantially parallel relation to each other; and

b. a pair of strips of flexible material disposed at and non-adhesively engaging opposite sides of said fasteners, at least one of said strips comprising material that is yieldable in the direction of its length, said strips being joined together between adjacent fasteners such that such yieldable strip is positively held against said fasteners with a force derived from its having yielded, the marginal portions of said strips adjacent the heads of said fasteners being outwardly flaring flanges to provide guides for the passage of the fastener heads.



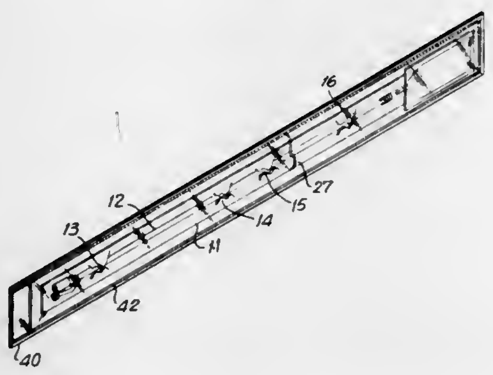
2. A bundle of fasteners, comprising in combination:

a. a series of headed fasteners arranged in substantially parallel relation to each other; and

b. a pair of strips of flexible material disposed at and non-adhesively engaging the opposite sides of said fasteners, at least one of said strips comprising crepe paper that is yieldable in the direction of its length, said one strip having a flexible layer of plastics material which follows the inherent surface irregularities of said crepe paper, said strips being joined together between adjacent fasteners such that such yieldable strip is positively held against said fasteners with a force derived from its having yielded.

3,967,728
CATHETER PACKAGE

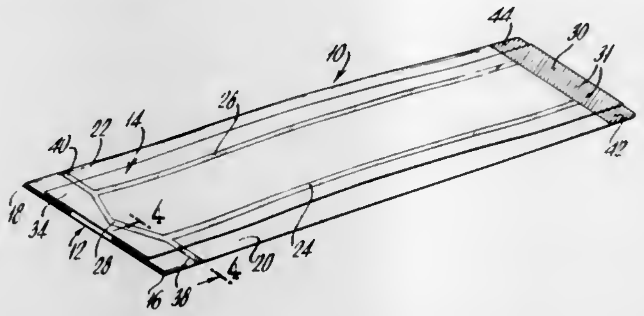
Robert L. Gordon, Monroe, N.Y., and Burton Salkin, Schaumburg, Ill., assignors to International Paper Company, New York, N.Y.
Continuation of Ser. No. 337,445, March 2, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,755
Int. Cl.² A61B *19/02*
U.S. Cl. 206—364 13 Claims



1. In combination with a sterile catheter package which includes an envelope that surrounds a catheter contained therein, the improvement which comprises a sealed pouch of lubricant within said package, said pouch being secured at the end of said package nearest the tip of said catheter, one edge of said pouch being adjacent to the tip of said catheter and transverse to the longitudinal axis of said catheter, the pouch seal adjacent to said one edge being rupturable when said pouch is squeezed, whereby lubricant may be discharged over the tip of said catheter while said catheter is under sterile conditions.

3,967,729
FULLY SEALED PACKAGE FOR STERILE CONTENTS

John Clinton Tanner, II, Hinsdale, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sept. 29, 1975, Ser. No. 617,903
Int. Cl.² A61B *19/02*
U.S. Cl. 206—440 6 Claims



1. In a package for containing a sterile article and comprising:

a bottom sheet having an inner surface and folded side edges folded along longitudinally extending fold lines providing longitudinally extending side flanges;

a top sheet having an inner surface and overlying the inner surface and flanges of said bottom sheet; and

a peripheral seal comprising side seals bonding the sides of the top sheet to the flanges of said bottom sheet and end seals bonding the ends of said top sheet to the ends of the flanges and the ends of the inner surface of the bottom sheet therebetween; the improvement which comprises:

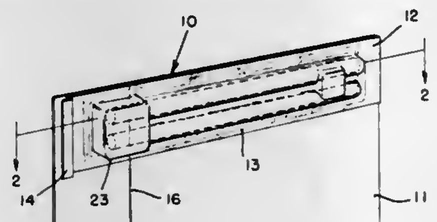
a first adhesive disposed on the inner surface of said bottom sheet in the areas which contact said folded side edges and are under said end seals, said first adhesive being limited within said areas of contact with the area between said flanges and under said end seal being free of said first adhesive;

a thermoplastic adhesive, adhesively incompatible with said first adhesive, overall coating the inner surface of said top sheet;

said side seals of said package being affected by heat and pressure applied along the sides of the package and activating said thermoplastic adhesive and said end seals affected by heat and pressure applied along the ends activating both said first adhesive and said thermoplastic adhesive with said thermoplastic adhesive filling any channels existing along said flanges between said bottom sheet and said cover sheet.

3,967,730
CIGARETTE PACKAGE

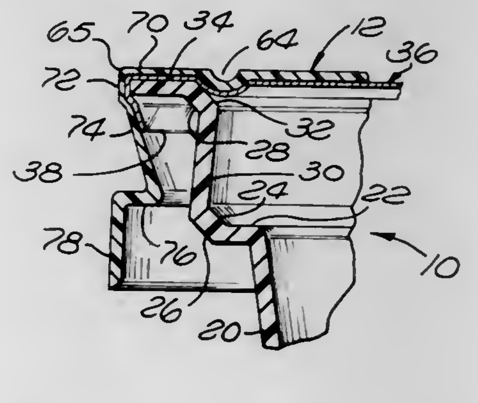
Frank E. Driscoll, Winston Salem, and Richard S. Wimbish, Mount Airy, both of N.C., assignors to Techform, Inc., Mount Airy, N.C.
Filed Jan. 28, 1975, Ser. No. 544,823
Int. Cl.² B65D *85/10, 85/62*
U.S. Cl. 206—461 5 Claims



1. A package for elongated elements comprising a planar base support, a clear plastic blister form secured to said base support, said blister form forming an elongated chamber with said base support, closure means openable at one end of said package for exposing elements in said package, said blister reinforcing and spacing means on said package at spaced intervals extending outwardly therefrom to space a plurality of packages and prevent crushing of packaged elements and blister form, said blister form having a perimetrical flange secured to said base support, and a lip on said blister form at one end in juxtaposition to said reinforcing and spacing means to facilitate opening and closing said closure means.

3,967,731
STACKABLE LID AND CONTAINER

Stanley W. Boduch, Ludlow, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 3, 1975, Ser. No. 546,842
Int. Cl.² B65D *21/04*
U.S. Cl. 206—508 7 Claims



1. In combination:

a container having a bottom and integral upwardly and outwardly flared sidewalls merging into a horizontal shoulder, said shoulder having an upwardly and outwardly extending first beveled portion which joins an upwardly extending slightly inwardly inclined annular wall portion; said wall portion merges into an upwardly and outwardly extending second beveled portion connecting a flat horizontal sealing rim defining a top opening; and,

a lid retained on said container over said top opening, said lid comprising a circular planar area having an annular groove concentric with the axis of said lid and radially offset inwardly from the peripheral edge thereof; said edge merging into a rim portion which extends substantially vertically a distance at least equal to the thickness of the container sealing rim and then inwardly to define an inclined wall portion which connects an integral outwardly extending substantially horizontal annular seat portion, said seat portion joining an integral substantially vertical ring flange.

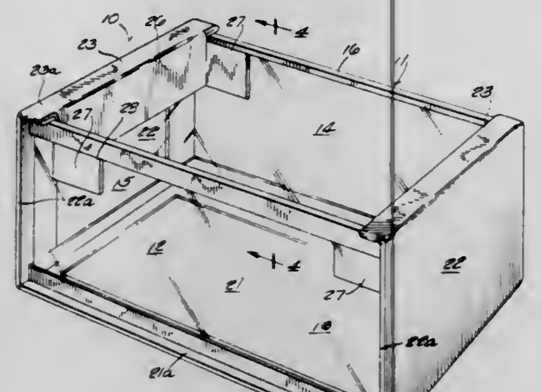
3,967,732
SHIPPING WRAPPER FOR AQUARIUM

Gerald R. Ritzow, 6300 Parkview Road, Greendale, Wis. 53129, and Roger C. Ritzow, 553 W23581 Big Bend Road, Waukesha, Wis. 53186
Filed Aug. 1, 1975, Ser. No. 601,061
Int. Cl.² B65D *81/14*
U.S. Cl. 206—521 5 Claims

1. A protective wrapper for an aquarium, the aquarium having a bottom, a front wall, a rear wall, and end walls interconnected to form an enclosure, the front, rear, and end walls having an overlapping rim on the top edges, said wrapper comprising:

a. a bottom panel, end wall panels, and end wall rim panels, said panels being hingedly connected along fold lines and positioned generally adjacent corresponding portions of the aquarium,

b. end flaps hingedly connected to said end wall rim panels, said end flaps each having outwardly extending end tabs with locking edges, said end flaps and end tabs being folded into the aquarium so that said locking edges are captured beneath the overlapping rim on the top edges of the front and rear walls of the aquarium.



3,967,733

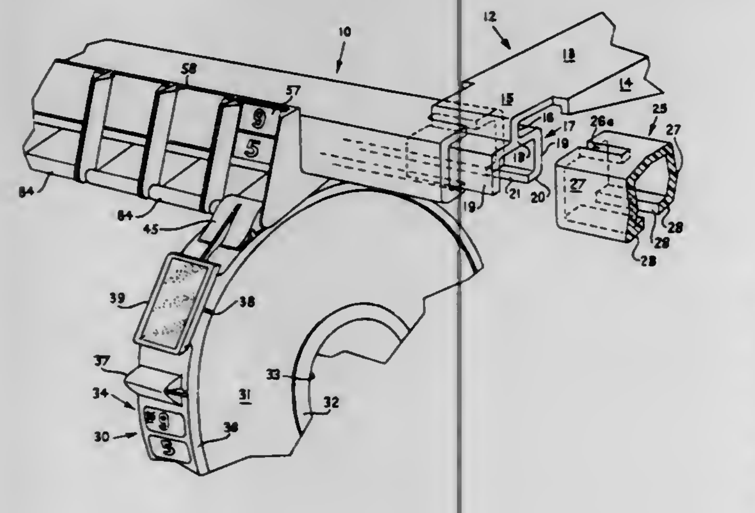
TAPE REEL HANGER

Leonard N. Albrecht, Beverly Hills, Calif., assignor to Tab Products Company, Palo Alto, Calif.

Filed May 8, 1974, Ser. No. 467,863

Int. Cl.² A47F *5/08*

U.S. Cl. 211—113 **6 Claims**



6. A structure for suspending disc-like reels and the like each provided with a peripheral suspension hook, said structure comprising:

- a suspension framework includng a horizontal beam and
- a plurality of individual hanger elements suspended from such beam, and movable therealong to any desired position, each said hanger element comprising,
- an exposed, forward portion sloping outwardly from the top and having hanger means for receiving a hook on a tape seal to suspend the reel and allow swinging thereof when suspended, said hanger means being located at the bottom of said sloping forward portion, and
- a lock member rearwardly of the said forward portion, said lock member being attachable to and removable from said beam and serving, while so attached, to secure the hanger to the beam and to permit horizontal movement of the hanger along the beam to any desired position, and a rear spring member acting only on the reel suspended by such hanger element to damp swinging movement thereof and to swing the suspended reel forwardly for access in response to a rearward push on the reel.

3,967,734

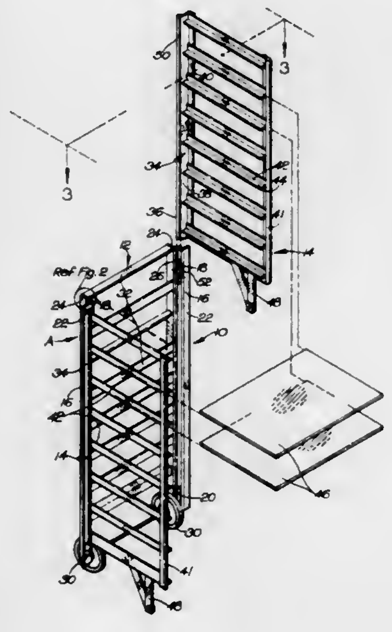
HAND DELIVERY TRUCK

Melvin G. Morgan, Broken Arrow, and Cal L. Dixon, Tulsa, both of Okla., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 23, 1974, Ser. No. 491,090

Int. Cl.² A47F *5/10*

U.S. Cl. 211—199 **2 Claims**



1. A foldable delivery cart of the type described comprising the combination of a main panel and a pair of wing panels, each of the wing panels being hingedly connected to the main panel for at least the major portion of the length of a wing panel and each of the marginal side edges of the main panel comprising an angular light metal extruded section provided with a centrally disposed arcuate groove which extends substantially continuously for the full length of the said angular section and said groove being bounded on one side thereof by a stop element formed integrally with the said angular section, the side edge of a wing panel that is connected to the main panel comprising a light metal Z-shaped extruded section provided with a main flange and adjacent oppositely projecting flange elements for accommodating and receiving shelving supports secured to said Z-shaped section, the inner terminal free end of the said Z-shaped extruded section comprising a bulbous portion that extends substantially the full length of the said Z-shaped extruded section and serves as a hinge pin that is telescopingly fitted and pivotally mounted within the groove of one of the said main panel angular sections, the degree of pivoting of a wing panel provided with the said Z-shaped extruded section in one direction being limited by the stop element on the main panel angular section that is cooperatively associated therewith, means including a further stop element disposed in the bottom part of the groove of the said cooperatively associated main panel angular section and engageable with the bottom part of the bulbous portion of the said wing panel Z-shaped extruded section for anchoring the said bulbous portion of the said wing panel Z-shaped extruded section in the groove of the said cooperatively associated main panel angular section and the wing panel provided with said Z-shaped extruded section to the main panel.

3,967,735

CRANES WITH LOOK INDEPENDENT OF SHEAVE BLOCK

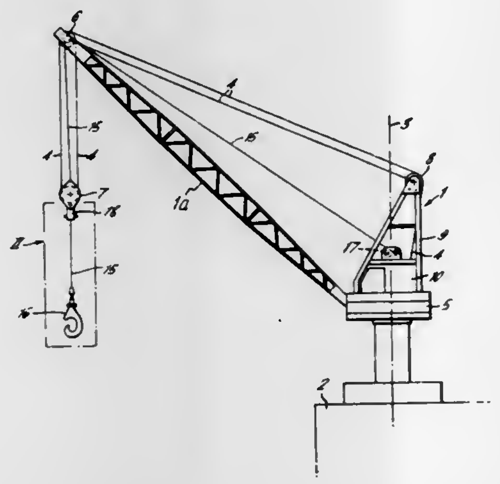
Alexander William Payne, 2, Appleshaw Close, Harestock, Winchester, England

Filed Jan. 28, 1975, Ser. No. 544,793

Claims priority, application United Kingdom, Jan. 28, 1974, 3873/74; Feb. 14, 1974, 6817/74

Int. Cl.² B66C *23/52*

U.S. Cl. 212—3 **5 Claims**



1. In a crane, comprising, in combination:

sheave block means;

primary cable means operatively-connected to said sheave block means;

winch means operatively-connected to said primary cable means for raising and lowering the sheave block means and a load suspended therefrom;

crane hook means for engaging a load to be raised or lowered;

secondary cable means connected directly to said crane hook for raising the crane hook means completely independent relative to said sheave block means;

second winch means operatively-connected to said crane hook means for moving the crane hook means relative to the sheave block means and to a load; and

cooperating means between said sheave block means and said crane hook means for detachably connecting the crane hook means and the sheave block means.

3,967,736

BOOM CONTROL SYSTEM

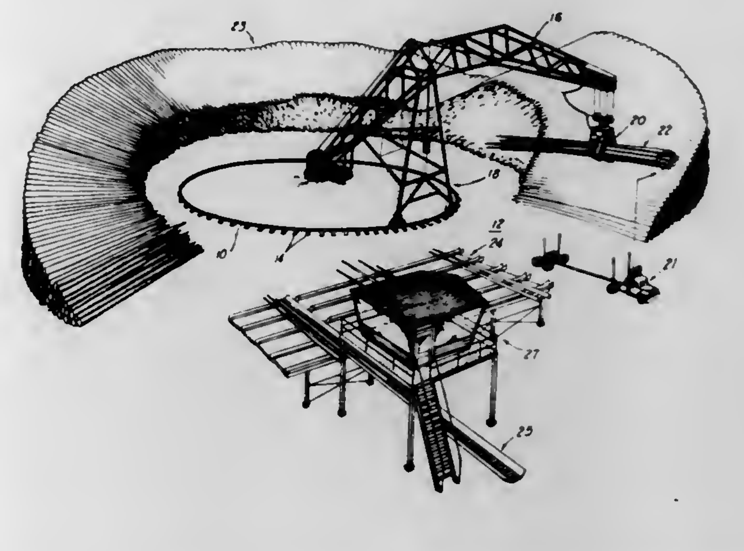
Iradj Tarassoli, Trussville, Ala., assignor to Bush Manufacturing Company, Trussville, Ala.

Filed Nov. 21, 1974, Ser. No. 525,927

Int. Cl.² B66C *3/00*

U.S. Cl. 212—42 **7 Claims**

1. A boom comprising an arcuate rail; a pivotable structure including an upright support having wheels rotatably supported upon said rail and a truss supported above said rail by said upright support; a grapple suspended from said truss; winch means mounted to said pivotable structure for raising and lowering said grapple; hydraulic circuit means mounted to said pivotable structure for driving said wheels, winch and grapple; electric circuit means for controlling said hydraulic circuit means including a set of solenoid valves mounted on said pivotable structure and a set of solenoid valves actuators mounted off said pivotable structure; and wherein said hydraulic circuit means for driving said winch includes a variable output hydraulic pump, an hydraulic motor mechanically coupled with said winch, and an hydraulic line coupling said hydraulic pump with said hydraulic motor.



3,967,737

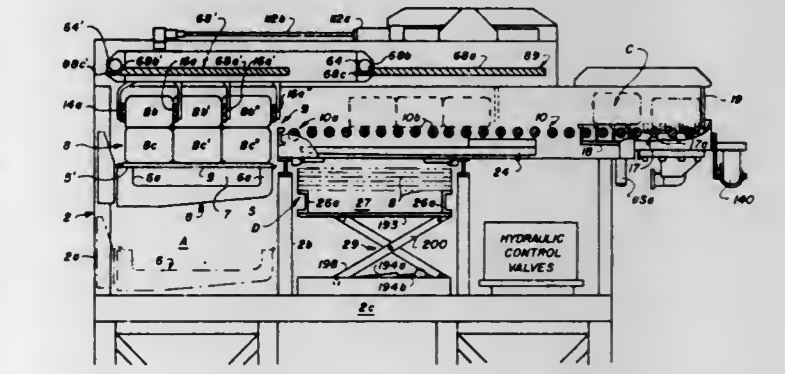
DEPALLETIZING AND PALLET STACKING APPARATUS

Roberto S. Peralta, Chicago; Torrance L. Duffy, II, Evanston, and Raymond E. Derflinger, Chicago, all of Ill., assignors to Conveyor Systems, Inc., Morton Grove, Ill.

Filed Aug. 19, 1974, Ser. No. 498,320

Int. Cl.² B65G *59/02*

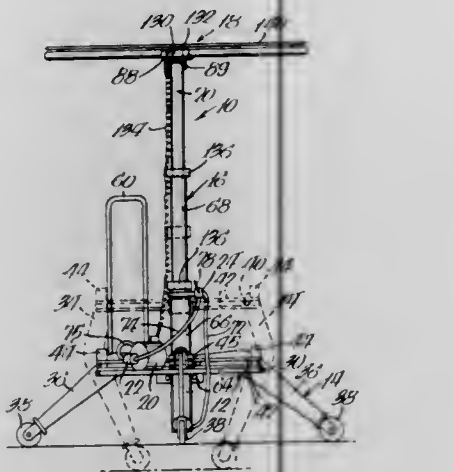
U.S. Cl. 214—1 BB **13 Claims**



1. Article shuttle apparatus for moving one article or a row of articles bodily from one point to another, said one article of a row of articles to be moved thereby occupying a variable longitudinal extent due either to a varying number or size of the article or articles involved, said article shuttle apparatus including at least one pair of horizontally spaced clamping members, said horizontally spaced clamping members being respectively attached for bodily movement with a cylinder and a piston rod connected to a piston movable longitudinally within said cylinder, the cylinder being mounted on a horizontally movable frame so it and the clamping member attached thereto are supported for movement as a unit toward and away from the other clamping member, said pair of clamping members having initial relatively widely spaced apart positions located beyond the ends of the longest row of articles to be moved thereby and much closer spaced positions as close together as possible up to a minimum spacing point where less than the maximum number of articles can be clamped therebetween, and operating means for effecting movement of said frame and movement of the piston within said cylinder between an initial position in the cylinder where said clamping members have their maximum spacing and a second position in the cylinder where further movement is limited by the clamping engagement thereof with the article or articles involved.

3,967,738
PANEL BOARD LIFT

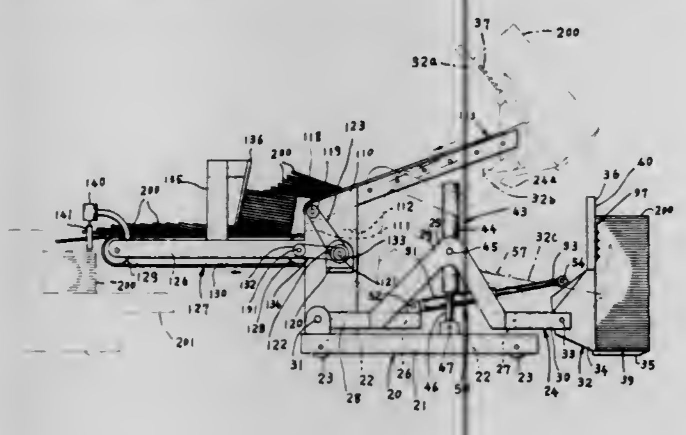
LeRoy Winings, 208 E. Third St., Harristown, Ill. 62537
Filed Jan. 6, 1975, Ser. No. 538,963
Int. Cl.² B66F *3/18*; **B25J** *3/00*
U.S. Cl. 214—1 S **8 Claims**



1. A lift for raising panels of material comprising a base, at least three legs pivoted on said base and extending outwardly into a stable supporting position, a telescoping pillar movably mounted through said base and projecting upwardly therefrom, means for supporting said pillar on said base, means for elongating said pillar, a support rack positioned on said pillar and extending transverse to the axis of said pillar, and control means on said support rack for deactivating said elongating means when excessive pressure urges said panels against an obstruction.

3,967,739
APPARATUS FOR SUPPLYING THIN, FLAT ARTICLES

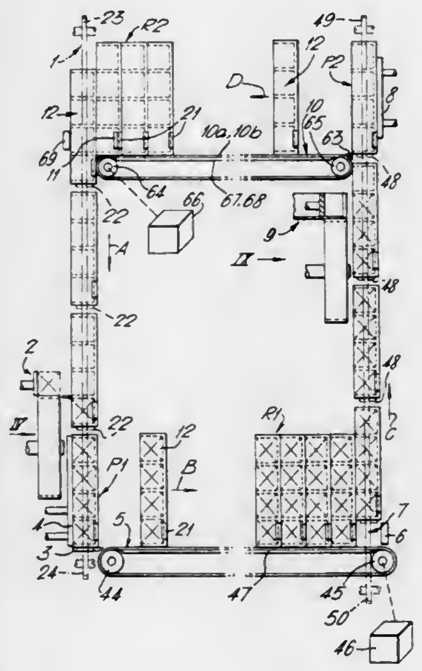
Naoki Kumagai, Yokohama, Japan, assignor to Itogihan Company, Ltd., Tokyo, Japan
Division of Ser. No. 308,820, Nov. 22, 1972, Pat. No. 3,900,115. This application Dec. 13, 1974, Ser. No. 532,700
Claims priority, application Japan, Nov. 24, 1971, 46-93613; Dec. 27, 1971, 46-105242; June 12, 1972, 47-57704; June 21, 1972, 47-61314; June 23, 1972, 47-62312
Int. Cl.² B65G *59/08*
U.S. Cl. 214—6 C **10 Claims**



1. An apparatus for supplying thin, flat articles comprising:
a reversing means for reversing the direction toward which said articles face while in a piled condition;
conveyers installed parallel to each other for conveying said articles;
said reversing means having at least one bottom surface supporting part for supporting the bottom surface of said piled articles and a plurality of edge supporting parts disposed perpendicular to said bottom surface supporting part for supporting one side edge of each of said articles;
said reversing means being able to lift and rotate said piled articles for the reversal thereof;
said edge supporting parts being able to cooperate with said conveyers in alternate fashion while said articles are being reversed;
said conveyers being able to receive said reversed articles and cooperate with each other for feeding said articles to a subsequent station; and
said edge supporting parts being passable through spaces ajoining said conveyers in an alternate fashion so as to be able to return to an initial position by passing downwardly through said spaces adjacent said conveyers without upward movement through said spaces after the reversal of said articles.

3,967,740
ARTICLE-HANDLING APPARATUS

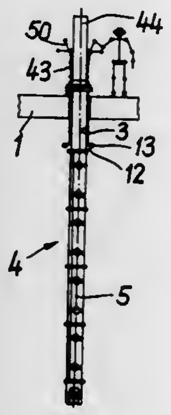
Desmond Walter Molins, London, England, assignor to Molins Limited, London, England
Filed July 31, 1972, Ser. No. 276,302
Claims priority, application United Kingdom, Aug. 2, 1971, 36319/71
Int. Cl.² B65G *1/06*
U.S. Cl. 214—16.4 C **44 Claims**



1. Apparatus for conveying cigarettes or other rod-like articles including means for feeding a stream of such articles transversely to their lengths; batch-forming means including retaining means for successively forming articles from said stream into batches confined by said retaining means, each batch comprising a stack of the articles; a loading station; means for transferring successive batches of articles from said retaining means into containers at said loading station; an unloading station; means for successively removing batches of articles from said containers at said unloading station; retaining means for receiving and confining batches of articles removed from said containers; and means for conveying away from said unloading station, as a continuous stream, batches of articles received by said retaining means.

3,967,741
DEVICE FOR MOVING FUEL ELEMENTS AND CONTROL BARS FROM ONE PLACE TO ANOTHER PLACE IN A CORE REACTOR

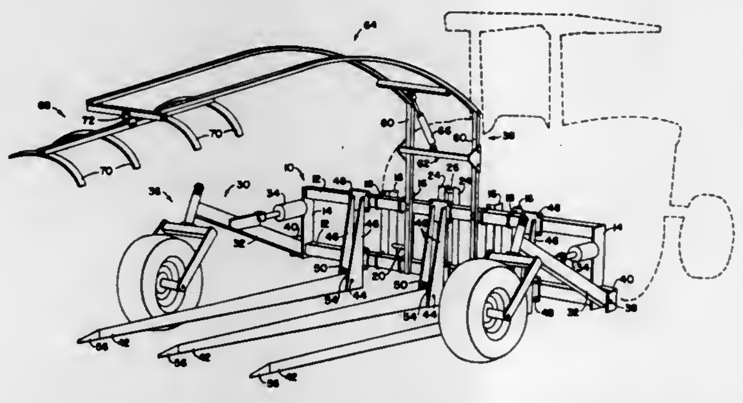
Bernhard Hoffmeister, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Feb. 3, 1975, Ser. No. 546,773
Claims priority, application Germany, Feb. 15, 1974, 2407228
Int. Cl.² G21C *19/10*
U.S. Cl. 214—27 **11 Claims**



1. A device for manipulating work members, especially fuel elements and control rods in a core reactor, comprising; a work platform mountable bodily in the horizontal direction and having a hole therethrough on a vertical axis, a mast on said axis extending through said hole, bearing means supporting said mast on said platform for rotation of the mast on the said axis, said mast having a workpiece gripping mechanism nonrotatably but reciprocably mounted therein, a first latch body nonrotatably but vertically movable on the mast on the outside thereof and above said platform, a second latch body fixed to said platform for cooperation with said first latch body and comprising circumferentially spaced regions which align with said first latch body in predetermined rotated positions of said mast, and bolt actuating means operable for moving said first latch body on said mast to effect positive engagement thereof with a said region of said second latch body in each of said rotated positions of said mast, said bolt actuating means also being operable for moving said first latch body on said mast to effect disengagement thereof from the region enaged thereby to permit rotation of said mast to another rotated position thereof.

3,967,742
HAY STACK MOVER

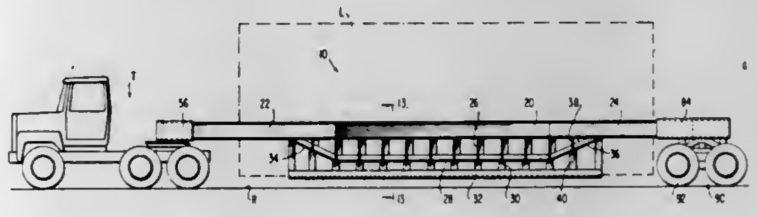
Harry Mathais Meinert, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Jan. 31, 1975, Ser. No. 545,825
Int. Cl.² B66F *9/12*
U.S. Cl. 214—766 **1 Claim**



1. A load lifting device comprising: an upstanding mast having means thereon for detachably securing said mast to a tractor three-point hitch; a pair of independent lift arms rockably secured to the mast end portions and projecting rearwardly therefrom; lift wheels carried on the arms adjacent their rear ends; an extensible and retractable power means between the mast and each arm for adjusting the latter; a plurality of transversely spaced apart tine members each member pivotally secured at its forward end for vertical movement with respect to said mast and extending rearwardly therefrom; means on the mast for limiting each tine's vertical movement; an elongated boom pivotally carried by said mast, extending in vertically spaced and overlying relation to the tines; power means coupled with said boom for swinging the boom; and a downwardly facing clamping structure articulately mounted on the boom for securing a load on the tines.

3,967,743
TRAILER CONSTRUCTION

John W. Yoder, P.O. Box 1337, Cumberland, Md. 21502
Filed Oct. 4, 1974, Ser. No. 512,318
Int. Cl.² B60P *3/40*
U.S. Cl. 214—390 **4 Claims**



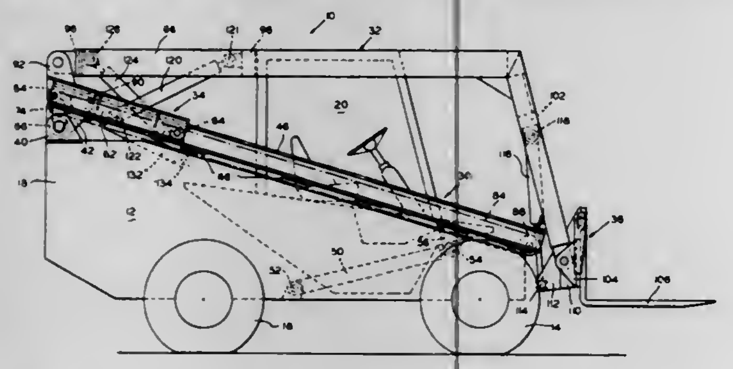
1. A trailer construction for carrying a load comprising:
a pair of spaced elongated side trusses including an elongated upper beam, a plurality of structural members carried by each truss and depending from the beam thereof, means carried by each truss and connected to the depending members adjacent their lower ends for supporting a load between said trusses, means connecting said trusses one to the other adjacent opposite ends thereof thereby defining an open area between the opposed side trusses and the opposed end connecting means whereby said trusses and said end connecting means are adapted to respectively straddle a load in said open area long the respective opposed sides and ends thereof, means carried by said trailer construction at each of the opposite ends thereof for displacing said trusses toward and away from one another, and means coupled to said connecting means at opposite ends of said trailer construction for connecting the trailer construction to wheeled supports adjacent its opposite ends, wherein the connecting means at one end of said trailer construction includes a guide carried thereby intermediate said trusses, an element carried by each side truss is movable toward and away from one another, and fluid actuated means carried by the trailer construction between said trusses for moving said trusses toward and away from one another, said apparatus including means coupling said elements and said side trusses for vertical movement of said side trusses relative to said elements; means carried by said trailer and cooperable between said side trusses and said element for moving said side trusses relative to said elements.

3,967,744
EXTENSIBLE REACH LOAD LIFTING MECHANISM

Wynand M. J. M. Goyarts, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Feb. 18, 1975, Ser. No. 550,894
Int. Cl.² E02F *3/74*
U.S. Cl. 214—770 **19 Claims**

1. An extensible reach load lifting mechanism for a truck or similar vehicle comprising first boom means pivotally connected adjacent one end of the truck and extending longitudinally thereof to a position adjacent the opposite end, first means for elevating the boom means above the truck about

said pivotal connection, trolley means mounted on said boom means for movement longitudinally thereof and of the truck, means for actuating said trolley means longitudinally of said boom means, second boom means pivotally connected at one end to said trolley means and extending longitudinally of the first boom means and of the truck, second means for elevating said second boom means above the truck and above said first boom means.



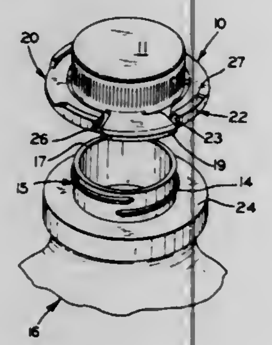
3,967,745
SELF-POSITIONING CHILD-RESISTANT CLOSURE

Randall K. Julian, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Aug. 18, 1975, Ser. No. 605,225

Int. Cl.² B65D *41/34, 41/36, 41/38*

U.S. Cl. 215—216 **15 Claims**



1. A child-resistant closure for the threaded neck of a container, said closure comprising, in combination,

a. an inverted cup-shaped cap having a disc-like top and a depending annular skirt,
b. a thread on the interior of said cap which mates with the thread on the container neck,
c. a tab integrally formed with and at the margin of said skirt,
d. a retaining ring integrally formed with and at the margin of said skirt, said ring being attached to said skirt by frangible elements and having a stop adjacent to and aligned with the trailing edge of said tab, and
e. a shoulder on the container neck adapted to be engaged by said retaining ring when said cap is rotated onto said neck to sealing position,

said ring being fixed to said shoulder and said cap being rotatable in retrograde direction relative to said ring and said container neck only after displacement of said tab to a position removed from alignment with said stop.

3,967,746
CANNING CLOSURE AND METHOD

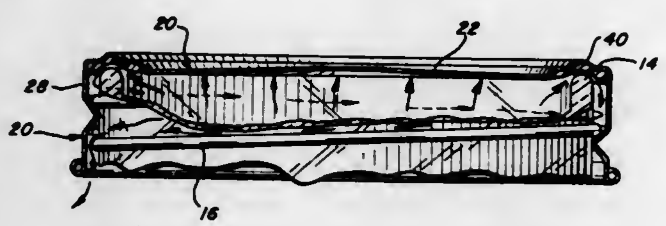
Albert L. Botkin, 3018 Hood Ave., Chicago, Ill. 60645

Filed Apr. 28, 1975, Ser. No. 572,160

Int. Cl.² B65D *51/16*

U.S. Cl. 215—260 **12 Claims**

1. A sealed package under vacuum comprising a container having a mouth, an upper circumferential sealing lip and a thread, a one-piece reusable closure sealingly secured to said container, said closure comprising a central cover section terminating outwardly in a depending peripheral flange, said flange providing a thread in threaded engagement with said container thread, an annular gasket bonded to said closure adjacent said flange, said gasket comprising closed-cell foam material resilient at temperatures up to about 250°F. and in sealing engagement with said lip around the entire lip, a portion of said closure central cover section being inwardly dished and being maintained in that inwardly dished configuration by internal vacuum in said sealed package, said central cover portion, when said closure is unscrewed to gain access to the contents of said package, springing preferentially to an outwardly dished configuration.



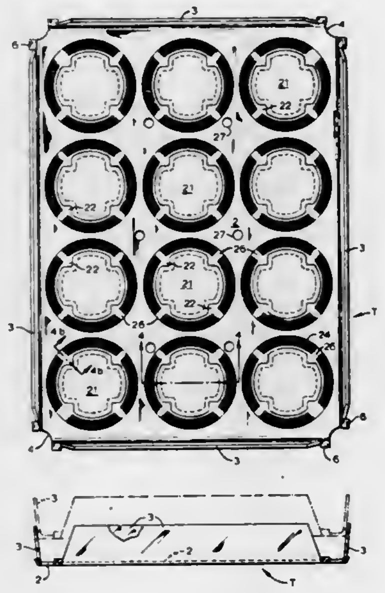
3,967,747
BOTTLE SUPPORT TRAY OF MOISTUREPROOF MATERIAL FOR A BOTTLE CASE

Gary L. Wagner, Covington, La., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 385,856, Aug. 6, 1973. This application June 9, 1975, Ser. No. 585,031

Int. Cl.² B65D *21/02, 81/16*

U.S. Cl. 217—26.5 **10 Claims**



1. A bottle support tray of integrally molded moistureproof plastic material for providing the bottom of a bottle carrier case, comprising a bottom panel having side edges, upstanding flanges attached to said edges for attachment to walls of the carrier case, and a plurality of spaced apart ledges integral with and projecting laterally outwardly beyond the outer faces of said flanges with each ledge substantially in alinement with said panel, said ledges having support surfaces above the plane of the undersurface of said panel adapted to engage the bottom edges of the carrier case walls to maintain the carrier case wall bottom edges out of contact with a surface upon which the case may be supported, parallel transversely and longitudinally extending rows of bottle support platforms upstanding from the top of said panel and integral therewith; each platform being elevated a slight distance above the top surface of the panel and having a relatively flat smooth top surface and spaced apart recesses projecting inwardly from its edge; the undersurface of said panel having a smooth shallow bottle-top accommodating recess under the elevated portion of said platform, and inwardly projecting projections under said edge recesses.

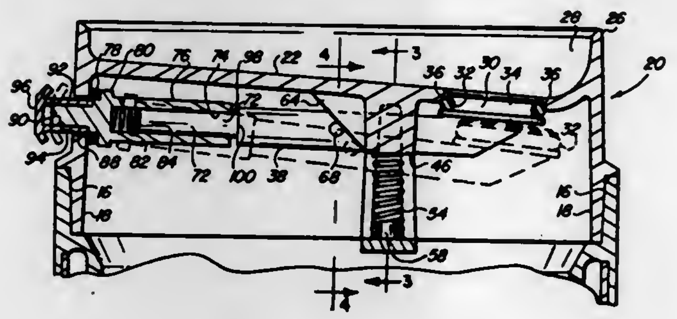
3,967,748
DRINKING RECEPTACLE VALVE MEANS

Kenneth J. Albert, 7212 Sunset Blvd., Hollywood, Calif. 90046, assignor to Thermo Seal, Los Angeles, Calif.

Continuation-in-part of Ser. No. 583,284, June 3, 1975, abandoned. This application July 11, 1975, Ser. No. 595,110

Int. Cl.² A47G *19/22*

U.S. Cl. 220—90.4 **22 Claims**



1. In a drinking receptacle valve means; a receptacle cover; said cover having a lip engaging edge; said cup having a drinking opening therein adjacent said edge; a drinking valve member adapted to close said opening; a movable member carrying said valve means; first means cooperable with said movable member and said cover for opening said valve member relative to said drinking opening; a manually operable and reciprocable plunger extending from the exterior to the interior of said cover; said plunger adapted to engage said movable member to force it and said first means to open said valve member relative to said drinking opening; a relief valve operable by said manually operable plunger; said relief valve adapted to relieve steam and fluid pressure from the interior of said cover to atmosphere; and lost motion engaging means disposed between said plunger and said movable means whereby manual movement of said plunger initially operates said relief valve and upon further movement of said plunger said lost motion engaging means opens said drinking valve member after said relief valve has relieved fluid pressure from inside said cover.

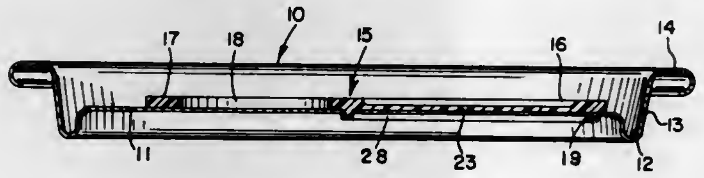
3,967,749
EASY OPENING END CLOSURE FOR A CONTAINER AND METHOD OF MAKING THE SAME

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 29, 1973, Ser. No. 365,014

Int. Cl.² B65D *41/02*

U.S. Cl. 220—265 **7 Claims**



1. An easy opening end closure for a container, said end closure comprising a metal panel, a slit in said panel, said slit defining a separable closure in said panel, a plastic tab completely overlying said separable closure and including a closure portion seated in said slit, said closure portion including a displaced portion having the appearance of being seated in said slit by the forging and displacement of the plastic material of said tab and said panel has a depending displaced edge in the form of a downwardly depending lip adjacent said slit, said forged plastic underlying both a marginal edge portion of the panel surrounding said separable closure along one side of the slit and the separable closure on the other side of the slit with said forged plastic being interlocked with said displaced edge and resisting outward movement of said separable closure.

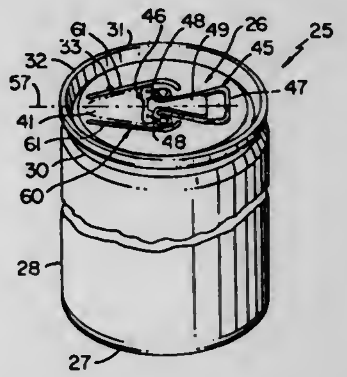
3,967,750
EASY-OPEN WALL

Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 506,453, Sept. 16, 1974, abandoned. This application July 1, 1975, Ser. No. 592,232

Int. Cl.² B65D *41/32*

U.S. Cl. 220—266 **20 Claims**



1. An easy-open wall for a container comprising, an approximately U-shaped score line in said wall, said score line having a bight and a pair of extensions extending from said bight and having arcuate end lengths terminating in spaced ends, said spaced ends having a portion of said wall therebetween, said score line defining a panel which is completely severable from said wall while remaining attached at said wall portion to define an opening in said wall, and a tab attached substantially flatly against said wall, said tab having a forward portion which overlies said panel adjacent said arcuate end lengths and having a rear portion, said rear portion being easily grasped and lifted to urge said forward portion against said panel to thereby sever said panel first along said arcuate end lengths and then progressively along said extensions and bight to move said panel within said container with said wall portion holding said panel securely to said wall.

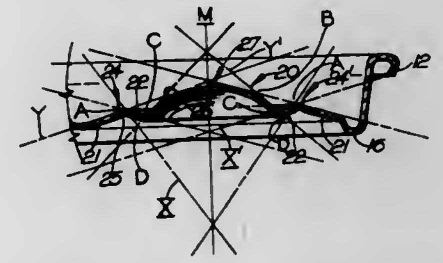
3,967,751
EASY OPEN END

Gordon R. Gane, Pleasanton, and Lawrence C. Hoffmann, Jr., Oakland, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed June 13, 1975, Ser. No. 586,671

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **21 Claims**



1. An easy open metal closure member comprised of a main panel encompassed by a rim and at least one reinforcing peripheral rib, a panel stiffening embossment means at least part of which is formed in the panel adjacent the central portion thereof and at least one outwardly projecting button-like depressible tab formed in said panel intermediate a selected portion of the peripheral rib and the stiffening embossment means, said depressible tab being provided with selectively offset concentrically arranged and interconnected primary and secondary base sections and an outwardly projecting dome-like section, said primary base section being generally inclined upwardly and inwardly and said secondary base sec-

tion projecting generally downwardly and inwardly to merge with the wall of the dome-like section and both of said base sections having hoop-like strength characteristics, web means disposed at least in part at an angle to the normal plane of the panel and interconnecting said base sections, said web means being comprised of an embrittled and readily frangible tear line portion that extends for a selected length of said web means and a hinge portion, a selected sector of the tear line portion spaced a predetermined distance from the hinge portion being more work hardened and embrittled than the remaining sectors of the tear line portion, force application indicator means integrated with the structure of the dome-like section and located substantially immediately adjacent the said selected sector of the tear line portion, the frangible tear line portion of the web means and the normal slope of a selected part of the wall of the dome-like section adjacent the wall's point of mergence with the secondary base section when projected along hypothetical lines also forming opposing and intersecting cone-like geometrical figures and said frangible tear line portion being of substantially less thickness than the adjacent base sections whereby when an external and inward force is applied to said dome-like section in the area of said force application indicator means said tear line portion sector will become the focal point of stress concentration and readily fracture to allow the dome-like section of the tab to pivot inwardly about the hinge portion.

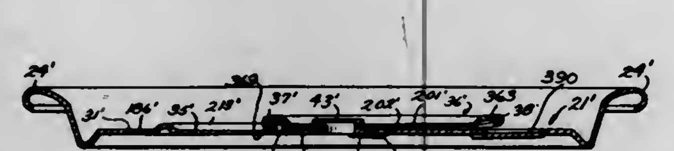
3,967,752
EASY-OPEN WALL

Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. Nos. 592,232, July 1, 1975, Ser. No. 529,461, Dec. 4, 1974, abandoned, Ser. No. 519,992, Nov. 1, 1974, Ser. No. 506,453, Sept. 16, 1974, abandoned, Ser. No. 492,033, July 26, 1974, Ser. No. 488,805, July 15, 1974, Ser. No. 378,448, July 12, 1973, abandoned, and Ser. No. 293,115, Sept. 28, 1972, Pat. No. 3,836,038, said Ser. No. 592,232, is a continuation of Ser. No. 506,453, said Ser. No. 529,461, is a continuation-in-part of Ser. No. 519,992, Ser. No. 492,033, Ser. No. 378,448, and Ser. No. 293,115, said Ser. No. 492,033, is a continuation-in-part of Ser. No. 378,448, and Ser. No. 293,115, , said Ser. No. 378,448, is a continuation-in-part of Ser. No. 293,115. This application Nov. 24, 1975, Ser. No. 634,755

Int. Cl.² B65D *41/32*

U.S. Cl. 220—269 **32 Claims**



26. A tab suitable for levering open a tear panel on an end wall of an easy-open container without being detached from the container, said tab having a rear end adapted to be lifted to open a tear panel and a front end adapted to be pressed down on a tear panel and comrising: a first member of a first material extending substantially the length of said tab between its ends and providing rigidity against transverse bending when the tab is used as a lever; a second member of a second material; said first and second members being mechanically joined together by overlap of a marginal portion of said first member around a marginal portion of said second member, said members having other portions thereof which have aligned openings therethrough for receiving a rivet from a container end wall and which are bendable for permitting pivotal movement of said tab about an axis transverse to said length; said first material having greater strength than said second material; and said second material being more capable of being bent back and forth without breaking than first material.

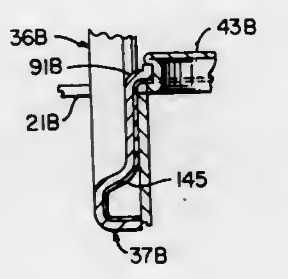
3,967,753
EASY-OPEN WALL

Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. Nos. 293,115, Sept. 28, 1972, Pat. No. 3,836,038, and Ser. No. 378,448, July 12, 1973, abandoned. This application July 26, 1974, Ser. No. 492,033

Int. Cl.² B65D *41/32*

U.S. Cl. 220—269 **16 Claims**



1. An easy-open end wall for a beverage container, said end wall having a periphery, a rupturable score line in said end wall defining most of the periphery of a non-removable tear panel while leaving an integral hinge between the panel and the remainder of the end wall, a non-detachable tab, means for attaching said tab to said end wall in a region adjacent to but outside of said tear panel and providing for pivotal movement of said tab about an axis transverse to the length of said tab, said score line including two spaced portions extending from said region away from said tab, said score line extending from said two spaced portions into a generally arcuate section, said tab having a forward, rupturing portion that overlies a minor part of said tear panel adjacent said region and with the greater part of said tear panel being uncovered by and extending away from said tab toward said generally arcuate section, said tab having a rear portion being adapted to be easily grasped and lifted up to urge said forward portion against said panel as the tab is pivoted about said axis to rupture said score line and depress said panel away from said end wall and about its hinge to open position, the initial listing movement of said tab rear portion effecting an initial rupturing of said score line adjacent said tab forward portion and further lifting of said tab rear portion causing propagation of the initial rupturing of the score line away from said tab forward portion and into said generally arcuate section of said score line.

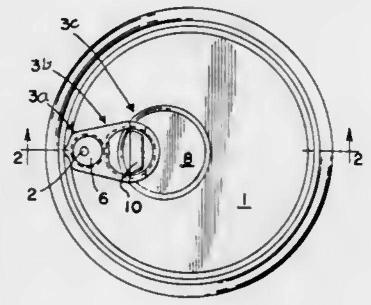
3,967,754
PULL TAB ANTI-ROTATION MOUNTING

Obert M. Ostrem, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 12, 1975, Ser. No. 576,420

Int. Cl.² B65D *41/32*

U.S. Cl. 220—273 **12 Claims**



1. An improved easy-open end closure for a can or similar container, said end closure comprising an end panel, a score line formed in said end panel and defining an opening flap therein, a pull tab rotatably attached to said end panel, anti-rotation abutment means on said end panel for restraining rotation of said tab, and means for panelwardly biasing said tab to engage said tab with said abutment means, said tab being attached to said end panel by a rivet with said rivet being oriented to bias said tab panelwardly, said tab including a finger ring portion, said anti-rotation abutment means comprising a recess formed in said end panel and said finger ring portion of said tab rests partially within said recess.

3,967,755
PRESENTATION DEVICE WITH A MUSICAL MOVEMENT

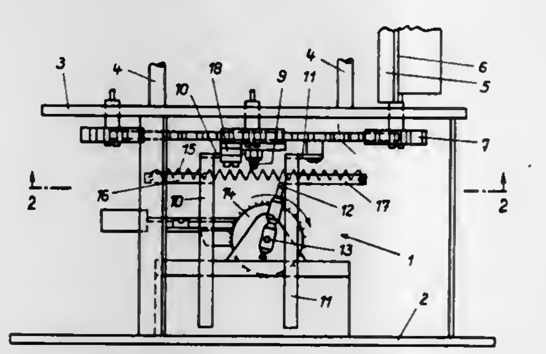
Guido Reuge, 21, rue des Rasses, 1450 Ste Croix, Switzerland

Filed Sept. 9, 1975, Ser. No. 611,603

Claims priority, application Switzerland, Sept. 10, 1974, 12324/74

Int. Cl.² G10F *1/06*

U.S. Cl. 221—3 **1 Claim**



1. A presentation device provided with a musical movement for articles, particularly cigarettes or the like, said device comprising at least one holder for the articles to be presented, said holder being mounted pivotally on a spindle so as to move from a closed position to an open position where the articles to be presented are visible, the pivot-spindle of the holder carrying a pinion engaging with a ring-gear driven by at least one angle-lever mounted on the ring-gear and actuated by a crank fixed to the spindle of the drum of the musical movement, wherein two angle-levers are pivoted on the ring-gear, and a return-spring maintains said levers near to each other while permitting a relative movement therebetween.

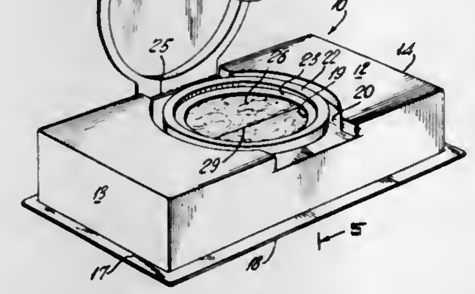
3,967,756
WET WIPE DISPENSER

Robert A. Barish, Trenton, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed June 9, 1975, Ser. No. 585,006

Int. Cl.² A47K *10/24*

U.S. Cl. 221—45 **4 Claims**



1. A dispensing container for stacked sheets comprising a single molded element having a top portion, a front wall, a back wall and two opposing end walls, said top portion being substantially planar from the end walls to a lid receiving depression in said top portion, said lid receiving depression extending from said front wall to said back wall, a neck portion extending upwardly from the base of said depression and having a horizontally extending rim located on a plane no higher than the plane of said top portion, a horizontal shoulder extending inwardly from said neck and an aperture defined by the termination of said shoulder, a reclosable lid adapted to fit over said neck portion, the front, back and end walls having an outwardly extending flange at their lower terminal edge, said flange being continuous around the circumference of said container and a liquid impervious bottom element secured to the flange around its entire circumference to form a continuous seal.

3,967,757
ANTI-BURGLARY IRRITANT SPRAYING DEVICE

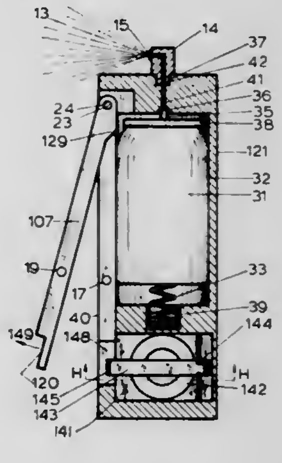
Charles Robert Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605

Continuation-in-part of Ser. No. 349,300, April 9, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,667

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² B67B *7/24*

U.S. Cl. 222—5 **12 Claims**



1. A chemical dispensing anti-burglary device for use with a pressurized container, the device comprising: a body member; means for slidably supporting said pressurized container in said body member; a fluid passageway extending through said body member having an entry section at one end thereof and a means for directing fluid discharge from the other end thereof; means for causing the discharge of fluid from said pressurized container into said entry section of said fluid passageway; a spring biasing said pressurized container in said body member and arranged to cause fluid discharge from said pressurized container upon movement of said slidably supported pressurized container when said pressurized container is released; means for releasably retaining said pressurized container in a cocked position; said retaining means including a trigger element; said trigger element being mounted for movement between an actuation position and a release position; said trigger element having a shaped portion for engaging with said pressurized container whereby movement of said spring urged pressurized container will force said trigger element to move to said release position; a trigger holding means mounted for movement between a holding position and a release position; said trigger holding means in said holding position adapted to hold said trigger in said actuation position to retain said pressurized container in said cocked position; said trigger holding means in said release position allowing said spring urged pressurized container to be forced against said entry section, whereby the means for discharging fluid causes discharge.

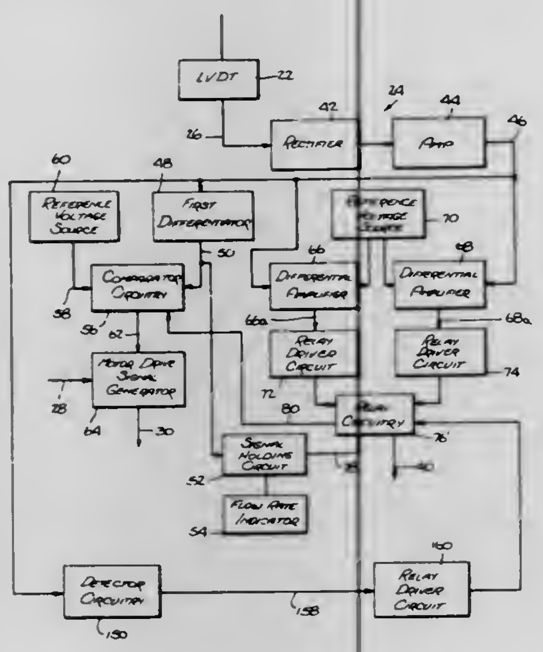
3,967,758
AUTOMATICALLY CONTROLLED WEIGH FEEDING APPARATUS

Angelo Ferrara, Fairfield, N.J., assignor to Acrison, Inc., Carlstadt, N.J.

Filed Feb. 18, 1975, Ser. No. 550,639

Int. Cl.^{2} G01G *11/14*

U.S. Cl. 222—58 **8 Claims**



1. A weigh feeding apparatus comprising a container for a prefilled substance, means for discharging the substance from the container at a controllable rate, means for weighing the container and its contents and for producing an electrical signal proportional to the weight, means actuated by said electrical signal for controlling the discharge of the substance from the container, detector cirucit means actuated by said electrical signal for producing an output which is responsive to predetermined excessive excursions of said electrical signal, and means responsive to said output for locking the discharge control means against deviation during the time of said excessive excursion.

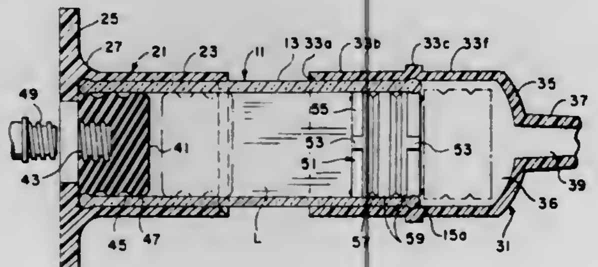
3,967,759
SYRINGE ASSEMBLY WITH CONTAINED POP-OUT ELASTIC PLUG SEAL

Brian E. Baldwin, Wilmette, and Edward A. Tischlinger, Plaines, both of Ill., assignors to MPL, Inc., Chicago, Ill.

Division of Ser. No. 197,845, Nov. 11, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,910

Int. Cl.^{2} B65D *37/00*

U.S. Cl. 222—145 **57 Claims**



1. A glass tube and non-glass finger grip and nose-forming arrangement for use particularly in packaging and subsequent dispensing of chemicals, comprising

a substantially cylindrical glass tube formed of a length of substantially constant diameter thin-walled glass tubing of substantially constant wall thickness along its length and having a wall thickness substantially smaller than the outer and inner wall diameters of said glass tubing,

a finger-grip sleeve of thermoplastic resin and having a tube-gripping sheath section laterally extending finger-grip protrusion integrally formed thereon,

and a nose-forming sleeve of thermoplastic resin and having a reduced diameter section integral with a tube-gripping sheath section thereof,

said sleeves being frictionally secured in annularly extending stretch-fit along their sheath sections over and along respectively opposite ends of said glass tube,

a piston slidably disposed in sealing relation within and at said end of said glass tube having said finger-grip sleeve thereon,

a valve seal disposed at the opposite nose end of said glass tube,

said reduced diameter section of said nose-forming sheath including a laterally extending wall spaced longitudinally forwardly of the respective adjacent end of said glass tube and having a reduced diameter central orifice formed therein for fluid flow therethrough during dispensing,

said nose-forming thermoplastic resin sleeve sheath section extending longitudinally beyond the respective overlain said end of said glass tube to form a fluid flow by-pass cavity of larger internal diameter than the internal diameter of said cylindrical glass tube,

and said valve seal being a pop-out elastic plug frictionally sealing the nose sleeve end of said tube,

said plug having a free relaxed diameter and length size less than the corresponding diameter and length sizes of said fluid flow by-pass cavity at all corresponding annular and longitudinal points along the length and annular periphery of said plug and said by-pass cavity to enable free plug movement within said by-pass cavity and fluid by-pass flow around the annular periphery of said pop-out valve plug when such plug is longitudinally popped out into said by-pass cavity by forward motion of said plunger.

3,967,760
ACTUATORS FOR PRESSURIZED CONTAINERS

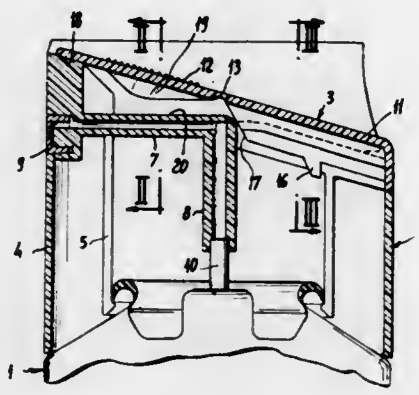
Christian Marcon, Bonneuil, France, assignor to VCA Corporation, Baton Rouge, La.

Filed May 19, 1975, Ser. No. 579,022

Claims priority, application France, May 21, 1974, 74.17565

Int. Cl.^{2} B67D *5/32*

U.S. Cl. 222—153 **10 Claims**



1. An actuator cap assembly for an aerosol can having a valve with a projecting valve stem comprising: a body having an upper wall providing a central, longitudinal slot thereacross, and a skirt portion depending from the upper wall of said body adapted to be mounted on an aerosol can; means on the rear portion of said upper wall adjacent said slot forming a slide; a movable slide member comprising a rear carriage portion mounted in said slot supported and continuously engaged by the slide for linear movement only therealong between a first position and a second position, and a forward button portion hingedly connected to said rear carriage portion at its forward end and movable relative to the carriage, the arrangement being such that when in use on an aerosol can operation of the valve can be brought about by moving the forward button portion relative to the rear carriage portion when the rear carriage portion is in its first position and operation of the valve by the forward button portion is not possible when the rear carriage portion is in its second position.

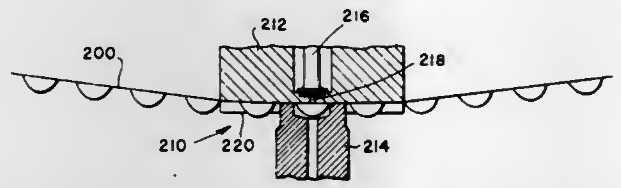
3,967,761
SYSTEM FOR INJECTING PARTICULATE MATERIAL INTO THE COMBUSTION CHAMBER OF A REPETITIVE COMBUSTION COATING APPARATUS

Rosser B. Melton, Jr., Helotes, and Elbert M. Hubbard, Dallas, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 458,884, April 8, 1974, Pat. No. 3,893,578. This application Nov. 4, 1974, Ser. No. 520,670

Int. Cl.^{2} B67D *5/54*

U.S. Cl. 222—194 **7 Claims**



1. A system for injecting predetermined quantities of particulate coating material into a chamber from an elongated tape forming a plurality of discrete tubular capsules each encapsulating a predetermined quantity of particulate coating material, each capsule having an inlet face and an outlet face at opposite ends of the tubular capsule, said system comprising:

means for forming a seal around the tubular capsule to seal the inlet face from the outlet face,

inlet manifold means including valve means for applying a pneumatic pulse to the inlet face, said inlet manifold means being separable from said means for forming a seal around the tubular capsule, and

outlet manifold means including an outlet port communicating with the outlet face of the capsule and the chamber wherein the particulate coating material can be co-mingled with a hot gas to heat and accelerate it against a work piece.

3,967,762
PUMP FOR DISPENSING LIQUID FROM A CONTAINER IN A GENERALLY CONTINUOUS MANNER

Charles S. Machon, Woodbury, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

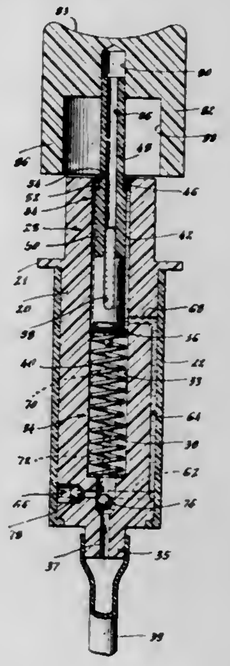
Filed Apr. 16, 1975, Ser. No. 568,515

Int. Cl.^{2} G01F *11/02*

U.S. Cl. 222—321 **6 Claims**

1. A finger operable pump for dispensing liquid from a container in a generally continuous manner, said pump comprising:

1. a pump housing including
   - a. an inner pump body, and
   - b. an outer sealing element, said inner pump body having:
     - i. a liquid receiving chamber divided into primary and secondary chamber portions,
     - ii. an inlet conduit for enabling liquid to be conducted from the container to said primary chamber portion,
     - iii. an outer surface formed with a channel and an air dome communicating with said channel and located to confine air as a pressure head above liquid flowing in said channel,
     - iv. a first lead passage communicating between said primary chamber portion and said channel, and
     - v. a second lead passage communicating between said channel and said secondary chamber portion,
   - said outer sealing element being dimensioned and shaped to tightly nest about said inner pump body and seal said channel and said air dome,
2. a plunger assembly including,
   - a. a piston mounted in said liquid receiving chamber for reciprocal pumping movement, said piston dividing said liquid receiving chamber into said primary and secondary chamber portions, and
   - b. a hollow piston rod mounted on said piston extending out of said pump housing and defining an outlet conduit communicating between atmosphere and said secondary chamber portion, and



3. valve means located to enable said piston to pump liquid from said primary chamber portion through said channel, into said secondary chamber portion to be dispensed through said outlet conduit and to pressurize air in said air dome, and further to enable said air pressurized in said air dome to force liquid through said channel, into said secondary chamber portion to be dispensed through said outlet conduit.

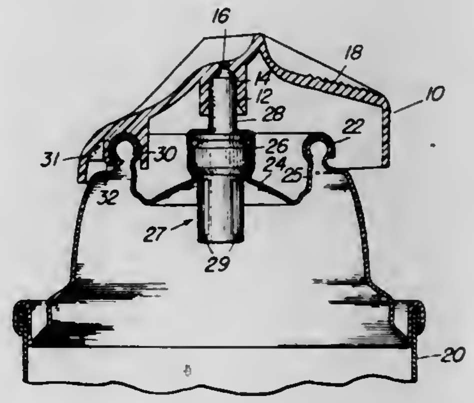
3,967,763
CLIP MOUNTED AEROSOL DISPENSER ACTUATOR

John Richard Focht, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Continuation of Ser. No. 292,185, Sept. 25, 1972, abandoned, which is a continuation of Ser. No. 86,045, Nov. 2, 1970, abandoned. This application Dec. 20, 1973, Ser. No. 426,515

Int. Cl.^{2} B65D *83/14*

U.S. Cl. 222—402.15 **1 Claim**



1. In a one-piece actuator lever for controlling the dispensing of material from a pressurized container having a top opening closed by a valve mounting cup affixed to the container by a toroidal rolled seam bead of generally circular cross-section, the valve mounting cup including a centrally disposed axially actuable valve with a product outlet passage, the actuator lever being of the type wherein the actuator lever comprises a finger engageable surface at one end of the lever for application of valve actuating force, means on the under-

side of the lever between the two ends for communication with and frictional retention of the valve product passage and a discharge orifice in communication with the valve product passage,

the improvement comprising

an integral resilient fulcrum clip at the other end of the lever from the finger engageable surface for pivotally snap-fitting on the bead, said fulcrum clip being in the form of a downwardly opening channel with a reentrant U-shaped configuration which is narrowed toward the opening by a lip for gripping said bead,

said channel being curved in its length to mate with the toroidal bead and extending circumferentially of said bead through a relatively small sector of arc from about 20° to about 60° to permit free pivotal movement of the fulcrum clip about the circular surface of the bead for valve actuation while restraining the actuator lever against motion perpendicular to the valve actuation axis,

said actuator lever including at least one reinforcement rib to rigidify said channel.

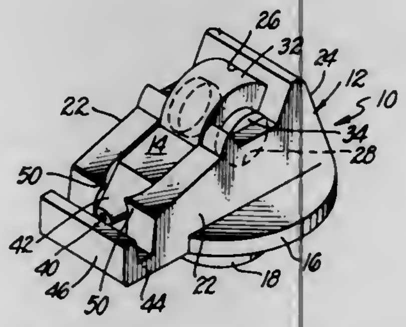
3,967,764
CHILD-RESISTANT CLOSURES WITH LIMITED SPOUT ACCESSIBILITY

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Continuation-in-part of Ser. No. 326,425, Jan. 24, 1973, Pat. No. 3,851,805. This application Dec. 2, 1974, Ser. No. 528,652

Int. Cl.^{2} B65D *25/46, 47/06*

U.S. Cl. 222—536 **1 Claim**



1. A dispensing closure having a cap adapted to be secured to a container so that it is substantially impossible to remove the cap from the container and having a spout rotatably mounted on the cap so as to be capable of being rotated between a closed position in which the spout covers an opening through the cap and an opened position in which the spout is in alignment with the opening in which the improvement comprises:

said cap including a base, means on said base for mounting the cap on a container, two substantially parallel spaced walls extending upwardly from said base, said parallel walls having adjacent ends, a part of said base extending between and connecting said parallel walls, a back wall connecting two adjacent ends of said parallel walls, a bottom wall extending horizontally from said part of said base adjacent to and generally between said other adjacent ends of said parallel walls, said bottom wall constituting an extension of said part of said base between said parallel walls, an upstanding end wall located on said bottom wall and spaced from said second mentioned adjacent ends of said parallel walls.

said spout being rotatably mounted on said cap so as to extend in its closed position between said parallel walls above said part of said base with its tip extending beyond said second mentioned adjacent ends of said parallel walls and above said bottom wall with said tip being spaced from said end wall,

said cap and said spout being shaped so that only said tip of said spout can be engaged to rotate said spout when said spout is in said closed position,

said bottom wall, said end wall, said parallel walls and said spout being dimensioned so that said tip cannot be directly engaged by the digits of the hand of a user so as to rotate said spout from said closed position and being of such dimensions that an implement can be inserted downwardly between said tip and said end wall underneath said tip and manipulated as a lever against said end wall to rotate said spout upwardly from said closed position to a sufficient extent that said spout may be thereafter engaged by the digits of the hand of a user to rotate said spout to said opened position.

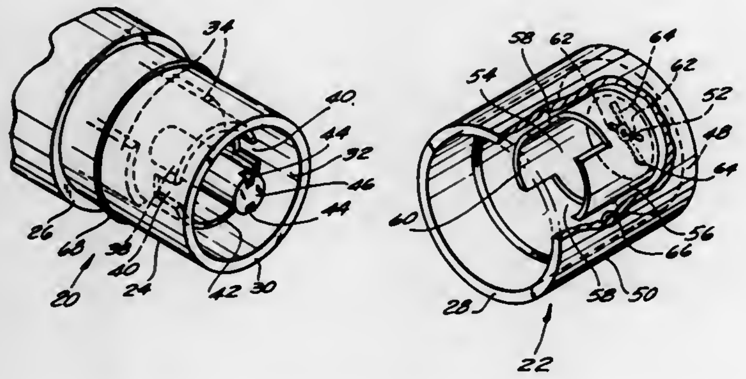
3,967,765
MULTIPLE PURPOSE NOZZLE

Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.

Continuation-in-part of Ser. No. 278,997, Aug. 9, 1972, Pat. No. 3,843,030. This application Sept. 30, 1974, Ser. No. 510,580

Int. Cl.^{2} B05B *1/12*

U.S. Cl. 222—554 **5 Claims**



1. A multiple purpose nozzle comprising: a tubular member having a passage means therethrough and through which material to be dispensed is adapted to pass, an adjustable cap associated with the tubular member and adapted to assume a first position at which it seals off the passage means to prevent the material form being dispensed, the cap adapted to assume at least one other position at which the material to be dispensed is adapted to pass in a selected predetermined discharge pattern, the cap including a discharge orifice, surfaces of the tubular member and the cap define a passageway from the passage means to the orifice when the cap is in the other position, the tubular member having an end wall, the cap having an outer flat closed wall having the discharge orifice and a tubular skirt disposed around the end wall, the cap and the tubular member cooperating to form between them a laterally extending portion of said passageway when the cap is in the other position, the passageway including a cavity of predetermined configuration at the other position which cooperates with the orifice in producing the selected discharge pattern, the cap including a hollow boss extending from the flat wall inwardly within and coaxially with the skirt, an axially extending core portion and a surrounding spaced core skirt in the tubular member and positioned to receive the boss therebetween when the cap is coupled with the tubular member, the boss and core skirt having cooperating slots forming part of the passageway communicating with the passage means and the cavity when the cap is in the other position, the boss being adapted to close off the passage means and its communication with the orifice when the cap is in the first position, and coupling means for associating the cap with the tubular member whereby the cap may be shifted between the first and second positions there being at least two other positions angularly spaced with the discharge pattern of one being a spray and the discharge pattern of the other being a stream, the boss, core skirt, and core having slots therein cooperating with recesses in the flat closed wall of the cap upon alignment in a first of said other portions that produces a stream through the discharge orifice and alignment in a second of said other positions that produces a mechanical break-up to provide a spray pattern through the discharge orifice.

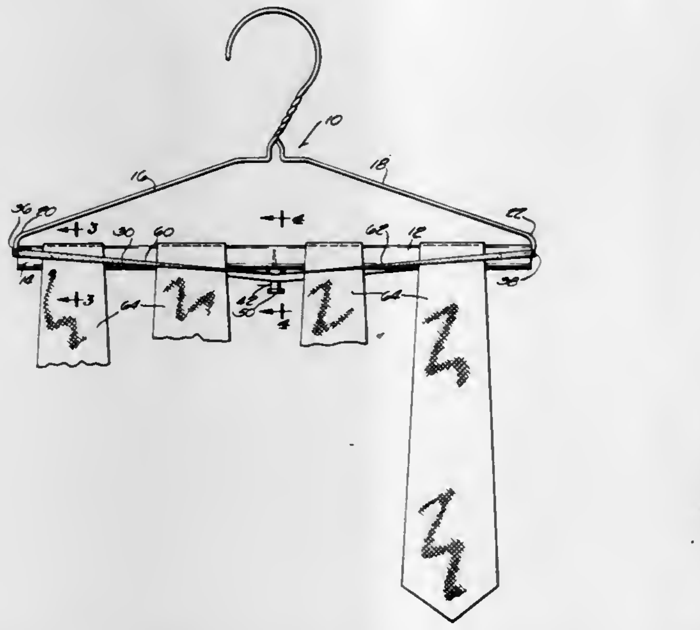
3,967,766
TIE ATTACHMENT FOR COAT HANGER

Joseph M. Hart, 5433 W. National Ave., Milwaukee, Wis. 53214

Filed Nov. 13, 1975, Ser. No. 631,763

Int. Cl.^{2} A47J *51/094*

U.S. Cl. 223—85 **2 Claims**



1. In a hanger of the type having a lower supporting run including a paperboard sleeve spanning the run and having upwardly converging runs extending from the lower run, the improvement comprising a continuous elastomeric band having opposed ends and elongated runs with said opposed ends arranged around the juncture of said lower run and converging runs of said hanger and above said sleeve and guide means located intermediate the length of said sleeve and fastened to said sleeve and projecting downwardly therefrom and said band having its elongated runs trained about said guide means with said elongated runs crossing each other on opposite sides of said guide means whereby said elongated runs are engaged under tension with said sleeve at points intermediate the ends of said sleeve and said guide to clamp articles to said sleeve.

3,967,767
DEVICE FOR SEVERING AND FEEDING FLACCID WRAPPING SHEETS

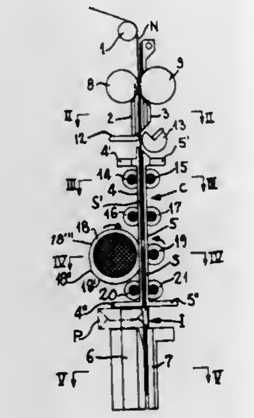
Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa Per Azioni, Italy

Filed Dec. 2, 1974, Ser. No. 528,734

Claims priority, application Italy, Dec. 20, 1973, 3547/73

Int. Cl.^{2} B26F *3/02;* **B65H** *35/10*

U.S. Cl. 225—96 **6 Claims**



1. Apparatus for feeding flaccid sheet material, comprising;

a channel having surfaces disposed to contact surfaces of an elongate strip of flaccid sheet material and to guide said strip toward a zone of utilization, the channel having feed rolls to feed the strip to said zone, the channel surfaces and feed rolls generally defining a plane of travel for the strip and having means in a channel section upstream of said zone for removably impressing longitudinally extending, transversely spaced ribs in the strip to strengthen the flaccid material against curling;

a cutter disposed adjacent said channel, upstream of said channel section, for making transverse perforations in the strip, in synchronism with the feeding of the strip, and for thereby partly defining successive sheets which constitute parts of the strip, but leaving the sheets interconnected at spaced points; and

a pair of rolls positioned on opposite sides of said channel and engaging the strip, said pair of rolls having means for tearing the successive sheets from the engaged, perforated strip and for moving them to the zone of utilization while preventing displacement of any detached sheet from the lateral orientation relative to the channel in which the sheet, as part of the perforated strip, was engaged by the pair of rolls.

3,967,768
SEALING DEVICE FOR HOT FLUID CURING UNITS

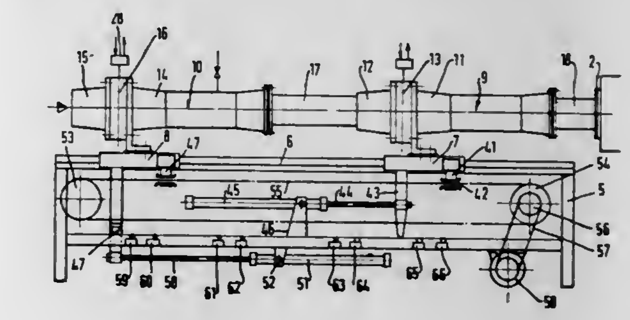
Augusto Previati, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jan. 22, 1974, Ser. No. 435,492

Claims priority, application Italy, Jan. 22, 1973, 19414/73

Int. Cl.^{2} B65H *17/36*

U.S. Cl. 226—115 **6 Claims**



1. Sealing device for hot fluid curing units used to cure elongated elements as tubes, structural shapes and the like, which comprises at the inlet and outlet opening of the curing unit at least two coaxial tubular bodies, one of said tubular bodies being secured to any opening of the curing unit and the other tubular body being tightly slidable in the first with an alternative telescopic movement, each of said tubular bodies being provided with an element for tightly locking the elongated element to be cured, whereby the passage of said elongated element in the curing unit takes place without rubbing against part of said curing unit.

3,967,769
TAPE DRIVING ASSEMBLY

Isao Matsumoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,801

Claims priority, application Japan, Dec. 22, 1973, 48-1570[U]

Int. Cl.^{2} B65H *17/20*

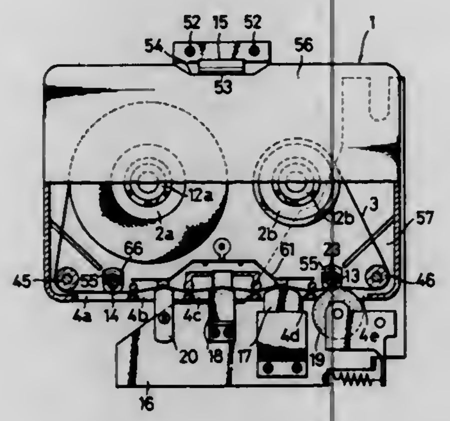
U.S. Cl. 226—194 **10 Claims**

1. A tape driving assembly for a recording tape contained in a cassette and which is transported past a signal reproducing head, comprising:

a. a pinch roller;

b. a capstan mounted adjacent to said pinch roller and operating therewith to transport said tape;

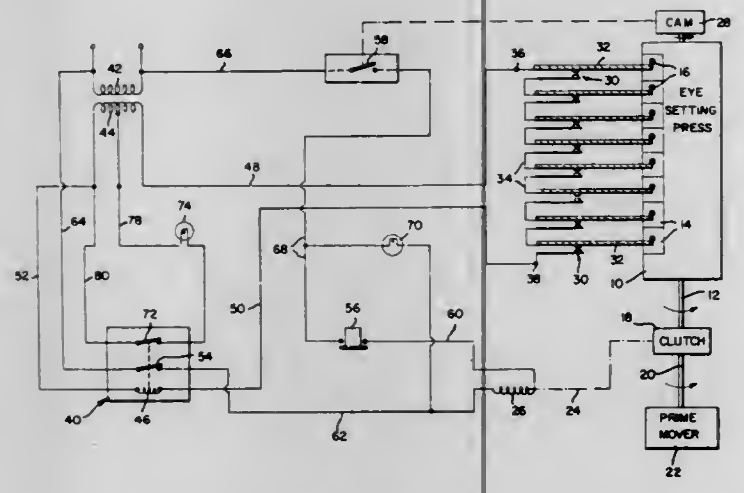
c. a capstan cover partially surrounding said capstan and having a vertical reference surface against which said cassette is receivable so as to provide a position reference;
d. means engageable with said cassette to hold it against said vertical reference so as to accurately position said cassette;



including a horizontal reference surface formed adjacent said capstan cover to form an accurate vertical reference for said cassette; and
wherein said capstan cover has an upper tapered portion for guiding said cassette.

3,967,770
INTERLOCK FOR EYE SETTING MACHINE

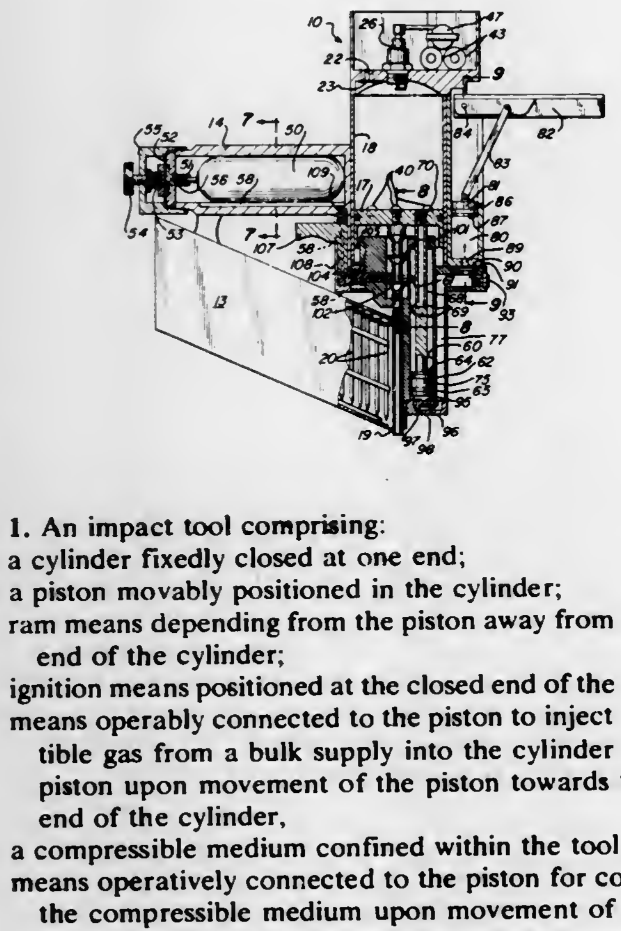
Daniel L. Davis, Franklin, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed July 3, 1975, Ser. No. 592,827
Int. Cl.² B21J *15/28*
U.S. Cl. 227—2 **2 Claims**



1. In a machine for simultaneously setting plural fastener elements into a work piece, said machine having a primemover for rotating a drive shaft for the machine, disengageable clutch means between a fastener setting press and said prime mover, said clutch means being disengageable in response to a solenoid, and a cam carried by said press means for indicating the cyclical state of said press means, an interlock for insuring the presence of each of said plural fasteners in said press means comprising: plural normally open feeler switch means positioned for detecting the presence of properly located fasteners in said press means, each of said feeler switch means being connected electrically in a series combination, a relay coil connected between said series combination of switch means and a source of voltage, a normally open micro-switch in following relationship on said cam, configured for closing when said cam indicates a cyclical state of said press just prior to pressing of said fasteners, a normally closed relay contact associated with said relay coil, said solenoid being connected to a source of voltage via the series combination of said relay contact and said microswitch, whereby said relay coil is energized to open said relay contact, preventing disengagement of said clutch means only if each of said feeler switch means detects a fastener at the time of closure of said micro-switch.

3,967,771
SELF-CONTAINED IMPACT TOOL

James E. Smith, 217 Meadowlook Way, Boulder, Colo. 80302
Filed Dec. 16, 1974, Ser. No. 532,792
Int. Cl.² B25C *1/08*
U.S. Cl. 227—10 **6 Claims**



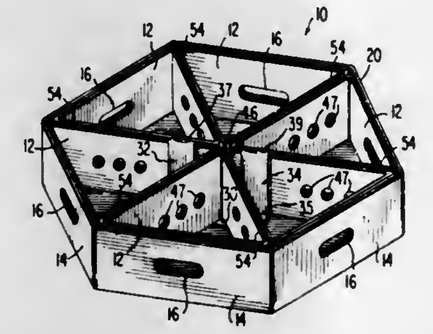
1. An impact tool comprising:
a cylinder fixedly closed at one end;
a piston movably positioned in the cylinder;
ram means depending from the piston away from the closed end of the cylinder;
ignition means positioned at the closed end of the cylinder;
means operably connected to the piston to inject a combustible gas from a bulk supply into the cylinder above the piston upon movement of the piston towards the closed end of the cylinder,
a compressible medium confined within the tool;
means operatively connected to the piston for compressing the compressible medium upon movement of the piston away from the closed end of the cylinder;
means to releasably secure the piston and ram means against the force exerted by the compressed medium in a position with the piston spaced from the closed end of the cylinder, and;
means to position a nail below the ram means;
whereby, a combustible gas may be ignited by the ignition means to drive the piston and ram means away from the closed end of the cylinder thereby to drive a nail disposed below the ram means and to concurrently compress the compressible medium and engage the means to secure the piston in the spaced position away from the closed end of the cylinder, and thereafter, upon releasing the piston from the securing means, allowing the compressed medium to urge the piston towards the closed end of the cylinder while concurrently injecting the combustible gas into the cylinder above the piston and, when the piston reaches a position adjacent the closed end of the cylinder, again igniting the combustible gas to drive the piston, ram means and nail position under the ram means away from the closed end of the cylinder and again compress the compressible medium.

3,967,772
REUSABLE CONTAINERS FOR CITRUS FRUIT AND THE LIKE

Howard W. Baker, Box 11, Rte. 1, Terra Bella, Calif. 93270
Filed Jan. 22, 1975, Ser. No. 542,951
Int. Cl.² B65D *21/02*
U.S. Cl. 229—18 **11 Claims**

1. A reusable container comprising:
a base member made of a foldable, non-metallic sheet material and having a polygonal central portion with a plurality

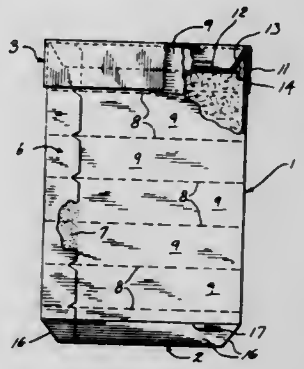
of outer side walls joined thereto by fold lines which define the periphery of the base central portion;
a continuous band of foldable, non-metallic sheet material frictionally engaging the outer side walls of said base member in an encircling relationship for maintaining said outer side walls in an upright position and being removable to fold the base member to a flattened condition for return shipment of the empty container after initial use of the container;
said band having a width substantially equal to the height of said side walls whereby the band provides column support at the corners of the container; and
a plurality of divider members made of a foldable, non-metallic sheet material formed as members separate from the base member and from each other, said divider members each having at least three wall sections joined by at least two substantially parallel fold lines to have the form of a triangle, said divider members being positioned inside said container with one wall section located adjacent the inside surface of one of said base member side walls, said divider member one wall section having a length substantially equal to the length of the adjacent container side wall thereby to locate two of said fold lines at corners of said base member and the other two wall sections along diagonal lines, each of said other two wall sections being in a substantially in-line relationship with opposed wall sections belonging to another divider member to provide reinforcement of the container and resist inward movement of side walls at the corners of the base member, said divider members being removable without destruction of the container and foldable to a flattened condition for return shipment of the empty container after initial use of the container;
said base member, band, and divider members providing sufficient reinforcement to enable the container to carry contents weighing more than 150 pounds.



3,967,773
STORAGE METHOD EMPLOYING SEVERABLE WALLED CONTAINER HAVING A CONTINUOUSLY MERGIBLE COVER

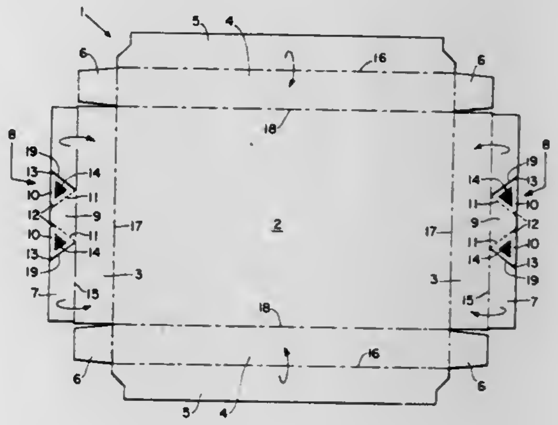
David P. Kaufmann, 6760 N. 54th St., Milwaukee, Wis. 53223
Continuation of Ser. No. 330,998, Feb. 9, 1973, abandoned.
This application Jan. 20, 1975, Ser. No. 542,597
Int. Cl.² B65D *5/54*
U.S. Cl. 229—51 DB **4 Claims**

1. In the method of storing a successively removed product from a severable container having a tubular body of a constant cross-section and having a plurality of encircling severable parallel lines defining similar sequentially removable body portions for reducing the depth of the container and defining similar end body portions, the steps providing a removable cover telescoped over one end body portion of said container, said cover having an outer encircling side wall of essentially the same cross-section and slidably telescoping over each of said end body portions formed by removal of a body portion, said replaceable cover having an inner projecting wall portion connected to said outer encircling side wall and projecting inwardly to an inner base wall, said inner projecting wall portion extending into the adjacent end body with said cover side wall projecting over the body portion, the depth of said inner projecting wall portion being less than the depth of the outer encircling side wall, successively removing said product, and replacing said cover over the end body portion as the level within the container is reduced until said inner base wall abutts the products, and removing a body portion at least when the product is below a severable line to continuously maintain a minimal gap between the base wall of the cover and the product.



3,967,774
CARTON LID HAVING EASILY OPENABLE, NON-RESEALABLE TAB

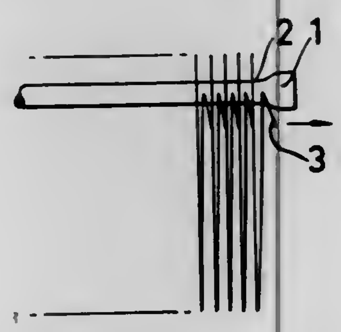
William Edward Querner, Springboro, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 23, 1975, Ser. No. 580,378
Int. Cl.² B65D *5/54*
U.S. Cl. 229—51 TC **10 Claims**



1. In a carton lid employing a turned under lip along the exposed portions of its periphery to protect the user from injury after initial opening thereof, the improvement comprising an easily openable, non-resealable, pilfer-proof tab for securing said carton lid to the body of the carton, said tab being at least partially formed from the turned under portion of said lip and including a medial tear strip portion defined by a pair of tear lines extending the full depth of said tab, the attached end of said medial tear strip portion having a width substantially equal to that of the line of jointure between said tab and said carton lid, as measured at the attached end of said tab, said tear strip portion having a width less than that of said tab along at least a portion of its length, thereby permitting securement of said tab to said carton body along those portions of said tab outside the medial tear strip portion thereof.

3,967,775
METHOD OF STORING HANDLE BAGS

Erik Kramming, Saltsjobaden, Sweden, assignor to Bengt Lundin AB, Arvika, Sweden
Division of Ser. No. 415,854, Nov. 14, 1973. This application June 13, 1975, Ser. No. 586,694
Claims priority, application Sweden, Nov. 24, 1972, 15339/72
Int. Cl.² B65D *33/08*
U.S. Cl. 229—54 R **1 Claim**

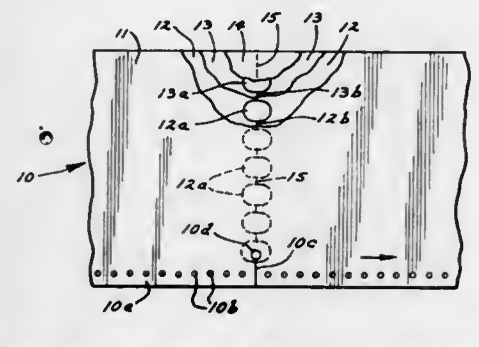


1. A bundle of plastic bags arranged in a stacked side-by-side relationship
each of the bags in said bundle having a first handle opening located on one side of the bag,
each of the bags in said bundle having a second handle opening located on the side opposite to the side containing said first handle opening,
the first handle opening of each bag being aligned with the first handle opening of every other bag in the bundle,
the second handle opening of each bag being aligned with the second handle opening of every other bag,
the pattern established by the alignment of said first handle openings being disposed at least partially out of alignment with the pattern established by the alignment of said second handle openings,
said bundle of plastic bags being adapted to be slideably supported on an elongated supporting member that has a discharge end that is shaped to control the removal of only one bag at a time over the discharge end of the elongated supporting member,
whereby, when the bundle of plastic bags is slideably supported on an elongated supporting member that has a discharge end that is shaped to permit the removal of only one bag at a time, removal of one bag at a time can be effected from said bundle by first pulling the side containing the second handle opening over the discharge end of the elongated supporting member and outwardly until the first handle opening is inhibited against further outward sliding movement by the discharge end of the elongated sliding member, thus opening the interior of the bag so that it can be loaded with the desired number of items.

3,967,776
CONTINUOUS MULTI-LAYERED PACKAGING ASSEMBLY

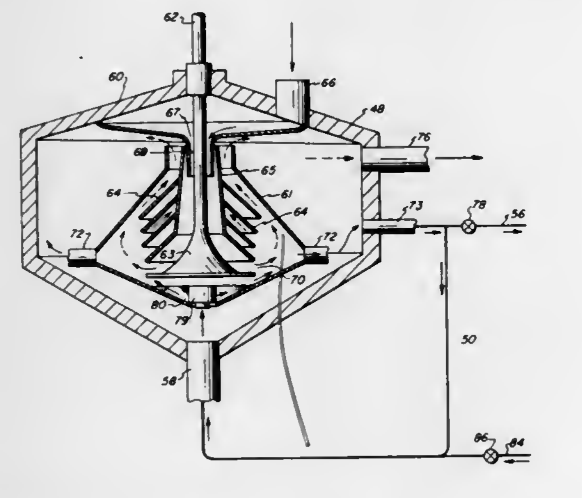
Edward W. Getsch, Minneapolis, Minn., and Gale N. Puerner, Fort Atkinson, Wis., assignors to Pako Corporation, Minneapolis, Minn.
Filed Mar. 27, 1975, Ser. No. 562,507
Int. Cl.² B65D *27/10*
U.S. Cl. 229—69 **4 Claims**

1. A continuous multi-layer assembly for forming multipocket packages,
a pair of outer cover sheets having spaced apart transverse division lines to define the sides of each individual package,
intermediate sheets interposed between said cover sheets and joined together therewith along only one longitudinal edge and having cut-out seal-through windows respectively underlying said division lines to provide spaced connecting lands and open areas to provide face-to-face contact between the inner surfaces of the cover sheets through said windows,
said inner cover sheet surfaces having means for adhesively sealing said cover sheets together through said windows between said lands to form individual multi-pocket packages having sealed edge portions with the edges of the intermediate sheets positively attached to said sealed edge portions by said spaced lands, said sheets being severable along said division lines to form each multi-pocket sealed package.



3,967,777
APPARATUS FOR THE TREATMENT OF TAR SAND FROTH

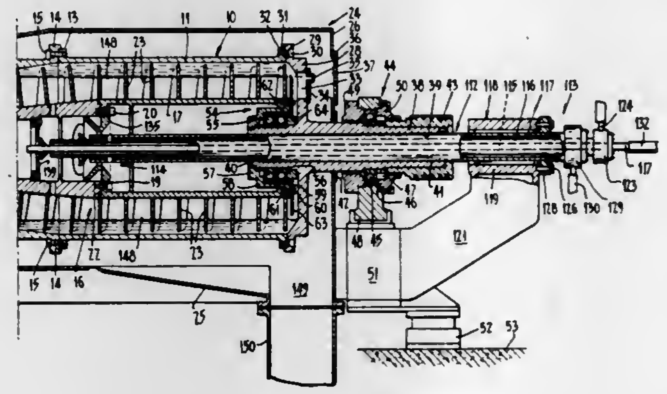
Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Division of Ser. No. 395,930, Sept. 10, 1973. This application Nov. 27, 1974, Ser. No. 527,601
Int. Cl.² B04B *1/12, 11/02*
U.S. Cl. 233—3 **8 Claims**



1. An improved centrifuge comprising:
a stationary centrifuge housing;
a rotor assembly including a rotor housing positioned within said centrifuge housing;
a rotary drive shaft means;
said rotor assembly mounted to said drive shaft means for rotation therewith;
a stack of discs mounted within said rotor housing for rotation with said rotor;
a plurality of nozzles spaced about said rotor housing and communicating between the interior of said rotor and the interior of said centrifuge housings;
means for introducing a feed into said rotor housing;
an annular aperture formed between said disc stack and said rotor housing and communicating between the interior of said rotor housing and the interior of said centrifuge housing;
means positioned within said rotor housing for accelerating said feed to velocities at which relatively higher and lower density components are separated and wherein said higher density components elute from said rotor housing through said spaced nozzles and said lighter density component elutes from said rotor housing through said annular aperture;
means for drawing said lighter density material from said centrifuge housing;
means for drawing said higher density material from said centrifuge housing and for reintroducing said higher density material into said centrifuge housing and into said rotor housing;
accelerating means mounted within said rotor housing for rotation therewith for accelerating said reintroduced heavier density components to velocities for eluting said reycled heavier density components from said rotor housing through said apertures;
means for diverting the flow direction and causing said heavier density components which are reintroduced into said rotor to self impact; and
said means for impacting said reintroduced heavier density components comprising a plurality of concave shaped baffles spaced between a plurality of radially extending vanes and adapted for altering the direction of flow of said heavier density components for impact upon itself.

3,967,778
CENTRIFUGAL SEPARATOR

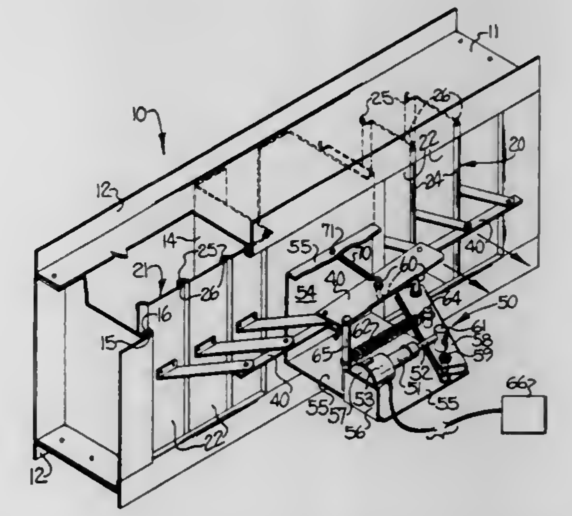
Richard James Hunwick, Wollstonecraft, Australia, assignor to Dorr-Oliver Incorporated, Stamford, Conn.
Filed Apr. 14, 1975, Ser. No. 567,523
Claims priority, application Australia, Apr. 23, 1974, 7339/74
Int. Cl.² B04B *1/20*
U.S. Cl. 233—7 **3 Claims**



1. A solid bowl type centrifugal separator adapted to separate sugar juice from a sugar mud slurry feed and which separator comprises an external solid bowl member and means to rotate said bowl about a longitudinal axis, said bowl comprising a longitudinally extending cylindrical wide end portion and a conically constricted end portion extending from one end of said wide end portion such that when in use a bath of the sugar mud feed material will form partially up said conical section forming a beach area up which separated solids are conveyed by conveyor means adapted to collect separated solids from adjacent the inside wall of the bowl and convey them out of said bath and up the beach to an outlet from said bowl for said solids, and means provided at the opposite end of the wide end portion of the bowl to allow substantially solids free sugar liquid to be removed from said bowl,
said conveyor means comprising an elongated hollow rotatable member arranged within said bowl and having a tubular section corresponding in length to said wide end portion of said bowl and having a tapered conical end portion arranged within said conical constricted portion of the bowl with screw conveyor means provided about the periphery of the outer surface of said member for transporting solids from the bath to the beach upon rotation thereof,
a plurality of material receiving compartments provided at spaced preselected intervals along the length of said screw conveyor with said compartments having discharge openings in the surface of said conveyor means for discharging material to said bowl,
a plurality of stationary conduit feed means extending into said rotatable hollow conveyor body and having outlets in open communication selectively with said material receiving compartments,
said material receiving compartments comprising a pair of flocculent treatment material receiving chambers, a main feed material compartment for receiving the sugar mud slurry interposed between said flocculent treatment material compartments and a wash water compartment located within said constricted portion of said conveyor and
said discharge opening for the sugar mud slurry open to the wide end bath portion of said separator bowl with the discharge openings from said flocculent compartments also open to the wide end bath portion at opposite sides of said sugar mud input opening,
said discharge opening for the wash water compartment lying in a transverse plane substantially coincident with the transition zone between the bath and beach sections of said bowl to provide wash water at said transition point.

3,967,779
AIR MIXING VALVE HAVING A THERMAL MOTOR ACTUATOR FOR EFFECTING ADJUSTMENT

Hillard Glenn Logsdon, Charlotte, N.C., assignor to Aeronca, Inc., Pineville, N.C.
Continuation-in-part of Ser. No. 438,570, Feb. 1, 1974. This application Sept. 3, 1974, Ser. No. 502,302
Int. Cl.² F24F *13/04*
U.S. Cl. 236—49 **8 Claims**



6. A mixing valve for mixing airstreams in an air distributing system, said mixing valve including a housing having substantially side-by-side first and second air inlet passages therein for receiving respective warm and cool airstreams, valve means comprising first and second groups of louvers pivotally mounted in said housing on spaced parallel axes for pivotal movement in the respective first and second passages, means including an elongate longitudinally movable operating member operatively connected to said first and second groups of louvers, said operating member being movable to and fro longitudinally thereof so as to move one group of louvers toward an open position while moving the other group of louvers toward a closed position and vice versa so as to permit obtaining a desired mixture of the warm and cool airstreams from the mixing valve, and actuator means positioned downstream of and between said first and second air inlet passages and operatively connected to said operating member for imparting longitudinal movement thereto and being responsive to a demand for an increased or decreased temperature of air from the mixing valve for effecting adjustment of the temperature of the air mixture from the mixing valve, said actuator means including a thermal motor of the type comprising a

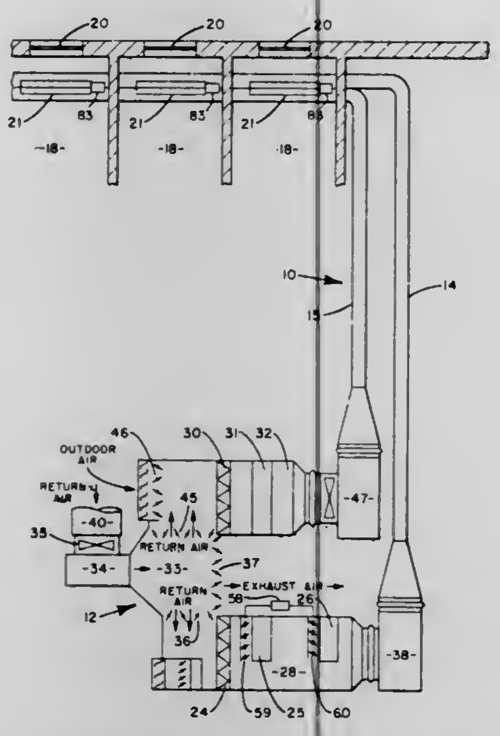
compact sealed hollow casing containing a temperature responsive filler material therein and having an opening in one end of the casing with an axially movable shaft extending therefrom, thermostat means, electrical resistance heating means cooperating with the casing of said thermal motor and with said thermostat means and being responsive to the thermostat means for applying heat to said thermal motor to effect movement to said motor shaft toward an extended axial position, and means cooperating with said thermal motor and operatively connecting the same to said longitudinally movable operating member for imparting a relatively large longitudinal movement thereto in response to a relatively small axial movement of said motor shaft.

3,967,780

AIR CONDITIONING SYSTEM

Darwin G. Traver, DeWitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 311,076, Dec. 1, 1972, Pat. No. 3,867,980.
This application Dec. 9, 1975, Ser. No. 530,577
Int. Cl.² F24F *13/06, 11/04*
U.S. Cl. 236—49 **2 Claims**



1. An air conditioning terminal operable to discharge conditioned air into an enclosed space, said terminal including means defining a plenum, means to provide a first conditioned air stream at a temperature which varies inversely to the temperature of the outdoor air to a first portion of said plenum, and means to provide a second conditioned air stream at a predetermined temperature level to a second portion of the plenum, said terminal further comprising:

a. means to maintain said first air stream in said first portion of said plenum separate from said second air stream in said second portion of said plenum; and

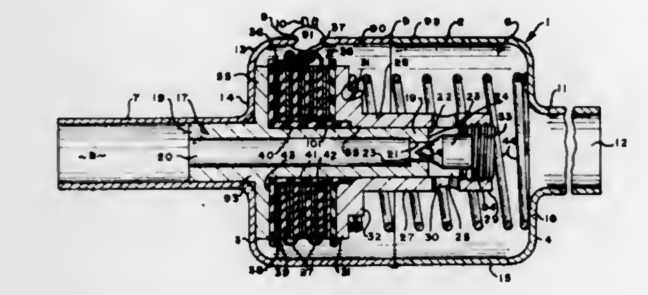
b. discharge means connected to said plenum to discharge the conditioned air into said space, said discharge means including first diffuser means to direct the first conditioned air stream along the ceiling of said space towards the peripheral wall thereof, said first air stream compensating for transmission gains or losses through said wall, and second diffuser means to direct the second conditioned air stream along the ceiling of said space towards the interior portion thereof, said second air stream compensating for the remaining cooling load in said space, the volume of said second air stream being varied in accordance with changes in said cooling load, the volume of said first air stream discharged into said space being maintained substantially constant irrespective of changes in the pressure of said air in said first portion of said plenum.

3,967,781

ELECTRICALLY OPERATED EXPANSION VALVE FOR REFRIGERATION CONTROL

Bernard L. Kunz, Collinsville, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 12, 1975, Ser. No. 549,455
Int. Cl.² G05D *23/24*
U.S. Cl. 236—68 R **12 Claims**



1. An electrically operated valve, comprising:

a shell, said shell defining a chamber having an inlet side and an outlet side;

a valve body mounted in said shell, said valve body having a first end, a second end, and an opening from and between said first and said second ends, said second end having a valve seat formed in it, said valve seat being positioned in said chamber near said outlet side;

electrically energizable means mounted to said valve body, said electrically energizable means including heater means and expansion means responsive to a temperature change in said heater means, said heater means comprising a plurality of ceramic supports, each of said supports having a first face and a second face, said supports also having an axial opening through them, and a resistance heater disposed along at least one of said first and said second faces about said axial opening of each of said supports, said axial opening permitting mounting of said heater means on said valve body, said expansion means moving longitudinally in response to said temperature change;

valve means movably mounted in said chamber between at least a closed position and an open position, said valve means being operatively connected to said electrically energizable means, said valve means being movable in response to the longitudinal movement of said expansion means; and

means for biasing said valve means towards said closed position, said biasing means comprising a spring mounted in said chamber between said valve means and said shell.

6. An electrically operated valve, comprising:

a shell having a longitudinal axis, said shell defining a chamber having an inlet side and an outlet side along said axis;

a valve body having a first end and a second end, said valve body having a central opening therethrough between said first and said second ends, said second end having a valve seat formed in it, said valve body being mounted in said chamber such that said central opening is coincident with said longitudinal axis;

means for generating a temperature change mounted to said valve body, said temperature generating means including a plurality of heater elements, each of said heater elements comprising a support having a first face and a second face, and an electrical resistor device attached to at least one of said faces, said support having a central opening through it for permitting mounting of said heater element to said valve body;

means for sensing a temperature change, said temperature change sensing means comprising a plurality of expandable elements mounted to said valve body, individual ones of said plurality of expandable elements of said temperature change sensing means comprising first and second metal discs having substantially different coefficients of expansion, each of said discs having a central opening through them for permitting mounting of said

discs on said valve body, individual ones of said heater elements and individual ones of said expandable elements being alternately placed on said valve body in abuttment with one another, said expandable elements moving longitudinally in response to changes in temperature;

valve means movably mounted in said chamber for movement between at least a closed position where said valve means abuts said valve seat, and an open position where said valve means is spaced from said valve seat, movement of said valve means being responsive to longitudinal movement of said temperature change sensing means; and

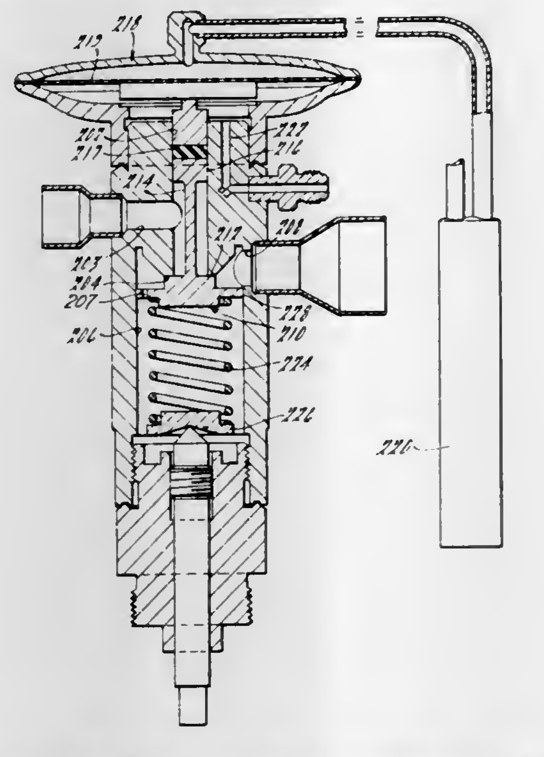
means for biasing said valve means towards its closed position.

3,967,782

REFRIGERATION EXPANSION VALVE

John T. Eschbaugh, Chesterland, Ohio, and Herbert S. Lindahl, Danville, Ill., assignors to Gulf & Western Metals Forming Company, Southfield, Mich.

Continuation-in-part of Ser. No. 733,946, June 3, 1968, abandoned. This application Mar. 23, 1971, Ser. No. 127,174
Int. Cl.² G05D *27/00*
U.S. Cl. 236—92 B **6 Claims**



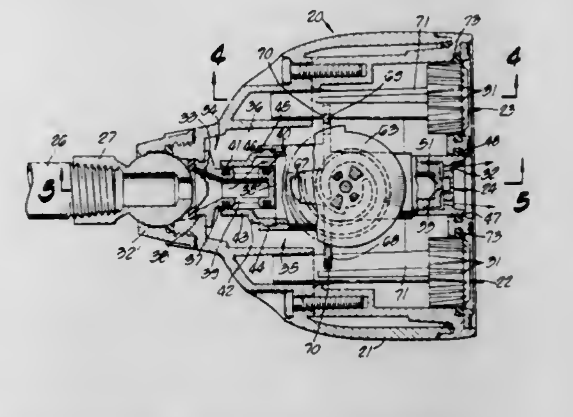
1. A thermostatically controlled expansion valve for use in a refrigeration system comprising an elongated body having an opening extending therethrough from end to end, said opening having intermediate its ends an abrupt change in cross-sectional area defining a shoulder forming a valve seat, and an enlarged outlet chamber at one side of said valve seat, the portion of said opening at the other side of said shoulder forming a cylindrical guide passage of uniform cross-section, and forming a valve orifice at said shoulder whose cross-sectional area is equal to the cross-sectional area of said guide passage, an elongated valve element having a piston-like head movable in said cylindrical guide passage and an enlarged valving portion movable within said chamber to form a variable restriction with said valve seat and adapted to seat against said valve seat to close said orifice, the portion of said valve element intermediate said head and said enlarged valving portion being reduced to define with the surrounding portion of said guide passage an annular inlet chamber, an inlet passage communicating with said inlet chamber, motor means carried at the end of said body containing said guide passage and forming a closure therefor, said motor means comprising a flexible diaphragm operatively mechanically connected to said valve element, a connection for applying pressure to said diaphragm variable with evaporator outlet temperature in a direction tending to open said valve, and a connection for applying pressure to said diaphragm variable with evaporator pressure tending to close said valve, adjustable spring means in said outlet chamber engaging said valve element and urging it in valve closing direction, the high pressure existing within said inlet chamber being substantially balanced as a result of applying a valve closing force to said head and a valve opening force to the portion of the valving portion of said valve element exposed at the valve orifice, said outlet chamber being cylindrical, said valve element including a guide portion engaging the periphery of said outlet chamber.

3,967,783

SHOWER SPRAY APPARATUS

Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, both of Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.

Filed July 14, 1975, Ser. No. 595,882
Int. Cl.² B05B *1/08*
U.S. Cl. 239—102 **11 Claims**



1. Showerhead spray apparatus, comprising:

a hollow housing with an inlet for pressurized water and a wall having first and second spray exit openings therein;

a pulsating spray generator located within said housing and having an outlet end slidably received within said first housing spray exit opening; and

slide valve means interconnected with said pulsating spray generator and having parts movable therewith for selectively communicating pressurized water from the inlet with the housing interior, the pulsating spray generator or proportionately therebetween.

3,967,784

BEAD DISPENSING GUN FOR MARKING PAVEMENT

Harry C. Ammon, Paul, Idaho, assignor to Idaho Norland Corporation, Paul, Idaho

Filed May 16, 1975, Ser. No. 578,292
Int. Cl.² B05B *1/04*
U.S. Cl. 239—583 **3 Claims**

1. A bead dispensing gun adapted to be mounted upon a vehicle and used in marking pavement comprising:

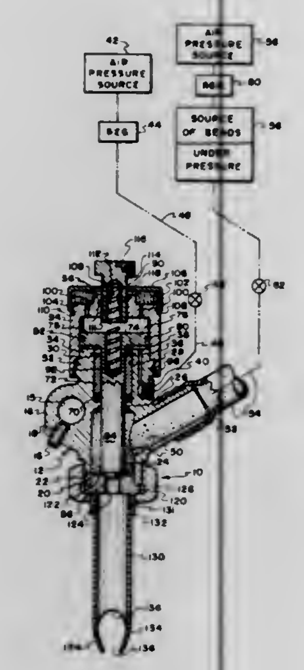
piston means against which fluid pressure is imposed to selectively displace the piston means;

cylinder means within which the piston is caused to reciprocate;

bead accumulation chamber means to which beads are communicated under fluid pressure from a bead source;

valve means associated with the piston means for opening and closing the bead accumulation chamber means to selectively downwardly dispense or accumulate beads, respectively;

hollow dispensing chute means the influent of which is below the bead effluent of the valve means, the hollow of the chute means having a uniform diameter throughout the length thereof, exclusive of the effluent end thereof and being of substantially greater cross-sectional area than that of the valve means effluent, and the effluent end of the chute means being without venturi configuration comprising opposed fingers defining two opposed U-shaped slots, each finger being downwardly convergently tapered to a tip and the two fingers between said U-shaped slot downwardly converging one toward the other whereby the fan of bead discharge is determined.



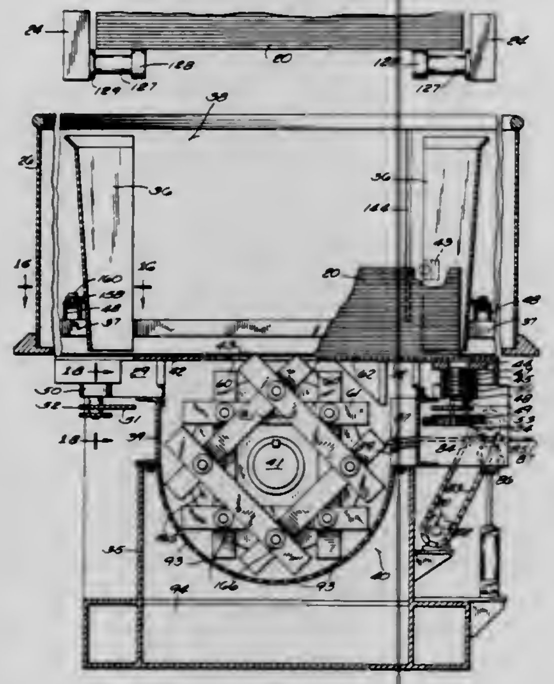
3,967,785
METHOD AND APPARATUS FOR PRODUCING DEFIBRATED CELLULOSE FLUFF FROM BALES OF COMPACTED WOOD PULP SHEETS

George S. Grosch, Lake Worth, Fla., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Feb. 12, 1975, Ser. No. 549,252

Int. Cl.^{2} B02C *13/286*

U.S. Cl. 241—28 17 Claims



1. A method of producing defibrated cellulose fluff from wood pulp sheets baled in stacks of such sheets and comprising the steps of advancing a face of such a stack against a rotary cutting mill having a curved periphery, rotating the cutting mill on a horizontal axis with a portion of its curved periphery exposed to the face of the stack, and rotating the stack on a vertical axis to move it horizontially and produce relatively motion in the plane of said face between the stack face and the curved periphery of the cutting mill.

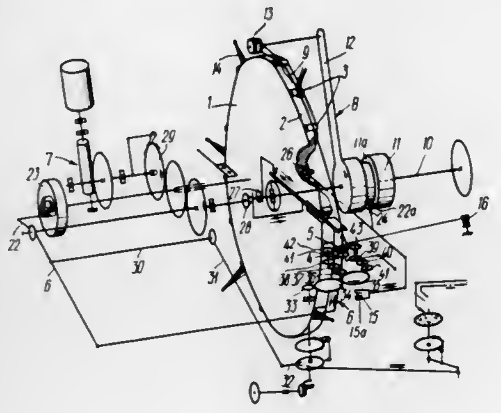
3,967,786
MACHINE FOR WINDING SMALL-SIZE TOROIDAL CORES

Leonid Alexandrovich Ivanov, ulitsa Borodulina, 13, kv. 3, Rybinsk, U.S.S.R.

Continuation of Ser. No. 408,427, Oct. 23, 1973, abandoned, which is a continuation of Ser. No. 241,796, April 6, 1972, which is a continuation of Ser. No. 87,399, Nov. 6, 1970, abandoned. This application Apr. 3, 1975, Ser. No. 564,886

Int. Cl.^{2} B65H *81/02*

U.S. Cl. 242—4 R 2 Claims



1. In a machine for winding toroidal coils on ring-shaped cores, in which the end of a wire length is passed in a form of a loop through a ring-shaped core which is so fixed as to turn gradually around its axis to form a toroidal core, the machine comprising means for pulling one end of the wire through the ring-shaped core, a disk-shaped fixed guide element having a cylindrical surface on which at least part of the wire length being wound on the core is retained, retaining means for retaining part and the end of the wire on the cylindrical surface of the disk-shaped guide element, means for widening the free end of the wire pulled through the ring-shaped core, and means for locating the free end of the wire pulled through the ring-shaped core, the improvement including a plurality of spaced projections on the cylindrical surface of the disk for guiding the wire, with the projections reducing to a minimum, the total contact area between the wire and the guide element.

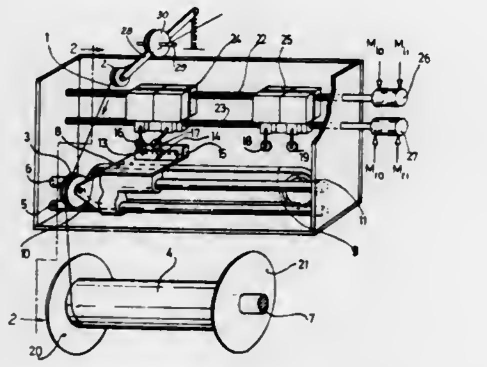
3,967,787
WIRE WINDING APPARATUS

Carlos Mulleman, Kortrijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 5, 1974, Ser. No. 521,032

Int. Cl.^{2} B65H *54/28*

U.S. Cl. 242—25 R 6 Claims



1. In a wire winding apparatus including means for supporting a flanged spool and winding wire thereon, a wire guide arranged to traverse the wire back and forth lengthwise of the spool in use, a first end sensor associated with the flange at one end of said spool and a second end sensor associated with the flange at the other end of said spool, each of said end sensors being operative to automatically reverse the direction of the operation of the guide at the end of each traverse, the improvement which comprises means for automatically moving each end sensor after each actuation thereof away from the other end sensor by a first distance, means for detecting an accumulation of wire adjacent each flange of the spool, and means for automatically moving the end sensor associated with each of said flanges upon an accumulation being detected adjacent thereto toward the other end sensor by a second distance which is greater than said first distance.

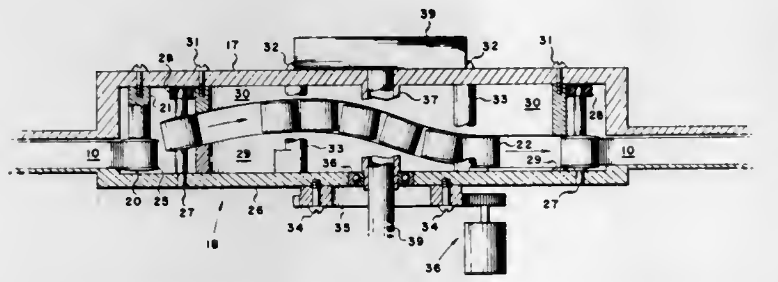
3,967,788
ENDLESS LOOP CASSETTE

Fred C. Ponce, 217 Avenue C, Redondo Beach, Calif. 90277

Division of Ser. No. 461,062, April 15, 1974, which is a continuation-in-part of Ser. No. 191,460, Oct. 21, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 562,620

Int. Cl.^{2} G11B *23/04*

U.S. Cl. 242—55.19 A 12 Claims



1. In a cassette for an endless loop, wound pack of film, said film being planar with a width dimension at least 10 times its thickness dimension and a length dimension at least 100 times its width dimension, wherein the innermost convolution of film is withdrawn from the center of the film pack, which is rotating in a primary path, traversed through a secondary path, led to a first position outside said primary path, and then fed back to a second position outside said primary path, then onto the periphery of the film pack as the outermost convolution thereof; the improvement, comprising:

- a plurality of film pack rollers fixed in position along said primary path and adapted to support at least a portion of the inner circumference of the film pack, said film pack rollers being disposed to approximate at least an arc of a circle having a first radius;
- a plurality of film path rollers adapted to guide the innermost convolution of film from said film pack along said secondary path, said film path rollers being fixed in position to approximate at least an arc of a circle having a second radius less than said first radius and being disposed for spiral concentricity with said film pack rollers; and
- differential take-up means, for adjusting film tension, in the path of said film at at least one of said first and second positions.

3,967,789
TAPE WINDING SYSTEM

Norman E. H. Deletzke, Jr., P.O. Box 221, Wilmette, Ill. 60091

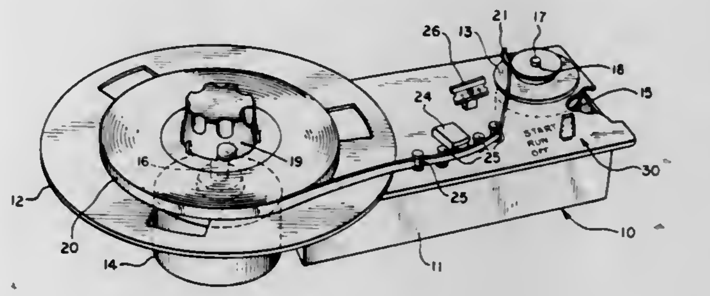
Filed Oct. 2, 1974, Ser. No. 511,200

Int. Cl.^{2} B65H *19/20*

U.S. Cl. 242—56 R 15 Claims

1. In a tape winding system having supply means driven by supply driving means, and takeup means driven by takeup driving means said supply driving means and said takeup driving means comprising the sole drive for said supply means and said takeup means, a method for winding a quantity of tape from said supply means to said takeup means, comprising the following steps:

- a. forwardly energizing said supply driving means and said takeup driving means causing tape to unwind from said supply means and wind onto said takeup means with minimal tension on said tape; then
- b. reducing the energization of said supply driving means causing tape to be pulled from said supply means onto said takeup means; and then
- c. stopping said supply means and said takeup means.



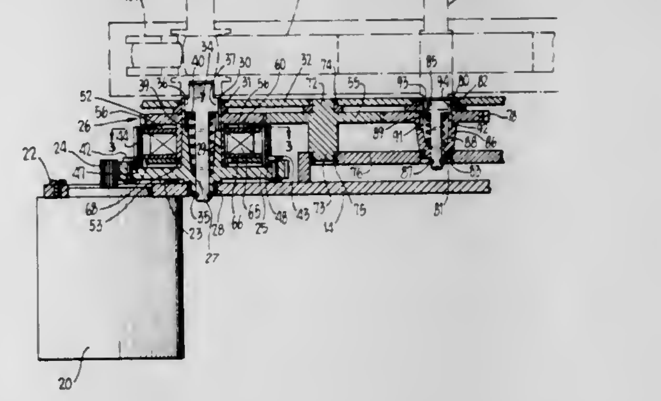
3,967,790
CARTRIDGE DRIVE APPARATUS

Ernst P. Hess, Castro Valley, Calif., assignor to Qume Corporation, Hayward, Calif.

Continuation of Ser. No. 448,848, March 7, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,758

Int. Cl.^{2} B65H *17/04, 17/18*

U.S. Cl. 242—67.2 10 Claims



1. A compact apparatus for driving a cartridge mounted rotatable capstan and take-up reel to enable a ribbon to be transported by said capstan from a cartridge mounted supply reel and snugly accommodated on said take-up reel, said apparatus comprising:

- a pair of spaced upper and lower support members;
- a drive motor carried by one of said support members and having an output shaft provided with a driving gear;
- a capstan drive assembly for providing a direct driving force to said capstan and a releasable driving force to said take-up reel, said capstan drive assembly including:
- an input gear having an elongate central body portion rotatably secured at opposite ends thereof to said upper and said lower support members and a toothed periphery engaged with said motor driving gear, said central body portion having a central bore provided with a pair of oppositely disposed slotted walls axially extending from the end of said bore adjacent said upper support member toward the other end of said bore and terminating at an intermediate axial location,
- a capstan drive key received within said bore, said key having an upper end and a lower end and a pair of oppositely extending tab portions located at said upper end each slideably received by a different one of said slotted walls to permit axial translation of said key, rotation of said input gear being transmitted to said tab portions of said key by said slotted walls,
- means for biasing said key toward said upper support member,

limit stop means secured to said key adjacent the lower end thereof for limiting axial translation of said key in the direction of said upper support member,

an output gear having an elongate central body portion with a central bore slidably received on the outer surface of said central body portion of said input gear to permit relative rotation therebetween, said output gear having a toothed outer periphery located adjacent and below said upper support member, and

a magnetic clutch assembly for providing a releasable driving force to said output gear from said input gear, said magnetic clutch assembly including a magnetic drive ring secured to said input gear and having a toothed inner peripheral surface, a pair of magnetic members mechanically linked to said central body portion of said output gear, each said magnetic member having a toothed outer peripheral surface positioned adjacent said inner peripheral surface of said magnetic drive ring, and a magnet positioned between said pair of magnetic members for providing magnetic flux linking said pair of magnetic members with said magnetic drive ring; and

a reel drive assembly rotatably carried by said support members and driven by said output gear;

said magnetic clutch providing a releasable driving force for said output gear whenever the tension in the ribbon between said capstan and said reel lies below a predetermined threshold value.

3,967,791

SPINNING REEL FOR FISHING

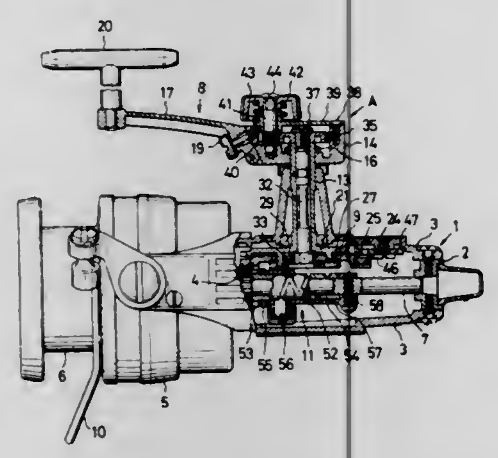
Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed June 23, 1975, Ser. No. 589,190

Claims priority, application Japan, June 25, 1974, 49-75078[U]

Int. Cl.² A01K *89/02*

U.S. Cl. 242—84.21 R **8 Claims**



1. A spinning reel for fishing comprising a master gear rotated by a handle, a pinion formed on a tubular shaft to mesh with said master gear, the pinion being arranged to rotate a rotor supported by a reel body, a main shaft carrying a spool at its one end and inserted in said tubular shaft, the main shaft being interlocked with said master gear through a reciprocation mechanism, a tubular handle shaft rotatably supported in said reel body and having at its inner end a plate-like portion carrying an integral extended cylindrical portion, a handle box fixed to the outer end of said tubular handle shaft and connected with a handle, a cover closing an opening of said handle box, said master gear having a central aperture and being rotatably mounted on said cylindrical portion together with washers, a drag washer also mounted on said cylindrical portion so as to be rotatable therewith and also slidable axially and adapted to hold said master gear between it and said plate-like portion, a drag shaft fitted in a central hole of said drag washer so as to be unrotatable and inserted in said tubular handle shaft, a spring washer interposed between a head portion provided at the inner end of said drag shaft and said drag washer, a gear threadedly screwed on the outer end of said drag shaft, a drag pinion shaft rotatably supported in said handle box and through said cover, a drag pinion formed on said pinion shaft and meshed with said gear, and a drag knob fixed to the outer end of said pinion shaft.

3,967,792

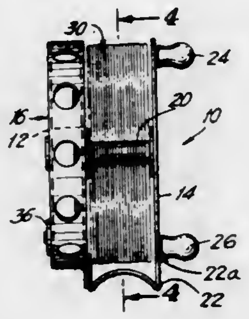
FLYCASTING REEL

Edmund V. Goedl, 773 John St., Teaneck, N.J. 07666

Filed Dec. 18, 1974, Ser. No. 533,927

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.1 R **5 Claims**



1. In a flycasting reel for use upon a fly rod a circumferential housing, a pair of large diameter closely spaced apart disc members, said disc members have a minimal predetermined thickness solely dependent on the structural integrity of the material comprising said disc members, a single common shaft extending between and joining said disc members for enabling simultaneous rotational movement thereof, said shaft being a centrally located axial shaft, only one of said disc members being rotatably mounted in said housing, said other disc member solely being supportably mounted in position on said axial shaft, said housing comprising means for mounting said reel to said fly rod, said fly rod mounting means including an arcuate segmental guide means beneath said other disc member and spaced therefrom for enabling rotatable movement of said other disc member thereabove while providing a vertical stop against vertical deflection of said other disc member, said other disc member comprising handle means for enabling rotational movement of said disc members on said common axial shaft, said axial shaft having a relatively small diameter compared to said disc diameter for enabling take-up and play-out of a slack line therefrom, and said housing further comprising means for selectively enabling free rotatable movement of said disc members to fly cast said slack line.

3,967,793

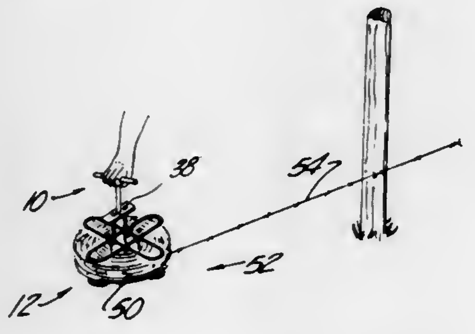
BARBED WIRE SPOOL HOLDER

David O. Walker, Rte. 1, Box 149, Maynard, Ark. 72444

Filed Apr. 21, 1975, Ser. No. 569,966

Int. Cl.² B65H *75/40*

U.S. Cl. 242—96 **7 Claims**



1. A wire spool holder device comprising:

a. means for engaging a spool of wire, the means being freely rotatable about the longitudinal axis thereof, and

b. means for grasping a spool of wire interconnected to the means for engaging, the means for grasping being freely rotatable about the longitudinal axis thereof.

3,967,794

DEVICE FOR INITIATING THE BLOCKING OF A REEL SHAFT FOR A SAFETY BELT WINDING-UP AUTOMAT

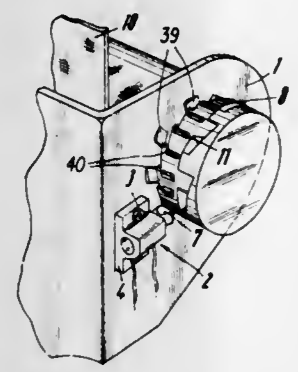
Artur Fohl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Filed Jan. 20, 1975, Ser. No. 542,382

Claims priority, application Germany, Jan. 21, 1974, 2402748

Int. Cl.² A62B *35/00*

U.S. Cl. 242—107.4 R **12 Claims**



1. In combination with a device for initiating the blocking of the reel shaft in a safety belt mechanism, said device including inertia responsive means including a disc mounted on the reel shaft, said disc being rotatable relative to the shaft in response to acceleration of said shaft in the paying out direction, and magnet means adjacent said disc and magnetically coupled thereto for imparting a retarding force on said disc exclusively upon at least a small, peripheral segment thereof and thereby enhancing the response of said disc to acceleration of said shaft, said magnet means being an electromagnet stationarily mounted near the periphery of said disc, said disc comprising a plurality of circumferentially distributed elements in the peripheral region of the disc, said disc and said elements forming a unitary structure.

3,967,795

BOBBIN TUBE

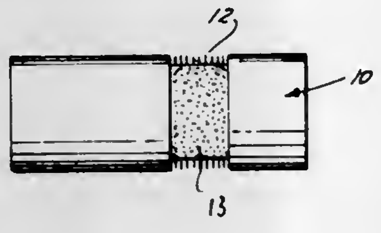
Noboru Shindo, and Mistuhiko Miyaoka, both of Kyoto, Japan, assignors to Murata Machinery Ltd., Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 438,510

Claims priority, application Japan, Feb. 8, 1973, 48-16244

Int. Cl.² B65H *75/28*

U.S. Cl. 242—125.1 **5 Claims**



1. A bobbin tube, particularly for use with filament winding apparatus having automatic bobbin change mechanism, comprising a tubular body having a smooth cylindrical surface and being provided in said surface with a shallow depression extending in circumferential direction at least partly about the circumference of the tubular body within the traversing range of a filament to be wound in form of a yarn package on said tubular body; and resilient tentacular filament engaging means of synthetic plastic material extending in radial direction in said depression with outer ends thereof substantially flush with said cylindrical surface of said tubular body for engaging and capturing a filament moving over said engaging means.

3,967,796

AUTOMATIC RETURN DEVICE FOR USE IN CASSETTE TAPE RECORDER

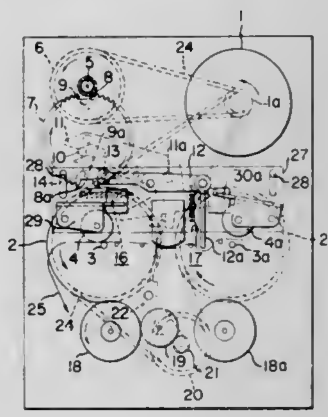
Kyohei Naito, Tokyo, Japan, assignor to Shinwa Shoko Co., Ltd., Tokyo, Japan

Filed Sept. 19, 1974, Ser. No. 507,589

Claims priority, application Japan, Oct. 2, 1973, 48-110839

Int. Cl.² B65H *59/38, 63/02;* **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—189 **1 Claim**



1. In a cassette type tape recorder, an automatic tape return arrangement, comprising in combination:

a. a chassis panel with chassis support means (28) towards the center of said panel;

b. pivoted frame means (29, 29*a*) with inner end sections (30, 30A) supported on said support means (28);

c. first and second pinch rollers (4, 4*a*) pivoted to said frame means (29, 29*a*);

d. first and second capstans (3, 3*a*) disposed to contact with said pinch rollers (4, 4*a*) and so disposed as to define together with the pinch rollers a loose passage for a tape (25);

e. drive means (1) towards one side of said panel center coupled to at least one of said capstans to rotate said capstan;

f. a first gear (5) also towards said one side of said panel center likewise driven by said drive means (1);

g. a second gear (7) having opposed circumferential notches (8, 8*a*) to receive said first gear (5) but in drive contact with said first gear (5) when said first gear (5) is not in one of said notches, said second gear having outer pins (9, 9*a*);

h. an eccentric pin (10) on said second gear (7), a reverse lever (11) with one end engaged to said eccentric pin (10) and the other end defining actuating parts (31, 31*a*) engaging the end sections (30, 30*a*) so as to bring the first or the second pinch roller (4, 4*a*) into engagement with the first or second capstan (3, 3*a*), said reverse lever (11) having a fulcrum (11*a*) and an engaging part between said actuating parts;

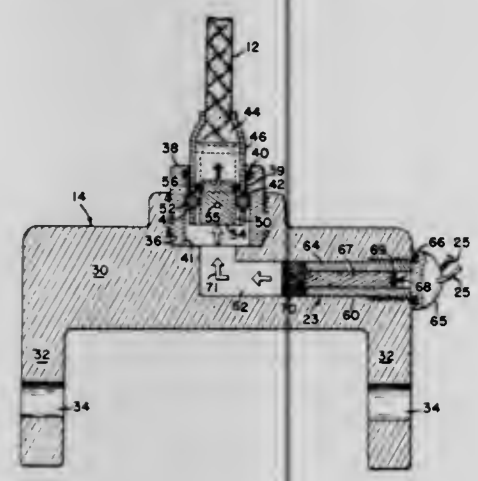
i. a sensing lever (12) with a sensing part (12*a*), so disposed with respect to said tape defined passage as to be in contact with said tape (25) when said tape is tensioned, said sensing lever (12) having a fulcrum (15) and one coupling end, a lock lever (14) with a fulcrum (14*a*) coupled to said coupling end, said lock lever being disposed to engage one of said outer pins (9, 9*a*); and,

j. first and second reel tables (18, 18*a*) on the other side of said panel center, a roller arm (22) disposed pivotally on a pivot pin (32) between said reel tables (18, 18*a*) said roller arm (22) having an inner end towards said panel center, a center part, and an outer end, a roll-up pulley (20) driven by said drive means (1) on said outer end with a roll-up roller (21) coaxially connected thereto, a contact roller (19) on said roller arm center part, and an arm extension (23) extending from said roller arm inner end towards said panel center into said reverse lever engaging part.

3,967,797
ELECTRICALLY ACTIVATED PENDANT RELEASE MECHANISM

Gene R. Drew, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 8, 1975, Ser. No. 539,472
Int. Cl.² B64D *17/30*
U.S. Cl. 244—151 B **1 Claim**

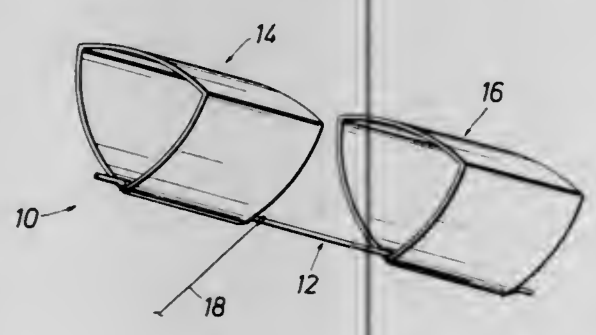


1. A release mechanism for connecting an extraction rocket pendant to a parachute harness comprising:
- a connector fitting adapted to be attached to a parachute harness;
- separable means for connecting the pendant to the connector, a manual actuating means,
- a thermal battery operably connected to the manual means for generating an electrical current,
- a pyrotechnic device mounted in the connector responsive to said electrical current for producing explosively a fluid pressure;
- said battery being connected to the pyrotechnic device by electrical conductors;
- said pyrotechnic device having means for delaying for a predetermined period of time the initiation of said fluid pressure,
- said separable means being responsive to the fluid pressure to release the pendant.

3,967,798
BOX-LIKE KITE

Julius M. Christoffel, Jr., Houston, Tex., assignor to Gayla Industries, Inc., Houston, Tex.

Continuation of Ser. No. 389,867, Aug. 20, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,830
Int. Cl.² B64C *31/06*
U.S. Cl. 244—153 R **14 Claims**

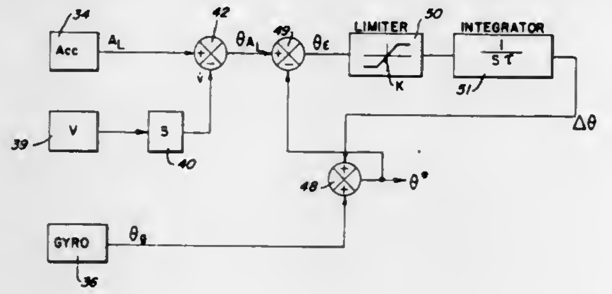


1. A box-like kite comprising:
- a single strut-like member,
- a plurality of hollow, open-ended box-like airfoil members having a single, continuous side wall extending longitudinally along the strut-like member, and
- means separately and independently pivotally connecting each airfoil member to the strut-like member, said connecting means being formed by the side wall being adjacent to the strut-like member and a member cooperating with the side wall and the strut-like member to pivotally attach the airfoil member to the strut-like member in spaced apart relation whereby each airfoil member may freely move about its pivot and rotate relative to the other airfoil member to stabilize the flight of the kite.

3,967,799
HEAD UP DISPLAY AND PITCH GENERATOR

Hans Rudolf Muller, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Division of Ser. No. 307,726, Nov. 17, 1972, Pat. No. 3,851,303. This application Nov. 25, 1974, Ser. No. 527,044
Int. Cl.² B64C *13/18;* **G05D** *1/08*
U.S. Cl. 244—181 **16 Claims**

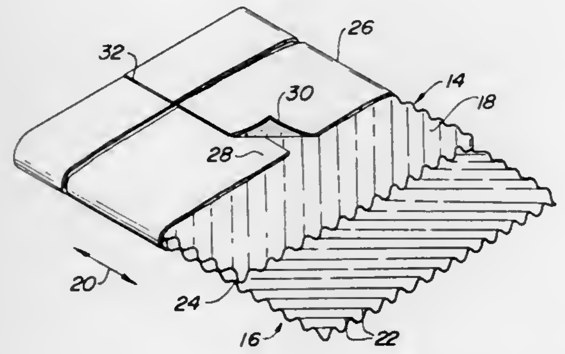


1. A pitch signal generator for an aircraft, comprising:
- a source of gyroscope based aircraft pitch signal;
- a source of inertial based aircraft pitch signal;
- means for combining the gyroscope based pitch signal with a pitch correction signal to produce a generated pitch signal;
- means for subtracting the generated pitch signal from the inertial based pitch signal to produce a pitch error signal; and
- means responsive to said pitch error signal to generate said pitch correction signal.

3,967,800
CLOTH-BOARD REEL

Morris Firstenberg, 225 Cherry Lane, River Edge, N.J. 07661; Daniel Chestnut, 274 Rutledge Ave., East Orange, N.J. 07017, and Edward Marshall, 147 President St., Passaic, N.J. 07055

Filed Nov. 10, 1975, Ser. No. 630,396
Int. Cl.² B65H *75/06*
U.S. Cl. 242—222 **5 Claims**

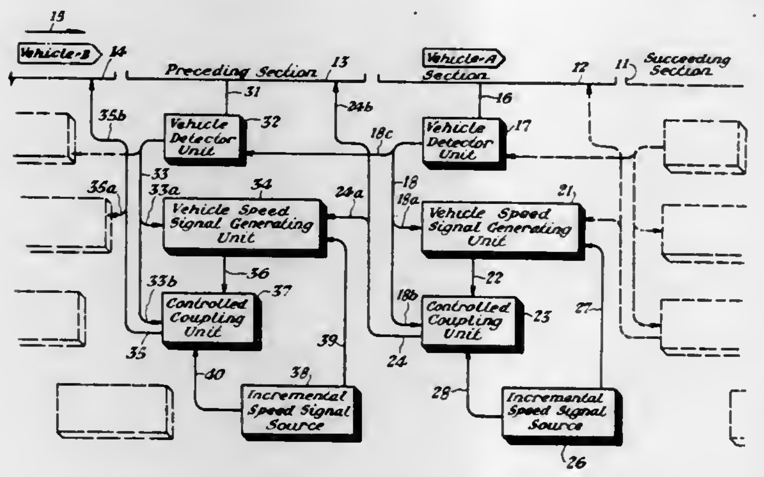


1. A cloth-board reel fabricated from flexible sheet material, comprising:
- a first longitudinally extending stiffener sheet, said first stiffener sheet having corrugations extending obliquely with respect to the longitudinal dimension of said stiffener sheet, a second longitudinally extending stiffener sheet generally congruent with and adhesively secured to said corrugations of said first stiffener sheet, said second stiffener sheet having corrugations extending obliquely with respect to the longitudinal dimension of said second stiffener sheet and transversely of said first stiffener sheet corrugations, and a wrapper sheet extending circumferentially about said first and second stiffener sheets and adhesively secured to the corrugations of said stiffener sheets.

3,967,801
SIGNAL SYSTEM FOR HIGH SPEED TRAINS

George W. Baughman, The Cloisters, Apt. 517, 106 Interlachen Ave., Winter Park, Fla. 32789

Filed Sept. 26, 1974, Ser. No. 509,476
Int. Cl.² B61L *21/10*
U.S. Cl. 246—34 R **20 Claims**



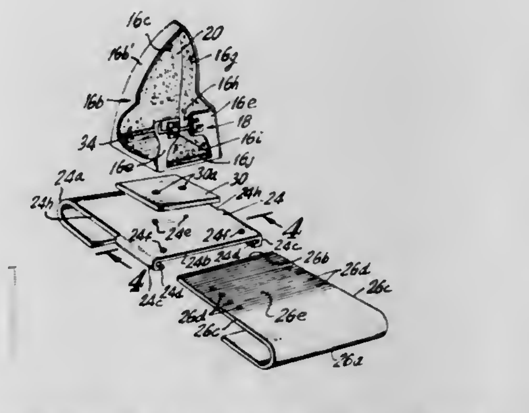
1. A signal system for vehicles traveling along a predetermined way, said system having at least two consecutive sections and a vehicle to be controlled by a vehicle speed control signal received during travel through each section, each section including,
- a. vehicle detector means to detect a vehicle in said section electrically connected to a next preceding vehicle detector means,
- b. a coupling means controlled by said vehicle detector means,
- c. a vehicle speed signal generating means controllably coupled by said vehicle detector means through said coupling means respectively to a next preceding section and to a vehicle speed signal generating means of a next preceding section to deliver a vehicle speed control signal to said preceding section, when the section is unoccupied and the next succeeding section is occupied,
- d. an incremental speed signal source providing respectively a signal to said vehicle speed signal generating means and to said coupling means, said incremental speed signal being delivered through said coupling means only when said section is unoccupied and the next succeeding section is occupied.

3,967,802
SAFETY STAND FOR IRONS

Marcel Lomagno, 26-20 E. 13th St., Brooklyn, N.Y. 11218

Filed Sept. 4, 1974, Ser. No. 502,919
Int. Cl.² D06F *79/00*
U.S. Cl. 248—117.4 **17 Claims**

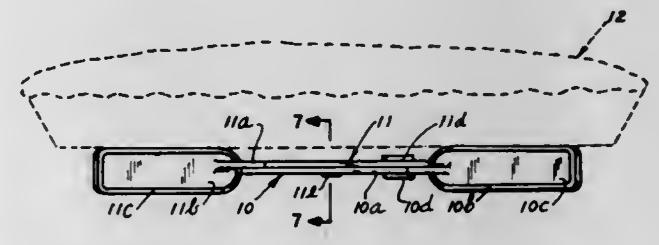
1. A safety stand for an iron, wherein the iron has heated portions and a handle, comprising a substantially closed housing for receiving the iron and covering the heated portions thereof, said housing having an opening therein said housing having an inclined rear wall having tapering edges to form an apex at the top thereof, a pair of sidewalls, each side wall having a rearwardly disposed wall portion which extends along the entire length of the edges of said rear wall to said apex, and a frontwardly disposed wall portion which extends only partially towards said apex, a front wall which extends upwardly to the same extent as said frontwardly disposed wall portions, the major portion of said opening being formed by the upper edges of said front wall and said frontwardly disposed wall portions and the front edges of said rearwardly disposed wall portions, said opening being dimensioned to permit insertion into and removal of the iron from said housing, said opening further comprising a passageway in said front wall dimensioned to correspond to the transverse dimensions of the handle, whereby the body of the iron may be found through said major portion of said opening and the handle may be moved through said passageway to position the iron within said housing in a normal resting position during periods of iron non-use, said housing being configurated to at least partially expose the handle of the iron through said opening when the iron is disposed within said housing to permit gripping of the handle for movement of the iron into and out of said housing; mounting means for securely fixing said housing to a support surface; and locking means provided on said front wall for engaging the handle when the iron is disposed within said housing and preventing the iron from moving out of said housing during periods of non-use of the iron, said locking means comprising a latch having a bolt mounted for axial movement on said front wall to one side of said passageway, and keeper means fixedly mounted on said front wall to the other side of said passageway, said bolt being movable to an engaging condition with said keeper means between the handle and the body of the iron, whereby said bolt retains the iron within said housing in the keeper means engaging condition, whereby the heated portions of the iron are maintained concealed in all positions and orientations which said housing may assume; and whereby the iron is safely maintained on a desired support surface and has the heated portions thereof during periods of non-use.



3,967,803
COLLAPSIBLE TRIVET

Loren C. Kienlen, and Jack H. Poppler, both of Nisswa, Minn., assignors to Doormaid, Inc., Nisswa, Minn.

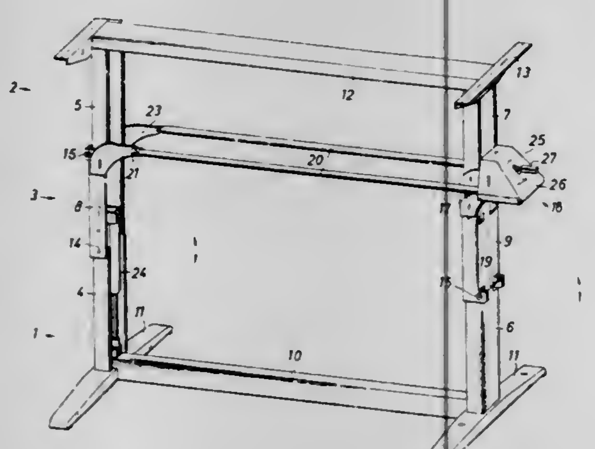
Filed Aug. 30, 1974, Ser. No. 502,075
Int. Cl.² A47G *23/00*
U.S. Cl. 248—152 **6 Claims**



1. A collapsible trivet comprising
- a pair of elongated integrally molded plastic arms,
- each arm having a generally flat horizontally oriented inner connector section and a pair of outwardly disposed vertically oriented spacer blades extending above and below said sections on the respective end portions of the con-

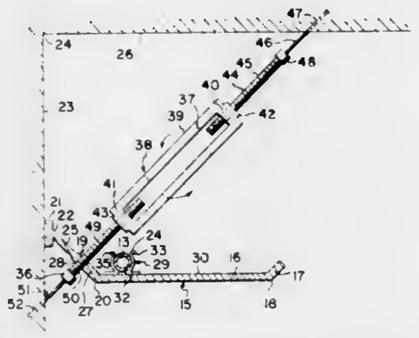
nector section, said outwardly disposed blades each having front and rear surface
the generally flat horizontally orientd inner connector sections being pivotally connected to permit the front surfaces of the outwardly disposed blades to be collapsed into face to face relationship for compact storage,
the extreme end portions of each of said inner connector sections extending outwardly beyond the inner portions of the ends of the rear surface of the respective blades to provide a positive overlapped connection therebetween while still permitting collapsing of the arms with the blades in face to face relation.

3,967,804
FRAME STRUCTURE FOR FURNITURE, ESPECIALLY TABLE FRAME STRUCTURE
Karl Knelle, Holzmaden, Teck, Germany, assignor to Robert Krause KG Zweiniederlassung Weilheim/Teck, Weilheim an der Teck, Germany
Filed Mar. 31, 1975, Ser. No. 563,364
Claims priority, application Germany, Mar. 30, 1974, 2415572
Int. Cl.^{2} F16M *11/24*
U.S. Cl. 248—188.2 **23 Claims**



1. A frame structure for furniture, especially table frame structure, which includes: a first rigid support structure, a pivotal support structure supported by and pivotally connected to said first rigid support structure for selective movement along a vertical plane from a first position of use in which it forms an upwardly directed extension of said first rigid support structure to a second position of use in which it is folded downwardly at least approximately onto said first rigid support structure, and vice versa, a second rigid support structure pivotally supported by and extending upwardly from said pivotal support structure while forming with the latter a parallelogram linkage system, said pivotal support structure including pivotal arms and pivot shafts pivotally connecting upper end portions of said first rigid support structure to the respective adjacent end portions of said arms, pin means parallel to said pivot shafts and respectively extending through to the other end portion of said arms, connecting rod means pivotally connected to said arms by said pin means, and additional pivot shafts parallel to said pivot shafts which pivotally connect said one end portion of said arms to said first rigid support and pivotally connecting said other end portion of said arms to the respective adjacent end portions of said second rigid support structure, said pin means being offset relative to the respective adjacent additional pivot shaft in the pivoting direction of said pivotal support structure from said first position of use to said second position of use, and in said first position of use of said pivotal support structure, said connecting rod means being located at a level higher than said additional pivot shafts.

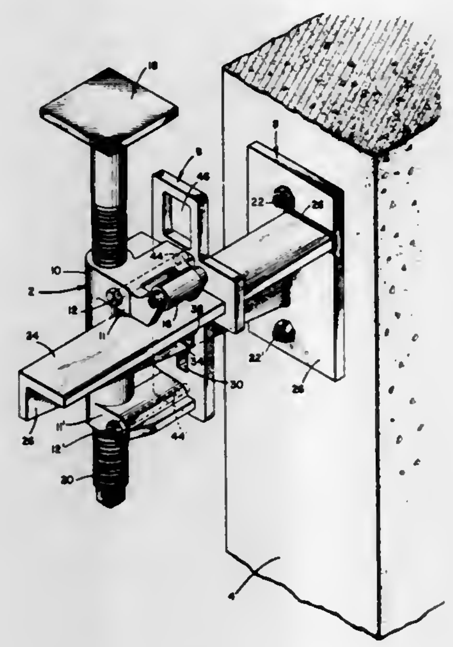
3,967,805
CURTAIN ROD SUPPORT ASSEMBLY
Robert Hoffman, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Mar. 12, 1975, Ser. No. 557,770
Int. Cl.^{2} A47H *1/10, 5/14*
U.S. Cl. 248—262 **3 Claims**



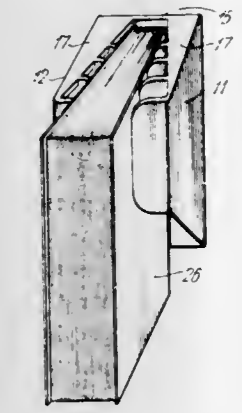
1. A curtain rod support assembly for maintaining a curtain rod in a horizontal plane, which comprises:
a. support brackets affixed onto a vertical wall, each said support bracket including a central horizontal portion, an upwardly extending lip flange joined at an obtuse angle to a first end of said horizontal portion, a two sectional telescopic rod assembly extending upwardly at an obtuse angle from a second end of said horizontal portion, said rod assembly consisting of an inner and an outer section joined to said second end of said horizontal portion, a vertical support block member joined to a free end of said outer section, said vertical support block member affixed onto said vertical wall, said inner section having a beveled opening therethrough, said beveled opening having a threaded interior surface;
b. an anchoring device communicating with each support bracket as well as said vertical wall and a ceiling; and
c. each end of said curtain rod communicating with one said support bracket.

3,967,806
ADJUSTABLE APPARATUS FOR SUPPORTING CONCRETE FORMWORK
James K. Strickland; Frank J. Hessel, and James W. Cote, all of Jacksonville, Fla., assignors to Strickland Systems Inc., Jacksonville, Fla.
Filed Mar. 17, 1975, Ser. No. 558,648
Int. Cl.^{2} A47F *5/10;* **A47H** *33/00*
U.S. Cl. 248—287 **12 Claims**

1. Apparatus for supporting concrete formwork used in construction of multi-story concrete buildings, said apparatus comprising in combination:
a formwork shoring bracket having a vertically adjustable supporting surface for supporting vertical loads, and
attaching means for attaching said shoring bracket to a column in said building, said attaching means comprising
a support comprising a base and an arm extending outwardly from said base, said base being attachable to said supporting column and said arm having at least one generally upwardly facing planar surface and one generally horizontally outwardly facing planar surface, and
adjustable mounting means received on said outwardly extending arm, said adjustable mounting means comprising a generally planar member affixed to said shoring bracket and having an aperture therethrough receiving said outwardly extending arm, said member having upper and lower portions and a pair of side portions integral therewith and surrounding said aperture, said aperture generally conforming to the configuration of said outwardly extending arm such that said member matingly engages both said generally upwardly facing planar surface and said generally horizontally outwardly facing side portion surface to support said member against any substantial movement in any direction transversely of said arm and against any rotation about said arm, said mounting means further including means for releasably holding said member at predetermined positions along said outwardly extending arm.

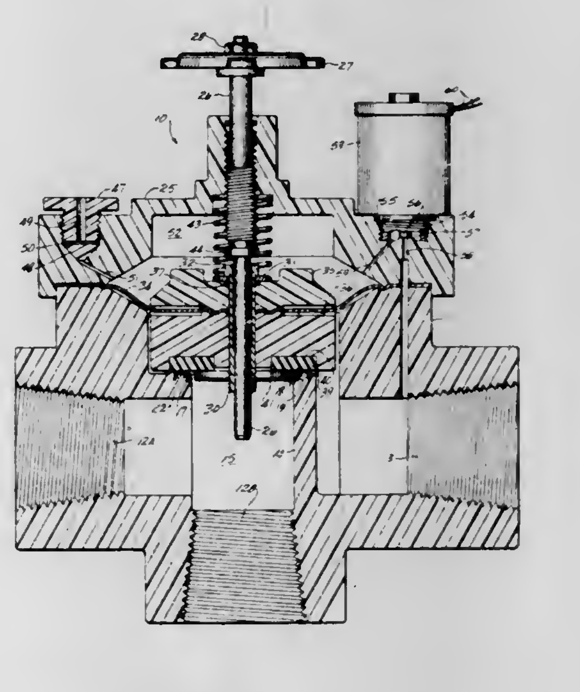


3,967,807
SELF-CLOSING BOOK HOLDER AND SUPPORT
H. Hugh Claxton, Lachine, Canada, assignor to Northern Electric Company Limited, Montreal, Canada
Filed Sept. 8, 1975, Ser. No. 611,070
Int. Cl.^{2} A47B *97/04*
U.S. Cl. 248—447 **2 Claims**



1. A self-closing book holder and support comprising:
a back portion including a rear surface for positioning against and attachment to a support structure;
two spaced apart wings extending forwardly from each side of said back portion; and
hinge means at a top part of said back portion between said wings for hinged attachment of a book at its top back edge to said back portion;
each wing including a side surface and a top surface, said top surface extending laterally inward from said side surface and also extending forward and downward from said back portion, and a plurality of vertical webs extending inwardly from said side surface and having inner edges, said inner edges at a top end of each web extending in an arcuate form upward and outward to an inner edge of said top surface;
said webs of one wing extending towards and in opposition to said webs of the other wing, and said inner ends of said webs defining a space for acceptance of said book therebetween;
the arrangement such that said book can be pivotted forward and upwardly on said hinge means and opened to rest on said top surface while held, release of said book causing the book to pivot and slide down over said arcuate forms at the top ends of said webs, to a closed condition.

3,967,808
IRRIGATION VALVE WITH METAL SEAT
Calvin A. Lieding, Glendora, Calif., assignor to Irrigation Specialties Company, San Gabriel, Calif.
Filed Sept. 22, 1975, Ser. No. 615,587
Int. Cl.^{2} F16K *25/00*
U.S. Cl. 251—46 **7 Claims**

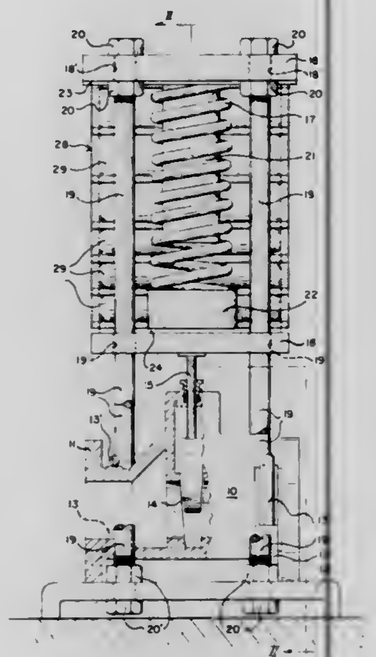


1. A fluid valve, comprising:
a valve body made of a plastic material and defining a flow passage therethrough with inlet and outlet conduits at opposite ends of the passage;
a metal seat ring having a generally U-shaped cross-section defined by a seat portion and a pair of spaced-apart sidewalls extending from the seat portion, the sidewalls being embedded in the plastic valve body to position the seat portion around the flow passage between the inlet and outlet conduits, at least one of the sidewalls being nonparallel to a central axis of the ring;
a valve closure member mounted in the valve body to be movable into seating engagement with the seat portion to close the valve; and
means on the valve body and connected to the closure member for moving the closure member against and away from the seat portion to close and open the valve.

3,967,809
LINEAR FLUIDIC ACTUATOR
Michael J. Skantar, P.O. Box No. 13, Pleasant Unity, Pa. 15676
Filed Oct. 3, 1974, Ser. No. 511,943
Int. Cl.^{2} F16K *31/126*
U.S. Cl. 251—61 **14 Claims**

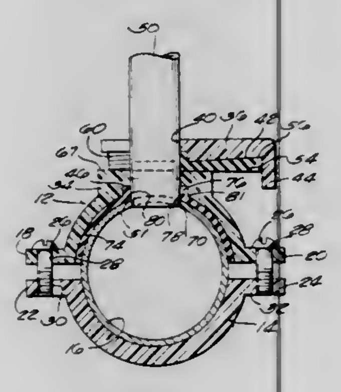
1. A linear fluidic actuator comprising a tubular envelope closed at opposite ends and inflatable from a flat deflated condition to a certain maximum circular diameter, and a flexible inextensible tension means of fixed length carrying said tubular envelope in a position such that the longitudinal axis of the inflated envelope is transverse to the line of action of said tension means, whereas the diametral axis of the deflated envelope lies in a plane paralleling said line of action,

one end of said tension means being fixed in position and the other end being movable linearly toward the fixed end responsively to inflation of the tubular envelope from a flat to a circular configuration.



3,967,810
PIPELINE INLET VALVE

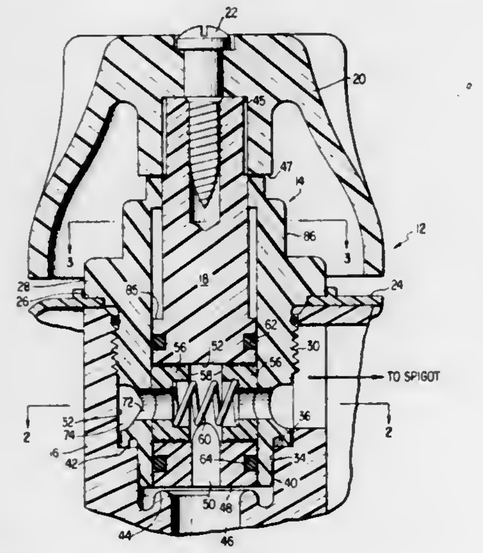
Norman Nrobert Pulvermacher, 1008 W. Main St., Princeton, Wis. 54968
Filed Apr. 28, 1975, Ser. No. 572,608
Int. Cl.² F16K *3/02;* **F16L** *41/00*
U.S. Cl. 251—146 5 Claims



1. A valve assembly comprising a valve housing having first and second valve housing parts, one of said parts having a planar surface and a shoulder, a through opening in said surface for communication with a manifold line, means for clamping said valve parts in assembly and adapted for securing said valve housing in a selected location on a manifold line, said first housing part including a valve cover, said cover having a lower surface spaced from said planar surface of said first part and including an elastomeric seal occupying the space between said cover and said planar surface, said cover including a depending stop flange, means for pivotally mounting said valve cover on said first housing part for generally parallel movement with respect to said planar surface between a first position closing and sealing said through opening with said stop flange engaging said shoulder and defining said first position, a second displaced position and a third position remote from said second position with said seal free of said planar surface, a pipe sized to be received in said through opening, and said valve cover having a recess complimentary in shape to said inlet pipe and wherein said recess engages said inlet pipe when said valve cover is in said second position, and biasing means on said first part for urging said cover into said first and second positions with said valve cover seal engaging said inlet pipe in said second position and covering and sealing said opening in said first position.

3,967,811
ALL PLASTIC VALVE CONSTRUCTION

Robert J. Keller, III, Richmond, Va., assignor to Kel-Win Manufacturing Company, Inc., Chester, Va.
Filed Dec. 3, 1975, Ser. No. 637,135
Int. Cl.² F16K *25/00*
U.S. Cl. 251—175 12 Claims



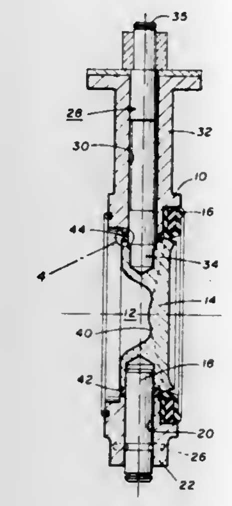
1. A valve construction comprising:
- a. a hollow underbody member,
- b. a hollow valve body member threadedly received in a first bore of said underbody member,
  - 1. said hollow valve body member having a depending skirt portion insertable into a second bore of said underbody member and establishing an interference fit therewith,
  - 2. said hollow valve body member further having an aperture communicating with spigot means,
- c. a plastic stem member mounted for rotation within said hollow valve body member,
- d. handle means for rotating said plastic stem member,
  - 1. said stem member being provided with a supply port and supply passageway in fluid communication with said underbody :member and at least one laterally extending passageway to an exit port,
  - 2. said exit port of said stem member being alignable with said aperture in said hollow valve body member,
- e. at least one hollow resilient seal member received in said laterally extending passageway,
- f. and means for urging said hollow resilient seal member toward the port adjacent said hollow valve body member.

3,967,812
SHAFT SEAL FOR CORROSION RESISTANT BUTTERFLY VALVE

Fred T. Newell, and Gerald B. Smith, both of Bradford, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 26, 1975, Ser. No. 553,365
Int. Cl.² F16K *31/44*
U.S. Cl. 251—214 10 Claims

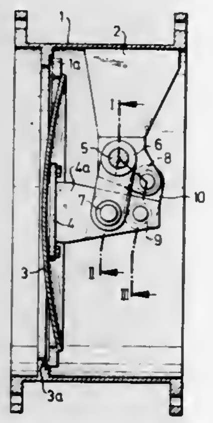
1. In a rotatably operable pipe line valve for corrosive service including a metal body defining a flow passage between an inlet and an outlet, a closure member in said passage operable between open and closed positions thereof, a thruport seal in said passage for cooperating with said closure member in its closed position and an operator shaft extending through said body from a driving connection internally enclosed within said closure member to a location external of said body, an annular seal member surrounding said shaft in axially squeezed relation interposed between said closure member and said body thereat, said seal member being operably effective for shaft

protection against line content independent of said thruport seal and comprising an elastomer and deflection control means operative against said elastomer to restrict radial deflection thereof.



3,967,813
BUTTERFLY FLAP VALVE

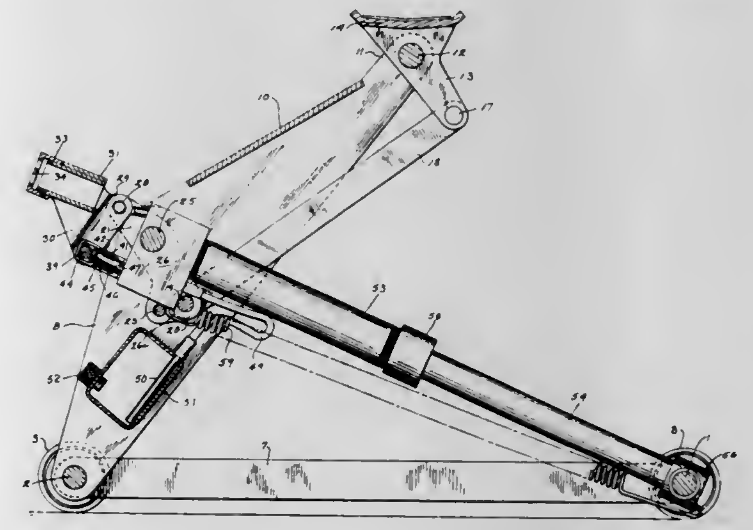
Karl Heinrich Fröhlich, Bergstrasse 47, D-6672 Rohrbach, Saar, Germany
Filed Nov. 25, 1974, Ser. No. 527,057
Claims priority, application Germany, Dec. 18, 1973, 2362966
Int. Cl.² F16K *1/16*
U.S. Cl. 251—298 3 Claims



1. A butterfly flap valve comprising:
- a housing containing a sealing surface and suitable for fluid flow along an axis;
- a generally circular butterfly flap having a central flow blocking portion and a periphery mateable with said sealing surface for closing said valve and adapated to be firstly axially displaced from said sealing surface and thereafter turned to lie generally parallel to the axis of fluid flow to open said valve, said flap having a projection extending from the central portion thereof parallel to the axis of fluid flow when said flap is in the closed position;
- a first journal located in said housing for journalling a shaft extending across the flow of fluid within said housing and adjacent said projection of said flap, a support means in said housing extending toward said projection when said flap is in the closed position and containing a second journal for receiving the end of said shaft within said housing;
- a single lever arm mounted on said shaft and pivotally connected to said projection of said butterfly flap for moving said flap upon rotation of said shaft, said lever arm having a length which is small compared to the diameter of said flap; and
- a single link pivotally connected to said projection at a location which is axially spaced from the connection of said lever in a direction away from said flap and connected to said support means adjacent said lever arm for guiding the movement of said butterfly flap during opening, said link having a length which is small compared to the diameter of said flap, said lever arm and said link being positioned so as to form an articulated quadrilateral when said flap is closed.

3,967,814
HIGH CAPACITY HAND PORTABLE JACK

James A. Leibundgut, Waterford, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.
Filed Apr. 30, 1975, Ser. No. 573,171
Int. Cl.² B66F *3/24*
U.S. Cl. 254—8 B 8 Claims



1. A lightweight hand portable jack, comprising a chassis having front and rear axles and wheels supporting the axles, a pair of laterally spaced parallel tension members connected at opposite ends to each of the axles and free of other members of the jack, a lift arm of generally triangular configuration pivoted directly to the rear axle and extending forwardly of the jack to a line adjacent to the front axle, a hydraulic unit directly pivoted at the forward end to the front axle and pivoted at the rear end to the upper portion of the lift arm generally centrally of the jack to actuate the lift arm, a lifting saddle having depending members pivotally supported at the forward end of the jack, link means pivoted at the forward end of the jack to the saddle and at the rear end to the hydraulic unit, and means to actuate the hydraulic unit to raise the lift arm operating against the rear axle and the hydraulic unit operating against the front axle and thereby raise the saddle, the said tension members only being subject to tension thereby requiring only lightweight members and the bending moment developed in the jack being absorbed solely by the lift arm.

3,967,815
DUSTLESS MIXING APPARATUS AND METHOD FOR COMBINING MATERIALS

James H. Backus, 3320 Franconia Road, Alexandria, Va. 22310, and Charles E. Cornwell, 7104 Marlan Drive, Alexandria, Va. 22307
Filed Aug. 27, 1974, Ser. No. 500,956
Int. Cl.² B28C *5/46*
U.S. Cl. 259—148 17 Claims

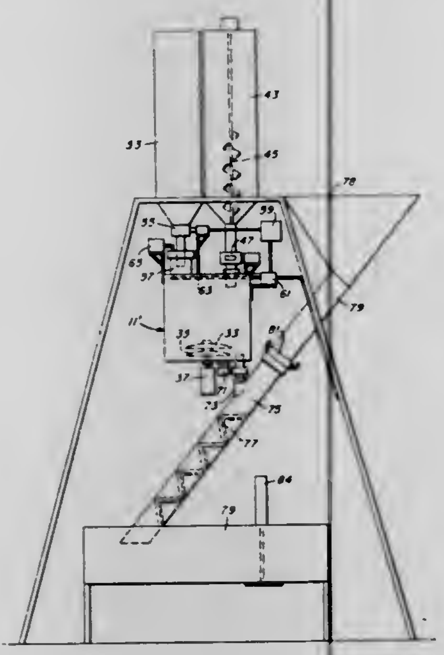
9. Apparatus for dustless mixing of materials comprising in combination:
- a. a mixing container;
- b. one or more symmetrical impellers mounted for rotation within said container;
- c. means for rotating said impellers at a predetermined rpm;
- d. means for metering a first material into said container, said impellers establishing a vortex in the metered material;

e. means for metering further material to the container for mixing with said first metered material through the use of said vortex;

f. said first material being a fluid and further comprising means for spray cleaning the container with said fluid metered under pressure; and,

g. means for combining a measurement of the volume of spray cleaning fluid along with a measurement of the volume of fluid metered to determine the total amount of fluid metered into the container.

13. A dustless mixing method using a closed container supplied with materials to be combined comprising the steps of:



a. metering a first material into the container;

b. establishing agitation in the metered material;

c. metering further material to the container;

d. developing a vacuum in the container to draw off air displaced by said materials as the materials enter the container; and

e. mixing said materials within the container.

14. The method of claim 13 wherein said first material is a fluid, and comprising the further step of:

spray cleaning the container with said fluid metered under pressure and combining the volume of spray cleaning fluid used in cleaning with the volume metered to determine the total amount of fluid metered into the container.

3,967,816
FIXTURE BLOCK SERVING AS A MANUFACTURING ACCESSORY

Hans Ramsperger, Lossburg-Rodt, and Rolf Kölblin, Oberndorf (Neckar), both of Germany, assignors to Mauser-Schaerer GmbH, Germany

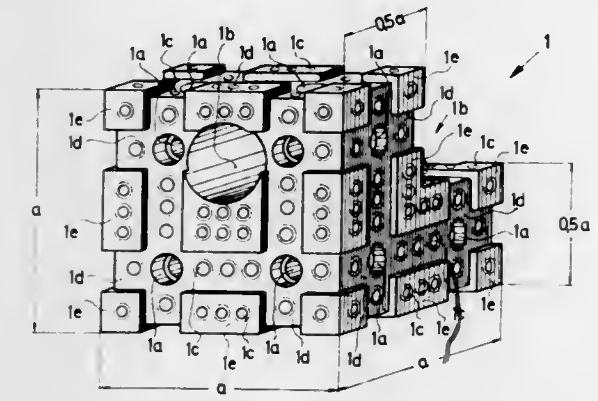
Filed Feb. 20, 1975, Ser. No. 551,090

Claims priority, application Germany, Feb. 21, 1974, 2408350

Int. Cl.² B23Q *3/00*

U.S. Cl. 269—9 **7 Claims**

1. In a building block system including a fixture block serving as a manufacturing accessory, particularly for the machining of metal workpieces and the like, adapted to be combined with further correspondingly designed accessories with the aid of which workpieces to be machined can be brought into proper position or orientation for the particular machining operation, such as planing, milling, drilling, honing, grinding, and the like, and maintained in such proper position or orientation during at least one working cycle, the improvement comprising a basic fixture block formed as an L-shape body, having its shape derived from the geometrical form of a rectangular parallelepiped with all intersecting surfaces being mutually perpendicular to each other, having a pair of mutually perpendicular legs each having relatively wider inner and outer surfaces joined to each other by relatively narrow side surfaces, with the length and width of the relatively wider outer surface of each leg being equal to each other and to the length and width, respectively, of the relatively wider outer surface of the other leg, and the thickness, across the relatively narrow surfaces, of each leg being equal to one-half such length or width; the inner, outer and side surfaces of said legs forming contact surfaces and being formed with aligned rows of coplanar projecting areas separated by machined rows of coplanar recessed areas; all the surfaces of said block being formed with a plurality of tapped bores and with smooth untapped bores of different diameters, which at least partially intersect each other within the block.



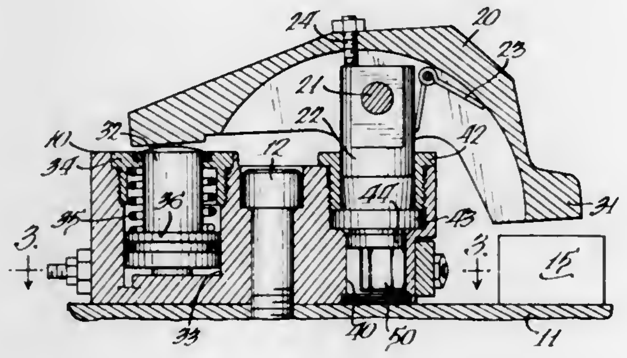
3,967,817
SWING CLAMP

Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Continuation of Ser. No. 487,570, July 11, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,760

Int. Cl.² B25B *5/06*

U.S. Cl. 269—32 **3 Claims**



1. A swing clamp comprising a body with a bore, a pivot shaft rotatably mounted in said bore and having an exposed end and an opposite end with an integral crescent-shaped cam having an outer surface coincident with the perimeter of the shaft and in contact with the wall of the bore, a clamp arm pivotally mounted on the exposed end of said pivot shaft for movement between operative and inoperative positions by rotation of the pivot shaft, a clamping piston positioned beneath an end of the clamp arm when the clamp arm is in operative position for pivoting the clamp arm relative to the pivot shaft, means for rotating said pivot shaft including a pair of operating pistons movable in cylinders extending toward said bore and at an acute angle to each other with said operating pistons in engagement with opposite ends of said crescent-shaped cam whereby force exerted by an operating piston rotates said pivot shaft and said cam is supported by the wall of the bore, one of said operating pistons being fluid operated, a stop for said last-mentioned piston positioned at an end of the cylinder and adjacent said cam to limit the stroke of the fluid operated piston, means external of the body for adjusting said stop along a line parallel to the axis of the last-mentioned piston and offset from the path of movement of the crescent-shaped cam, the stop being positioned for engagement by the last-mentioned piston while the latter also engages an end of the cam, and a hydraulic circuit including communicating body passages leading to said clamping piston and said fluid operated piston and a sequencing valve in one of said passages openable to direct hydraulic fluid to said clamping piston after the hydraulic fluid pressure has built up to a predetermined value resulting from said fluid operated piston being held against said stop.

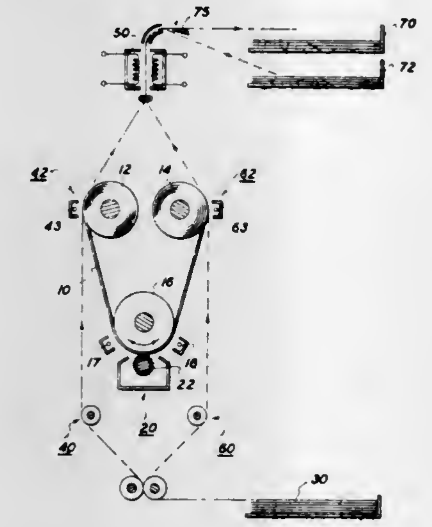
3,967,818
DUPLICATING SYSTEM

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1974, Ser. No. 532,783

Int. Cl.² B41F *13/64*

U.S. Cl. 270—18 **5 Claims**



5. A method of producing collated sets of precollated information comprising the steps of

transporting a web bearing precollated graphic information in a first direction, developing the web by contact with a rotatable member, transferring developed images onto copy sheets at a first transfer station, and directing sheets in sequence to a first tray image face down and then reversing the direction of the web and rotatable member, and transferring developed images onto copy sheets at a second transfer station, and directing the sheets from the second transfer station to a second tray image face up and repeating the aforementioned steps to produce collated copy sets for movement of the web in each direction.

3,967,819
COMBINATION CONTAINER AND BALL GOAL WITH REFLECTOR

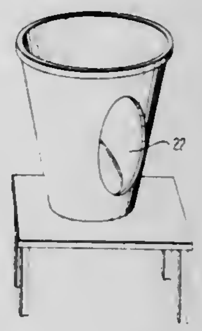
Jonathan Jay Lewis, 4103 Priscilla Lane, Baltimore, Md. 21208

Filed Feb. 10, 1975, Ser. No. 548,729

Int. Cl.² A63B *63/02*

U.S. Cl. 273—103 **4 Claims**

1. A combination container and ball goal comprising an enclosure having side and bottom walls and an opening through its upper end for passage of a ball from outside of said enclosure into said enclosure, said side wall having an aperture for passage of the ball from within the container to the outside of the container, and means carried by said enclosure for selectively opening and closing said aperture whereby said enclosure is adapted for use as a ball goal or as a container open at its upper end and bounded by said side and bottom walls, means carried by and within said enclosure for deflecting the ball received through the opening at its upper end toward said side wall aperture, said deflecting means including a side wall panel forming at least a portion of said opening and closing means, and means for releasably securing said side wall panel in position closing said side wall aperture whereby said side wall panel forms a substantially continuous part of said side wall when said enclosure is used as a container, said panel being removable from said enclosure, said securing means including a pivotal connection between said panel and said enclosure for pivotal movement of said panel between a position within said enclosure and a position closing said aperture.



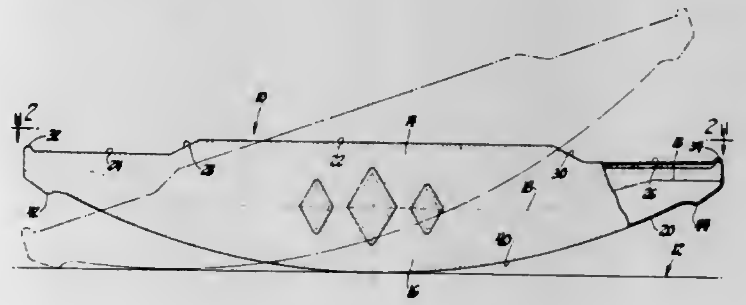
3,967,820
AMBULATORY ROCKING DEVICE

James T. Harper, 824 Beecher, Pittsford, Mich. 49271

Filed Nov. 24, 1975, Ser. No. 634,432

Int. Cl.² A63B *23/04*

U.S. Cl. 272—70 **2 Claims**

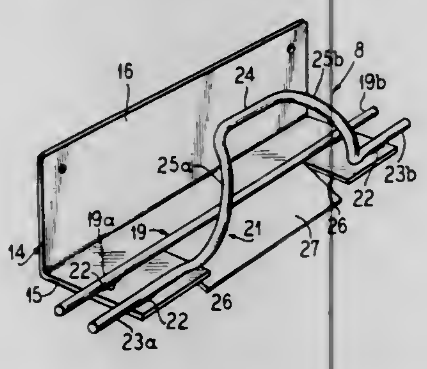


1. A substantially hollow and light weight bi-ped supporting rocking-and-ambulating recreation device having transverse width substantially in excess of either its vertical height or longitudinal length, said device comprising top and bottom shell-like portions mutually engaging and supporting each other at a single mating lip encircling the periphery of said device, said top and bottom shell-like portions comprising respectively top and bottom transversely extending surfaces and front and back longitudinally spaced apart walls extending vertically from said top and bottom surface, said top surface comprising a substantially flat central portion bounded at each of its outboard ends by a downwardly recessed platform portion for locating and supporting a respective foot of said biped, said bottom surface comprising a substantially arcuate portion bounded at each of its outboard ends by a downwardly extending rocking stop portion, and said front and back walls of said top member defining one side of said mating lip and comprising therealong contiguous first and second top wall portions and said front and back walls of said bottom member defining the other side of said mating lip and comprising therealong contiguous first and second bottom wall portions aligned coplanar respectively with said first and second top wall portions and mated thereto at said mating lip, said first portions of each said top and bottom wall portions being substantially coplanar in a first vertical plane to provide a primary support of said bi-ped in the verticle direction and said second portions of said top and bottom wall portions being coplanar in a second vertical plane different from said first vertical plane for a secondary support of second bi-ped in said verticle direction.

3,967,821
BALL SEPARATING DEVICE FOR POOL TABLES AND THE LIKE

Stuart C. Bagley, Glen Ellyn, Ill., assignor to Armac Enterprises, Inc., Chicago, Ill.

Filed Dec. 5, 1974, Ser. No. 529,805
Int. Cl.^{2} A63D *15/00*
U.S. Cl. 273—11 C **8 Claims**

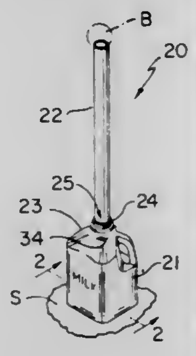


1. A device for separating a ball of one diameter from a ball of slightly larger diameter, comprising guide means forming a two-rail track, the rails of which are uniformly spaced a distance less than the diameter of either ball, supportingly conducting all balls to a separating station, one of the rails of said track operatively terminating the support of said smaller ball at said station, the other of said rails having an extended portion continuing through the separating station, and a third rail supported higher than and cooperating with said extended portion of said other rail and uniformly spaced therefrom a distance greater than the diameter of the smaller ball and less than the diameter of the larger ball, said third rail being so disposed with respect to said extended portion that the larger ball will be supportingly guided by said third rail and said extended portion through the separating station approximately forming a continuation of the first line and that the smaller ball, by being unsupported by said third rail will thereby be separated at said separating station by the action of gravity.

3,967,822
METHOD OF MAKING A BALL TEE

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429, and Joseph V. Tassone, 2425 Rawnsdale Road, Kettering, Ohio 45440

Division of Ser. No. 326,806, Jan. 26, 1973, Pat. No. 3,858,879. This application Oct. 23, 1974, Ser. No. 517,300
Int. Cl.^{2} A63B *69/40*
U.S. Cl. 273—26 R **10 Claims**

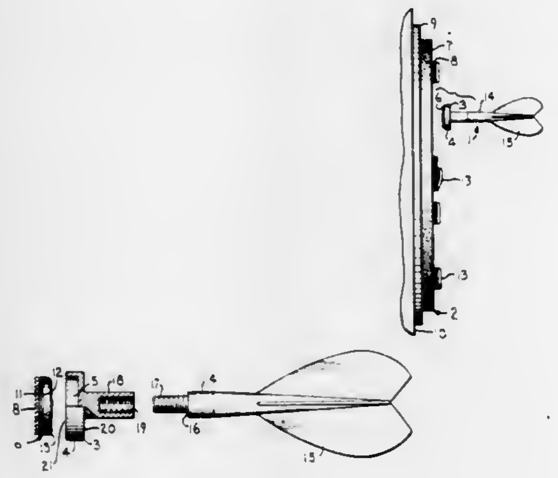


1. A method of making a baseball and softball ball tee comprising the steps of providing a conventional container means of a box or bottle type that originally contained a product therein and which has a top wall spaced from a bottom wall thereof by an enlarged chamber of said container means, telescopically disposing an elongated tubular ball support in an opening in said top wall of said container means by snuggly fitting the outer periphery of said ball support through said top wall at said opening so that said ball support is supported by said top wall snuggly engaging said ball support at said opening and said ball support extends substantially vertically out of the opening to a predetermined height thereabove whereby when said container means has said bottom wall disposed on a support surface said tubular ball support will be disposed in an upright manner so that a ball having an external diameter within the range of the diameter of a standard baseball to the diameter of a standard softball can be hit off of the upper end thereof in a ball strike zone which is at least equal to a vertical height defined by the batter's knees, and stabilizing the lower end of said tubular ball support with said bottom wall of said container means so that both the top and bottom walls of said container means support said tubular ball support in said upright manner.

3,967,823
TARGET AND SEPARABLE TARGET MARKERS FOR A DART

Robert E. Yount, 11108 W. 70th Terrace, Shawnee, Kans. 66203

Filed June 23, 1975, Ser. No. 589,125
Int. Cl.^{2} F41J *3/00*
U.S. Cl. 273—95 R **1 Claim**

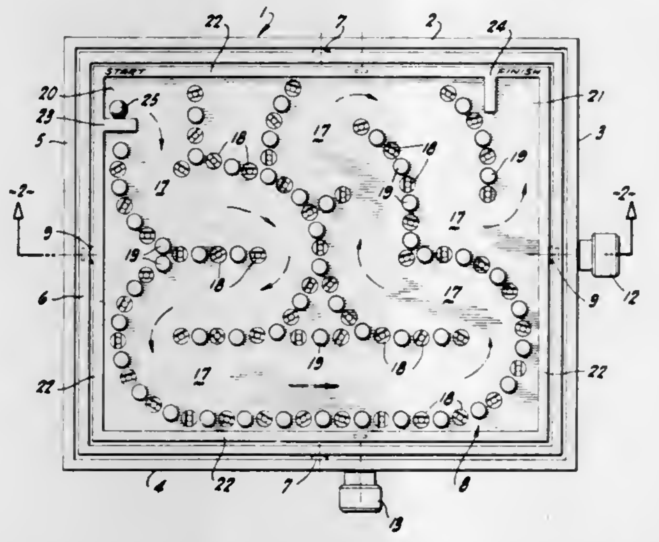


1. A dart game comprising in combination:
- a. a target having an outwardly presented face provided with a textile covering having a surface of a pile fabric having upstanding loops;
- b. a plurality of darts each adapted to be thrown toward said target, said darts each having an elongated shaft;
- c. an enlarged end portion for each of said darts, said enlarged end portions each having a peripheral wall defining a recess therein, said enlarged end portions each being removably mounted on said shaft of a respective one of said darts;
- d. a target marker for each of said enlarged end portions, said target markers each being separably received in a respective one of said enlarged end portions and each having a forwardly presented first face provided with a textile covering having integral outwardly extending stiff hooks and spines formed of broken loops of filament adapted for retentive imbedment in said target surface upon engagement therewith whereby each of said target markers is retained on said target in a manner requiring greater force to separate same than force required to separate said target marker and said enlarged end portion upon impact of said dart upon said target; and
- e. a second face for each of said target markers and provided with a textile covering having a surface of pile fabric having upstanding loops whereby said second face is adapted to retain thereon said first face of an other of said target markers upon engagement thereby.

3,967,824
GAME BOARD UNIT

William J. Lund, 1869 Carmel Ave., Stockton, Calif. 95204

Filed May 22, 1975, Ser. No. 579,773
Int. Cl.^{2} A63F *7/04*
U.S. Cl. 273—110 **5 Claims**

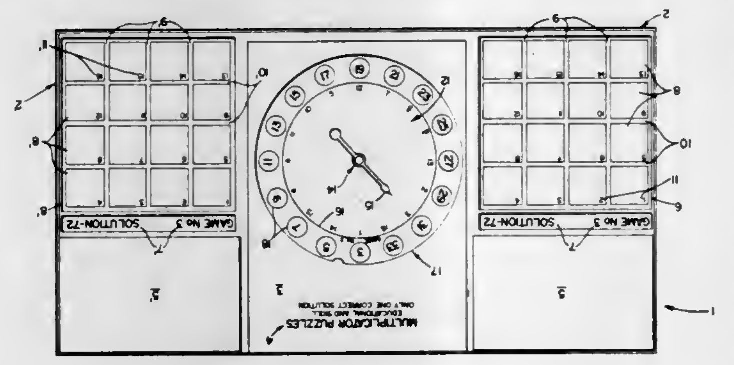


5. In a game board which embodies an upwardly facing, player-manipulated, universally tiltable game board, means on the game board forming a circuitous path on the face thereof between a starting point and a finish point, and a ball adapted to be run along said path between such points in response to variable tilting by the player of the game board in a manner attempting to maintain the running ball on said path intermediate its margins; the improvement characterized by the game board being of non-metallic material, the ball being of magnetically-responsive material, and said path-forming means including a multiplicity of board-mounted elements which for substantially the length thereof define and magnetically border both sides of such path, and said elements being a multiplicity of magnets in rows wherein the magnets are disposed in relatively close but spaced relation.

3,967,825
EDUCATIONAL GAME HAVING A RANDOM NUMBER SELECTOR

James A. Anania, Sr., 801 N. 6th St., No. 716, P.O. Box 186, Newark, N.J. 07107

Filed May 14, 1975, Ser. No. 577,233
Int. Cl.^{2} A63F *3/06*
U.S. Cl. 273—135 B **20 Claims**



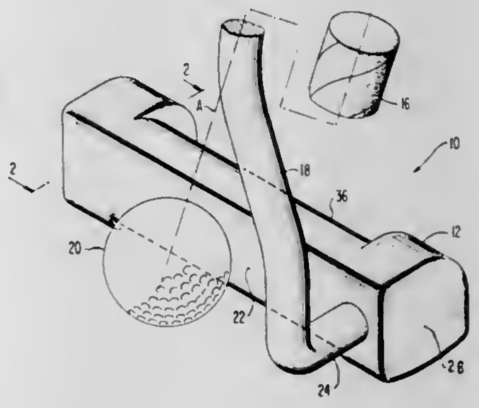
1. An educational game comprising:
- a. at least one game board surface divided into sixteen substantially equal spaces having four spaces in each direction and being divided laterally and longitudinally in order to define separate individual spaces for the reception of numbered tokens;
- b. a plurality of numbered tokens containing numerals thereon, said tokens to be placed within the sixteen spaces of the game playing board;
- c. disc means comprising a generally circular disc having reference numerals thereon which correspond identically to the numerical tokens to be placed on the game board;
- d. random selector number means providing means for reception of said disc and for selecting any of said numbers on said disc by random means;

whereby on selection of a number on said disc by said random selector means, a numerical token corresponding identically to that number is inserted into one of said sixteen spaces on said game surface, said selection of numbers and insertion of numerical tokens continuing until all of the sixteen spaces on said game board contain numerical tokens whereby the tokens must provide the indicated numerical solution to the game by the addition of said numerical tokens when added longitudinally, latitudinally, diagonally or any four adjoining spaces.

3,967,826
GOLF PUTTER

Clay Judice, P.O. Box 2782, 222 Eraste Landry Road, Lafayette, La. 70501

Filed Dec. 30, 1974, Ser. No. 537,570
Int. Cl.^{2} A63B *53/04*
U.S. Cl. 273—167 F **5 Claims**



1. A golf club for stroking a golf ball comprising an elongated shaft, a head having a flat surface for striking a golf ball and a shank connecting one end of said shaft and said head, said shaft having an axis forwardly of and in a plane generally parallel to and spaced forwardly a predetermined distance from a plane containing said striking surface so that the axis extended is adapted to intersect a golf ball when said head lies in striking position relative to the ball, said shank extending from said shaft for connection with the striking surface of said head at a heel portion thereof, said head having a cavity opening downwardly through the bottom face of said head, the cavity being offset toward the heel portion of said head to provide a greater weight in the toe portion of said head than in the heel portion thereof, thereby shifting the center of gravity of the head towards said toe portion the connecting portion of said shank and the heel portion of said head lying on one side of an oblique plane containing the axis of said shaft and extending normal to a plane containing said striking surface, the toe portion of said head and the center of gravity of said head lying on the other side of said oblique plane, the cavity being so located to balance the club about the shaft axis such that when the shaft lies in a horizontal position the club head will be so oriented that the striking face lies in a horizontal plane;

said head further including a recess formed along its upper face and a side face thereof remote from said striking surface, and spaced midway between the heel and toe portion of said head the recess locating the center of gravity of said head above the median of the head height;

the bottom face of said head being recessed between its heel and toe portions so that drag resistance during stroking is minimized.

3,967,827
SYNCHRONIZED INDUCTION MOTOR

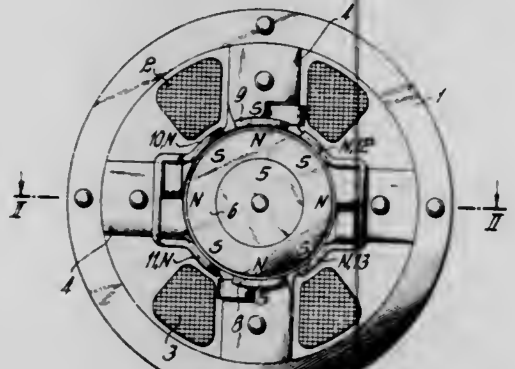
Rudiger Lehmann, St. Georgen, Black Forest, Germany, assignor to Firma Dual Gebruder Steidinger, St. Georgen, Black Forest, Germany

Filed Apr. 11, 1974, Ser. No. 460,141

Claims priority, application Germany, Apr. 13, 1973, 2318728

Int. Cl.² G11B *17/00;* **H02K** *21/12*

U.S. Cl. 274—1 E **4 Claims**



1. A record player having a turntable, a motor and transmission means drivingly connecting said motor with said turntable, said motor comprising:

a stator centered on an axis and provided with an even number of pairs of diametrically opposite stator poles angularly equispaced from one another;

coil means on said stator energizable with alternating current for reversibly magnetizing adjacent stator poles with opposite polarity, thereby generating a primary magnetic field with a vector component rotating at a predetermined speed about said axis;

a rotor having an electrically short-circuited cylindrical body centered on said axis for inductive entrainment by said rotating component;

a permanently magnetic ring coaxially secured to said body, said ring forming a multiplicity of angularly equispaced magnet poles of alternate polarities equaling twice the number of said stator poles; and

magnetically permeable armature means on said stator forming a first and a second set of pole shoes respectively associated with alternate stator poles and magnetically coupled therewith for joint magnetization by said coil means, the pole shoes of said first set being substantially aligned with their associated stator poles, the pole shoes of said second set lying substantially midway between their associated stator poles and adjoining stator poles for establishing a secondary magnetic field rotating at half said predetermined speed for the synchronous entrainment of said rotor by coaction of said pole shoes with said magnet poles, said coil means being constructed and arranged to provide an induction torque insufficient to accelerate said rotor beyond the speed of said secondary magnetic field.

3,967,828
RECORD SELECTOR MECHANISM FOR A PHONOGRAPH SYSTEM

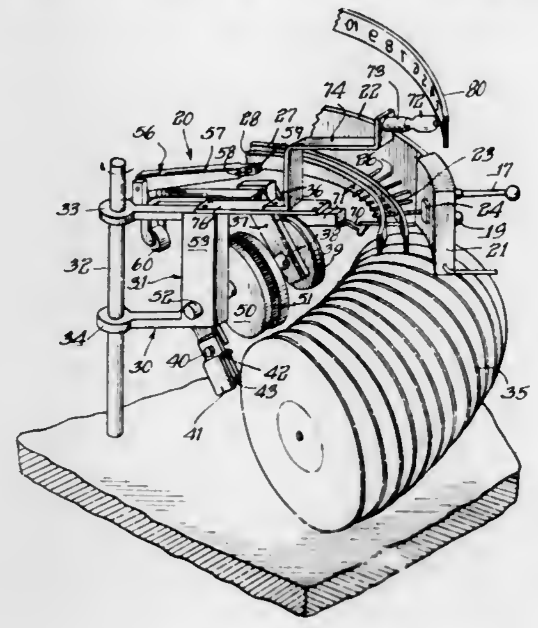
Alvin S. Topolski, Tonawanda, N.Y., assignor to The Wurlitzer Company, Chicago, Ill.

Filed Mar. 3, 1975, Ser. No. 554,584

Int. Cl.² G11B *17/22, 3/60*

U.S. Cl. 274—10 D **6 Claims**

1. In a phonograph system the combination comprising: first and second spaced-apart resilient disk means having opposed frictional surfaces for engaging opposite faces of a disk type record therebetween, said frictional surfaces engaging the faces of said record and rotationally driving said record prior to centering thereof, drive means engageable with at least one of said spaced-apart disk means for driving said disk means and said record placed therebetween at playing speed, coarse means for placing the center of said record within close proximity of said spaced-apart disk means, dynamic self-centering means formed on said disk means and engageable with the faces of a record to effect self-centering of said record upon rotation of said disk means and said record, transducer means engageable with said record for reproducing the information thereon, and reproducing means for producing an audio output of the information on said record.



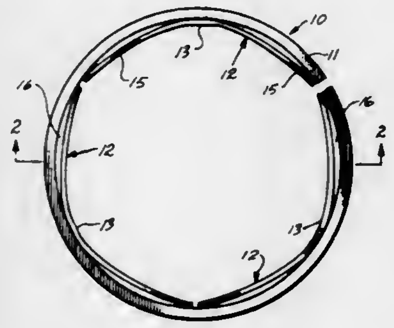
3,967,829
SEAL RING

William A. Rogers, San Pedro, Calif., assignor to Rogers-Dierks, Inc., San Pedro, Calif.

Continuation of Ser. No. 339,649, March 9, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,840

Int. Cl.² F16J *9/06*

U.S. Cl. 277—149 **2 Claims**



1. A seal ring assembly for installation in a ring groove of a tubular member making a relatively loose telescoping fit with a second tubular member, the members being subject to temperature variations and vibration therebetween, comprising:

a split ring of uniform cross-sectional configuration and area at all locations circumferentially thereof except at a single gap radially through the ring; and

a plurality of separate multiple-spring metal members having a shallow-V-shape and being of substantially uniform cross-section symmetrically arranged around the ring and each welded at a generally central portion to a peripheral surface of the ring, the central portion being annealed to divide each multiple-spring member into a pair of leaf springs which act substantially independently of each other when deflected, each leaf spring being substantially freely supported at its ends by the adjacent peripheral surface of the split ring so the springs deflect and react under loading substantially as simple beams; the metal members being sufficient in number and length that the several leaf springs cumulatively subtend a substantially major part of the arc of the ring; the leaf springs being operative to urge the ring radially away from the grooved member substantially uniformly along the extent of the ring when the ring is fitted into the ring groove to effect a seal between the tubular members, the leaf springs maintaining effective seal loading due to decoupling of the leaf springs in each member by the annealed central portion and resulting low-rate, large-displacement action of the leaf springs.

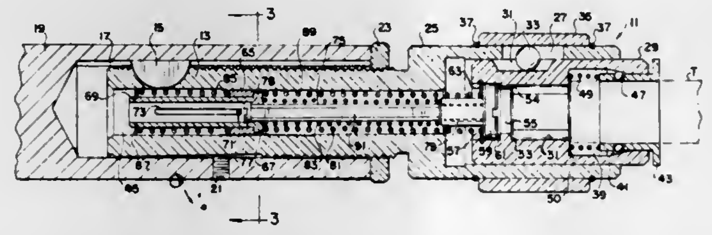
3,967,830
ADJUSTABLE TENSION AND/OR COMPRESSION TAP HOLDER

Theodore M. Smith, Mount Clemens, Mich., assignor to The Theodore M. Smith Trust, Mount Clemens, Mich., Lucille G. Smith; Theodore M. Smith, trustees

Filed Nov. 3, 1975, Ser. No. 628,387

Int. Cl.² B23B *31/08;* **B23G** *1/46, 3/06*

U.S. Cl. 279—16 **6 Claims**



1. An adjustable compression tap holder comprising an elongated shank having an internally threaded bore and a drive socket at one end communicating with said bore;

said shank adapted for securing within a longitudinally adjustable power rotated spindle;

a carrier of cylindrical shape having a bore therethrough slidably nested within said socket and having a series of spaced longitudinal drive slots;

a corresponding series of drive balls nested and retained in corresponding slots in said socket and operatively extending into said drive slots, for interconnecting said shank and carrier and providing for longitudinal adjustment of said carrier relative to said socket;

said carrier adapted to receive a quick release tap retaining bushing;

a tension and compression adjusting screw nested in said shank bore and at one end secured to and journalled upon said carrier;

a tension and compression adjusting nut threaded into said shank bore;

connecting means between said screw and nut, whereby manual rotation of said screw effects corresponding rotation and longitudinal adjustment of said nut;

a tension spring between said nut and said connecting means, biasing said screw and connected carrier inwardly of said socket;

and a compression spring between said nut and carrier biasing said carrier outwardly of said socket, whereby longitudinal adjustment of said nut regulates said tension and compression and the longitudinal positioning of said carrier and the tap carrier thereby relative to said socket.

3,967,831
SPRING COIL HOLDING DEVICE

Ming-Chao Chang, No. 61-28, 18 Lin, Chung Chou Li, Shih Lin, Taipei, and Chun-Ya Chen, No. 1 Kuo Chun St., San Chung, Taipei Hsien, both of China

Filed Oct. 21, 1974, Ser. No. 516,670

Int. Cl.² B23B *31/04*

U.S. Cl. 279—23 R **2 Claims**

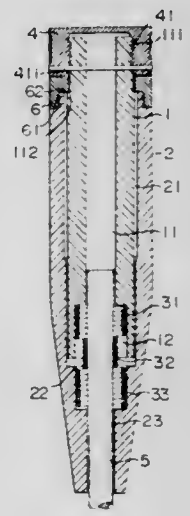
1. A spring holding device for clamping a rod-shaped object comprising:

a housing sleeve having a bore therethrough;

an actuator sleeve having a bore therethrough and coaxially disposed within said housing sleeve so that one end of said actuator sleeve projects axially beyond a corresponding adjacent end of said housing sleeve, said housing and actuator sleeves being rotatable relative to one another;

a coil spring having at least three sections integral with each other and each section comprising a plurality of coils, said sections including an end section at each end of the coil spring and a center section joining the end sections, said center section having a circular configuration and being smaller in diameter than the end sections and the end sections both being substantially elliptical in transverse configuration whereby the end sections may be operatively engaged and turned relative to one another to expand the coils of the center section to release a rod-shaped object gripped by the coils of the center section, and the natural resiliency of the coils is such that the center section automatically closes on and grips a rod-like object inserted thereinto, and

a cap secured on the projecting end of the actuator sleeve, the other end of the housing sleeve projecting axially beyond the adjacent, other end of the actuator sleeve, said sleeves having axially aligned circular bores therethrough, a portion of the bore in the actuator sleeve at the other end thereof and an adjacent portion of the bore in the housing sleeve being elliptical in transverse cross-section, and one of said end sections of said spring disposed in said actuator sleeve elliptical bore portion and the other end section of said spring being disposed in said housing sleeve elliptical bore portion so that, upon rotation of said sleeves relative to one another, said spring end sections rotate relative to one another to expand the coils of the center section.



3,967,832
COMPOSITE SKATE ASSEMBLY

Alan F. Chambers, Agincourt, Canada, assignor to Nylite Skate Company of Canada Ltd., Markham, Canada

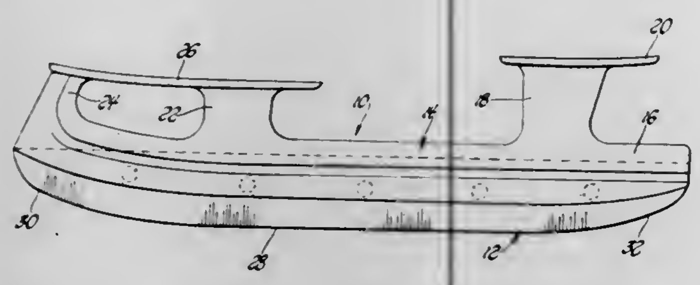
Filed Oct. 6, 1975, Ser. No. 619,751

Int. Cl.² A63C *1/02*

U.S. Cl. 280—11.12 **7 Claims**

1. An ice skate assembly comprising a hardened steel blade having upper and lower surfaces extending throughout the length thereof, said lower surface providing an ice-engaging portion, a plurality of longitudinally spaced holes formed transversely of said blade subadjacent said upper surface, a thermoplastic blade-supporting body molded about said blade to enclose said upper blade surface and said holes while leaving unenclosed the ice-engaging portion of said lower blade surface, said plastic body including integral elements extend-

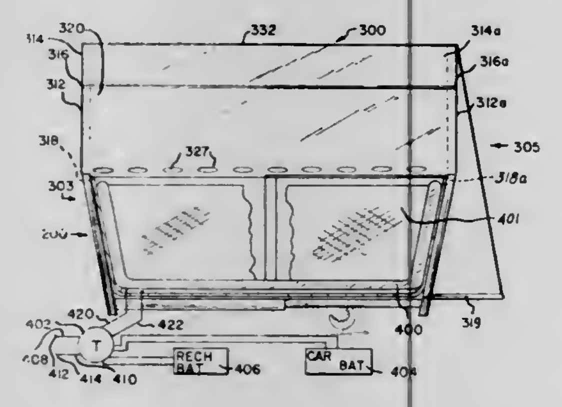
ing through said blade holes, and means disposed intermediate said integral body elements and said blade holes and which



means permit said elements to adjust relative to said blade as said plastic body shrinks after molding about said blade.

3,967,833
BABY HOLDING DEVICE

Henry Fleischer, 18 Notch Park Road, Little Falls, N.J. 07424
Division of Ser. No. 406,620, Oct. 15, 1973. This application Mar. 10, 1975, Ser. No. 556,708
Int. Cl.² B62B *7/08*
U.S. Cl. 280—639 **37 Claims**



1. A collapsible baby holding device comprising a collapsible frame and baby holding means supported on said frame, said frame comprising a primary support member comprising a substantially elongated member, a pair of secondary support members having first and second end portions, for supporting said baby holding means, said first end portions of said pair of secondary support members being connected to said primary support member, and the second end portions of said secondary support members being spaced from each other and adapted to move toward each other and away from said primary support member, a wheel support member having first and second end portions and an intermediate portion, said first and second end portions extending from said primary support member, and said intermediate portion being disposed in contact with said primary support member, at least one front wheel rotatably connected to said first portion of said wheel support member, a pair of back wheels rotatably connected to said second portion of said wheel support member in close proximity to said second end portion thereof, at least a pair of cross members connected to said pair of secondary support members; handle means for maneuvering said frame; and shielding means for protecting the baby, connected to said baby holding means.

3,967,834
MOTORCYCLE LIFTING DEVICE

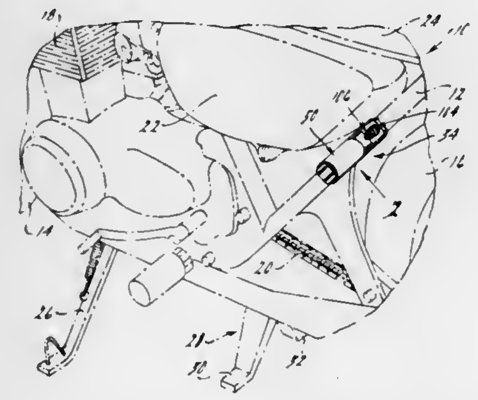
George J. La Charite, Clawson, Mich., assignor to Rolland G. C. La Charite, Santa Ana, Calif. and Gene V. Rowley, Clawson, Mich., part interest to each
Filed Nov. 29, 1974, Ser. No. 527,940
Int. Cl.² B62J *25/00, 39/00*
U.S. Cl. 280—291 **5 Claims**

1. In combination with a motorcycle or similar two-wheeled vehicle having a frame,

a retractable vehicle standard and a seating area for the vehicle operator,

a pair of substantially identical manually engageable handles secured to the opposite sides of the vehicle frame at positions adapted to be manually grasped by the vehicle operator for elevating the vehicle and thereby facilitating placing the vehicle on the standard,

first and second mounting bracket means for supporting each of said handles for pivotal movement between a first downwardly projecting position arranged generally parallel to said frame and a second generally horizontal position extending laterally outwardly from said frame,



a pair of pivot elements pivotally securing said handles to the associated of said mounting brackets,

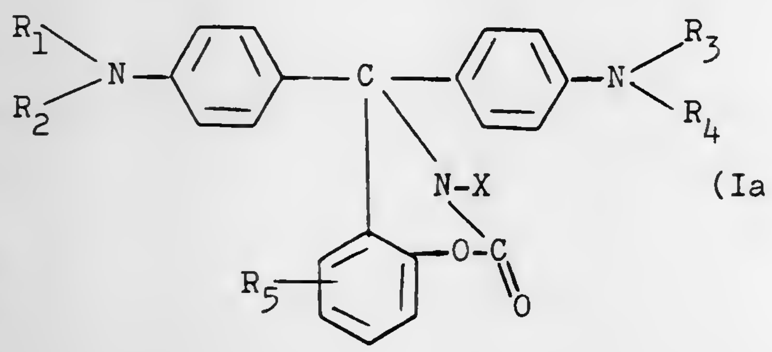
interengageable abutment means on said handles and said mounting brackets for preventing said handle from pivoting upwardly beyond said second position, and

securing means including a threaded element fixedly attached to a portion of said frame adjacent to each of said handles for securing said mounting brackets thereto.

3,967,835
PRESSURE-SENSITIVE COPYING MATERIAL

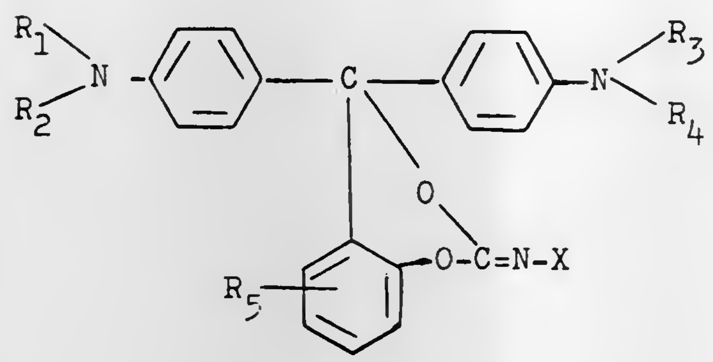
Minoru Ozutsumi; Yoshihide Miyazawa; Masahiko Yamaguchi, all of Tokyo; Akio Watanabe, and Keiso Saeki, both of Fujimiya, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo and Fuji Photo Film Co., Ltd., Minamiashigara, both of, Japan
Filed July 8, 1975, Ser. No. 594,174
Claims priority, application Japan, July 8, 1974, 49-77433
Int. Cl.² B41M *5/16*
U.S. Cl. 282—27.5 **8 Claims**

1. A pressure-sensitive copying material comprising a support having thereon a microencapsulated color former capable of forming a color on contact with an electron-donating color developer, the color former comprising at least one of a benzoxazine derivative represented by the formula (Ia)



(Ia)

, a benzodioxane derivative represented by the formula (Ib)



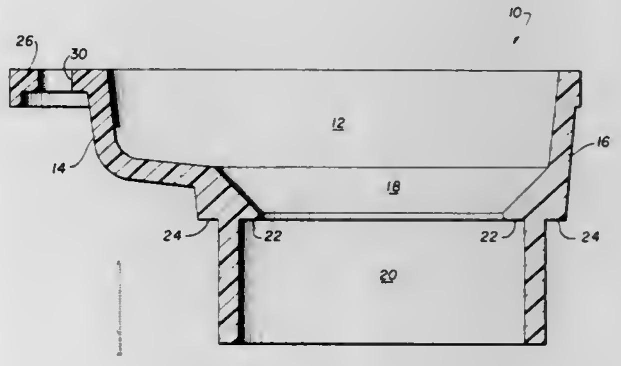
(Ib)

or a mixture thereof; wherein R_1 and R_3, which may be the same or different, each represents a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_2 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of said benzyl and phenyl groups may be substituted with a halogen atom or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_5 represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a halogen atom, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a dibenzylamino group, an N-lower alkyl-N-benzylamino group having 1 to 4 carbon atoms in the lower alkyl moiety thereof, an N-lower alkyl-N-benzylamino group having 1 to 4 carbon atoms in the lower moiety thereof, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms; and X represents a lower alkyl group having 1 to 4 carbon atoms, a lower alkyl group having 2 to 4 carbon atoms, a cyclohexyl group, an aralkyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an aryl group, in which the aromatic nucleus of said aralkyl and aryl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a halogen atom, a nitro group, and when the aralkyl group is a benzyl group, the aromatic nucleus thereof may also be substituted with an N-lower alkyl-N-phenyl group having 1 to 4 carbon atoms in the N-lower alkyl moiety thereof.

3,967,836
OFFSET PLASTIC FLANGE FOR CONNECTING TOILET BOWLS TO DRAIN PIPES

Lewis B. Izzi, Sr., 918 Surrey Drive, Shelby, N.C. 28150
Filed Apr. 16, 1975, Ser. No. 567,471
Int. Cl.² E03D *11/13*
U.S. Cl. 285—12 **1 Claim**

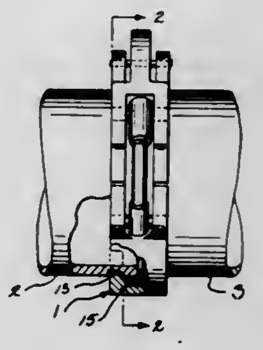
1. A plastic offset flange connector for positioning toilet bowls in a given position with respect to a wall and connecting its bowl outlet pipe with an unaligned floor-positioned plastic drain pipe comprising; a large connector bowl having a front and a rear wall and an outlet tube and being open at its top in a generally elliptical configuration and having a downwardly tapering outlet section inwardly overlying and terminating in said outlet tube; said outlet tube being inset from said rear wall to form a pair of spaced inner and outer annular shoulders to



optionally seat the upper end of different sized plastic drain pipes; said annular shoulders being fuseable to the upper end of said plastic drain pipe with solvent cement; and an annular flange projecting from the upper edge of said connector bowl for sealed connection with said toilet bowl.

3,967,837
HIGH PRESSURE COUPLING APPARATUS

Robert E. Westerlund, Mequon, and Herbert A. Westerlund, Port Washington, both of Wis., assignors to Construction Forms, Inc., Cedarburg, Wis.
Filed Nov. 4, 1974, Ser. No. 520,548
Int. Cl.² F16L *17/00*
U.S. Cl. 285—112 **10 Claims**



1. In combination, a pair of conduit members located in end-to-end coaxial alignment, each of said conduit members including annular circumferential grooves spaced axially inwardly from the aligned ends and having end sidewalls spaced axially inwardly from said ends, an encircling coupling unit encircling the ends of the conduit members and having means to tighten the coupling unit about the conduit members, said coupling unit including laterally spaced side legs projecting generally radially one each into each of said grooves, said coupling legs each having an inner wall adjacent the sidewall of the corresponding groove, said adjacent sidewall and inner wall being formed to define a first pair of clamping walls

adapted to move into engagement upon closure of the clamp unit with the legs spaced from the base of the grooves to tightly clamp the conduit members to each other, said inner wall and sidewall including stepped portions defining at least one additional pair of clamping walls axially spaced from said first clamping walls, the axial spacing of said second clamping walls being greater than the axial spacing of the first clamping walls whereby only upon removal of the first clamping walls the second clamping walls move into clamping engagement upon closure of the clamp unit to maintain firm, physical connection between the conduit members.

3,967,838
BANJO TYPE PIPE UNIONS

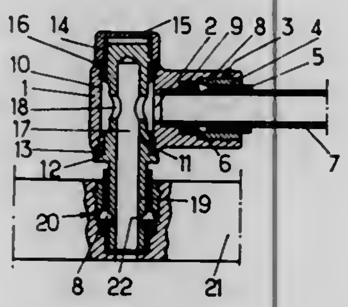
Andre Legris, St-Maur, France, assignor to Societe Legris France S.A., France

Filed Aug. 15, 1974, Ser. No. 497,675

Claims priority, application France, Aug. 20, 1973, 73.30167; Mar. 7, 1974, 74.07818

Int. Cl.^{2} F16L *27/08*

U.S. Cl. 285—190 **10 Claims**



1. A pipe union of the banjo type, comprising a body having at least one first bore in which is located a quickfitting connecting member adapted to receive the end of a pipe, said first bore opening into a second bore whose axis is perpendicular to that of the first bore and in which is pivotably mounted a connecting socket having a conduit in communication through at least one orifice with the first bore, said socket having a recess in which are engaged jaws of a flexible clip mounted in a collar secured in a supporting member, said collar having a diverging zone, disposed towards the interior of the union, for squeezing together the jaws of the clip and a toroidal seal preventing leakage from said socket and the union.

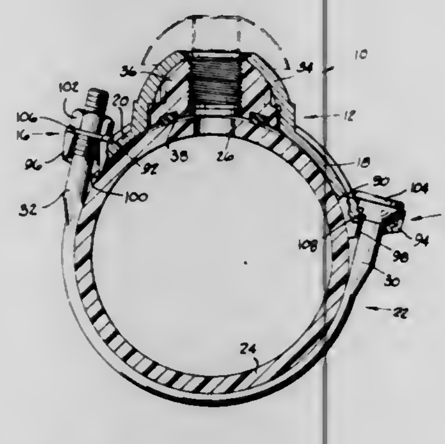
3,967,839
PIPE SADDLE ASSEMBLY

Paul George Dunmire, Sonoma, Calif., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 28, 1974, Ser. No. 473,962

Int. Cl.^{2} F16L *41/06*

U.S. Cl. 285—199 **12 Claims**



1. A pipe saddle assembly, comprising:

a. an insert housing having an outer open end and an inner open end, the inner open end being adapted for positioning adjacent to and around an opening in the wall of a pipe;

b. an insert having an outer end, an opposite inner end and an opening extending through the insert from its inner end to its outer end, said insert being positioned in a predetermined way within said housing such that the inner ends and the outer ends of said insert and housing are respectively adjacent each other;

c. said housing including an inwardly facing internal shouldered surface and said insert including a complementary, outwardly facing, external shouldered surface which slidably abuts against said internal shouldered surface when said insert is positioned within said housing in said predetermined way, said shouldered surfaces respectively defining segments of a spherical surface;

d. circumferential sealing means positioned adjacent the inner end of said insert around the opening therein and being adapted to engage against said pipe wall around the opening in said pipe wall; and

e. means for holding said housing, insert and sealing means in position against said pipe.

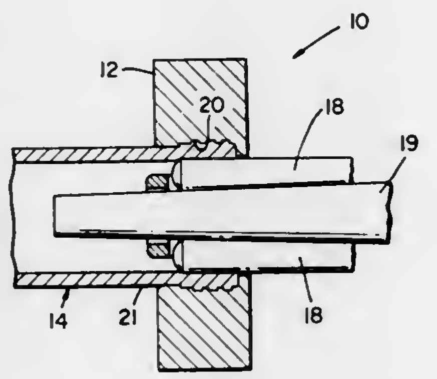
3,967,840
JOINT AND PROCESS FOR FORMING SAME

Robert A. McFall, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 13, 1975, Ser. No. 558,197

Int. Cl.^{2} F16L *41/00*

U.S. Cl. 285—222 **9 Claims**



1. In a process for forming a tubing-machined metallic member joint comprising providing a metallic member of substantially full theoretical density having a portion thereof adapted to matingly receive a metallic tube, placing one end of said tube against said mating portion of said metallic member, said tube being formulated of a less hard metal than said member, and cold flowing said one end of said tube against said mating portion thereby forming said joint, the improvement of increasing the torque strength of said joint comprising:

controllably oxidizing only said member at an elevated temperature prior to the placing of said tube in mating contact with said mating portion to form a thin adherent hard metal oxide layer on said mating portion; and

cooling said member after completion of said oxidizing.

9. A tubing-machined metal joint formulated by providing a metallic member of substantially full theoretical density having a portion thereof adapted to matingly receive a metallic tube formulated of a less hard metal than said member, controllably oxidizing only said member at an elevated temperature prior to the placing of said tube in mating contact with said mating portion to form a thin adherent hard metal oxide layer on said mating portion, placing one end of said tube against said mating portion of said metallic member and cold flowing said one end of said tube against said mating portion thereby forming said joint of increased torque strength.

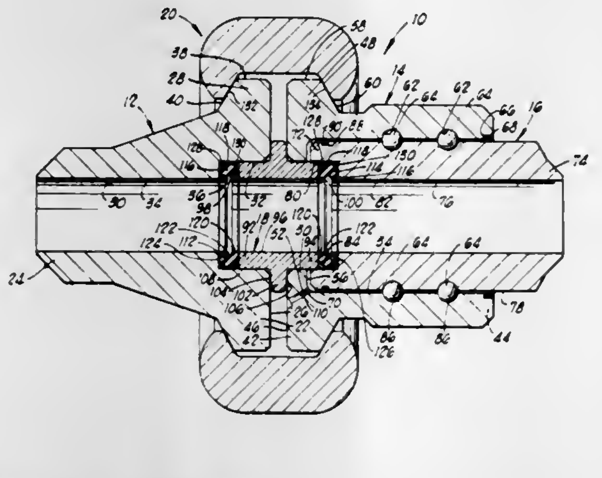
3,967,841
HIGH PRESSURE TUBULAR SWIVEL JOINT

William D. Kendrick, Duncan, Okla., and Bruce J. Frazier, Coffeyville, Kans., assignors to Halliburton Company, Duncan, Okla.

Filed Sept. 22, 1975, Ser. No. 615,797

Int. Cl.^{2} F16L *27/00*

U.S. Cl. 285—276 **19 Claims**



1. A swivel joint comprising:

a first swivel body having a first end, said first swivel body having an end face on the first end thereof, and a passage extending through said first swivel body communicating with the first end;

a second swivel body having a first end and a second end, said second swivel body having an end face on the first end thereof, and a passage extending through said second swivel body communicating the first and second ends, said passage including a cylindrical inner surface;

a third swivel body having a first end and having a passage extending therethrough communicating with the first end thereof, and a cylindrical outer surface, said third swivel body being disposed within the cylindrical inner surface of said second swivel body, said passage through said third swivel body including: a first cylindrical inner surface communicating with the first end of the third swivel body; a second inner surface having a diameter less than the diameter of the first cylindrical inner surface; and a shoulder extending between the first and second inner surfaces;

a sleeve having a first end and a second end and a passage extending therethrough communicating the first and second ends, said sleeve including: a first cylindrical outer surface communicating with the first end of said sleeve and received within the passage through said first swivel body; a second cylindrical outer surface communicating with the second end of said sleeve; a first end face formed on the first end of said sleeve; and a second end face formed on the second end of said sleeve with the second end of said sleeve extending into the first cylindrical inner surface of said third swivel body;

static annular seal means disposed intermediate the first end of said sleeve and the passage through said first swivel body for providing a fluid-tight seal between said sleeve and said first swivel body;

dynamic annular seal means disposed intermediate the second end face of said sleeve and the first cylindrical inner surface and the shoulder of the passage extending through said third swivel body for providing a sliding fluid-tight seal between said sleeve and said third swivel body;

rotary bearing means disposed intermediate the cylindrical outer surface of said third swivel body and the cylindrical inner surface of said second swivel body for journally supporting said third swivel body within said second swivel body for rotation about the axis of the cylindrical inner surface of said second swivel body; and

means for mutually securing said first swivel body, said second swivel body and said sleeve for preventing relative movement therebetween.

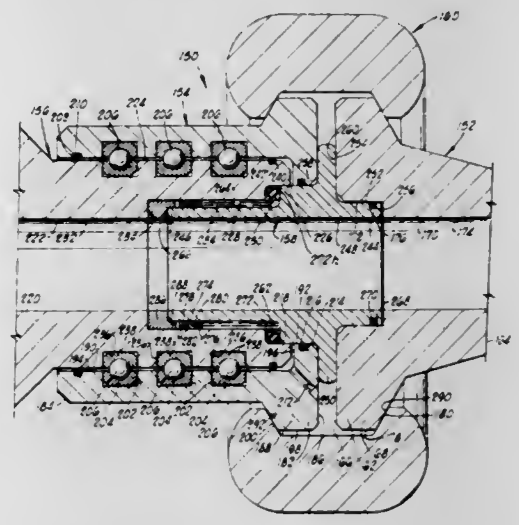
3,967,842
HIGH PRESSURE TUBULAR SWIVEL JOINT

William D. Kendrick, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sept. 22, 1975, Ser. No. 615,791

Int. Cl.^{2} F16L *27/00*

U.S. Cl. 285—276 **20 Claims**



1. A swivel joint comprising:

a first swivel body having a first end, said first swivel body having an end face on the first end thereof, and a passage extending through said first swivel body communicating with the first end thereof;

a second swivel body having a first end and a second end, said second swivel body having an end face on the first end thereof, and a passage extending through said second swivel body communicating the first and second ends, said passage including a cylindrical inner surface;

a third swivel body having a first end and having a passage extending therethrough communicating with the first end thereof, and a cylindrical outer surface, the cylindrical outer surface of said third swivel body being disposed within the cylindrical inner surface of said second swivel body, said passage through said third swivel body including a first cylindrical inner surface communicating with the first end of said third swivel body, a second cylindrical inner surface having a diameter less than the diameter of the first cylindrical inner surface, a first annular shoulder extending between the first and second cylindrical inner surfaces, a third inner surface having a diameter less than the diameter of the second cylindrical inner surface, and a second annular shoulder extending between the second cylindrical inner surface and the third inner surface;

a sleeve having a first end and a second end and a passage extending therethrough communicating the first and second ends, said sleeve including: a first cylindrical outer surface communicating with the first end of said sleeve and received within the passage through said first swivel body; a second cylindrical outer surface intermediate the first cylindrical outer surface and the second end of said sleeve; a radially inwardly extending annular shoulder communicating with the second cylindrical outer surface of said sleeve; a third cylindrical outer surface extending from the annular shoulder to the second end of said sleeve; a first end face on the first end of said sleeve; and a second end face on the second end of said sleeve; the second cylindrical outer surface of said sleeve extending within the first cylindrical inner surface of said third swivel body and the third cylindrical outer surface of said sleeve extending within the second cylindrical inner surface of said third swivel body;

static annular seal means disposed intermediate the first end of said sleeve and the passage through said first swivel body for providing a fluid-tight seal therebetween;

dynamic annular seal means disposed intermediate the annular shoulder of said sleeve and the first cylindrical inner surface and the first annular shoulder of said third swivel body for providing a sliding, fluid-tight seal between said sleeve and said third swivel body;

an annular piston positioned in mutual sliding sealing engagement between the second cylindrical inner surface of said third swivel body and the third cylindrical outer surface of said sleeve;

a quantity of fluid disposed in the annular space defined by the second cylindrical inner surface of said third swivel body, the third cylindrical outer surface and the annular shoulder of said sleeve, said dynamic annular seal means and said annular piston;

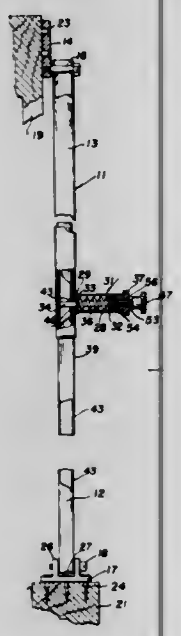
rotary bearing means disposed intermediate the cylindrical outer surface of said third swivel body and the cylindrical inner surface of said second swivel body for journally supporting said third swivel body within said second swivel body for rotation about the axis of the cylindrical inner surface of said second swivel body; and

means for mutually securing said first swivel body, said second swivel body and said sleeve for preventing relative movement therebetween.

3,967,843

WINDOW LOCK

Frank M. Hart, 740 Clayton St., Denver, Colo. 80206
Filed Nov. 22, 1974, Ser. No. 526,090
Int. Cl.² E05C *17/30*
U.S. Cl. 292—273 **1 Claim**

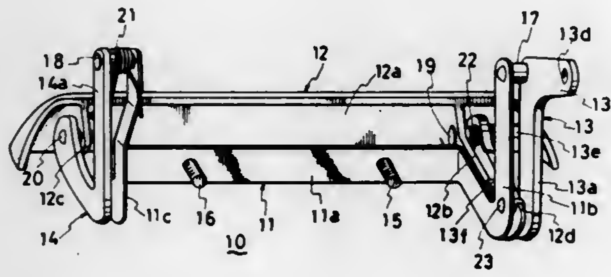


1. A window lock for frame-mounted double-hung windows to hold the lower and upper windows in closed and in adjusted open positions one with respect to the other comprising a first elongated element secured to the lower window, a second elongated element secured to the upper window, said first and second elements being cooperatively formed and arranged whereby one element is telescopically received in the other for conjoint movement to retracted and extended positions as the windows are moved to open and closed positions, respectively, a latch assembly for said window lock mounted on one of said telescoping elements, a latch plunger for said latch assembly, a resilient member engaging said plunger and biasing the latch plunger for movement toward the other of said telescoping elements, said other telescoping element providing a plurality of catches at longitudinally spaced positions therealong for the selective reception of said latch plunger whereby the windows are selectively held in desired relative positions one with respect to the other in the frame, an anchor plate secured to said upper window, a threaded screw for engagement with said anchor plate for selectively securing the second elongated element to the upper surface of the meeting rail for said bottom window, means interconnecting the first elongated element to said pivot plate, and a pivot bolt engaging said pivot plate and the first elongated element with the axis of said bolt arranged transversely with respect to said meeting rail whereby the telescoping first and second elements may be moved pivotally about said pivot bolt to a position disposed along the meeting rail for the bottom window when the threaded screw is removed from said anchor plate.

3,967,844

OUTSIDE DOOR HANDLE ASSEMBLY FOR VEHICLES

Nozomu Torii, Hekinan, and Yosikatsu Furuya, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Continuation of Ser. No. 296,970, Oct. 12, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,744
Claims priority, application Japan, Oct. 14, 1971, 46-81209
Int. Cl.² E05C *3/26*
U.S. Cl. 292—336.3 **6 Claims**



1. An outside door handle assembly for actuating a door latch mechanism of vehicle doors, comprising:

a base member having a pair of arms being secured to the vehicle door;

a pair of levers respectively being pivotally mounted upon said pair of arms, one of said levers being operably connected to said door latch mechanism;

a manually operable main door handle pivotally mounted upon said pair of levers;

biasing means constantly biasing said main door handle so as to maintain said main door handle in a normal non-operative position;

locking means normally locking the pivotal movement of said levers and said latch mechanism, said locking means releasing said levers and said latch mechanism only when said main door handle is initially rotated from said normal non-operative position in a door opening direction; and

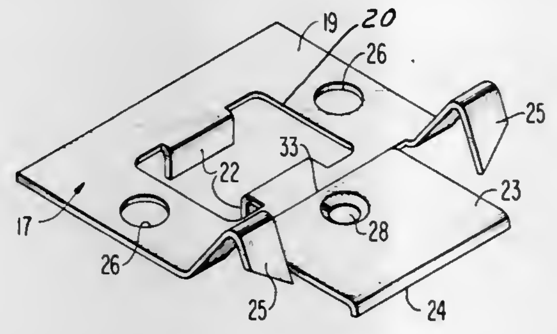
means for relatively non-pivotally engaging said main door handle with said one of said pair of levers upon a further door opening rotation of said main door handle, whereby said main door handle and said pair of levers are rotatable as a unit about the pivotal mounting point of said levers on said pair of arms for unlatching the door latch mechanism.

3,967,845

REINFORCED STRIKER ASSEMBLY FOR DOOR LOCKS

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.
Filed Oct. 21, 1974, Ser. No. 516,485
Int. Cl.² E05C *1/00*
U.S. Cl. 292—340 **8 Claims**

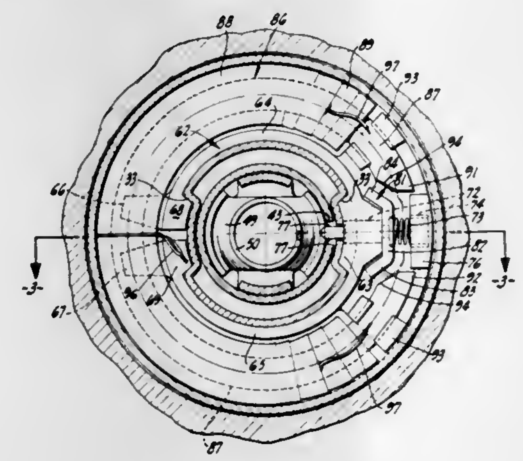
1. Means to resist forceable entry through a bolted door which is swingable with relation to a fixed surrounding door frame having a bolt receiving socket and an adjacent striker plate recess, said means comprising a reinforcement plate disposed in the bottom of said recess and having a pair of opposed anchor tabs projecting into said socket and engaging the forward and rear walls thereof, prongs on said reinforcement plate rearward of said tabs and being driven into a door jamb rearward of said socket to further anchor the reinforcement plate, and a conventional striker plate mounted on the outer face of said reinforcement plate and each having a bolt receiving opening in registry with the bolt socket, the conventional striker plate covering and substantially concealing the reinforcement plate from view, and anchor screw means common to the reinforcement plate and said conventional striker plate penetrating into an adjacent door jamb portion, and further penetrating the adjacent wall stud.



3,967,846

LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.
Filed Apr. 8, 1974, Ser. No. 458,532
Int. Cl.² E05B *13/00, 13/10, 47/04*
U.S. Cl. 292—359 **6 Claims**



1. A lock having a frame, a knob spindle mounted on said frame for rotation about an axis, means for preventing said rotation of said spindle including a pin movable on said frame in a direction radial to said axis between a first position holding said spindle against rotation relative to said frame and a second position freeing said spindle from said frame, a spring urging said pin toward one of said positions, an electromagnet substantially arcuate in shape and having a pole positioned to urge said pin against said spring and for urging said pin toward the other of said positions, and means mounting said electromagnet on said frame coaxially around said spindle.

3,967,847

CHUCK APPARATUS FOR GLASS CONTAINER COATING LINE

Warren L. Ellis, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sept. 15, 1975, Ser. No. 613,617
Int. Cl.² B66C *1/42*
U.S. Cl. 294—116 **8 Claims**

1. An apparatus for suspending a container by a finish portion thereof, wherein the finish portion is gripped by a chuck having jaws mounted to a chuck body and engageable under a rib on said finish portion, said body is carried on a spindle, and wherein said chuck includes a sleeve slidable axially along said spindle to engage the jaws and secure them in radially gripping engagement with said finish portion,

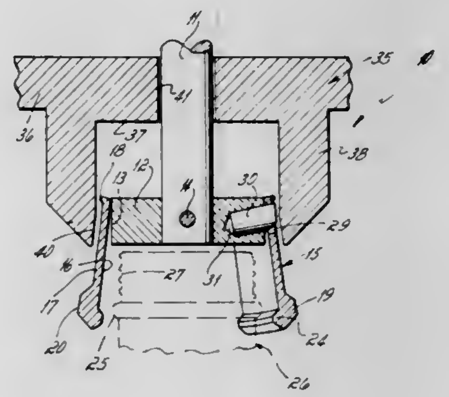
the improvement wherein,

the chuck body is in the form of a disk having a sidewall,

the jaws are substantially arcuate segments each having an inwardly facing surface whose configuration approximates that of said sidewall,

each said jaw being carried on a pin projecting radially outwardly from the sidewall of said body, the pin passing through an oversize radial hole in the respective jaw and terminating centrally of the sleeve,

each said jaw having an inwardly facing lip for supporting said container by engagement under said rib thereon, each said jaw also having an outwardly facing cam surface



which lies substantially diametrically outwardly of said lip,

a cam on said sleeve engageable with the cam surfaces of said jaws to cam the jaws inwardly,

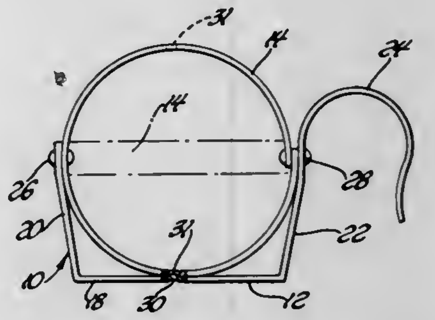
clearance in the direction parallel to said spindle being provided between said sleeve and body such that in use said sleeve can engage the jaws only and not the body, the entire weight of said sleeve thereby being applied to said jaws through the said cam surfaces thereof,

the dimension of said clearance being sufficient that, when wear of said jaws occurs in use, the wear is accommodated without loss of grip by greater axial movement of the sleeve relative to the jaws.

3,967,848

FOLDING HANDLE FOR CUPS, CANS AND OTHER USES

Niles M. Sowle, 1156 Herbert J, Jackson, Mich. 49202
Filed June 7, 1973, Ser. No. 367,964
Int. Cl.² A47J *45/06;* **B65D** *25/28*
U.S. Cl. 294—31.2 **4 Claims**



1. A folding handle for hand held beverage cups, containers and the like, and comprising; a frame member including a U-shaped strap having a bottom portion and relatively spaced upturned ends, a finger receptive handle loop provided on one of said upturned ends, and an annular ring pivotally engaged at diametrically opposite sides to said upturned ends for being disposed transversely of said frame member for use in receiving a beverage container therewithin and supported on said bottom frame portion and for being disposed in relative alignment with said frame member and in combination therewith being sized for compact storage and ready accessibility within a shirt pocket or the like, said annular ring including semi-

annular halves pivotally engaged together and to said upturned frame ends for being relatively brought together and folded one within the other, and said handle loop being pivotally engaged to said one upturned frame end for being relatively turned from an outwardly disposed position to an inwardly disposed position relatively over said semi-annular ring halves as folded together.

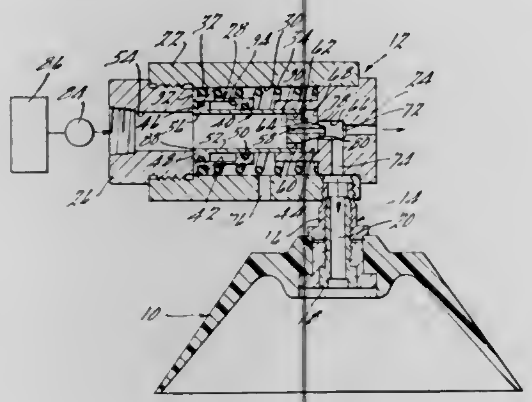
3,967,849
VACUUM CONTROL SYSTEM

Harlan R. Cagle, Clarkston, Mich., assignor to Sahlin International, Inc., Birmingham, Mich.

Continuation of Ser. No. 369,861, June 14, 1973, abandoned, which is a continuation of Ser. No. 147,322, May 27, 1971, abandoned. This application May 14, 1975, Ser. No. 577,407

Int. Cl.^{2} B66C *1/02*

U.S. Cl. 294—64 A **7 Claims**



1. A vacuum control unit comprising a housing having an air inlet passage at one end and an air outlet passage at the other end, a first sleeve slidably supported in said housing for movement relative to said outlet passage and having an open end communicating with said inlet passage so that incoming air is received within the sleeve, said sleeve having adjacent transverse wall means in the outlet end of the housing, said wall means including aperture means for the passage of air into the outlet passage, means providing a fixed seat for the sleeve around the opening into the outlet passage, said aperture means and said outlet passage being shaped and disposed so that the passage of air under pressure from said air inlet passage through said sleeve and aperture means to said outlet passage holds the sleeve on said seat and during seating creates a vacuum at an inner portion of said outlet passage, a passage in said housing opening at one end into said inner portion of said outlet passage and adapted at the other end for connection to a vacuum operated device, and spring means acting in opposition to inlet air pressure for unseating the sleeve from said seat when the pressure of air on the sleeve drops below a predetermined level, said spring means including a second sleeve slidable on the first and a spring urging the second sleeve toward the inlet end of the housing.

3,967,850
GRAB HANDLE AND DOOR STOP ASSEMBLY

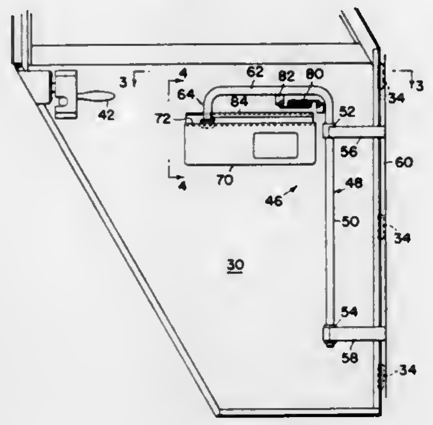
Edwin Lee Whisler, Peosta, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 20, 1974, Ser. No. 534,734

Int. Cl.^{2} B60J *5/04*

U.S. Cl. 296—146 **1 Claim**

1. In combination with a vehicle cab including a framework defining a door opening and a door hingedly secured to the framework for swinging movement about a first upright axis between a closed position and an open position relative to said opening, a combined door stop and handle means, comprising: a bracket secured to an inside wall of said door and defining track means extending widthwise of said door; a grab handle pivotally mounted on said framework for movement about a second upright axis; said grab handle including a hand grippable portion traversing said first upright axis and located further away from the inside wall of said door than the bracket and extending in general parallelism to the guide track means and elevated above the bracket a distance sufficient to permit easy insertion of an operator's hand between the hand grippable portion and the bracket; an end portion depending from the hand grippable portion and including a horizontal portion extending toward the inside wall and including a roller means received in said guide track means; said guide track means and grab handle being so disposed relative to each other that said roller means travels between first and second locations in said guide track means when said door is moved from its closed to its open position, detent means located at said second location in said guide track means for frictionally resisting initial movement of said door from its open to its closed position and a protective shield extending, from a location on the bracket between the guide track means and the inside wall of the door over the guide track means at a level above said horizontal portion of the grab handle for preventing the operator's hand from accidentally entering the guide track means where it is vulnerable to being pinched.



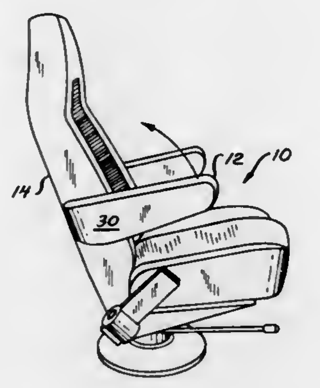
3,967,851
PUSH-ON PIVOTED SIDE ARM FOR VEHICLE SEAT

Paul G. Stier, Muskego, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 27, 1975, Ser. No. 583,090

Int. Cl.^{2} A47C *7/54*

U.S. Cl. 297—416 **8 Claims**



1. In combination, a seat frame member including at least one apertured side arm member mounting bracket; at least one side arm member including pin mounting means supporting a plurality of transversely spaced mounting pins positioned in corresponding transversely spaced parallel apertures in the mounting bracket; a first mounting pin being attached to a rigid portion of said pin mounting means; a second mounting pin having a base end carried by a resilient portion of the pin mounting means, the axis of said second mounting pin being normally skewed relative to the axis of said first mounting pin; and a third mounting pin whose axis is parallel to the axis of the first pin, said third pin having a tapered lead end which is sufficiently tapered that it can engage a side edge of a complementary aperture in the mounting bracket on the seat frame whereby application of axial force to said pins during assembly will initially cause said second mounting pin to become parallel to said first and third pins as a leading untapered portion of the third pin passes through said mounting bracket, the force of said resilient portion causing the second pin to reassume its skewed position as the pins are moved sufficiently far into their complementary apertures to cause the base end of the second pin to approach the bracket member.

3,967,852
UPHOLSTERING BODY HAVING A SUPPORTED CORE IN THE FORM OF A YIELDABLE PLATE OF SYNTHETIC MATERIAL AND A RESILIENT LAYER ON THE CORE

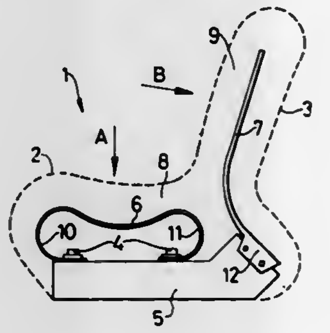
Günter Eiselt, and Rudolf Hossbach, both of Unkel, Germany, assignors to Günter Eiselt, Unkel, Germany

Division of Ser. No. 377,735, July 9, 1973, abandoned. This application Feb. 26, 1975, Ser. No. 553,258

Claims priority, application Germany, July 7, 1972, 2233389; Oct. 13, 1972, 2250249

Int. Cl.^{2} A47C *7/02*

U.S. Cl. 297—452 **19 Claims**



1. A body for use in upholstering and comprising in combination: a layer of resilient material forming the outer part of the body, and core means supportingly engaging the inner side of said layer, said core means comprising at least one sheet exclusively of continuous synthetic material, said sheet including means for anchoring the sheet to the frame of an article of furniture, said sheet being resiliently yieldable in the direction in which a load is normally imposed thereon and being resistant to yielding also in other directions.

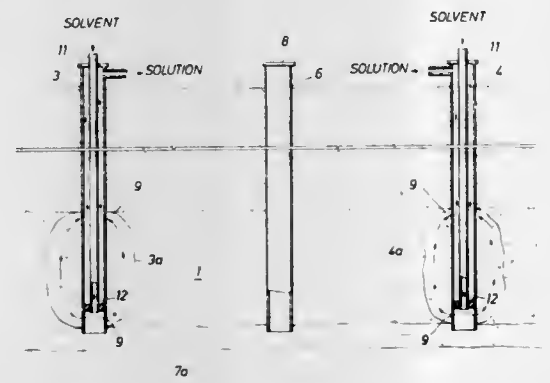
3,967,853
PRODUCING SHALE OIL FROM A CAVITY-SURROUNDED CENTRAL WELL

Philip J. Closmann, and Min Jack Tham, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed June 5, 1975, Ser. No. 584,100

Int. Cl.^{2} E21B *43/24, 43/28*

U.S. Cl. 299—4 **4 Claims**



1. A process for producing shale oil from a subterranean oil shale which contains or is contiguous with an areally extensive layer of water-soluble mineral, which process comprises:

- forming a plurality of cavities in horizontally-spaced locations surrounding a central well;
- casing or lining the borehole of the central well in a manner that restricts the rubbling or disaggregating of earth formations that form the wall of the borehole;
- solution-mining portions of the areally extensive layer of water-soluble mineral to form a generally horizontal, substantially solids-free passageway that interconnects the cavities and the central well; and
- circulating hot fluid into the cavities, through the passageway interconnecting the cavities with the central well, and out through the central well to recover shale oil.

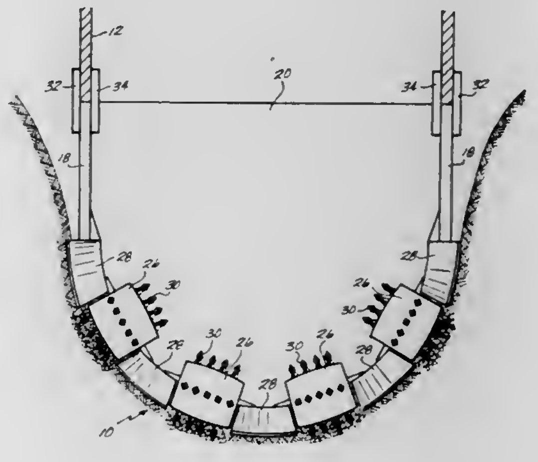
3,967,854
ENDLESS BUCKET TYPE EXCAVATOR

Charles L. Posciri, S.R. Box L1620 Clark R., Palmer, Alaska 99645

Filed Nov. 7, 1974, Ser. No. 521,583

Int. Cl.^{2} E21C *25/10, 27/30*

U.S. Cl. 299—40 **8 Claims**



1. An endless bucket type excavator comprising:

- an endless chain of buckets supported for tangential entry into ground to be excavated, each said bucket having a transverse leading portion characterized by roller cutter means alternating with scoop teeth, with scoop teeth on alternate buckets following the path of roller cutter means on intermediate buckets, and with scoop teeth on intermediate buckets following the path of roller cutter means on alternate buckets, said roller cutter means comprising a plurality of radially extending teeth which penetrate into and fracture the ground material.

3,967,855
AUTOMOBILE WHEEL COVER

Odean J. Johnson, 1200 S. Cester, Park Ridge, Ill. 60068

Filed July 28, 1975, Ser. No. 599,528

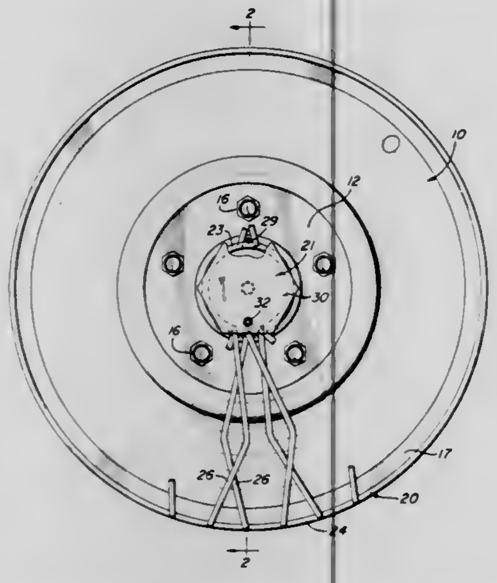
Int. Cl.^{2} B60B *7/00*

U.S. Cl. 301—37 R **8 Claims**

1. An ornamental cover for a wheel of an automotive vehicle, comprising

- a circular member having a cup-shaped central portion and a planar annular peripheral portion,
- said member having an intermediate annular planar portion provided with a plurality of spaced holes for receiving the bolts on which said wheel is mounted,
- said planar portion being deformed inwardly around each of said holes,
- said member being provided with an internally threaded axial hole, and

a screw member threaded into said axial hole,
said screw member having a head having a minimum cross-



wise dimension not substantially less than the external diameter of said cup-shaped central portion.

3,967,856
FIXED-ADJUSTMENT HUB FOR SPOKED BICYCLE WHEELS

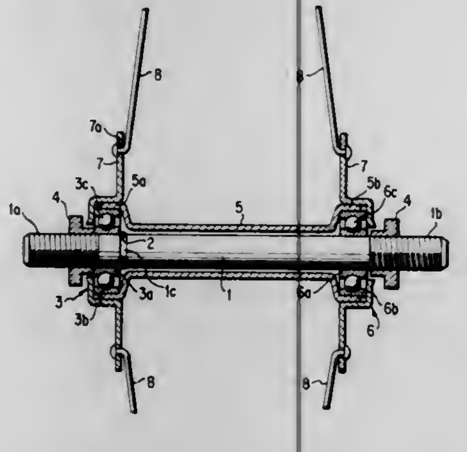
Jean Beauchet, Veyrier-du-Lac, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed July 16, 1974, Ser. No. 488,982

Claims priority, application France, Oct. 10, 1973, 73.36255

Int. Cl.² B60B *27/00*

U.S. Cl. 301—105 B **5 Claims**



1. A fixed-adjustment hub for spoked bicycle wheels comprising:
- two outer flanges on which the spokes are hooked;
- an axle threaded at the two ends thereof;
- two bearings disposed about said axle near said two threaded ends thereof for mounting the wheel on a bicycle;
- a cylindrical crosspiece containing said threaded axle and said two bearings, the latter of which are disposed within diametrically expanded portions of the two ends of said cylindrical crosspiece;
- the assembly formed by said crosspiece and said two bearings being held between said two flanges by the tension of the spokes;
- at least one of the inner races of said bearings being held, so as not to slide on said threaded axle, between a retaining ring and a first nut for mounting said wheel upon said bicycle, while the second one of said bearings can slide upon a smooth part of said axle;
- a second nut, for also mounting said wheel upon said bicycle, being screwed to the base of the threads of said axle to within a certain distance from the inner race of said second bearing; and

said outer bearing races being interposed between said flanges and said diametrically expanded portions of said crosspiece.

3,967,857
SPINDLE FOR A VEHICLE WHEEL, PROVIDED WITH AT LEAST ONE BALL JOINT

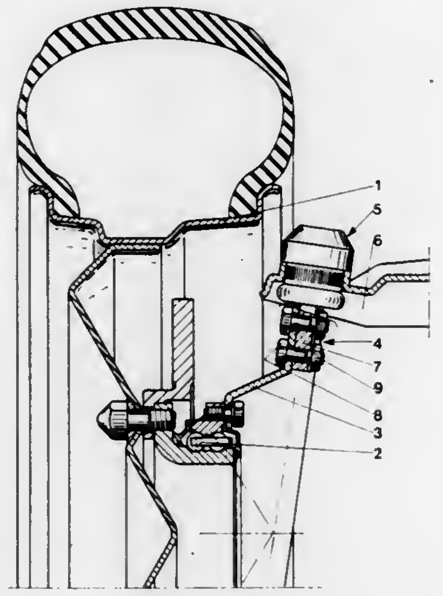
Sture L. Asberg, Partille, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Oct. 7, 1974, Ser. No. 512,513

Claims priority, application Sweden, Oct. 18, 1973, 7314189

Int. Cl.² B60B *35/00*

U.S. Cl. 301—125 **12 Claims**



1. In a suspension system for the wheel of a vehicle of the type having a steering spindle articulated at a joint with a further member; the improvement wherein said spindle comprises a pressed sheet metal member, one of said spindle and further member having a substantially flat portion, a ball joint member having a ball and a plate-shaped means depending therefrom, means for affixing said plate-shaped means to said substantially flat portion, and means for connecting said ball to the other of said sheet metal member and further member to form an articulated joint.

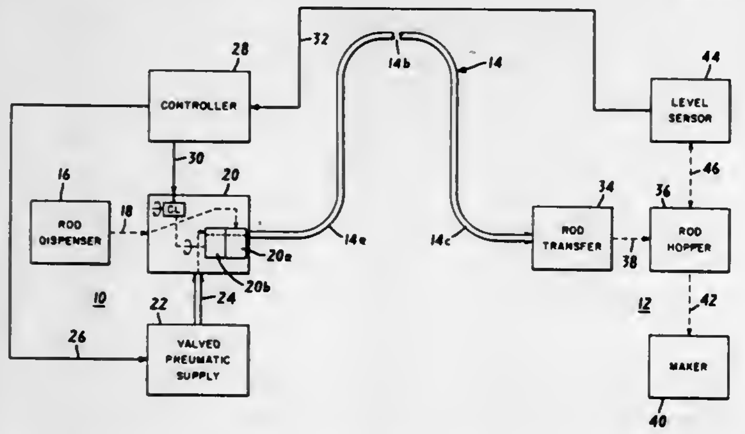
3,967,858
CIGARETTE FILTER ROD TRANSFER APPARATUS

Charles Gary Atwell, Mechanicsville; Gilbert W. Tew, Richmond; Gerald A. Kraft, Richmond, and Joseph A. Faries, Jr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,907

Int. Cl.² B65G *51/02*

U.S. Cl. 302—2 R **18 Claims**



13. A system for transporting cigarette rods from a first rod supply location to a second cigarette maker location, comprising:

- a. conduit means extending from said first location to said second location;
- b. pneumatic source means having an outlet and energizable to supply pressurized air to said outlet;
- c. rod supply means at said first location defining a passage between said pneumatic source means outlet and said conduit means and energizable to supply individual rods to said passage;
- d. rod receiver means at said second location for receiving rods conveyed through said conduit and having an outlet, said rod receiver means including first conveyor means issuing rods sequentially therefrom at said outlet;
- e. rod hopper means at said second location comprising first and second separable vertically-stacked hoppers, said first hopper having a sideward inlet for receiving rods issuing sequentially from said rod receiver means outlet, second conveyor means for conveying rods from said sideward inlet to the interior of said first hopper and a downward outlet for transferring said rods to cigarette making machinery, said rod hopper means generating a first output signal upon containment of rods in said first and second hoppers in quantity less than a preselected rod quantity and generating a second output signal upon containment of rods in said first and second hoppers in quantity equal to said preselected rod quantity;
- f. control means responsive to said rod hopper means first output signal to energize said pneumatic source means and to energize said rod supply means upon expiration of a first predetermined time period after such energization of said pneumatic source means and responsive to said second output signal to deenergize said rod supply means and to deenergize said pneumatic source means upon expiration of a second predetermined time period after such deenergization of said rod supply means.

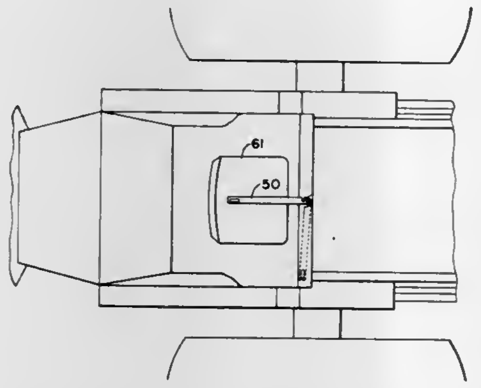
3,967,859
VANDAL LATCH FOR PREVENTING REMOVAL OF A POP-OUT TYPE VEHICLE WINDOW

Edwin Lee Whisler, Peosta, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 5, 1975, Ser. No. 574,582

Int. Cl.² B62D *25/00*

U.S. Cl. 296—28 C **4 Claims**



1. In a combination with a completely enclosed vehicle cab including a framework defining a window opening, a window disposed in a normal position closing said opening and held in said normal position by fastening means connected to the framework and capable of being forcibly distorted by a person located exteriorly of the cab for permitting movement of the window to an open position, and a seat mounted in the cab adjacent the window and having a seating surface for supporting an operator, a window latch comprising: a first locking part means movably mounted on one of said framework and window for movement between latched and stored positions, a second locking part means mounted on a different one of said framework and window than said first locking part is mounted, said first and second locking part means respectively including first and second cooperating means for establishing a connection between the framework and window when the first part means is in its latched position for preventing movement of the window to its open position, and for becoming disconnected for permitting opening of the window when the first part means is moved from its latched to its stored position; and said first part means including a portion so located relative to the seat that it prevents an operator from sitting on the seating surface only when the first part means is in said latched position.

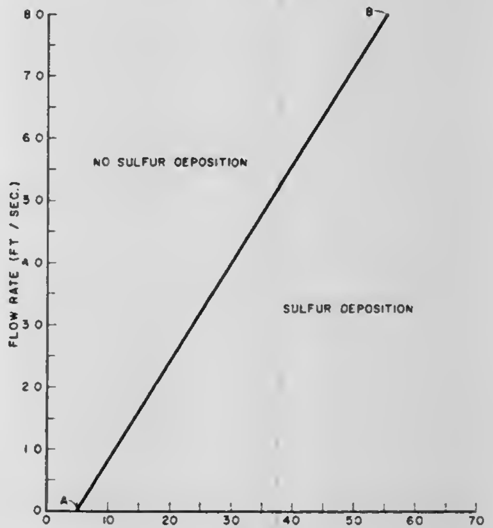
3,967,860
METHOD OF TRANSPORTING A SULFUR-HYDROCARBON SLURRY IN A PIPELINE

Anthony G. Fonseca, and Richard L. Every, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 2, 1972, Ser. No. 303,300

Int. Cl.² B65G *53/30*

U.S. Cl. 302—66 **8 Claims**



1. In a method for transporting sulfur in a pipeline by forming a pumpable slurry of said sulfur and a carrier fluid, pumping said slurry through said pipeline, in order to inhibit the plating on the walls of said pipeline of nascent sulfur from said slurry while in transit due to the solubility differences caused by the temperature differential (ΔT) between said slurry and said pipeline, the improvement comprises maintaining the flow rate of said slurry to at least about the value given by the equation:

$$\text{flow rate (ft/sec)} = 0.16\,[\Delta T(^{\circ}F) - 5]$$

when the flow rate is below 8.0 feet per second.

4. In a method for transporting sulfur in a pipeline by forming a pumpable slurry of said sulfur and a carrier fluid, pumping said slurry through said pipeline, in order to inhibit the plating on the walls of said pipeline of nascent sulfur from said slurry while in transit, the improvement comprises maintaining said pipeline at a temperature of no more than 5°F below the temperature of said slurry.

3,967,861
FLUID PRESSURE REGULATING VALVE FOR VEHICLE BRAKING SYSTEMS

Hiroaki Nagara, Kobe, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 5, 1975, Ser. No. 574,267

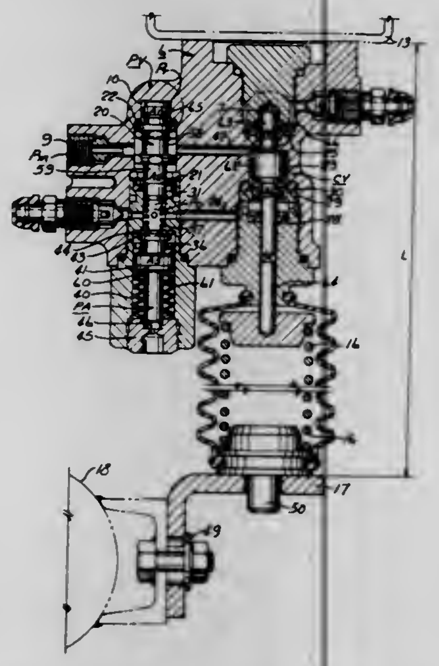
Claims priority, application Japan, May 10, 1974, 49-52732; Nov. 8, 1974, 49-129277; Nov. 8, 1974, 49-135859[U]

Int. Cl.² B60T *8/18, 8/26*

U.S. Cl. 303—6 C **5 Claims**

1. A load-responsive reducing valve for the rear wheel brake system of a vehicle comprising a reducing valve having a valve plunger therein operated in cooperation with a valve

seat by the difference in area between the plunger surfaces receiving hydraulic pressure from a hydraulic pressure source and from a rear wheel brake respectively to open and close the passage of braking fluid from the hydraulic pressure source to the rear wheel and a control chamber operable to store a controlling pressure for pressing said plunger in the direction to open said plunger from said valve seat and to control the starting pressure of the reducing operation of said reducing valve in response to the load on the vehicle, characterized by



a control valve including a valve spindle which opens and closes the passage of fluid from the hydraulic pressure source to said control chamber, bias means urging said control valve to remain open in proportion to the load on the vehicle and thereby correspondingly raise the reduction starting pressure of said reducing valve, said bias means including a spring urged in response to the load on the vehicle and in turn urging said spindle in the direction required to open said control valve in response to the load on the vehicle.

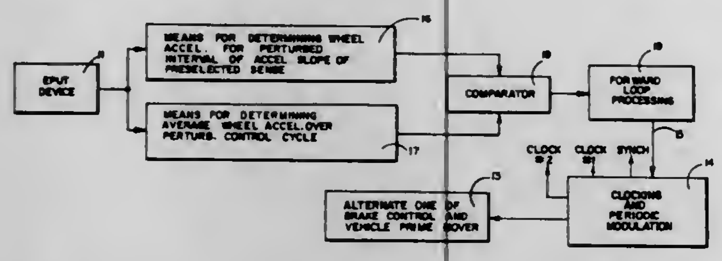
3,967,862
ANTI-SKID CONTROL SYSTEM EMPLOYING INTEGRAL-PLUS-PROPORTIONAL CONTROL OF PULSED MODULATION

Gordon E. Hunter; James E. Rau, both of Anaheim, and Rogell Van Wyk, Brea, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 17, 1975, Ser. No. 559,100

Int. Cl.^{2} B60T ***8/02***

U.S. Cl. 303—21 P **14 Claims**


INPUT DEVICE
MEANS FOR DETERMINING WHEEL ACCEL. FOR PERTURBED INTERVAL OF ACCEL SLOPE OF PRESELECTED SENSE
16
MEANS FOR DETERMINING AVERAGE WHEEL ACCEL. OVER PERTURB. CONTROL CYCLE
17
COMPARATOR
FORWARD LOOP PROCESSING
CLOCK #2
CLOCK #1
SYNCH
CLOCKING AND PERIODIC MODULATION
14
ALTERNATE ONE OF BRAKE CONTROL AND VEHICLE PRIME MOVER
13

1. In an anti-skid type control system for wheeled vehicles having both braked wheels and a prime mover for applying an accelerating torque to said wheels, apparatus for maintaining wheel slip (s) in a region of values associated with a maximum coefficient of road friction μ, comprising
  first means for determining the variation of the coefficient of friction from a maximum value and including pulse modulation means for periodically increasing and decreasing alternately an alternative one of a braking action and accelerating torque; and
  second means responsive to said first means for changing said alternative one of an applied braking action and an applied accelerating torque in such sense as to increase said coefficient of friction and including integral-plus-proportional control means for both applying the pulse modulation of said pulse modulation means and biasing the average system acceleration condition about which such modulation is applied, said modulation being varied in a sense to maximize said coefficient of friction.

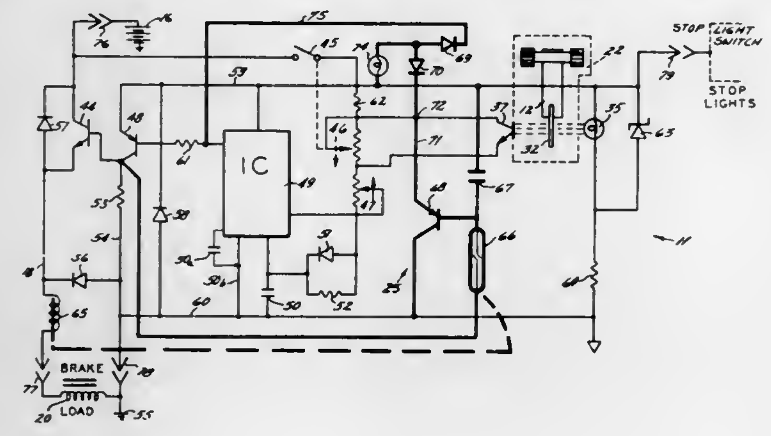
3,967,863
BRAKE CONTROLLER AND SHORT CIRCUIT PROBE DISCONNECT

Jerry J. Tomecek, Milford, and Philip J. Hagerty, Marshall, both of Mich., assignors to Tekonsha Engineering Company, Tekonsha, Mich.

Filed Dec. 9, 1974, Ser. No. 531,171

Int. Cl.^{2} B60T ***8/16***

U.S. Cl. 303—24 C **3 Claims**



1. A brake control system for brakes in towed vehicles and connected to a source of electrical energy comprising:
- a light sensitive monitor;
- inertially operated and adjustably positioned dampened cantilever beam attenuating light to said monitor;
- a pulsed power circuit controlled by said monitor, said circuit transmitting upon actuation a constant width pulse at a frequency proportional to the amount of attenuation of the sensed light as determined by said inertially operated beam; and
- brakes in a towed vehicle operably connected to said pulsed power circuit.

3,967,864
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

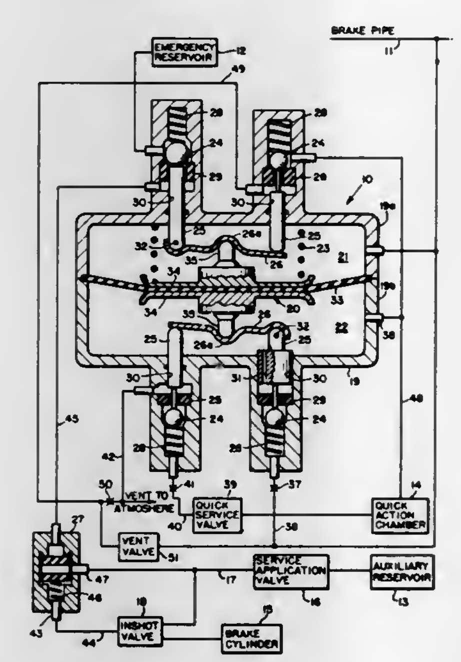
Filed Aug. 20, 1975, Ser. No. 606,139

Int. Cl.^{2} B60T ***15/44***

U.S. Cl. 303—81 **7 Claims**

1. A fluid brake control system for a vehicle having a brake control pipe, emergency and auxiliary fluid reservoirs, a first quick action chamber, a brake cylinder, and service and emergency control valves wherein an improved emergency application and stability control device is provided comprising;
  a. a housing containing a differential abutment subject to actuation axially by differences in fluid pressures in brake pipe pressure and quick action control pressure chambers on opposite sides of the abutment,
  b. at least one poppet type valve means disposed in the housing on each of said opposite sides of the abutment and located partly in each of said brake pipe pressure chamber and said quick action control pressure chamber spring biased toward a closed position and having an operating push rod longitudinally disposed between the associated valve means and the abutment,
  c. the poppet valve means on one side of the abutment being opened by movement of the abutment in one direction and having means for permitting application of fluid from the emergency reservoir to the brake cylinder when this valve is opened,

  d. the poppet valve means on the other side of the abutment being opened by movement of the abutment in the opposite direction and having means to permit charging of the first quick action chamber at a controlled rate from the brake pipe when this valve is opened, and



  e. a stabilizing spring in the brake pipe pressure chamber biasing the abutment in a direction to normally open the poppet valve means on the other side of the abutment.

3,967,865
BALL BOX

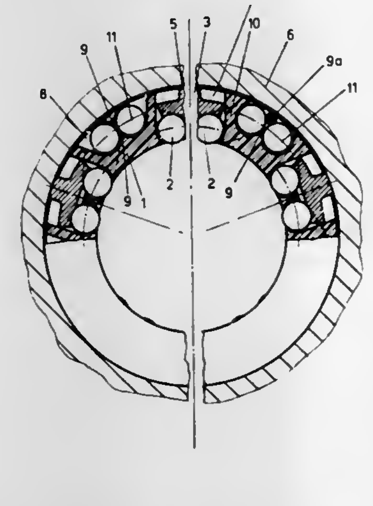
Lothar Walter, Schweinfurt; Erich Burkl, Stammheim; Rainer Schürger, Schwanfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Oct. 30, 1974, Ser. No. 519,336

Claims priority, application Germany, Dec. 21, 1973, 7345379[U]

Int. Cl.^{2} F16C ***29/06***

U.S. Cl. 308—6 C **4 Claims**



1. A ball box adapted to be mounted in a housing and having a load zone and a load-free zone for the recirculation of balls, comprising a plurality of continuous ball races formed by a cage, said ball races having a plurality of adjacent, axially directed return channels provided pairwise in said load-free zone, and the balls in said ball races, said return channels being separated from each other in said pairs by axially directed cross-pieces, the width of each said cross-piece, measured in the circumferential direction, being zero at the level of the ball pitch circle, said cross-pieces being positioned to inhibit contact of balls in adjacent return channels, thereby providing a minimum separation of the return channels while preventing contact of the balls of adjacent ball races.

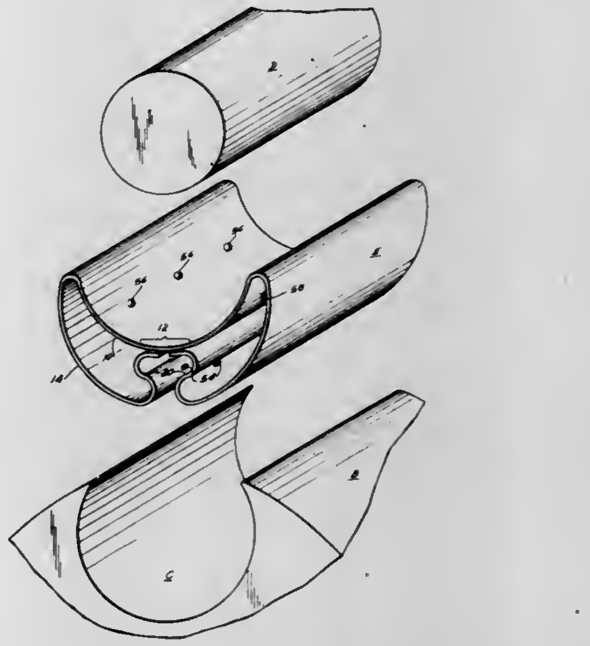
3,967,866
ANTI-FRICTION PRESSURE SEAL

William A. Cohen, Brooklyn, N.Y., assignor to Sphero International Company, West Long Branch, N.J.

Filed June 9, 1975, Ser. No. 584,770

Int. Cl.^{2} F16C ***19/04, 33/64***

U.S. Cl. 308—187.1 **16 Claims**



1. In combination, for use with an element having a cavity therein, a roller bearing at least partially received within said cavity and a spring deformable to be inserted within said cavity between said roller bearing and the walls of said cavity, said spring comprising a first part surrounding at least substantially half of the circumference of said roller bearing, said first part, when said spring is inserted into said cavity, contacting said roller bearing, substantially at only a single location between but not including said end sections thereof, substantially all other portions of said first part between but not including the end sections thereof being spaced from said roller bearing, a second part spaced from said first part and adjacent the wall of said cavity when said spring is inserted in the said cavity, and resilient means extending between said first and said second parts in the vicinity of said location in order to maintain the spacing between said parts.

3,967,867
ROLLER BEARINGS

John K. Richardson, Hedon, England, assignor to Priestman Brothers Limited, Hull, England

Filed Jan. 7, 1975, Ser. No. 539,140

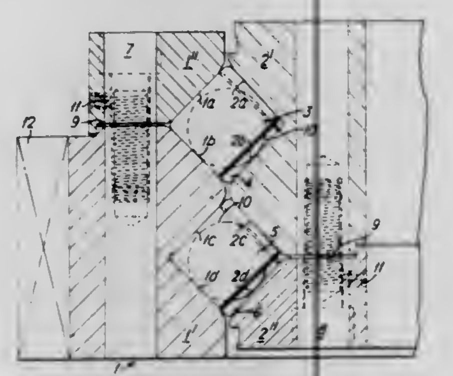
Claims priority, application United Kingdom, Feb. 4, 1974, 5049/74

Int. Cl.^{2} F16C ***27/04***

U.S. Cl. 308—207 R **6 Claims**

1. A bearing assembly comprising: inner and outer bearing rings defining two axially spaced, coaxial, annular, quadrangular-sectioned passages between them, and a plurality of rollers retained in said annular passages, some of said rollers having axes which are inclined at a first angle to the axis of said bearing assembly and others of said rollers having axes which are inclined at substantially said first angle to said axis, but in an opposite sense, said inner bearing ring comprising a first part forming two sides of a first of said passages and one side of the second of said passages, and a second part forming one

side of said second passageway, and said outer bearing ring comprising a first part forming two sides of said second passage and one side of said first passage, and a second part forming one side of said first passage.



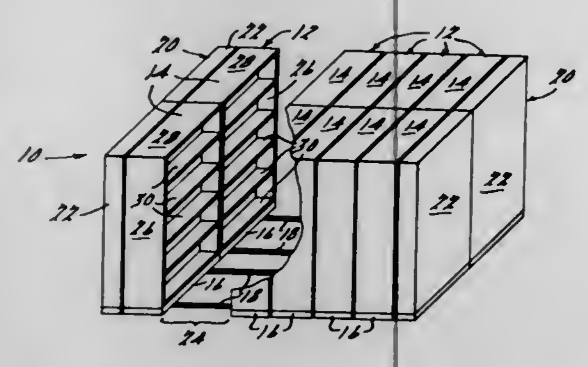
3,967,868
STORAGE SYSTEM

Edward A. Baker, Jr., Birmingham, Mich., assignor to E. Baker and Associates, Inc., Franklin, Mich.

Filed Feb. 14, 1975, Ser. No. 550,129

Int. Cl.² A47B *53/00*

U.S. Cl. 312—201 **22 Claims**



1. A storage system including at least one storage unit, means supporting said unit for movement between spaced apart locations and including:

a base structure having first and second pairs of rollers,

a pair of relatively flexible track members matingly associated with said storage unit and adapted to have said rollers of the base structure supported upon and guided thereby,

said track members being operatively mounted directly upon and being compliant with and conformable to a relatively irregular surface.

3,967,869
FISHING TACKLE CASE

Elmo Jackson, P.O. Box 138, Orange Grove, Tex. 78372

Filed Nov. 29, 1974, Ser. No. 528,283

Int. Cl.² A47B *51/00*

U.S. Cl. 312—270 **7 Claims**

1. A tackle case comprising:

a. a base section having walls defining an open top receptacle;

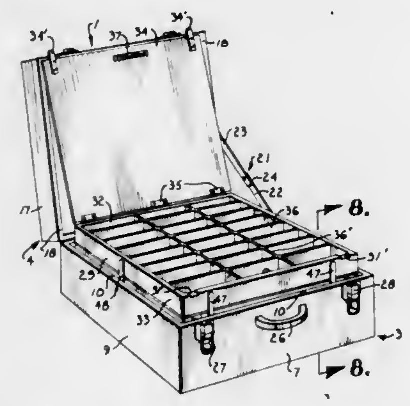
b. a cover section hingedly mounted on said base section and movable between an open position and a closed position, said cover section having walls defining a receptacle;

c. a first container selectively removably received in one of said base section and said cover section, said container having walls defining a receptacle and a cover hingedly mounted thereon and movable between an open position and a closed position;

d. a second container receivable in said base section in underlying relation to said first container when said first container and second container are positioned in said base section;

e. first and second retaining means mounted on said walls of said base section and on said walls of said cover section respectively and extending inwardly therefrom and each operative to frictionally engage said containers in the respective said base section and said cover section, said second retaining means being adapted to frictionally retain said first container in said cover section when said cover section is in the open position;

f. said second container is frictionally engageable with said first retaining means on said walls of said base section, said second container having walls defining a receptacle and a cover hingedly mounted thereon and movable between an open position and a closed position while said second container is in said base section;



g. a plurality of flat guide means on walls of said second container positioned to be in engagement with the exterior of corresponding walls of said first container when the cover of said second container is in closed position to effect alignment of said first container and said second container and retain said second container connected to the first container when said first container and second container are positioned in said cover section with said cover section in the open position for access to the interior of said base section; and

h. a keeper member extending between said base section and said cover section to retain said cover section in the open position, said keeper member being adapted to limit movement of said cover section through an angle greater than ninety degrees and less than one hundred twenty degrees whereby the tackle case is stable even when said first and said second containers are received in said cover section while in the open position.

3,967,870
MOLDED PLASTIC DRAWER

Thomas S. Noneman; Thomas R. Smith, and John B. Stokes, all of Bryan, Ohio, assignors to Tomco Plastics, Inc., Byron, Ohio

Continuation-in-part of Ser. No. 393,944, Sept. 4, 1973, Pat. No. 3,890,024. This application Mar. 12, 1975, Ser. No. 557,527

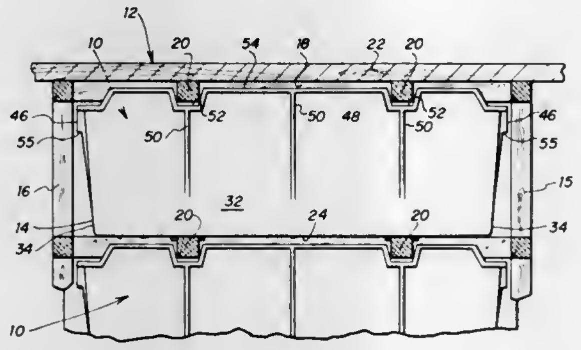
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.² A47B *88/04*

U.S. Cl. 312—330 SM **10 Claims**

1. A molded plastic drawer for a cabinet having spaced, parallel upper and lower guide rails which comprises a normally horizontal bottom wall including front, side and back edges; guide members formed integrally with and disposed on the underside of the bottom wall, said guide members being positioned adjacent to the back edge and extending forwardly therefrom and being spaced apart to receive the lower guide rails of the cabinet; back and side walls formed integrally with and rising upwardly and slightly outwardly from the back and side edges of the bottom wall; a front wall integrally formed with and rising upwardly from the front edge of the bottom

wall; an outwardly extending lip on the back and side walls and formed integrally therewith, the lip of the back wall being positioned above the lips of the side walls to provide an elongate shoulder for restraining the drawer in the opened condition and including grooves for receiving the upper guide rails of the cabinet.



3,967,871
PROCESS FOR MANUFACTURING TUBELESS VACUUM ELECTRIC DISCHARGE LAMPS

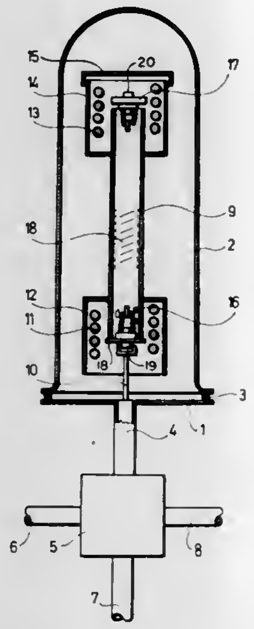
Bela Kerekes, Budapest, Hungary, assignor to Egyesult Izzolampa Es Villamossagi Resvenytarsasag, Budapest, Hungary

Division of Ser. No. 366,741, June 4, 1973, abandoned. This application June 30, 1975, Ser. No. 591,503

Claims priority, application Hungary, June 23, 1972, EE 2038

Int. Cl.² H01J *9/395*

U.S. Cl. 316—4 **6 Claims**



1. A process of manufacturing an electrical metal vapor discharge lamp with an elongated bulb and without a suction tube, comprising the steps of:

placing said elongated bulb in a chamber;

sealing a first end closure member and electrode assembly to a first end of said bulb;

introducing a discharge substance through a second end of said bulb;

mounting a second closure member provided with sealing material and an electrode assembly into said second end of said bulb;

producing a vacuum pressure in said chamber;

mounting a second closure member provided with sealing material and an electrode assembly into said second end of said bulb;

heating said first end of said bulb under said vacuum pressure so as to evaporate said discharge substance, while maintaining a remaining portion of the bulb between said ends at a lower temperature than that of said heated first end of said bulb so that the vapors of the evaporated discharge substance will precipitate on said remaining portion and said second end;

heating said second end of said bulb so as to evaporate said discharge substance, while maintaining said remaining portion at a lower temperature than that of said heated second end of said bulb so that the vapors of the evaporated discharge substance will precipitate on said remaining portion;

sealing said second closure member to said bulb by locally heating said second end of said bulb.

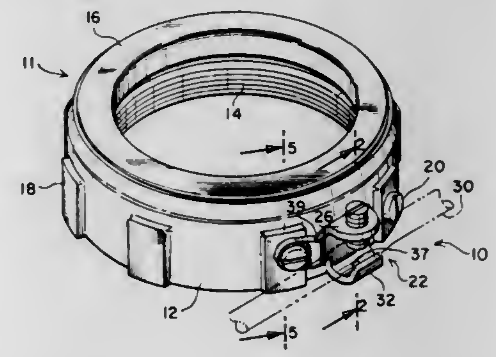
3,967,872
CRADLE-TYPE GROUND LUG FOR CONDUIT

Thomas Mooney, Mount Sinai, N.Y., and Richard A. Bauer, Etters, Pa., assignors to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,377

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 L **10 Claims**



1. A grounding lug to be secured to and to make contact with an electrical conducting surface comprising: a wire receiving body having a generally C-shaped cross section including a base superposed from said electrical conducting surface and upper and lower flanges extending transversely from opposite ends of said base, a binding screw extending down through the upper flange toward said lower flange and adapted to clamp the wire into engagement with the lower flange, and a mounting tang extending from one edge of said base between said flanges and angularly offset from a plane containing said base, said tang having a mounting screw opening therethrough transverse to the longitudinal axis of said tang and adjacent the end remote from said base.

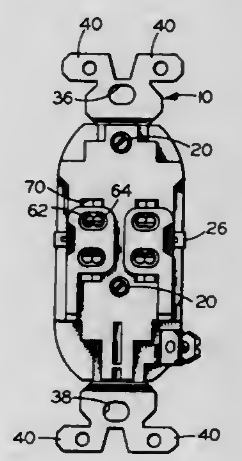
3,967,873
WIRE TERMINAL ELECTRICAL CONTACT

Walter Carl Schumacher, Warwick, R.I., assignor to General Electric Company, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,773

Int. Cl.² H01R *9/08*

U.S. Cl. 339—95 D **1 Claim**

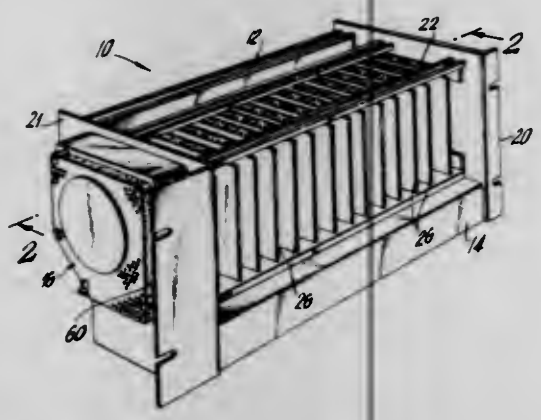


1. A wire terminal electrical contact for accepting a wide

range of wire diameters in the most compact manner possible comprising:
a. an insulating housing,
b. a conductive strip of metal having spring properties mounted and supported within said housing,
c. said strip having an F configuration of slits formed in the metal strip to form two movable tongues,
d. the end portions of said tongues being bent up from the plane of the strip,
e. circular openings in the housing aligned with and below the bent-up portions of said tongues,
f. said openings each being large enough to admit a wire of the largest diameter in the range and said openings intersecting along their entire extent,
g. the area of intersection being smaller than the smallest wire diameter in the range and preventing movement of a smaller diameter wire from one opening to the other.

3,967,874
UNIFORMLY COOLED PRINTED CIRCUIT BOARD MOUNTING ASSEMBLY

Anthony D. Calabro, 8738 West Chester Pike, Upper Darby, Pa. 19082
Filed Sept. 30, 1975, Ser. No. 618,026
Int. Cl.² H01R *13/00*
U.S. Cl. 339—112 R **13 Claims**

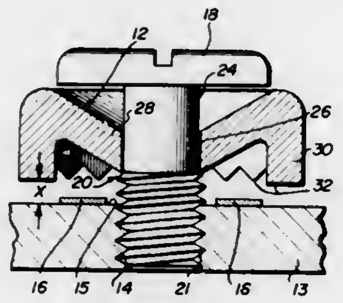


1. A uniformly cooled printed circuit board mounting assembly comprising the combination of:
printed circuit board holding means for maintaining a plurality of printed circuit boards in generally parallel array;
an elongated plenum chamber secured to the lower end of said holding means and extending generally perpendicular to the planes of said printed circuit boards;
blower means for providing forced air to said plenum chamber; and
baffle means disposed in said plenum chamber and operative to generate turbulence of the forced air so as to cause the air to be uniformly distributed over the array of printed circuit boards.

3,967,875
CAPTIVE FASTENER AND CAPTIVE WASHER ASSEMBLY

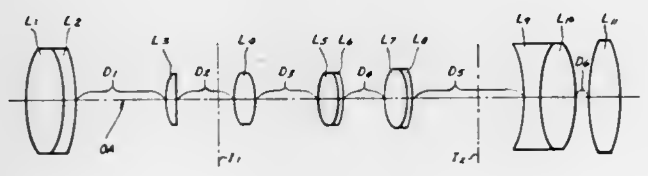
Peter P. Stanaitis, Rockford, Ill., assignor to Textron, Inc., Providence, R.I.
Filed Mar. 10, 1975, Ser. No. 556,716
Int. Cl.² H01R *7/16*
U.S. Cl. 339—263 R **10 Claims**

1. A threaded terminal fastener assembly of the type engageable with an internally threaded element to effect clamping of an electrically conductive element, said assembly comprising a screw fastener element and an apertured clamping washer captively mounted on said fastener element, said screw fastened element having a driving head portion, and an elongate shank, said shank including an externally threaded portion and an unthreaded neck portion disposed intermediate said driving head portion and said threaded portion, said unthreaded portion having the apertured clamping washer element mounted thereon, said washer including an axially extending peripheral flange, an intermediate portion joined with said peripheral flange and extending radially inward thereof and defining a centrally disposed aperture, the improvement, wherein said intermediate portion includes at least a segment thereof which is tapered radially inward and extends in the same direction as said peripheral flange, said tapered segment terminating at a location spaced axially of the point of juncture of said peripheral flange and said intermediate section, said segment engaging means on said fastener to maintain said clamping washer and said fastener in assembly.



3,967,876
TELESCOPIC GUN SIGHT

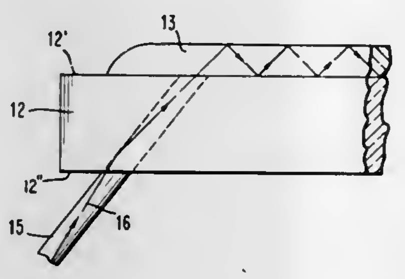
William F. Steck, III, Stamford, Conn., assignor to W. R. Weaver Company, El Paso, Tex.
Continuation-in-part of Ser. No. 381,312, July 20, 1973, abandoned. This application June 26, 1974, Ser. No. 483,168
Int. Cl.² G02B *23/00*
U.S. Cl. 350—54 **4 Claims**



1. An optical gun sight comprising a plurality of lenses including objective lens means, ocular lens means, and erector lens means interposed between said objective and ocular lens means, said objective lens means having a diameter which, at a lowest magnification power of the sight, is operative to provide an exit pupil of at least about 25 mm in diameter, and said ocular lens means having a diameter which is substantially no greater than the diameter of said exit pupil at the lowest magnification power of the sight so that said ocular lens means is substantially filled with exit pupil at the lowest magnification power of the sight.

3,967,877
COUPLER FOR COUPLING OPTICAL ENERGY TRANSMITTED BY OPTICAL FIBER TO OPTICAL WAVEGUIDE AND METHOD OF MANUFACTURE

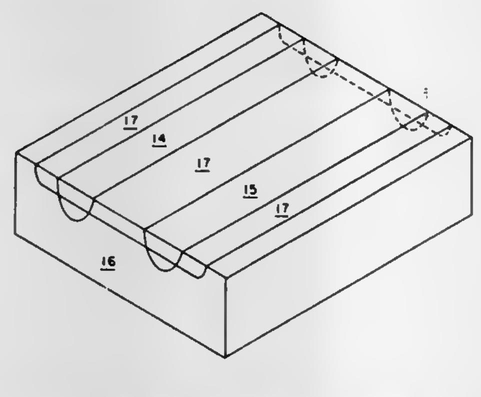
Paul F. Heidrich, Mahopac, and Carl G. Powell, Yorktown Heights, both of N.Y., assignors to International Business Machines (IBM), Armonk, N.Y.
Filed July 16, 1974, Ser. No. 489,012
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **16 Claims**



1. A coupler for coupling energy from an optical fiber to a thin-film optical wave guide by internal reflection in said guide comprising,
a substrate with a surface and an optical wave guide on said surface,
an optical fiber having a portion thereof included in said substrate with a cross section of said fiber lying in a plane of said surface.

3,967,878
OPTICAL WAVEGUIDE COUPLER

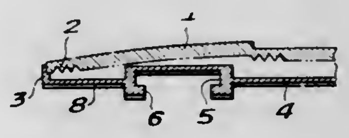
William M. Caton, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 3, 1975, Ser. No. 554,956
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **5 Claims**



1. A passive coupler for transferring light energy between first and second optical paths comprising:
a first optical path including a first channel optical waveguide defined by a selected material diffused into a substrate for increasing the refractive index of the diffused region to support independent light wave propagation;
a second optical path including a co-directional second channel optical waveguide defined by a selected material diffused into said substrate for increasing the refractive index of the diffused region to support independent light wave propagation and disposed in substantially uniformly spaced, co-extensive, non-coupling proximity relative to said first channel optical waveguide and,
an area of said substrate overlapping the co-extensive portions of said channel optical waveguides and diffused with a material selected for inducing a determinable degree of passive coupling therebetween, but of insufficient depth of diffusion to support independent light wave propagation within said area.

3,967,879
SPOKE MOUNTED REFLECTOR

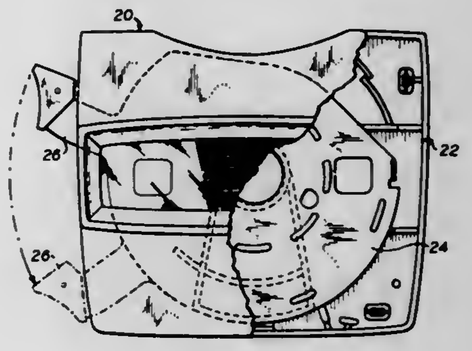
Yoshimasa Tsuyama, Osada, Japan, assignor to Tsuyama Manufacturing Co., Ltd., Japan
Filed Nov. 1, 1974, Ser. No. 519,852
Claims priority, application Japan, July 2, 1974, 49-78589[U]
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **9 Claims**



1. A spoke-mounted reflector for bicycles or the like comprising first and second side reflector means adapted to be secured to one another, each side reflector means comprising a support having a reflective outer surface the supports of said side reflector means including interengaging track and channel means, said channel means formed on the first support and said track means formed on said second support, said interengaging means including oppositely inclined outer faces, said track means being slidable into engagement with said channel means so as to clamp at least one spoke therebetween when the first and second side reflector means are engaged on a spoked wheel.

3,967,880
ADVERTISING AND SALES PROMOTION METHOD AND APPARATUS

Frank Johnson, Deerfield Road, Lake Katonah, R.F.D. No. 3, Katonah, N.Y. 10536
Division of Ser. No. 249,710, May 2, 1972, Pat. No. 3,844,057. This application Sept. 18, 1974, Ser. No. 506,939
Int. Cl.² G02B *27/22*
U.S. Cl. 350—133 **3 Claims**



1. Apparatus for enhancing the visual display or presentation of goods comprising a light-weight housing capable of being held in the hand, said housing including a portable stereoscopic viewing device adapted for viewing stereo scenes through means of a plurality of images of said goods placed within said housing, manually actuated means for advancing said images in said housing, container means for an odor producing liquid within said housing, an odor producing liquid characteristic of said viewed goods within said container means, said container means capable of being opened by a knife-like instrument to release said odor liquid, and a knife-like instrument opening means in said housing movable with said manually actuated means to open said container so that said odor liquid can run out of said container and said odor can vaporize and become recognizable in the atmosphere adjacent said apparatus.

3,967,881
LIQUID CRYSTAL DISPLAY

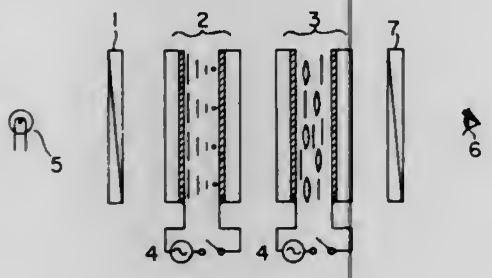
Akio Moriyama, Katano; Masakazu Fukai, Nishinomiya; Seiichi Nagata, Sakai, and Katsuji Hattori, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 31, 1975, Ser. No. 563,800

Claims priority, application Japan, Apr. 4, 1974, 49-38605; May 17, 1974, 49-55868

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—150 **4 Claims**



1. A liquid crystal display device comprising:
- one linear polarizer;
- a first liquid crystal display cell containing a nematic liquid crystal composition with positive dielectric anisotropy dissolving a dichroic dye and exhibiting a homogeneous alignment;
- a second liquid crystal display cell containing a neumatic liquid crystal composition of a twisted structure located between said one linear polarizer and said first liquid crystal display cell;
- said linear polarizer, second and first liquid crystal display cells being disposed on an optical path in a laminate structure; and
- means for externally applying an electric field selectively to liquid crystal layers in said first and second cells.

3,967,882
LIQUID CRYSTAL DISPLAY DEVICE HAVING EXTENDED SERVICE LIFE

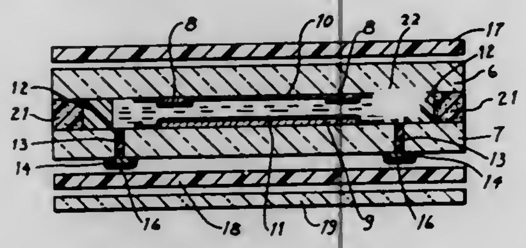
Kanemitsu Kubota, Suwa, and Jin Nagasaki, Shimosuwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 242,003, April 7, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 495,008

Claims priority, application Japan, Apr. 9, 1971, 46-22152

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—160 LC **10 Claims**



1. A field-effect liquid crystal display device, comprising a pair of opposed glass plates, at least one transparent electrode on the inner surface of each of said glass plates, said transparent electrodes being connectable to an external source of voltage, nematic liquid crystals of positive dielectric anisotropy between said glass plates, said nematic liquid crystals being thoroughly dry and free of volatiles, an insulating spacer of a material deformable at elevated temperature between said glass places and conforming exactly to said inner surfaces of said glass plates, a sealant which is free of volatiles and is essentially impermeable to water vapor between said glass plates and exterior to said spacer, a film of a synthetic resin covering that portion of the inner surface of each glass plate interior to said spacer, said films being unidirectionally grooved and thereby oriented, said films being thick enough to be grooved and thin enough to interfere only negligibly with transmission of visible light therethrough, said glass plates being mounted opposite each other so that the directions of the grooves on said opposed plates are at right angles to each other and a pair of polarizer plates sandwiching said glass plates, the deformation temperature of said spacer material being lower than the melting and decomposition temperatures of said synthetic resin, and said spacer and the inner surfaces of said glass plates being essentially free of such organic compounds, water and water-of-composition of said glass plates as are volatile at temperatures at least as high as the deformation temperature of said spacer and below that at which said synthetic resin flows or is thermally degraded.

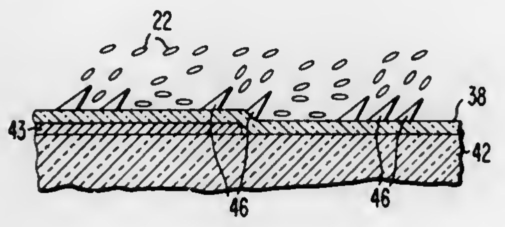
3,967,883
LIQUID CRYSTAL DEVICES OF THE SURFACE ALIGNED TYPE

Dietrich Meyerhofer, and Alan Sussman, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 22, 1975, Ser. No. 579,969

Int. Cl.^{2} G02F *1/16*

U.S. Cl. 350—160 LC **7 Claims**



1. A liquid crystal device comprising,
- an enclosure having a surface,
- a first layer on said surface,
- a second layer on said first layer,
- said first and second layers having been deposited by slant evaporation processes onto said surface along directions at about right angles to each other, one of said layers evaporated at a deposition angle of between 20° and 50° to said surface and the other of said layers evaporated at a deposition angle of less than 15° to said surface and
- a liquid crystal material in contact with said second layer.

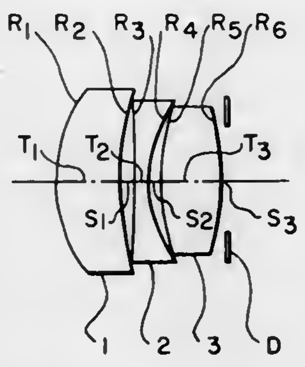
3,967,884
THREE ELEMENT OBJECTIVE LENS

Donald De Jager, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,227

Int. Cl.^{2} G02B *9/14, 3/04*

U.S. Cl. 350—226 **2 Claims**



1. A three element objective lens comprising, from front to rear, a positive meniscus element, a negative biconcave element and a positive biconvex element, each of said elements being formed of a glass having an index of refraction in excess of 1.90 and said lens including an aspheric surface on the rear surfaces of said positive meniscus element and said negative biconcave element, said aspheric surfaces being represented

by the following formula and parameters:

$$x = \frac{Cy^2}{1 + \sqrt{1 - (1 + K)C^2y^2}} + Dy^4$$

Surface	R=1/C	K	D
2	36.338	0	0.12283×10^{-2}
4	9.4853	−1.6218	0

wherein x is the sag of the aspheric surface from a plane reference surface at a radial distance y from the axis of the lens, C is equal to the reciprocal of the vertex radius of curvature R and K is the conic constant.

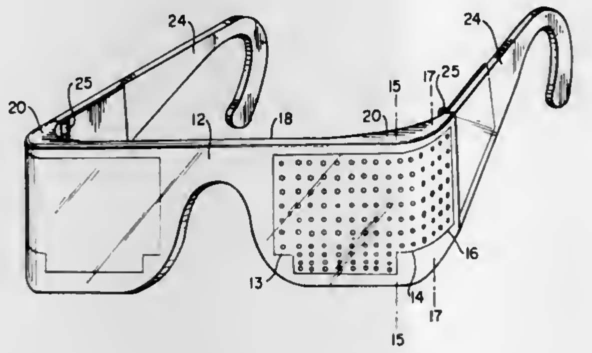
3,967,885
OPTICAL DEVICE FOR POST-OPERATIVE CATARACT PATIENTS

William H. Byler, Winter Park, Fla., assignor to U.S. Radium Corporation, Morristown, N.J.

Filed Nov. 4, 1974, Ser. No. 520,647

Int. Cl.^{2} G02C *7/16*

U.S. Cl. 351—46 **27 Claims**



1. An optical device for use by post-operative cataract patients in combination with means for holding the device in position before the eye, saidd optical device comprising:
- a. an opaque mask for mounting before the eye, said mask having:
  - 1. a first front section for disposition generally in front of the eye in the line of sight of forward vision,
  - 2. a second curved section extending from the outside edge of the front section in a generally curved pattern for disposition to the side of the individual's eye, and
  - 3. a third side section extending from the second curved section toward the individual's temple when the mask is positioned before the eye; and
- b. an array of discrete circular transparent areas on said mask:
  - 1. said array extending along the surface area of each of the sections of said mask, and
  - 2. said transparent areas being of a size and formed on centers spaced from each other in a pattern providing imaging for the eye when viewing objects through each of the sections of the mask.

23. An optical device for use by post-operative cataract patients in combination with means for holding the device in position before the eye, said optical device consisting of:
- a. an opaque mask for mounting before the eye, said mask being about 40 × 50 mm. in size;
- b. a central array of circular transparent areas in said mask forming a square pattern of about 20 mm. to a side;
- c. a side array of transparent areas extending horizontally from the central array toward the outside of the mask, said side array being connected to the central array and having a vertical height of about 9 mm. and horizontal length of about 17 mm.; and
- d. said transparent areas each having a diameter between 0.375 to 1.0 mm. and being formed on centers spaced from each other in linear rows in parallelogram pattern and together defining about 3% of the surface area of the plate.

3,967,886
MOTION PICTURE CAMERA CAPABLE OF SYNCHRONIZED SOUND RECORDING

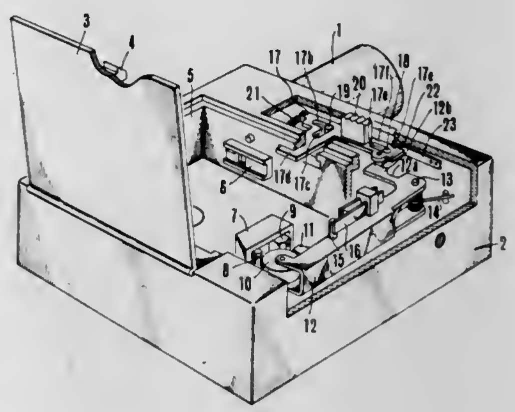
Yoshio Komine, Tokyo; Kazuya Hosoe, Machida; Mamoru Shimazaki, Tokyo; Toshikazu Ichiyanagi, Tokyo, and Kiyoshi Takahashi, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,206

Claims priority, application Japan, Oct. 5, 1973, 48-112634

Int. Cl.^{2} G03B *23/02*

U.S. Cl. 352—29 **13 Claims**



1. A motion picture camera which permits recording image information and sound information concurrently on a photographic film contained in a film magazine with a sound recording track provided thereon, the camera comprising:
- a camera housing having a film magazine loading chamber which is provided with an inlet port opening directed toward the outside of the housing for loading and unloading a film magazine;
- an opening and closing lid selectively usable for covering said inlet port of the magazine loading chamber;
- locking means for locking said lid in its closed position at said inlet port of the magazine loading chamber;
- image forming means for recording image information on said film;
- a sound recording mechanism including sound recording means for recording sound information on the sound recording track of said film and film transporting means for causing the film to continuously travel past a point at which the sound recording means performs sound recording, the sound recording mechanism being divided into two parts disposed across the path of the film and operable in two variable modes such that, in the first mode, the film path is widened to facilitate film loading and, in the second mode, the film path is narrowed with the sound recording mechanism partially coming into contact with said film; and
- operating means for controlling the locking action of said locking means and the shifting between the two operating modes of said sound recording mechanism, the operating means being selectively shiftable, to first, second and third positions in a stepwise manner so that, in the first position, said locking means is held in an unlocking condition while the sound recording mechanism is held in said first mode, then, in the second position, the locking means is held in a locking condition while the sound recording mechanism is still held in the first mode and, in the third position, the sound recording mechanism is shifted into the second mode while the locking means is still maintained in the locking condition, the shifting path of the operating means being non-linear.

3,967,887

SYSTEM FOR CONTROLLING PROJECTION OF IMAGE INFORMATION RECORDING MEDIA

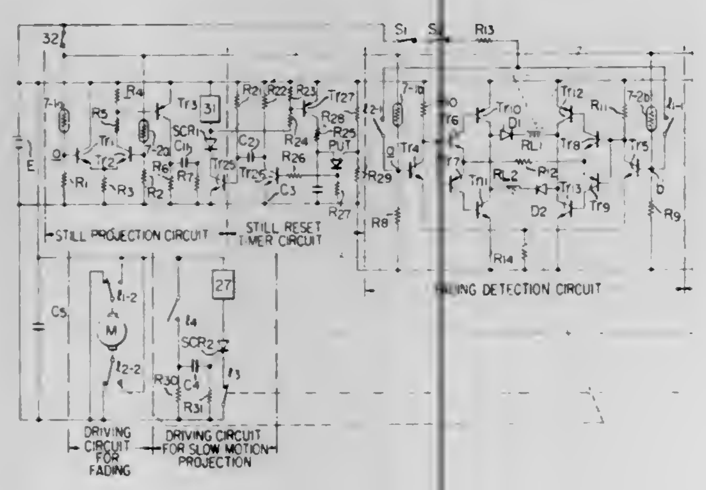
Kuniyoshi Suzaki, Machida, and Masanori Uchidoi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

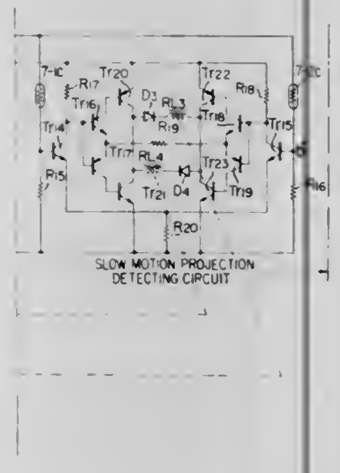
Filed Feb. 8, 1974, Ser. No. 440,736

Claims priority, application Japan, Feb. 15, 1973, 48-18604

Int. Cl.² G03B *21/50*

U.S. Cl. 352—92 34 Claims


32
S1
S2
R13
R4
Tr3
31
R21
R22
R23
Tr27
R28
Tr12
R11
STILL PROJECTION CIRCUIT
STILL RESET TIMER CIRCUIT
FADING DETECTION CIRCUIT
27
SCR2
DRIVING CIRCUIT FOR FADING
DRIVING CIRCUIT FOR SLOW MOTION PROJECTION



1. In an image presentation system, wherein a film having recorded thereon images to be projected is converted from an ordinary projection mode to another projection mode, different from the former, by detection means which detect an indicia placed on the film, the improvement which comprises:

a. a film having:
  1. a plurality of image information frames, on which image information is recorded, said information frames being provided linearly in the moving direction of the film at equally spaced intervals;
  2. a projection mode information carrying region which is formed of a pair of indicia consisting of a first indicia having a low optical density and providing a relatively high transmission of light during the projection of the film, and a second indicia disposed adjacent said first indicia, having a high optical density with respect to said first indicia, and providing relatively low transmission of light during the projection of said film, and which is for directing change-over of the projection mode from one to another in a series of continuous information frames, said projection mode information carrying region being provided outside said frames and between the frames where the conversion of the projection mode is scheduled; and

b. a projection apparatus to present said image information on said film, said apparatus having:
  1. driving means to actuate said apparatus;
  2. intermittent film feeding means, which is actuated by the driving force of said driving means, to intermittently feed said film to said projection position;
  3. an information presentation mode conversion means for converting said image information presentation mode of the film, which said apparatus presents, from its ordinary presentation mode to another presentation mode, said information presentation mode conversion means having an indicia detecting means disposed at a position corresponding to the projection mode information carrying region for said film which has been fed to said projection position, and possesses light detection elements corresponding in number to at least said first and second indicia portions;
  4. light irradiation means for the projection, which is actuated in interrelationship with said intermittent film feeding means, and irradiates the projecting light onto said film and projection mode information carrying region for only a predetermined period of time, when said intermittent film feeding means has completed feeding said film to said projection position;
  5. control means electrically connected to said indicia detection means to control said information presentation mode conversion means utilizing an output from said detection means, said control means being provided with a circuit which differentially detects the differences in outputs from said detection elements and generates a control signal.

3,967,888

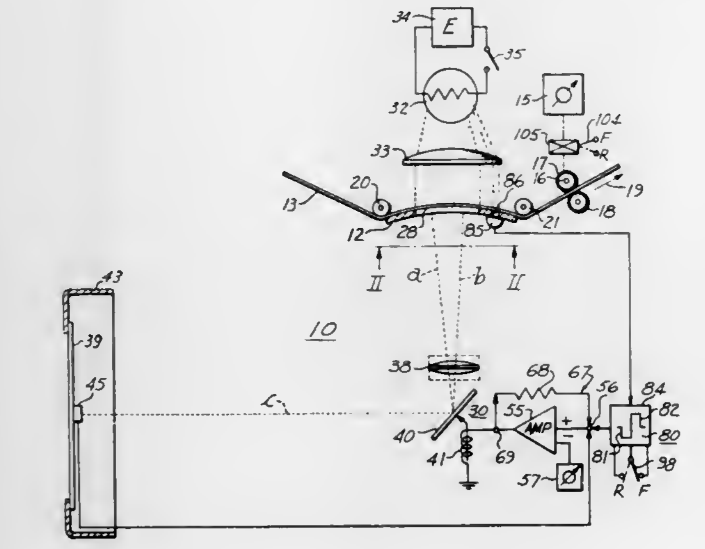
IMAGE DISPLAY FROM CONTINUOUSLY MOVING IMAGE CARRIER

Joseph H. Lancor, Jr., deceased, late of Arcadia, Calif. (by Ellen B. Lancor, administratrix), and Leonard A. Ferrari, San Clemente, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 13, 1970, Ser. No. 89,323

Int. Cl.² G03B *41/10*

U.S. Cl. 352—109 17 Claims



1. In a method of displaying images of a succession of recordings from a substantially continuously moving carrier, with the aid of an electrically powered optical compensator of a type having a driven compensator part which is repeatedly advanced through a range of motion to compensate for the continuous carrier movement, and which is reset between successive advancements, the improvement comprising in combination the steps of:

advancing said driven compensator part through said range of motion in accordance with substantially the following equation of motion:

$$F(t) = J\frac{d^2x}{dt^2} + b\frac{dx}{dt}$$

where

F(t) = force for advancing the driven compensator part;

J = mass-moment of inertia of the driven compensator part;

b = damping coefficient of the driven compensator part;

$\frac{dx}{dt}$ = velocity of the driven compensator part;

$\frac{d^2x}{dt^2}$ = acceleration of the driven compensator part;

applying a substantially constant driving torque to said driven compensator part in response and proportional to said damping coefficient *b;*

applying a variable electric bias to said compensator for biasing during image display said driven compensator part in a direction opposed to the advance direction;

sensing relative movements of each displayed image;

controlling the application of electric power to said compensator in response to sensed image movements to advance the driven compensator part through said range of motion to render the display of each image substantially stationary;

providing for each reset of the driven compensator part electric resetting power comprising an electric power pulse doublet; and

applying said electric resetting power comprising said electric power pulse doublet to said compensator for resetting said driven compensator part through said range of motion upon completion of the display of an image and preparatory to the display of the next image.

3,967,889

DRIVE AND STOPPING METHOD AND DEVICE FOR A CINEMATOGRAPHIC CAMERA

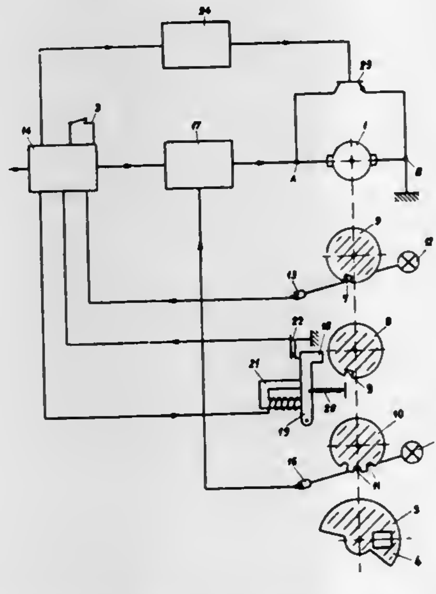
Serge Oulevay, Yverdon, and Marc Niederhauser, Boudry, both of Switzerland, assignors to Bolex International SA, Ste-Croix, Switzerland

Filed Sept. 7, 1973, Ser. No. 395,048

Claims priority, application Switzerland, Sept. 8, 1972, 013591/72

Int. Cl.² G03B *1/00*

U.S. Cl. 352—174 5 Claims



1. In a cinematographic apparatus, means defining an optical path;

a shutter arranged to intercept said optical path and having an open position and a closed position;

an electric motor drivingly coupled with said shutter to control its position;

a power supply circuit to energize said motor;

position detecting means coupled to said shutter for common rotation to supply a signal every time a predetermined position is reached by said shutter in a timed relation to said closed position of said shutter;

release means moveable into operative and inoperative positions for controlling the drive of said shutter;

mechanical locking means to stop said shutter mechanically in its closed position, said locking means including abutting means moveable into an unlocking position and moveable towards a locking position, and counter-abutting means coupled to said shutter for common movement and for abutting in a locking relationship against said abutting means to lock said shutter in said closed position;

electric brake means to stop the motor within a predetermined distance; and

control means responsive to said operative position of said release means for maintaining said abutting means in said unlocking position and responsive to said inoperative position of said release means and said signal of said position detecting means for causing said abutting means to move towards said locking position and initiating braking by said electric brake means before said abutting means and said counter-abutting means abut in said locking relationship.

3,967,890

CARRIAGE MECHANISM FOR MICROFICHE READER

Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,801

Int. Cl.² G03B *1/42*

U.S. Cl. 353—27 A 6 Claims

1. A microfiche film holding device comprising means for enabling said device to travel over a mutually perpendicular set of rails with a rectilinear movement, a pair of spaced parallel glass plates mounted on said device to travel with said device over said rectilinear movement means on said device for automatically lifting one of said glass plates when said device is moved to one extremity of said rectilinear movement, said device including an upper generally rectangular carrier mounted on a generally rectangular lower carrier, each of said rectangular carriers having wheels on the corners thereof engaging said rails, one set of said rails being mounted on a microfiche reader, the other of said set of rails being mounted on said lower carrier, said automatic lifting means including a dependent hook means on said upper carrier, and said lower carrier including a slot terminating in an upstanding wall for engaging said hook, said engagement of said hook and said upstanding wall lifting said one glass plate.

3,967,891

IMAGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES

Robert P. Rippstein, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,902

Int. Cl.² G03G *15/00*

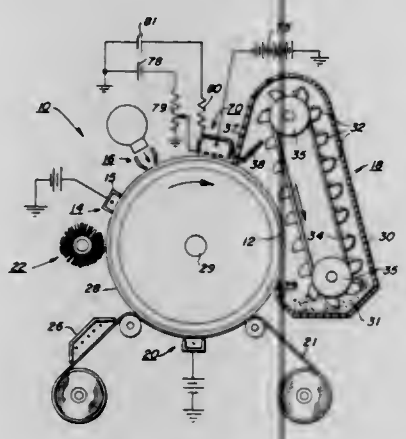
U.S. Cl. 355—3 R 6 Claims

1. In an electrostatic reproduction machine having a photoconductive member, the combination of:

charging means to charge said photoconductive member in preparation of imaging

exposure means to expose said charged photoconductive member to selectively discharge said photoconductive member and form a latent electrostatic image on said photoconductive member in accordance with the original being reproduced;

means forming a reservoir of charged ions, said ions being charged opposite from said photoconductive member charge whereby charges left on said photoconductive member and comprising said latent electrostatic image tend to attract oppositely charged ions from said reservoir

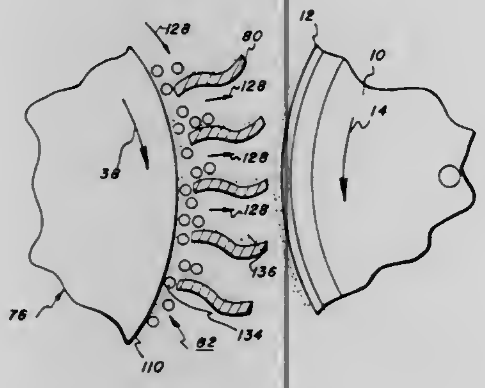


in accordance with the charge level of the charges left on said photoconductive member and thereby reduce peak charge levels remaining on said photoconductive member; and

control gate means for regulating the flow of ions from said reservoir to said photoconductive member.

3,967,892
DEVELOPMENT SYSTEM

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 26, 1974, Ser. No. 492,305
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—3 DD **14 Claims**



8. An electrophotographic printing machine of the type having a photoconductive member, means for charging the photoconductive member to a substantially uniform charge potential, and an exposure mechanism for projecting a light image corresponding to the original document being reproduced onto the charged photoconductive member to record thereon an electrostatic latent image thereof, wherein the improvement includes:

magnetic field producing means operatively positioned closely adjacent to the electrostatic latent image recorded on the photoconductive member for forming a brush-like array of developer mix comprising carrier granules and toner particles;

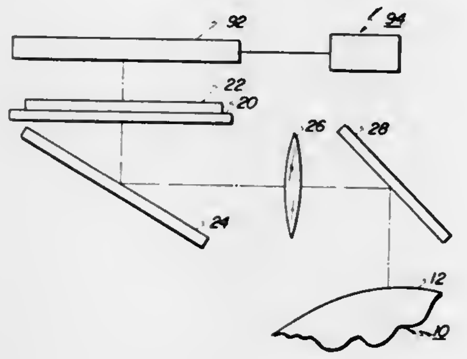
development electrode means associated with said magnetic field producing means;

means for separating a portion of the toner particles from the developer mix including a plurality of closely spaced vanes arranged to contact the brush-like array of developer mix; and

means for moving the separated toner particles into contact with the electrostatic latent image recorded on the photoconductive member producing a toner powder image thereon.

3,967,893
ILLUMINATING APPARATUS

Edward J. Majewicz, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 29, 1974, Ser. No. 465,443
Int. Cl.^{2} G03G *15/30*
U.S. Cl. 355—4 **12 Claims**



1. An apparatus for exposing a moving charged photoconductive member to record thereon an electrostatic latent image corresponding to an original document, including:

an array of solid state light emitters, said array comprising a plurality of parallel rows of solid state light emitters;

means for supporting the original document in a light receiving relationship with said array of solid state light emitters, said array of solid state light emitters illuminating the original document;

means for projecting the light rays transmitted from the original document onto the charged photoconductive member;

means for driving the photoconductive member at a substantially constant velocity;

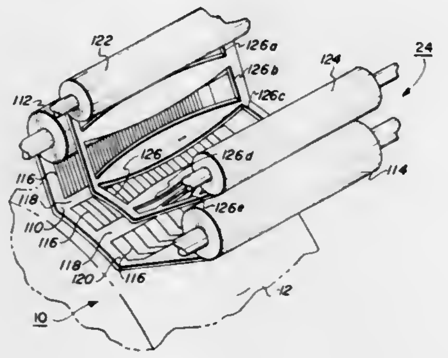
means for successively energizing parallel rows of said array of solid state light emitters;

timing means, operatively associated with the photoconductive member, for generating an electrical signal indicative of the movement of the photoconductive member; and

circuit means coupling said timing means with said energizing means to excite successive rows of said light emitters in a timed relation with the movement of the photoconductive member to transmit light rays corresponding to successive portions of the original document to said projecting means.

3,967,894
SCREENED OPTICAL SYSTEM

George N. Tsilibes, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 18, 1974, Ser. No. 507,176
Int. Cl.^{2} G03G *15/22*
U.S. Cl. 355—4 **9 Claims**



1. An optical system including:

a light source positioned to illuminate an original document with light rays;

a lens in a light receiving relationship with the light rays transmitted from the original document to form a light image thereof;

a plurality of screen members;

a belt member having each of said screen members mounted thereon in a spaced relationship with one another;

means for movably supporting said belt member;

means for moving said belt member to position a preselected one of said screen members in the optical light path in a light receiving relationship with the light image transmitted from said lens with the other of said screen members being spaced from the optical light path;

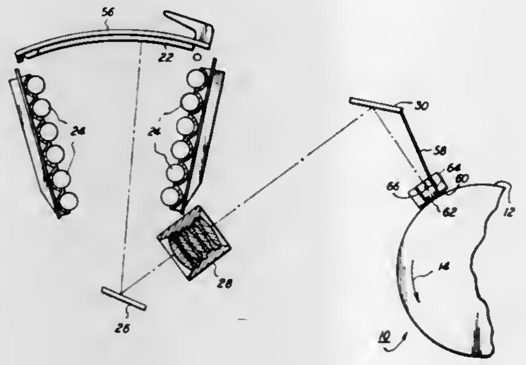
a substantially opaque belt member having a plurality of spaced slits therein, each of the slits decreasing the intensity of the light image inwardly from the marginal regions to the central region thereof;

means for movably supporting said opaque belt member; and

means for moving said opaque belt member to position a pre-selected one of said slits in the optical light path in a light receiving relationship with the light image transmitted from said lens with the other slits therein being spaced from the optical light path.

3,967,895
ILLUMINATION CONTROL SYSTEM

Douglas L. Crook, Reno, Nev., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 18, 1974, Ser. No. 507,104
Int. Cl.^{2} G03G *15/30*
U.S. Cl. 355—8 **6 Claims**



1. An apparatus for controlling exposure of a light receiving surface, including:

a source of illumination for generating light rays;

a support member for positioning a document in a light receiving relationship with the light rays generated by said illumination source;

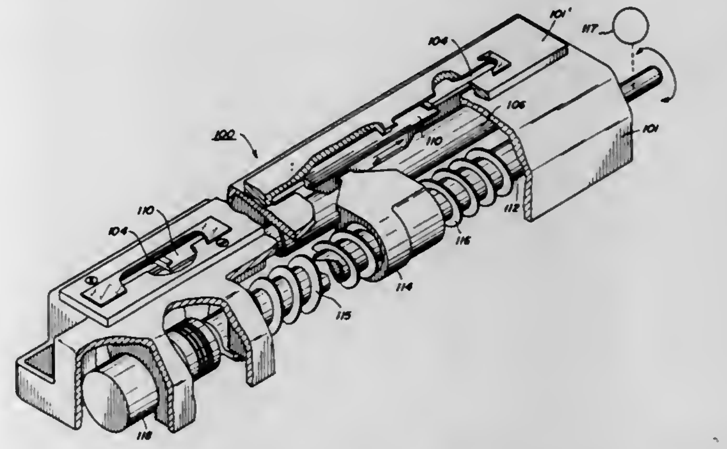
optical means disposed to receive the light rays transmitted from the document on said support member for creating a light image thereof;

light masking means interposed in the path of the light image, said light masking means comprising a base plate having an elongated light transmitting first slit therein, and a pair of substantially opaque, spaced apart movable wall members defining a second slit in juxtaposition with the first slit; and

a movable mirror interposed between said optical means and said light masking means for directing the light image through the first and second slits in said light masking means, said mirror being coupled to the pair of spaced apart walls of said light masking means and being arranged to move in unison therewith so that movement of said mirror regulates the width of the second slit in said light masking means, thereby defining the size of the second slit through which the light image passes.

3,967,896
VARIABLE EDGE FADEOUT APPARATUS FOR ELECTROSTATIC REPRODUCTION MACHINES

John H. Looney, Fairport; Hugh L. Jones, Rochester, and Donald R. Tickner, Pittsford, all of N.Y., assignors to Rank Xerox Ltd., London, England
Filed May 14, 1975, Ser. No. 577,374
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—14 **8 Claims**



1. A discharge device for use in erasing a boundary area on the movable photosensitive member of an electrostatic type reproduction machine, comprising:

a housing adjacent said photosensitive member, said housing having at least one opening facing said photosensitive member;

discharge lamp means in said housing for illuminating said photosensitive member through said opening to discharge the area of said photosensitive member illuminated;

a shutter for controlling the size of said opening;

means supporting said shutter for movement over said opening to change the size of said opening and vary the area of the photosensitive member discharged; and

reversible drive means for moving said shutter selectively forward and backward to provide infinite changes in the size of said opening and the area of the photosensitive member discharged.

3,967,897
APPARATUS AND METHOD FOR EVALUATING COLOR NEGATIVES

Winston L. Rogers, P.O. Box 206, Rheem Valley, Calif. 94570
Filed Oct. 4, 1974, Ser. No. 512,077
Int. Cl.^{2} G03B *27/32, 27/52, 27/44*
U.S. Cl. 355—32 **7 Claims**

1. An apparatus for color negative evaluation for use with a photo enlarger comprising

a set of interchangeable filter matrix boards, each board having a plurality of different gradation filter elements disposed therein and means for compensating for transparency differentials between filter elements,

a lens matrix board arranged for positioning an individual lens with respect to each of the filter elements in any one of said filter matrix boards, and

a frame for supporting said lens matrix board and a filter matrix board preselected from said set of interchangeable filter matrix boards complimentary to one another between the photo enlarger and a sheet of photosensitive paper such that the image on a color negative held in the photo enlarger can be projected through said lens matrix and said preselected filter matrix and focused onto said photosensitive paper to produce a plurality of images thereon whereby each of said plurality of images has a different coloration from each of the others depending on the combination and gradation of filter elements disposed in the filter matrix board selected.

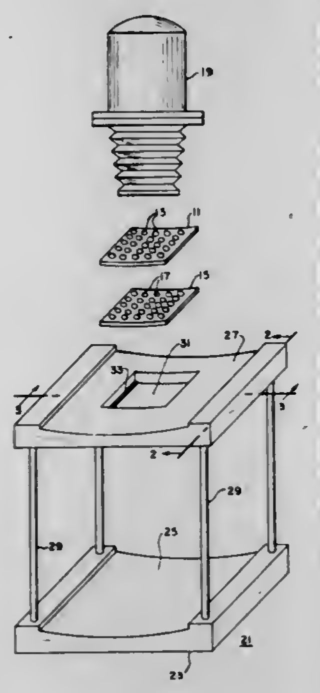
7. A method for color negative evaluation for choosing a suitable filter combination for the final color print comprising,

removing the focusing lens from a standard type photo enlarger,

exposing said color negative to photosensitive paper concurrently through a filter matrix board preselected from a set of filter matrix boards and a lens matrix board wherein the filter elements of said filter matrix board have different filter combinations and gradations depending on the matrix board selected and are equalized to correct for transparency differentials, and the lenses of said lens matrix board are arranged complimentary to said filter elements,

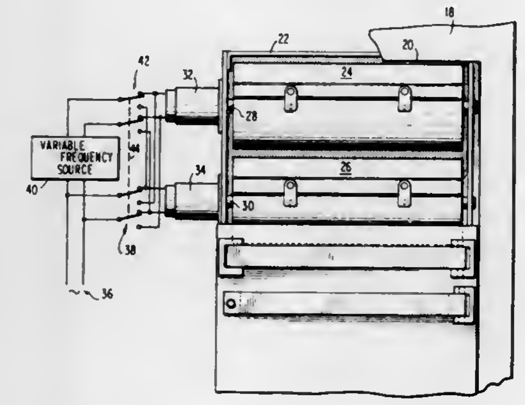
developing said photosensitive paper to provide a matrix of different color prints of the same negative, the color tones of each print of said matrix of prints being determined by the particular filter combination associated therewith whereby said matrix of color prints can be visually evaluated to determine which filter combination of said matrix of filter elements produces the print which most accurately reproduces the true coloration of the subject or which is visually the most pleasing to the eye, and

repeating the aforementioned steps of exposing and developing the photosensitive paper, as required to obtain a desired color reproduction, using a new filter matrix board of finer gradation selected from said set of matrix boards, said newly selected matrix board to be determined in accordance with the filter combination of the element of said matrix board giving the best overall print coloration from the previous exposure.

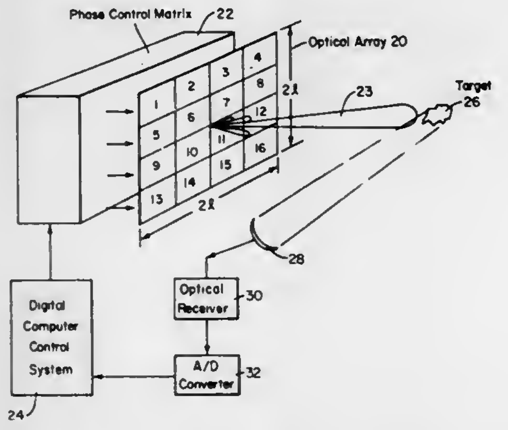


3,967,898
OPTICAL DISTORTION DEVICE
Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22981
Filed Nov. 14, 1974, Ser. No. 523,947
Int. Cl.^{2} G03B *27/10*
U.S. Cl. 355—110 **7 Claims**

1. A device for producing a print from a photographic image with a predetermined change in one dimension thereof comprising a fixed frame, light source means mounted in said frame, enclosure means surrounding said frame and having a flat upper surface provided with an elongated light aperture, first and second roller means rotatably mounted in said fixed frame with the axes of rotation thereof disposed parallel to each other and to said elongated light aperture, attaching means on said roller means to which an image sheet and a photosensitive sheet may be secured, drive means for rotating said first and second roller means at different speeds to drive said sheets in superimposed relation on said flat surface across said light aperture to provide a distorted image on said photosensitive sheet in the direction of travel of said sheets, said drive means being comprised of two variable speed synchronous motors connected to said first and second rollers, respectively, a source of line voltage, means for varying the frequency of said line voltage means and switch means for selectively connecting one of said motors directly to said line voltage and the other said motors to the output of said means for varying the frequency of the line voltage whereby the speed of said other motor may be varied relative to the speed of said one of said motors.



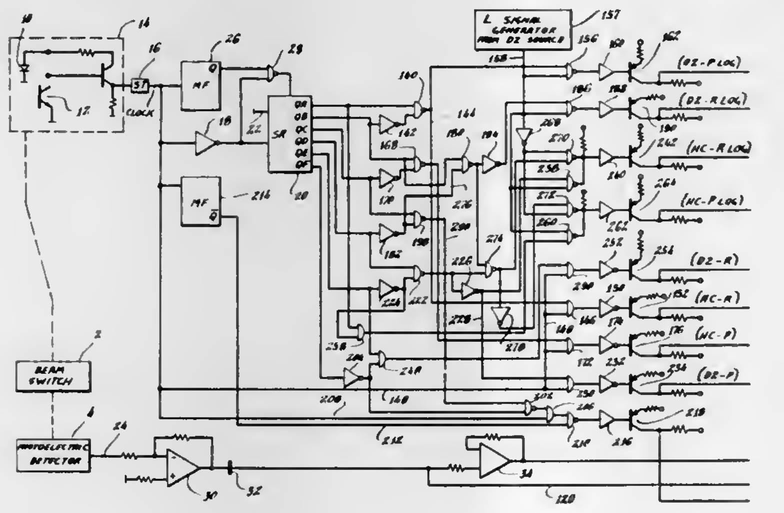
3,967,899
METHOD AND APPARATUS FOR MAINTAINING FAR FIELD SPATIAL COHERENCY IN ELECTROMAGNETIC TRANSMITTING SYSTEMS
Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 30, 1974, Ser. No. 537,214
Int. Cl.^{2} G01C *3/08;* **G01B** *11/26*
U.S. Cl. 356—5 **10 Claims**

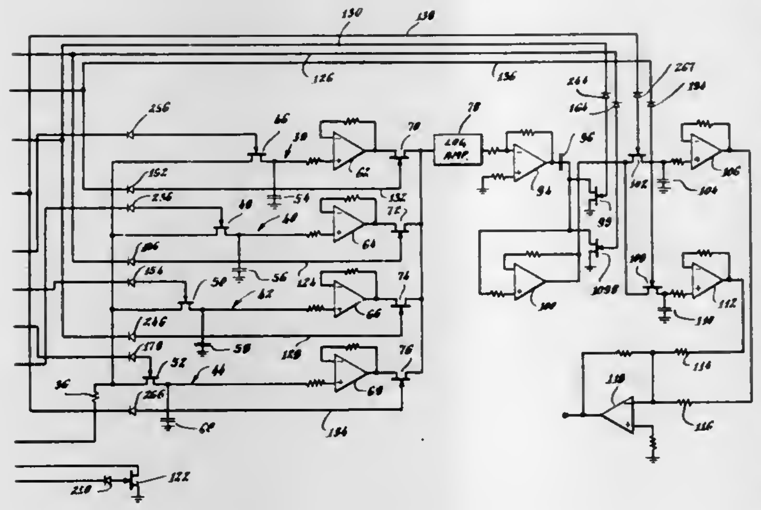


1. A method of controlling the relative phasing of a plurality of transmitted beams of electromagnetic energy such that the energy is substantially in phase at a remotely located target; said method comprising the steps of:

a. identifying a plurality of spatial orthogonal sets of said plurality of beams, such that each set has a first portion comprised of some of said plurality of beams and a second portion comprised of the remaining ones of said plurality of beams;
b. applying phase perturbations to the beams of the first portion of a given set and measuring the relative intensity of the transmitted energy reflected from the target;
c. applying phase perturbations to the beams of the second portion of said given set and measuring the relative intensity of the transmitted energy reflected from the target;
d. computing a phase value, based on the intensities measured in steps (b) and (c), which when inserted into the beams of one portion of said given set will substantially reduce the difference between said measured intensities of the reflected energy;
e. applying said computed phase value to the beams of said one portion of said given set; and
f. sequentially repeating steps (b) through (e) for each of said spatial orthogonal sets.

3,967,900
SIGNAL GATING DEVICE
Heinz Willi Henninger; Lothar Riethmüller, both of Uhldingen-Muhlhofen, both of Uhldingen-Muhlhoffen; Hans Walter Kiefer, Nussdorf, and Ernst Gunther Robert Spreitzhofer, Uberlingen, all of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany
Filed Feb. 12, 1975, Ser. No. 549,157
Claims priority, application Germany, Feb. 16, 1974, 2407607
Int. Cl.^{2} G01J *3/42*
U.S. Cl. 356—88 **12 Claims**





1. Apparatus for directing signals from a photoelectric detector to separate storage channels in sequence with the positions of a beam switch which sequentially directs light from different beams to the photoelectric detector, comprising:

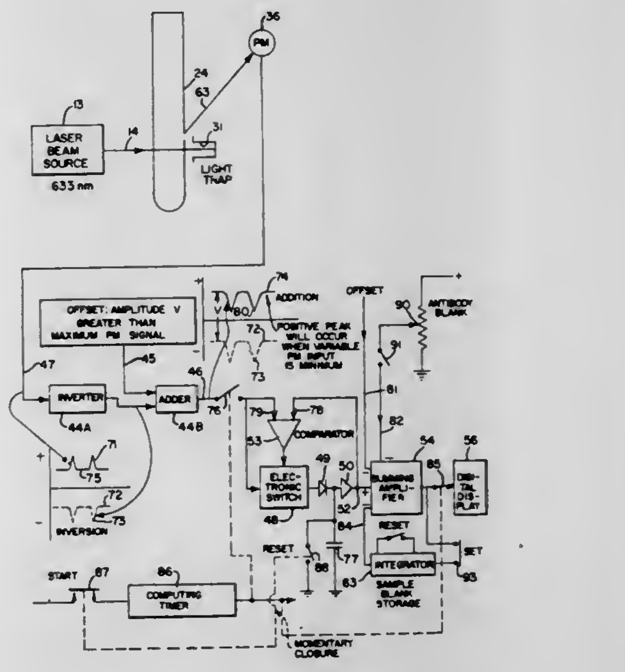
counter means for generating output signals in sequence with input pulses thereto;

a logic gate having the output thereof connected to reset the counter means;

gating means for directing signals from the photoelectric detector to each storage channel in sequence with the output signals of the counter means; and

photoelectric means for generating a marker pulse within a sequence of clock pulses which correspond to the positions of the beam switch, the pulses being connected to the input of the counter means and to one input of the logic gate, with a second input of the logic gate being connected to the pulses through a monostable flip-flop.

3,967,901
NEPHELOMETER HAVING MEANS SEMIAUTOMATICALLY CANCELLING COMPONENTS FROM SCATTERING BY PARTICLES SMALLER OR LARGER THAN THOSE OF INTEREST
Rodolfo R. Rodriguez, Columbia, Md., assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Continuation-in-part of Ser. No. 545,069, Jan. 29, 1975, abandoned. This application July 31, 1975, Ser. No. 600,593
Int. Cl.^{2} G01N *21/00*
U.S. Cl. 356—103 **5 Claims**



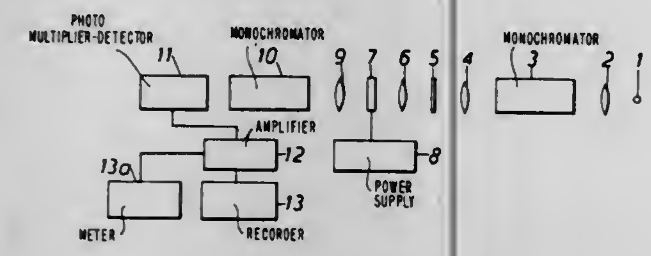
1. A method of discriminating against the effects of artifacts in optical testing wherein a light beam is directed through material containing particles of interest and wherein such particles are detected by the response of a photosensitive electrical detector located in a selected scatter beam path leading from said material which generates a signal wave containing fluctuating artifact peaks representing fluctuating particles larger than those of interest along with a steady normal signal component representing the particles of interest, comprising inverting said signal wave, adding a constant signal of the same original polarity as said artifact peaks to the inverted signal wave but greater in amplitude than that of the maximum artifact peak, whereby to obtain an inverted signal wave wherein the former artifact peaks are reversed in sense, switching out the reversed artifact peaks of the inverted signal wave, and generating a resultant smoothed output signal from the remainder of the inverted signal wave, whereby the amplitude of said smoothed output signal represents quantitatively the particles of interest unaffected by the fluctuating artifacts from particles larger than those of interest.

3,967,902
METHOD AND APPARATUS FOR INVESTIGATING THE CONFORMATION OF OPTICALLY ACTIVE MOLECULES BY MEASURING PARAMETERS ASSOCIATED WITH THEIR LUMINESCENCE
Izchak Zevi Steinberg, Rehovoth, Israel, assignor to Yeda Research & Development Co. Ltd., Rohovoth, Israel
Continuation-in-part of Ser. No. 224,706, Feb. 9, 1972, abandoned. This application July 22, 1974, Ser. No. 490,660
Claims priority, application Israel, Feb. 26, 1971, 36297
Int. Cl.^{2} G01J *4/00*
U.S. Cl. 356—114 **11 Claims**

1. A method of investigating the conformation of optically active molecules comprising the steps of:

a. projecting a monochromatic and unpolarized beam of light into a sample cell containing such molecules for causing the latter to luminesce;

b. beaming a portion of the luminescent output of the sample cell through optical modulating means in such a way as to minimize the amount of linear polarization incident on the optical modulating means;
c. driving the optical modulating means at a predetermined frequency for intensity modulating polarized light incident thereon;



d. converting the intensity of light emerging from the optical modulating means into an electrical signal; and
e. measuring the amplitude of a time-variable component in said signal at said predetermined frequency for determining the amount of circularly polarized light in said portion of the luminescent output of the sample cell.

3,967,903
PHOTODENSITOMETER FOR MEASURING OPTICAL FRINGE PATTERNS

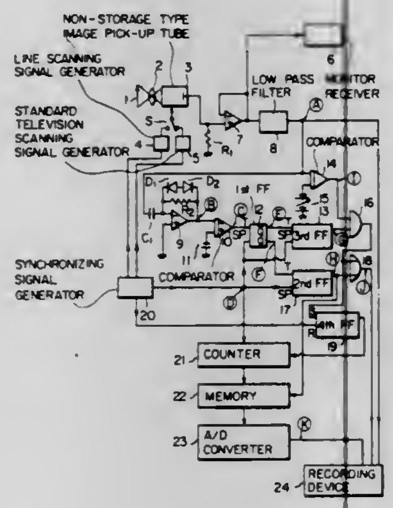
Toyoichiro Enami, Tokyo; Kazuo Kurasawa; Masaktaka Ii, both of Hamamatsu, and Masaru Hashimoto, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 18, 1974, Ser. No. 524,808

Claims priority, application Japan, Nov. 22, 1973, 48-130729

Int. Cl.² G01B *11/00*

U.S. Cl. 356—167 **8 Claims**


NON-STORAGE TYPE IMAGE PICK-UP TUBE
LINE SCANNING SIGNAL GENERATOR
STANDARD TELEVISION SCANNING SIGNAL GENERATOR
LOW PASS FILTER
MONITOR RECEIVER
COMPARATOR
SYNCHRONIZING SIGNAL GENERATOR
COUNTER
MEMORY
A/D CONVERTER
RECORDING DEVICE

1. A photodensitometer comprising:
an image pick-up tube of the non-storage type for receiving light rays from fringes formed on a sample:
first scanning means for energizing said image pick-up tube so that said image pick-up tube scans said sample along a scan line and produces an image signal representing brightness of the fringes lying on the scan line;
pulse generating means responsive to said image signal for producing a position pulse at each of the maximum and minimum values of said image signal; and
circuit means for producing an output signal corresponding to an interval from the beginning of scanning along the scan line to a moment when each position pulse appears, whereby said output signal represents a spacing from the beginning point of the scan line to each of the position pulses.

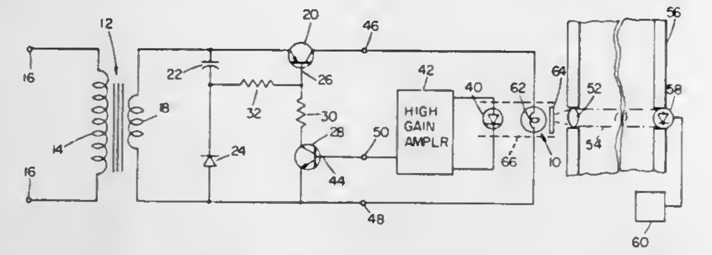
3,967,904
PRECISION RADIATION SOURCE REGULATION CIRCUIT

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Jan. 15, 1975, Ser. No. 541,741

Int. Cl.² G01N *21/22;* **G01J** *1/32;* **H05B** *37/02*

U.S. Cl. 356—201 **13 Claims**



1. A monitoring system comprising a source of AC power,
a radiation source connected in circuit with said AC source,
a transistor switch connected in circuit between said AC source and said radiation source,
a radiation sensor optically coupled to respond to the radiation output of said radiation source,
circuitry for placing said transistor switch in conducting condition at the beginning of a half cycle of applied AC power to apply power to said radiation source to cause said radiation source to produce an increased radiation output,
and a feedback circuit responsive to said radiation sensor for placing said transistor switch in non-conducting condition in response to said increased radiation output of said radiation source to terminate energization of said radiation source during that half cycle of applied AC power so that the radiation output of said radiation source is regulated with precision.

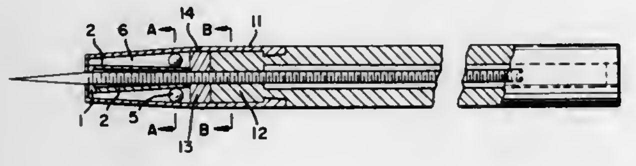
3,967,905
SELF-SHARPENING PENCIL

Wan Hsing Hsien Hsieh, 21 Fu Teh Road, Kang Chu Li, Pan Chiao Town, Taipei Hsien, China /Taiwan

Filed May 12, 1975, Ser. No. 576,458

Int. Cl.² B43K *29/06*

U.S. Cl. 401—51 **3 Claims**



1. A self-sharpening mechanical pencil comprising, in combination:
a tubular body, for receiving an elongated graphite core in a central bore thereof;
driving means, for axially reciprocating said graphite core and simultaneously rotating the same;
a sharpening mechanism, contained within the tubular body, for abrading the forward end of the graphite core into a sharpened configuration, said sharpening mechanism including a pair of pivotally disposed abraders having abrading surfaces which form a sharpening core upon convergence of the abraders; and
cam means for engaging said abraders with the graphite core in one position of the mechanical pencil, and for disengaging said abraders from the graphite core in another position of the mechanical pencil, said cam means comprising channels in the inner wall of the tubular body adjacent to the outer surface of the abraders in combination with movable members disposed therein, said channels being increasingly shallower toward the tip of the mechanical pencil whereby the displacement of said movable members towards said tip causes said abraders to pivotally converge to form a sharpening cone.

3,967,906
SAFETY BREAK-AWAY GROUND MOUNTED POST SUPPORT ASSEMBLIES

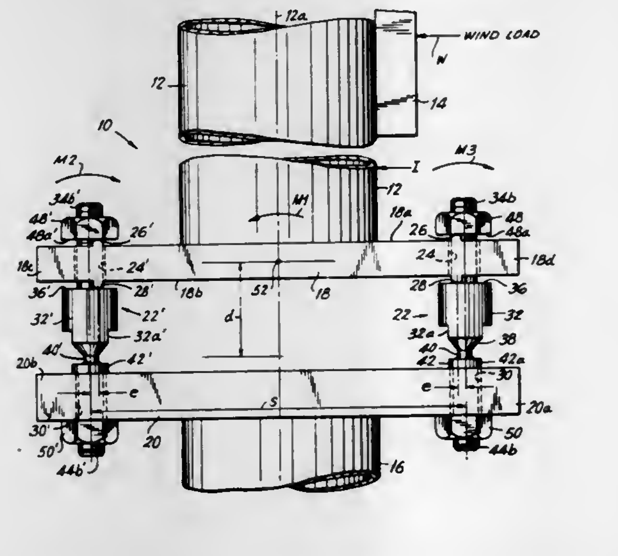
Richard A. Strizki, Ringoes, N.J., assignor to Transpo-Safety, Inc., New Rochelle, N.Y.

Continuation-in-part of Ser. No. 470,371, May 16, 1974. This application May 2, 1975, Ser. No. 574,247

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² F16D *9/00*

U.S. Cl. 403—2 **26 Claims**



1. A breakaway assembly for supporting an elongate post or the like at one end thereof, which post generally defines an axis and may be subjected to transverse forces and negligible vertical forces along a predetermined direction at the other end thereof and to transverse forces proximate to the supported end, the assembly comprising: spaced upper and lower support means, said support means including means for fixedly anchoring the same to a support surface, said upper support means being fixedly connected to the post and having at least two portions thereof spaced from each other along a line substantially parallel to said predetermined direction, each of said spaced portions being provided with at least one opening therethrough, two openings, each on a different one of said associated spaced portions, defining a pair of associated openings, said openings having axes substantially parallel to the axis of the post, said spaced portions having opposing surfaces respectively facing toward and away from said lower support means; a coupling member associated with each opening in said spaced portions, each coupling member extending between an associated spaced portion and said lower support means, each coupling member being provided with a weakened portion disposed between said upper and lower support means and being fixedly connected at one end to said lower support means, the other end of each coupling member extending through an associated opening and defining two spaced bearing surfaces each of which faces a different one of said opposing surfaces of said spaced portions; and protuberance means joined to and projecting from each of said opposing surfaces of said spaced portions, one of said protuberance means being disposed between one of said opposing surfaces and as associated bearing surface of a coupling member and being in abutting relationship against the latter, and another protuberance means being disposed between the other of said opposing surfaces and an associated bearing surface of a coupling member and being in abutting relationship against the latter, each protuberance means being eccentric relative to the axis of an associated opening to dispose the same inwardly in the space between a pair of associated openings.

3,967,907
BALL SOCKET FOR BALL JOINT

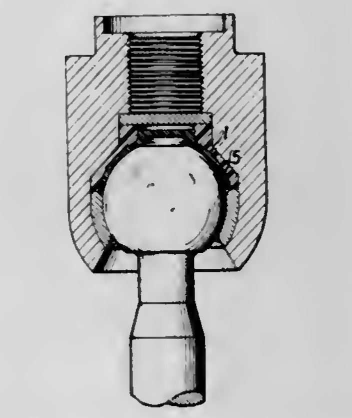
Andreas Schmidt, Meerbusch, Germany, assignor to A. Ehrenreich & Cie., Dusseldorf-Oberkassel, Germany

Filed July 2, 1975, Ser. No. 592,363

Claims priority, application Germany, July 18, 1974, 2434490

Int. Cl.² F16C *11/00;* **F16D** *1/12*

U.S. Cl. 403—133 **4 Claims**



1. A plastic ball socket for a grease lubricated ball joint socket into which a ball is to be inserted, comprising:
a hemispherical inner cup composed of thin hard, elastic material and having an internal surface adapted at least partially to engage the ball and having an external surface;
an outer cup composed of soft elastic material with an inner surface at least partially conforming to and supporting the external surface of said inner cup; and
elongated rib means disposed on an outer surface of said outer cup and being operable to support said outer cup in said ball joint socket spaced apart from said ball joint socket, whereby said plastic ball socket may be deformed during use to form grease lubrication grooves between said internal surface and the ball.

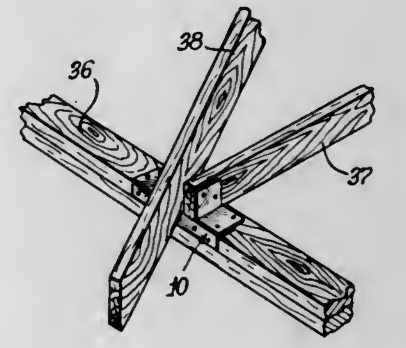
3,967,908
CROSS TIE SADDLE BRACKET

Kenneth T. Snow, 1303 N. Cross St., Wheaton, Ill. 60187, and Kenneth T. Snow, Jr., 317 Shagbark Court, Schaumburg, Ill. 60172

Filed Apr. 21, 1975, Ser. No. 569,680

Int. Cl.² F16B *5/00*

U.S. Cl. 403—219 **1 Claim**



1. A cross-tie saddle bracket comprising an elongated L-shaped member having a horizontal top portion and a vertical side portion of substantially the width of 2 inch nominal lumber, said elongated L-shaped member having a plurality of holes in both its horizontal top portion and its vertical side portion, a first L-shaped member having its width substantially the width of 4 inch nominal lumber and having a horizontally disposed side and a vertically disposed side, the outer end of the horizontal side of said first L-shaped member lying flush with one end of the horizontal top portion of said elongated L-shaped member and welded thereto in a manner so that one

side edge of the horizontal side is substantially flush with the vertical side portion of the elongated L-shaped member and the other side edge overhangs the surface of the horizontal top portion by an amount substantially the width of 2 inch nominal lumber, and a spaced apart identical second L-shaped member having the end of the horizontal side thereof lying flush with the other end of said elongated L-shaped member and one side edge thereof being-substantially flush with the vertical side portion of the elongated L-shaped member and the other side edge overhanging the surface of the horizontal top portion by an amount substantially the width of 2 inch nominal lumber, and the second L-shaped member welded to said horizontal top portion of the elongated L-shaped member in the same manner as the first L-shaped member, said vertical sides of said first and second L-shaped members being spaced apart and disposed generally parallel to each other, said first and second L-shaped members having holes in both the horizontal and vertical sides with at least one hole of the horizontal sides being in alignment with at least one hole in the horizontal top portion of the elongated L-shaped member, whereby the elongated L-shaped member is adapted to have its vertical side portion abut and be nailed through the holes therein to the side of the top wooden wall plate of a building, and the horizontal top portion of the elongated L-shaped member and its superimposed horizontal sides of the first and second L-shaped members thereon are adapted to be jointly nailed to the top of the top wooden wall plate and the overhanging portions of the horizontal side portions are adapted to be separately nailed directly to the top wooden wall plate, and the spaced apart vertical sides of the first and second L-shaped members are adapted to act as a saddle for building cross tie members and are adapted to have nails driven through the holes therein to the cross tie members to thus provide for the secure locking of the wall plate to the cross tie members.

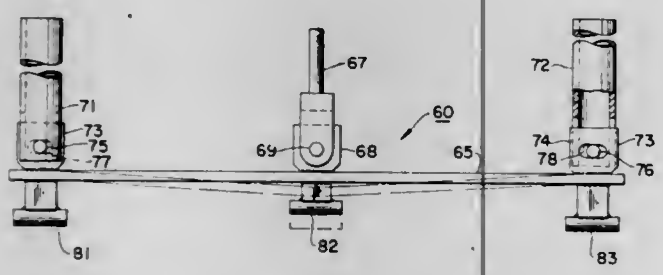
3,967,909
LATCHING AND LATCH RELEASING MECHANISM FOR AUGER STRING COUPLINGS

Ronald C. Deeter, Malvern; Thad A. Lora, and John M. Pozniko, both of Salem, all of Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Nov. 7, 1974, Ser. No. 521,637

Int. Cl.^{2} F16D *7/00*

U.S. Cl. 403—322 **12 Claims**



1. Apparatus for simultaneously releasing a plurality of adjacent coupiings between two interconnected members wherein a plurality of said two interconnected members and their respective couplings are adjacent one another in lateral alignment and subject to displacement from an intended coplanar relationship, comprising:

a latch pin for each coupling, mounted on one of the interconnected members of each coupling and adapted for reciprocating movement between a latching position in engagement with said other member and a retracted unlatching position out of engagement with said other member,

resilient means biasing each latch pin to said latching position,

a lever for each latch pin pivotally mounted on said one member, operatively connected to its respective latch pin and having an operating arm adapted when depressed, to move said latch pin to its retracted position,

unlatching means reciprocable toward and away from said operating arms between a retracted position and an extended position wherein said unlatching means engages and pivots each of said operating arms to unlatch each of said couplings,

said unlatching means being provided with means to allow it to flex adequately to accommodate variation in the locations of said operating arms relative to one another out of a common plane so that extension movement of said unlatching means continues beyond a position whereat certain of said latch pins are retracted until all of said latch pins are retracted even though said latch pins are displaced from their predetermined coplanar position, and

means for operating said unlatching means.

3,967,910
ELEMENTS FOR INTERCONNECTION OF ENDS OF PROFILES AT CORNERS IN FRAMES, PANEL POINTS AND THE LIKE

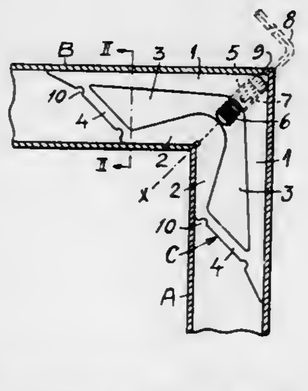
Ole Jachob Tollefsrud, 2840 Reinsvoll, Norway

Filed Jan. 22, 1975, Ser. No. 543,075

Claims priority, application Norway, Jan. 29, 1974, 268/74

Int. Cl.^{2} F16D *7/04*

U.S. Cl. 403—402 **5 Claims**



1. An unitary element for interconnecting the ends of frame sections at corners in frames, panel points and the like, comprising at least two legs arranged at right angles to each other, each having in common an inner and an outer angle wall said angle walls being opposed to each other and defining an intermediate space therebetween and inclined end walls connected to the corresponding ends of the angle walls in each leg, the inner and outer angle walls forming inner and outer adjacent apex points, respectively, at a corner angle of the legs, said element further comprising means for forcing the apex points of the angle walls apart so as to impart in each leg a dislacement of the angle walls relative to each other which, in cooperation with the inclined end walls of the legs, causes contemporary and substantially equal expansion force to be applied so as to expand both legs in the ends of the respective frame sections to fasten the frame sections together.

3,967,911
SEALING MEMBER

John Aubrey Miers, Woodford Green, England, assignor to John Aubrey Miers, Woodford Green, England

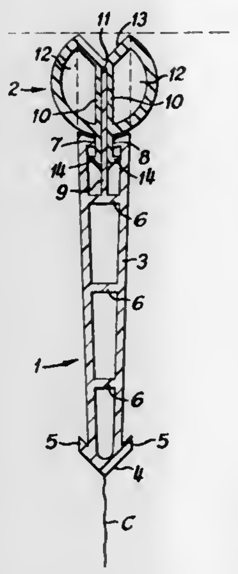
Filed Nov. 27, 1974, Ser. No. 527,867

Claims priority, application United Kingdom, Nov. 28, 1973, 55173/73

Int. Cl.^{2} E01C *11/02*

U.S. Cl. 404—48 **6 Claims**

1. An insertion member for use in the construction of concrete slabs, comprising a first eiongated element of rigid synthetic plastic material having an upper and a lower portion each extending longitudinally of said first element, said first element diverging in direction from said lower to said upper portion, said upper portion being formed with a shoulder region and with an upstanding reinforcing plate extending upwardly beyond said shoulder region, said plate being separated from said shoulder region by a pair of slits extending longitudinally of said first element; and a second elongated element of resiliently yieldable material including a bifurcated web extending longitudinally of said second element and having a top end and a pair of limbs extending downwardly from said top end and each having a lower end formed with a laterally extending rib, and a pair of hollow sections laterally flanking said web adjacent said top end thereof, said first and second elements being so connected that said second element straddles said reinforcing plate of said first element and said ribs of said limbs are received in said slits, respectively, so that said plate extends up to the uppermost part of said second element and so that, when said hollow sections are evacuated for insertion of the insertion member between the slabs, and thus collapsed against said reinforcing plate, the latter reinforces said hollow sections and said shoulder region protects the same from below during said insertion.



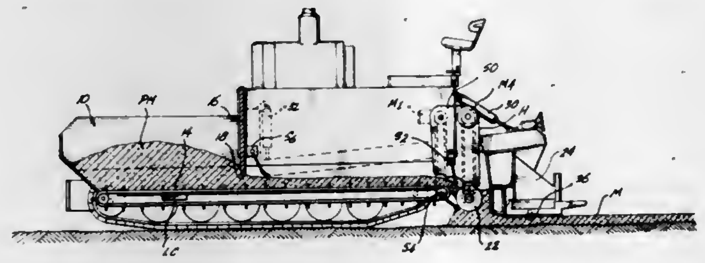
3,967,912
PAVER FEED CONTROL

Jimmy L. Parker, 19909 Filbert Drive, Bothell, Wash. 08011

Filed Mar. 18, 1974, Ser. No. 452,056

Int. Cl.^{2} E01C *19/00*

U.S. Cl. 404—84 **10 Claims**



1. In a paving machine comprising a pair of endless feed conveyors arranged to deliver paving material rearwardly from a hopper to the inboard ends of a pair of transverse augers which spread the material outwardly and deposit it onto the surface being paved forwardly of a leveling screed which trails the augers, the improvement comprising:

a fixed height opening at the hopper to control the amount of paving material that is delivered from the hopper onto each feed conveyor;

a separate variable speed drive means for each feed conveyor, each of which is operatively connected to its feed conveyor;

control means for the feed conveyor drive means, including a separate sensor for each feed conveyor, each of which is mounted on the paving machine adjacent the discharge end of its feed conveyor and at the inboard end of the associated auger, for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated feed conveyor as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such feed conveyor as the level rises;

a separate variable speed drive means for each auger, each of which is operatively connected to its feed conveyor; and

control means for the auger drive means, including a separate sensor for each auger, each of which is mounted on the paving machine adjacent the outboard end of its auger for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated auger as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such auger as the level rises, whereby the feed conveyors and the augers are continuously being independently and automatically driven at speeds proportional to the demand for paving material at the discharge ends thereof.

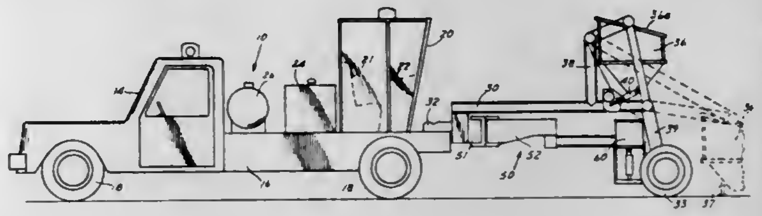
3,967,913
ASPHALT ROADWAY PATCHING APPARATUS

Gifford W. Gabriel, Jr., 8198 S. Marshall St., Littleton, Colo. 80123

Filed Dec. 16, 1974, Ser. No. 533,158

Int. Cl.^{2} E01C *19/18*

U.S. Cl. 404—109 **7 Claims**



1. In an asphalt pavement patching vehicle having a supply hopper provided with an outlet and a small distribution hopper mounted on an articulated arm for distributing small portions of asphalt material from said supply hopper to a predetermined area comprising:

a. auger means mounted in the supply hopper arranged to move material to said outlet and said outlet being positioned for depositing the asphalting material into the distribution hopper, said auger means including a central tube member supporting helical flights for movements of material;

b. burner means extending internally of and along said tube member for heating said tube member and the asphalting material surrounding said tube member;

c. frame means for the supply hopper arranged for supporting the same in an elevated position on the vehicle for supplying asphalting material to said distribution hopper by gravity and constructed for lowering the supply hopper to ground level permitting filling of the same with a conventional dump truck; and

d. means mounted between said frame means and said supply hopper for moving the supply hopper to and from ground level to its elevated position.

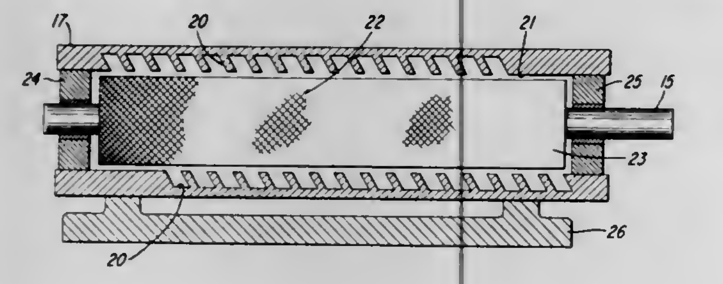
3,967,914
POWER GENERATING SYSTEM

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 402,064, Oct. 1, 1973, abandoned, which is a division of Ser. No. 196,478, Nov. 8, 1971, Pat. No. 3,800,528. This application Jan. 6, 1975, Ser. No. 538,527

Int. Cl.^{2} F04D *19/00*

U.S. Cl. 415—90 **14 Claims**



1. A turbine comprising
a stator having a cylindrical bore;
a cylindrical rotor coaxially journalled in said stator and provided with a substantially uniformly rough lateral surface; and
an output shaft secured to the rotor and projecting axially from one end of the rotor;
said stator being provided with a motive fluid inlet port near one end of the rotor and with a motive fluid outlet port near the other end of the rotor; and
the inner wall of said stator being provided with a continuous oblique helical groove over that portion of the inner wall which is coextensive with the lateral surface of the rotor, one end of said groove communicating with said inlet port and the other end of said groove communicating with said outlet port.

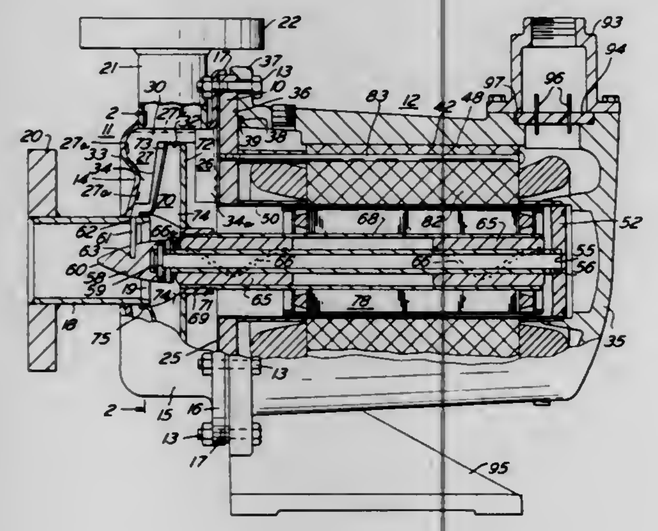
3,967,915
CENTRIFUGAL PUMP

David P. Litzenberg, 1528 Bryant Lane, Meadowbrook, Pa. 19046

Filed Jan. 27, 1975, Ser. No. 541,492

Int. Cl.^{2} F04D *29/44*

U.S. Cl. 415—209 **9 Claims**



1. A centrifugal pump for liquids comprising
a pump casing having a liquid inlet connection and a liquid delivery connection communicating with the interior thereof,
a rotatably mounted centrifugal liquid impeller in said pump casing with which said inlet connection is in communication, and
said impeller having a plurality of impeller blades between two spaced outwardly extending shrouds and said shrouds being spaced from said pump casing,
said pump casing having said inlet connection longitudinally alined with the rotational axis of said impeller,
said pump casing having the interior thereof concentric with the rotational axis of said impeller, and
a cut-water plate member mounted in said casing contiguous to said delivery connection for guiding liquid from said impeller and in said casing to said delivery connection,
said plate member extending inwardly from the interior of the casing and having an inner edge extending transversely across the space between said shrouds at the periphery of said impeller and side wings disposed inwardly along said shrouds thereby providing a clearance opening determined by the diameter and width of the impeller and said plate defining with said casing a converging passageway toward said delivery connection.

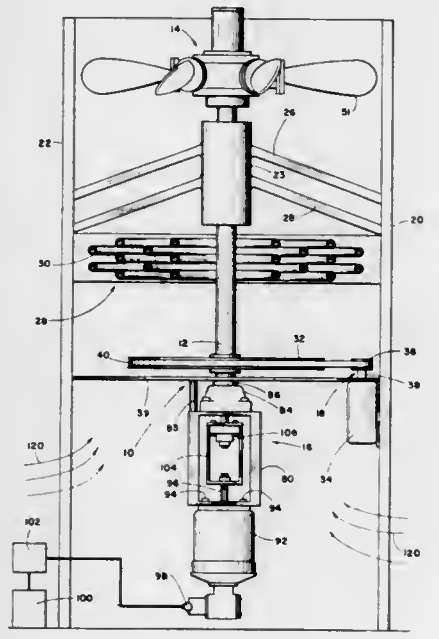
3,967,916
FAN ASSEMBLY

Charles N. Chittom, 728 S. Wheeling, Tulsa, Okla. 74104

Continuation-in-part of Ser. No. 368,820, June 11, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,826

Int. Cl.^{2} F04D *29/36*

U.S. Cl. 416—167 **6 Claims**



1. A fan comprising:
a. an elongated rotatable tubular shaft;
b. a fan blade assembly secured to one end of the tubular shaft, said fan blade assembly comprising a hub means secured to the tubular shaft, a plurality of circumferentially spaced outwardly extending fan blades carried by the hub means, each fan blade being rotatable about its own longitudinal axis;
c. elongated axial rod carried by the hub means, and reciprocally disposed inside the tubular shaft, means for operably connecting the axial rod to the fan blades for rotation of the fan blades about their longitudinal axis for changing the pitch of said fan blades when the elongated axial rod is longitudinally moved with respect to the tubular shaft;
d. pitch control means completely supported by the opposite end of the tubular shaft and comprising a first outer housing, a first thrust bearing carried by the outer housing and rotatably secured to the end of the tubular shaft, a linear actuator means secured to the outer housing and oppositely disposed from the first thrust bearing, said actuator means having a movable portion, a second housing disposed within the outer housing, a second thrust bearing carried by the second housing rotatably secured to the end of the axial rod, the movable portion of the actuator means secured to the second housing and oppositely disposed from the second thrust bearing;
e. means connected to the linear actuator means for reciprocally moving the second housing with respect to the outer housing, thereby reciprocally moving the axial rod with respect to the tubular shaft said movement being parallel to the centerline axis of the tubular shaft for changing the pitch of the fan blades.

3,967,917
PROCESS AND EQUIPMENT FOR LIFTING SECONDARY LIQUIDS WITH THE ENERGY OF PRIMARY LIQUIDS

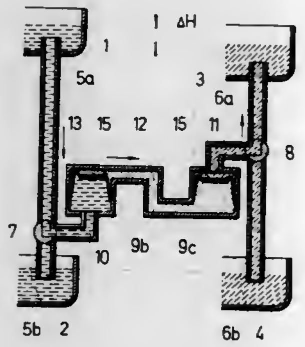
Janos Pucher, and Antal Schmieder, both of Budapest, Hungary, assignors to Nikex Nehezipari Kulkereskedelmi Vallalat, Budapest, Hungary

Continuation of Ser. No. 423,583, Dec. 10, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,700

Claims priority, application Hungary, June 19, 1970, PU 171

Int. Cl.^{2} F04B *1/06, 43/06*

U.S. Cl. 417—54 **8 Claims**



1. A process for elevating a secondary liquid with the potential energy of a falling primary liquid through energy exchange between the primary and secondary liquids in a plurality of vessels in which the primary and secondary liquids move with reciprocating motion and in which the intermixing of said primary and secondary liquids is prevented, comprising lifting the secondary liquid in two stages comprising a pressure stage and a suction stage, discharging said secondary liquid from said system during said pressure stage, drawing said primary liquid into said system during said pressure stage, drawing said secondary liquid into said system during said suction stage, discharging said primary liquid from said system during said suction stage, increasing the elevation of a portion of said primary liquid to increase the potential energy thereof, then decreasing the elevation of said portion of primary liquid to effect said suction stage of said secondary liquid, and disposing between said primary and secondary liquids a vertically movable weight means that separates said liquids from each other and whose potential energy is increased by said upward movement of a portion of said primary liquid and whose downward movement effects said suction stage of said secondary liquid, said primary and secondary liquids being continuously in contact with said weight means whereby vertical movement of said weight means transfers energy between said liquids.

3,967,918
ROTOR FOR ROTATING WING TYPE AIRCRAFT

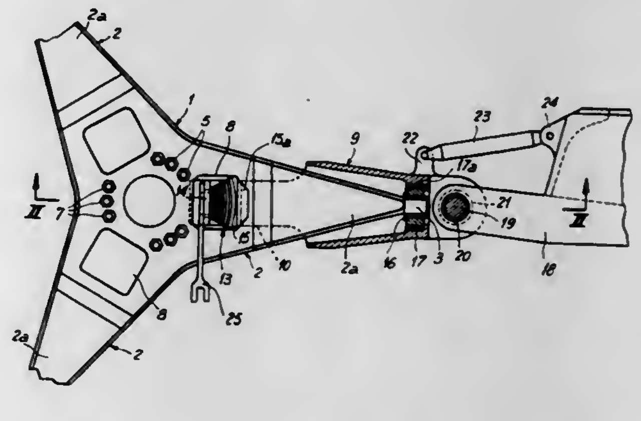
René Louis Mouille, Aix-en-Provence; René Louis Coffy, Marseille; Michel Aimé Hancart, Marignane, and Daniel Mao, Marseille, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 10, 1974, Ser. No. 469,045

Claims priority, application France, May 10, 1973, 73.16887; Mar. 7, 1974, 74.7776

Int. Cl.^{2} B64C *27/38*

U.S. Cl. 416—141 **12 Claims**



1. A rotor for a rotating-wing craft comprising a driving shaft, a flat star-shaped rotor hub made of resin-reinforced glass fibres and substantially extending in a plane perpendicular to said driving shaft, said rotor having a central part adapted for being secured to the end of said driving shaft and a plurality of flat arms extending each from said hub central part substantially along a radial axis in said plane, said hub central part and flat arms having, in the direction perpendicular to said plane, respective thickness of substantially different values so that said central part is rigid and said flat arms are flexible in said direction, a same plurality of rotor blades having each a root part, disposed in closed relationship to the outer end of one of said hub arms, each rotor blade extending from its root part substantially along said radial axis, first and second means for connecting the root part of each rotor blade to said hub central part and to the outer end of said hub arm respectively, said first and second connecting means being adapted for permitting resiliently limited rotations and sliding displacement of said blade root part around and along said radial axis in relation to said hub central part and arm, and said first connecting means being further adapted for transmitting centrifugal radial forces from said rotor blade directly to said rigid hub central part, whereby flapping movements of the rotor blades in said direction are permitted by the flexible hub flat arms and said connecting means.

3,967,919
COMPOUND TURBINE ROTOR

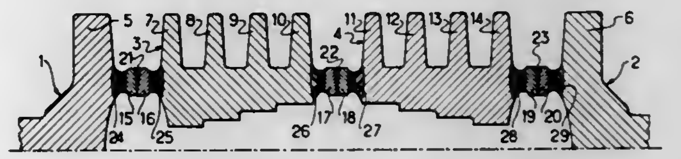
André Coulon, and René Perrin, both of Belfort, France, assignors to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Paris, Cedex, France

Filed Apr. 18, 1975, Ser. No. 569,435

Claims priority, application France, May 21, 1974, 74.17627

Int. Cl.^{2} F01D *5/06*

U.S. Cl. 416—198 A **4 Claims**



1. In a turbine rotor constituted by an axial succession of elements welded to one another and each comprising a blade bearing block, provided with at least one axial protuberance,

in the form of a body having a substantially circular cross-section, to which is welded a similar axial protuberance of an adjacent element, the improvement wherein: said axial protuberance is made of a steel different from that constituting said block and is joined to that block by a transition zone also made of steel.

3,967,920
HORTICULTURE SPRAYING SYSTEMS

Raymond G. Hill, P. O. Box 1043, Victoria, Tex. 77901

Division of Ser. No. 502,074, Aug. 30, 1974, Pat. No. 3,894,690. This application May 29, 1975, Ser. No. 581,905

Int. Cl.² F04B *21/00*

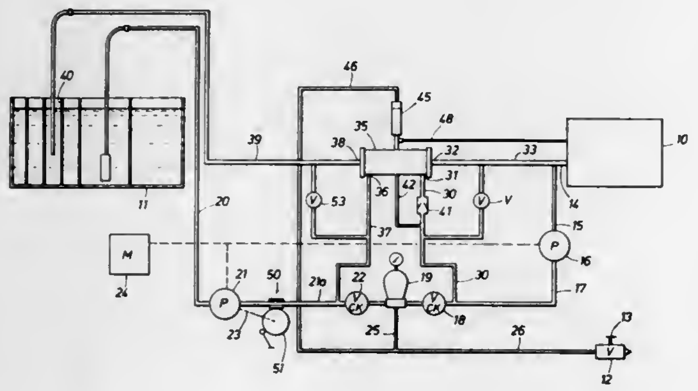
U.S. Cl. 417—63 **4 Claims**

1. Apparatus for metering the supply of liquid from a supply tank and pump means, comprising

pump means for discharging a fluid through an outlet conduit, said outlet conduit having a flexible section and said pump having a shaft rotatable in proportion to liquid flow through the pump,

means for timing the rotation of said shaft including a timing element rotatively supported on said pump shaft,

means responsive to pressure in said flexible section for selectively coupling said timing element to said pump shaft, and



means responsive to rotation of said timing element for producing an indication of pressure existant in said flexible section.

CHEMICAL

3,967,921
SOLID, NON-DUSTY DYESTUFF-FOAMS OF ANY DESIRED SHAPE AND SIZE

Roland Häberli, Wurenlingen, and Hans Mollet, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1973, Ser. No. 377,882

Claims priority, application Switzerland, Aug. 1, 1972, 11385/72

Int. Cl.² C09B *67/00*

U.S. Cl. 8—93 **5 Claims**

1. A solid foam dyestuff composition, comprising 10 to 99% by weight of a dyestuff, 0.1 to 20% by weight of a foaming agent, and up to 80% by weight of a bonding agent selected from the group consisting of dextrin, starch, gelatin, alginates, lignin sulphonates, polyacrylates, polyacrylamides, polyvinylpyrrolidone, and water glass, wherein all components of the composition are readily soluble in water.

3,967,922
GRANULAR DYESTUFF PREPARATIONS BASED ON POLYVINYLALCOHOL AS THE CARRIER

Karlheinz Wolf, Leverkusen; Reinhold Hörnle, Cologne; Hans Künzelmann, and Theodor Hild, both of Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1974, Ser. No. 495,902

Claims priority, application Germany, Aug. 16, 1973, 2341292

Int. Cl.² C08F *116/06;* **C09B** *67/00*

U.S. Cl. 8—93 **4 Claims**

1. A pulverulent or granular composition consisting essentially of

a. a water-soluble dyestuff; and

b. polyvinyl alcohol in the amount of from about 5% to about 100% by weight of said dyestuff.

3,967,923
PROCESS FOR THE WET TREATMENT OF TEXTILES

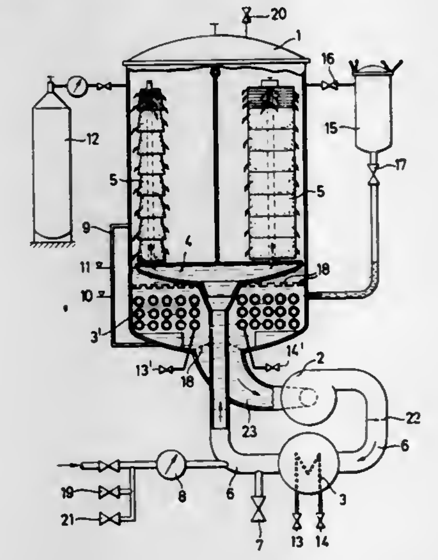
Bernhard Ameling, Coesfeld, Westphalia, Germany, assignor to Thies KG, Coesfeld, Westphalia, Germany

Filed Nov. 27, 1974, Ser. No. 527,801

Claims priority, application Germany, Dec. 1, 1973, 2359974

Int. Cl.² D06B *5/18*

U.S. Cl. 8—149.1 **13 Claims**



1. A process for the wet treatment of textiles by a treating liquor in a pressure-tight container suitable for use at high temperatures comprising the steps of:

suspending said textile material above said liquor;

subjecting said textile material to the flow of said treating liquor under pressure and elevated temperature outwardly from inside through the textile material to flow therethrough laterally at an angle to the vertical and down on the outside of the textile material below it and

pumping back said treating liquor into the interior of said textile material, the ratio by weight between said textile material and said treating liquor is from about 1:3 to about 1:6, respectively.

3,967,924
COMPOSITION FOR USE IN THE DYEING OF POLYESTER FIBERS

Cyril Hobday, Manchester, and Ian Michael Price, Glossop, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,098

Claims priority, application United Kingdom, Jan. 23, 1974, 3042/74; Aug. 8, 1974, 35060/74

Int. Cl.² D06P *5/04*

U.S. Cl. 8—169 **10 Claims**

1. A composition for use in the substantially crease-free dyeing of polyester fibres, said composition comprising a dyeing assistant, which is a phenoxy alkanol where the benzene ring is substituted by one or two chlorine atoms and a surface-active glyceride which is one produced by oxidation of a polyunsaturated oil followed by treatment with an alkali metal salt of an oxyacid of sulphur.

10. A process for the substantially crease-free dyeing of polyester fibres which comprises contacting the fibres with a dyebath containing a disperse dye in the presence of a nonfoaming composition comprising a dyeing assistant, which is a phenoxy alkanol where the benzene ring is substituted by one or two chlorine atoms and a surface-active glyceride which is one produced by oxidation of a polyunsaturated oil followed by treatment with an alkali metal salt of an oxyacid of sulphur.

3,967,925
CATIONIC DYEING OF NOVOLOID FIBERS

James Economy, Eggertsville, and George Y. Lei, Williamsville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,658

Int. Cl.² D06P *5/04*

U.S. Cl. 8—173 **14 Claims**

1. A composition for dyeing novoloid fibers, said composition comprising from about one to about ten percent cationic dye based upon fiber weight, from about three to about ten volume percent carrier medium, from about one to about ten volume percent formic acid, from about one to about five volume percent acetic acid, from about one to about four weight percent electrolyte, and water.

3,967,926
METHOD FOR INHIBITING THE CORROSION OF METALS WITH VAPOR PHASE INHIBITORS DISPOSED IN A ZEOLITE CARRIER

Iosif Lvovich Rozenfeld, ulitsa Gubkina, 4, kv. 96; Vlveya Pavlovna Persiantseva, ulitsa Krasikova, 19, kv. 3; Jury Igorevich Kuznetsov, ulitsa Dovatora, 1/28, kv. 7, and Nikolai Mikhailovich Petrov, ulitsa Petrovka, 20, kv. 30, all of Moscow, U.S.S.R.

Filed Nov. 9, 1973, Ser. No. 414,428

Int. Cl.² C23F *11/02, 11/14*

U.S. Cl. 21—2.5 B **7 Claims**

1. A method for inhibiting the atmospheric corrosion of metals in a sealed space with a corrosion-inhibiting amount of vapor phase inhibitors consisting of disposing in said sealed space a carrier means for diffusing the vapors of said inhibitors, said carrier means consisting of zeolites, and said carrier means containing a liquid inhibitor selected from the group

consisting of primary, secondary and tertiary amines, and mixtures thereof.

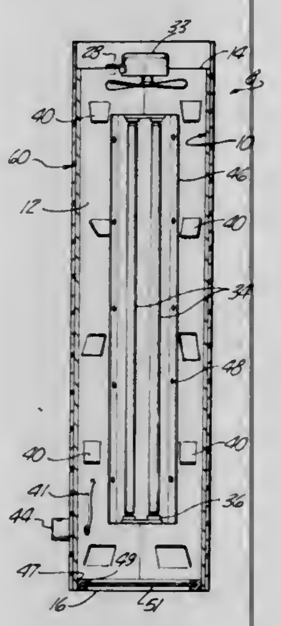
3,967,927
DECORATIVE ULTRAVIOLET LAMP FIXTURE

Lawrence Patterson, 28745 Berrywood Lane, Farmington Hills, Mich. 48024

Continuation-in-part of Ser. No. 514,600, Oct. 11, 1974, which is a continuation-in-part of Ser. No. 374,576, June 28, 1973, Pat. No. 3,846,072. This application Nov. 25, 1974, Ser. No. 527,048

Int. Cl.^{2} A61L *9/00*

U.S. Cl. 21—74 R **5 Claims**



1. An ultraviolet lamp fixture for purifying the air within a room, said fixture comprising:

a floor-to-ceiling tension supported pole;

a housing having a plurality of upright side walls;

means fastening a first of said housing walls to said tension supported pole such that said housing is supported in an upright position when said tension supported pole is positioned between a floor and a ceiling;

the lower portion and the upper portion of said housing being opened and respectively defining an air brake and an air outlet with the interior of said housing defining an air passageway between said air inlet and said air outlet;

a motorized fan releasably supported at said housing outlet for drawing air through said air intake into the interior of said housing and exhausting said air through said air outlet defined at the top of said housing;

means releasably securing said motorized fan between a pair of opposing side walls defining said housing;

a plurality of ultraviolet ray tubes mounted in said housing in said air passageway between said air inlet and said air outlet;

bracket means attached to adjacent side walls of said housing for supporting said tubes in an upright fashion in said air passageway;

a portion of a second of said side walls of said housing being pivotally attached to said housing to define an access door of a length at least equal to the length of said tubes to permit access to the interior of said housing to permit the dusting of the outer surfaces of said ultraviolet ray tubes without removing said tubes from said housing;

a circular decorative covering opened at opposite ends and encircling said housing and concealing the same, said cover being slidably movable with respect to said housing to permit removal of said covering from said housing to gain access to said door; the space between said first-mentioned side wall of said housing and the opposing inner surface of said decorative cover being of a sufficient distance to permit the passage of said tension supported pole; said decorative cover being releasably secured to said tension pole at spaced locations opposite said first-mentioned side wall.

3,967,928
METHOD FOR QUANTITATIVELY ANALYZING SUBSTANCES CONTAINING ELEMENTS OTHER THAN CARBON, HYDROGEN AND OXYGEN AND VOLATILE ORGANIC COMPOUNDS

Donald D. Schmidt; Gary L. Jewett; Richard G. Melcher, and Ritchie A. Wessling, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1974, Ser. No. 454,032

Int. Cl.^{2} G01N *31/06, 23/00*

U.S. Cl. 23—232 R **10 Claims**

1. A method of quantitatively analyzing substances having a vapor pressure of at least 1 Torr at room temperature, said substances containing elements other than carbon, hydrogen and oxygen said method comprising the sequential steps of (1) adsorbing directly from the atmosphere and untreated sample of said substances on a particulate, substantially dust and contaminant free carbonized product prepared by (A) first partially dehydrochlorinating a normally crystalline vinylidene chloride polymer at temperatures less than the melting point of said polymer to an extent of at least about 5 percent of theoretical HCl loss, then (B) completing the dehydrochlorination of the partially dehydrochlorinated polymer, in the substantial absence of oxygen, by heating said polymer to carbonizing temperatures from about 600°C to about 1200°C, then (2) quantitatively analyzing for said substances while said substances remain adsorbed on said carbonized material.

3,967,929
EXHAUST GAS PURIFYING SYSTEM

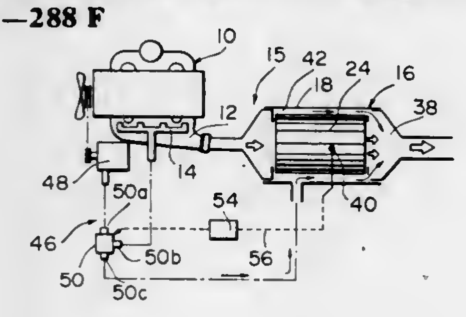
Tsuyoshi Tamazawa, and Hiroshi Yaguchi, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

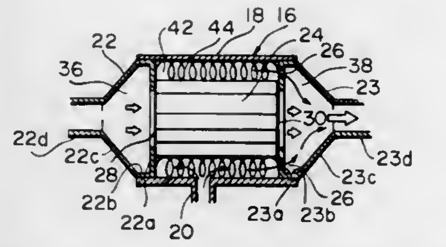
Filed Jan. 8, 1974, Ser. No. 431,606

Claims priority, application Japan, Jan. 13, 1973, 48-6832

Int. Cl.^{2} B01J *8/04;* **F01N** *3/15;* **B01J** *8/02, 8/00*

U.S. Cl. 23—288 F **10 Claims**





1. An exhaust purifying system for an engine, comprising;

a. a catalytic converter including a casing, exhaust gas inlet means for providing communication to the casing from an exhaust passageway of an engine, an outlet from the casing communicating with the atmosphere, catalytic means disposed in the casing and including an outer peripheral wall to provide a cooling chamber disposed between an inner circumference of the casing and the outer peripheral wall of the catalytic means, means spacing said catalytic means from the inner circumference of the casing, and an air inlet communicating with the space between the inner circumference of said casing and said catalytic means;

b. means defining an upstream opening of the catalytic means communicating with the exhaust gas inlet means and defining a downstream opening of the catalytic means communicating with the outlet to provide an inlet chamber between the exhaust gas inlet and the upstream opening of the catalytic means and an outlet chamber between the outlet and the downstream opening of the catalytic means, said exhaust gas inlet and outlet chambers being disposed at mutually spaced ends of said casing and of said outer peripheral wall;

c. a source of air;

d. a valve having an inlet communicating with the source of air and having a first outlet communicating with said cooling chamber through said air inlet, whereby air passing into said cooling chamber via said air inlet is in direct heat-exchange contact with the catalytic means; and

e. means, including temperature sensing means for feeding a signal to the valve when the temperature in the catalytic converter is above a predetermined level at which the activity of the catalyst means degenerates, to normally block communication between the source of air and said air inlet via the valve, and to selectively establish communication between the source of air and said air inlet via the valve in response to said electrical signal.

3,967,930
SEPARATION OF COMPLEX POTASSIUM SALTS FROM BRINE EVAPORITES

Abraham Sadan, Salt Lake City, Utah, assignor to N L Industries, Inc., New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,485

Int. Cl.^{2} B01D *9/04;* **C01D** *5/00*

U.S. Cl. 23—296 **6 Claims**

1. Process for separating kainite from a mixture of salts comprising essentially kainite and sodium chloride characterized by relatively coarse crystals comprising: slurrying said mixture of salts in a $MgCl_2$ brine, heating the slurry to temperatures above about 80°C. for a predetermind period of time such that said kainite only of said mixture of salts is converted by recrystallization to relatively fine crystals of langbeinite and carnallite in said slurry and thereafter subjecting the slurry to a particle size dependent separation process whereby the fine recrystallized langbeinite and carnallite are separated from the remaining relatively coarse crystalline salts.

6. In a process for producing potassium sulfate from salt deposits derived from naturally occurring brines wherein said salts comprise essentially a mixture of kainite and sodium chloride of relatively coarse crystal size the improvement comprising: adding said mixture of salts to a brine of from 28 to 32% $MgCl_2$ to form a slurry of about 50% solids, separating the sodium chloride from the kainite by heating said slurry to a temperature above 80° to as high as 120°C. for from one to two hours such that the kainite is converted by recrystallization to the potassium salts langbeinite and carnallite of relatively fine crystal size, separating these potassium salts from the relatively coarse sodium chloride crystals by elutriation, recovering the potassium salts substantially free of sodium chloride and then treating said potassium salts to recover the potassium values as potassium sulfate.

3,967,931
FLAME AEROSOL DETECTOR FOR LIQUID CHROMATOGRAPHY

Richard S. Juvet, Jr., Phoenix, Ariz., and Richard A. Mowery, Jr., Bartlesville, Okla., assignors to Research Corporation, New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,258

Int. Cl.^{2} G01N *31/08, 31/12*

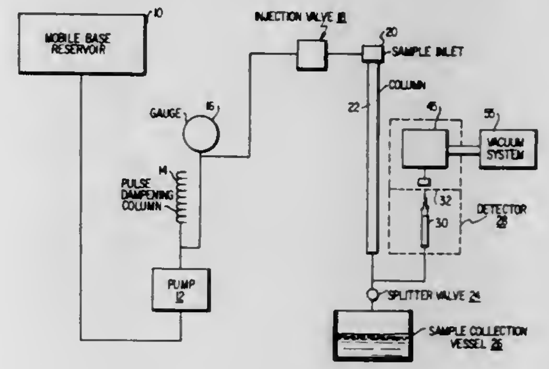
U.S. Cl. 23—230 PC **22 Claims**

1. A method of detecting components eluted from a liquid chromatograph comprising the steps of:

producing a liquid aerosol from a liquid sample eluted from said chromatograph,

ionizing at least a portion of said liquid aerosol,

filtering said ionized liquid aerosol to remove unwanted ionic species; and,



sensing variations in the current formed by the ionized liquid aerosol subsequent to said step of filtering whereby said components are detected.

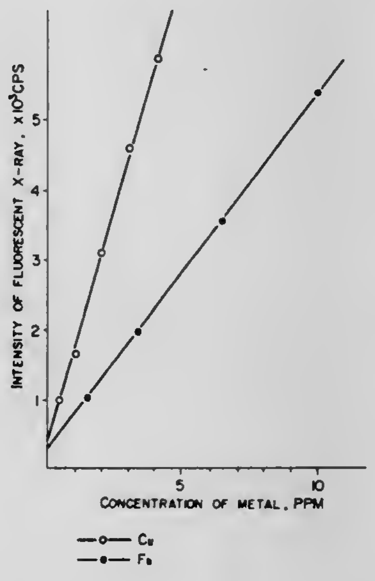
3,967,932
RAPID ANALYSIS OF CATION CONTAINED IN LIQUID

Takezo Sano, Takatsuki, and Akira Kobayashi, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 10, 1975, Ser. No. 621,344

Int. Cl.^{2} G01N *31/04, 23/223, 23/10*

U.S. Cl. 23—230 R **12 Claims**



1. A method for the rapid analysis of a cation contained in a liquid, which comprises filtering a liquid sample through a cation exchange filter paper having a high rate of ion exchange, which is composed of fibers having cation exchange functional groups, thus collecting in the top surface layer of said filter paper substantially the entire amount of the cation contained in said liquid sample, and analyzing the cation-loaded filter paper as such or the eluate obtained by elution of the objective cation from said cation-loaded filter paper to determine the cation.

3,967,933
DUAL CHANNEL NITROGEN OXIDES ANALYZER

Edward Etess, La Jolla, and Allan L. Budd, San Diego, both of Calif., assignors to Monitor Labs, Inc., San Diego, Calif.

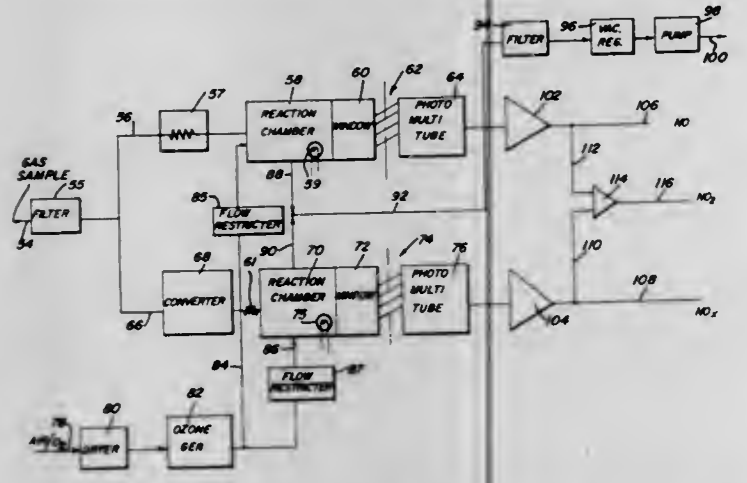
Filed May 23, 1974, Ser. No. 472,698

Int. Cl.^{2} G01N *33/00*

U.S. Cl. 23—232 E **10 Claims**

9. A method for measuring first and second compounds in a gas mixture sample, the method comprising the following steps:

continuously introducing the sample along two parallel paths;
continuously reacting the sample, along a first path, with a preselected reactant for causing chemiluminescence of the first compound in the sample;
continuously converting, along the second path, the second compound in the sample to the first compound;



continuously reacting, along the second path, the first compound with the reactant to cause chemiluminescence of the first compound;
continuously measuring the light emission from the first and second path chemiluminescence for determining the concentrations, in the mixture, of the first and second compounds.

3,967,934
PROTHROMBIN TIMER

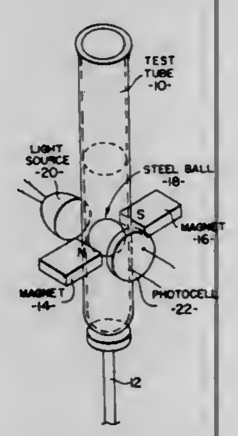
Lamont J. Seitz, Huntington Beach, and John G. Bowen, South Pasadena, both of Calif., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 846,992, June 13, 1969, Pat. No. 3,635,678, which is a continuation-in-part of Ser. No. 738,382, June 17, 1968, abandoned. This application June 25, 1971, Ser. No. 156,740

The portion of the term of this patent subsequent to Jan. 16, 1989, has been disclaimed.

Int. Cl.² G01N *11/10, 33/16*

U.S. Cl. 23—253 R **1 Claim**



1. Apparatus for use in determining the prothrombin time of a blood sample comprising: a container for holding the blood sample, a freely movable ferromagnetic member disposed in the container, a magnetic field source located near the container and forming a weak magnetic couple with the ferromagnetic member, means for producing relative movement between the ferromagnetic member and the container, the intensity of the magnetic field source being sufficient to prevent relative movement between the ferromagnetic member and the magnetic field source prior to clotting but insufficient to prevent relative movement between the ferromagnetic member and the magnetic field source on clotting due to an increase in the resistance to movement of the ferromagnetic member in the container imposed on the ferromagnetic member by the blood sample, and means for deriving a signal in response to relative movement between the ferromagnetic member and the magnetic field source, the signal signifying the end point in determining the prothrombin time.

3,967,935
CORROSION AND WEAR RESISTANT STEEL SINTER ALLOY

Fritz Frehn, Krefeld, Germany, assignor to Deutsche Edelstahlwerke Gesellschaft mit beschrankter Haftung, Krefeld, Germany

Filed Sept. 5, 1973, Ser. No. 394,475

Claims priority, application Germany, Sept. 11, 1972, 2244470

Int. Cl.² C22C *29/00*

U.S. Cl. 29—182.7 **4 Claims**

1. A corrosion-resistant and wear-resistant steel sinter alloy consisting essentially of 33% by weight titanium carbide, and 67% by weight of a ferritic steel matrix of the composition:

chromium	28.00%
molybdenum	2.00%
copper	0.50%
niobium	0.50%
aluminum	0.60%
titanium	0.30%
boron	0.01%
iron	balance.

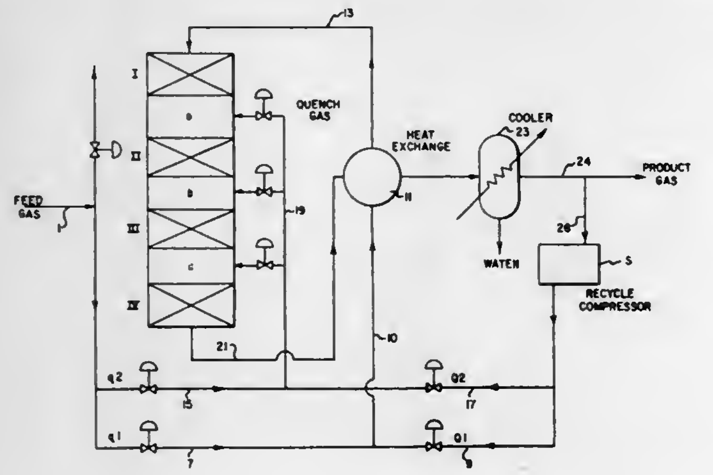
3,967,936
METHANATION PROCESS UTILIZING SPLIT COLD GAS RECYCLE

Daniel G. Tajbl, Evanston; Bernard S. Lee, Lincolnwood; Frank C. Schora, Jr., Palatine, all of Ill., and Henry W. Lam, Rye, N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,061

Int. Cl.² C10K *3/04*

U.S. Cl. 48—197 R **3 Claims**



1. A process for the methanation of feed gas in a series of at least two catalytic reaction zones each of said zones being separated by a quench zone wherein effluent from each of said reaction zones, except the last zone, is passed through a quench zone and into the succeeding reaction zone which comprises splitting said feed gas comprised of carbon monoxide and hydrogen into a first feed and a second feed, cooling product gas from the last of said reaction zones and splitting a portion of said cooled product gas into a first cold recycle gas and a second cold recycle gas, mixing said first cold recycle gas with said first feed gas, preheating said mixture of first feed gas and first cold recycle gas to a temperature sufficient to initiate the methanation reaction and prevent carbonyl formation and passing said gas mixture to the first reaction

zone, the ratio of said first feed gas to said first cold recycle gas being selected to provide a gas mixture containing a carbon monoxide and hydrogen content which upon methanation produces insufficient heat to raise the gas temperature above the upper safe operating temperature of the catalyst in said first reaction zone, mixing said second feed gas and said second cold recycle gas to form a quench stream and passing said quench stream into the quench zone for admixture with the reaction zone effluent to provide a resultant gas mixture having a temperature sufficient to initiate methanation reaction and prevent carbonyl formation on the catalyst, the ratio of said second feed gas to said second cold recycle gas being selected to provide a quench stream having a carbon monoxide and hydrogen content which upon methanation produces insufficient heat to raise the gas temperature above the upper safe operating temperature of the catalyst.

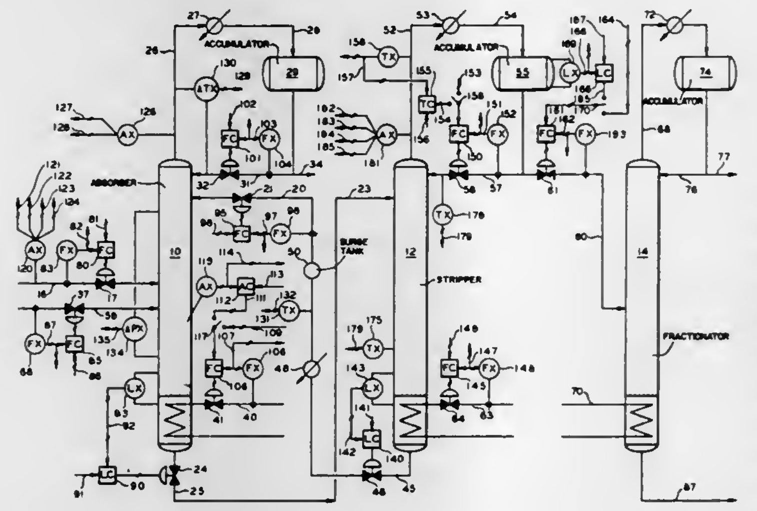
3,967,937
ABSORPTION PROCESS METHOD AND APPARATUS

James W. Hobbs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 30, 1974, Ser. No. 474,405

Int. Cl.² B01D *53/14*

U.S. Cl. 55—18 **49 Claims**



1. A method of operating an absorption process wherein a product constituent of a feed material is absorbed by an absorption medium and removed with said absorption medium as a bottoms product from an absorption zone, said method comprising:
establishing a first signal responsive to the concentration of said product constituent leaving said absorption zone in an overhead stream;
establishing a second signal responsive to the concentration of said product constituent in the feed entering said absorption column;
establishing a third signal representative of the maximum allowable flow rate of said absorption medium into said absorption zone;
establishing a mode control signal having a first condition indicative of the need for a maximum rate of production of said product constituent and a second condition indicative of the absence of a need for maximum product constituent production; and
responsive to said first condition of said mode control signal:
controlling the flow of said absorption medium into said absorption zone in response to said third signal;
generating from said first signal, said second signal, and said third signal, a fourth signal representative of the optimum flow rate of said feed material into said absorption zone; and
controlling the flow of said feed material into said absorption zone in response to said fourth signal.

3,967,938
PROCESS FOR THE SEPARATION OF A GASEOUS MIXTURE CONSISTING OF WATER VAPOR, HYDROCARBONS, AND AIR

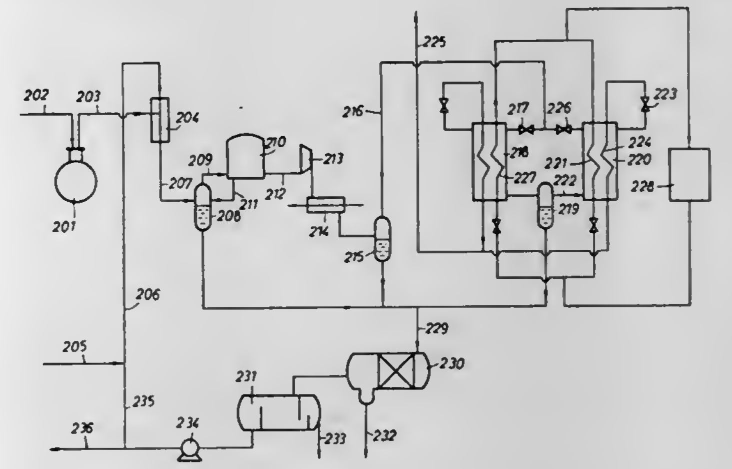
Werner Daeschler, Munich; Hans-Jakob Finkenauer, Mainz-Weisenau; Gerhard Frey, Munich; Hans Rainer, Munich, and Walter Schramm, Munich, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed July 22, 1974, Ser. No. 490,876

Claims priority, application Germany, July 20, 1973, 2337055; Oct. 5, 1973, 2350115; Oct. 5, 1973, 2350114; Dec. 20, 1973, 2363504

Int. Cl.² B01D *53/02*

U.S. Cl. 55—30 **4 Claims**



1. A process for the separation of hydrocarbons from a compressed gaseous mixture consisting essentially of air, hydrocarbons and water vapor, said process comprising cooling said gaseous mixture in a heat exchanger cooled by indirect heat exchange relationship with a closed refrigeration cycle, said cooling of said gaseous mixture being conducted in a first stage within said cooled heat exchanger to form a liquid condensate of water and hydrocarbons, and in a second stage in said cooled heat exchanger to freeze out residual hydrocarbons and water to form solid deposits on the tube surfaces of the heat exchanger; removing the air freed of water and hydrocarbon from said cooled heat exchanger, said cooled heat exchanger being a regenerated heat exchanger (220) of two alternating heat exchangers (218, 220), said gaseous mixture to be treated, prior to being cooled in the regenerated heat exchanger (220) having been utilized for the regeneration of the other heat exchanger (218) loaded in an earlier switching phase to melt off frozen-out water and hydrocarbons; recovering resultant melted condensate of water and hydrocarbons and the liquid condensate from said first stage, and separating water from resultant liquid phases to recover said hydrocarbons.

3,967,939
ELECTROSTATIC SCRUBBER-PRECIPITATOR

Addison B. Scholes, and Bruce F. Semans, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

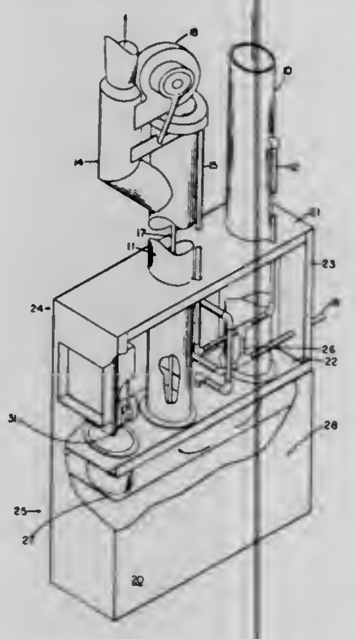
Division of Ser. No. 404,450, Oct. 9, 1973, Pat. No. 3,919,391. This application Apr. 24, 1975, Ser. No. 571,162

Int. Cl.² B03C *3/16*

U.S. Cl. 55—108 **1 Claim**

1. An apparatus for removing hot exhaust treatment gases containing hydroscopic materials including tin and titanium compounds, which comprises; means for exhausting and wetting the treatment gases, said means for wetting including a conduit with at least one pair of nozzles for directing a fluid treatment liquid sprays, a reservoir of liquid and situated above said reservoir and beneath said conduit for impringement of the gas and collecting at least some of the materials exhausted therethrough, means for imparting to the remaining treated materials an electrostatic charge, said imparting means including conduit means being positioned above said reservoir of fluid and spaced from said conduit, and means

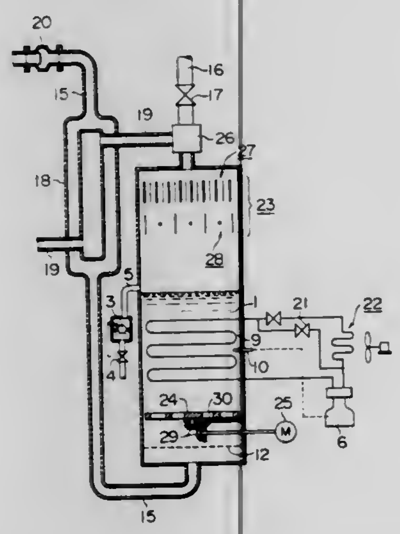
providing a liquid advancing collecting surface proximate said conduit means for removing the charged particles, said surface presenting a descending fluid film circumferentially of said conduit means, and means within the conduit means for imparting the electrostatic charge for condensing a substantial portion of the resulting exhausted gases, said means for imparting an electrostatic charge including a electrode having a multiplicity of needle-like electrodes directed toward said descending fluid film.



3,967,940
APPARATUS FOR COOLING AND DEHUMIDICATION OF COMPRESSED AIR

Itsuro Hirano; Mitsuru Uchiyama, and Masao Satoh, all of Tokyo, Japan, assignors to BF Kogyo Kaisha, Ltd., Tokyo, Japan

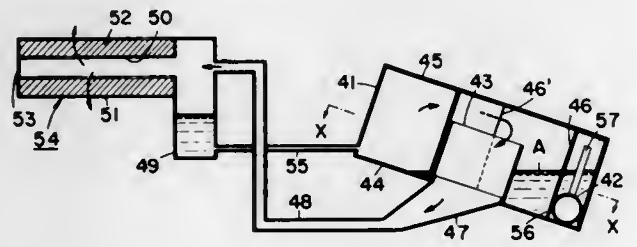
Filed June 13, 1975, Ser. No. 586,841
Int. Cl.² B03C *3/12*
U.S. Cl. 55—122 **3 Claims**



1. Apparatus for dehumidification of compressed air comprising a cooling tank (2), said tank having a lower portion adapted to be filled with cooling water, inlet means (15) for compressed air connected to said tank at the lower end thereof, a heat exchange coil pipe (9) located in said lower portion of said tank for receiving therethrough a cooling medium for cooling the cooling water, supply means (12) within said lower portion of said tank to form air introduced through said inlet means into bubbles as the air passes through the cooling water and outlet means (19) for compressed air connected to said tank at the upper end thereof, characterized in that dehumidification means (23) in the form of an electrostatic dust collector is provided in the upper portion of said tank for dehumidifying and cleaning air cooled by the cooling water, said dehumidification means including an ionizing portion (28) and a collecting portion (27) positioned above said ionizing portion, said collecting portion including a plurality of facing pole plates, one side of each facing pole plate being coated with an insulator material.

3,967,941
EXHAUST GAS LIQUID CONTACTOR

Kunio Terao, Kanagawa, Japan, assignor to Okamura Manufacturing Company Limited, Yokohama, Japan
Continuation of Ser. No. 186,677, Oct. 5, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,888
Int. Cl.² B01D *47/02*
U.S. Cl. 55—222 **1 Claim**

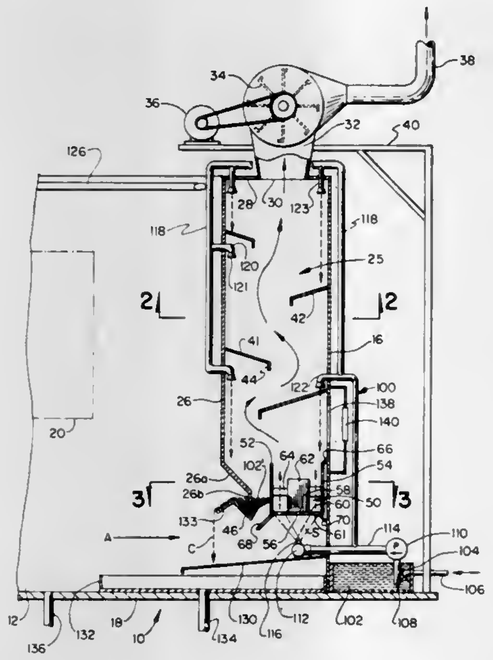


1. Apparatus for cleaning exhaust gas containing pollutants in the form of suspended particulate solid particles comprising in combination:

1. A tank having an inlet and an outlet, said tank comprising a substantially circular outer casing, said gas inlet pipe being tangentially connected to the lower portion of said tank; an inner cylinder erected in the center of said outer casing, said inner cylinder being slightly lower in height than said casing, and an arc-shaped air guide plate extending from an inside end of said gas inlet pipe in the outer casing to the outer peripheral face of said inner cylinder, and the bottom end of said inner cylinder being connected to the cooling means;
2. A gas inlet pipe connected to said tank and adapted to be connected to a source of heated gas containing pollutants;
3. A body of liquid within said tank, said gas inlet pipe being arranged relative to said body of liquid to insure gas-liquid contact to cause vaporization of said liquid and to form an intimate mixture of hot gas and liquid vapor;
4. An elongate gas outlet pipe, connected at one end thereof to said tank outlet, said outlet pipe having a length selected to make the said suitable to cool said mixture below the dew point of the liquid vapor so as to form droplets of liquid in the gas, the solid particulate material suspended in the gas serving as nuclei for the formation of such droplets; and
5. A filter connected to the other end of said elongate gas outlet pipe remote from said tank, said filter being adapted for separating the liquid droplets from the gas, whereby the solid particles, which would otherwise be too fine to be removed directly from the gas, are retained by the filter as the nuclei of the relatively larger liquid droplets, so that undesirable particulate material can be readily removed from an exhaust gas prior to discharge to the atmosphere.

3,967,942
PURIFYING APPARATUS

Barrie Reginald Kirby Pain, Oxford, England, and Gunnar Robert Wilhelmsson, Vaxjo, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Sweden
Continuation-in-part of Ser. No. 329,951, Feb. 2, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,161
Claims priority, application United Kingdom, Feb. 2, 1972, 4922/72
Int. Cl.² B01D *47/06*
U.S. Cl. 55—223 **11 Claims**



1. Apparatus for purifying an air stream laden with impurities, comprising:

a vertical duct having opposed spaced walls;
baffle means extending alternately from opposite ones of said walls to define a tortuous path for an air stream free of said impurities passing through said duct;
outlet means connected to the upper end of said duct;
suction means communicating with said outlet means for drawing said air stream through said tortuous path;
inlet means connected to the lower end of said duct, said inlet means comprising:
vertical plate means supported in said duct;
a horizontal bottom wall joined in part to said vertical plate means and having at least one slot therein with closely spaced edges for receiving said stream of air laden with impurities;
an upright guide structure extending from said bottom wall toward said outlet means and spaced between said plate means adjacent said slot, to define a narrow passage leading to said tortuous path; and
spray means below said bottom wall for directing a conical spray of a washing liquid against the underside of said bottom wall toward said slot as a cone whose maximum diameter just exceeds the extent of said slot whereby said washing liquid is distributed into fine drops by the edges of said slot so that said fine drops of liquid and said air laden with said impurities are mixed intimately to entrain said impurities in said drops.

3,967,943
METHOD OF IMPROVING GLASS BATCH MELTING BY USE OF WATER GLASS

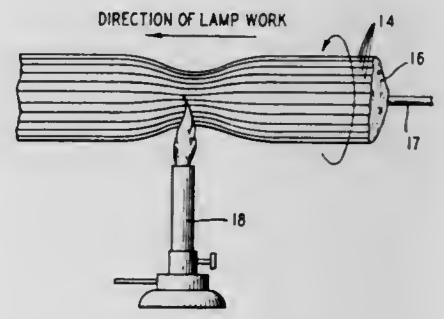
Clarence E. Seeley, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Oct. 30, 1974, Ser. No. 519,084
Int. Cl.² C03B *1/00, 5/16;* **C03C** *3/04*
U.S. Cl. 65—27 **6 Claims**

1. In the preparation of a glass composition containing Na_2O as an oxide constituent thereof, said composition being melted from a batch of glass making materials including sodium-containing batch materials which upon melting provide the said Na_2O content of said composition,

the improvement comprising,
preparing an unreacted batch of glass making materials into which sodium silicate water solution is mixed as one of the sodium-containing materials thereof, the amount of sodium silicate water solution being such as to provide about 1–10% of the total Na_2O content of said composition, said batch including the said sodium silicate water solution being prepared at ambient temperature so that the components thereof do not react or set up,
including in said batch at least one other sodium-containing material in addition to said sodium silicate water solution, the other sodium-containing material being present in said batch in particulate solid form and providing about 90–99% of the total Na_2O content of said composition,
the batch being semi-wet through the inclusion of said water solution,
gradually charging the thus prepared unreacted semi-wet batch to a continuous melting furnace after said sodium silicate water solution has been mixed into it but before it hardens, so that batch setup does not occur,
melting the batch so formed in the furnace,
and forming non-particulate bulk articles such as beverage containers from the molten glass, the percent pack of the finished articles exceeding that of similar articles having the same oxide analysis but made without use of any sodium silicate water solution.

3,967,944
MILLICANE GLASS AND A METHOD FOR ITS PRODUCTION

Helen Keller, and Raymond J. Keller, both of c/o Springville School, Springville, Pa. 18844
Filed Sept. 3, 1974, Ser. No. 502,386
Int. Cl.² C03G *23/20*
U.S. Cl. 65—36 **10 Claims**



1. A method for fashioning glass objects with a lamp so as to produce millicane surface effects on interior and exterior surfaces of the finished objects utilizing glass rods and a disposable core and following the steps which comprise:

assembling a sufficient number of said rods lengthwise touching one another and completely encircling said disposable core,
fusing at one end of said assembled rods all of the free ends thereof in common to join the assembled rods into a rigid unitary structure sustained independently from said core,
subjecting portions of the assembled rods to heat from said lamp uniformly applied to the outer surfaces of the assemblage of rods to cause adjacent touching portions of said rods to fuse together, and
shaping said assemblage during said last step simultaneously to fashion glass objects having a contiguous millicane surface effect.

3,967,945

METHOD OF SEALING GLASS OBJECTS TO ONE ANOTHER BY PASSING A CURRENT THROUGH THEM

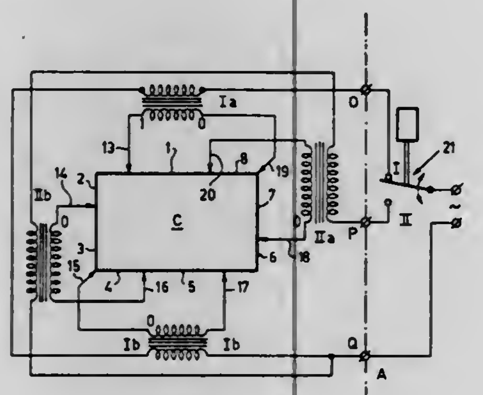
Theodorus Cornelis Groot, and Johan Josephus Hendricus Bogaard, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 452,150, March 18, 1974, abandoned. This application Feb. 6, 1975, Ser. No. 547,600

Claims priority, application Netherlands, Mar. 19, 1973, 7303770

Int. Cl.² C03B *23/20*

U.S. Cl. 65—40 **7 Claims**



1. A method of sealing glass objects to one another by passing an electric current through portions thereof, said method comprising the steps of:

preheating edges of objects to be sealed, the edges adapted to forming a seal joint;
positioning stationary electrodes about said entire seal joint;
supplying electric current to said electrodes from at least two independent current circuits, each circuit having at least two transformers, the secondary windings of said transformers being connected to said electrodes so that at least some successive electrodes of each circuit have potentials of opposite signs; and
switching said two circuits on and off.

3,967,946

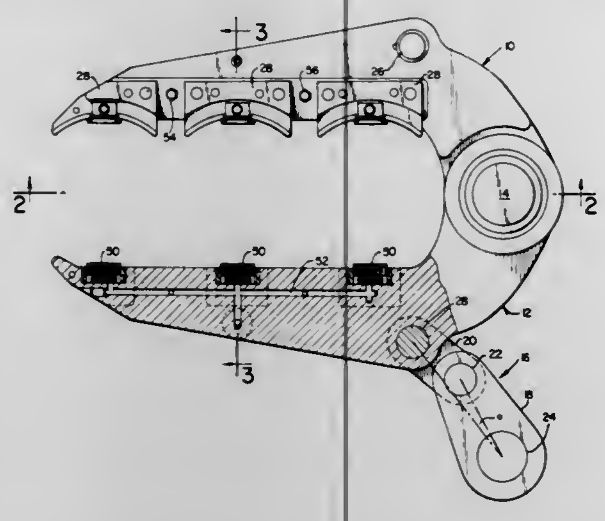
MOLD HOLDER ARMS FOR GLASSWARE FORMING MACHINE AND METHOD OF OPERATING THE SAME

Lyman Lavelle Campbell, East Longmeadow, Mass., assignor to Emhart Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 315,619, Dec. 15, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,089

Int. Cl.² C03B *9/44*

U.S. Cl. 65—68 **8 Claims**



7. A method of applying equal closing pressure on a plurality of glassware forming machine molds each of which comprises complementary halves, there being a plurality of such halves supported along each of a pair of arms pivotally connected at one end on a common axis and the halves on at least one arm being supported for movement relative to the said one arm while being engaged by pressure responsive means movably supported by said one arm, the said method comprising the steps of mechanically moving said arms toward each other to effect forceful engagement of the complementary mold halves and subjecting each pressure responsive means supported on said at least one arm to the same fluid pressure to limit movement of the mold halves relative to the said at least one arm and thereby to control the complementary mold halves in engagement.

3,967,947

METHOD OF MAKING A HOLLOW GLASS ARTICLE

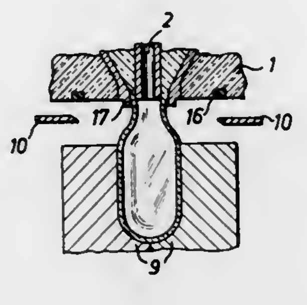
Franz Günthner, Mainz-Lerchenberg, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Apr. 5, 1974, Ser. No. 458,490

Claims priority, application Germany, Apr. 11, 1973, 2318116

Int. Cl.² C03B *9/00, 5/30*

U.S. Cl. 65—70 **5 Claims**



1. Method of making a hollow glass article, which comprises:

a. discharging molten glass from a feeder in the form of a tube closed at one end, into a finishing mold,
b. applying a pressure differential between the interior of the tube and the exterior thereof within the mold by blowing gas into the tube for shaping of the molten glass into the hollow article in the mold,
c. preventing deformation of the tube between the feeder and mold due to said pressure differential by sealing of the feeder against the mold throughout application of said pressure differential,
d. interrupting the blowing of gas into the tube and thereafter lowering of the mold relative to the feeder while the glass between the feeder and mold is still molten so that a neck forms interconnecting the hollow article in the mold and glass in the feeder, and
e. with the mold in the lowered position, severing the glass in the feeder from the hollow article in the mold at said neck, said severing leaving the hollow article with a closed upwardly disposed neck portion and the glass from the feeder with a closed downwardly disposed neck portion.

3,967,948

PURIFICATION OF PHOSPHORIC ACID WITH UREA AND NITRIC ACID

John F. McCullough, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

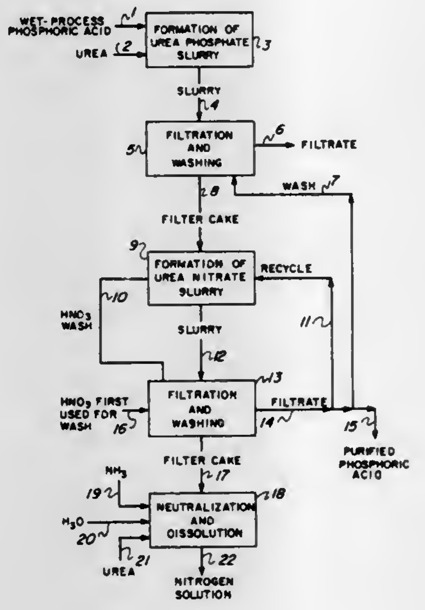
Filed Sept. 29, 1975, Ser. No. 617,699

Int. Cl.² C05C *1/00*

U.S. Cl. 71—29 **3 Claims**

1. A process for the partial or essentially complete purification of wet-process phosphoric acid by use of urea and nitric acid with co-production of nitrogen solution suitable for fertilizer use, which comprises the steps of:

1. mixing wet-process phosphoric acid with about stoichiometric amounts of urea to thereby prepare urea phosphate, said urea phosphate containing 50 percent or less of the impurities in the wet-process acid;
2. mixing said urea phosphate with nitric acid while maintaining the temperature of the resulting slurry of urea nitrate in phosphoric acid below 35°C for a period of time from 15 to 60 minutes; wherein for each mole of urea in the urea phosphate, 0.9 to 1.1 moles of nitric acid is used and the concentration of said nitric acid is in the range from 49 to 72 percent by weight;



3. separating the phosphoric acid from the solid urea nitrate in said slurry as product;
4. washing the solid urea nitrate with nitric acid of the same concentration as used in step (2) supra and subsequently using the nitric acid wash solution for reaction with urea phosphate in step (2); and
5. treating the washed urea nitrate with ammonia and water to form a nitrogen solution consisting of urea and ammonium nitrate.

3,967,949

FLUOROALKOXYPHENYL-SUBSTITUTED NITROGEN HETEROCYCLES AS PLANT STUNTING AGENTS

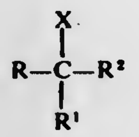
Robert Lee Benefiel, Manila, and Eriks Viktors Krumkalns, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 18, 1973, Ser. No. 371,106

Int. Cl.² A01N *5/00*

U.S. Cl. 71—76 **9 Claims**

1. A method of inhibiting the internodal growth of plants which comprises contacting the plants selected from the group consisting of crop plants, ornamental plants, and turf, with an effective growth inhibiting amount of a compound of the formula



$$R-\underset{\underset{R^1}{|}}{\overset{\overset{X}{|}}{C}}-R^2$$

wherein

R is 5-pyrimidinyl;
R^1 is isopropyl;
R^2 is trifluoromethoxyphenyl, tetrafluoroethoxyphenyl or pentafluoroethoxyphenyl;
X is hydroxy;
and the nonphytotoxic acid addition salts thereof.

3,967,950

COMBATING WEEDS IN RICE WITH BENZOTHIAZOLE DERIVATIVES

Saburo Kano; Osami Nomura, both of Odawara; Yoshihiko Hirono, Hiratsuka; Hisao Ishikawa, Oiso, and Shozo Yamada, Hiratsuka, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed June 10, 1974, Ser. No. 477,930

Claims priority, application Japan, July 2, 1973, 48-74610

Int. Cl.² A01N *9/22*

U.S. Cl. 71—90 **3 Claims**

1. A method of combating weeds in rice cultivation which comprises applying to the weed habitat a herbicidally effective amount of 3-(5-methylbenzothiazole-2-il)-1,1,3-trimethylurea.

3,967,951

SELECTIVE HERBICIDES

Yoshihiko Hirono, Hiratsuka; Hisao Ishikawa, Oiso; Shozo Yamada, Hiratsuka; Saburo Kano, and Osami Nomura, both of Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

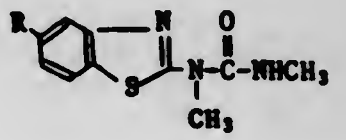
Filed Jan. 31, 1974, Ser. No. 438,475

Claims priority, application Japan, Feb. 5, 1973, 48-13768

Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **5 Claims**

1. A method of combating weeds which comprises applying to the weed habitat an effective amount of a compound of the formula



wherein R is selected from the group consisting of isopropyl and tert-butyl.

3,967,952

3,5-DIPHENYL-4(1H)-PYRIDAZINONES(THIGNES)

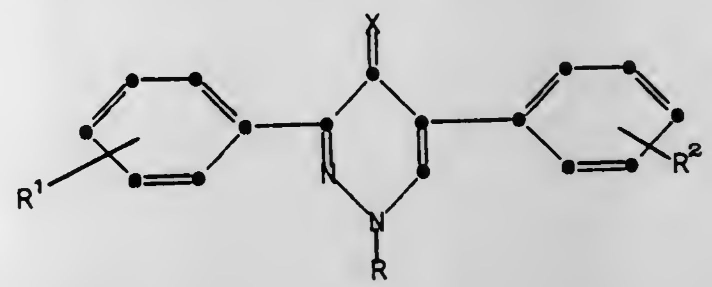
Riaz F. Abdulla, Greenfield, and Quentin F. Soper, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 3, 1975, Ser. No. 593,096

Int. Cl.² C07D *237/18, 237/14;* **A01N** *9/22, 9/12*

U.S. Cl. 71—92 **12 Claims**

1. A compound of the formula:



wherein

X represents oxygen or sulfur;
R represents C_1–C_3 alkyl;
R^1 and R^2 independently represent hydrogen, trifluoromethyl, fluoro, chloro, bromo or methyl.

7. An herbicidal composition which compromises a herbicidally active quantity of a compound of claim 1 and an inert carrier.

3,967,953

ROSE GROWTH STIMULATION

Robert R. MacMurray, Bloomsburg, Pa., assignor to American Agtech, Inc., Bloomsburg, Pa.

Continuation-in-part of Ser. No. 186,508, Oct. 4, 1971, Pat. No. 3,861,901, which is a continuation-in-part of Ser. No. 3,697,253, April 11, 1969. This application Nov. 25, 1974, Ser. No. 526,819

The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.

Int. Cl.^{2} A01N *9/20*

U.S. Cl. 71—97 **6 Claims**

1. A method of stimulating the growth of roses comprising applying thereto a composition including N,N-di-n-propyl-4-trifluoromethyl-2,6-dinitroaniline and 2,4-dichlorophenoxyacetic acid or salt thereof as active ingredients in a combined concentration and amount sufficient to stimulate growth of the roses.

4. The method of claim 1 and cacodylic acid or a salt thereof as an additional active ingredient, the active ingredients being applied in a concentration and amount sufficient to stimulate growth of the roses.

3,967,954

PRE-LEACHING OR REDUCTION TREATMENT IN THE BENEFICIATION OF TITANIFEROUS IRON ORES

James H. Chen, Corpus Christi, Tex., assignor to Benilite Corporation of America, New York, N.Y.

Continuation of Ser. No. 132,806, April 9, 1971, abandoned. This application Sept. 10, 1974, Ser. No. 504,829

Int. Cl.^{2} C22B *1/00*

U.S. Cl. 75—1 T **7 Claims**

1. In a process for the beneficiation of titaniferous iron ores which comprises the steps of

1. heating said raw material at a temperature of from about 1500°F. to about 2000°F. for from about 10 minutes to about 60 minutes with a reducing agent mixture of
   a. from about 3% to about 5% by weight based upon the weight of the raw material of a cabonaceous reducing agent or hydrogen or mixtures thereof and
   b. from about 0.2% to about 2% by weight based on the weight of the raw material of solid elemental sulfur to convert and lower the ferric oxide contaminant content of the raw material to acid-soluble ferrous oxide and ferrous sulfide, the latter in small amount,
2. rapidly cooling down the reduced raw material to a temperature of about 500°F. or lower out of contact with air to prevent reoxidation of the ferrous iron compounds to ferric iron compounds,
3. leaching the cooled and reduced raw material with a mineral acid leach liquor to provide a waste leach liquor containing acid-soluble iron contaminant values and acid-insoluble titanium values, and
4. separating these values from one another, the improvement which comprises said step (2) being performed by a procedure selected from the group consisting of
   a. quenching the reduced raw material with water,
   b. spraying water directly onto the reduced raw material,
   c. immersing the reduced raw material in a water bath, and
   d. passing the reduced raw material through a water tube cooler in direct contact with a cold metal surface;

whereby the purity of the beneficiated titanium dioxide product of the process is increased.

3,967,955

METHOD FOR TREATING A METAL MELT

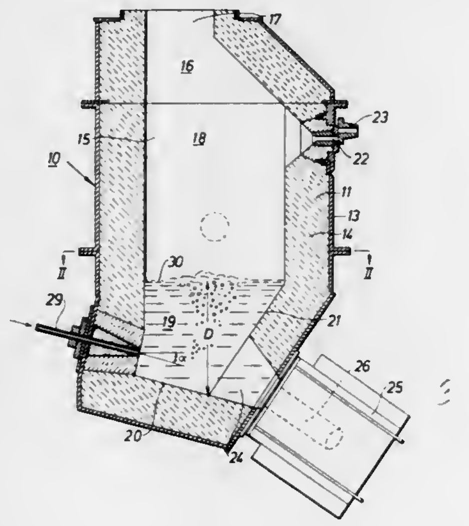
Kåre M. Folgerö; Bengt Fredriksson, both of Vasteras; Lars-Gunnar Norberg, Hagfors, and Karl-Erik Öberg, Borlange, all of Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Apr. 15, 1975, Ser. No. 568,159

Claims priority, application Sweden, Apr. 16, 1974, 74.05030

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—12 **7 Claims**



1. A method for treating a bath of molten metal in a reaction vessel having a refractory lining and at least one induction-heated space opening into the lower portion of the reaction vessel, said method comprising the step of injecting into the bath a mixture of gas and a solid material in powder form, said mixture containing at least 5 kilograms of solid material per cubic meter, as measured at normal temperature and pressure, of gas, and being injected through a tuyere extending through the lining and opening into the bath below the surface thereof, the injection being made in a direction between 15° above and 45° below the horizontal direction and at such a velocity and at such a weight rate that the momentum of the solid material corresponds to an injection of at least 0.03 kilogram of solid material per minute per square millimeter of internal cross-sectional area of the tuyère.

3,967,956

SEPARATION OF NOBLE METALS

John Blunden Payne, London, England, assignor to Matthey Rustenburg Refiners (Proprietary) Limited, Johannesburg, South Africa

Filed Dec. 10, 1974, Ser. No. 531,369

Claims priority, application United Kingdom, Dec. 13, 1973, 57796/73

Int. Cl.^{2} C22B *11/04*

U.S. Cl. 75—101 BE **36 Claims**

1. A process for the separation and purification of palladium which is present in a solution with at least one other platinum group metal, said process comprising the steps of:

a. adjusting, as necessary, the pH of the solution to render the solution acidic;
b. contacting the so-obtained acidic solution with an oxime solvent; and
c. removing from contact with the acidic solution the organic phase containing substantially all of the palladium present in association with the oxime solvent.

3,967,957

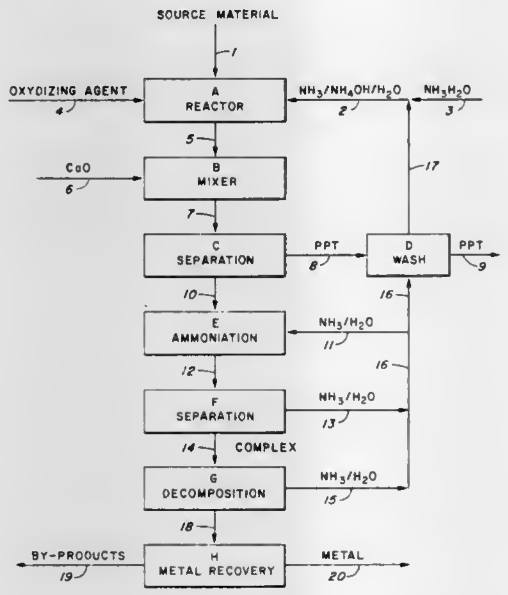
AQUEOUS AMMONIA OXIDATIVE LEACH AND RECOVERY OF METAL VALUES

Anthony G. Fonseca, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 26, 1973, Ser. No. 344,785

Int. Cl.^{2} C22B *15/10, 23/04*

U.S. Cl. 75—103 **6 Claims**



1. A process for recovering metal values from a source material containing sulfides of copper and nickel comprising:

a. leaching said source material with an oxidative ammonia leach solution;
b. recovering a pregnant leach liquor containing leached metal values and sulfate values;
c. adding a calcium salt or base to precipitate a portion of said sulfate values as calcium sulfate;
d. pressurizing said pregnant leach liquor to at least 5 psig with ammonia to precipitate complexes of copper and nickel;
e. recovering said complexes from said leach liquor and partially decomposing said complexes; and
f. recovering copper and nickel from the partially decomposed complexes.

3,967,958

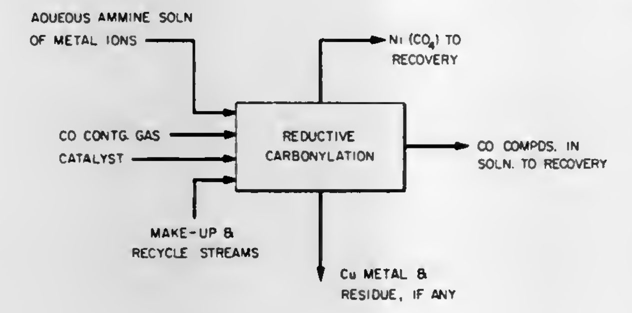
METHOD OF WINNING COPPER, NICKEL, AND OTHER METALS

Thomas H. Coffield, Waterloo, Belgium, and Kestutis A. Keblys, Southfield, Mich., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 55,850, July 17, 1970, Pat. No. 3,755,099, which is a continuation-in-part of Ser. No. 717,034, March 28, 1968, and a continuation-in-part of Ser. No. 807,987, March 17, 1969. This application Aug. 27, 1973, Ser. No. 391,619

Int. Cl.^{2} C22B *15/10, 23/04*

U.S. Cl. 75—103 **13 Claims**


AQUEOUS AMMINE SOLN OF METAL IONS
CO CONTG. GAS
CATALYST
MAKE-UP & RECYCLE STREAMS
REDUCTIVE CARBONYLATION
Ni (CO_4) TO RECOVERY
CO COMPDS. IN SOLN. TO RECOVERY
Cu METAL & RESIDUE, IF ANY

1. A process for recovering nickel values from manganese sea nodules, said process comprising:

a. comminuting said nodules;
b. subjecting the comminuted nodules to a reducing roast to convert the nickel values to nickel metal;
c. cooling the reduced nodules under non-oxidizing conditions;
d. oxidatively leaching said reduced nodules with an aqueous ammoniacal ammonium carbonate solution having a molar ratio of ammonia to metal of from 0:1 to 100:1 by injecting an oxygen-containing gas into a slurry of said reduced nodules in said aqueous ammoniacal ammonium carbonate solution;
e. contacting the resultant leach solution containing nickel ammonium salt complexes with a carbon monoxide-containing gas at a temperature of from about 50° to about 250°C and a pressure of from about 50 to about 3000 psig whereby the nickel values are reduced to nickel carbonyl;
f. separating said nickel carbonyl from said leach solution; and
g. decomposing said nickel carbonyl to metallic nickel.

13. A process of claim 1 wherein said manganese sea nodules contain recoverable amounts of nickel, copper, and cobalt, said process comprising:

a. comminuting said manganese nodules;
b. subjecting the comminuted nodules to a reducing roast to convert the nickel, copper, and cobalt to nickel metal, copper metal, and cobalt metal;
c. cooling the reduced nodules under non-oxidizing conditions;
d. oxidatively leaching said reduced nodules with an aqueous ammoniacal ammonium carbonate solution having a molar ratio of ammonia to metal of from 0:1 to 100:1 by injecting an oxygen-containing gas into a slurry of said reduced nodules in said aqueous ammoniacal ammonium carbonate solution;
e. contacting the resultant leach solution containing nickel, copper, and cobalt ammonium salt complexes with a carbon monoxide-containing gas at a temperature of from about 50° to about 250°C and a pressure of from about 50 to about 3000 psig whereby the nickel, copper, and cobalt values are reduced to nickel carbonyl, metallic copper, and cobalt tetracarbonyl anion;
f. separating said nickel carbonyl from said leach solution;
g. decomposing said nickel carbonyl to metallic nickel;
h. recovering said metallic copper;
i. separating said cobalt from said leach solution by injecting an oxygen-containing gas into said solution whereby said cobalt tetracarbonyl anion is oxidized to hydrated cobalt oxide; and
j. heating said hydrated cobalt oxide at a temperature sufficient to drive off the waters of hydration to produce cobalt oxide.

3,967,959

MIGRATION IMAGING SYSTEM

William L. Goffe, Webster, and George A. Brown, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 97,866, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 172, Jan. 2, 1970, abandoned. This application Dec. 13, 1973, Ser. No. 424,504

Int. Cl.^{2} G03G *13/00, 13/22*

U.S. Cl. 96—1 PS **16 Claims**

1. An imaging process comprising:

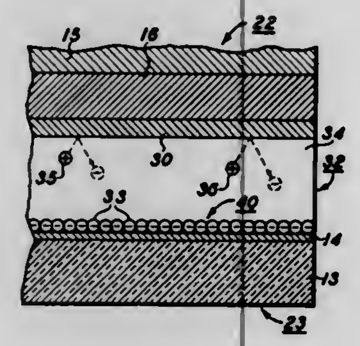
providing an imaging member comprising a substrate, a layer of substantially electrically insulating softenable material containing agglomerable migration marking marking material comprising a fracturable layer of said agglomerable migration marking material, said softenable layer capable of having its resistance to migration of agglomerable migration marking material decreased sufficiently to allow migration of agglomerable migration marking material in depth in said softenable layer, a layer of gelatin overlying said softenable layer and said fracturable layer of said agglomerable migration marking mate-

- rial contacting said gelatin layer-softenable layer interface;
- forming an electrical latent image on said imaging member; and
- developing said imaging member by decreasing the resistance to migration of agglomerable migration marking material in depth in the softenable layer at least sufficient to allow imagewise migration of agglomerable migration marking material in depth in the softenable layer.

3,967,960
PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING DARK CHARGE INJECTING ELEMENT

P. Keith Watson, Rochester; Paul J. Cressman, Fairport, and Richard V. LaDonna, Irondequoit, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 21, 1974, Ser. No. 516,702
Int. Cl.^{2} G03G *17/04*
U.S. Cl. 96—1 PE **22 Claims**



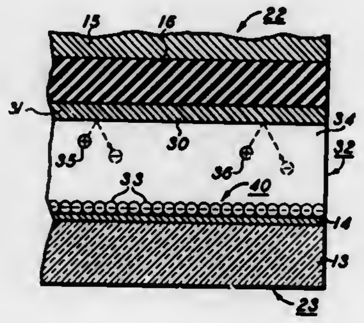
1. A photoelectrophoretic imaging process comprising the steps of providing an imaging layer comprising a suspension of electrically photosensitive pigment particles in an electrically insulating liquid placed between an electrically conductive electrode and a first blocking electrode, said conductive electrode being at least partially transparent to electromagnetic radiation to which at least a portion of said pigment particles are sensitive and said first blocking electrode being coated with a dark charge injecting agent, said dark charge injecting agent on said first blocking electrode being capable of causing said pigment particles to be substantially uniformly attracted to said conductive electrode when an electrical field is applied across said suspension in the dark between said conductive electrode and said first blocking electrode, subjecting said suspension to a first electrical field established between said conductive electrode and said first blocking electrode in the dark while in contact with said dark charge injecting agent whereby said pigment particles are substantially uniformly deposited on said conductive electrode, subjecting said imaging layer to a second electrical field established between said conductive electrode and a second blocking electrode free of said dark charge injecting agent while exposing said suspension to electromagnetic radiation to which at least a portion of said pigment particles are sensitive until an image is formed.

3,967,961
PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A DARK CHARGE INJECTING AGENT - ALKYD RESIN COATING

Luke C. Lin, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1974, Ser. No. 529,330
Int. Cl.^{2} G03G *17/04*
U.S. Cl. 96—1.2 **23 Claims**

1. A photoelectrophoretic imaging process comprising the steps of providing an imaging layer comprising a suspension of electrically photosensitive pigment particles in an electrically insulating carrier liquid placed between an electrically conductive electrode and a blocking electrode, said conductive electrode being at least partially transparent to electromagnetic radiation to which at least a portion of said pigment particles are sensitive and said blocking electrode being coated with a dark charge injecting agent, said agent being dispersed in a binder of an unpolymerized, electrically insulating, oil modified alkyd resin, wherein said dark charge injecting agent coating on said blocking electrode is capable of causing said pigment particles to be substantially uniformly attracted to said conductive electrode when an electrical field is applied across said suspension in the dark, subjecting said suspension to an electrical field established between said conductive electrode and said blocking electrode in the dark while in contact with said dark charge injecting agent containing binder whereby said pigment particles are substantially uniformly attracted to said conductive electrode, and during said electrical field application exposing said suspension to electromagnetic radiation to which at least a portion of said pigment particles are sensitive until an image is formed.



3,967,962
DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS

James J. O'Malley, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 418,628, Nov. 23, 1973, abandoned. This application Oct. 22, 1975, Ser. No. 624,676
Int. Cl.^{2} G03G *13/08, 9/02*
U.S. Cl. 96—15 D **14 Claims**

1. In an electrophotographic imaging process including the steps wherein a particulate electrostatographic toner composition is applied in image configuration to the surface of a recording member, and said recording member bearing said toner composition in image configuration is subjected to heat or heat and pressure sufficient to fuse said toner composition to the surface of said recording member, the improvement which comprises conducting said imaging process using a finely divided toner composition comprising a uniform mixture of:

- a. a colorant material and
- b. a polymeric material, said polymeric material comprising a segmented copolymer consisting of at least one crystalline or crystallizable polymeric segment chemically linked to at least one isomeric amorphous polymeric segment, said segmented copolymer having a glass transition temperature of less than about 20°C and a melting point of at least about 45°C.

3,967,963
BLEACHED HOLOGRAPHIC MATERIAL AND PROCESS FOR THE FABRICATION THEREOF USING HALOGENS

Andrejs Graube, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 463,013, April 22, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,634
Int. Cl.^{2} G03C *5/04, 5/32*
U.S. Cl. 96—27 H **7 Claims**

1. A process for the fabrication of a hologram having a resistance to printout greater than 500 seconds at a light power level of at least 3.4 watts per square centimeter and low film distortion consisting of the following steps;

- A. Exposing a photographic plate comprising a silver halide emulsion on a transparent substrate to the interfering beams of a laser,
- B. Developing and fixing said exposed plate in a conventional manner,
- C. Drying said developed plate,
- D. Exposing said plate to halogen vapor source until said plate is transparent, and
- E. Aerating said plate until halogen discoloration, if any, is removed.

3,967,964
PHOTOSENSITIVE FILM COMPRISING AN ORGANOPOLYSELENIDE AND AN ORGANOMERCURY COMPOUND

Dana G. Marsh, Rochester, and Joseph Y. C. Chu, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1975, Ser. No. 601,007
Int. Cl.^{2} G03C *5/24, 1/00*
U.S. Cl. 96—48 R **13 Claims**

1. An imaging method which comprises exposing in an imagewise manner to activating radiation a film comprising:

- a. an organic polymer as matrix material having uniformly dispersed therein;
  - i. an organopolyselenide characterized by the formula:

$$R_1\!-\!\!(Se)_n\!\!-\!R_2$$

wherein n is 2 or 3; and

R$_1$ and R$_2$ are aralkyl or alkyl hydrocarbon moieties; and

  - ii. an organomercury compound characterized by the formula:

$$R_3-Hg-R_4$$

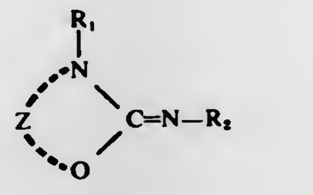
wherein R$_3$ and R$_4$ are aryl, aralkyl or alkyl hydrocarbon moieties thereby forming dark brown images with a metallic luster.

3,967,965
PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING ANTI-FOGGING AGENT

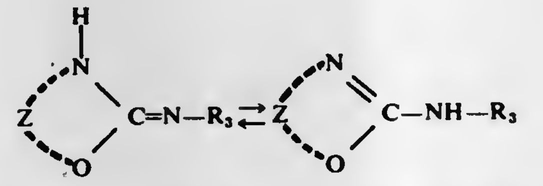
Keiichi Adachi; Akikazu Mikawa; Ikutaro Horie, and Hisashi Shiraishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 14, 1975, Ser. No. 540,764
Claims priority, application Japan, Jan. 14, 1974, 49-7271
Int. Cl.^{2} G03C *1/48, 1/06, 1/34*
U.S. Cl. 96—76 R **8 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer at least one of the layers of the photographic light-sensitive material containing in an amount sufficient to inhibit fog, a compound of the following general formulae (I) or (II):



(I)



(II)

wherein R$_1$, R$_2$ and R$_3$ each represents a hydrogen atom, an alkyl group, an aryl group or a six member heterocyclic ring containing up to two nitrogen atoms with the remaining atoms of the six member ring being carbon atoms, or R$_1$ and R$_2$ can combine to form a ring through a dimethylene group or a methylene carbonyl group in which the methylene moiety can be substitued with an alkyl group having 1 to 4 carbon atoms or a phenyl group, and Z represents an alkylene group having 2 to 4 carbon atoms or the organic acid salts or mineral acid salts of the compound of the general formula (I) or (II).

3,967,966
PHOTOGRAPHIC GELATINE LAYERS WITH IMPROVED PHYSICAL AND PHOTOGRAPHIC PROPERTIES

Wolfgang Himmelmann, Opladen; Gerhard Balle; Fritz Nittel, both of Cologne, and Wilhelm Saleck, Schildgen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 17, 1973, Ser. No. 351,850
Claims priority, application Germany, Apr. 19, 1972, 2219004
Int. Cl.^{2} G03C *1/72*
U.S. Cl. 96—114 **13 Claims**

1. In a photographic material containing a gelatin layer in which the gelatin is plasticized, the improvement according to which it is plasticized with a substantially water-insoluble compolymer of

- a. at least one C$_1$ to C$_{18}$ alkyl ester of acrylic acid or C$_4$ to C$_{18}$ alkyl ester of methacrylic acid, and
- b. a disulfonimide or sulfonimido-phosphate or sulfonimido-phosphoric acid amide,

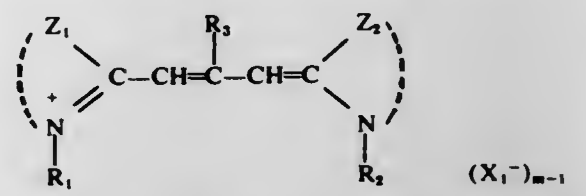
the copolymer being at least 70% (a) and at least 5% (b), and the copolymer being present in an amount from about 5% to about 100% of the gelatin by weight.

3,967,967
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Atsuo Iwamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

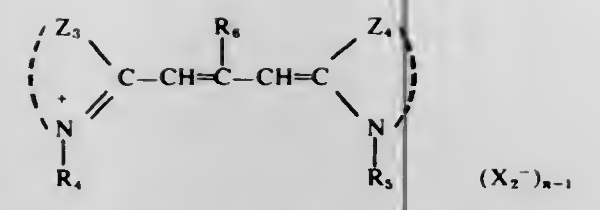
Filed Dec. 6, 1974, Ser. No. 530,102
Claims priority, application Japan, Dec. 6, 1973, 48-138344
Int. Cl.^{2} G03C *1/14*
U.S. Cl. 96—124 **10 Claims**

1. A silver halide photographic emulsion containing, in combination, supersensitizing amounts of (A) at least one sensitizing dye of the following general formula (I)



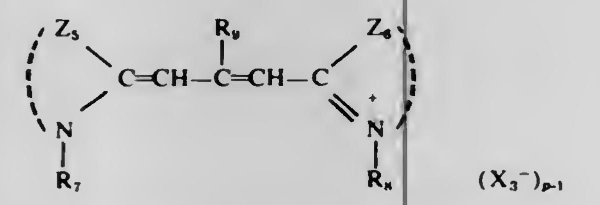
(I)

wherein Z$_1$ represents an atomic group required to form a benzimidazole ring; Z$_2$ represents an atomic group required to form a benzoselenazole ring; R$_1$ and R$_2$ each represents an aliphatic group, with at least one of R$_1$ and R$_2$ being a carboxy-containing alkyl group or a sulfo-containing alkyl group; R$_3$ is a hydrogen atom or an alkyl group; X$_1$ is an acid anion; and m is 1 or 2, and when m is 1 the dye forms an intramolecular salt; and (B) at least one sensitizing dye selected from the group consisting of a sensitizing dye of the following general formula (II)



(II)

wherein Z_3 represents an atomic group required to form a benzothiazole ring, a β-naphthothizole ring or a 62-naphthoselenazole ring; Z_4 represents an atomic group required to form a benzimidazole ring; R_4 and R_5 each represents an aliphatic group, with at least one of R_4 and R_5 being a carboxy-containing alkyl group or a sulfo-containing alkyl group; R_6 is a hydrogen atom or an alkyl group; X_2 is an acid anion; and *n* is 1 or 2, and when *n* is 1 the dye forms an intramolecular salt; and a sensitizing dye of the following general formula (III)



(III)

wherein Z_5 represents an atomic group required to form a benzothiazole ring or a benzoselenazole ring; Z_6 represents an atomic group required to form a benzoxazole ring; R_7 and R_8 each represents an aliphatic group, with at least one of R_7 and R_8 being a carboxy-containing alkyl group or a sulfo-containing alkyl group; R_9 is a hydrogen atom or an alkyl group; X_3 is an acid anion; and *p* is 1 or 2, and when *p* is 1 the dye forms an intramolecular salt.

3,967,968

BAND PLY DOPE COMPOSITIONS

Christopher Robin Stone, Fulham, and Brian Matthew Eugene McGarry, Kingston-on-Thames, both of England, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 365,650, May 31, 1973, abandoned, Continuation-in-part of Ser. No. 236,531, March 10, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,000

Int. Cl.² B28B *7/36, 7/38;* **C08L** *1/28;* **C09J** *3/04*

U.S. Cl. 106—38.28 **2 Claims**

1. A band ply dope in the form of a thixotropic composition, maintainable as a viscous sprayable material by moderate agitation which rapidly sets to a gel when agitation is terminated, such composition comprising an azeotropic mixture of isopropyl alcohol and water as the volatile liquid phase, such mixture having sufficient water to yield a boiling point below 90°C., a hydroxybutyl methyl cellulose thickening agent capable of imparting thixotropic properties to said liquid, a filler selected from the group consisting of finely divided mica and finely divided graphite, a high viscosity lubricant having a viscosity in excess of 2,000 centipoises at 20°C. and selected from the group consisting of a silicone oil and a silicone - polyglycol copolymer, said dope having 1.5 to 4 parts of said thickening agent, 10 to 40 parts of said finely divided filler, and 1 to 15 parts of said lubricant, all per 100 parts of said liquid phase, said dope composition being capable of drying to a strong, tough film containing said dispersed lubricant and filler.

3,967,969

HIGH ZIRCONIA CONTAINING GLASS CERAMIC CEMENT

Terence Stanley Busby, and Geoffrey Charles Cox, both of Sheffield, England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 253,669, May 1, 1972, Pat. No. 3,826,659. This application July 9, 1974, Ser. No. 486,754

Claims priority, application United Kingdom, May 5, 1971, 13278/71; Nov. 27, 1971, 55157/71

The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.

Int. Cl.² C03C *3/22, 3/04, 3/12*

U.S. Cl. 106—39.6 **3 Claims**

1. A glass ceramic cement comprising by weight 20% to 45% ZrO_2, 20% to 60% Al_2O_3, 0% to 27% SiO_2, 0% to 30% CaO, 0% to 10% Na_2O, the cement including at least one material selected from the group B_2O_3 and PbO, in the amounts up to 35% and 25% respectively, sufficient to assist in taking ZrO_2 into solution during the melting of said glass ceramic cement, B_2O_3 in the absence of PbO being in an amount more than 5%, PbO in the absence of B_2O_3 being in an amount more than 2%.

3,967,970

CELLUATION METHOD AND PRODUCT

John W. North, Decatur, Ga.

Continuation of Ser. No. 293,810, Oct. 2, 1972, abandoned. This application Dec. 27, 1974, Ser. No. 536,846

Int. Cl.² C04B *35/00*

U.S. Cl. 106—41 **7 Claims**

1. A method of preparing a bloated cellular product comprising:

a. admixing naturally occuring clayey material particles and an aqueous solution having dissolved therein a non-oxidizing flux for said material and a bloating agent containing reactable carbon under such conditions that the solution is uniformly dispersed and absorbed into the clayey material particles;

b. heating said admixture under temperature and time conditions sufficient to drive the liquid from said solution so as to cause the dissolved flux and bloating agent to migrate with the water to the surface of the particles and be deposited thereon as the water is driven off of the particles;

c. continuing the heating of said admixture under temperature conditions sufficiently high that said flux and said bloating agent become molten and flow into the particles; and

d. still further continuing the heating of said admixture under elevated temperature conditions above 2100°F and sufficiently high and for a sufficient length of time that the oxygen contained in said naturally occurring clayey material reacts with said carbon to produce an oxide of carbon in gaseous form and said clayey material particles become viscous, said bloating agent being so evenly dispersed in said viscous clayey material that the gases are trapped in said material, forming a cellular structure in said clayey material.

3,967,971

TRANSLUCENT CERAMIC WHITEWARE PRODUCTS

Richard A. Eppler, Timonium, Md., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 161,273, July 9, 1971, abandoned, and a continuation-in-part of Ser. No. 425,554, Dec. 17, 1973, abandoned. This application Dec. 31, 1975, Ser. No. 645,539

Int. Cl.² C04B *33/24, 33/00*

U.S. Cl. 106—45 **3 Claims**

1. A vitrified, translucent, low-expansion ceramic body suitable for glazing with a glaze, the ceramic body, consisting essentially of:

a semicrystalline, non-porous, whiteware ceramic body having an oxide analysis consisting essentially of 51.5 to 58 parts by weight SiO_2, 28 to 36 parts by weight Al_2O_3, 10 to 17 parts by weight MgO, and 4 to 10 parts by weight of oxides selected from Na_2O, K_2O, CaO, BaO, SrO, PbO, and ZnO, wherein the parts by weight are based on $SiO_2 + Al_2O_3 + MgO = 100$ weight parts;

said ceramic body having a coefficient of expansion less than 50×10^{-7} cm./cm./°C;

said ceramic body having a crystalline phase consisting of cordierite;

said ceramic body having an $Fe_2O_3 + TiO_2$ content of less than 1% by weight;

said ceramic body being substantially free of lithia (Li_2O); and

said ceramic body having a light transmission of at least about 0.9% per 0.1 inch thickness.

3,967,972

SOLUBLE SILICATE DISKS

Frank J. Lazet, Media, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Filed May 12, 1975, Ser. No. 576,515

Int. Cl.² C09J *1/02*

U.S. Cl. 106—74 **8 Claims**

8. A substantially dust free alkali metal silicate particle prepared by crushing a fracture and stress free, circular disk of alkali metal silicate which has a diameter of ¾ to 2½ inches (1.9 to 6.35 cm) and a thickness up to 7/16 of an inch (1.12 cm).

3,967,973

VEHICLE AND SEALING GLASS PASTE AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 246,316, April 21, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,202

Int. Cl.² C08K *5/11;* **C08L** *1/20, 1/18;* **C09J** *3/04*

U.S. Cl. 106—183 **6 Claims**

1. A vehicle for a glass frit, said vehicle comprising a solution of:

A. nitrocellulose

B. a solvent selected from the group consisting of amyl acetate, methyl amyl acetate, ethyl hexyl acetate, n-butyl acetate, isobutyl acetate, sec. butyl acetate and diethylene glycol monobutyl ether acetates;

C. hydroxypropyl cellulose having a molecular weight of about 40,000 to about 300,000; and

D. a solvent selected from the group consisting of ethylene glycol methyl ether and ethylene glycol ethyl ether; wherein said hydroxypropyl cellulose is present in an amount sufficient to impart stability to a paste comprising said vehicle and frit.

3,967,974

SYNTHETIC WOLLASTONITE AND A PROCESS FOR ITS MANUFACTURE

Walter Ohnemuller, Leverkusen, and Alexander Solf, Bensberg-Refrath, both of Germany, assignors to Reimbold & Strick, Cologne-Kalk, Germany

Continuation of Ser. No. 18,342, March 10, 1970, Pat. No. 3,861,935. This application Jan. 21, 1975, Ser. No. 542,796

Claims priority, application Germany, Mar. 12, 1969, 1912354

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C01B *33/24;* **C09C** *1/28*

U.S. Cl. 106—306 **4 Claims**

3. The pure, synthetic, crystalline beta-wollastonite having a BET specific surface area of 3 to 100 sq.m./g. and a crystal particle size of 0.01 to 2 um, which is the product made in accordance with the process which comprises subjecting an aqueous suspension of calcium oxide hydrate and a source of SiO_2 in a molar ratio of SiO_2:CaO of about 0.7 to about 1.3 to hydrothermal treatment in the range of about 100°C. to about 500°C. to produce calcium silicate hydrates having a SiO_2/CaO molar ratio of about 0.7 to about 1.3 and annealing the calcium silicate hydrates at about 800°C. to about 1150°C. to dehydrate the same to the substantially pure, crystalline beta-wollastonite, the solid contents of the aqueous suspension of calcium oxide hydrate and source of SiO_2 being about 30% to 80% by weight.

4. The pure synthetic crystalline beta-wollastonite of claim 3, wherein in the process there is added soluble alkali or alkaline earth metal salts to the initial aqueous suspension in an amount of about 2% to 10% by weight of the solids content.

3,967,975

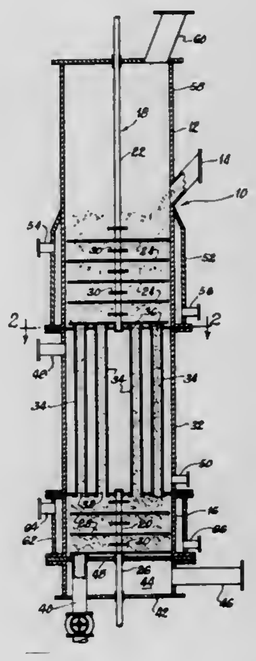
FLUIDIZATION APPARATUS

Leo R. Idaszak, Palos Heights, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 25, 1974, Ser. No. 526,784

Int. Cl.² C13K *1/06;* **C13L** *1/10;* **F26B** *17/10*

U.S. Cl. 127—23 **11 Claims**



1. Apparatus for carrying out fluidized operations comprising an elongate generally upstanding housing, said housing defining an upper chamber, an intermediate chamber and a lower chamber, said upper and lower chambers each including agitating means therein, said agitating means including rotatable agitator blades mounted in each of said upper and lower chambers, a plurality of open ended tubes positioned in said intermediate chamber, the open ends of each of said tubes communicating the interior of said tubes with the upper and lower chambers, respectively, inlet means to supply a fluidizable material to either of said upper or lower chamber, said intermediate chamber comprising jacket means surrounding the tubes to effect heat exchange therewith, outlet means to remove fluidizable material from the other of said upper or lower chamber and means to supply a fluidizing gas to the lower chamber whereby the fluidizing gas passes upwardly through the lower chamber, through each of the tubes and into the upper chamber while fluidizing the material therein, and outlet means in said upper chamber for removing said fluidizing gas.

3,967,976

METHOD FOR PREPARING ELECTRODES FOR AN ELECTROCHEMICAL STORAGE CELL

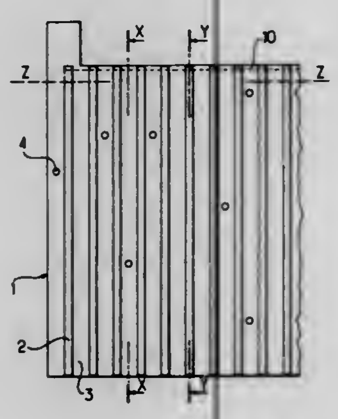
Robert Gadessaud, Massy, and Claudette Audry, Issy-les-Moulineaux, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 24, 1975, Ser. No. 561,501

Claims priority, application France, Mar. 28, 1974, 74.10902; Mar. 28, 1974, 74.10903

Int. Cl.^{2} H01M *35/18*

U.S. Cl. 136—75 **30 Claims**



1. A method for preparing an electrode for an electrochemical storage cell, the electrode comprising a collector part of an electronically conductive and chemically inert material coated on an electrochemically active part comprising an oxide of a metal, as well as a partly reticulated polymer, the method comprising:

A. preparing a substantially saturated solution of said polymer in water, and adding an agent capable of forming an aldehyde in a quantity sufficient for partly reticulating said polymer in contact with at least a catalyst, in a proportion of 5 to 20% by weight of the agent capable of forming the aldehyde based on the weight of said polymer;

B. adding a salt of said metal to the aqueous solution of said polymer in a proportion of 20 to 50 parts by weight for one part of said polymer, said salt being soluble in water and compatible with said polymer; the addition being at a temperature between 50° and 100°C;

C. filling a mould in which said collector part of the electrode has previously been placed with said solution, until said collector part of the electrode is completely immersed;

D. cooling the mould to a temperature of no lower than −20°C;

E. removing the cake formed in D) from said mould and immersing said cake in an alkaline solution saturated with an oxide of said metal;

F. washing said cake in cold water;

G. drying said cake at a temperature between 20° and 60°C; and

H. compressing said cake at a pressure between 2 and 10 bars/sq.cm., whereby

longitudinal strips of a material having, with respect to said electrochemically active part of said electrode, non-adhesive properties are deposited on each of the faces of said collector part, so that a space thus remains between said electrochemically active part and each of the longitudinal strips.

3,967,977

CLOSURE FOR GALVANIC DRY CELLS

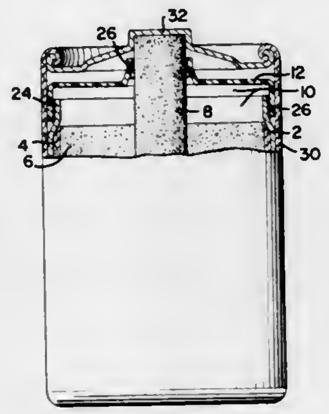
Richard B. Affeldt, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,133

Int. Cl.^{2} H01M *2/04*

U.S. Cl. 136—133 **10 Claims**

1. A galvanic cell comprising in combination a cylindrical container having an open end, an electrode comprising a depolarizer mix disposed within said container and separated therefrom by a separator, a current collector centrally embedded in said depolarizer mix and a closure covering the open end of said container, said closure having a tubular neck at its center and a tubular skirt at its periphery and being disposed such that the upper portion of the current collector passes through and is adhesively secured to the internal wall defining said tubular neck and the peripheral tubular skirt of the closure is disposed outside and is adhesively secured to the upper rim at the open end of said container thereby providing a closure seal for said cell and wherein the thickness of said closure is between about 0.005 inch and about 0.06 inch.



3,967,978

RESIN SHEET HAVING POROUS LAYERED STRUCTURE USEFUL AS ELECTRODE SEPARATOR FOR ELECTRIC CELLS

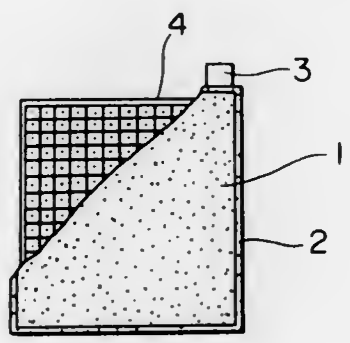
Seiichirou Honda, Kawanishi; Hiroyoshi Hata, Mishima; Yosimasa Simura, Mishima, and Soichi Une, Mishima, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1974, Ser. No. 455,726

Claims priority, application Japan, Mar. 30, 1973, 48-36930; Mar. 30, 1973, 48-36931; Apr. 5, 1973, 48-39229; Apr. 5, 1973, 48-39230

Int. Cl.^{2} H01M *2/14;* **136/***146*

U.S. Cl. 136—146 **16 Claims**



1. A resin sheet having a porous layered structure useful as an electrode separator for electric cells, said sheet comprising 100 parts by weight of an olefin resin having integrally and uniformly incorporated therein (A) 5 to 300 parts by weight, per 100 parts by weight of the olefin resin of a finely divided inorganic substance and (B) at least one substance selected from the group consisting of (1) 3 to 100 parts by weight per 100 parts of the olefin resin of a water-swellable thermoplastic resin, (2) 0.01 to 30 parts by weight per 100 parts by weight of the olefin resin of a water-insoluble or difficultly water-soluble hydrophilic nonionic surface active agent and (3) 0.01 to 30 parts by weight per 100 parts by weight of the olefin resin of a water-insoluble or difficulty water-soluble hydrophilic anionic surface active agent, said sheet including fine pores arranged throughout its cross section in a plurality of layers, the diameter of said pores being 0.005 to 20 microns and 40 to 90% of the pores being open cells of which the maximum pore diameter is 0.01 to 10 microns.

3,967,979

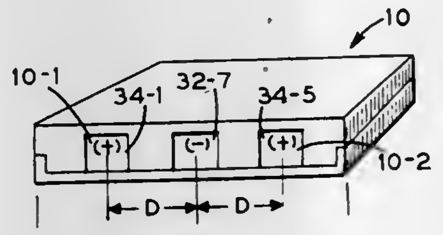
BATTERY AND CASE FOR APPLICATION IN RANDOM MODE TO SUPPLY PROPER POLARITY TO APPARATUS TO BE ENERGIZED

Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Dec. 4, 1974, Ser. No. 529,310

Int. Cl.^{2} H01M *1/02*

U.S. Cl. 136—173 **11 Claims**



1. A battery cartridge comprising a case with an interior bounded in part by a wall having a succession of apertures therethrough, a first aperture in said succession being situated equidistant from second plural apertures in said succession, cell means disposed in said case interior and having first and second polar surfaces for providing a voltage difference therebetween, terminal means for said cartridge comprising a first terminal juxtaposed with said first aperture and second terminals juxtaposed individually with said second apertures, first electrically conductive means in said case interior for connecting said first terminal to said cell means first polar surface and second electrically conductive means in said case interior for connecting said second terminals in common to said cell means second polar surface.

3,967,980

METHOD FOR FORMING A DRY CHARGE-TYPE BATTERY ITSELF

Anthony Sabatino, St. Paul, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Filed July 8, 1974, Ser. No. 486,659

Int. Cl.^{2} H01M *10/04*

U.S. Cl. 136—176 **3 Claims**

1. A method of manufacturing a lead-acid storage battery including a container having a plurality of cell compartments and a plurality of battery elements consisting of a plurality of positive and negative plates with separators positioned therebetween, the battery elements being electrically connected, to provide a battery capable of being stored and thereafter activated by the addition of activation electrolyte, and, if required, charging, which comprises forming the plates by bringing said plates into contact with a formation electrolyte and applying current thereto at levels and for time to reach the desired end-of-charge voltage, treating the battery elements such that sufficient acid will be retained in the elements to provide, upon activation, including the addition of activation electrolyte having a specific gravity of about 1.265, a battery operating electrolyte having a specific gravity in the range of from about 1.260 to 1.290, the formation electrolyte being drained from the battery and said treating being carried out by adding a development electrolyte and allowing the development electrolyte to diffuse into and saturate the battery elements and mix with the residual formation electrolyte therein, draining the battery leaving the battery elements substantially saturated, reducing the level of residual acid retained in the battery plates sufficiently below saturation so that, on standing, the retained acid will not migrate to the outer surfaces of the battery elements so as to form liquid bridges between the plates and separators that result in crystal growth and clusters of crystals creating internal shorts, and sealing the battery.

3,967,981

METHOD FOR MANUFACTURING A SEMICONDUCTOR FIELD EFFORT TRANSISTOR

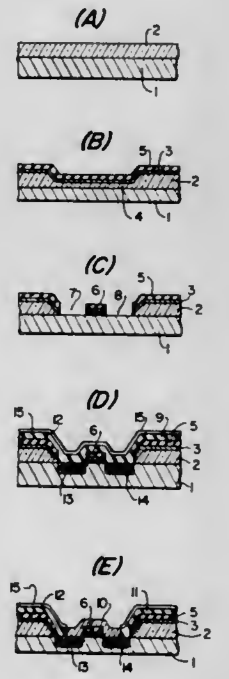
Shumpei Yamazaki, 20-7, 1-chome, Shinkawa, Shizuoka, Japan

Continuation of Ser. No. 575,032, May 5, 1975, abandoned, which is a continuation of Ser. No. 407,878, Oct. 19, 1973, abandoned, Division of Ser. No. 213,998, Dec. 30, 1971, abandoned. This application June 25, 1975, Ser. No. 590,082

Claims priority, application Japan, Jan. 14, 1971, 46-000799; Jan. 14, 1971, 46-000798

Int. Cl.^{2} H01L *7/34*

U.S. Cl. 148—1.5 **7 Claims**



1. A method for making a semiconductor structure having at least two diffused regions of one conductive type in a semiconductor substrate, which comprises: forming an insulating layer on said substrate, etching away a portion of said insulating layer, diffusing impurities into said exposed portions of said semiconductor substrate to form said diffused regions, forming a selectively oxidized conductor layer on said diffused regions and said insulating layer by forming a mask selectively on such conductor layer, and fully oxidizing the unmasked portion by anodic oxidation and simultaneously making conductive leads of said masked portion of said conductor layer on said insulating layer and electrodes of said unmasked portion of said conductor layer contacting with said diffused regions.

3,967,982

METHOD OF DOPING A SEMICONDUCTOR LAYER

Heinz-Herbert Arndt, Taufkirchen; Joachim Burtscher, Munich; Gustav Fischer, Nurnberg; Ernst Haas, Erlangen; Joachim Martin, Erlangen; Gunter Raab, Erlangen, and Manfred Schnoeller, Haimhausen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 11, 1975, Ser. No. 595,150

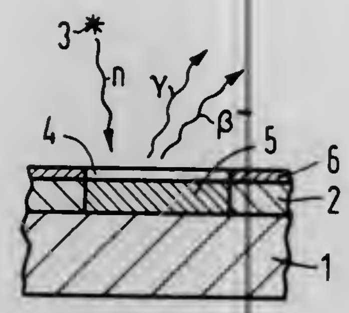
Claims priority, application Germany, July 15, 1974, 2433991

Int. Cl.^{2} H01L *21/263*

U.S. Cl. 148—1.5 **16 Claims**

1. A method of doping a semiconductor layer arranged on a substrate with a dopant substance comprising:

subjecting said semiconductor layer to controlled bombardment by neutrons so that atoms of said semiconductor



layer are converted by a nuclear reaction into dopant substance atoms.

3,967,983
METHOD FOR MAKING A ALUMINUM NICKEL BASE ALLOY ELECTRICAL CONDUCTOR

Enrique C. Chia, and Roger J. Schoerner, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 160,189, July 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 147,196, May 26, 1971, abandoned. This application Feb. 21, 1974, Ser. No. 444,497

Int. Cl.^{2} C22F *1/04*

U.S. Cl. 148—2 **4 Claims**

3. Method of preparing an aluminum base alloy electrical conductor having a minimum conductivity of 57% IACS, a tensile strength of at least 12,000 psi, a yield strength of at least 8,000 psi, and good thermal stability characteristics comprising the steps of:

a. alloying 0.60% Nickel, 0.30% Niobium, 0.18% Tantalum, and the remainder Aluminum with associated trace elements;
b. casting the alloy into a continuous bar in a moving mold formed by a groove in the periphery of a casting wheel and a belt lying adjacent the groove along a portion of the periphery of the wheel;
c. hot-working the cast bar substantially immediately after casting while the bar is in substantially that condition as cast to form a continuous rod;
d. drawing the continuous rod through a series of wire-drawing dies with no preliminary or intermediate anneals to form wire having nickel aluminate inclusions dispersed therein the majority of which are less than 2 microns in length and less than ½ micron in width; and
e. annealing or partially annealing the wire.

3,967,984
METHOD FOR TREATING COATED FERROUS SUBSTRATES

Lawrence E. Helwig, Hampton Township, Allegheny County, and Richard A. Neish, Snowden Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,657

Int. Cl.^{2} C23F *7/26*

U.S. Cl. 148—6.16 **9 Claims**

5. In the method for the treatment of ferrous metal substrates coated with thin layers of a metal selected from a group consisting of Zn, Al and Pb base alloys;

the improvement which comprises, applying to said coated substrate a solution consisting essentially of,
(a) 2.0 to 12.0 gms/l of hexavalent chromium, and
(b) 0.7 to 4.0 gms/l of a bifluoride selected from the group of $NaHF_2$, NH_4HF_2 and mixtures thereof,
(c) less than 0.5 gms/l of phosphate,
said solution adjusted to a pH within the range 2.7 to 5.5;
metering the amount of solution remaining on the surface of said substrate to provide a final coating thickness of 0.8 to 2.0 mg. of Cr per square foot of substrate surface and thereafter;
drying the thus coated substrate to remove substantially all of the physically bound water in said film.

3,967,985
PROCESS FOR TREATING SURFACES OF A PERFORATED MASK

Akiya Izumi; Shigemi Hirasawa, and Yoshifumi Tomita, all of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 12, 1973, Ser. No. 405,841

Claims priority, application Japan, Oct. 18, 1972, 47-103583

Int. Cl.^{2} C23F *7/10, 7/04*

U.S. Cl. 148—6.35 **13 Claims**

1. A process for treating surfaces of a perforated mask made of iron, comprising bringing at least one surface of the perforated mask in contact with an acidic aqueous solution of antimony trichloride to form a thin film of metallic antimony, depositing a protective coating of a phosphate onto said thin film and heating said coated surfaces in an oxygen atmosphere at 350° to 600°C for 1 to 5 hours, thereby producing a grayish black coating having an excellent thermal emission power on said surfaces of the perforated mask for use in a color picture tube.

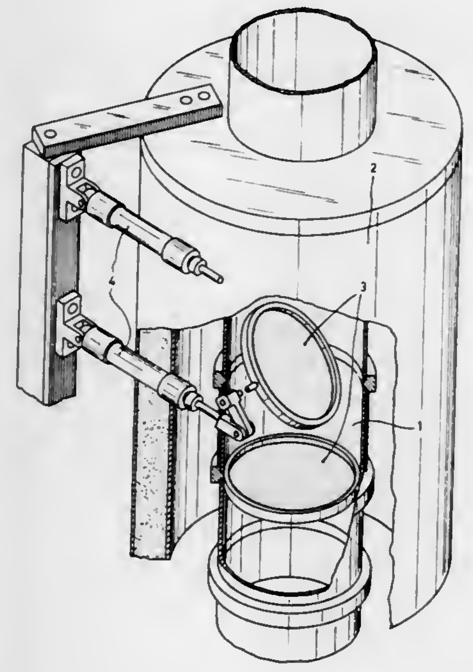
3,967,986
METHOD OF PREPARING FERROMAGNETIC MATERIAL

Hans Rau, Aachen-Laurensberg, and Karl-Georg Knauff, Aachen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 536,162

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—105 **5 Claims**



1. A method of preparing ferromagnetic material in the form of acicular particles consisting at least predominantly of iron, comprising the steps of reducing an iron oxide or iron oxide hydrate powder by intimately contacting the powder with a quantity of a gaseous reduction agent which predomimantly contains hydrogen flowing at a rate corresponding at least to the formula $V = 0.4 \times T - 120$, where V is the volume in liters of the quantity of gaseous reduction agent at 0°C and 1 atm. which flows per hour and per gram of Fe contents of the material to be reduced, and T is the reduction temperature in °C, T being between 300° and 600°C.

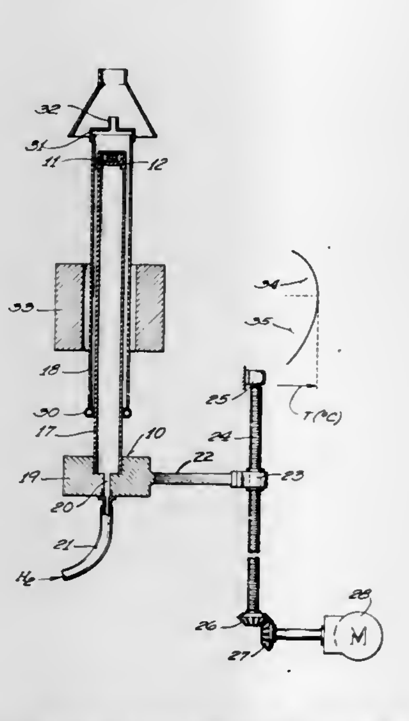
3,967,987
EPITAZY OF HETEROJUNCTION DEVICES

Addison Brooke Jones, LaMirada, and Herbert F. Matare, Los Angeles, both of Calif., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 15, 1972, Ser. No. 234,770

Int. Cl.^{2} H01L *7/38*

U.S. Cl. 148—171 **9 Claims**



1. A method of producing an epitaxial layer on a crystalline semiconductor substrate comprising precoating the semiconductor substrate with a portion of a master melt, depositing a selected quantity of the master melt, heating the deposited master melt and the semiconductor substrate to melt a portion of the substrate and controlling the cooling of the substrate and the master melt so that a high-quality epitaxial layer is grown on the substrate.

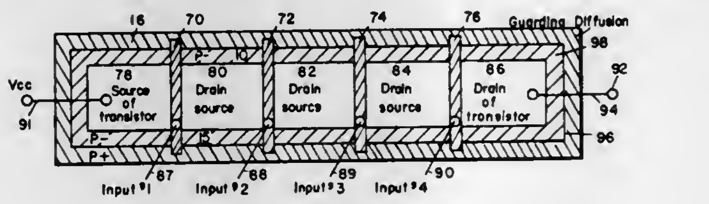
3,967,988
DIFFUSION GUARDED METAL-OXIDE-SILICON FIELD EFFECT TRANSISTORS

Uryon S. Davidsohn, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 494,437, Aug. 5, 1974, Pat. No. 3,898,984, which is a division of Ser. No. 95,521, Dec. 7, 1970, Pat. No. 3,868,721, which is a continuation-in-part of Ser. No. 86,544, Nov. 2, 1970, abandoned. This application Mar. 14, 1975, Ser. No. 558,592

Int. Cl.^{2} H01L *21/22*

U.S. Cl. 148—187 **4 Claims**



1. A method for fabricating a field effect transistor having at least one guard region in a semiconductor substrate of one conductivity type, which comprises:

forming spaced apart source and drain regions of opposite conductivity type to said substrate in said substrate,
forming an insulating layer over the space between said source and drain regions,
forming a conductive gate electrode having two ends over said insulating layer, and
subsequently forming said at least one guard region so that the ends of said gate electrode are in registration with a corresponding portion of said at least one guard region.

3,967,989
HIGH ENERGY PROPELLANT COMPOSITIONS INCLUDING VINYL DECABORANE-POLYESTER COPOLYMER BINDER

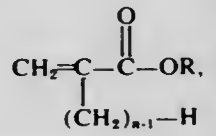
Marion F. Hawthorne, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,614, Dec. 29, 1958, abandoned. This application Nov. 3, 1959, Ser. No. 851,935

Int. Cl.^{2} C06D *5/06*

U.S. Cl. 149—19.2 **10 Claims**

1. Polymerizable combustible compositions, suitable for the manufacture of propellants, consisting essentially of a mixture of (1) 10 to 50 parts of a monomer of the formula:



$$CH_2{=}\underset{\displaystyle (CH_2)_{n-1}{-}H}{\underset{|}{C}}{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}OR,$$

in which n is 1 to 2 and R is a radical selected from the group consisting of

$(HDCH_2)_2CH-$,
$(HD)_2CH-$,
$HDCH_2-$,
$HD(CH_2)_2-$,
$HD(CH_2)_3$,
$HD(CH_2)_4$,
$HD(CH_2)_5-$, and
$(CH_3D)_2CH-$

in which formulas —D— represents

$$-\overline{C(B_{10}H_{10})C}-,$$

(2) 0.1 to 3 parts of a polymerizable soluble multiply ethylenically unsaturated polyester selected from the group consisting of (1) 25 to 80 parts by weight of addition polymers of acids selected from the group consisting of maleic, fumaric, adipic, azelaic, sebacic, succinic and phthalic acids and mixtures thereof with glycols selected from the group consisting of ethylene, propylene, butylene, diethylene and triethylene glycols and mixtures thereof dissolved in (2) 20 to 75 parts by weight of a polyvinylidene composition selected from the group consisting of diallyl phthalate, diallyl maleate, diallyl succinate and divinylbenzene, (3) 5 to 25 parts of a nitrato ester of an alcohol containing not more than 10 carbon atoms, said alcohol having not more than three hydroxyl groups, (4) 50 to 80 parts of an oxidizer selected from the group consisting of solid inorganic oxidizing salts, nitroguanidine, pentaerythritol tetranitrate and cyclotrimethylenetrinitramine and mixtures thereof, (5) 0 to 25 parts of a finely particled readily combustible solid selected from the group consisting of carbon, lithium, aluminum, magnesium, zinc, zirconium and boron.

3,967,990
COMBINATION OF BAND-TYPE AND LINE-TYPE EMISSION PHOSPHORS WITH EXPLOSIVE

Frederick M. Ryan, New Alexandria, Pa., and Frank M. Vodoklys, Wayne, N.J., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,839

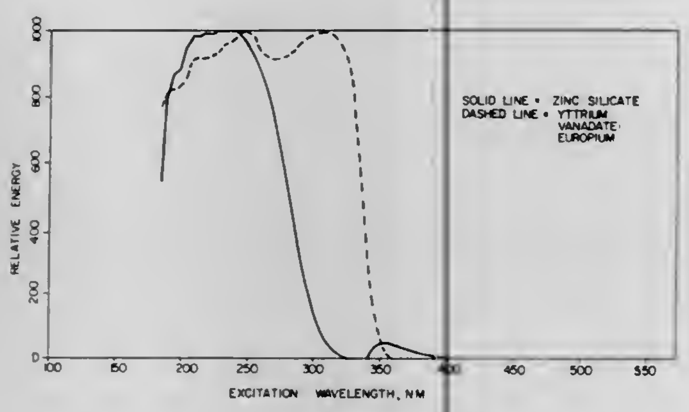
Int. Cl.^{2} C06B *45/00*

U.S. Cl. 149—109.4 **7 Claims**

1. A fluorescent tagging phosphor composition comprising:

a spotting phosphor having zero excitation at a UV wavelength of 325 nm, said phosphor consisting of zinc silicate or calcium silicate activated with manganese; and
about 1% by weight of the spotting phosphor of a coding phosphor which fluoresces strongly at a UV wavelength

of 325 nm, said coding phosphor consisting of yttrium vanadate activated with a trivalent rare earth ion.



7. An explosive material tagged with the composition of claim 1.

3,967,991

METHOD FOR PRODUCING RECEPTACLES FROM THERMOPLASTIC RESIN FOAM SHEET

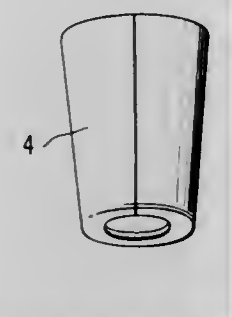
Ikuya Shimano, Osaka, and Takashi Matsui, Nara, both of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Dec. 7, 1973, Ser. No. 422,958

Claims priority, application Japan, Dec. 8, 1972, 47-123595; Oct. 5, 1973, 48-112665

Int. Cl.^{2} B29C *27/14, 27/20*

U.S. Cl. 156—85 **14 Claims**



1. A method for producing receptacles of a thermoplastic resin foam, which comprises the steps of:

forming a cylinder of a rectangular-shaped unidirectionally shrinkable thermoplastic resin foam which, when heated, shrinks in a first direction to a greater extent than other directions perpendicular to said first direction, so that when heated, said thermoplastic resin foam sheet will shrink toward the central axis of said cylinder;

bonding the side edges of said sheet forming said cylinder;

heating said foam sheet on a male mold member of a mold comprising a male mold member and a female mold member, having a hollow part provided at the upper part of a mold cavity formed by said male mold member and said female mold member, and which can be heated and cooled to a temperature above the softening point of said resin, whereby said cylindrical foam sheet shrinks toward the central axis of said cylinder formed by said sheet and intimately contacts the circumferential side wall of said male mold member to form a bottomless cylindrical article, said male mold member being of a size such that a portion of said foam sheet extends beyond one end surface of said male mold member;

further bending the circumferential edge of said cylinder formed by said sheet which extends beyond said end surface of said male mold member to circumferentially cover the edge of said male mold member;

inserting the resulting cylindrical article on said male mold member into said female mold member together with a bottom plate for said bottomless cylindrical article so that the bottom portion of said cylindrical article is adjacent said bottom plate;

compression-molding said article under heat thereby bonding said bottom plate to the bottom of said cylindrical article; and

pressing the upper edge of said cylindrical article which is positioned at said hollow part under heat to form a rib which reduces a volume.

3,967,992

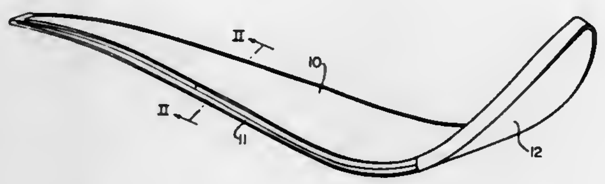
PLASTIC SKI SURFACING SYSTEM

Harold O. McCaskey, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 326,910, Jan. 26, 1973, abandoned. This application Mar. 19, 1975, Ser. No. 559,939

Int. Cl.^{2} B29C *27/14*

U.S. Cl. 156—85 **12 Claims**



1. A method of making a ski, comprising a flexible core surrounded by and bonded to a top surface, base surface and side wall surfaces between the top surface and base surface, comprising the steps of:

A. preparing an assembly of a plurality of polyacrylate sheets, each sheet having a weight average molecular weight of between about 260,000 and about 654,000,

B. superimposing the assembly of polyacrylate sheets on a flexible core having a bonded base surface and side wall surfaces,

C. consolidating the assembly of polyacrylate sheets and ski core at between about 100–600 psi and 120°–165°C to provide a ski having a polyacrylate stress relieved top surface which is shrunk between about 2–15% during consolidation of the polyacrylate sheets.

3,967,993

PROTECTED CONTAINER AND A PROCESS FOR PREPARING SAME

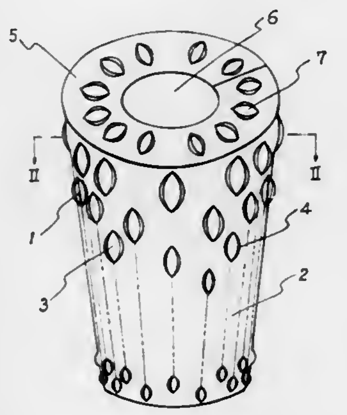
Yoshio Isomi, Nara, Japan, assignor to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Mar. 21, 1974, Ser. No. 453,649

Claims priority, application Japan, Mar. 23, 1973, 48-36054[U]

Int. Cl.^{2} B29C *27/00;* **B32B** *31/00*

U.S. Cl. 156—86 **3 Claims**



1. A progress for placing a protective coating of a foamed, heat shrinkable, styrenic resin sheet around at least a portion of a container, said process comprising:

a. stretching said sheet in a first direction;

b. forming a plurality of slits in said sheet said slits being positioned at less than ± 70° to the perpendicular to said first direction;

c. surrounding at least a portion of said container with said sheet;

d. heating said sheet to a temperature between the softening and melting temperature of said resin whereby said sheet shrinks to closely contact said portion of said container; and,

e. further heating said sheet until the side of said slits warp outward and harden to form a hole with a raised hardened portion at each side.

3,967,994

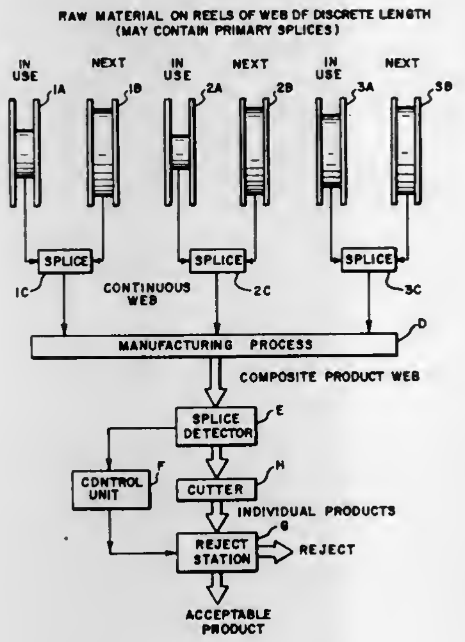
METHOD OF INSPECTION FOR SPLICES USED FOR JOINING WEBS IN A MANUFACTURING PROCESS

Edwin Langberg, Mount Laurel, N.J., assignor to Langberg Associates, Inc., Mount Laurel, N.J.

Filed Oct. 9, 1974, Ser. No. 513,302

Int. Cl.^{2} G01N *23/00*

U.S. Cl. 156—64 **5 Claims**



1. A method for maintaining the continuity of a manufacturing process employing one or more webs, each of which is provided in the form of shorter webs of raw material to be fed sequentially into the process as the preceeding web of the same material is depleted, comprising:

a. splicing successive shorter webs of the same raw material together as each is depleted through use in the process with an adhesive tape having thereon an electrically conductive coating; and

b. monitoring the web at the output of such process by irradiating it with a microwave frequency electromagnetic field, and detecting variations in said field due to the presence therein of the conductive coating on said tape, thereby permitting identification of portions of such webs containing splices.

3,967,995

JACKETED BOTTLE AND METHODS OF MAKING SAME

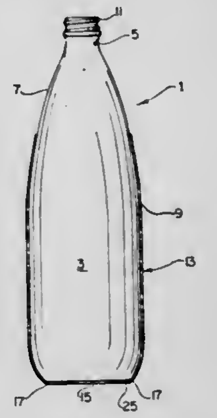
William L. Fabianic, Alton, Ill., assignor to Liberty Glass Company, Sapulpa, Okla.

Continuation-in-part of Ser. No. 255,992, May 23, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,785

Int. Cl.^{2} B29C *27/20*

U.S. Cl. 156—86 **4 Claims**

1. The method of protecting glass bottles from bottle-weakening abrasion and scratches, each bottle having a body and a neck and a generally conical transition from the upper end of the body to the neck, with a shoulder at the junction of said body and said transition, said method comprising feeding forward bottles standing upright one after another in a predetermined generally horizontal path, placing a jacket on each bottle as it travels forward along said path, the jacket being a pre-formed paper jacket having an upper generally conical portion slightly larger than said generally conical transition of the bottle and a lower generally cylindrical body portion slightly larger than the body of the bottle, said conical portion of the jacket being open at its upper end and said cylindrical portion of the jacket being open at its lower end, the jacket being telescopically applied lower end first to the bottle over the upper end of the bottle and moving downwardly on the bottle to position the jacket with the conical portion of the jacket surrounding and contiguous to the exterior surface of the conical transition of the bottle and the cylindrical portion of the jacket surrounding and contiguous to the exterior surface of the body of the bottle, passing each bottle with a jacket thereon through a humidifying zone to humidify the entire jacket, and then passing each bottle with the humidified jacket thereon through a drying zone to dry the jacket and cause it to shrink on the bottle.



3,967,996

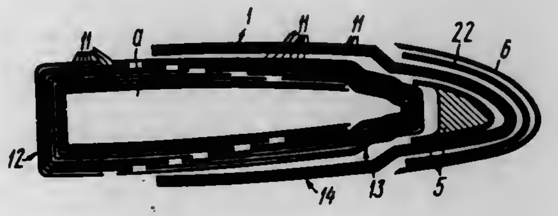
METHOD OF MANUFACTURE OF HOLLOW PIECES

Nikolai Ilich Kamov, ulitsa Gorkogo, 43, kv. 96; Nikolai Nikolaevich Priorov, ulitsa Novoslobodskaya, 57/60, kv. 9, both of Moscow; Anatoly Fedorovich Kovalev, ulitsa L.Tolstogo, 7, kv. 150, Moskovskaya oblast, Ljubertsy; Mark Alexandrovich Kupfer, ulitsa Festivalnaya, 19, kv. 9, Moscow; Alexandr Georgievich Satarov, ulitsa Sovkhoznaya, 24, korpus 2, kv. 8, Moskovskaya oblasti, Ljubertsy; Iosif Shulimovich Sherman, 9 Parkovaya, 49, korpus 1, kv. 32; Anatoly Filippovich Vakulenko, Leninsky prospekt, 66, kv. 264, both of Moscow; Igor Ivanovich Kovyryalkin, kvartal 2a, 20, kv. 49, Moscow, Lenino-Dachnoe; Stanislav Ivanovich Stetsenko, ulitsa L.Tolstogo, 11, kv. 40, Moskovskaya oblast, Ljubertsy; Vladimir Borisovich Golstman, ulitsa 8 Marta, 42, kv. 8, Moskovskaya oblast, Ljubertsy, and Konstantin Nikolaevich Guskov, ulitsa 8 Marta, 40, kv. 18, Moskovskaya oblast, Ljubertsy, all of U.S.S.R.

Continuation of Ser. No. 360,025, May 14, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 512,307

Int. Cl.^{2} B29C *17/00, 27/00;* **B64C** *27/04*

U.S. Cl. 156—156 **12 Claims**



1. A method of manufacturing hollow blades and hollow blade spars of aircraft rotors having a variable cross-sectional shape, comprising the steps of: making a composite blank by first assembling each component part thereof from separate flexible flat sheets cut from an adhesive-covered cloth of material which sheets are placed one onto another on a rigid mandrel having an outer surface corresponding with the inner

surface of the blade; subjecting each of the component parts assembled of separate sheets and lying on the rigid mandrel to a preliminary compression which consists of applying pressure and heat to the sheets to cause agglutination of the sheets and forming a component part of a blank having an unclosed profile and a rigidity sufficient for subsequent steps; assembling the component parts so as to form a cavity of a closed profile; placing an elastic bag into the cavity; placing the blank assembled of its component parts and with the elastic bag in its cavity into a mold whose inner surface corresponds with the outer surface of the blade; and performing final pressing by supplying pressure into the elastic bag and heating the blank whereby the blade of a specified shape is produced.

3,967,997

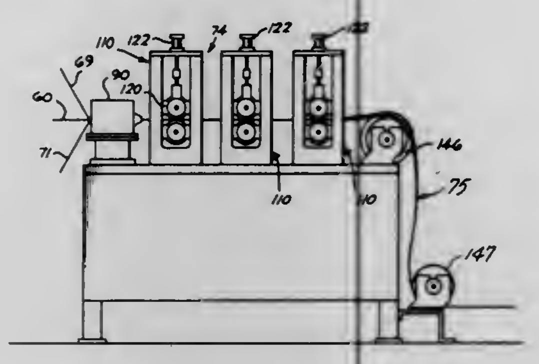
METHODS OF AND APPARATUS FOR PRODUCING A STRESS-FREE LAMINATE

Charles Henry Masters, Baltimore, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 129,890, March 31, 1971, abandoned. This application Jan. 31, 1973, Ser. No. 328,236

Int. Cl.^{2} B32B *31/06, 31/14*

U.S. Cl. 156—201 **10 Claims**



1. A method of forming a laminate from materials having different coefficients of thermal expansion which are bonded with a temperature sensitive adhesive, which comprises the steps of:

advancing the laminate along a path;

providing in the path a roller which is a segment of a sphere wherein the radius of curvature of the spherical segment of the roller is determined by the expression:

1. $r_o = r_2 - r_2[(\Delta l_c t_c) - (\Delta l_x t_c)] - T_x/2$

imparting a predetermined three-dimensional curvature having finite values greater than zero in each of the materials of the laminate while the adhesive is flowable and the materials are at some predetermined elevated temperature above ambient temperature by advancing the laminate over the roller such that the radius of curvature of the laminate material innermost of the roller and the laminate material outermost of the roller are determined by the expressions:

2. $r_1 = r_o + T_x/2$

3. $r_2 = r_o + T_x + T_a + T_c/2$, respectively,

where

r_o is the radius of the spherical segment of the roller;

r_1 is the radius of the center line of the laminate material innermost of the roller;

r_2 is the radius of the center line of the laminate material outermost of the roller;

Δl_x is the length of expansion of the laminate material innermost of the roller;

Δl_c is the length of expansion of the laminate material outermost of the roller;

t_c is the temperature of the laminate at the predetermined elevated temperature minus ambient temperature;

T_x is the thickness of the laminate material innermost of the roller;

T_c is the thickness of the laminate material outermost of the roller;

T_a is the thickness of the adhesive; and

cooling the materials to reach ambient temperature while removing the three-dimensional curvature so that a flat and substantially stress free laminate results;

the laminate being advanced along the path past the roller such that the three-dimensional curvature is imparted and removed continuously in successive portions of the materials forming the laminate.

3,967,998

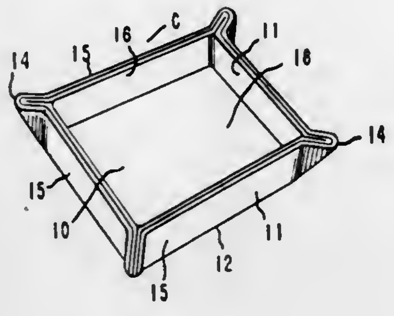
POLYETHYLENE TEREPHTHALATE/PAPERBOARD LAMINATE AND METHOD OF MAKING IT, CONTAINER BLANK FORMED FROM SUCH LAMINATE AND CONTAINER FORMED FROM SUCH BLANK, AND COOKING METHOD USING SUCH CONTAINER

William Paul Kane, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 281,943, Aug. 18, 1972, Pat. No. 3,924,013. This application May 9, 1974, Ser. No. 468,536

Int. Cl.^{2} B29C *19/00*

U.S. Cl. 156—226 **8 Claims**



1. A method of forming a container including the steps of:

forming a blank formed from a laminate including paperboard having a layer of substantially amorphous polyethylene terephthalate extruded onto an uncoated surface thereof and wherein such surface is heated to a temperature of at least about 285°F. prior to such extrusion;

folding the blank to bring surface portions of the amorphous polyethylene terephthalate layer thereof into abutting contact with other surface portions of such layer and

heat-sealing these abutting surface portions together.

3,967,999

HIGH FREQUENCY PLASTIC WELDING FLUX

Dieter Sommerfeld, Monheim-Baumberg; Bernhard Kowald, Opladen-Lutzenkirchen, and Monika Winkels, Dusseldorf-Wersten, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 29, 1974, Ser. No. 518,246

Claims priority, application Germany, Nov. 3, 1973, 2355016

Int. Cl.^{2} B29C *27/04*

U.S. Cl. 156—273 **5 Claims**

1. In the process for preparing a welded article by high-frequency welding comprising

providing a layer of thermoplastic material and a substrate;

coating at least one of said layer of thermoplastic material or said substrate with an intermediate material;

juxtaposing said layer of thermoplastic material and said substrate with said coating of intermediate material therebetween;

welding said layer of thermoplastic material to said substrate by application of a high-frequency electric field; and

recovering said welded article: the improvement wherein said intermediate coating material is a high frequency plastic welding flux consisting essentially of

A. from 20 to 40% by weight based upon the total weight of a redispersible powder of a polymer prepared by suspension polymerization selected from the group consisting of (1) polyvinyl chloride, (2) copolymer of vinyl chloride with up to 20% by weight based upon the copolymer weight of an olefinically-unsaturated monomer copolymerizable with vinyl chloride, and (3) the mixtures of (1) and (2);

B. from 1 to 5% by weight based upon the total weight of a nonion surface-active agent; and

C. the remainder up to 100% by weight of an aqueous medium selected from the group consisting of water and aqueous dispersions of polymers selected from the group consisting of copolymerizates of styrene and acrylic acid, copolymerizates of styrene and butadiene, copolymerizates of styrene and maleic acid anhydride, copolymerizates of styrene, butadiene and maleic acid anhydride, vinyl acetate polymers and copolymerizates of vinyl acetate and ethylene.

3,968,000

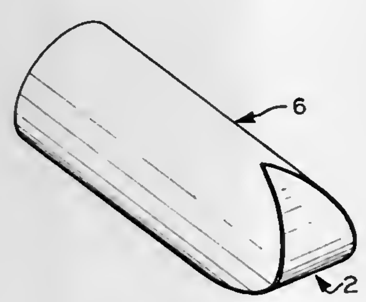
METHOD FOR MAKING PIPE END PLUGS

James C. Carroll, Bartlesville, Okla., and Clel H. Shafer, Perryton, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 7, 1975, Ser. No. 565,871

Int. Cl.^{2} B32B *31/00;* **F16L** *55/10;* **B23K** *9/02;* **B65D** *7/42*

U.S. Cl. 156—258 **7 Claims**



1. A method for the production of an end plug for a thermoplastic pipe which comprises the steps of

a. removing a V-shaped section of pipe wall from a first pipe having an outer diameter D;

b. removing a portion of the butt end of a second pipe having an outer diameter D, so as to form the end into a complementary shape to that of said V-shaped section of said first pipe;

c. cutting a hole from said V-shaped section of said first pipe to allow passage of a bolt therethrough to accommodate a complementary shaped inner jig having an outer diameter approximately equal to the inner diameter of said first pipe, and a complementary shaped outer jig having an inner diameter approximately equal to said outer diameter D;

d. affixing said inner jig and said outer jig with said bolt to said V-shaped section;

e. heating to heat-sealing temperature said V-shaped section in the region of the face of the pipe wall;

f. heating to heat-sealing temperature said butt end in the region of the face of the pipe wall of the complementary shape;

g. pressing together said V-shaped section and said complementary shaped butt end so as to form an end plug;

h. reducing the temperature of the heated region to below heat-sealing temperature;

i. removing said jigs and said bolt; and

j. filling in said hole in said V-shaped section by fusing a plug of the same thermoplastic into said hole.

3,968,001

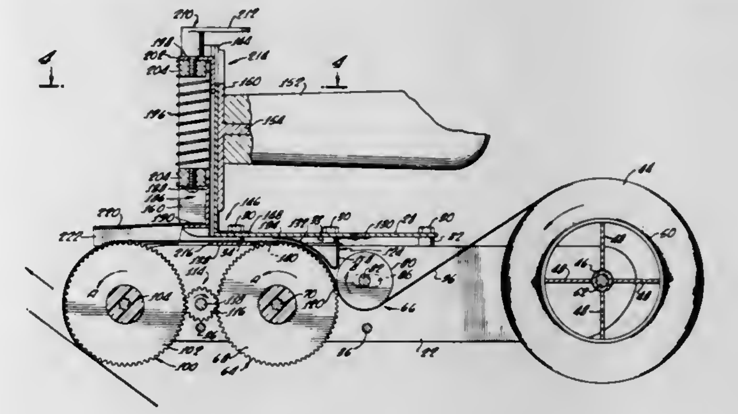
AUTOMATIC TAPE DISPENSER

William G. Lockwood, 4800 Clair Del, Long Beach, Calif. 90808

Filed Sept. 26, 1974, Ser. No. 509,554

Int. Cl.^{2} B32B *31/00;* **B44C** *7/06*

U.S. Cl. 156—523 **5 Claims**



1. A portable tape dispenser, which comprises,

a dispensing body comprising a pair of laterally spaced elongate sides fixedly connected to each other,

a tape supply spool rotatably mounted to said body at one end thereof,

pressure wheels rotatably mounted to said body at the other end thereof,

first and second mutually spaced feed wheel shafts mounted to said body,

first feed wheels and second feed wheels mounted upon respective ones of said first and second shafts for rotation between said pressure wheels and tape supply spool, at least one of said pressure wheels and one of said first feed wheels having mutually spaced toothed peripheries,

means for urging said first feed wheels and second feed wheels toward each other,

tape guide means mounted on said body for providing a tape guide path from said feed wheels toward said pressure wheels,

means for driving one of said first feed wheels and second feed wheels in response to rotation of said pressure wheels,

a roll of tape mounted on said supply spool and including a tape portion extending under said second feed wheels, over said first feed wheels, through said guide means and freely and loosely over and beyond said pressure wheels,

a cutter support fixed to said body and upstanding therefrom between said first feed wheels and said pressure wheels, said tape guide means including a guide plate positioned below said tape and having an edge substantially aligned with one side of said cutter support, blade guide means fixed to said cutter support, a cutter blade slidably mounted in said guide means for motion toward and away from said guide plate edge, a handle fixed to said cutter support, means for urging said cutter blade away from said guide plate edge, and means connected with said cutter blade and generally in line therewith adapted to be engaged by the thumb of a hand that grasps said handle for pressing said blade toward said guide plate edge to shear a tape section extending therebetween.

3,968,002

FEED HEATING METHOD FOR MULTIPLE EFFECT EVAPORATORS

Ferris C. Standiford, 2713 S. North Bluff Road, Greenbank, Wash. 98253

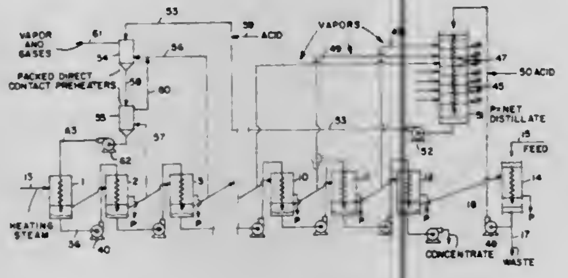
Filed Mar. 7, 1975, Ser. No. 556,472

Int. Cl.^{2} B01D *1/14, 1/22, 1/26, 1/00*

U.S. Cl. 159—13 A **4 Claims**

1. A feed preheater system for a forward feed multiple effect falling film evaporator, said system comprising a falling

film indirect preheater and a direct vapor contacting preheater, the discharge of the former feeding the latter, said system being constructed and arranged to raise the temperature of the feed to below the atmospheric boiling point thereof in the falling film preheater, said falling film preheater being heated by vapors from the lower temperature effects and the direct contact preheater by vapor from a higher temperature effect, said preheated feed entering the highest temperature effect.



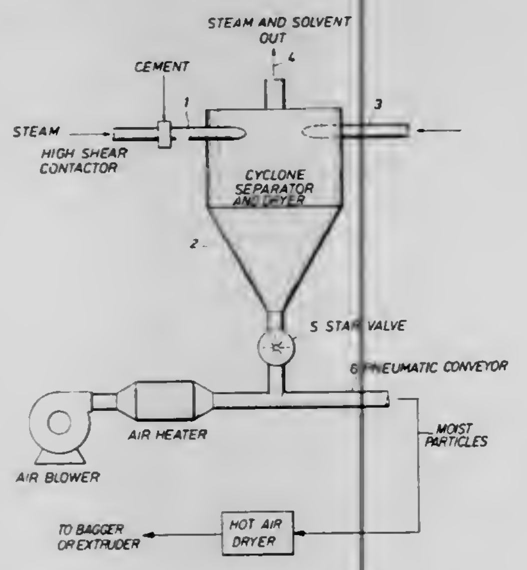
3,968,003
PROCESS OF RECOVERING POLYMERS FROM THEIR SOLUTIONS

Anthony C. Wolfe, Los Alamitos, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1974, Ser. No. 501,539

Int. Cl.^{2} B01D *1/16, 1/14;* **C08L** *9/00*

U.S. Cl. 159—48 R **8 Claims**



1. In the process for the recovery of polymers from their solutions which comprises mixing steam of at least 50 psig and polymer cement in a high shear mixing-contacting zone whereby part of the solvent is vaporized and solid polymer particles are formed, passing the mixture of particles, cement, vaporized solvent, and steam to a cyclone separation, whereby further solvent vapors are released therein and all vapors and steam are separated from the resulting polymer particles, said particles bearing condensed steam and residual solvent in minor amounts being conveyed to a hot air dryer where the residual solvent and condensed steam are removed, the improvement in controlling the recovered polymer particle size which comprises tangentially feeding steam and polymer cement into said high shear mixing-contacting zone in a steam to cement weight ratio of from about 0.5:1.0 to about 1.0:1.0 where the cement has a polymer concentration from about 5 to about 60 percent by weight and the steam is at a temperature between about 150°C and about 225°C and a pressure between about 50 psig to about 100 psig and passing the high shear contacting zone product to said cyclone separation for additional vaporization and thereby forming additional particles as the sheared product enters the cyclone separator and tangentially feeding a second quantity of steam through a separate steam inlet into the cyclone separator expressed in steam to initial cement weight ratio of from about 1.0:1.0 to 0.5:1.0 thereby reducing the residual solvent and condensed steam level of the resulting particles to below about 2.0 parts per hundred polymer.

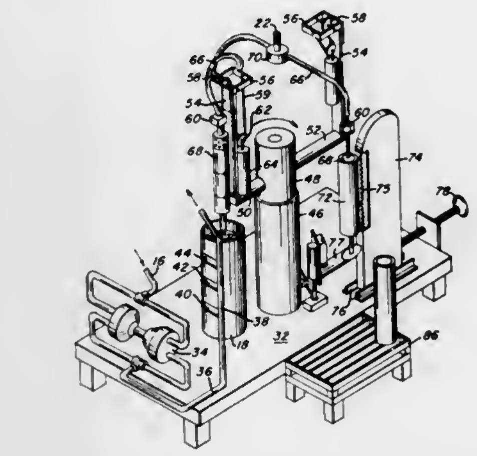
3,968,004
PROCESS FOR MAKING A SHAPED FIBROUS ARTICLE BY A VACUUM FORMING PROCESS AND THE SHAPED FIBROUS ARTICLE MADE THEREBY

Fred Simms Coffey, Bradford; Harold Lloyd Weaver, Port Allegany, and Howard Beattie Johnson, Bradford, all of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Nov. 21, 1973, Ser. No. 417,976

Int. Cl.^{2} D21F *11/00*

U.S. Cl. 162—152 **11 Claims**



1. A process for making a fibrous shaped article comprising, introducing a dilute aqueous slurry containing mineral wool fibers, a clay binder and other binders into a forming tank tangentially to the direction of circulation to toroidally circulate said slurry in said forming tank to maintain said solids substantially uniformly distributed therein, said slurry having between about 1 and 5% solids by weight,

positioning a foraminous member in said circulating slurry in said forming tank so that said foraminous member is submerged in said slurry,

applying a suction to an internal portion of said foraminous member and accreting a substantially uniform layer of said solids in said slurry on the outer surface of said foraminous member,

maintaining said foraminous member submerged in said slurry while accreting said substantially uniform layer of said solids thereon,

trimming the outer surface of said layer of accreted solids while said layer of accreted solids is on said foraminous member to form a shaped article having an inner surface with the configuration of the outer surface of said foraminous member and an outer surface of a preselected configuration,

thereafter removing said shaped article from said foraminous member, and

drying said shaped article to remove substantially all of the liquid in the shaped article of accreted solids.

3,968,005
PAPER SIZING PROCESS USING A REACTION PRODUCT OF MALEIC ANHYDRIDE WITH A VINYLIDENE OLEFIN

Otto B. Wurzburg, Whitehouse Station, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 404,595, Oct. 9, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,816

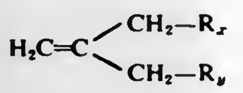
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

Int. Cl.^{2} D21D *3/00*

U.S. Cl. 162—158 **9 Claims**

1. The method of sizing paper which comprises the step of intimately dispersing within the wet pulp, prior to the ultimate

conversion of said pulp into a dry web, a sizing agent which comprises the non-polymeric reaction product of maleic acid anhydride with a vinylidene olefin corresponding to



$$H_2C{=}C\begin{cases}CH_2{-}R_x\\ CH_2{-}R_y\end{cases}$$

wherein R_x and R_y are alkyl radicals containing at least 5 carbon atoms in each radical.

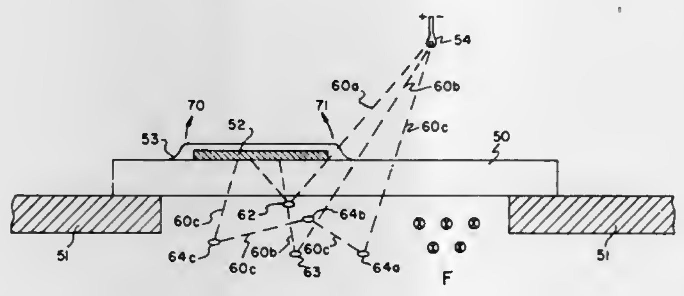
3,968,006
PULP BLEACHING PROCESS CONTROL USING PHOTOCELLS TO MEASURE PULP BRIGHTNESS

William E. Zimmerman, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,414

Int. Cl.^{2} D21C *9/10, 9/12*

U.S. Cl. 162—198 **6 Claims**



1. A chlorine flow control system for the bleaching of wood pulp, said system comprising:

A. a continuous flow stream of wood pulp suspended as a dilute aqueous slurry;

B. a conduit for carrying said flow stream having sufficient volumetric capacity to retain an element of said flow stream at least fifteen minutes between a chlorine solution injection point in said flow stream and pulp washing means at the end of said flow stream;

C. First transparent window means in said conduit approximately one to five minutes downstream of said chlorine injection point;

D. Second transparent window means in said conduit prior to said pulp washing means;

E. First and second selenium photocells having photo-sensitive face planes secured contiguous with outer planes of respective window means wherein the photocells form an angle relative to said respective window means neutralizing the effect of consistency;

F. A source of white light directed past said photocells, through said windows and into said flow stream, said photocells being responsive to the relative magnitude of white light reflected from said wood pulp to emit respective first and second electrical signals proportional thereto;

G. First differentiator means to receive said second photocell signal from said second photocell for comparison to an independently variable first set-point signal.

H. Second differentiator means to receive said first photocell signal for comparison to a second set-point signal that is dependently variable relative to the difference between said second photocell signal and said first set-point signal; and,

I. Chlorine flow regulating means for controlling the flow of chlorine into said flow stream at said injection point responsive to the difference between said first photocell signal and said second set-point signal.

5. A method for measuring the brightness of a low consistency slurry of wood pulp, said method comprising the steps of:

A. Providing a transparent window in a conduit carrying a low consistency flow stream of wood pulp, said window having an exterior planar surface disposed substantially parallel to the flow direction of said flow stream;

B. Positioning a selenium photocell having a planar, photosensitive face contiguously adjacent said exterior window surface;

C. Providing a source of white light directed past said photocell, through said window and into said flow stream;

D. Adjusting the planar angle of said photocell relative to said flow stream flow direction and the position of said light source to neutralize the effect of consistency variations in said flow stream on the power generation response of said photocell;

E. Measuring the magnitude of electrical power generated by said photocell responsive to light reflected from said flow stream, and;

F. Correlating photocell power generation responses to relative magnitudes of wood pulp brightness.

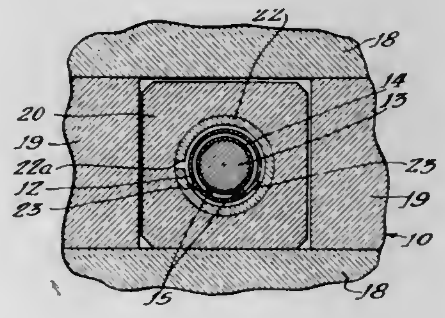
3,968,007
NEUTRONIC REACTOR CONSTRUCTION

Norman E. Huston, Fullerton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 9, 1952, Ser. No. 324,885

Int. Cl.^{2} G21C *5/02*

U.S. Cl. 176—41 **2 Claims**



1. A neutronic reactor comprising a moderator including horizontal layers formed of horizontal rows of graphite blocks, alternate layers of blocks having the rows extending in one direction, the remaining alternate layers having the rows extending transversely to the said one direction, alternate rows of blocks in one set of alternate layers having longitudinal ducts, the moderator further including slotted graphite tubes positioned in the ducts, the reactor further comprising an aluminum coolant tube positioned within the slotted tube in spaced relation thereto, bodies of thermal-neutron-fissionable material, and jackets enclosing the bodies and being formed of a corrosion-resistant material having a low neutron-capture cross section, the bodies and jackets being positioned within the coolant tube so that the jackets are spaced from the coolant tube.

3,968,008
FISSILE ELEMENT AND A METHOD FOR CHARGING OR RECHARGING IT

Gijsbrecht Gerhardus Piepers, Heiloo; Christiaan Gustaaf Adolf Scholtus, Alkmaar, and Leonard Hendrik Vons, Bergen, all of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Filed Apr. 11, 1973, Ser. No. 349,940

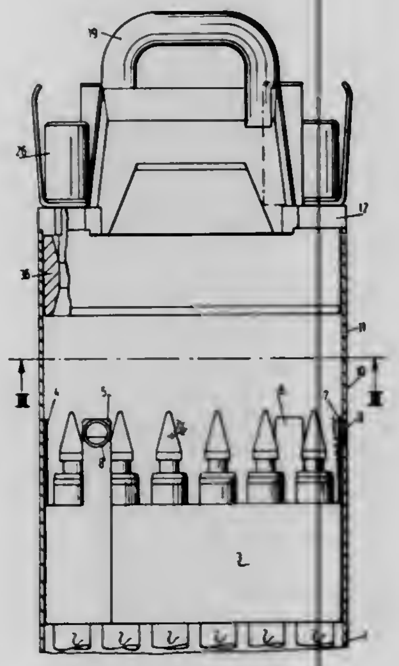
Claims priority, application Netherlands, Apr. 20, 1972, 7205288

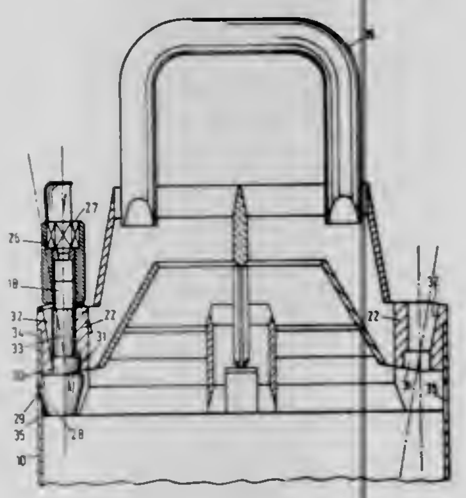
Int. Cl.^{2} G21C *3/32*

U.S. Cl. 176—78 **4 Claims**

1. A fuel assembly for a nuclear reactor comprising an open-ended elongated approximately prismatic sleeve with solid side walls, a plurality of spaced fuel elements vertically disposed in said sleeve and supported therein by a bottom plate and a plurality of intermediate lattices for lateral sup-

port, said bottom plate being anchored to said sleeve, said sleeve containing near the upper end a plurality of open recesses in the walls thereof, a removable head fitted to the top of said sleeve and connected to the sleeve in an easily detachable manner by means of a plurality of bolts passing through passages in said head, said bolts having boltheads at one end thereof, said boltheads each having a portion projecting into and engaging one of said open recesses and said passages being contoured to allow said bolts to tilt to facilitate movement of said boltheads into and out of said recesses.





3,968,009

PROCESS FOR REDUCING NUCLEIC ACID CONTENT OF YEASTS AND BACTERIA

Steven R. Tannenbaum, Framingham; Anthony J. Sinskey, Boston, both of Mass., and Stephen B. Maul, Flemington, N.J., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 340,022, March 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 53,263, July 8, 1970, Pat. No. 3,720,585. This application May 19, 1975, Ser. No. 578,772

The portion of the term of this patent subsequent to Mar. 13, 1990, has been disclaimed.

Int. Cl.² C12C *11/00*

U.S. Cl. 195—98 **11 Claims**

1. A process for reducing the nucleic acid content in a unicellular substance selected from the group of yeasts and bacteria comprising the steps of:

heat shocking said unicellular substance for a period of time and at a temperature selected to increase the activity of enzymes inside the cells of said unicellular substance sufficiently to enable said enzymes to break down nucleic acids into smaller fragments, said heat shock being insufficient to rupture substantial numbers of cell walls or to induce protein to leak out of said cells, and;

incubating cells which have been subjected to said heat-shocking step for a period of time and at a temperature which is lower than the temperature selected in said heat-shocking step, the temperature at which heat-shocked cells are incubated being a temperature at which the cells of said unicellular substances remain intact but at which nucleic acid fragments permeate the walls of said cells.

3,968,010

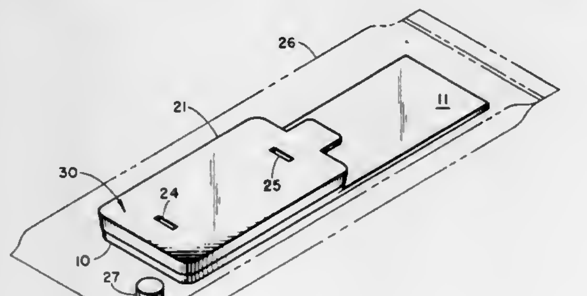
MICROBIOLOGICAL CULTURING METHOD AND MEANS

Frank Edward Young, Pittsford, N.Y., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 8, 1975, Ser. No. 638,652

Int. Cl.² C12K *1/06*

U.S. Cl. 195—103.5 R **22 Claims**



1. In a method for culturing or detecting an osmotically fragile microorganism which comprises the steps of rehydrating a substantially dry, water-absorbent, nutrient-incorporated matrix by contact with an aqueous liquid, simultaneously or subsequently contacting said matrix with said microorganism or with a test specimen suspected of containing said microorganism, and thereafter incubating said test specimen in contact with the rehydrated matrix, the improvement which comprises including in said rehydrating aqueous liquid a water soluble polyhydric alcohol.

7. Means for culturing an osmotically fragile microorganism comprising a substantially dry, water-absorbent matrix incorporated with microbiological nutrient material sufficient to support the growth of said microorganism, and an aqueous rehydration liquid therefor containing a water soluble polyhydric alcohol.

3,968,011

TEST IMPLEMENT AND TEST METHOD FOR COLORIMETRICALLY DETERMINING WHETHER A FEMALE IS FERTILE OR PREGNANT

Jorge Martinez Manautou, and Adolfo Rosado Garcia, both of Mexico City, Mexico, assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 333,029, Feb. 16, 1973, Pat. No. 3,875,013. This application Mar. 27, 1975, Ser. No. 562,743

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² G01N *31/14, 33/16*

U.S. Cl. 195—103.5 R **17 Claims**

1. A test implement for colorimetrically determining the quantity of N-acetyl-β-glucosaminidase present in a female biological medium, said quantity being indicia of fertility or pregnancy, comprising an absorbent material containing a buffer that is capable of maintaining an acidic pH and an effective amount of an N-acetyl-β-d-glucosaminide that reacts in the presence of said glucosaminidase at said pH to form a reaction product that has a distinct color at a predetermined pH.

3,968,012

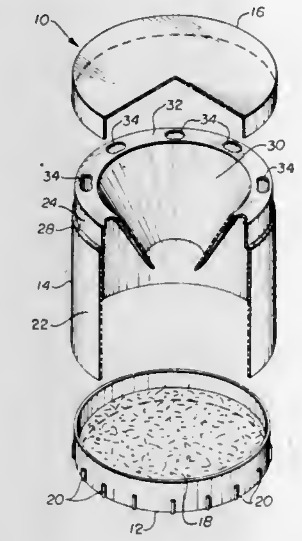
AEROSOL BACTERIAL CONTAMINATION TEST KIT

Jay A. Jones, 4141 W. Mercer Way, Mercer Island, Wash. 98040

Filed June 6, 1975, Ser. No. 584,372

Int. Cl.² C12B *1/02*

U.S. Cl. 195—142 **10 Claims**



1. A disposable kit for sterile sampling and culturing of gas-borne microorganisms and the like, comprising a rimmed, flat and shallow tray having an internal bottom coating thereon of microorganism culture medium, a removable cover for said tray, and an enclosed gas-flow directing chamber having one end open to which the tray is removably fitted so as to protectively close said one end in substantially airtight relationship, having an opposite end open to which the tray cover is removably fitted so as to protectively close said opposite end in substantially airtight relationship in pre-use storage thereof, said opposite end having inlet orifice means rimmed by an inwardly convergent exteriorly presented chamber wall defining a locating funnelling receptacle for placement of the end of a gas supply hose so as to direct gases from the hose through said inlet orifice into the chamber interior, and said opposite end further having an outlet orifice means formed therein adjacent to but separated by said wall from said inlet orifice, for the discharge of gases from the chamber after such gases have flowed against said tray interior.

3,968,013

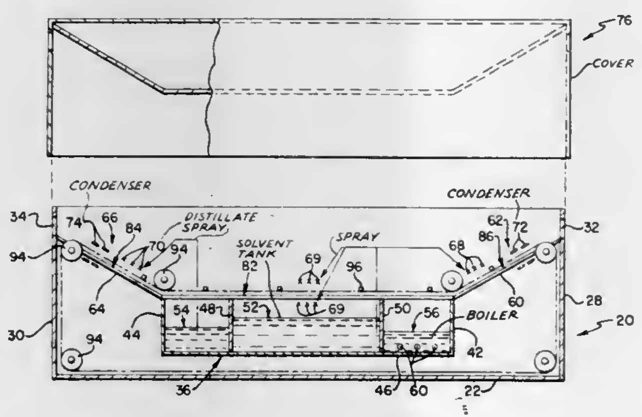
SYSTEM FOR CLEANING WORK PIECES WITH SOLVENT

Kenneth G. Boynton, Milford, N.H., assignor to Hollis Engineering, Inc., Nashua, N.H.

Filed Sept. 12, 1974, Ser. No. 505,317

Int. Cl.² B01D *3/00;* B65G *19/00;* B08B *3/00*

U.S. Cl. 202—170 **7 Claims**



1. In a system for cleaning work pieces with an organic solvent vapor, and having a tank for containing a liquid body of said solvent, a frame for supporting said tank, and means disposed in said tank for heating at least a portion of said solvent to boiling whereby to generate a quantity of solvent vapor above said tank, and means disposed above said tank for limiting the level of solvent vapor above said tank, the improvement comprising;

means for moving said work pieces in and out of contact with said solvent vapor and comprising

an array of substantially parallel, spaced, elongated members each having a central portion depressed with respect to its end portions, said elongated members extending through and between said end portions, at least one intermediate section rigidly joining said elongate members so as to preserve the parallel relationship of said elongated members, means for supporting said array in a fixed position relative to said tank and frame so that said central portion of said array is located so as to be enveloped in said quantity of solvent vapor, and the end portions of said array are disposed to be above said level of solvent vapor, and

means for moving said work pieces across the top surface of said array in the direction of elongation of said members.

3,968,014

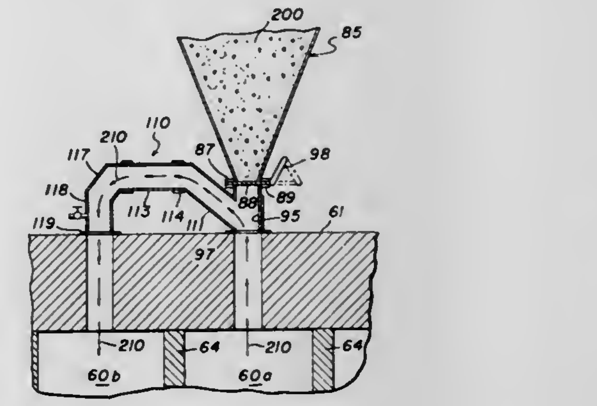
COLLECTION DEVICE FOR COKE OVEN GASES

Frank K. Armour, Flossmoor, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Mar. 29, 1974, Ser. No. 456,056

Int. Cl.² C10B *31/00, 31/04, 35/00*

U.S. Cl. 202—263 **10 Claims**



1. A system for preventing effluents containing coal dust from being emitted from coke ovens upon charging certain of the coke ovens with coal while coking in others of the coke ovens, comprising means for providing communication between one end of a first oven being charged with coal and one end of a second oven having coal coking therein, means for introducing air into the second oven with the effluents flowing from the first oven through said communication means, a venturi tube in communication with the other end of the second oven, said venturi tube having a restriction therein to accelerate effluents therethrough at a rate sufficient to accommodate substantially all of the effluents produced during the charging of the first coke oven, and means connected to said venturi tube for reducing the pressure in the venturi tube and in the second oven adjacent thereto to increase the draft through the second oven thereby facilitating flow of effluents from the first oven through the entire second oven to said venturi tube, whereby effluents containing coal dust produced during the charging of coal to the first oven are drawn through the entire second oven with sufficient oxygen to incinerate the coal dust and are accelerated through said venturi tube sufficiently to prevent effluents containing coal dust from leaking to the atmosphere due to pressure build-up in the first oven.

3,968,015
POLY(TETRAMETHYLENETEREPHTHALATE) CROSSLINKED BY IRRADIATION

David D. Nyberg, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 11, 1973, Ser. No. 405,522

Int. Cl.² C08F *8/00;* **C08G** *18/00*

U.S. Cl. 204—159.15 **9 Claims**

1. A process for crosslinking poly(tetramethyleneterephthalate) comprising subjecting poly(tetramethyleneterephthalate) containing at least one part per 100 of N,N′-m-phenylenedimaleimide to irradiation with ionizing radiation to a dose of from about 2 to about 80 megarads and to a heating step wherein said heat may be applied during or after irradiation.

3,968,016
MIXTURE OF UNSATURATED POLYESTER RESINS WITH AN EPOXY DIACRYLATE AND THE ACTINIC LIGHT TREATMENT OF SAME

Marco Wismer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 254,060, May 17, 1972, abandoned. This application May 14, 1973, Ser. No. 360,253

Int. Cl.² C08F *8/00*

U.S. Cl. 204—159.16 **10 Claims**

1. The method comprising subjecting, in the presence of air, a composition comprising an actinic light sensitive mixture of compounds comprising

- a. an ethylenically unsaturated polyester of an alpha, beta ethylenically unsaturated polycarboxylic acid and a polyhydric alcohol,
- b. from about 10 to about 80 percent by weight, based on said ethylenically unsaturated polyester, of the reaction product of a member of the group consisting of acrylic acid and methacrylic acid with a polyglycidyl ether of a polyphenol or polyhydric alcohol, and
- c. from about 0.01 to about 10 percent by weight, based on the weight of said composition, of a photosensitizer

to actinic light having a wavelength in the range of from about 1800 to about 4000 Angstrom units to cure said composition and to impart thereto hardness, stain resistance and abrasion resistance.

3,968,017
PROCESS AND AN EQUIPMENT FOR PRODUCING CRYSTALLINE CITRIC ACID FROM SOLUTIONS OF ALKALINE CITRATES

Pierluigi Canata, Pellaro (Reggio Calabria), and Giampiero Longobardi, Rome, both of Italy, assignors to Compagnia Tecnica Industrie Petroli S.p.A., Rome and Liquichimica S.p.A., Milan, both of, Italy

Filed Feb. 6, 1975, Ser. No. 547,556

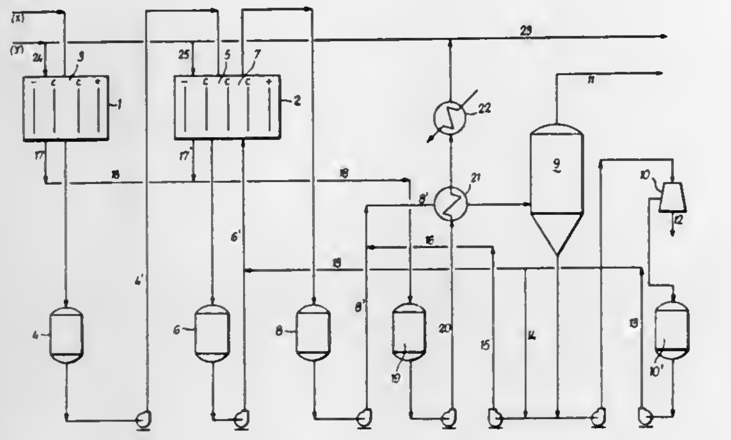
Claims priority, application Italy, Feb. 13, 1974, 48311/74

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **5 Claims**

1. A process for producing citric acid in crystalline form from solutions of alkaline citrates, characterized in comprising sequentially the stages of:

- a. partially converting by electrodialysis the alkaline citrate to citric acid;
- b. concentrating by hot fractional crystallization the solution of citric acid and alkaline citrate as obtained in (a), heat for the crystallization being supplied by heat exchange from the hot cathodic solution of electrodialysis stage (a);
- c. separating by centrifugation the crystalline citric acid from the concentrated solution coming from (b);
- d. re-cycling the mother liquors of crystallization residual from the separating operation (c) part to the electrodialysis stage (a) and part to the stage of crystallization (b).



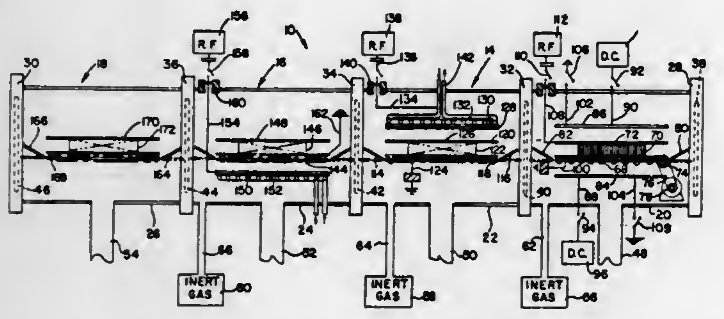
3,968,018
SPUTTER COATING METHOD

George C. Lane, Danbury; Cyril A. Cartwright, Monroe, and Keith W. Elmslie, Guilford, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 861,937, Sept. 29, 1969, abandoned. This application July 25, 1974, Ser. No. 491,717

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **12 Claims**



12. A method of cleaning and coating at least one article comprising, inserting said article into a cleaning chamber, evacuating said cleaning chamber, establishing a high electrical potential between said article and a reference point within said cleaning chamber, introducing a minute quantity of an inert gas into the region between said article and said reference point to clean said article by ionic surface bombardment, transferring said article directly from said cleaning chamber to an evacuated coating chamber while maintaining a high vacuum level in said cleaning chamber, isolating said cleaning chamber from said coating chamber into which said article is transferred, establishing an electrical potential between a target disposed within said coating chamber and said article, leaking small quantities of an inert gas into the region between the article and target to sputter surface material from the target to the article, re-evacuating said coating chambers, moving said article from said re-evacuated coating chamber to at least one adjacent evacuated coating chamber, and establishing and maintaining substantially the same vacuum level in each of said coating chambers while moving said article between said coating chambers when said coating chambers are in spatial communication with each other, and, after completion of the coating process, moving said article directly to a previously evacuated article removal chamber disposed adjacent said adjacent evacuated coating chamber to prevent communication between an outside atmosphere and said adjacent evacuated coating chamber, isolating said adjacent evacuated coating chamber from said removal chamber and removing said article from said removal chamber while said adjacent evacuated coating chamber is isolated therefrom.

3,968,019
METHOD OF MANUFACTURING LOW POWER LOSS SEMICONDUCTOR DEVICE

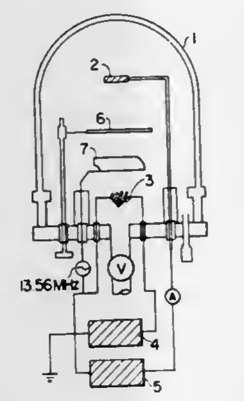
Masanobu Hanazono; Osamu Asai; Moriaki Fuyama; Masao Iimura; Hideyuki Yagi, and Masahiro Okamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 21, 1975, Ser. No. 560,880

Claims priority, application Japan, Mar. 25, 1974, 49-32574

Int. Cl.² C23C *15/00;* **H01L** *29/48*

U.S. Cl. 204—192 **13 Claims**



1. A method of manufacturing a low power loss semiconductor device comprising supporting a semiconductor substrate on a cathode in an inert gas atmosphere of low pressure, the semiconductor substrate including a lower resistivity layer and a higher resistivity layer adjacent thereto, the higher resistivity layer being doped with sufficient impurities to provide a resistivity of about 0.1 to 10 Ω. cm, and bombarding the surface of the higher resistivity layer of the semiconductor substrate with metal particles ionized in a glow discharge region to deposit a metal coating on the semiconductor substrate thereby forming a semiconductor-metal contact junction.

3,968,020
APPARATUS FOR SURFACE TREATING METAL MEMBERS

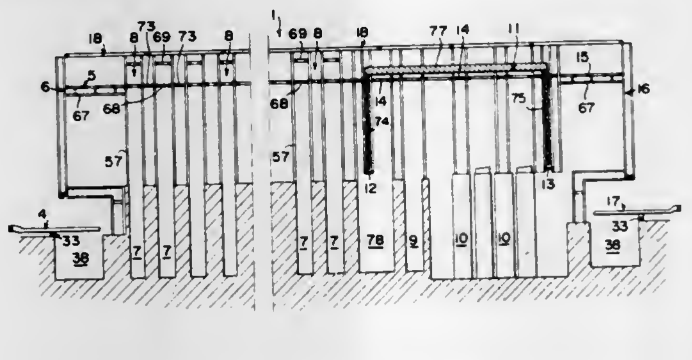
Toshihiro Nagano; Masashi Ikegaya; Tadao Maruyama; Fumio Shigeta, and Yoshio Sano, all of Shizuoka, Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Sept. 17, 1974, Ser. No. 506,726

Claims priority, application Japan, Sept. 29, 1973, 48-110044; Dec. 5, 1973, 48-137510

Int. Cl.² C25D *17/06*

U.S. Cl. 204—203 **12 Claims**



1. Apparatus for surface-treating a plurality of workpieces simultaneously comprising:

- a. at least one means at a given position for treating the workpieces;
- b. a detached carrier bar having devices for receiving and vertically suspending the plurality of the workpieces in side-by-side relationship;
- c. loading means having frame means for receiving and releasing said carrier bar and for rotating between horizontal and vertical positions while retaining said carrier bar horizontally and broadside;
- d. first lifting means for receiving said carrier bar when loaded with the workpieces from said loading means in its vertical position and for returning said carrier bar when unloaded to said loading means, said lifting means being vertically movable between lower and higher positions with said carrier bar retained horizontally thereon by its ends;
- e. conveyor means for receiving said loaded carrier bar from said first lifting means at said higher position and for conveying said carrier bar by its ends horizontally and broadside;
- f. second lifting means positioned above said treating means and interacting with said conveyor means for vertically moving said carrier bar in a horizontal position with said plurality of workpieces suspended therefrom downwardly into and upwardly from said treating means and back substantially to the level of said higher position;
- g. unloading means having frame means for receiving and releasing said carrier bar and for rotating between vertical and horizontal positions while retaining said carrier bar horizontal and broadside;
- h. third lifting means for receiving said carrier bar when loaded with the workpieces from said conveyor means and lowering said carrier bar to said unloading means in its vertical position and for receiving said carrier bar when unloaded from said unloading means and raising said unloaded carrier bar vertically; and
- i. return conveyor means for receiving said unloaded carrier bar from said third lifting means and returning said unloaded carrier bar broadside to said first lifting means for lowering to said loading means in its vertical position.

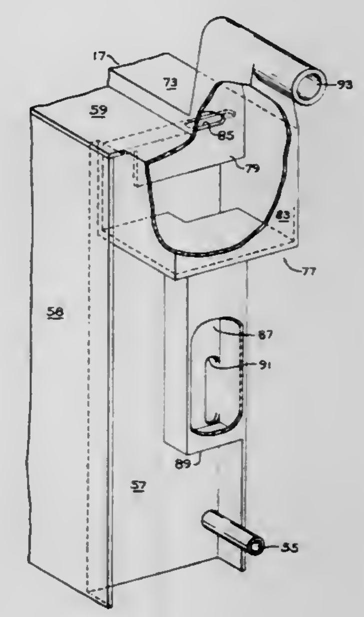
3,968,021
ELECTROLYTIC CELL HAVING HYDROGEN GAS DISENGAGING APPARATUS

Henry W. Rahn, Pittsburgh, Pa.; Hugh Cunningham, Corpus Christi, Tex.; Colonel R. Dilmore, New Martinsville, Tex.; Thomas C. Jeffery, Lake Charles, Tex., and Carl W. Raetzsch, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 457,299, April 2, 1974, Pat. No. 3,938,150. This application May 29, 1975, Ser. No. 581,601

Int. Cl.² C23B *9/00*

U.S. Cl. 204—256 **4 Claims**



1. In a chlor-alkali bipolar electrolyzer comprising a plurality of individual diaphragm cells electrically and mechanically in series, each of said cells comprising:

a first cell unit having an anolyte-resistant backplate;

anode means mounted on the backplate of said first cell unit;

a second cell unit having a catholyte-resistant backplate;

hollow cathode means mounted on the backplate of said second cell unit;

permeable barrier means interposed between said anode means and said hollow cathode means, and dividing said individual cell into an anolyte chamber and a catholyte chamber including said hollow cathode means;

means for feeding brine to said cell;

means for recovering anodic gas of said cell;

means for recovering cathodic gas from the catholyte chamber of said cell; and

means for recovering cell liquor from the catholyte chamber of said cell;

the improvement wherein said cathodic gas recovery means comprises:

horizontal channel means extending across substantially the entire width of said cell and separate from said catholyte chamber;

a plurality of apertures between said channel means and said catholyte chamber, at least one of said apertures being at an end of the channel means opposite an outlet therefrom;

gas disengaging means at the outlet of said channel means, which disengaging means comprises:

a disengaging chamber;

catholyte gas downward deflection means and catholyte gas upward deflection means interposed between the outlet of said horizontal channel and the gas outlet of said disengaging chamber whereby to deflect catholyte gas first downward and then upward;

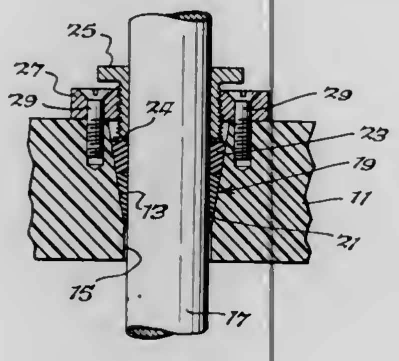
hydrogen recovery means at the outlet from said disengaging means; and

catholyte liquor recovery means.

3,968,022
ELECTROLYTIC CELL SEAL

Jeffrey D. Eng, North Vancouver; Cyril J. Harke, Burnaby; Primo Bosa, Vancouver, all of Canada, and Wilfredo E. Figueras, Amherst, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,741
Int. Cl.^{2} C25B *1/26, 9/00, 9/02*
U.S. Cl. 204—279 **6 Claims**

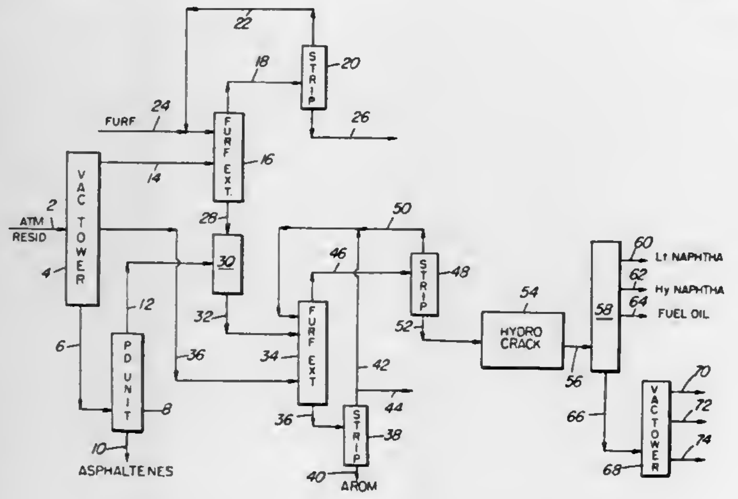


1. A seal for preventing passage of fluid through an opening in an electrolytic cell wall through which a conductor for carrying electricity to a cell electrode passes which comprises a portion of a cell wall having a tapered opening therein which is larger at the outer part of the wall than at the inner part, silicone rubber in the narrower tapered opening part, an electrolyte-resistant rubber in the wider tapered opening part and means for pressing such rubber against the silicone rubber so as to help tightly seal the silicone rubber against the wall and the conductor.

3,968,023
PRODUCTION OF LUBRICATING OILS

Tsoung-Yuan Yan, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,655
Int. Cl.^{2} C10G *37/00*
U.S. Cl. 208—86 **5 Claims**



1. A method for producing lube oils from an atmospheric residual oil which comprises,

separating an atmospheric residual oil to recover a light vacuum gas oil, a heavy vacuum gas oil and a resid containing asphaltic material, deasphalting said resid to provide a first raffinate product thereof,

solvent extraction said light vacuum gas oil to provide a second raffinate phase and a first extract phase, separating solvent from said extracted light vacuum gas oil, combining said first extract phase with said first raffinate product of said resid deasphalting operation to form a mixed oil phase comprising solvent with extracted polycyclic aromatics,

using said mixed oil extract phase with solvent to remove undesired aromatics from said heavy vacuum gas oil in a second solvent extraction zone,

recovering a second extract phase from said second solvent extraction zone and separating solvent from aromatics in said second extract phase, recycling solvent thus separated to said second solvent extraction zone,

recovering a third raffinate phase from said second solvent extraction zone and separating solvent from an oil phase comprising said third raffinate and boiling above about 800°F., recycling solvent thus separated to said second extraction zone,

passing said oil phase boiling above about 800°F. to a hydrocracking zone maintained under relatively mild hydrocracking conditions selected to enhance the yield of lube oil base products and separating a product of said hydrocracking operation boiling above about 650°F into a plurality of separate boiling range lube oil fractions.

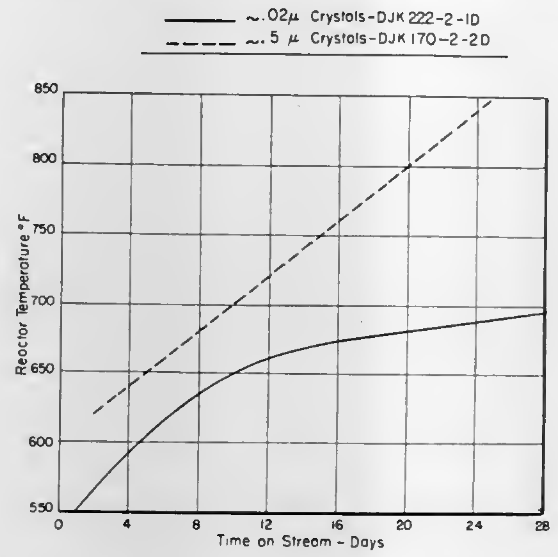
3,968,024
CATALYTIC HYDRODEWAXING

Robert L. Gorring, Washington Crossing, Pa., and George F. Shipman, Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 377,157, July 6, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,670
Int. Cl.^{2} C10G *13/02, 11/04;* **B01J** *29/28*
U.S. Cl. 208—111 **7 Claims**

1. In the process of upgrading hydrocarbon feeds by contacting such with a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12, at a temperature of about 500° to 1100°F, a space velocity of about 0.1 to 100 LHSV and a hydrogen to hydrocarbon mole ratio of about 0 to 20; the improvement, whereby eliminating net hydrogen

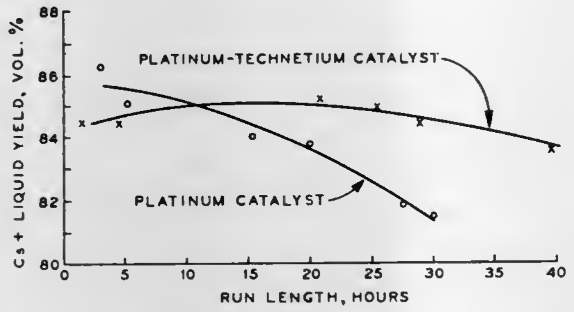
consumption and increasing catalyst cycle life, which comprises: utilizing a catalyst comprising said zeolite having a crystal size of up to about 0.05 micron; and operating said process at a total pressure of up to about 500 psig.



3,968,025
HYDROCARBON CONVERSION PROCESS

Melvin M. Holm, Alameda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 20, 1969, Ser. No. 801,008
Int. Cl.^{2} C10G *35/06, 35/08*
U.S. Cl. 208—135 **3 Claims**



1. A catalytic composite comprising a combination of a platinum group metallic component, a technetium component, and a halogen component with an alumina carrier material, said components being present in amounts sufficient to result in the catalytic composite containing, on an elemental basis, about 0.1 to about 10 weight percent halogen, about 0.01 to about 3 weight percent of platinum group metal and about 0.01 to about 10 weight percent technetium.

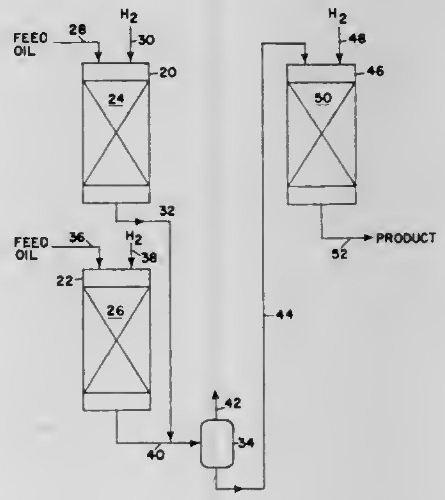
3. A process for increasing the octane number of hydrocarbons boiling within the gasoline range comprising contacting the hydrocarbons with a catalyst consisting of technetium on an inert support under reforming conditions.

3,968,026
HYDRODESULFURIZATION PROCESS WITH PARALLEL FIRST STAGES IN SERIES WITH A UNIFIED SECOND STAGE

James A. Frayer; Richard E. Hildebrand, both of Indiana, and John A. Paraskos, McCandless, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 28, 1975, Ser. No. 572,419
Int. Cl.^{2} C10G *23/02*
U.S. Cl. 208—210 **5 Claims**

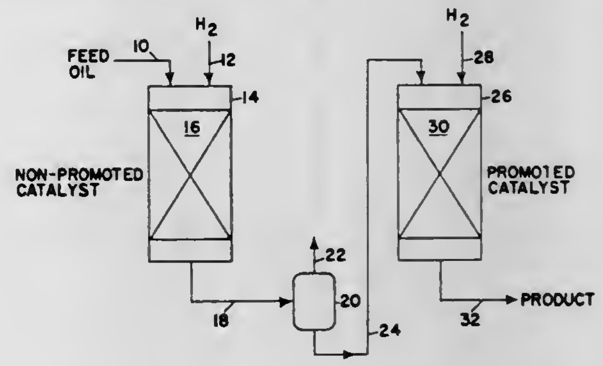
1. A process for the desulfurization of an asphaltene-containing feed oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psig and a temperature between 600° and 900°F., comprising passing said feed oil together with hydrogen downwardly through at least two prallel first catalytic hydrodesulfurization stages, combining effluent from at least two parallel first stages and passing the combined effluent downwardly through a second catalytic hydrodesulfurization stage, the catalyst in said second stage comprising Group VI and Group VIII metals together with a promoting amount of Group IV-B metal impregnated on a non-cracking support, said promoting amount being between 1 to 10 weight percent based on the total weight of said catalyst the catalyst in said first stage comprising Group VI and Group VIII metals on a non-cracking support without said Group IV-B metal promoting amount of said process including a flashing step between said first and second stages for removing contaminating gases from the oil stream flowing from said first to said second stages interrupting the feed oil and hydrogen being passed through at least one of said parallel first stages which supplies effluent to said second stage to replace deactivated catalyst therein, and continuing to pass said feed oil and hydrogen through at least another of said parallel first stages to supply a reduced oil flow to said second stage during the catalyst replacement step.



3,968,027
MULTI-STAGE HYDRODESULFURIZATION UTILIZING A SECOND STAGE CATALYST PROMOTED WITH A GROUP IV-B METAL

James A. Frayer; Richard E. Hildebrand, both of Indiana, and John A. Paraskos, McCandless, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 28, 1975, Ser. No. 572,460
Int. Cl.^{2} C10G *23/02*
U.S. Cl. 208—210 **9 Claims**

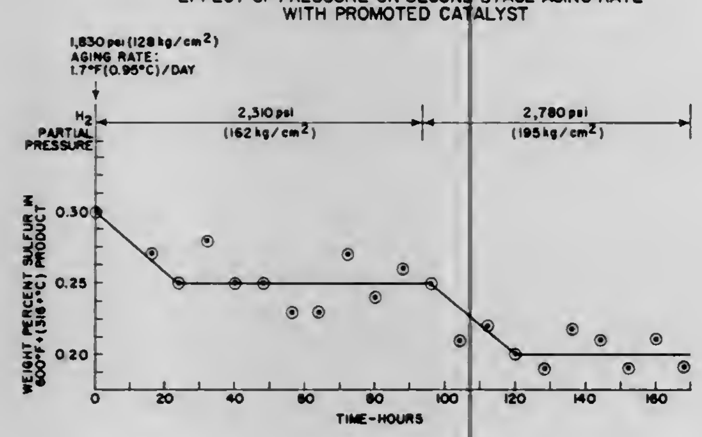


1. A process for the desulfurization of an asphaltene-containing feed oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psig and a temperature between 600° and 900°F., comprising passing said oil together with hydrogen downwardly through first and second hydrodesulfurization stages in series, the catalyst in said second stage comprising Group VI and Group VIII metals together with a promoting amount of Group IV-B metal impregnated on a non-cracking support, said promoting amount being between 1 to 10 weight percent based on the total weight of said catalyst, the catalyst in said first stage comprising Group VI and

Group VIII metal on a non-cracking support without said promoting amount of Group IV-B metal, said process including a flashing step between said first and second stages for removing contaminating gases from the oil stream flowing from said first to said second stage, and removing desulfurized oil from said second stage.

3,968,028
PROCESS FOR ONSTREAM REGENERATION OF A HYDRODESULFURIZATION CATALYST
James A. Frayer; Richard E. Hildebrand, both of Indiana, and John A. Paraskos, McCandless,all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Apr. 28, 1975, Ser. No. 572,504
Int. Cl.² C10G *23/02*
U.S. Cl. 208—210 **9 Claims**

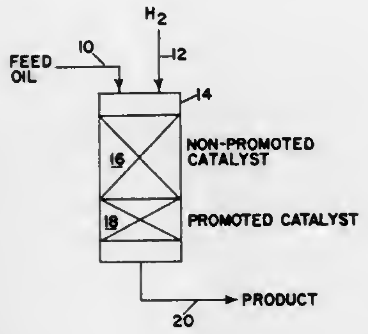
EFFECT OF PRESSURE ON SECOND STAGE AGING RATE WITH PROMOTED CATALYST



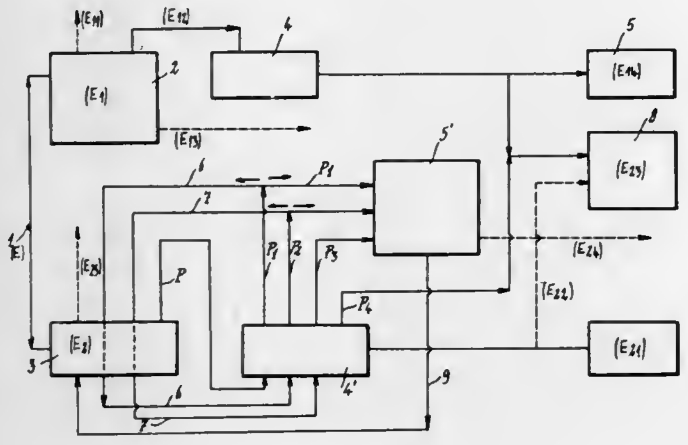
1. A process for the desulfurization of an asphaltene-containing feed oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psig and a temperature between 600° and 900°F., comprising passing said oil together with hydrogen downwardly through first catalytic and second catalytic hydrodesulfurization stages in series, said hydrogen being at least one selected from the group of recycle hydrogen and make-up hydrogen, the catalyst in said second stage comprising Group VI and Group VIII metals together with a promoting amount of Group IV-B metal impregnated on a non-cracking support, said promoting amount being between 1 to 10 weight percent based on the total weight of said catalyst, the catalyst in said first stage comprising Group VI and Group VIII metals on a non-cracking support without said promoting amount of Group IV-B metal, said process including a flashing step between said first and second stages for removing contaminating gases from the oil stream flowing from said first to said second stage, increasing the hydrogen partial pressure in said second stage after coke has deposited on the catalyst therein until the coke level on said second stage catalyst is reduced, lowering the hydrogen partial pressure in said second stage after the coke level on the catalyst is reduced, and removing desulfurized oil from said second stage.

3,968,029
DESULFURIZATION PROCESS EMPLOYING MULTI-CATALYST REACTOR
James A. Frayer; Richard E. Hildebrand, both of Indiana, and John A. Paraskos, McCandless, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Apr. 28, 1975, Ser. No. 572,417
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **7 Claims**

1. A process for the desulfurization of an asphaltene-containing feed oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psig and a temperature between 600° and 900°F., comprising passing said oil together with hydrogen downwardly through a hydrodesulfurization reactor containing an upstream catalyst bed and a downstream catalyst bed, said downstream catalyst bed comprising Group VI and Group VIII metals together with a promoting amount of Group IV-B metal impregnated on a non-cracking support, said promoting amount being between 1 to 10 weight percent based on the total weight of said catalyst, said upstream catalyst bed comprising Group VI and Group VIII metals on a non-cracking support without said promoting amount of Group IV-B metal and removing desulfurized oil from said reactor.



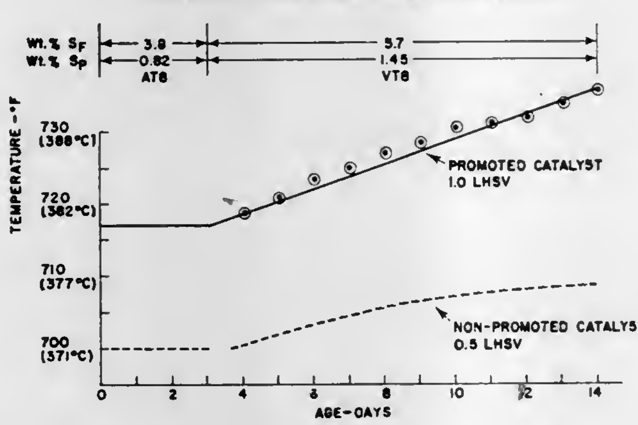
3,968,030
METHOD AND AN INSTALLATION FOR IMPROVING THE ENERGY BALANCE OF INSTALLATIONS FOR PROCESSING CHEMICAL PROCESS STREAMS AND ESPECIALLY PETROLEUM REFINERIES
Pierre Cros, Paris, France, assignor to Spie-Batignolles and Societe Generale de Techniques et d'Etudes, both of Puteaux, France
Filed Jan. 3, 1975, Ser. No. 538,380
Claims priority, application France, Jan. 17, 1974, 74.0501541
Int. Cl.² C10G *7/00*
U.S. Cl. 208—347 **8 Claims**



1. A method for improving the energy balance of a petroleum refinery in which crude oil is heated and then distilled in at least one distillation column, comprising the steps of producing steam in a boiler at a pressure of at least about 120 bars, feeding said steam to a back-pressure turbo-alternator that has a plurality of turbine stages that are driven by steam at a plurality of successively lower pressures with the steam moving from stage to stage of said turbine stages as the steam progressively decreases in pressure and in temperature, withdrawing steam from each of a plurality of said turbine stages thereby to produce a plurality of streams of steam of successively different temperature and pressure, heating said crude oil by indirect heat exchange with each of said streams in succession in progressively ascending order of temperature and pressure of said streams, and feeding said heated crude oil into said at least one distillation column after said heat exchange with said stream of highest temperature and pressure.

3,968,031
MULTI-STAGE HYDRODESULFURIZATION PROCESS UTILIZING MULTI-CYCLE SECOND STAGE PROMOTED CATALYST
James A. Frayer; Richard E. Hildebrand, both of Indiana, and John A. Paraskos, McCandless, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Apr. 28, 1975, Ser. No. 572,418
Int. Cl.² C10G *23/02*
U.S. Cl. 208—210 **5 Claims**

FIRST STAGE AGING PROMOTED VERSUS NON-PROMOTED CATALYST



1. A process for the desulfurization of an asphaltene-containing feed oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psig and a temperature between 600° and 900°F., comprising passing said oil together with hydrogen downwardly through first catalytic and second catalytic hydrodesulfurization stages in series, the catalyst in said second stage comprising Group VI and Group VIII metals together with a promoting amount of Group IV-B metal impregnated on a non-cracking support, said promoting amount being between 1 to 10 weight percent based on the total weight of said catalyst, the catalyst in said first stage comprising Group VI and Group VIII metals on a non-cracking support without said promoting amount of Group IV-B metal, said process including a flashing step between said first and second stages for removing contaminating gases from the oil stream flowing from said first to said second stage, replacing deactivated non-promoted first stage catalyst with fresh non-promoted first stage catalyst at least once without replacing said promoted second stage catalyst so that said promoted second stage catalyst remains onstream for a period equal to at least two first stage catalyst cycles, and removing desulfurized oil from said second stage.

3,968,032
PROCESS FOR CONCENTRATING LEAD AND SILVER BY FLOTATION IN PRODUCTS WHICH CONTAIN OXIDIZED LEAD
Francisco Javier Sitges Menendez; Vicente Arregui Fernandez, and Macario Quesada Quintana, all of Salinas-Castrillon (Oviedo), Spain, assignors to Asturiana de Zinc S.A., Castrillon (Oviedo), Spain
Filed Jan. 22, 1974, Ser. No. 435,409
Claims priority, application Spain, Jan. 27, 1973, 411058
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **7 Claims**

1. A flotation process for concentrating lead and silver from electrolytic zinc residues which contain lead sulfate and silver comprising the steps:

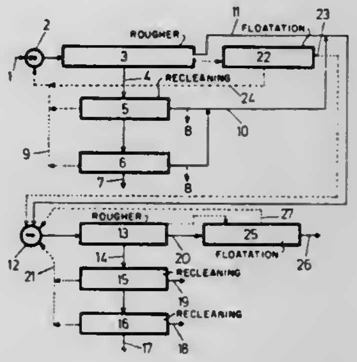
subjecting the zinc residue to a "rougher" operation employing collector agents such as xanthates and dithiophosphates and floating in an acid medium most of the silver, sulphur and zinc contained therein:

recleaning said floated product in one to three stages and obtaining a concentrate rich in silver, sulphur and zinc;

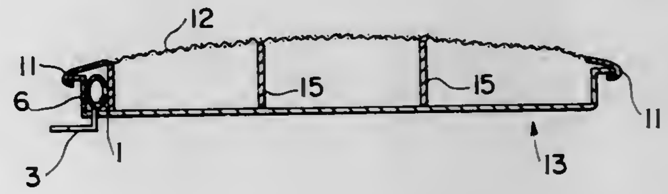
treating the residue from said first "rougher" operation with sulphurizing agents to activate the lead component as a pH ranging from 2 to 4.5;

subjecting the sulphurized treated residues to another "rougher" operation wherein said lead and additional silver components are floated;

recleaning said floated product from said treated residues in one to three stages; and recovering said lead and additional silver as a concentrate.



3,968,033
CLAMPING DEVICE FOR SCREEN BOTTOMS
Heinrich Illemann, St. Magdelen near Villach, and Josef Urbanek, Steindorf, both of Austria, assignors to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft, Carinthia, Austria
Filed Feb. 21, 1975, Ser. No. 551,544
Claims priority, application Austria, Feb. 25, 1974, 1493/74
Int. Cl.² B07B *1/48*
U.S. Cl. 209—403 **8 Claims**



1. A screening apparatus comprising:
a. a screen frame having first and second opposed sides;
b. a screen bottom for positioning on said screen frame, wherein said screen bottom has first and second opposed sides corresponding to said first and second opposed sides of said screen frame, said first opposed side of said screen bottom being detachable and attachable to said first opposed side of said screen frame;
c. a fluid pressure source; and
d. means for pneumatically tightening said screen frame, said tightening means being disposed below said screen bottom and horizontally adjacent said second opposed side of said screen frame for tightening said second opposed side of said screen bottom to said second opposed side of said screen frame, and wherein said tightening means includes:
  i. a deflatable and inflatable tubular member running substantially the length of said second opposed side of said screen frame, and operatively connected to said fluid pressure source; and
  ii. a detached clamping member movably mounted on said screen frame and running horizontally along the length of one side of said tubular member between said tubular member and said second opposed side of said screen bottom, said clamping member being movable by inflation of said tubular member for engagement with said second opposed side of said screen bottom.

3,968,034
PROCESS AND APPARATUS FOR TREATING WASTES BY A COMBINED ACTIVATED SLUDGE AND BIOLOGICAL FILTER BED

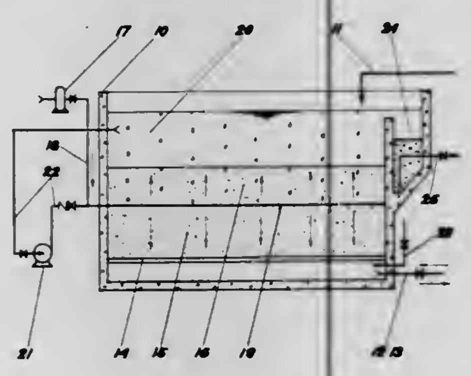
Jerzy Tymoszczuk, 3415 Girouard Ave., Apt. 914, Montreal, N.D.G., Quebec, Canada

Continuation-in-part of Ser. No. 100,220, Dec. 2, 1970, Pat. No. 3,853,752. This application Oct. 15, 1974, Ser. No. 515,044

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.^{2} C02C *1/04*

U.S. Cl. 210—8 **34 Claims**



1. A process for the treatment of wastes such as sewage and waste liquid, said process comprising: maintaining a submerged aerated biological filter bed zone containing finely divided particulate filtering media which is circulated in said zone; maintaining an aerated activated sludge zone in upstream fluid zone, feeding waste to be treated to said activated sludge zone; recycling said waste from said activated sludge zone through said biological filter bed back to said activated sludge zone; maintaining a biological stable filter bed zone in downstream fluid flow relationship to said aerated biological filter bed zone and said activated sludge zone so that the waste passes thereto; draining treated waste from said biological stable filter bed zone; and backwashing said biological stable filter bed zone as often as required to maintain the operating effectiveness of said biological stable filter bed zone and an acceptable headloss at the point of withdrawal of the treated effluent.

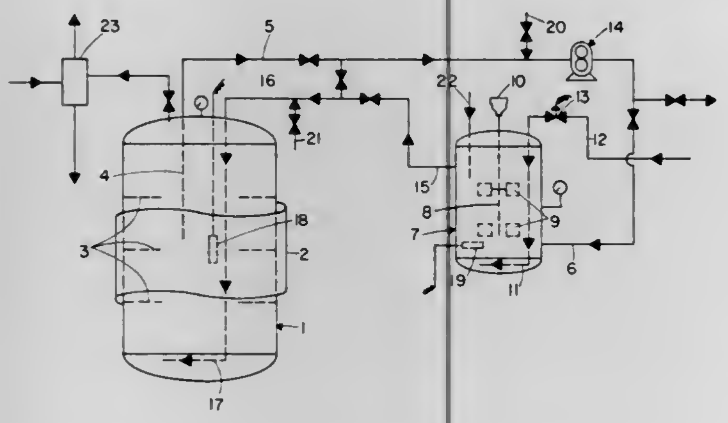
3,968,035
SUPER-OXYGENATION METHOD

Robert H. L. Howe, West Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 348,377, April 5, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,863

Int. Cl.^{2} C12B *1/14*

U.S. Cl. 210—15 **12 Claims**



1. A method for continuously super-oxygenating a portion of the bio-oxidizable fluid from a bio-oxidation reactor to increase the concentration of oxygen dissolved in such fluid and reduce the energy required to effect the dissolution of such oxygen in such fluid comprising the steps of:

a. continuously transferring a stream of said fluid in said reactor from a point near the top of the column of said fluid to a point near the bottom of an oxidator vessel equipped with a high shear agitator, said vessel having a capacity of from about one-tenth to one-two hundreth of the capacity of said reactor and having a diameter to height ratio of from about 1:2 to about 1:10 and said agitator having a diameter of from about 1:3 to 2:3 of the diameter of said vessel and impellers thereon having an effective surface area about the same as the cross-sectional area of said vessel, said reactor and said vessel being connected in a closed system;

b. filling said vessel with a column of said fluid from said reactor to a point near the top of said vessel where there is disposed a return conduit from said vessel to a point near the bottom of said vessel to a point near the bottom of said reactor;

c. introducing an oxygen containing gas into said fluid in said vessel at a point near the bottom of said vessel, at a pressure of from about 1.0 to about 40 psig;

d. revolving said agitator in said fluid in said vessel while said gas is being introduced thereinto;

e. operating said agitator at from about 150 to about 1,800 rpm wherein the energy utilization is from about 5 to about 15 horsepower per 1,000 gallons of said fluid in said vessel;

f. shearing said oxygen containing gas into submillimeter bubbles of the order of from about 10^{-1} to about 10^{-4} centimeters in said fluid; and

g. continuously transferring a stream of the bio-oxidizable fluid containing the sub-millimeter bubbles of oxygen containing gas from said vessel to a point near the bottom of said reactor, said stream being taken from a point near the top of said column of said fluid in said vessel, said transferring being conducted at a rate such that the volume of said fluid in said vessel is renewed every 30 to 240 seconds.

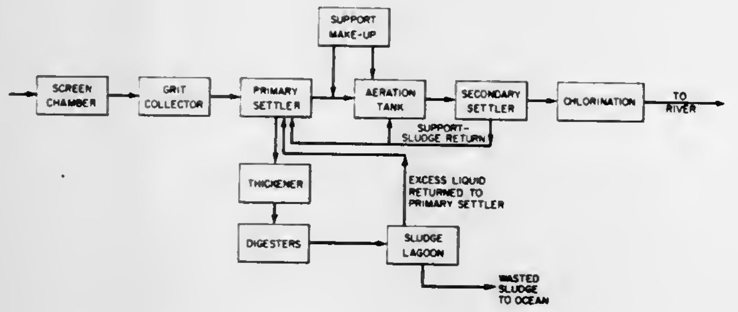
3,968,036
METHOD OF TREATING WASTE WATER

Arthur W. Liles, Murray Hill, and Robert D. Schwartz, East Windsor, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 17, 1974, Ser. No. 480,011

Int. Cl.^{2} C02C *1/20*

U.S. Cl. 210—15 **2 Claims**



1. In a process for biologically treating industrial and municipal waste water containing organic carbon, which comprises the steps of mixing said waste water with an activated sludge at conditions whereby a portion of the organic carbon present in said waste water is biologically oxidized, said conditions including a temperature of from 10° to 60°C, and separating an effluent from said mixture of waste water and activated sludge which is depleted in organic carbon, the improvement which comprises mixing with said activated sludge a catalyst

which has been deactivated in a fluid cracking process, said catalyst comprising V, Fe, Ni, Cu, and C supported on an inorganic oxide selected from the group consisting of alumina, silica, aluminum silicates and mixtures thereof said catalyst being mixed at a ratio of inorganic oxide to activated sludge of from 0.1 to 10 wt. % of said activated sludge whereby said inorganic oxide functions as a nucleation center.

3,968,037
EMULSION POLYMERIZATION OF CATIONIC MONOMERS

Janice Elaine Morgan, Carnegie, and Jerry Emile Boothe, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 285,888, Sept. 1, 1972, abandoned. This application June 17, 1974, Ser. No. 479,922

Int. Cl.^{2} C02B *1/20*

U.S. Cl. 210—47 **1 Claim**

1. A method of releasing water from activated sewage sludge which comprises steps of adding to the sludge from about 0.1 ppm to about 20 ppm of a cationic polymer prepared by forming an aqueous solution of from about 5% to about 95% by weight dimethyl diallyl ammonium chloride and about 0.005 to about 5 mole %, based on the moles of dimethyl diallyl ammonium chloride of a copolymerizable, polyunsaturated cross-linking monomer selected from the group consisting of methylenebisacrylamide, methyl triallyl ammonium chloride and tetraallyl ammonium chloride, preparing a water-in-oil emulsion of said aqueous solution in a water insoluble liquid containing a surfactant, said water insoluble liquid being about 25% to about 90% by weight of the total emulsion and said surfactant being 0.5 percent to 10 percent by weight of the total emulsion, and heating the emulsion to a temperature sufficient to essentially completely polymerize the monomers in the presence of a free radical polymerization initiator, said free radical polymerization initiator being present in amounts from 10^{-7} to 10^{-1} mole per mole of dimethyl diallyl ammonium chloride, and filtering the sludge-polymer mixture.

3,968,038
APPARATUS FOR TREATING LIQUIDS

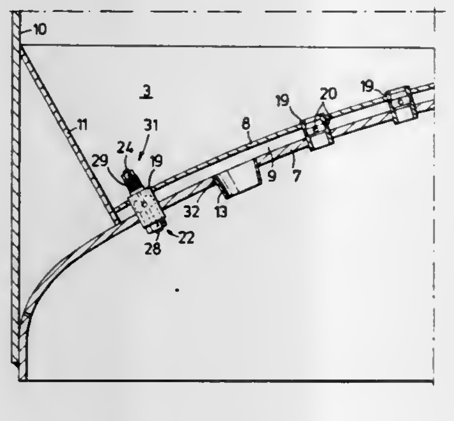
Bengt H. Nilsson, Skoghall, Sweden, assignor to Uddeholms Aktiebolag, Sweden

Filed July 10, 1975, Ser. No. 594,641

Claims priority, application Sweden, July 10, 1974, 7409056

Int. Cl.^{2} B01D *29/38*

U.S. Cl. 210—275 **7 Claims**



1. Apparatus for treating a liquid by causing it to flow downwardly through a bed of particulate material, comprising a tank forming a bed-accommodating chamber therein and having a bed-supporting bottom structure, said bottom structure comprising upper and lower bottom plates having a plurality of opposing openings therein and forming between them a bottom compartment, conduit means communicating with the bottom compartment through the lower bottom plate, and a plurality of sleeves extending between the upper and lower bottom plates in alignment with pairs of opposing openings therein, the lower ends of said sleeves adapted to be closed in operation; axially spaced portions of each sleeve being rigidly joined with respectively the upper and the lower bottom plate, the interior of each sleeve communicating with the bed-accommodating chamber and with the bottom compartment.

3,968,039
FILTER PRESS

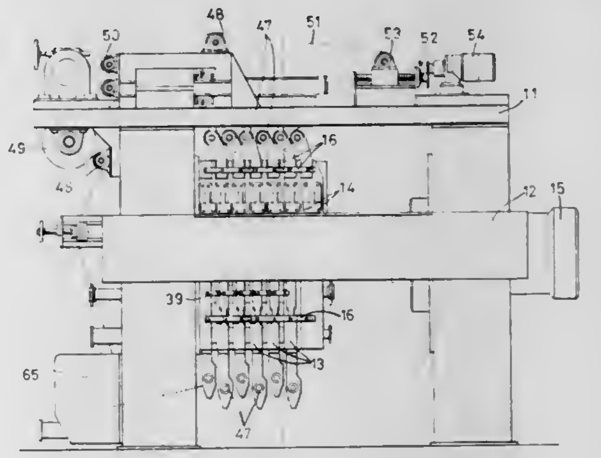
Kazuo Inujima, Sakai; Kiyohiko Tokunaga, Kishiwada, and Yoshiyuki Sotobayashi, Amagasaki, all of Japan, assignors to Kubota Tekko Kabushiki Kaisha (Kubota, Ltd.), Osaka, Japan

Filed Jan. 23, 1975, Ser. No. 543,234

Claims priority, application Japan, Nov. 26, 1974, 49-137336

Int. Cl.^{2} B01D *25/32*

U.S. Cl. 210—225 **3 Claims**



1. A filter press comprising:

a. a longitudinal rectangular frame (11) to each side of which are supports (12) for holding filter plates (13);

b. a plurality of vertically disposed filter plates (13) having a projecting portion (30) with sliding means (14) for free movement along said supports (12);

c. sliding link means (16) at the sides of said filter plates (13) coupling said filter plates for movement towards or away from each other;

d. hydraulic cylinder means horizontally disposed, coupled to said filter plates to push them together or pull them apart;

e. a filtrate recess portion (20) in said filter plates at one surface, with filtrate passages (21) at the bottom, a sealing diaphragm (22) at the other surface, and a hollow (26) in said recess portion (20);

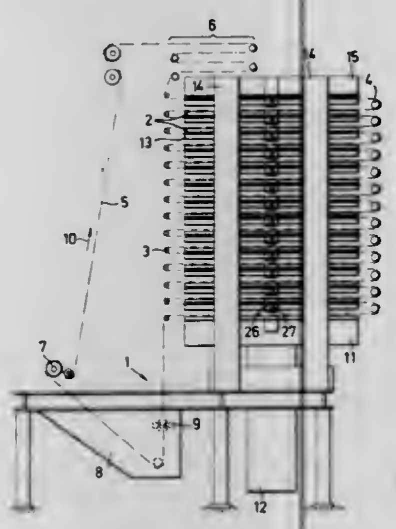
f. a mouthpiece (25) for each of said filter plates for entering said hollow, said mouth piece having a flat fitting portion (27) that fits in said hollow (20), a pipeline portion (66) opposite said projecting portion (30) of the respective filter plate with a corresponding pipeline aperture (32) and, guide means (35, 36) to couple the pipeline portion aperture (32) and the projecting portion apertures (32) so as to form a pipeline when said filter plates are pressed together, a lower projecting portion (41) under the projecting portion (30) with an opening (42), a filtrate conduit (43) leading to said opening (42) from said filtrate passages (21) so that when said openings (42) are pressed together a discharge line is formed and the filtrate can be discharged from one end of the line;

g. pressure water feed means (46) coupled to said filter plates (13) to feed water under pressure to said diaphragm; and,

h. roller means for passing an endless filter cloth (51) along a travel path over and under said filter plates (13), with filter cloth cleaning means (65) along said travel path.

3,968,040
PLATE FILTER WITH HORIZONTALLY ARRANGED BILATERALLY ACTING FILTERS

Ernst Ostrop, Stockheim, Germany, assignor to Eberhard Hoesch & Söhne, Duren, Germany
Filed May 6, 1975, Ser. No. 574,909
Claims priority, application Germany, May 6, 1974, 2421781
Int. Cl.² B01D *25/12*
U.S. Cl. 210—225 **11 Claims**

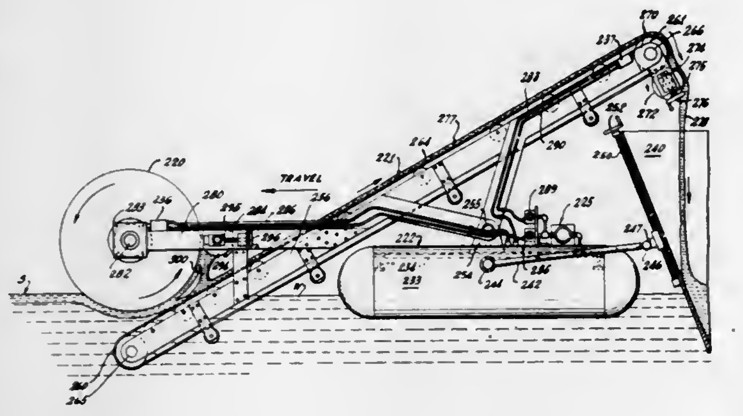


1. In a plate filter apparatus composed of a plurality of horizontally disposed filter plates arranged in a vertical stack and each presenting an upper face and a lower face, a locking assembly associated with the plates and operable to press the plates toward one another to close the filter and to move the plates away from one another to open the filter, an endless filter cloth band, and a plurality of guide rollers around which the band passes, the rollers being arranged in a manner such that the band passes between adjacent filter plates, each filter plate defining a liquid tight partition located between its faces and provided with channels for the discharge of liquids, and each plate being provided with rim portions projecting vertically at both plate faces to define sealing surfaces, the improvement wherein: each said filter plate is provided at each of its said faces with fluid flow channels communicating with said channels for the discharge of liquids; said apparatus comprises a plurality of frame members each disposed between a respective pair of adjacent filter plates and each constituted by a rim surrounding a hollow region and formed to coincide with the rim portions of said plates which are directed toward said frame member, the rim of each said frame member and said pair of filter plates adjacent thereto defining a filter chamber when said plates are pressed toward one another; and said filter cloth band extends along a path which passes between each filter plate face and the respective adjacent frame member.

3,968,041
APPARATUS FOR COLLECTING OIL SLICK FROM A BODY OF WATER

Edwin A. De Voss, 1363 Clarence Drive, Vista, Calif. 92083
Continuation-in-part of Ser. No. 128,766, March 29, 1971, abandoned. This application Sept. 12, 1973, Ser. No. 396,348
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 S **19 Claims**

1. In an apparatus for removing oil from a body of water while moving along the water in a forward direction of motion: a conveyor having a surface to which oil tends removably to adhere, said surface being contactible with the top of a slick of oil to be removed while the slick is on the surface of the body of water, and movable rearwardly of the said forward direction and upwardly relative to the water; a secondary conveyor formed as a belt having a lower loop beneath the surface of the water, and a length disposed rearwardly of the first-named conveyor, and extending rearwardly and upwardly, whereby to form at the elevation of the oil atop the water an initially wedge-shaped path into which the oil slick tends to be drawn as a consequence of movement of the conveyors relative to one another, the first-named conveyor comprising a drum having a substantial portion of its periphery forming a downwardly-facing region so disposed and arranged as to contact the top of the oil slick.

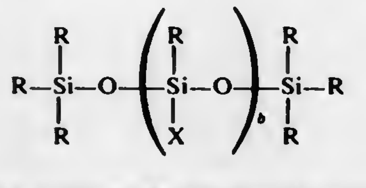


3,968,042
FINISHING AGENT AND NONSCROOPY POLYOLEFIN FIBERS

Wayne K. Erickson, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sept. 13, 1974, Ser. No. 505,916
Int. Cl.² D06M *13/18, 13/46*
U.S. Cl. 252—8.9 **7 Claims**

1. A two-component finishing agent composition comprising:

on a dry solids basis, from about 60 to about 80 weight percent of a first component and from about 20 to about 40 weight percent of a second component wherein said first component comprises an organopolysiloxane and said second component comprises from about 86 to about 98 weight percent of a quaternary ammonium salt surface-active material having softening properties for polyolefin fibers; from about 0.3 to about 2 weight percent of a nonionic wetting agent; from about 0.7 to about 4 weight percent of a buffering agent; and from about 1 to about 8 weight percent of a corrosion inhibitor; with the amounts of said components being adjusted within said ranges relative to each other so that when said composition is dispersed in water to provide an aqueous dispersion containing from about 1to about 20 weight percent solids, said dispersion has a pH with the range of from 6 to 8, said organopolysiloxane being represented by the formula



$$R-\overset{\overset{\textstyle R}{|}}{\underset{\underset{\textstyle R}{|}}{Si}}-O-\left(\overset{\overset{\textstyle R}{|}}{\underset{\underset{\textstyle X}{|}}{Si}}-O\right)_b-\overset{\overset{\textstyle R}{|}}{\underset{\underset{\textstyle R}{|}}{Si}}-R$$

wherein each R is individually selected from the group consisting of alkyls having from 1 to 6 carbon atoms, each *x* is individually selected from the group consisting of R and $+CH_2CH_2O+CH$ with from 10 to 90 percent of the *x*'s being R, *b* is an integer having a value of at least 10, and *c* is an integer having a value of at least 20.

3,968,043
METHOD OF PREPARATION OF MATERIAL FOR LUBRICATION OF EXTERNAL SURFACE OF DRILLING PIPE

Vladimir Sergeevich Shavyrin, Ploschad Svobody, 4, kv. 18; Vyacheslav Nikolaevich Gusakov, ul. Kuibysheva, 23, kv. 3, both of Gorky; Klavdia Vasilievna Pankova, ul. Tsiolkovskogo la, kv. 50, Volgograd; Nina Petrovna Polyakova, Ploschad Svobody, 4, kv. 116; Natalya Petrovna Shirkaeva, ul. Svetloyarskaya, 75, kv. 5, both of Gorky; Valentin Nikolaevich Gorin, ul. Basseinaya, 53, kv. 1; Oleg Semenovich Goyovin, ul. Mikhailova, 8, kv. 29, both of Leningrad, all of U.S.S.R.; Alexei Egorovich Mastjukova, deceased, late of Gorky, U.S.S.R., and by Maria Pavlovna Mastjukova, heir at law, Ploschad Svobody, 4, kv. 67, Gorky, U.S.S.R.
Continuation of Ser. No. 472,866, May 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 268,894, July 3, 1972, abandoned. This application May 13, 1975, Ser. No. 576,959
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 R **1 Claim**

1. A method of preparing a lubricant for lubrication of the external surface of a drilling pipe comprising the following steps: preparing a mixture consisting essentially of 55–75% by weight of transmission lubricating oil obtained as a petroleum rectification product, with a congealing temperature of not higher than − 20°C; a relative viscosity at 100°C of from 18.7 to 22 centistokes and an open cup flash point of at least 170°C, 5–10% by weight of petroleum paraffins with a melting point of at least 50°C, 15–35% by weight of tall oil pitch and, optionally, bitumen obtained as a result of oxidation of petroleum distillation residues with a melting point of at least 90°C, a solubility in chloroform and benzene of at least 99 percent by weight and a flash point of at least 230°C; primary heating said mixture to 100°C with subsequent holding of said mixture at this temperature for 20 minutes while stirring to obtain a homogeneous mass; and secondary heating said mixture to 300°C with subsequent holding of the mixture at this temperature for one hour to obtain the final lubricant product.

3,968,044
MILLED LIQUID DEVELOPER

Yasuo Tamai, and Hajime Miyatuka, both of Tokyo, Japan, assignors to Rank Xerox Ltd., London, England
Filed Feb. 1, 1974, Ser. No. 438,896
Int. Cl.² G03G *9/03*
U.S. Cl. 252—62.1 L **7 Claims**

1. A liquid developer for forming visible images on the surface of a latent image bearing member comprising a milled dispersion of about one gram graft pigment and from about 0.1 to about 100 grams alkyd resin which is soluble in the developer carrier, said dispersion being homogeneously dispersed in about one liter of an electrically insulating carrier liquid.

3,968,045
ALKALINITY REDUCTION IN AN ABSORPTION REFRIGERATION SYSTEM

Howard W. Sibley, Baldwinsville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Feb. 28, 1975, Ser. No. 553,956
Int. Cl.² C09K *5/00*
U.S. Cl. 252—68 **14 Claims**

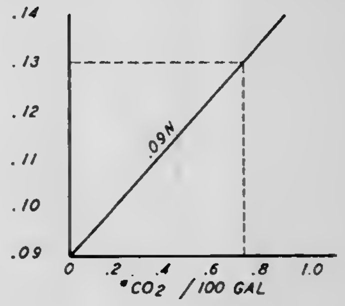
1. The method of reducing the alkaline normality of a lithium bromide solution containing lithium hydroxide including the steps of

introducing carbon dioxide into the solution whereby the carbon dioxide reacts with lithium hydroxide to adjust the normality of the solution,

metering the flow rate of the carbon dioxide as it is introduced into the solution whereby the reaction rate is regulated to minimize loss of free carbon dioxide from the solution, and

controlling the amount of carbon dioxide introduced into the solution to bring the normality of the solution to a predetermined range.

5. An absorbent solution for a refrigeration system comprising an aqueous solution containing lithium bromide, a primary inhibitor of lithium hydroxide and a carbonate formed by a reaction of carbon dioxide with the primary inhibitor to maintain the normality of the solution at a predetermined level.



7. An absorbent solution of claim 5 further including a secondary inhibitor of lithium nitrate and the normality of the solution being maintained at about 0.09N.

8. An absorbent solution of claim 5 further including a secondary inhibitor of lithium chromate and the normality of the solution being maintained at about 0.005N.

3,968,046
POLYPHOSPHATE FREE DETERGENT COMPOSITIONS

Fred Smeets, Tienen, Belgium, assignor to Citrex, Societe Anonyme, Brussels, Belgium
Filed Feb. 28, 1974, Ser. No. 447,037
Claims priority, application United Kingdom, Mar. 1, 1973, 9936/73
Int. Cl.² C11D *3/395, 7/54*
U.S. Cl. 252—95 **24 Claims**

1. A phosphate-free detergent composition which comprises

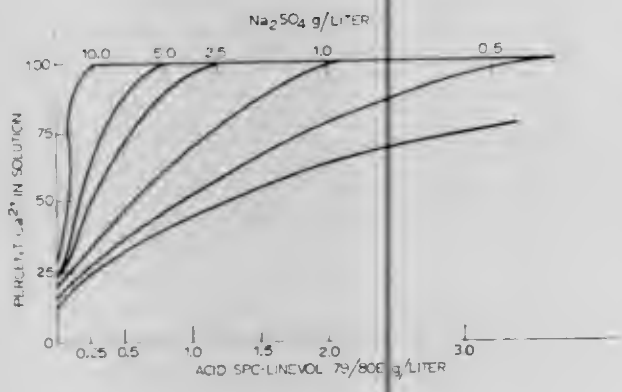
- a. 1 to 30 parts by weight of a sodium, potassium, ammonium or triethanolamine salt of an organic polycarboxylic acid selected from the group consisting of
  - 1. the unsaturated tetracarboxylic acid which is the pyrolysis product prepared by heating an alkaline-earth metal salt of citric acid to a temperature within the range of 250° to 400°C for a period of time until an increase in titratable alkalinity of the reaction mixture is obtained and until not more than 32% by weight of the original citric acid salt remains in the reaction mixture, and
  - 2. the sulfotetracarboxylic acid obtained by sulfonating the said unsaturated tetracarboxylic acid, and
- b. 99 to 70 parts by weight of an alkali metal sulfate selected from the group consisting of sodium sulfate and potassium sulfate.

3,968,047
DETERGENT COMPOSITIONS

Fred Smeets, Tiennen, Belgium, assignor to Citrex, Societe Anonyme, Brussels, Belgium
Filed Feb. 28, 1974, Ser. No. 447,039
Claims priority, application United Kingdom, Mar. 1, 1973, 9937/73
Int. Cl.² C11D *3/395, 7/54*
U.S. Cl. 252—95 **24 Claims**

1. A phosphate-free detergent composition, which comprises:

- a. 1 to 30 parts by weight of a salt of an organic sulfopolycarboxylic acid, the carboxyl groups of which are at least partially esterified with at least one non-ionic compound containing at least one hydroxyl group and the sulfonic acid group of which is salified with a cation selected from the group consisting of sodium, potassium and triethanolamine, said sulfopolycarboxylic acid being obtained by sulfonating and acidifying the pyrolysis product prepared by heating an alkaline-earth metal salt of citric acid to a temperature within the range of 250° to 400°C for a period of time until an increase in titratable alkalinity of the reaction mixture is obtained and until not more than 32% by weight of the original citric acid salt remains in the reaction mixture, said non-ionic compound containing at least one hydroxyl group being se-



lected from the group consisting of aliphatic alcohols containing from 4 to 24 carbon atoms alkoxylated with from 1 to 50 moles of a C_2–C_3 alkylene oxide per mole of aliphatic alcohol and alkylphenols containing from 8 to 15 carbon atoms in the alkyl chain alkoxylated with from 1 to 50 moles of a C_2–C_3 alkylene oxide per mole of alkylphenol, and

b. 99 to 70 parts by weight of an alkali metal sulfate selected from the group consisting of sodium sulfate and potassium sulfate.

3,968,048
DRAIN CLEANING COMPOSITIONS

Joseph A. Bolan, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Feb. 14, 1975, Ser. No. 550,057

Int. Cl.² C11D *7/06*

U.S. Cl. 252—157 **4 Claims**

1. A granular drain cleaning composition consisting essentially of Parts A and B which are physically separated until utilization in the presence of water wherein:

a. Part A consists essentially of 20 to 40 parts by weight of an alkali metal hydroxide selected from the group consisting of sodium hydroxide and potassium hydroxide; and

b. Part B consists essentially of a mixture containing one or more ingredients that are chemically incompatible in the dry state with said alkali, said mixture comprising 10 to 40 parts by weight of an acidic agent selected from the group consisting of sodium bisulfate and citric acid, and 1 to 10 parts by weight of an oxidizing agent selected from the group consisting of sodium carbonate peroxide, sodium perborate monohydrate and monopotassium peroxymonosulfate.

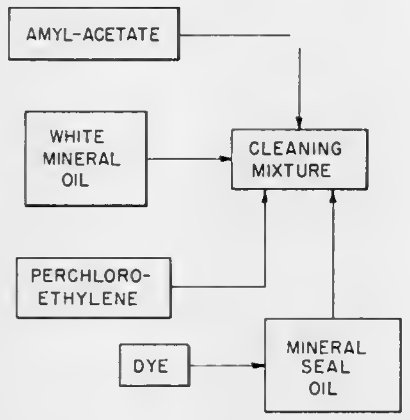
3,968,049
SOLVENT CLEANING COMPOSITION

Eugene C. Lockett, 1580 Stewart St., Reno, Nev. 89502

Filed Oct. 4, 1973, Ser. No. 403,398

Int. Cl.² B08B *1/00;* **C11D** *7/30*

U.S. Cl. 252—171 **8 Claims**



7. A composition for treating dust cloths comprising a mixture by volume 35% Perchloroethylene, 35% Mineral Seal Oil, and 30% ice machine oil, a dye added thereto, and 1 to 3 ounces of amyl acetate per gallon of said mixture.

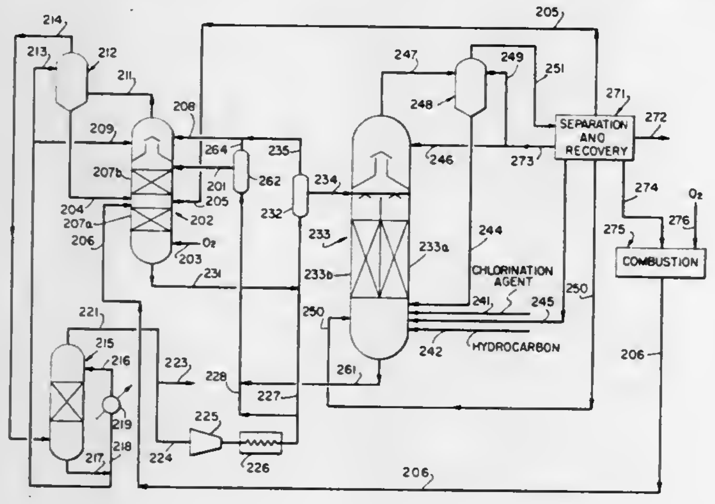
3,968,050
OXIDATION OF MOLTEN SALTS AND RECOVERY OF CHLORINE VALUES

Herbert Riegel, Maplewood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Mar. 12, 1974, Ser. No. 450,456

Int. Cl.² C01B *9/02;* **C07C** *17/00, 21/06*

U.S. Cl. 252—187 R **6 Claims**



1. In the process for oxidizing a molten salt and recovering chlorine values wherein a molten salt mixture containing a multivalent metal chloride in its higher and lower valence state is contacted in a reaction zone with chlorine values selected for the group consisting of chlorine, hydrogen chloride and mixtures thereof to recover the chlorine values by generation of the higher valent chloride and is also contacted with molecular oxygen to produce the oxychloride of the multivalent metal, said multivalent metal chloride being selected from the group consisting of the chlorides of copper, chromium, manganese, iron and cobalt, said reaction zone being operated at a temperature from about 600° to about 1000°F, the improvement comprising:

introducing the molten mixture into an upper portion of said reaction zone;

introducing the chlorine values into an intermediate portion of said reaction zone;

introducing molecular oxygen into a lower portion of said reaction zone, passing the molten mixture through said reaction zone in countercurrent contact with said chlorine values and molecular oxygen to recover the chlorine values and produce oxychloride; and

recovering molten salt from said reaction zone having an increased content of the higher valent metal chloride and containing the oxychloride of the multivalent metal.

3,968,051
FREEZE DRYING PHOTOCHROMIC FILTERS

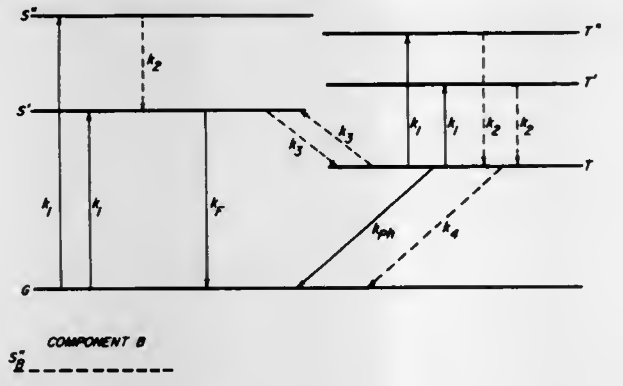
Robert Franz Stamm; Jacob Solomon Brinen, both of Stamford; Evalyn Hosterman Tennant, Old Greenwich, and Frederick Halverson, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 769,028, Oct. 21, 1968, Pat. No. 3,635,544, which is a continuation-in-part of Ser. No. 332,752, Dec. 23, 1963, abandoned. This application July 14, 1971, Ser. No. 162,465

The portion of the term of this patent subsequent to Jan. 18, 1989, has been disclaimed.

Int. Cl.² G02C *7/10;* **G02B** *5/28;* **F21V** *9/00*

U.S. Cl. 252—300 **3 Claims**



1. A method of making a photochromic plastic article comprising the steps of dissolving transparent polymerized synthetic vinyl resin together with a small but effective amount of organic polyaromatic photochromic material in a solvent, freezing the solution produced thereby, vaporizing all of said solvent without melting the residual solid solute materials, and compression molding said solid residue under sufficient elevated temperatures and p:essures to fuse the same into an optically clear plastic article displaying reversible photochromic properties when subjected to sunlight.

3,968,052
SYNTHESIS GAS MANUFACTURE

Leonard Seglin, New York, N.Y., and Ralph Tracy Eddinger, Princeton Junction, N.J., assignors to Cogas Development Company, Princeton, N.J.

Continuation-in-part of Ser. No. 114,642, Feb. 11, 1971, Pat. No. 3,850,839. This application May 30, 1974, Ser. No. 474,417

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² C10J *3/46;* **C10F** *3/54*

U.S. Cl. 252—373 **4 Claims**

1. In the process of making synthesis gas by the gasification of a solid consisting primarily of carbon with steam in a fluidized-bed gasification zone which is connected to a dust recovery zone, in which the heat for the process is provided by a recirculating stream of recycle solids which are heated by the combustion of the carbon-containing fines collected from the dust recovery zone of the fluidized-bed gasification zone, the improvement which comprises using as the recycle solids inert, refractory pellets which are not fluidized in the gasification zone, passing a hot stream of said pellets through said gasification zone to provide the heat for the gasification reaction, withdrawing said stream, separating entrained carbon from the pellets and returning said separated carbon to the gasification zone charging the separated pellets into a heating zone along with the carbon-containing fines and enough oxidizing gas to burn the carbon-containing fines, maintaining the pellets in the heating zone for a time sufficient to raise their temperature to a point where they provide the heat of reaction in the gasifier, and recirculating the heated pellets back to the gasifier.

3,968,053
CATALYTIC REFORMING WITH AN ACTIVATED BIMETALLIC CATALYTIC COMPOSITE

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 406,134, Oct. 12, 1973, Pat. No. 3,864,241, which is a continuation-in-part of Ser. No. 187,579, Oct. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application June 21, 1974, Ser. No. 482,708

The portion of the term of this patent subsequent to Nov. 7, 1989, has been disclaimed.

Int. Cl.² B01J *27/04, 27/08, 27/10*

U.S. Cl. 252—439 **6 Claims**

1. An activated catalytic composite comprising a combination of platinum group metal in the elemental state, tin and halogen with a porous carrier material in amounts sufficient to result in a catalyst containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen, said tin component being uniformly dispersed throughout the porous carrier material in a particle size less than 100 angstroms in maximum dimension and in a positive oxidation state the catalytic composite having been activated by contacting with an activating gas comprising oxygen and a halogenating component selected from the group consisting of halogen and hydrogen halide at a temperature between 700 to 1100°F. for a time of at least 0.5 to about 10 hours followed by reduction of said activated catalyst with a substantially water-free reduction agent to reduce substantially all of the platinum to the metallic state while maintaining substantially all of the tin component in an oxidation state above the elemental metal.

3. An activated catalytic composite as defined in claim 1 wherein the tin component is tin oxide or tin sulfide.

3,968,054
CATALYST FOR THE OXIDATION OF BUTANE TO MALEIC ANHYDRIDE

Wesley E. Cherry, Prospect Park; Alan F. Dickason, Chester, both of Pa., and John A. Hedge, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 407,340, Oct. 17, 1973, Pat. No. 3,928,392. This application Apr. 21, 1975, Ser. No. 570,289

Int. Cl.² B01J *23/06, 23/28, 23/84*

U.S. Cl. 252—468 **2 Claims**

1. A process for preparing a catalyst composition useful for the vapor phase oxidation of butane to maleic anhydride which comprises dissolving an antimony salt in water, adjusting the pH of the solution to about 6.5 to precipitate said salt, adding to said precipitate an aqueous solution of a mixture of a molybdenum salt and a salt of nickel, cobalt, copper or zinc, drying the resulting composition at about 110° to 130°C and crushing it to small particle size, and thereafter calcining the particles at a temperature of from about 750° to 850°C for at least about 2 hours.

3,968,055

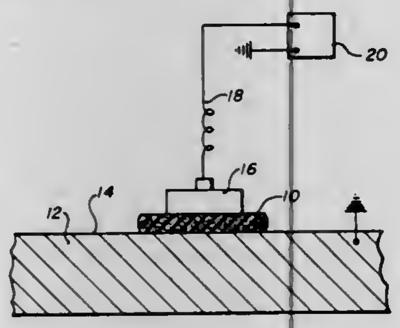
METHOD OF PREPARING CONDUCTIVE ROOM TEMPERATURE VULCANIZING MATERIAL

David Nelson Palmer, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 25, 1974, Ser. No. 517,983

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 252—506 **2 Claims**



1. A method of preparing an electrically conductive room temperature vulcanizing material which is stable in the absence of moisture but which will cure open exposure to moisture which comprises the steps of:

- a. mixing in the absence of moisture (1) 100 parts by weight of a matrix material selected from the group consisting of vinylmethyl siloxane and polyphenyl siloxane, (2) from 10 to 25 parts by weight of an iron oxide filler-binder, (3) from 0.1 to 5.0 parts by weight catalyst cross-linking agent selected from the group consisting of acetic anhydride, dibutyl tin dilaurate and tin octoate to permit cross-linking of said matrix material upon exposure to moisture, and (4) a first quantity of a temporary dispersing agent selected from the group consisting of cyclohexane, cyclobutane, cyclopentane, cycloheptane and cyclopentanone;
- b. mixing from 50 to 100 parts by weight of a finely divided conductive material with a second quantity of said temporary dispersing agent, said conductive material being selected from the group consisting of palladium and graphite; the total of said first and second quantity of temporary dispersing agent being from 1000 to 1550 parts by weight;
- c. mixing in the absence of moisture said mixtures from steps a. and b.; and
- d. evaporating said temporary dispersing agent from said mixture whereby said conductive material is homogeneously dispersed in said room temperature vulcanizing material.

3,968,056

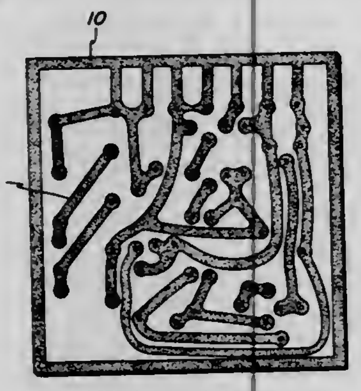
RADIATION CURABLE INKS

Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,822

Int. Cl.^{2} H01B *1/02*

U.S. Cl. 252—514 **15 Claims**



1. A screen printable radiation curable ink convertible to an abrasion resistant conductive coating exhibiting a specific resistivity of less than 10 ohm-cm when cured on the surface of a substrate consisting essentially of by volume

- A. from about 10 to 60 percent of a radiation curable organic resin binder having a viscosity of from about 50 to 10,000 centipoises at 25°C., and
- B. from about 90 to 40 percent of an electrically conductive filler consisting essentially of silver or copper containing particles with about 0 percent to about 15 percent by weight of silver or copper containing particles having an aspect ratio of diameter to thickness of a value greater than 20 based on the total weight of conductive filler.

3,968,057

METHOD FOR PRODUCING A SEMI-CONDUCTOR BODY

Francis H. Dulin, Oakland Township, Oakland County, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 25, 1974, Ser. No. 517,945

Int. Cl.^{2} H01B *1/04*

U.S. Cl. 252—516 **9 Claims**

1. A method for producing a semi-conductor body which consists essentially of mixing from 20 to 80 parts by weight of silicon carbide substantially all of which has a particle size from 150 to 800 mesh, with from 80 to 20 parts by weight of reactive alumina, substantially all of which has a particle size less than about 2 microns, dry ball milling the mixture for about 2 hours with from ½ to 2 percent by weight fatty acid, based on the alumina, pressing a shape from the resulting mixture and firing the shape to a temperature from about 1900° to 3000° F., with the proviso that the firing, when in air, is to a temperature from about 1900° to 2300° F. and when in an inert gas atmosphere, is to a temperature from about 2000° to 3000° F., and for a time sufficiently long to produce a semi-conductor body having an apparent porosity from substantially 10 to 25 percent.

3,968,058

FREE FLOWING NONIONIC INCLUSION COMPOUNDS

Bao-Ding Cheng, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 114,675, Feb. 11, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 409,899

Int. Cl.^{2} C11D *3/08, 3/32*

U.S. Cl. 252—544 **4 Claims**

1. The method of forming a free flowing particulate blend of urea and a liquid ethoxylated long carbon chain alcohol having an alkyl chain of from about 12 to about 18 carbon atoms and an average of about 10 to about 19 ethylene oxide units, comprising the steps of

- a. preparing a slurry of particulate urea having a particle size less than 74 microns and methanol
- b. said slurry consisting essentially of from about 80 to 90% urea and from about 10 to about 20% methanol, by weight
- c. mixing said slurry with said liquid ethoxylated alcohol, in a weight ratio of alcohol to urea of at least 3:2
- d. evaporating substantially all of said methanol from the mixture of said slurry and said ethoxylated alcohol, and
- e. adding microsized silica particles to said slurry ethoxylated alcohol mixture prior to said evaporating step.

4. A free flowing particulate material, comprising

- a. an inclusion compound of urea and liquid nonionic surfactant chosen from the group consisting of ethoxylated alcohols having an alkyl chain of from about 12 to about 18 carbon atoms and an average of about 10 to about 19 ethylene oxide units,
- b. from about 1% to about 5% by weight of microsized silica particles chosen from the group consisting of pyrogenic silicon dioxide and sponge-like silica gel.
- c. said inclusion compound including a finite amount of methanol not exceeding 1% by weight,
- d. said inclusion compound including at least about 60% by weight of said ethoxylated alcohol.

3,968,059

PROCESS FOR PRODUCING METHYL METHACRYLATE POLYMERS

Kazushi Shimada; Toru Maeda; Tamotu Nishizawa, all of Otake; Yositaka Sasaki, Tokyo; Takehiko Narisada, and Hisao Anzai, both of Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1975, Ser. No. 546,883

Claims priority, application Japan, Feb. 4, 1974, 49-14262

Int. Cl.^{2} C08F *2/02, 6/28, 20/14, 20/18*

U.S. Cl. 526—68 **11 Claims**

1. An improvement in the process of producing a methyl methacrylate polymer or a copolymer, said methyl methacrylate polymer or copolymer comprising at least 80% by weight of units derived from methyl methacrylate and at most 20% by weight of units derived from a copolymerizable ethylenically unsaturated compound, by a bulk polymerization procedure wherein the monomer or monomers are polymerized at temperatures of 150° to 180°C with a conversion of 50 to 80% in a polymerization zone and the polymerizaton mixture withdrawn from the polymerizaton zone is introduced into a separation zone where volatiles predominantly comprised of an unreacted monomer or monomers are separated from the polymer product, said separated volatiles being cyclically used as a part of the monomer feed for the polymerization, said improvement comprising substantially removing polymers having molecular weights of 186 to approximately 1,000 from the volatiles and cyclically using the volatiles so treated as a part of the monomer feed for the polymerization while maintaining the content in the volatiles of impurities having boiling points of lower than 200°C at normal pressure within the range from 5 to 20% by weight based on the weight of the volatiles.

3,968,060

ENCAPSULATED FLAME RETARDANT SYSTEM

David N. Vincent, Glenview, and Ronald Golden, Mount Prospect, both of Ill., assignors to Champion International Corporation, New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,523

Int. Cl.^{2} C08K *9/10;* **C08J** *9/00;* **C08G** *18/14*

U.S. Cl. 260—2.5 AJ **16 Claims**

1. A self-extinguishing composition comprising a foamed plastic containing microcapsules in the cell walls thereof, said microcapsules having substantially spherical, solid, polymeric walls surrounding a substantially spherical core consisting essentially of a flame retardant material, said microcapsules having an average particle diameter of below about 5 microns.

2. The self-extinguishing article of claim 1 wherein said plastic foam is a polyurethane foam.

3,968,061

POLYURETHANE FOAMS PREPARED BY A QUASI-PREPOLYMER TECHNIQUE

Charles Frederick Cardy, Luton, and Stephen Arthur Lee, Dunstable, both of England, assignors to Interox Chemicals Limited, London, England

Filed Dec. 30, 1974, Ser. No. 537,347

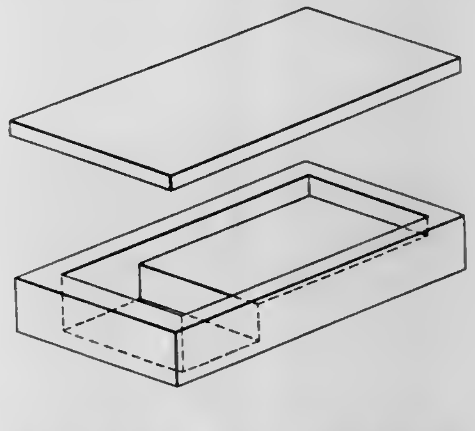
Claims priority, application United Kingdom, Jan. 11, 1974, 1351/74

Int. Cl.^{2} C08G *18/14, 18/12*

U.S. Cl. 260—2.5 AN **10 Claims**

1. A method of preparing a polyurethane foam by a quasi-prepolymerization technique which comprises the steps of:

- a. forming a first copolymer having an —OH number in the range of from 38 to 75 mg KOH/g from an ϵ-caprolactone, an epoxide and a mixture of a dihydric alcohol and a trihydric alcohol, said copolymer having an average —OH-functionality greater than 2.00 but less than 3.00;
- b. reacting said first copolymer with a polyisocyanate to form an isocyanate terminated prepolymer;
- c. preparing a reactant mixture comprising: a chain extender, which is a diol having a molecular weight below 140, dissolved in: a second copolymer having an —OH number in the range of from 38 to 75 mg KOH/g formed by reaction of an ϵ-caprolactone, an epoxide, a dihydric alcohol and sufficient trihydric alcohol that the said copolymer has an —OH-functionality in the range of 2.0 to 2.20, and



- d. reacting said prepolymer with said reactant mixture in the presence of a blowing agent and a catalyst.

3,968,062

USE OF PARA-TERT. BUTYL PHENOL DISULFIDE FOR VULCANIZING CHLOROBUTYL RUBBER COMPOSITIONS

Robert N. Ecsedy, Newtown, Conn., assignor to Fairfield Chemical Services, Westport, Conn.

Filed Aug. 23, 1974, Ser. No. 499,886

Int. Cl.^{2} C08L *7/00, 9/00, 23/22*

U.S. Cl. 260—5 **6 Claims**

1. A method of vulcanizing blends of chlorobutyl rubber with at least one other highly unsaturated elastomer capable of producing a co-vulcanizate with chlorobutyl rubber which comprises mixing said chlorobutyl rubber blends with a vulcanizing agent comprising a friable resinous para-tert-butyl. phenol disulfide containing 27 – 29 percent sulfur and vulcanizing the resultant mixture.

3,968,063

METHOD OF TREATING SYNTHETIC POLYMER LATEX OF STYRENE-BUTADIENE OR POLYISOPRENE TO MAKE SOLID POLYMER DERIVED THEREFROM RE-DISPERSIBLE TO A LATEX

Chin Peng Sung, Kuala Lumpur, Malaysia, assignor to The Board of the Rubber Research Institute of Malaysia, Malaysia

Division of Ser. No. 390,246, Aug. 21, 1973, Pat. No. 3,904,567. This application June 20, 1975, Ser. No. 588,950

Int. Cl.^{2} C08C *4/00;* **C08L** *5/00, 7/02, 9/00*

U.S. Cl. 260—17.4 SG **14 Claims**

1. A method of making a solid or pasty redispersible styrene-butadiene rubber which method comprises adding at least 0.05% by weight on the weight of the dry rubber of a polyhydric alcohol or a mono- or di-saccharide as a redispersing agent to a styrene-butadiene rubber latex and removing water from the latex.

3,968,064

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer Douglas Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 15, 1976, Ser. No. 649,501

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—23 XA **23 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCO_3$, NiO, Ni_2Si, and nickel stearate and (B) at least one

vanadium compound selected from the group consisting of NH_4VO_3, $Mg(VO_3)_2$, $NaVO_3$, $VOSO_4$, V_2O_5, and vanadium oxyacetylacetonate, said compounds (A) and (B) being compounds or hydrates thereof, and said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

3,968,065

VULCANIZABLE POLYMER BLENDS OF A HALOGEN-CONTAINING POLYMER AND A CARBOXYL-CONTAINING POLYMER

Roger E. Morris, Cuyahoga Falls, and Richard H. Backderf, Richfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1974, Ser. No. 537,062

Int. Cl.² C08L *33/02*

U.S. Cl. 260—23.5 R **22 Claims**

1. A vulcanizable polymer blend comprising (1) from about 1 part to about 99 parts by weight of a halogen-containing polymer per 100 parts by weight of the halogen-containing and carboxyl-containing polymers, (2) from about 1 part to about 99 parts by weight of a carboxyl-containing polymer per 100 parts by weight of the halogen-containing and carboxyl-containing polymers, and (3) a cure system consisting essentially of (A) from about 0.5 part to about 20 parts by weight of a metal oxy compound selected from the group consisting of (a) a metal salt of an organic acid and (b) a non-alkali metal oxide, hydroxide, or carbonate, and (B) from about 0.1 part to about 10 parts by weight of either a quaternary ammonium salt or a monofunctional tertiary amine, said parts by weight of the cure system based on 100 parts by weight of the halogen-containing and carboxyl-containing polymers.

3,968,066

OIL AND WATER REPELLENT TEXTILE COMPOSITION CONTAINING A FLUOROCHEMICAL POLYURETHANE RESIN AND A QUATERNARY AMMONIUM SALT

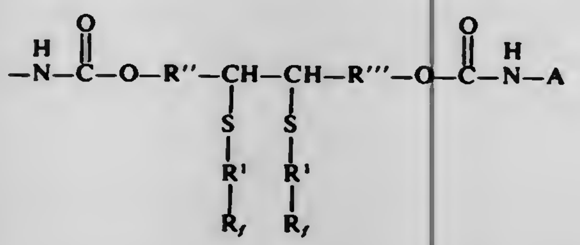
Karl Friedrich Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,169

Int. Cl.² C08L *75/04*

U.S. Cl. 260—29.2 TN **16 Claims**

1. A composition comprising a fluorochemical polyurethane textile resin and from about 3 to about 100%, based on the weight of resin, of a quaternary ammonium salt containing at least one long hydrocarbon chain, wherein the fluorochemical polyurethane textile resin is of the formula



$$-\overset{H}{N}-\overset{\overset{O}{\|}}{C}-O-R''-\underset{\substack{|\\ S\\ |\\ R^1\\ |\\ R_f}}{CH}-\underset{\substack{|\\ S\\ |\\ R^1\\ |\\ R_f}}{CH}-R'''-O-\overset{\overset{O}{\|}}{C}-\overset{H}{N}-A$$

where

R_f is perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R^1 is straight or branched chain alkylene of 1 to 12 carbon atoms, or alkylenethioalkylene, alkyleneoxyalkylene of alkyleneiminoalkylene of 2 to 12 carbon atoms;

R'' and R''' each independently is straight or branched chain alkylene of 1 to 12 carbon atoms or

$C_mH_{2m}(OC_kK_{2k})_r$

where

m is 1 to 12,

k is 2 to 6,

r is 1 to 40, and

A is the divalent residue of an organic diisocyanate.

3,968,067

PROCESS FOR PREPARING HIGH POLYMER LATICES FROM ORGANIC SOLVENT DISPERSIONS

Oliver W. Burke, Jr., Fort Lauderdale, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 226,419, Feb. 15, 1972, Pat. No. 3,879,327, which is a continuation-in-part of Ser. No. 817,494, April 18, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 621,997, March 7, 1967, Pat. No. 3,503,917, Ser. No. 691,823, Dec. 16, 1967, abandoned, Ser. No. 767,790, Oct. 15, 1968, Pat. No. 3,622,127, and Ser. No. 784,596, Dec. 18, 1968, Pat. No. 3,644,263. This application June 28, 1974, Ser. No. 484,340

Int. Cl.² C08L *7/02, 23/00*

U.S. Cl. 260—29.6 R **13 Claims**

1. In the formation of a latex from an organic solvent dispersion of a composition of an organic solvent soluble or dispersible, water insoluble, macromolecular polymer or resin by a process of the type which comprises:

1. providing a dispersion of the said composition in essentially water-immiscible volatile physical solvent which itself or as an azeotrope with water has a boiling point lower than that of water at atmospheric pressure,
2. adding water and emulsifier to said dispersion in proportions to form an emulsion having water as its continuum and emulsifying the same so that the discontinuous phase thereof is in particles at least principally of precursor latex particle size,
3. stripping the solvent from the emulsion to form a latex, and
4. recovering the latex product, and which comprises the particular steps of:
5. providing a moving flow of gas comprising steam as an initial continuous phase,
6. dispersing the said emulsion into the flow of gas comprising steam as the initial continuous phase while subjecting the phases to a decrease of pressure and maintaining the temperature thereof below the limiting temperature for stability of the emulsion of particles of precursor latex particle size, thereby vaporizing solvent from the dispersed droplets and forming latex and vapors,
7. establishing a separating zone maintained at a lower pressure, and establishing a flow of latex and water vapor into said separating zone,
8. introducing into said separating zone the latex droplets and vapor produced by step (6) and impinging said droplets upon the flow of latex therein,
9. withdrawing from said separating zone vapors therein resulting from steps 7 and 8, and
10. withdrawing latex from said separating zone, the improvement which consists in the combination in the process of the further steps of:
11. cooling and condensing the vapors withdrawn in step (9) to form a mixture of (a) said solvent in liquid form and (b) water containing some solvent,
12. effecting separation of the liquid solvent (a) from said solvent-containing water (b),
13. vaporizing a quantity of said solvent-containing water (b) sufficient to form at least a substantial part of the flow of gas comprising steam required by step (5), and
14. providing the flow of gas in step (5) at least in substantial part from the flow of gas formed in step (13).

3,968,068

GLASS SIZING

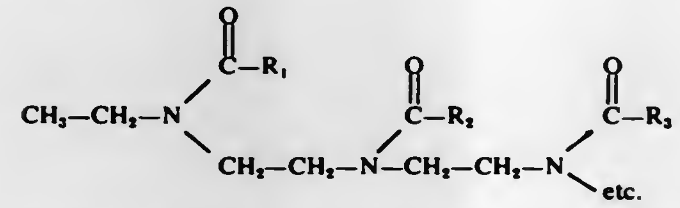
William N. Haggerty, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 7, 1974, Ser. No. 477,246

Int. Cl.² C03C *25/02;* **C08L** *31/04*

U.S. Cl. 260—29.6 RB **15 Claims**

1. At least one glass filament, at least a portion of the surface of said filament being in contact with the residue produced by evaporting water from an aqueous composition consisting essentially of a non-plasticized vinyl acetate copolymer emulsion, a polyvinyl acetate homopolymer, a vinyl-tri(-beta-methoxyethoxy)silane, a methacrylatochromic chloride, a amide and water said amide having the formula



wherein R_1, R_2 and R_3, represent a mixture of fatty acid chain lengths.

3,968,069

POSITIVELY CHARGED AQUEOUS DISPERSIONS OF POLYTETRAFLUOROETHYLENE AND METHOD FOR PREPARING THE SAME

Edouard Grimaud, Saint-Geis-Laval, and Claude Tournut, Francheville, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation-in-part of Ser. No. 225,305, Feb. 10, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 505,066

Claims priority, application France, Feb. 19, 1971, 71.05713

Int. Cl.² C08L *27/18*

U.S. Cl. 260—29.6 F **10 Claims**

1. A composition consisting essentially of a positively charged aqueous dispersion of solid polytetrafluoroethylene, anionic emulsifier and cationic emulsifier; said cationic emulsifier being present in a molar ratio to the anionic emulsifier that is substantially greater than 1:1.

3,968,070

CYCLOALIPHATIC COMPOUNDS AS ODOR- AND TASTE-MODIFYING AGENTS

Erling Sundt, Pinchat-Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

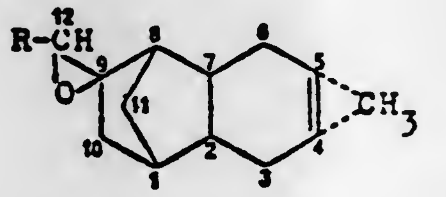
Continuation of Ser. No. 292,723, Sept. 27, 1972. This application Dec. 2, 1974, Ser. No. 528,729

Claims priority, application Switzerland, Oct. 11, 1971, 14784/71; May 19, 1972, 7456/72

Int. Cl.² C07D *303/06*

U.S. Cl. 260—348 R **4 Claims**

1. Compounds of formula



I (bg)

wherein a methyl group is bound to a carbon atom in position 4 or 5, as indicated by the dotted lines, and the symbol R represents a hydrogen atom or an alkyl radical comprising from 1 to 6 carbon atoms.

3,968,071

POLYAMIDE RESIN MOLDING COMPOSITION

Akira Miyamoto; Mitsuyasu Nagano, and Kiyoshi Morishige, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,847

Int. Cl.² C08L *77/06*

U.S. Cl. 260—37 N **6 Claims**

1. A polyamide resin composition for use in molding, which comprises a mixed polyamide resin comprising 3 to 97 parts by weight of a polyamide resin obtained from a xylylenediamine and an α,ω-straight chain aliphatic dibasic acid having 6 to 12 carbon atoms and correspondingly 97 to 3 parts by weight of nylon 66, and blended therewith, a glass fiber in amount of 10 to 100 parts by weight per 100 parts by weight of said mixed polyamide resin.

3,968,072

ASBESTOS FIBER AND ORGANIC POLYMERIC BINDER HEAT REACTION PRODUCTS AND METHOD OF FORMING SAME

James Julius Barna, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 255,904, May 22, 1972, abandoned, which is a continuation of Ser. No. 79,625, Oct. 9, 1970, abandoned. This application July 10, 1974, Ser. No. 487,415

Int. Cl.² C08K *7/12*

U.S. Cl. 260—40 R **7 Claims**

1. A method of enhancing physical and electrical insulating properties of asbestos products which consists essentially of forming a sheet composition consisting of 85–95 weight percent of chrysotile asbestos fiber, 5–15 weight percent of butadiene polymeric binder, and an added 0–25 weight percent of a reinforcement-filler component, said composition containing no curing agent for said butadiene polymeric binder; and thereafter subjecting said sheet composition to a temperature in the range of from 130°C to 200°C in an oxidizing atmosphere for a period of at least one minute such that as compared to the properties of the unheated and non-oxidized sheet composition, the tensile strength, volume resistance, and stiffness of the heated oxidized sheet composition are increased and the dielectric constant and dissipation factor at 60Hz are reduced.

3,968,073

PROCESS FOR PRODUCING FIBER-GLASS REINFORCED PLASTICS

Junji Hara, Kamakura; Shigenori Togami, Yokohama, and Masami Tsuruta, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 393,915

Claims priority, application Japan, Sept. 8, 1972, 47-89575

Int. Cl.² C08K *7/14*

U.S. Cl. 260—42.18 **9 Claims**

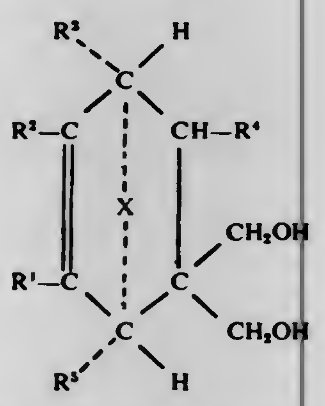
1. A process for the production of glass-fiber reinforced plastics, which process comprises the steps of partially copolymerizing a mixture consisting essentially of (A) 35–95% by weight methyl methacrylate, (B) 65–5% by weight of a vinyl aromatic hydrocarbon and (C) 0.2–5.0% by weight, based on the sum of said (A) and (B), of a polymerizable compound containing two or more ethylenically unsaturated groups, discontinuing the partial copolymerization before gelation of said mixture has taken place, impregnating glass fibers with the resultant partially polymerized mixture and curing the impregnated mixture.

3,968,074
REACTION PRODUCT OF 4,4-BIS-(HYDROXYMETHYL)-CYCLOHEXENE COMPOUNDS WITH SULFUR

Werner Schwarze, Frankfurt, and Siegfried Wolff, Bornheim-Merten, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany
Filed Feb. 7, 1975, Ser. No. 548,218
Claims priority, application Germany, Apr. 22, 1974, 2419235
Int. Cl.² C07G *17/00;* **C08K** *3/04, 3/06, 3/36*
U.S. Cl. 260—42.24 **35 Claims**

6. A composition comprising (1) the sulfur containing reaction product of (a) a 4,4-bis-(hydroxymethyl)-cyclohexene compound of the formula

I



where R¹, R2 and R⁴ are hydrogen, methyl or phenyl and there is also present either (1) X as the bridging member methylene or ethylene or (2) X is absent and there are present both R³ and R⁵ wherein R³ and R⁵ are hydrogen, methyl or phenyl with (b) sulfur as a reinforcing additive for (2) a light reinforcing filler, said composition containing in addition to (1) and (2) an elastomer cross-linkable with sulfur or a peroxide.

3,968,075
MOLDING COMPOSITION AND ARTICLES MOLDED THEREFROM

Edward I. Doucette, 6290 Sunset Blvd., Suite 414, Los Angeles, Calif. 90053; Robert W. Leiterman, 1618 N. Leafdale, El Monte, Calif. 91734, and Wesley C. Thompson, 1102 Charlinda St., West Covina, Calif. 91790
Continuation of Ser. No. 801,815, Feb. 24, 1969, abandoned. This application July 27, 1973, Ser. No. 383,318
Int. Cl.² C08K *3/04*
U.S. Cl. 260—42.25 **9 Claims**

1. A curable composition for producing a battery container or cover therefor having improved combined properties of surface hardness, impact strength, and flexural modulus, said composition consisting essentially of a mixture of:

rubber hydrocarbon polymer selected from the class consisting of natural rubber, copolymers of butadiene styrene or butadiene acrylonitrile, or compatible mixtures of natural rubber and/or said copolymers, the content of said rubber hydrocarbon polymer being about 9% of the composition by weight;

a filler consisting of finely divided petroleum coke, said filler making up about 75% of the composition by weight;

sulfur in an amount by weight being about 13% of the rubber hydrocarbon polymer content;

an accelerator making up about 0.27% of the composition by weight;

the remainder of the composition being made up of suitable quantities of activator and plasticizer.

3,968,076
COVULCANIZATION OF CONJUGATED DIENE-CONTAINING BUTYL WITH HALOBUTYL AND BUTYL RUBBER

Albert M. Gessler, Cranford, and Francis P. Baldwin, Summit, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.
Continuation of Ser. No. 393,349, Aug. 31, 1973, abandoned. This application June 2, 1975, Ser. No. 582,691
Int. Cl.² C08K *3/04;* **C03L** *23/22*
U.S. Cl. 260—42.35 **10 Claims**

1. A compositon of matter comprising a curable blend of from 5 to 95 weight percent (wt. %) conjugated diene-containing butyl rubber consisting essentially of a copolymer consisting of from 85 to 99.5% by weight of an isoolefin having from 4 to 7 carbon atoms, combined with 15 to 0.5% by weight of a conjugated diolefin having from 4 to 14 carbon atoms, containing in the linear backbone conjugated diene unsaturation, the copolymer having a number average molecular weight of from about 5,000 to 500,000 and from 95 to 5 wt. % of a rubber selected from the group consisting of butyl or halogenated butyl rubber.

3,968,077
METHOD OF STABILIZING POLYTHIOL REACTION PRODUCTS

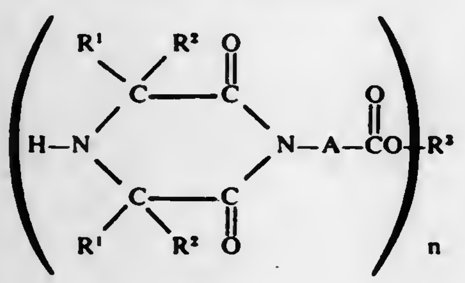
Jesse C. H. Hwa, Stamford, Conn., and Jung Il Jin, Irvington, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.
Filed Aug. 14, 1974, Ser. No. 497,360
Int. Cl.² C08K *5/00*
U.S. Cl. 260—45.8 A **4 Claims**

1. A method of stabilizing a reaction composition of a polythiol and sulfur which comprises contacting said composition with an effective amount of an epoxide stabilizing agent.

3,968,078
ALKYL ALKANOATE DERIVATIVES OF SUBSTITUTED PIPERAZINE-DIONES AND POLYMER COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 376,785, July 5, 1973, Pat. No. 3,920,659, which is a continuation-in-part of Ser. No. 239,795, March 30, 1972, abandoned. This application Oct. 15, 1975, Ser. No. 622,554
Int. Cl.² C07D *241/08;* **C08K** *5/34*
U.S. Cl. 260—45.8 N **6 Claims**

1. A compound of the formula



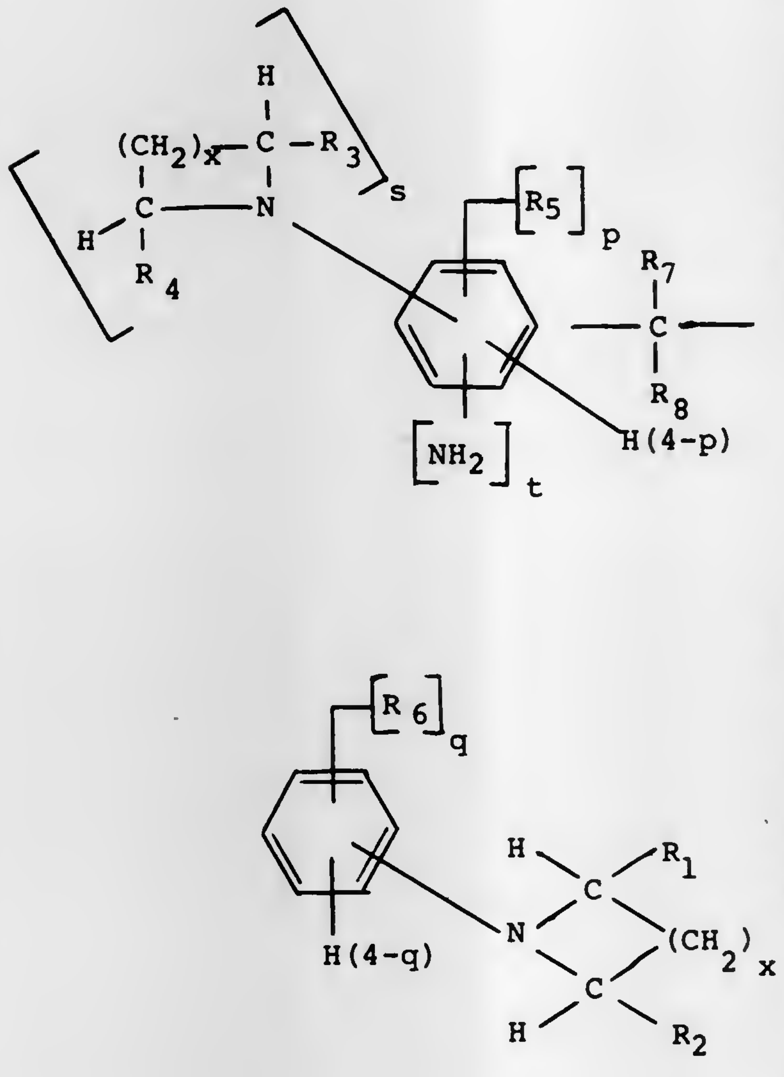
wherein

R¹ and R² are independently of each other methyl or ethyl;
n is an integer of from 1 to 2;
when *n* is 1, R³ is alkyl of from 1 to 20 carbon atoms;
when *n* is 2, R³ is alkylene of from 2 to 8 carbon atoms; and
A is a straight or branched chained (lower) alkylene group having from 1 to 6 carbon atoms with the limitation that the terminals of said alkylene group bear only hydrogen or one (lower) alkyl group.

3,968,079
RUBBER COMPOSITIONS STABILIZED WITH HETEROCYCLIC NITROGENOUS ANTIOXIDANTS

Paul A. Pinke, Des Plaines, and Stephen N. Massie, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Dec. 26, 1974, Ser. No. 536,492
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.8 R **10 Claims**

1. A rubber substrate containing, as an antioxidant therefor, an effective amount of a mono- or di(heterocyclic nitrogen)-substituted diarylalkane possessing the formula:



wherein R₁, R₂, R₃, R₅, R₆, R₇ and R₈ are selected from the group consisting of methyl or hydrogen, *x* is selected from the numbers 2 and 3, s is selected from the numbers 0 or 1, t is selected from the numbers 1 or 0 wherein, when s is equal to 0, t is equal to 1 and when s is equal to 1, t is equal to 0, and p and q are selected from the integers from 0 to 4.

3,968,080
N,N'-DIALKYL-P-PHENYLENEDIAMINE MIXTURE

Helmut Ludwig Merten, Hudson, and Gene Ray Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 10, 1974, Ser. No. 513,714
Int. Cl.² C08J *6/00*
U.S. Cl. 260—45.9 QB **8 Claims**

4. Vulcanizable diene rubber having incorporated therein a stabilizing amount of dialkyl-p-phenylenediamine composition comprising first component of symmetrical N,N'-di(sec-hexyl)-p-phenylenediamine in less than 50% by weight of the total composition, second component of unsymmetrical N-(sec-hexyl)-N'-(sec-alkyl)-p-phenylenediamine having 7 or 8 carbon atoms in said sec-alkyl in amount greater than the first component and greater than 40% of the total composition, and third component of symmetrical N,N'-di(sec-alkyl)-p-phenylenediamine having 7 or 8 carbon atoms in each alkyl group.

3,968,081
SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

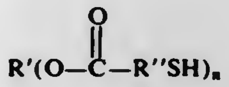
Elmer Douglas Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Jan. 15, 1976, Ser. No. 649,500
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.75 N **9 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiSO_4$, nickel acetylacetonate, nickel formate, nickel oxalate, and hydrates thereof, and (B) V_2O_5, said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

3,968,082
STABILIZED ETHYLENE-CARBON MONOXIDE COPOLYMERS

Donald E. Hudgin, Princeton Junction, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Sept. 9, 1974, Ser. No. 504,620
Int. Cl.² C08K *5/36, 5/37*
U.S. Cl. 260—45.85 H **10 Claims**

1. A stabilized ethylene-carbon monoxide copolymer composition containing about 0.1 to 20% based on the weight of polymer in the base composition of a stabilizer compound having the structural formula



$$R'(O-\overset{\overset{O}{\|}}{C}-R''SH)_n$$

wherein R' and R'' are hydrocarbon radicals and *n* is at least 2.

7. A stabilized ethylene-carbon monoxide copolymer composition containing about 0.1 to 20% based on the weight of polymer in the base composition of a stabilizer compound having the structural formula

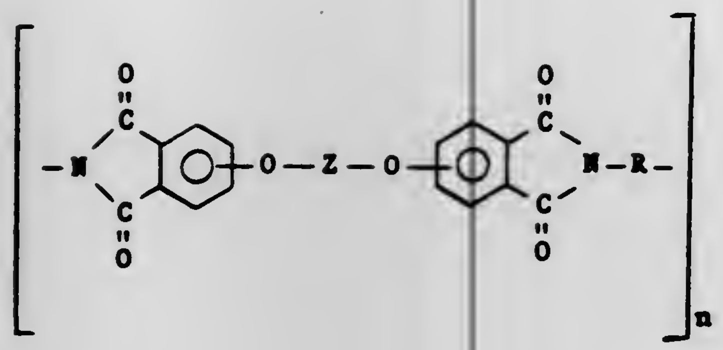
$$R(SH)_n$$

wherein R is a hydrocarbon radical containing up to 30 carbon atoms and is free of substituents which adversely affect the properties of the copolymer composition and *n* is at least 2.

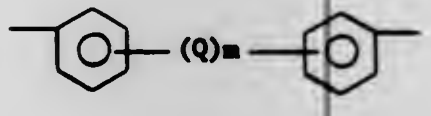
3,968,083
NOVEL POLYETHERIMIDES

Clayton B. Quinn, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 27, 1975, Ser. No. 553,659
Int. Cl.² C08G *73/10*
U.S. Cl. 260—47 CP **5 Claims**

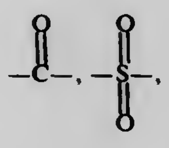
1. A polyetherimide corresponding to the formula



where n is a whole number greater than 1, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals, $C_{(2-8)}$ alkylene terminated polydiorganosiloxanes, cyclo-alkylene radicals having from 2–20 carbon atoms, and (c) divalent radicals included by the formula

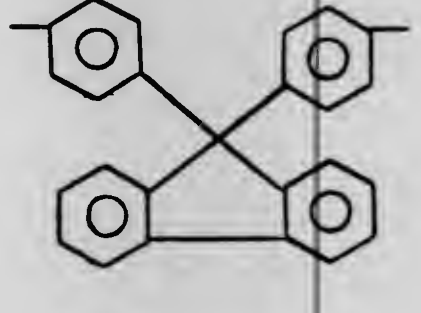


where Q is a member selected from the class consisting of —O—,

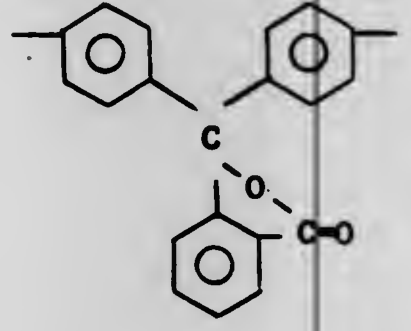


$$-\overset{\text{O}}{\overset{\|}{\text{C}}}-,\ -\underset{\underset{\text{O}}{\|}}{\overset{\text{O}}{\overset{\|}{\text{S}}}}-,$$

—S—, $-C_xH-_{2x}$ where x is a whole number from 1 to 5 inclusive, m is 0 or 1, and Z is a member selected from the groups



and



3,968,084
CURABLE COMPOSITION OF EPOXY RESIN AND CURED PRODUCT THEREOF

Toshio Yukuta, Kodaira, and Takashi Ohashi, Iruma, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 527,081

Claims priority, application Japan, Nov. 28, 1973, 48-132550

Int. Cl.^{2} C08G *59/14, 59/22, 59/40*

U.S. Cl. 260—47 EN **6 Claims**

1. A curable epoxy resin composition which comprises an epoxy resin having one or more epoxy groups per molecule and 3,9-bis(2-hydrazidoethyl)-2,4,8,10-tetraoxaspiro-[5,5]-undecane in an amount sufficient to act as a curing agent and produce a cured epoxy resin.

3,968,085
POLYAMINE COMPOSITIONS USEFUL AS HARDENING AGENTS FOR EPOXY RESINS

Guy Rabilloud, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

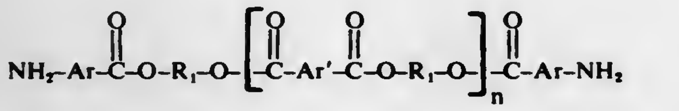
Filed Aug. 29, 1974, Ser. No. 501,696

Claims priority, application France, Aug. 29, 1973, 73.31311

Int. Cl.^{2} C08G *17/14*

U.S. Cl. 260—75 N **13 Claims**

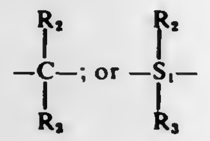
1. A composition consisting essentially of at least one aromatic polyamine of the general formula:



$$\text{NH}_2\text{-Ar-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-O-R}_1\text{-O-}\left[\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-Ar}'\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-O-R}_1\text{-O-}\right]_n\text{-}\overset{\text{O}}{\overset{\|}{\text{C}}}\text{-Ar-NH}_2 \qquad (1)$$

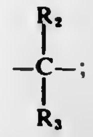
in which Ar is an aromatic divalent radical, said radical being unsubstituted benzene or benzene substituted by halogen or alkyl, or two fused benzene rings, or two benzene rings bonded by a single bond or by:

—O—; —S—; —SO—; $-SO_2-$; —CO—;



$$-\underset{\text{R}_3}{\underset{|}{\overset{\text{R}_2}{\overset{|}{\text{C}}}}}-;\ \text{or}\ -\underset{\text{R}_3}{\underset{|}{\overset{\text{R}_2}{\overset{|}{\text{S}_\text{i}}}}}-$$

in which R_2 and R_3 are hydrogen atoms or monovalent hydrocarbon radicals; and in which Ar′ is an aromatic divalent radical having two valences on separate carbon atoms and being a single benzene ring, or pyridine, or two fused benzene rings, or two benzene rings joined by a single bond or by —O—; —CO—; or



$$-\underset{\text{R}_3}{\underset{|}{\overset{\text{R}_2}{\overset{|}{\text{C}}}}}-;$$

in which R_2 and R_3 are hydrogen atoms or monovalent hydrocarbon radicals; each radical R_1 is selected from the divalent saturated aliphatic, saturated alicyclic, aliphatic alicyclic and arylaliphatic hydrocarbon radicals having from 2 to 24 carbon atoms and from the divalent radicals of the formula:

$-(-R_4-O-)-_mR_4,$

in which R_4 is a divalent saturated aliphatic radical having from 2 to 10 carbon atoms, m is an integer from 1 to 100 and n is an integer from 1 to 10.

3,968,086
DOUBLE FUNNEL DEVICE FOR OXYGENATING SEWAGE

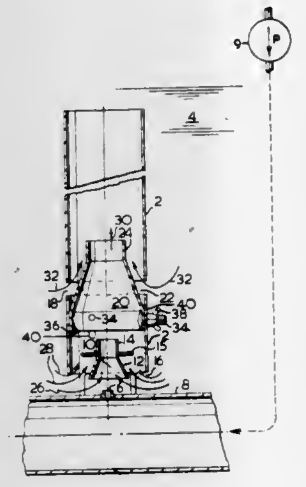
Jan W. Romanowski, Montreal, Canada, assignor to Atara Corporation, Quebec, Canada

Continuation of Ser. No. 479,449, June 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,694, July 19, 1973, abandoned, which is a continuation of Ser. No. 151,352, June 9, 1972, abandoned. This application Mar. 13, 1975, Ser. No. 557,908

Claims priority, application United Kingdom, June 12, 1970, 28473/70

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—77 **5 Claims**



1. An apparatus for oxygenating liquid sewage, comprising:
means for supplying a pressurized oxygen-containing gas, said means including an orifice for issuing a continuous stream of said gas upwardly from below the top surface of a volume of liquid sewage;
a first funnel means;
means to secure said first funnel means at a location downstream from said orifice, said first funnel converging in the downstream direction, the upstream opening of said first funnel comprising a first inlet for entraining liquid sewage into said first funnel by gas issuing in the downstream direction from said orifice;
a second funnel extending downstream from the downstream opening of said first funnel means;
means to secure said second funnel means in a predetermined relationship to said first funnel, said second funnel converging in the downstream direction, the upstream opening of said second funnel comprising a second inlet for entraining liquid sewage into said second funnel by sewage and gas issuing from the downstream opening of said first funnel;
and an exit tube of substantially constant diameter extending both upstream and downstream from the downstream opening of said second funnel, an upstream opening cut in said exit tube comprising a third inlet for entraining liquid sewage into said exit tube by liquid sewage and gas issuing from the downstream opening of said second funnel;
means for securing the exit tube to said gas supplying means;
and wherein the first and second funnel securing means comprise means for mounting said first and second funnels within the upstream extension of said tube, whereby said funnels are secured in said predetermined relationship to one another and to said orifice.

3,968,087
POLYMERIZATION OF 2-PYRROLIDONE

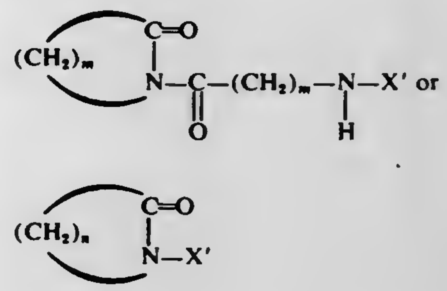
Sam Kwon Choi, Seoul, South Korea, assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 309,082, Nov. 24, 1972, Pat. No. 3,875,147. This application Nov. 8, 1974, Ser. No. 522,037

Int. Cl.^{2} C08G *69/24*

U.S. Cl. 260—78 P **8 Claims**

1. A method of making a polymer of 2-pyrrolidone in solid form, which comprises polymerizing 2-pyrrolidone in the presence of an alkaline polymerization catalyst and, as an activator or co-catalyst, an effective amount of a complex of a Lewis acid of the formula MX_a and a halogenated lactam of the formula:



where $m = 2$ or 3, $n = 5$ to 11; M is a metal of Group IIIA, IVA, VA, VIA or IVB of the Periodic Table; a is the valence of M; and X and X′ are independently chlorine or bromine.

3,968,088
PROCESS FOR PREPARING A THERMOPLASTIC RESIN

Harumi Asai, and Akira Wada, both of Kamakura, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 464,905

Claims priority, application Japan, May 7, 1973, 48-50485

Int. Cl. C08d *102, 304*

U.S. Cl. 526—283 **6 Claims**

1. A process for preparing a substantially gel-free thermoplastic resin having a softening point of 50°–180°C., an iodine value not exceeding 180 and a Gardner color of not more than 5, said process comprising heating at a temperature of 250°–300°C. a solution of a monomeric mixture consisting of 90–60% by weight of a cyclopentadiene type monomer selected from the group consisting of cyclopentadiene, methylcyclopentadiene, dicyclopentadiene, methyldicyclopentadiene and dimethylcyclopentadiene and 10–40% by weight of a chain conjugated diolefin monomer of 4–5 carbon atoms at a monomer concentration of 70–95% by weight in a hydrocarbon solvent inert to thermal polymerization conditions to effect the thermal polymerization of said monomeric mixture and thereafter recovering the resulting polymer from the solvent.

3,968,089
POLYMER-PREPOLYMER COMPOSITION PREPARED BY POLYMERIZING AN ETHYLENICALLY UNSATURATED MONOMER IN THE PRESENCE OF AN ISOCYANATE-TERMINATED PREPOLYMER

Michael Cuscurida, and George Phillip Speranza, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 18, 1974, Ser. No. 524,567

Int. Cl.² C08G *18/14;* **C08L** *27/00*

U.S. Cl. 260—859 R **21 Claims**

1. An isocyanate-terminated polyether-based polymer prepolymer composition consisting of a polymer dispersed in an isocyanate-terminated polyether-based prepolymer composition, wherein said prepolymer composition is obtained by reaction of a polyether polyol and an organic polyisocyanate, in a ratio such that the isocyanate index is from about 4 to about 20, said polyether polyol having a molecular weight of from about 2,000 to about 10,000 and being formed by reaction of an alkylene oxide of from 2 to 4 carbon atoms with a polyhydric alcohol initiator having a functionality of from 2 to 6, said organic polyisocyanate having a functionality of from 2 to 4, and said polymer is obtained by polymerizing one or more ethylenically unsaturated monomers which are nonreactive with isocyanato groups in the presence of an effective amount of a free radical catalyst and in the presence of the prepolymer composition with said polymer being present in the polymer prepolymer composition in an amount of from about 5 to about 25 weight percent, based upon the total polymer prepolymer composition.

3,968,090
METHOD FOR REMOVING HEAT OF POLYMERIZATION

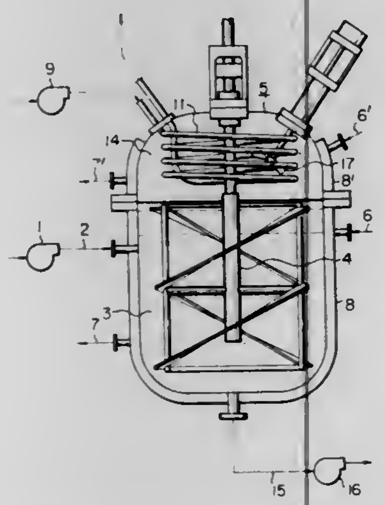
Kazushi Shimada; Toru Maeda; Yasuhiko Iwaoka, and Hisao Anzai, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,489

Claims priority, application Japan, Dec. 28, 1973, 49-950; June 27, 1974, 49-72805

Int. Cl.² C08F *218/00, 220/00, 222/00, 120/02*

U.S. Cl. 526—88 **3 Claims**



1. A method for removing the heat of polymerization evolved during bulk polymerization of methyl methacrylate or a mixture of a predominant amount of methyl methacrylate and a minor amount of at least one other copolymerizable monomer in which method the liquid polymerization mixture is stirred while polymerization is performed, comprising the step of: condensing a condensable vapor present in the space above the liquid level of the polymerization mixture inside the polymerization reactor by a cooling means provided in said space while the vapor phase above the liquid level is stirred and the inner pressure of the polymerization reactor is maintained at such a level that the polymerization mixture does not boil.

3,968,091
LOW MELT INDEX ETHYLENE-VINYL ACETATE COPOLYMERS

Claude J. Stiles, Tuscola, and Byford P. Hancock, Villa Grove, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 150,712, June 7, 1971, abandoned. This application July 23, 1973, Ser. No. 381,651

Int. Cl.² C08F *6/00, 218/08*

U.S. Cl. 528—503 **9 Claims**

1. A process for decreasing the melt index of preformed ethylene-vinyl acetate copolymers having about 8–55 weight percent vinyl acetate to a level sufficient for extrusion applications which comprises mechanically working a composition consisting essentially of the copolymer, at a peak temperature below the degradation temperature of the copolymer and for a maximum period of residence time at the peak temperature of 5 minutes.

3,968,092
USE OF AROMATIC FURFURYL POLYCARBAMATES AS CHLOROPRENE POLYMER VULCANIZATION ACCELERATORS

Wilhelm Franz Gruber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

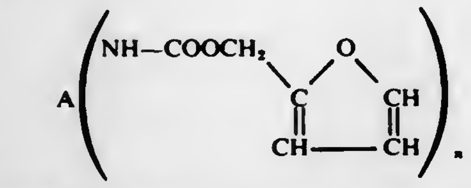
Continuation of Ser. No. 452,337, March 18, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,432

Int. Cl.² C08F *214/00, 136/16, 218/00, 18/24*

U.S. Cl. 526—17 **14 Claims**

1. In the process of vulcanizing in the presence of magnesium oxide and zinc oxide an elastomer composition comprising as the elastomer a chloroprene polymer containing 0–60 weight percent of 2,3-dichloro-1,3-butadiene,

the improvement of using as vulcanization accelerator a polycarbamate represented by the following formula



wherein A is 1,3-phenylene, 1,4-phenylene, 4,4'-methylenediphenylene, and polymethylene polyphenyl; and n is a positive number from 2 to 3;

provided that the aromatic rings in the A radical can be substituted with one or more C_1–C_4 alkyl groups;

the proportion of the polycarbamate being about 0.5–4 parts; the proportion of magnesium oxide being about 0.4–15 parts; and the proportion of zinc oxide being about 2–15 parts; all parts being by weight per 100 parts by weight of the polymer.

3,968,093
PROCESS FOR PRODUCING PARTIALLY HYDROLYZED POLYACRYLAMIDE IN THE PRESENCE OF ALKALI METAL HYDROXIDE AND BORIC ACID

Masao Hasegawa, Tokyo; Akihisa Furuno; Haruhiko Ishikawa, both of Yokohama, and Yasuo Ogawa, Kawasaki, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

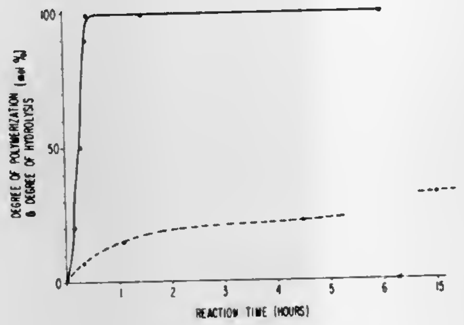
Filed May 13, 1974, Ser. No. 469,443

Claims priority, application Japan, May 12, 1973, 48-52145; May 12, 1973, 48-52146

Int. Cl.² C08F *120/52, 120/70;* **C02C** *1/02;* **B10D** *5/00*

U.S. Cl. 526—303 **8 Claims**

1. A process for producing partially hydrolyzed polyacrylamide, which comprises polymerizing acrylamide monomer in an aqueous solution in the presence of alkali metal hydroxide and boric acid, whereby the polymer formed is also hydrolyzed simultaneously with said polymerizing and the resulting polymer is of high molecular weight and high water solubility.



3,968,094
PHOTODEGRADABLE PLASTICS CONTAINING HALOOLEFINS

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of the Department of Agriculture, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,403

Int. Cl.² C08J *3/20*

U.S. Cl. 526—914 **9 Claims**

1. A photodegradable composition comprising a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutylene, polystyrene, mixtures of polyethylene and polypropylene, and vinyl acetate/ethylene copolymers, and about from 1 to 5% by weight of an additive of the structure

$$(XH_2C)_nCH_m = CH_m(CH_2X)_n$$

wherein:

X is chlorine, bromine, or iodine

n is 1 or 2

m is 2—*n*.

3,968,095
PHOTODEGRADABLE PLASTICS CONTAINING AN N-HALO AMIDE

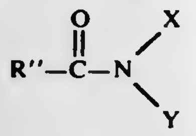
Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 453,911, March 22, 1974. This application May 30, 1975, Ser. No. 582,507

Int. Cl.² C08J *3/20*

U.S. Cl. 526—914 **2 Claims**

1. A photodegradable composition comprising a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutylene, polystyrene, mixtures of polyethylene and polypropylene, and vinyl acetate/ethylene copolymers and about from 0.1 to 10% of an additive of the structure —



$$R''-\overset{\overset{\displaystyle O}{\|}}{C}-N\begin{matrix}\diagup X\\ \diagdown Y\end{matrix}$$

wherein X is chlorine, bromine, or iodine, Y is hydrogen, chlorine, bromine, or iodine, and R' is a monovalent hydrocarbon radical containing 1 to 18 carbon atoms.

3,968,096
PHOTODEGRADABLE POLYOLEFINS CONTAINING AN HALOGENATED NITRILE

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 543,706, Jan. 23, 1975. This application Aug. 8, 1975, Ser. No. 603,080

Int. Cl.² C08J *3/20*

U.S. Cl. 526—914 **2 Claims**

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10% of an additive of the structure

$$C(CN)_rX_q$$

wherein:

X is chlorine, bromine, or iodine

r is 1, 2, or 3

q is 4—r.

3,968,097
VEGETABLE PROTEIN EXTRACTION AT A PH 1-5-3 USING GEL FILTRATION

Michel John Arthur Groux, Lauperswil; Ernesto Dalan, Vevey; Jan Kruseman, Coriser-sur-Vevey, and Pierre Yves Bertschy, Chardonne, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Apr. 2, 1974, Ser. No. 457,227

Claims priority, application Switzerland, Apr. 17, 1973, 5528/73

Int. Cl.² A23J *1/14*

U.S. Cl. 260—123.5 **9 Claims**

1. A process for the preparation of a soluble protein fraction which comprises extracting a protein-containing vegetable material with an aqueous medium at a pH value between 1.5 and 3, separating the resulting aqueous extract from vegetable material insolubles, treating said aqueous extract by gel filtration at a pH value below 4 and recovering a soluble protein fraction by elution.

3,968,098
ISOLATION PROCESS FOR WATER-SOLUBLE DYES

Anthony Kenneth Dunn; David Hugh Spence, and Bryan Stockton, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 318,086, Dec. 18, 1972, abandoned. This application June 6, 1974, Ser. No. 476,941

Int. Cl.² C09B *46/00*

U.S. Cl. 260—208 **4 Claims**

1. A process for the isolation of a water-soluble dye containing one or more groups selected from sulfuric acid and carboxylic acid groups from an aqueous paste containing said dye and an inorganic salt, said process comprising

- a. washing said paste with a water-miscible lower alkanol to displace an aqueous solution of an inorganic salt therefrom;
- b. slurrying the resulting washed paste with water;
- c. subjecting the resulting slurry to steam distillation to remove the lower alkanol therefrom; and
- d. subjecting the aqueous distillation residue resulting from (c) to spray drying so as to recover said dye.

3,968,099
PROCESS FOR THE PREPARATION OF AZO DYESTUFFS CONTAINING CYANO GROUPS

Klaus Leverenz, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

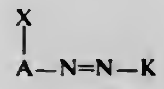
Filed Jan. 17, 1975, Ser. No. 542,051

Claims priority, application Germany, Jan. 19, 1974, 2402544

Int. Cl.² C09B *43/00*

U.S. Cl. 260—208 **3 Claims**

1. Process for the preparation of an azo dyestuff which contains in the diazo component at least one cyano group in the orthoposition to the azo bridge, which comprises reacting an azo dyestuff of the general formula



$$\overset{X}{\overset{|}{A}}—N=N—K$$

wherein

A is an aromatic-carbocyclic radical,

K is the radical of a coupling component and

X is a chlorine, bromine or iodine atom which is in the o-position to the azo group with CuCN or CuCN-forming compounds in polar organic solvents having a dielectric constant of >10 in the presence of an azole selected from the group consisting of imidazole, 1-methylimidazole, 2-methylimidazole, benzimidazole, 1-methylbenzimidazole, 2-methylbenzimidazole, 2-methylbenzthiazole, 4,5-dimethylthiazole, 2-methylbenzoxazole, and pyrazole, and recovering said azo dyestuff wherein the halogen substituent X is replaced by a cyano substituent.

3,968,100
GUANIDIO DERIVATIVES OF KASUGAMYCIN AND THEIR PRODUCTION

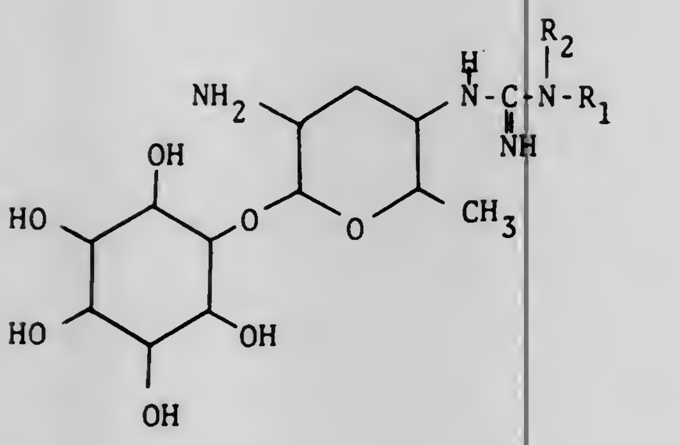
Hamao Umezawa, and Yasuji Suhara, both of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Jan. 24, 1972, Ser. No. 220,374

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **5 Claims**

1. A guanidino derivative of kasugamycin of the formula:



(I)

wherein R_1 and R_2 are hydrogen, hydroxyl, amino, alkyl, amino-alkyl, phenyl, or alkyl-sulfonyl, wherein said alkyl, amino-alkyl and alkyl-sulfonyl group have 1–4 carbon atoms.

3,968,101
8-SUBSTITUTED CYCLIC NUCLEOTIDES BY FREE RADICAL ALKYLATION AND ACYLATION

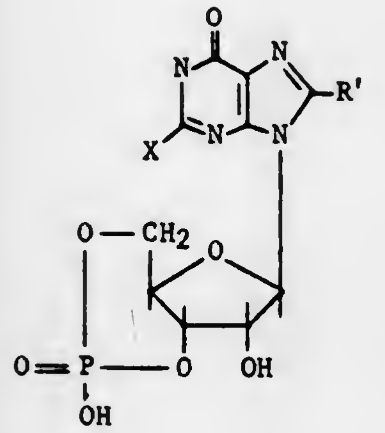
Leon F. Christensen, Costa Mesa, and Roland K. Robins, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Dec. 20, 1974, Ser. No. 534,750

Int. Cl.² C07C *19/20*

U.S. Cl. 260—211.5 R **17 Claims**

1. The compound of the structure:



wherein X is H or NH_2; and R′ is iso-propyl; neo-pentyl; C_1 to C_8 substituted alkyl wherein the alkyl is substituted at the 1-alkyl position and the substituents are selected from the group consisting of hydroxyl, phenyl, semicarbazone, thiosemicarbazone, 4-phenyl semicarbazone, and phenyl hydrazone; benzyl; C_1 to C_8 acyl; or carbamoyl.

3,968,102
S-SUBSTITUTED-2-THIOADENOSINES

Hideo Suehiro; Kiyomi Kikugawa, both of Kokubunji; Motonobu Ichino, Mitaka, and Tokuro Nakamura, Mitaka, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

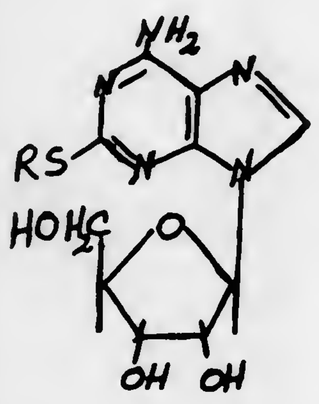
Filed Apr. 16, 1975, Ser. No. 568,491

Claims priority, application Japan, Apr. 18, 1974, 49-42718; Apr. 19, 1974, 49-43430

Int. Cl.² C07H *19/16*

U.S. Cl. 260—211.5 R **18 Claims**

1. A compound of the formula



wherein R is a mono- or di-hydroxyalkyl group or a mono- or dicarboxylalkyl group having 1 to 7 carbon atoms in the alkyl moiety which can be a straight or branched chain; a mono-hydroxyalkenyl group or a mono-carboxyalkenyl group having 2 to 5 carbon atoms in the alkenyl moiety which can be a straight or branched chain; a 2-hydroxy-, 4-hydroxy-, 2-carboxy- or 4-carboxy-cyclohexyl group; a phenyl group; a naphthyl group; an o- or p-mono-substituted, or o- or p-di-substituted phenyl group or a mono- or di-substituted-2-naphthyl group wherein the substituent of the phenyl or naphthyl group is selected from the group consisting of an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 or 2 carbon atoms, a halogen atom, a nitro group, a hydroxyl group, a carboxyl group and an amino group; a substituted or unsubstituted 5- or 6-membered heterocyclic group selected from the group consisting of pyridyl, pyrimidinyl, imidazolyl, thienyl, furyl, thiazolyl, thiadiazolyl, thiazolinyl and triazolyl groups wherein the substituent is selected from the group consisting of an alkyl group having 1 to 4 carbon atoms, a nitro group, a hydroxyl group, an amino group and a carboxyl group; a substituted or unsubstituted 9- or 10-membered condensed heterocyclic group selected from the group consisting of indolyl, quinolyl, isoquinolyl, benzimidazolyl, purinyl, benzothiazolyl, pteridinyl and benzoxazolyl groups wherein the substituent is selected from the group consisting of a nitro group, an amino group and a hydroxyl group; a 1- or 2-adamantyl group; or a 2-norbornyl group.

3,968,103
1,2,3-TRIAZOLE NUCLEOSIDES

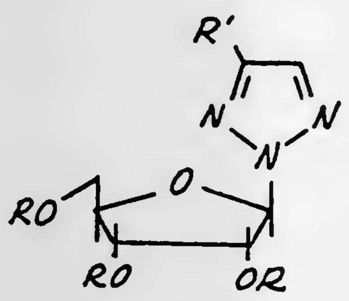
Roland K. Robins, Santa Ana, and Joseph T. Witkowski, Laguna Niguel, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Sept. 28, 1972, Ser. No. 292,930

Int. Cl.² C07H *19/04*

U.S. Cl. 260—211.5 R **13 Claims**

1. A 1,2,3-triazole nucleoside of structure



wherein R is hydrogen acetyl or benzoyl and R′ is selected from the group consisting of nitro, carboxamido, thiocarboxamido, cyano and carbomethoxy groups.

3,968,104
EXTREMELY LOW VISCOSITY ADDUCTS OF LACTAMS WITH ALCOHOLS

Kuno Wagner, Leverkusen-Steinbuechel, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 207,562, Dec. 13, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,892

Claims priority, application Germany, Dec. 17, 1970, 2062288

Int. Cl.² C07D *223/10*

U.S. Cl. 260—239.3 R **8 Claims**

1. Adduct of a lactam selected from the group of epsilon-caprolactam, 1-N-methyl hexahydro-1,4-diazepin-3-one, propiolactam, butyrolactam, valerolactam and dodecalactam, with an alcohol selected from the group of methanol, ethanol, propanol, n-butanol, isopropanol, t-butanol, cyclohexanol, allyl alcohol, ethylene glycol monomethyl ether, benzyl alcohol, chloroethanol, fluoroethanol, trichloroethanol, trifluoroethanol, beta-hydroxypropylester of C_{1-4} carboxylic acids, furfuryl alcohol, tetrahydrofurfuryl alcohol, n-butyl mercaptan, dodecyl mercaptan, mercaptoethanol, a hemiacetal of the foregoing alcohols with formaldehyde or chloral; ethylene glycol; diethylene glycol; thioglycol; a propane diol isomer; di- or tri-propylene glycol; glycerine, tri-methylol propane, hexane-1,6-diol or other isomer of hexane diol; hexahydroquinone; 1,4-bis-hydroxymethyl cyclohexane; terpin hydrate; mono-, di, tri- or tetrá-methylol cyclohexanone; anhydroenneaheptiotol; phthalic or terephthalic acid diglycol ester; methylene glycol; a mono- or bis-hemiacetal of formaldehyde or chloral of any of the aforementioned polyhydroxyl compounds; n-methyl diethanolamine; bis hydroxyethyl cyclo-hexylamine; and bis-hydroxyethyl stearylamine, and an N-methylol derivative of valeorlactam, butyrolactam, caprolactam, propiolactam, N-butylethylurethan, N-methylol benzamide, N-hydroxymethyl naphthalimide, ethanolamine, N-methylethanol amine, cyclohexylethanolamine, oxethylated benzoic acid amide, hydroxyethyl acetamide, hydroxyethyl carbamic acid butyl ester, N,N-dimethylethanolamine, N,N-diethylethanolamine, and hydroazinoethanol, said adduct containing from 0.3 to 4 moles of said alcohol per mol of said lactam.

2. Adduct of a lactam selected from the group of epsilon-caprolactam, 1-N-methyl hexahydro-1,4-diazepin-3-one, propiolactam, butyrolactam, valerolactam and dodecalactam, with primary and secondary alcohols containing cyclic acetal group of formaldehyde, acetaldehyde or acrolein and alcohols with carbonyl or oxirane groups in the molecule, said adduct containing from 0.3 to 4 moles of said alcohol per mol of said lactam.

3,968,105
PROLONGED RELEASE OF ANTIFERTILITY DRUGS

Allan Poe Gray, Chicago, Ill., assignor to IIT Research Institute, Chicago, Ill.

Filed Dec. 30, 1974, Ser. No. 537,676

Int. Cl.² C07J *43/00*

U.S. Cl. 260—239.5 **11 Claims**

1. A complex having a prolonged antifertility effect, said complex comprising the reaction product of an antifertility drug, tannic acid and a polyvalent metal ion, said antifertility drug being in the form of a basic amine derivative of said drug.

3,968,106
PROCESS FOR THE MANUFACTURE OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE AND ITS USE AS SWEETENER

Karl Clauss, Rossert, Taunus; Hartmut Pietsch, Hofheim, Taunus; Erwin Schmidt, Kelkheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 16, 1975, Ser. No. 596,226

Claims priority, application Germany, July 18, 1974, 2434564

Int. Cl.² C07D *291/06*

U.S. Cl. 260—243 R **7 Claims**

1. In the process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide or the nontoxic salts thereof by reacting acetone and fluorosulfonyl isocyanate to obtain acetoaceticamide-N-sulfofluoride and bringing about cyclization thereof by a treatment with an aqueous or alcoholic base or a combination thereof at a pH of from 5 to 12, the improvement which comprises reacting acetone and fluorosulfonyl isocyanate at a temperature of from 0° to 60°C in a molar proportion of from 14:1 to 150:1 and distilling off the excess acetone before cyclization.

3,968,107
PROCESS FOR THE MANUFACTURE OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE

Karl Clauss, Rossert, Taunus; Erwin Schmidt, Kelkheim, Taunus; Hartmut Pietsch, Hofheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

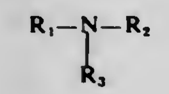
Filed July 16, 1975, Ser. No. 596,247

Claims priority, application Germany, July 18, 1974, 2434549

Int. Cl.² C07D *291/06*

U.S. Cl. 260—243 R **8 Claims**

1. In the process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide and of the nontoxic salts thereof by reacting acetoacetic acid with fluorosulfonyl isocyanate to yield acetoacetic acid amide- N-sulfofluoride and forming the oxathiazinone ring the improvement which comprises reacting acetoacetic acid with fluorosulfonyl isocyanate at a temperature of from −20°C to +50°C in the presence of from 0.5 to 2 moles, calculated on the isocyanate used, of an alkali metal fluoride or a tertiary amine of the formula



$$R_1-\underset{\displaystyle R_3}{\underset{|}{N}}-R_2$$

in which R_1, R_2, R_3 represent identical or different alkyl radicals having from 1 to 10 carbon atoms, two of the radicals R_1 to R_3 optionally form together an alkylene radical which may contain N, O, or S as a hetero atom or one of the radicals R_1 to R_3 represents a phenyl radical, or of pyridine or quinoline, or of a mixture of the aforesaid compounds, and transforming the salt of acetoacetamide-N-sulfofluoride obtained into the salt of oxathiazinone or the free oxathiazinone by a treatment with an aqueous or alcoholic base or a combination thereof.

3,968,108
PROCESS FOR PREPARING A DESACETOXYCEPHALOSPORIN FROM A PENAM AND/OR A CEPHAM COMPOUND

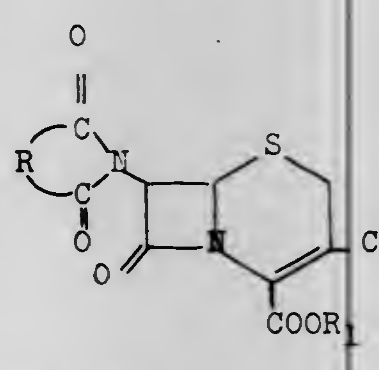
Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 267,795, June 30, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,098

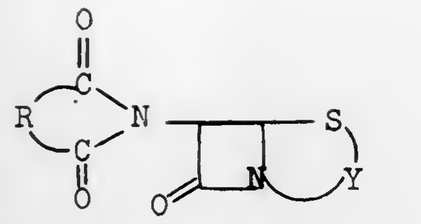
Int. Cl.² C07D *501/10, 501/04*

U.S. Cl. 260—243 C **13 Claims**

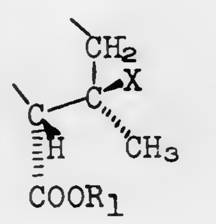
1. A process for preparing a compound of the formula:

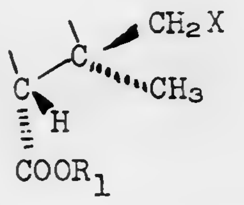


which comprises the step of reacting a compound of the formula:

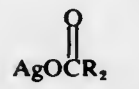


in which Y is





or a mixture of the two, with a compound of the formula



$$AgO\overset{\overset{O}{\|}}{C}R_2$$

in which, in the above formulae, R is C_2-C_4 alkylene, C_2-C_4 alkenylene, -CH_2-Z-CH_2- in which Z is oxygen or sulfur, 1,2-cyclohexylene, 1,2-phenylene, 1,2-cyclohexenylene, or a monosubstituted derivative of any of the above having a substituent selected from the group consisting of C_1-C_3 alkyl, C_1-C_3 alkoxy, and nitro; R_1 is a carboxy protecting group; R_2 is C_1-C_4 alkyl or C_5-C_6 cycloalkyl; and X is chlorine or bromine.

3,968,109
PRODUCTION OF 2-(THIO SUBSTITUTED)CEPHALOSPORIN SULFOXIDES AND 2-(THIO SUBSTITUTED)CEPHALOSPORINS

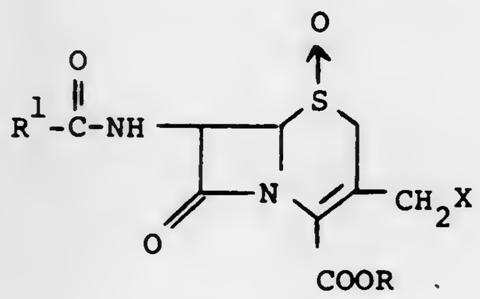
William Henry Koster, Pennington, and Joseph Edward Dolfini, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 23, 1973, Ser. No. 418,520

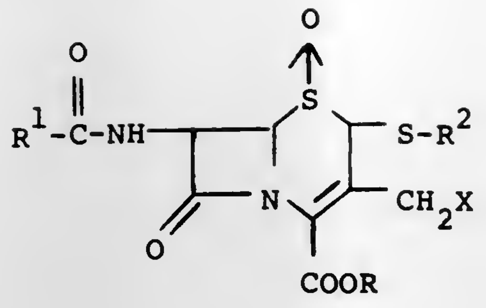
Int. Cl.² C07D *501/04, 501/18*

U.S. Cl. 260—243 C **19 Claims**

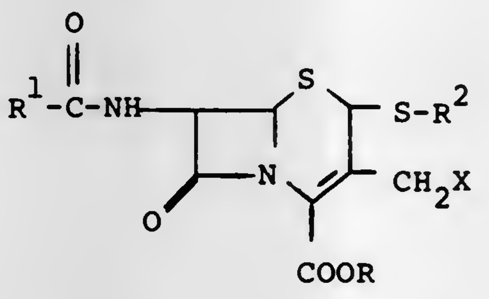
1. A process which comprises reacting a compound of the formula



with an electrophilic compound of the formula R^2—S—Y or $(R^2S)_2$ in the presence of an alkali metal lower alkoxide, phenyl lithium, triphenylmethyl lithium, lithium-lower alkylamide or alkali metal hydride at a temperature in the range of about −78°C. to +30°C. thereby producing a compound of the formula

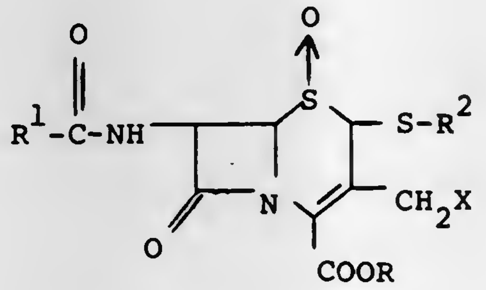


and chemically reducing the last compound with phosphorus halide, acetyl chloride-alkali metal dithionite, stannous halide or alkali metal iodide-acetyl chloride-acetic acid to obtain as a product a compound of the formula



wherein in each of said formulas R is lower alkyl, lower alkoxybenzyl, nitrobenzyl, halo-lower alkyl or lower alkylsilyl; R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, α-aminophenyl-lower alkyl, α-hydroxyphenyl-lower alkyl, phenoxy-lower alkyl, phenylthio-lower alkyl, pyridylthio-lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, pyridyl-lower alkyl, thienyl, thenyl, furylmethyl, cyclo-lower alkyl-lower alkyl or α-aminocyclo-lower alkadiene-lower alkyl, said phenyl, thienyl, pyridyl, cyclo-lower alkyl and cyclo-lower alkadienyl groups being unsubstituted or substituted with one or two lower alkyl, lower alkoxy, halo, nitro, amino or trifluoromethyl groups: R^2 is lower alkyl, substituted lower alkyl wherein the substituent is halo or lower alkoxy, phenyl or substituted phenyl wherein the substituent is halo, lower alkoxy, nitro, cyano or carbo-lower alkoxy; X is hydroxy lower alkoxy, lower alkanoyloxy or lower alkylthio; and Y is halogen or —SO_2—Z wherein Z is lower alkyl, lower alkylcarbonylthio or lower alkylthio.

10. A compound of the formula



wherein R is hydrogen, lower alkyl, trichloroethyl, phenyl-lower alkyl, nitrophenyl-lower alkyl or lower alkoxyphenyl-lower alkyl; R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, α-aminophenyl-lower alkyl, α-hydroxyphenyl-lower alkyl, phenoxy-lower alkyl, phenylthio-lower alkyl, pyridylthio-lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, pyridyl-lower alkyl, thienyl, thenyl, furylmethyl, cyclo-lower alkyl-lower alkyl or α-aminocyclo-lower alkadiene-lower alkyl, said phenyl, thienyl, pyridyl, cyclo-lower alkyl and cyclolower alkadienyl groups being unsubstituted or substituted with one or two lower alkyl, lower alkoxy, halo, nitro, amino or trifluoromethyl groups; R^2 is lower alkyl, substituted lower alkyl wherein the substituent is halo or lower alkoxy, phenyl or substituted phenyl wherein the substituent is halo, lower alkoxy, nitro, cyano or carbo-lower alkoxy; and X is hydrogen, lower alkoxy, lower alkanoyloxy or lower alkylthio.

3,968,110
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

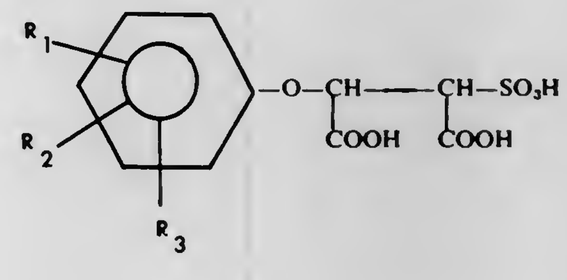
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, Pat. No. 3,925,375, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application May 19, 1975, Ser. No. 578,703

Int. Cl.² C07D *295/00;* **C07C** *143/54*

U.S. Cl. 260—247.1 E **4 Claims**

1. An α-substituted phenyl-β-sulfosuccinic acid having the general formula:



or the alkali metal, ammonium and substituted ammonium salt forms thereof wherein the substituted ammonium salts are selected from the group consisting of monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salts thereof, wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen, alkyl containing 1 to 4 carbon atoms and COOH providing that when COOH is present two of the R_1, R_2 and R_3 group must be hydrogen.

3,968,111
8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

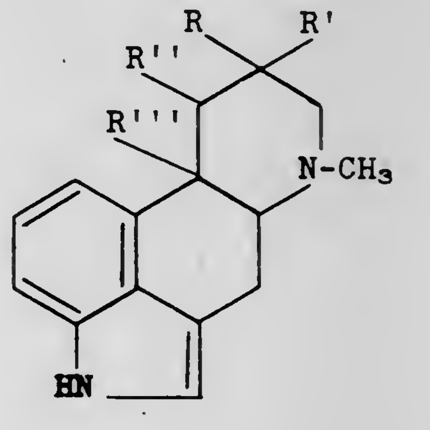
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 6, 1974, Ser. No. 530,320

Int. Cl.² C07D *457/02, 457/10*

U.S. Cl. 260—285.5 **9 Claims**

1. A compound of the formula



wherein R is alk, carbo(C_1–C_3)alkoxy, Cl or Br;
R′ is carboxyl, carbo(C_1–C_3)alkoxy, or CH_2Z,
wherein alk is (C_1–C_3) alkyl and
Z is H, OH, CN, OSO_2alk, Y-phenyl or Y-alk;
wherein Y is S or O; and
R″ and R‴ when taken singly are H; and, when taken together with the carbon atoms to which they are attached, form a double bond and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acids.

3,968,112

SYNTHESIS OF PENNICLAVINE AND ELYMOCLAVINE

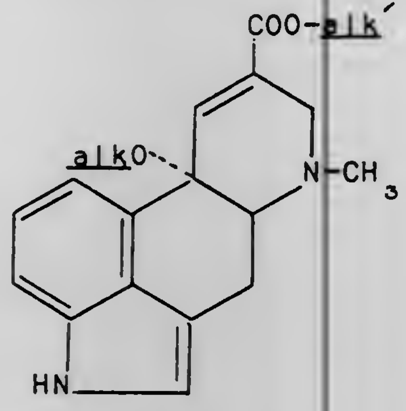
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 494,147, Aug. 2, 1974, Pat. No. 3,929,796. This application Aug. 11, 1975, Ser. No. 603,408

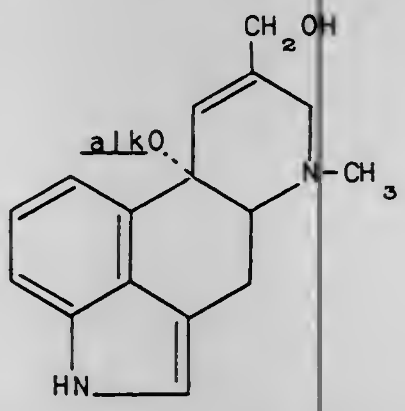
Int. Cl.² C07D *457/12*

U.S. Cl. 260—285.5 **1 Claim**

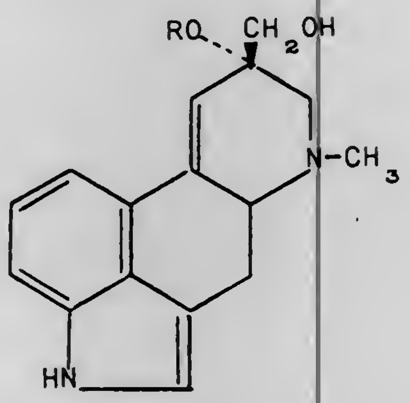
1. The process which comprises reducing with a metal hydride in an inert solvent a compound of the formula



wherein alk and alk′ are the same or different (C_1–C_3) alkyl groups to yield an 8-hydroxymethyl-8-ergolene of the formula



wherein alk has the same meaning as hereinabove; rearranging said 8-hydroxymethyl-8-ergolene in aqueous acid, in an alkanolic (alkOH) acid or in an acidic (alkCOOH) medium to yield, respectively, penniclavine (R=H), an 8α-alkylpenniclavine ether (R=alk) or 8α-alkanoyl penniclavine ester (R=alk—CO) of the formula



wherein R is H, alk or alk-CO, and alk is (C_1–C_3) alkyl.

3,968,113

CONVERSION OF LEUROSINE TO VINCATHICINE

Norbert Neuss, and Susan S. Tafur, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 7, 1975, Ser. No. 547,895

Int. Cl.² C07D *215/14*

U.S. Cl. 260—287 P **4 Claims**

1. The process which comprises the essential steps of heating leurosine with mineral acid in an aqueous solvent and isolating the vincathicine thus formed.

3,968,114

1,2,3,4,5,6,7,8,9,10-DECAHYDRO-8-OXO-2,6-METHANO-3-BENZAZOCINES

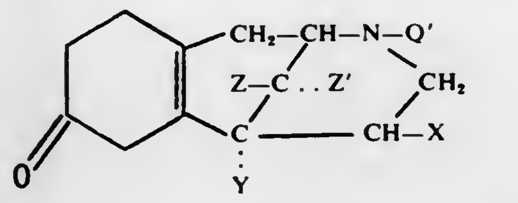
Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,966

Int. Cl.² C07D *221/26*

U.S. Cl. 260—293.54 **6 Claims**

1. 1,2,3,4,5,6,7,8,9,10-Decahydro-3-Q′-8-oxo-5-X-6-Y-11-Z-11Z′-2,6-methano-3-benzazocine having the formula



wherein:
Q′ is hydrogen, benzyl, propyl, isobutyl, neopentyl, allyl, 2-methyl-2-propenyl, 2-chloro-2-propenyl, cis-3-chloro-2-propenyl, cis-3-chloro-2-butenyl, trans-3-chloro-2-butenyl, propargyl, cyclopropylmethyl or (2,2-dichlorocyclopropyl)methyl;
X is hydrogen, methyl or ethyl;
Y is hydrogen, methyl, ethyl, propyl, allyl or phenyl;
Z is hydrogen, methyl, ethyl or hydroxy, and
Z′ is hydrogen, methyl or ethyl; or an acid addition salt thereof.

3,968,115

1-ALKYL-4-(10 AND/OR 11)-BROMO-10,11-DIHYDRO-5H-DIBENZO[a,d]-CYCLOHEPTEN-5-YLIDENE PIPERIDINE COMPOUNDS

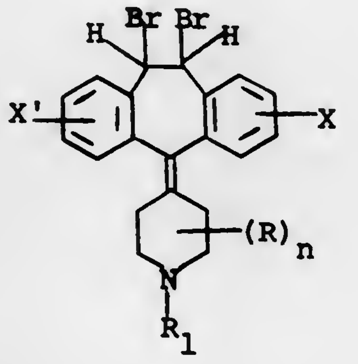
John D. Prugh, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 9,049, Feb. 5, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,684

Int. Cl.² C07D *211/08*

U.S. Cl. 260—293.62 **5 Claims**

1. A compound of the formula



wherein
R_1 is lower alkyl;
R is methyl or ethyl;
n is 0, 1 or 2;
X and X′ are similar or dissimilar and are selected from
hydrogen, an alkyl group having up to 6 carbon atoms, a perfluoroalkyl group having up to 4 carbon atoms, phenyl, amino,
an alkylamino group having up to 4 carbon atoms, a dialkylamino group having up to 8 carbon atoms, an alkylsulfonylamino group having up to 4 carbon atoms, halogen (fluorine, chlorine, bromine or iodine), hydroxyl,
an alkoxy group having up to 4 carbon atoms,
a perfluoroalkoxyl group having up to 4 carbon atoms,
cyano,
carboxy,
carbamoyl,
an alkylcarbamoyl group having up to 5 carbon atoms, a dialkylcarbamoyl group having up to 9 carbon atoms, a carbalkoxy group having up to 6 carbon atoms, an alkylmercapto group having up to 4 carbon atoms, a perfluoroalkylmercapto group having up to 4 carbon atoms, an alkylsulfonyl group having up to 4 carbon atoms, a perfluoroalkylsulfonyl group having up to 4 carbon atoms, sulfamoyl,
an alkylsulfamoyl group having up to 4 carbon atoms, or a dialkylsulfamoyl group having up to 8 carbon atoms.

3,968,116

1H-IMIDAZO(4,5-B)PYRIDINE COMPOUNDS

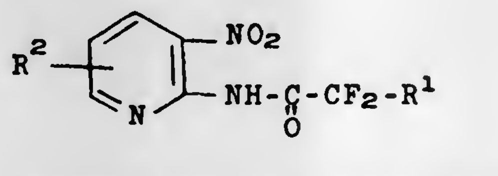
George O. P. Doherty, Greenfield, Ind., and Kenneth H. Fuhr, Columbus, Ohio, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 181,574, Sept. 17, 1971, Pat. No. 3,813,408, Continuation-in-part of Ser. No. 21,535, March 20, 1970, abandoned. This application Feb. 15, 1974, Ser. No. 442,943

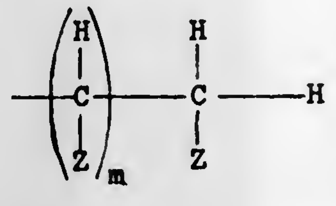
Int. Cl.² C07D *213/75*

U.S. Cl. 260—295 AM **8 Claims**

1. The compound of the formula



wherein R^1 represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula



wherein each Z independently represents hydrogen or halogen and *m* represents 0 or 1; R^2 represents amino, halogen, nitro, cyano, loweralkyl of C_1-C_4, perfluoroalkyl of C_1-C_8, —CF_2Cl, —CF_2H, or loweralkylsulfonyl of C_1-C_4.

3,968,117

1,4-DIHYDROPYRIDINES

Friedrich Bossert; Horst Meyer, both of Wuppertal-Elberfeld, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

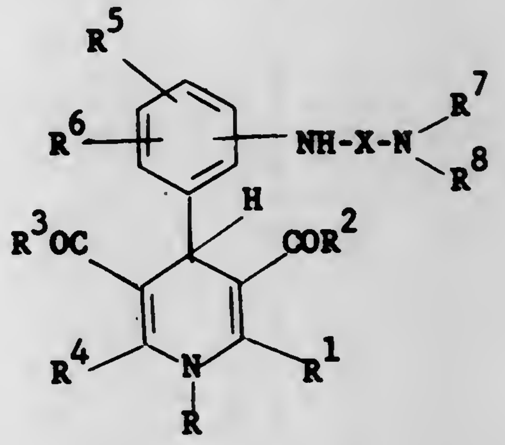
Division of Ser. No. 366,578, June 4, 1973, Pat. No. 3,928,818. This application Feb. 10, 1975, Ser. No. 548,521

Claims priority, application Germany, June 10, 1972, 2228363

Int. Cl.² C07D *213/24*

U.S. Cl. 260—295.5 R **6 Claims**

1. A compound of the formula:



wherein
R is hydrogen, lower alkyl or alkenyl of 2 to 4 carbon atoms:
each of R^1 and R^4 is hydrogen or lower alkyl;
each of R^2 and R^3 is lower alkyl, alkenyl of 2 to 4 carbon atoms, furfuryl or a member selected from the group consisting of lower alkoxy, alkenyloxy of 2 to 4 carbon atoms and alkynyloxy of 2 to 4 carbon atoms which is unsubstituted or substituted by hydroxy or lower alkoxy;
each of R^5 and R^6 is hydrogen, lower alkyl, lower alkoxy, nitro, halogeno, cyano, amino, lower alkylamino, di-(lower alkyl)amino or acetylamino;
R^7 and R^8 are each hydrogen or lower alkyl; and
X is lower alkylene or hydroxy-(lower alkylene); or a non-toxic pharmaceutically acceptable acid addition salt thereof.

3,968,118

PROCESS FOR THE MANUFACTURE OF 1-HYDROXY-2-PYRIDONES

Gerhard Lohaus, Kelkheim, Taunus, and Walter Dittmar, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

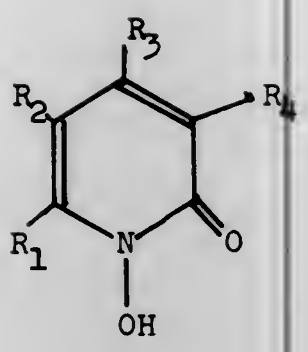
Division of Ser. No. 317,837, Nov. 22, 1972, Pat. No. 3,883,545, which is a continuation of Ser. No. 199,320, Nov. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 851,428, Aug. 19, 1969, abandoned. This application Aug. 30, 1974, Ser. No. 502,063

Claims priority, application Germany, Aug. 31, 1968, 1795270

Int. Cl.² C07D *213/02*

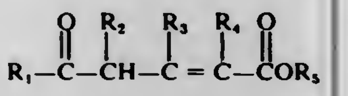
U.S. Cl. 260—297 Z **7 Claims**

1. The method of making a 1-hydroxy-2-pyridone of the formula



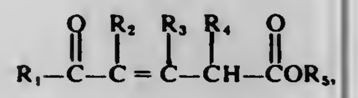
,

wherein R_1 is alkyl having 1 to 17 carbon atoms, cycloalkyl having 5 to 8 carbon atoms, α-furyl, or cyclohexylalkyl or phenylalkyl each having 1 to 3 carbon atoms in the alkyl portion thereof, all of which may be substituted by halogen; R_2 to R_4 are hydrogen or lower alkyl, or two adjacent substituents taken together form a trimethylene or tetramethylene chain; and R_1 to R_4 all together contain at least two carbon atoms, which method comprises reacting, at a temperature from 0°to 150°C., at least one unsaturated δ-keto ester of the formula



$$R_1-\overset{O}{\overset{\|}{C}}-\overset{R_2}{\overset{|}{C}H}-\overset{R_3}{\overset{|}{C}}=\overset{R_4}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}OR_5$$

or defined



$$R_1-\overset{O}{\overset{\|}{C}}-\overset{R_2}{\overset{|}{C}}=\overset{R_3}{\overset{|}{C}}-\overset{R_4}{\overset{|}{C}H}-\overset{O}{\overset{\|}{C}}OR_5,$$

wherein R_1 to R_4 are as earlier defined and R_5 is lower alkyl, with hydroxylamine or an acid addition salt thereof.

3,968,119
VIC-TRIAZOLE COMPOUNDS

Horst Harnisch, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

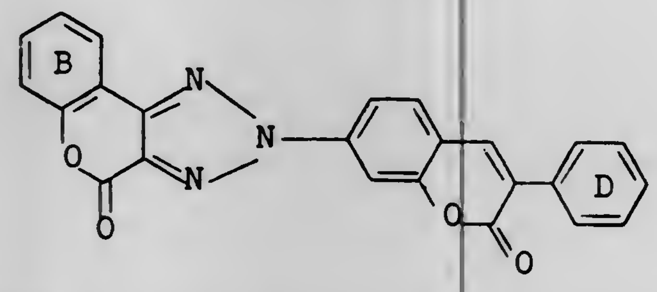
Filed Jan. 4, 1974, Ser. No. 430,931

Claims priority, application Germany, Jan. 5, 1973, 2300488

Int. Cl.² C07D ***487/04, 491/04***

U.S. Cl. 260—308 A **1 Claim**

1. Vic-triazole compound of the formula



wherein

B is unsubstituted; substituted by a fused unsubstituted benzene ring; monosubstituted by fluoro, chloro, bromo, C_1-C_4-alkyl or C_1-C_4-alkoxy; or disubstituted by fluoro, chloro, or bromo; and D is unsubstituted or monosubstituted by C_1-C_4-alkyl, fluoro, chloro, bromo, cyano, carboxylic acid C_1-C_4-alkyl ester, or carboxylic acid amide.

3,968,120
2-IMIDAZOLYLCARBONYLBENZOIC ACID COMPOUNDS

Erik Regel, Wuppertal-Elberfeld; Klaus Lürssen, Koenigsdorf, and Karl Heinz Büchel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

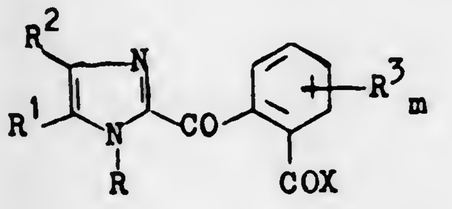
Filed Sept. 11, 1972, Ser. No. 288,229

Claims priority, application Germany, Sept. 10, 1971, 2145456

Int. Cl.² C07D ***233/64***

U.S. Cl. 260—309 **17 Claims**

1. 2-Imidazolylcarbonylbenzoic acid compound of the formula:



(I)

in which

X is hydroxy or OX′, X′ being
  a. an alkali metal cation,
  b. an equivalent of an alkaline earth metal cation or an equivalent of a metal cation selected from the group consisting of iron, copper, manganese and zinc, or
  c. alkyl of from 1 to 10 carbon atoms, alkenyl of from 2 to 6 carbon atoms, alkynyl of from 2 to 6 carbon atoms, haloalkyl of from 1 to 3 carbon atoms and 2 to 5 halogen atoms, hydroxyalkyl of from 1 to 4 carbon atoms, alkoxyalkyl of from 1 to 4 carbon atoms in the alkylene moiety and 1 to 3 carbon atoms in the alkoxy moiety, or aralkyl of from 1 to 2 carbon atoms in the alkylene moiety and 6 to 10 carbon atoms in the aryl moiety;

R is hydrogen or alkyl or alkoxyalkyl each of no more than 4 carbon atoms;

R^1 and R^2 are individually hydrogen, alkyl with up to 4 carbon atoms or phenyl; and

R^1 and R^2 together with the two carbon atoms to which they are attached form a fused benzene ring;

m is 1 or 2; and

R^3 is hydrogen, alkyl of from 1 to 4 carbon atoms, nitro or halogen;

or an agriculturally acceptable salt thereof.

3,968,121
1,2-DIPHENYL-4,5,6,7-TETRAHYDROINDOLES

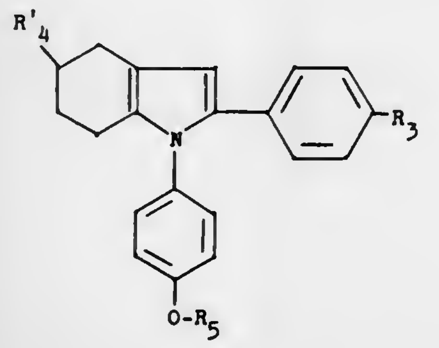
Malcolm R. Bell, East Greenbush, and Andrew W. Zalay, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 347,620, April 4, 1973, Pat. No. 3,898,246, which is a division of Ser. No. 156,068, June 23, 1971, Pat. No. 3,799,943. This application Jan. 13, 1975, Ser. No. 540,550

Int. Cl.² C07D ***209/08, 209/12***

U.S. Cl. 260—326.13 R **7 Claims**

1. A compound of the formula



where R_3 is hydrogen, lower-alkyl, lower-alkoxy or halo; R'_4 is hydrogen, lower-alkyl, lower-alkoxy or benzoyloxy; and R_5 is hydrogen or benzyl.

3,968,122
1-ACETYL-3-N-OCTANOYL-5-ETHYLIDENE TETRAMINIC ACIDS AND METAL SALTS THEREOF

Julia Nazareth; Naren M. Gandhi; Pandurang V. Divekar; Noel J. de Souza, and Hans Kohl, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

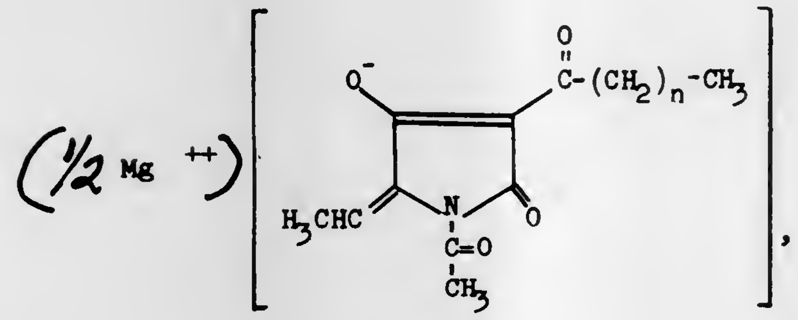
Filed Aug. 15, 1974, Ser. No. 497,719

Claims priority, application Germany, Oct. 19, 1973, 2352448

Int. Cl.² C07D ***207/00, 207/12, 207/24***

U.S. Cl. 260—326.5 FL **7 Claims**

1. Magnesidin, which is a mixture of compounds of the formula



,

said mixture consisting essentially of about equivalent amounts of a compound wherein *n* of said formula is 4 and of a compound wherein *n* of said formula is 6, the corresponding magnesium-free mixture having an —OH group in the 4-position, and salts of the latter with a mono-, di-, tri-, or tetravalent cation.

3,968,123
(3-THIOXO-1,2-DITHIOL-4-YL) SUBSTITUTED TRIARYL PHOSPHATES AND THIOPHOSPHATES

John Grey Dingwall, Brooklands Sale, and Donald Richard Randell, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

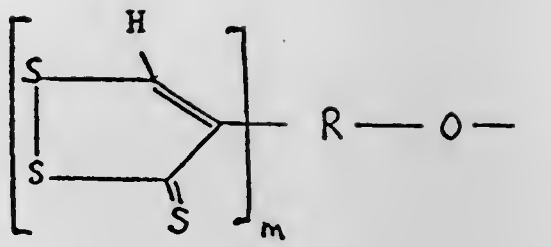
Filed June 17, 1974, Ser. No. 479,937

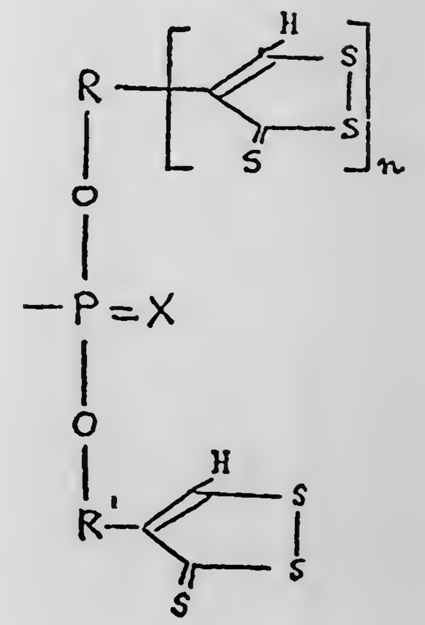
Claims priority, application United Kingdom, June 19, 1973, 29161/73

Int. Cl.² C07D ***339/04***

U.S. Cl. 260—327 C **31 Claims**

1. A compound of the formula:





I

in which X is an oxygen or sulphur atom, R is phenyl or phenylene and R^1 is phenylene both R and R^1 being unsubstituted or substituted by 1 to 3 branched or straight chain alkyl groups which may be the same or different and may contain 1 to 12 carbon atoms and in which *m* and *n* may be 0 or 1.

3,968,124
PROCESS FOR PREPARING PHENYL-ACETIC ACID ESTERS

Toshio Mizutani; Nobuo Ohno; Yoshitaka Ume, all of Toyonaka, and Takashi Matsuo, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

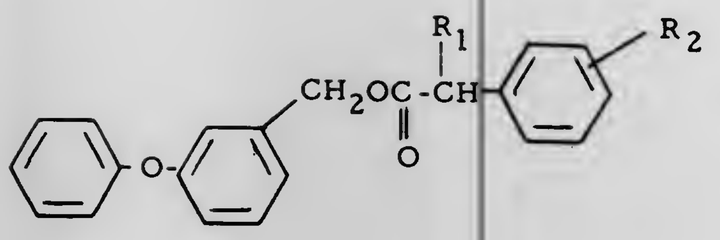
Filed Aug. 6, 1974, Ser. No. 495,155

Claims priority, application Japan, Aug. 28, 1973, 48-97063

Int. Cl.² C07C ***67/00;*** **C07D** ***317/68;*** **C07C** ***67/18***

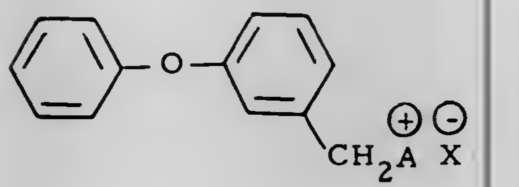
U.S. Cl. 260—340.5 **9 Claims**

1. A process for preparing a substituted phenyl-acetic acid ester of the formula (I),



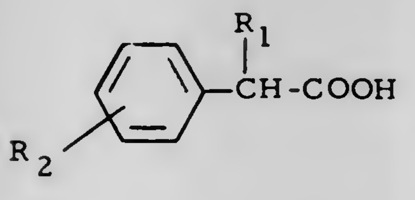
(I)

wherein R_1 is an ethyl group or an isopropyl group, R_2 is a hydrogen atom, a C_1–C_4 alkyl group, a methoxy group, a halogen atom or a methylenedioxy group, which comprises reacting in the presence of a solvent a quaternary ammonium salt of the formula (III),



(III)

wherein X is a halogen atom, and A^+ is trialkylammonium, pyridinium or a dialkylanilinium group, with a carboxylic acid of the formula (II),



(II)

wherein R_1 and R_2 are each as defined above, its reactive derivative, or mixture of the acid and its reactive derivative, said reactive derivative of said carboxylic acid being a member selected from the group consisting of the alkali metal salt, the ammonium salt and the alkyl ammonium salt.

3,968,125
DIHYDROXYHEXAHYDRODIBENZO[b,d]PYRANS

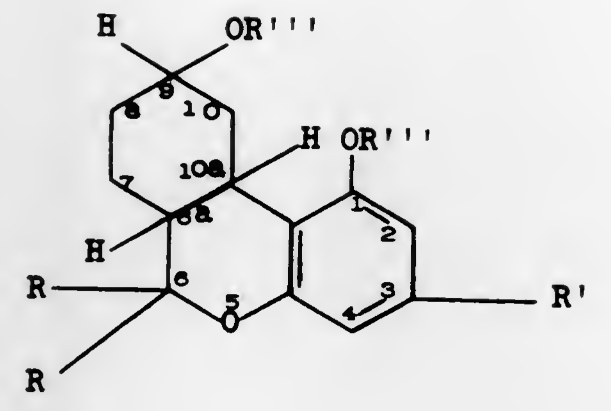
Robert A. Archer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 5, 1973, Ser. No. 413,010

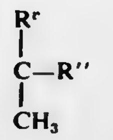
Int. Cl.^{2} C07D *311/78, 311/76*

U.S. Cl. 260—345.3 5 Claims

1. A compound of the formula



wherein R′ is



$$\overset{R^r}{\underset{CH_3}{C}}-R''$$

wherein R″ is C_1–C_7 alkyl, R^r is H or methyl, each R‴ is individually hydrogen or C_1–C_4 alkanoyl, and wherein both R's are the same and can be hydrogen or methyl.

3,968,126
FERROCENE DERIVATIVES AND THEIR PREPARATION

William P. Norris, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1974, Ser. No. 454,036

Int. Cl.^{2} C07D *307/00*

U.S. Cl. 260—346.1 M 10 Claims

1. 2-Ferrocenyl-2-(3-hydroxypropyl)tetrahydrofuran.
2. 4-Methyl-4-ferrocenylheptane-1,7-diol.

3,968,127
HYDROCARBON OXIDATION PROCESS

Jonas P. Harrison, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 24, 1975, Ser. No. 571,183

Int. Cl.^{2} C07D *307/60*

U.S. Cl. 260—346.8 A 10 Claims

1. A process for producing citraconic anhydride from isoprene which comprises contacting the isoprene feed and oxygen-containing gas in vapor phase in a pretreatment zone at a temperature between 150° and 430°C with a solid base composition, said base composition consisting essentially of an alkali or alkaline earth metal, and then contacting the effluent from the pretreatment zone at a temperature between 180° and 500°C with a hydrocarbon oxidation catalyst effective for catalyzing the reaction of isoprene with oxygen to obtain citraconic anhydride, wherein the hydrocarbon oxidation catalyst consists essentially of an oxide of vanadium, chromium, molybdenum, or a mixed oxide of tin and antimony, vanadium and chromium, tin and molybdenum, molybdenum and phosphorus, vanadium and phosphorus, vanadium and arsenic, or vanadium and titanium, and wherein the base composition and hydrocarbon catalyst are discrete catalyst beds.

3,968,128
MAGNESIUM-GROUP VIII TRANSITION METAL CARBONYL AND SUBSTITUTED CARBONYL COMPLEXES

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 51,669, July 1, 1970, abandoned. This application Nov. 27, 1973, Ser. No. 419,367

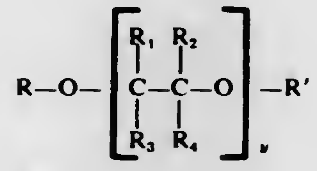
Int. Cl.^{2} C07D *307/04*

U.S. Cl. 260—347.8 7 Claims

1. A magnesium Group VIII transition metal carbonyl and substituted carbonyl complex having the following formula:

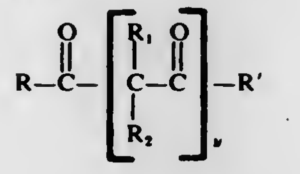
$$B_xMe[Me'(CO)_a(L)_b]_2$$

wherein B is a Lewis base selected from the group consisting of ether and ketones represented by the general formulae:



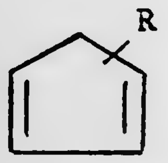
$$R-O-\left[\overset{R_1}{\underset{R_3}{C}}-\overset{R_2}{\underset{R_4}{C}}-O\right]_y-R' \quad \text{(ethers)}$$

and

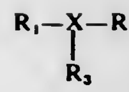


$$R-\overset{O}{\overset{\|}{C}}-\left[\overset{R_1}{\underset{R_2}{C}}-\overset{O}{\overset{\|}{C}}\right]_y-R' \quad \text{(ketones)}$$

wherein R and R′ are C_1 to C_{10} hydrocarbon radicals selected from the group consisting of normal, branched, and cyclic alkyl groups, aryl, alkaryl and aralkyl groups; R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen and C_1 to C_4 alkyl groups; *y* is an integer of from 0–3 provided that when *y* is O R and R′ may together form a ring which may or may not include oxygen; *x* is a positive integer from 1 to 4; Me is magnesium; Me′ is a transition metal selected from the group consisting of the metals of Group VIII of the Periodic Table of the Elements; *a* is an integer ranging from 1 to 4, *b* is an integer ranging from 0 to 3, and *a+b* total 4 or less; and L is a uni-or polydentate ligand or hydrocarbon residue which is selected from the group consisting of compounds of the following general formula:



and



$$R_1-\underset{R_3}{X}-R_2$$

wherein R, R_1, R_2 and R_3 are radicals independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{20} aryl, C_7 to C_{20} aralkyl and alkaryl, and X is selected from the group consisting of N, P, As and Sb.

3,968,129
AZIDOPHENOL AMINE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Wolfgang Kampe, Heddesheim; Kurt Stach, Mannheim-Waldhof; Max Thiel, Mannheim; Wolfgang Bartsch, Viernheim, and Karl Dietmann, Mannheim-Vogelstang, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

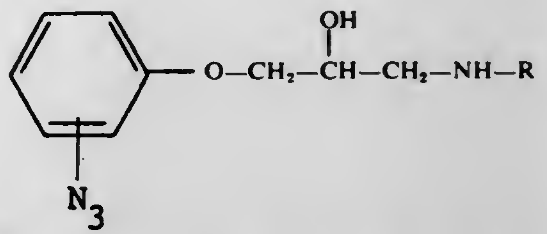
Filed Jan. 28, 1975, Ser. No. 544,720

Claims priority, application Germany, Feb. 22, 1974, 2408522

Int. Cl.^{2} C07C *117/00*

U.S. Cl. 260—349 6 Claims

1. Azidophenol amine compound of the formula:



(1)

wherein

R is straight-chained or branched alkyl of up to 6 carbon atoms; and the pharmacologically acceptable salts thereof.

3,968,130
PROCESS FOR THE NITRATION OF ANTHRAQUINONES

Istvan Székely, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 25, 1972, Ser. No. 300,689

Claims priority, application Switzerland, Oct. 26, 1971, 15542/71; Mar. 16, 1972, 3938/72

Int. Cl.^{2} C07C *79/37*

U.S. Cl. 260—369 2 Claims

1. A process for the manufacture of anthraquinone which is mono-nitrated in α-position, wherein anthraquinone is nitrated with concentrated nitric acid, and wherein there are used 6 to 100 moles of nitric acid to 1 mole of anthraquinone, and wherein the nitration is carried out isothermically at a temperature of 40°C to 70°C.

3,968,131
MANUFACTURE OF 1-AMINO-2-ALKOXY-4-HYDROXYANTHRAQUINONES

Karl Maier, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 31, 1975, Ser. No. 545,840

Int. Cl.^{2} C07C *97/26*

U.S. Cl. 260—380 10 Claims

1. An improvement in the process for the manufacture of 1-amino-2-alkoxy-4-hydroxyanthraquinone by reaction of primary, saturated, linear or branched aliphatic alcohols, which may be substituted by a further 1 or 2 hydroxyl or alkoxy groups, by a phenoxy group, by one or two phenyl groups, by a carboxylic acid amide group or by a nitrile group, with 1-amino-2-phenoxy-4-hydroxyanthraquinone or 1-amino-2-methoxy-4-hydroxyanthraquinone in the presence of alkaline reagents and optionally in the presence of inert solvents at elevated temperatures, which improvement comprises carrying out the reaction in the presence of from 10 to 25% by weight, based on the anthraquinone compound to be converted, of polyethylene glycols of molecular weight 150 or above.

3,968,132

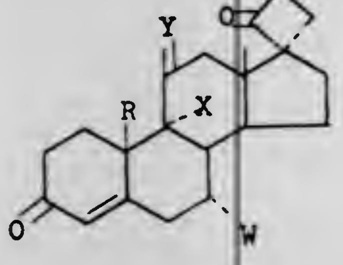
(17R)-SPIRO-[ANDROSTANE-17,1′-CYCLOBUTAN]-2′-ONES, METHODS FOR THEIR MANUFACTURE AND INTERMEDIATES USEFUL THEREIN

Michael J. Green, New Brunswick, and Ho-Jane Shue, Belleville, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 23, 1974, Ser. No. 535,387
Int. Cl.² C07J *5/00*

U.S. Cl. 260—397.3 **23 Claims**

1. A compound selected from the group consisting of a 3-oxo-4-androstene-17-spirocyclobutanone of the following formula I:



I

wherein R is a member selected from the group consisting of hydrogen and methyl; and

W is a member selected from the group consisting of hydrogen and acetylthio;

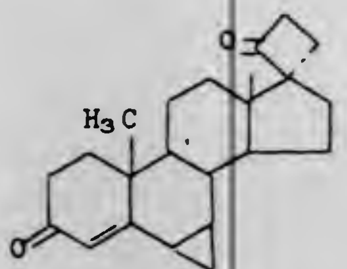
X and Y are both hydrogen, or X is fluorine and Y is (H,βOH) provided R is methyl;

the 1-dehydro analogs thereof when R is methyl;

the 6-dehydro analogs thereof when W is hydrogen;

the 1,6-bis-dehydro analogs thereof when R is methyl and W is hydrogen;

and a 3-oxo-4-androstene-17-spirocyclobutanone of the following formula II:



II

and the 1-dehydro analog thereof.

3,968,133

CARBOXYLATION PROCESS FOR PREPARING LINEAR FATTY ACIDS OR ESTERS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,867
Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.9 R **6 Claims**

1. A process for preparing linear, carboxylic (fatty) acids and their ester derivatives through the catalytic reaction of alpha-olefins containing from about 3 to about 40 carbon atoms, carbon monoxide and hydroxyl-containing co-reactants by:

a. admixing each molar equivalent of alpha-olefin to be carboxylated with at least a stoichiometric amount of hydroxyl-containing co-reactant selected from the group consisting of water, alkanols, alkane diols, containing 1 to 12 carbon atoms, chloroalkanols containing 1 to 4 carbon atoms, and at least a catalyst amount of ligand-stabilized palladium(II) halide complex dispersed in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) or trihalogermanate(II) selected from the group consisting of:

$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$
$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[ClCH_2(C_6H_5)_3P][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(n\text{-}C_4H_9)_4N][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_6H_5)_4As][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_7H_{15})_4N][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2$
$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(CH_3)_2C_6H_5]_2$
$[(C_2H_5)_4N][GeCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][GeCl_3]\text{-}PdCl_2[As(C_6H_5)_3]_2$

wherein the molar ratio of quaternary tin(II) or germanium-(II) salt to palladium is between 2 to 10 to 1, in a substantially oxygen-free environment, in the present of at least a stoichiometric amount of carbon monoxide with respect to olefin, at superatmospheric pressures of carbon monoxide of at least 100 psig, to form a pressurized reaction mixture;

b. heating said reaction mixture at temperatures ranging from about 25° to 120°C for a time sufficient to substantially carboxylate said alpha-olefin to the corresponding carboxylic (fatty) acid or ester, and

c. isolating said carboxylated products prepared therein.

3,968,134

PROCESS FOR RECOVERING CATALYST SYSTEMS FROM RAW HYDROFORMYLATION PRODUCTS

Guglielmo Gregorio, Milan, and Giorgio Montrasi, Gabagnate Milanese (Milan), both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 22, 1975, Ser. No. 543,151
Claims priority, application Italy, Jan. 23, 1974, 19691/74
Int. Cl.² C07F *15/00*

U.S. Cl. 260—429 R **6 Claims**

1. A process for recovering complexes of rhodium and triphenylphosphine from the organic liquid comprised in raw hydroformylation products of olefins, or in tails resulting from distillation of said raw products, which comprises treating the organic liquid containing the complexes of rhodium and triphenylphosphine with an aqueous solution of an aldehyde having from 1 to 4 carbon atoms and of a strong mineral acid, in a molar ratio of from 1:1 to 1:3 with respect to the phosphine, at a temperature of from 60°C to 150°C, separating by filtration the solid rhodium complex which forms during the treatment with the aqueous aldehyde and acid solution, and separating the aqueous solution containing triphenylphosphine by decantation.

3,968,135

CHROMIUM SALT CATALYSTS

Roger B. Steele, Fair Oaks, and Arthur Katzakian, Jr., Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Continuation-in-part of Ser. No. 4,056, Jan. 19, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,079
Int. Cl.² C07F *11/00*

U.S. Cl. 260—438.5 R **14 Claims**

1. A novel catalyst for the preferential reaction of oxirane compounds with compounds containing at least one acidic proton, said catalyst comprising a CrIII tricarboxylate of the formula:

$Cr(OOCR^a)_3$

where $OOCR^a$ is a carboxylate group containing at least 4 carbon atoms, said catalyst being prepared by heating a hydrated CrIII tricarboxylate in an excess of organic acid to a temperature above 140°C to prepare a product of the following characteristics:

1. emerald green in color,
2. slightly soluble in hexane but freely soluble in acetone,
3. melts slightly above room temperature,
4. does not exhibit water absorption peak at 2750 mμ in the near infrared, and

5. at least 90% of the carboxylate carbonyl absorption is at 1615 cm^{-1} and not at 1540 cm^{-1}.

3,968,136

CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES

Wellington E. Walker, Charleston, and Earle S. Brown, Jr., South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 12, 1974, Ser. No. 488,140
Int. Cl.² C07C *27/06*

U.S. Cl. 260—449 L **5 Claims**

1. The process of making alkane polyols which comprises reacting in a solvent selected from the group of gamma-butyrolactone and delta-valerolactone at a pressure of from about 500 psig to about 50,000 psig and a temperature of about 100°C. to about 375°C., a mixture consisting essentially of oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex, said complex is provided to the reaction as a rhodium carbonyl cluster which possesses an infrared spectrum which exhibits three intense wavelength bands between about plus and minus 10cm^{-1} of about 1868cm^{-1}, about 1838cm^{-1}, and about 1785cm^{-1}.

3,968,137

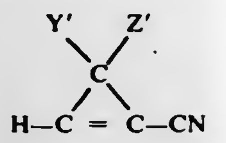
PERFLUORALKYLCYANOCYCLOPROPENES

Sam Andreades, and Richard L. Baird, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 77,724, Oct. 2, 1970, Pat. No. 3,919,227, which is a continuation-in-part of Ser. No. 832,841, June 12, 1969, abandoned. This application May 28, 1975, Ser. No. 581,565
Int. Cl.² C07C *120/00, 121/48*

U.S. Cl. 260—464 **6 Claims**

1. A polymerizable compound of the formula



wherein Y′ and Z′, alike or different, are perfluoroalkyl groups of up to six carbon atoms.

3,968,138

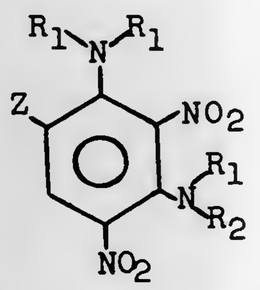
6-CYANO-2,4-DINITRO-1,3-PHENYLENEDIAMINES

Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Idaho, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 86,386, Nov. 2, 1970, Pat. No. 3,910,783. This application Feb. 10, 1975, Ser. No. 549,243
Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **6 Claims**

1. A compound of the formula



in which Z is cyano, each R_1 is selected from the group consisting of hydrogen, alkyl and alkenyl and R_2 is selected from the group consisting of alkyl and alkenyl, said alkyl and alkenyl groups having up to about six carbon atoms.

3,968,139

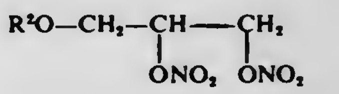
NITROGEN- AND FLUORINE-CONTAINING COMPOUNDS

Samuel Franklin Reed, Jr., Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 30, 1962, Ser. No. 235,176
Int. Cl.² G07C *77/02*

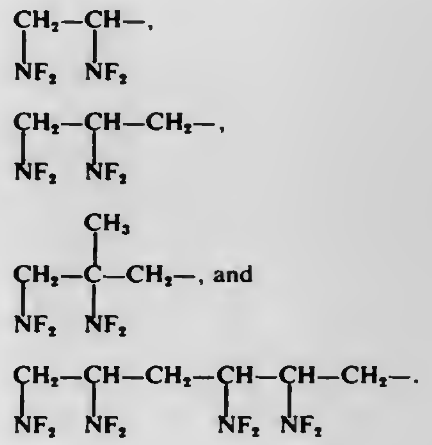
U.S. Cl. 260—467 **10 Claims**

1. Compounds of the general formula



$$R^2O{-}CH_2{-}\underset{ONO_2}{\underset{|}{CH}}{-\!\!-}\underset{ONO_2}{\underset{|}{CH_2}}$$

in which R^2 is selected from the group consisting of



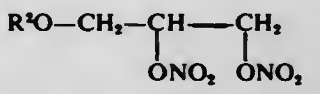
$$\underset{NF_2}{\underset{|}{CH_2}}{-}\underset{NF_2}{\underset{|}{CH}}{-},$$

$$\underset{NF_2}{\underset{|}{CH_2}}{-}\underset{NF_2}{\underset{|}{CH}}{-}CH_2{-},$$

$$\underset{NF_2}{\underset{|}{CH_2}}{-}\overset{CH_3}{\overset{|}{\underset{NF_2}{\underset{|}{C}}}}{-}CH_2{-}, \text{ and}$$

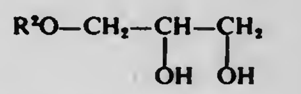
$$\underset{NF_2}{\underset{|}{CH_2}}{-}\underset{NF_2}{\underset{|}{CH}}{-}CH_2{-}\underset{NF_2}{\underset{|}{CH}}{-}\underset{NF_2}{\underset{|}{CH}}{-}CH_2{-}.$$

6. A process for the preparation of compounds of the general formula



$$R^2O{-}CH_2{-}\underset{ONO_2}{\underset{|}{CH}}{-\!\!-}\underset{ONO_2}{\underset{|}{CH_2}}$$

in which R^2 is as defined in claim 1, which comprises nitrating, with a mixture of sulfuric and nitric acids, diols of the general formula



$$R^2O{-}CH_2{-}\underset{OH}{\underset{|}{CH}}{-}\underset{OH}{\underset{|}{CH_2}}$$

in which R^2 is as defined in claim 1.

3,968,140

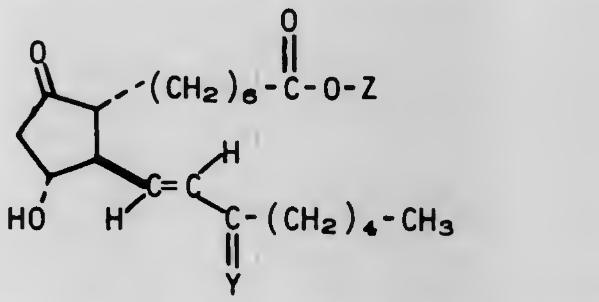
SUBSTITUTED ANILIDE ESTERS OF PGE_1

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 8, 1974, Ser. No. 431,599
Int. Cl.² C07C *133/08, 103/82*

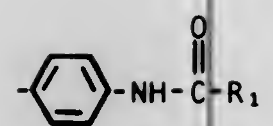
U.S. Cl. 260—468 D **10 Claims**

1. An optically active compound of the formula:

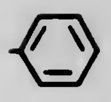


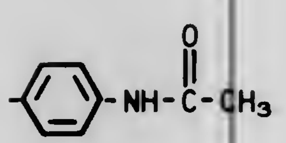
or a racemic compound of that formula and the mirror image thereof, wherein Z is

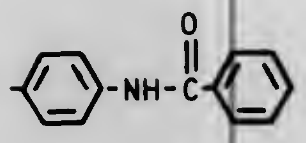
(1)



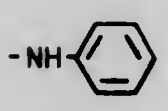
wherein R_1 is
—CH_3



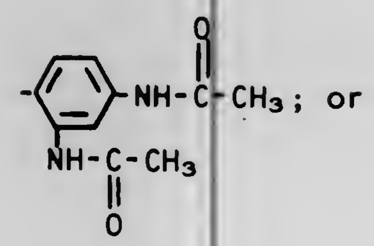




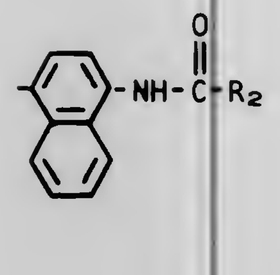
—NH_2
or



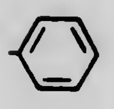
(2)



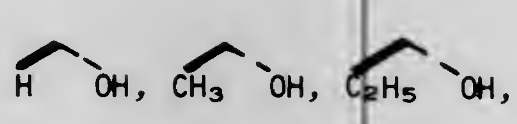
(3)

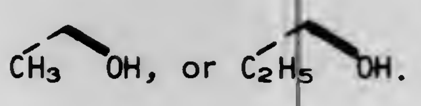


wherein R_2 is
—CH_3



or
—NH_2;
and wherein Y is





3,968,141

PROCESSES FOR STEREOSPECIFICALLY PREPARING CHIRAL 2-SUBSTITUTED-4-HYDROXY-2-CYCLOPENTEN-1-ONE

Charles J. Sih, Madison, and James B. Heather, Middleton, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 309,766, Nov. 27, 1972, abandoned. This application June 12, 1974, Ser. No. 478,713

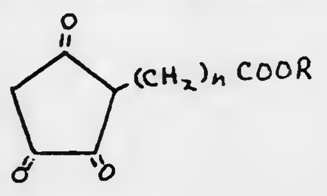
Int. Cl.² C07C *51/00, 61/38*

U.S. Cl. 260—468 K **9 Claims**

1. A method for preparing 2-substituted-4(R)-hydroxy-2-cyclopenten-1-one which comprises:

preparing 2-substituted-4(R)-hydroxy-cyclopentane-1,3-dione by a method selected from the group consisting of

a. catalytically hydrogenating a compound of the formula



where

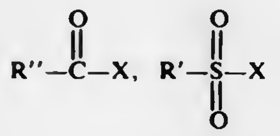
R is selected from the group consisting of a hydrocarbon radical containing from about 1 to 4 carbon atoms and benzyl and

n is an integer from about 1 to 12, the hydrocarbon chain represented by $(CH_2)_n$ being saturated or containing a cis double bond or triple bond at the 5–6 position in the equivalent acid side chain represented by $(CH_2)_nCOOH$ in the presence of a rhodium complex with a catalyst comprising a chiral phosphine ligand;

b. subjecting 2-substituted cyclopentane-1,3,4-trione or 2-substituted-3-alkoxy-2-cyclopentane-1,4-dione to the fermentative enzymatic action of a microorganism of the class Ascomycetes; and

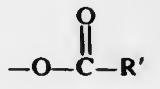
c. resolving 2-(6′-carbomethoxyhexyl)-4-hydroxy-cyclopentane-1,3-dione with brucine

and recovering the corresponding 2-substituted-4-(R)-hydroxy-cyclopentane-1,3-dione enolizing the said dione by reacting it under basic conditions with compounds selected from the group consisting of



$$R''—\overset{O}{\overset{\|}{C}}—X, \quad R'—\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}—X$$

where X is selected from the group consisting of I, Cl, Br,



$$—O—\overset{O}{\overset{\|}{C}}—R'$$

and —OSO_2R' and

R′ is selected from the group consisting of pivaloyl, isobutyl, phenyl, benzyl, biphenyl, naphthyl, alkanyl and alkenyl having from about 1 to 6 carbon atoms, and halogen-, biphenyl and naphthyl groups.

and R″X

where R″ is selected from the group consisting of saturated and unsaturated alkyl having from about 1 to 6 carbon atoms, benzyl, diphenylmethyl, CH_2COOR''' and R‴—CH—COOR‴ where R‴ is a hydrocarbon radical containing from about 1 to 6 carbon atoms, and

X is selected from the group consisting of Cl, Br, I, sulfate, isocyanate, aryl sulfonate and alkyl-substituted aryl sulfonate radicals

to preferentially promote acylation or alkylation of the oxygen atom at the C-1 position of the dione

recovering the substituted C-1 enol

reducing the said substituted C-1 enol with a hydride reducing agent and recovering 2-substituted-4(R)-hydroxy-2-cyclopenten-1-one from the reduction reaction mixture.

3,968,142

HYDRONAPHTHALENE CARBOXYLIC ACIDS AND DERIVATIVES

Dieter Beck, Basel; Karl Schenker, Binningen, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

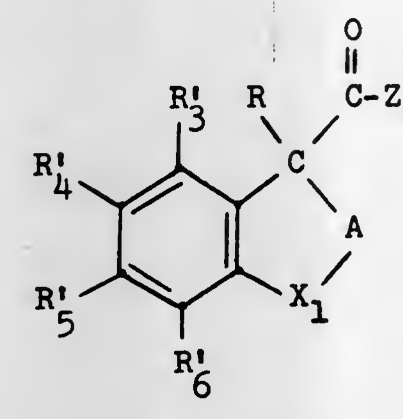
Filed Oct. 7, 1969, Ser. No. 864,543

Claims priority, application Switzerland, Oct. 16, 1968, 15455/68; July 3, 1969, 10201/69; Sept. 2, 1969, 13261/69

Int. Cl.² C07C *69/95*

U.S. Cl. 260—469 **19 Claims**

1. A member selected from the group consisting of the formula



in which Z_4 stands for a member selected from the group consisting of hydroxy and lower alkoxy, R stands for a member selected from the group consisting of hydrogen and lower alkyl, X_1 stands for a member selected from the group consisting of carbonyl and methylene, A stands for 1,2-ethylene R_3' and R_6' each stands for hydrogen, either of the radicals R_4' and R_5' stands for a member selected from the group consisting of lower cycloalkyl and lower cycloalkenyl, and the other one of the radicals R_4' and R_5' stands for a member selected from the group consisting of hydrogen, halogen and trifluoromethyl, and a pharmaceutically acceptable, nontoxic salt thereof.

3,968,143

PHENOXYPROPIONIC ACID DERIVATIVES

Erich Schacht; Günter Lauterbach; Werner Mehrhof; Herbert Nowak, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

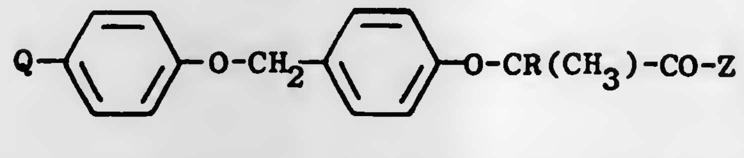
Filed Aug. 14, 1974, Ser. No. 497,300

Claims priority, application Germany, Aug. 21, 1973, 2342118

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 G **23 Claims**

1. A phenoxypropionic acid derivative of the formula



wherein Q is H or halogen, R is H or CH_3, Z is —OH or —OR_1, and R_1 is alkyl of 1–4 carbon atoms or 1-methyl-4-piperidyl, and the physiologically acceptable salts thereof.

3,968,144

5-OXA-11-DEOXY PHENYL- AND PHENOXY-SUBSTITUTED PROSTALANDIN E₁ ANALOGS

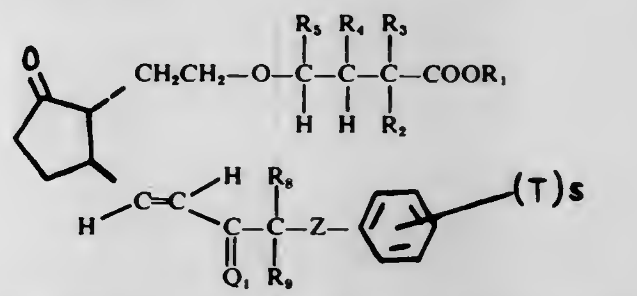
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Nov. 18, 1974, Ser. No. 524,959

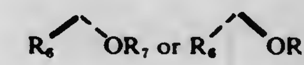
Int. Cl.² C07C *69/27*

U.S. Cl. 260—473 A **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between —CR_8R_9— and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_{10}, wherein R_{10} is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and *s* is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when *s* is 2 or 3 the T's are either the same or different; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein when Z is oxa (—O—), R_8 and R_9 are hydrogen or alkyl of one to 4 carbon atoms, being the same or different, and, when Z is C_jH_{2j}, R_8 and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_3 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,968,145

METHYL 2(1 CHLORONAPHTH-2-YLOXY)PROPIONATE

Mario Ghelardoni; Vittorio Pestellini, both of Florence; Giovanna Volterra, Sesto Fiorentino, and Nicola Pisanti, Florence, all of Italy, assignors to A. Menarini S.A.S., Italy

Continuation-in-part of Ser. No. 297,832, Oct. 16, 1972, abandoned. This application May 13, 1974, Ser. No. 469,552

Claims priority, application Italy, Oct. 21, 1971, 9731/71

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 F **1 Claim**

1. Methyl 2(1-chloronaphth-2-yloxy) propionate.

3,968,146
ESTERS OF SULFOTHIO ALKANOIC ACIDS

David Malcolm Lewis, Otley, England, assignor to I.W.S. Nominee Company Limited, London, England

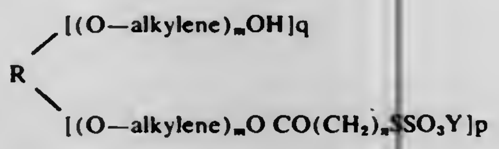
Filed Dec. 5, 1972, Ser. No. 312,356

Claims priority, application United Kingdom, Dec. 9, 1971, 57313/71; Feb. 7, 1972, 5643/72

Int. Cl.² C07C *161/05*

U.S. Cl. 260—481 R **8 Claims**

1. A curable compound having the formula:



$$R\begin{cases}[(O{-}\text{alkylene})_m OH]q\\[(O{-}\text{alkylene})_m O\,CO(CH_2)_n SSO_3Y]p\end{cases}$$

wherein p is an integer from 2 to 6;
- q is an integer such that (p + q) is from 2 to 6;
- m is a positive integer from 5 to 25 and may have different values in each of the p and q chains;
- n is an integer from 1–5;
- R represents a radical formed by removal of the hydroxyl groups from an aliphatic alcohol containing at least 2 carbon atoms:
- each 'alkylene' group comprises a chain of 2 to 6 carbon atoms between consecutive oxygen atoms; and
- Y represents a hydrogen atom or a salt forming ion or group.

3,968,147
ASYMMETRIC REDUCTION OF KETONES TO FORM OPTICALLY ACTIVE ALCOHOLS

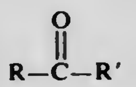
Arthur John Solodar, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 224,971, Feb. 9, 1972, Pat. No. 3,883,580. This application Oct. 29, 1974, Ser. No. 518,304

Int. Cl.² C07C *125/04, 29/16*

U.S. Cl. 260—482 C **21 Claims**

1. A process for preparing an optically active secondary alcohol comprising reacting an optically inactive ketone having no asymmetric atoms of the formula



$$R{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}R'$$

where R is different from R′; and where both Rs can be any substituted or unsubstituted monovalent hydrocarbon group attached directly to the carbonyl group through a carbon atom, with hydrogen in the presence of an optically active catalyst whch is a coordination complex comprising
- a. a Group VIII metal having an atomic number greater than 43, in combination with
- b. at least one optically active phosphine or arsine ligand wherein the optical activity of the ligand is contained in one or more groups attached to the phosphine or arsine atom.

3,968,148
COPOLYMERS OF 1-ALKENES AND ACRYLIC ACID DERIVATIVES

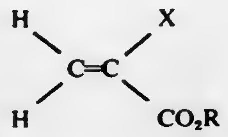
Norman A. Leister, Huntingdon Valley, and Richard J. Piccolini, Newtown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 13, 1971, Ser. No. 180,142

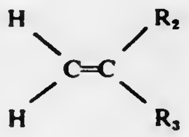
Int. Cl.² C07G *69/54*

U.S. Cl. 260—486 R **3 Claims**

1. An oligomer of
- a. about 10 to about 90 weight percent of a 1-alkene, or of a mixture of 1-alkenes, all having 4 to 32 carbon atoms;
- b. about 1 to aout 35% of a compound or compounds having the formula:



wherein X is hydrogen or a methyl group, and R is a straight or branched chain alkyl group having 8 to 34 carbon atoms, and;
- c. 1 to about 35% of a compound or compounds having the formula:



wherein R_2 is hydrogen or a methyl group, and R_3 is $(CH_2—)_nX$, wherein n is an integer ranging in value from 0 to 8, and X is CO_2R_4 where R_4 is any alkyl group having 1 to 4 carbon atoms.

3,968,149
PROCESS FOR THE ESTERIFICATION IN VAPOR PHASE OF ALPHA, BETA-UNSATURATED MONOCARBOXYLIC ACIDS

Luciano Moreschini; Guido Petrini, both of Milan, and Leonardo Dalloro, Bollate (Milan), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 6, 1975, Ser. No. 556,160

Claims priority, application Italy, Mar. 7, 1974, 49121/74

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **9 Claims**

1. A process for producing esters of alpha, beta-unsaturated monocarboxylic acids using as one reactant the raw acid having a high water content, which comprises reacting the acid with primary aliphatic alcohols containing from 1 to 8 carbon atoms, in the vapor phase, at a temperature of from 150°C to 350°C, and in the presence of a catalytic composition containing oxygen and tungsten as the essential catalyst-forming elements and, optionally, at least one of the elements lithium, sodium, potassium, rubidium and cesium, said elements being present in the catalyst in quantities such that the atomic ratios correspond to the empirical formula:

$W_{12}O_zMe_x$

wherein
- Me is one or more of the elements Li, Na, K, Rb and Cs;
- x is zero or a positive from 0,1 to 10; and
- z is a number which satisfies the mean valencies of the elements in the oxidation state in which they exist in the catalytic combination.

3,968,150
PROCESS FOR THE PREPARATION OF NITROGEN- AND FLUORINE-CONTAINING ACRYLATES AND METHACRYLATES

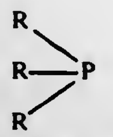
Samuel F. Reed, Jr., Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 13, 1964, Ser. No. 360,168

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 D **12 Claims**

1. A method for the preparation of difluoraminoalkyl acrylates and methacrylates in which there are at least two difluoramino groups present and the alkyl contains two to eighteen carbon atoms which comprises reacting in the temperature range of about 0° C. up to the reflux temperature of the reaction mixture a member from the class consisting of a difluoraminoalkyl α,β-dibromopropionate and difluoraminoalkyl α,β-dibromoisobutyrate in the presence of a compound having the formula



wherein R is a member from the group consisting of alkoxy one to four carbon atoms, alkyl one to eight carbon atoms, phenyl, alkylphenyl in which the alkyl portion contains from one to eight carbon atoms, phenoxy and alkylphenoxy in which the alkyl portion contains from one to eight carbon atoms.

3,968,151
ASHLESS DISPERSANT PRODUCTS AND PROCESS

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 503,946, Sept. 6, 1974, Pat. No. 3,919,094. This application May 12, 1975, Ser. No. 576,939

Int. Cl.² C07C *87/123, 87/20, 109/08, 145/02*

U.S. Cl. 260—501.2 **10 Claims**

1. As a new composition of matter, the oil-soluble reaction product obtained upon reacting for a time and under conditions of temperature and pressure to produce said reaction product
- a. a petroleum sulfonic acid with
- b. an adduct formed from
  - 1. at least one amine selected from primary monoamines having from 2 to 10, inclusive, carbon atoms, and polyamines represented by the formula $H_2N[(CH_2)_xNH]_yH$ wherein x is an integer of from 2 to 6 and y is an integer of from 1 to 10 and
  - 2. at least one aldehyde having from 2 to 12, inclusive, carbon atoms.

7. A process for the preparation of a lubricating oil and gasoline additive which comprises
- a. contacting at least one aldehyde having from 2 to 12, inclusive, carbon atoms with at least one amine selected from primary monoamines having from 2 to 10, inclusive, carbon atoms, and polyamines represented by the formula $H_2N[(CH_2)_xNH]_yH$ wherein X is an integer of from 2 to 6 and y is an integer of from 1 to 10, under conditions of a temperature and pressure and for a time sufficient to produce an aldehyde/amine adduct of said compounds, the molar ratio of aldehyde to amine present during said contacting being about 1/1 to about 2/1, and
- b. interreacting at a temperature and pressure and for a time sufficient to produce said additive said adduct obtained in step (a) with a petroleum sulfonic acid wherein the amounts of reactants present during said reacting are from 1/1 to 5/1 equivalents of petroleum sulfonic acid per mole of amine used to prepare said adduct.

3,968,152
PRODUCTION OF AROMATIC CARBOXYLIC ACIDS

Morgan C. Sze, Upper Montclair; Daniel H. Gold, Plainfield, and Richard T. Whitehead, Westfield, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 295,512, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 713,931, March 18, 1968, abandoned. This application Jan. 31, 1975, Ser. No. 545,793

Int. Cl.² C07C *63/24, 63/26*

U.S. Cl. 260—515 P **10 Claims**

1. A continuous process for the production of an aromatic carboxylic acid by hydrolysis of its corresponding aromatic nitrile, comprising:
- continuously introducing an aqueous slurry, containing the aromatic nitrile, water and a minor amount of a catalyst is at least one member selected from the group consisting of hydroxides and carbonates of the alkali and alkaline earth metals and the alkali, alkaline earth and ammonium salts of aromatic carboxylic acids, into an upper portion of a reactor;
- maintaining the slurry at a temperature of from 300°F to 600°F for a period of from 1 to 10 hours, while continuously simultaneously stripping ammonia from the aqueous reaction mixture by continuously introducing steam into a lower portion of the reactor;
- continuously removing ammonia as overhead from the reactor;
- continuously removing an aqueous hydrolysis effluent from a lower portion of the reactor;
- cooling the aqueous hydrolysis effluent to temperature of from about 100°F to about 300°F to precipitate essentially only the aromatic carboxylic acid from the aqueous hydrolysis effluent;
- separating the precipitated aromatic carboxylic acid from the aqueous hydrolysis effluent; and
- recycling aqueous hydrolysis effluent, subsequent to separation of the precipitated aromatic carboxylic acid, to the reactor.

3,968,153
EXTRACTION OF ACRYLIC ACID AND/OR METHACRYLIC ACID WITH A SOLVENT MIXTURE OF METHYLETHYLKETONE AND XYLENE OR ETHYLBENZENE

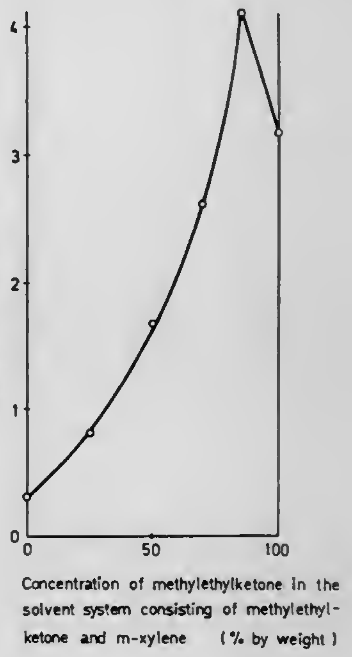
Tetsuya Ohrui, Niihama; Yasuhito Sakakibara, Saijo; Yukinaga Aono, Niihama; Michio Kato, Niihama; Hiroshi Takao, Niihama, and Masami Ayano, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed May 10, 1973, Ser. No. 358,997

Claims priority, application Japan, May 23, 1972, 47-51396

Int. Cl.² C07C *57/00*

U.S. Cl. 260—526 N **9 Claims**



1. A method for the extraction of acrylic acid from a solution containing the same which comprises treating said solution with a solvent mixture of methylethylketone and at least one member selected from the group consisting of o-xylene, m-xylene, p-xylene and ethylbenzene wherein the concentration of the methylethylketone is from about 80 to 95% by weight at room temperature to transfer acrylic acid from said solution into the solvent mixture, the amount of the solvent mixture being 0.1 to 10 parts by weight to 1 part by weight of said solution.

3,968,154
METHOD OF PRODUCING PENICILLAMINE

Manfred Klaus Joachim Bock, deceased, late of Berlin-Dahlem, Germany (by Ingrid Alida Anni Bock, heiress), assignor to Firma Heyl & Co. Chemisch-Pharmazeutische Fabrik, Berlin, Germany

Continuation-in-part of Ser. No. 236,962, March 22, 1972, Pat. No. 3,894,067. This application Oct. 29, 1974, Ser. No. 518,872

Claims priority, application Germany, Mar. 24, 1971, 2114329

Int. Cl.² C07C *149/243*

U.S. Cl. 260—534 S **9 Claims**

1. Method of producing penicillamine, which comprises reacting a compound selected from the group consisting of penicilloic acid and penilloic acid with a mercuric salt in a mol ratio of 1:0.3 – 1:0.7 in a medium of at least one water miscible organic solvent and water in a ratio of organic solvent to water of between about 1:3 and 3:1, thereby forming penicillamine-mercuric-mercaptide in crystalline form which precipitates in such form from the solution and penilloaldehyde as by-product which remains dissolved in the solution, separating and precipitated crystalline penicillamine-mercuric-mercaptide from the solution containing the by-product, and decomposing said penicillamine-mercuric-mercaptide to form penicillamine.

3,968,155
PROCESS FOR PREPARED PERCHLOROMETHYL MERCAPTAN BY CHLORINATION OF CARBON DISULFIDE

Jean Guérin, Grenoble, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 28, 1975, Ser. No. 571,919

Claims priority, application France, June 21, 1974, 74.21586

Int. Cl.² C07C *145/00, 149/16*

U.S. Cl. 260—543 H **5 Claims**

1. An improved process for preparing perchloromethyl mercaptan which comprises (i) chlorinating carbon disulfide in the presence of iodine to produce a first chlorinated liquor, (ii) separating said liquor by distillation into a high-boiling fraction of technical grade perchloromethyl mercaptan and a low-boiling fraction, A (iii) chlorinating fraction A in the presence of iodine and absence of any substantial amount of metallic halides to produce a second chlorinated liquor, (iv) separating said second liquor by distillation into a high-boiling fraction of crude perchloromethyl mercaptan and a second low-boiling fraction, B, comprising sulfur dichloride and (v) heating fraction B at about 90°–150°C in presence of a metallic halide to form sulfur monochloride and regenerate chlorine.

3,968,156
PROCESS FOR PREPARING ALKYL-OR ARYLPHOSPHONOTHIOIC DIHALIDES

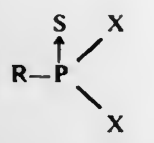
Eugene H. Uhing, Pleasantville, N.Y., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 20, 1974, Ser. No. 534,942

Int. Cl.² C07F *9/42*

U.S. Cl. 260—543 P **7 Claims**

1. A method of preparing compounds of the formula:



$$R-\overset{\overset{S}{\uparrow}}{P}\begin{smallmatrix}\diagup X\\ \diagdown X\end{smallmatrix} \qquad (I)$$

wherein R is a hydrocarbyl group consisting essentially of hydrogen and carbon including C_1 to C_{20} alkyl; the aryl substituted derivatives thereof, said aryl having 1 or 2 fused rings, cycloalkyl of 5–6 carbons in the ring, aryl of up to 3 fused rings, biphenyl and the C_1–C_4 alkyl substituted derivatives of said cycloalkyl, aryl or biphenyl and X is chlorine or bromine, comprising contacting under at least an autogenous pressure at a temperature of from about 175°C. to about 400°C. in the presence of phosphorus sulfides an alkyl or aryl halide of the formula:

$$RX \qquad (II)$$

wherein R and X are as defined above with a trivalent phosphorus trihalide of the formula:

$$PX_3 \qquad (III)$$

or a pentavalent thiophosphoryl halide of the formula:

$$P(S)X_3 \qquad (IV)$$

or mixtures thereof wherein X is as defined above.

3,968,157
BISPHOSPHORAMIDES

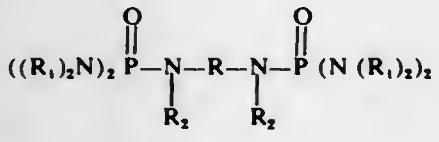
Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 499,675, Sept. 5, 1974, which is a division of Ser. No. 284,012, Aug. 25, 1972, Pat. No. 3,868,376, which is a continuation-in-part of Ser. No. 278,850, Aug. 7, 1972, Pat. No. 3,795,613. This application Apr. 24, 1975, Ser. No. 571,022

Int. Cl.² C07F *9/22*

U.S. Cl. 260—551 P **3 Claims**

1. A compound having the formula:



$$((R_1)_2N)_2\overset{\overset{O}{\|}}{P}-\underset{\underset{R_2}{|}}{N}-R-\underset{\underset{R_2}{|}}{N}-\overset{\overset{O}{\|}}{P}(N(R_1)_2)_2$$

wherein

R is alkylene of 2 to 18 carbons;

R_1 is a vegetable oil fatty hydrocarbyl radical; and

R_2 is alkyl of 2 to 8 carbons.

3,968,158
PROCESS FOR PREPARING PERFLUOROGUANIDINE AND DIFLUOROUREA

Charles O. Parker, Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 12, 1963, Ser. No. 273,263

Int. Cl.² C07C *127/00, 129/08*

U.S. Cl. 260—553 R **5 Claims**

1. A process for the preparation of difluorourea and perfluoroguanidine which comprises reacting in aqueous solution fluorine with a material selected from the group consisting of guanidine and water-soluble salts of guanidine.

3,968,159
PROCESS FOR PREPARING AZOMETHINES

Abul F. M. Iqbal, Glattbrugg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 282,620, Aug. 21, 1972, abandoned. This application May 23, 1974, Ser. No. 472,763

Claims priority, application Switzerland, Aug. 31, 1971, 12751/71

Int. Cl.² C07C *119/10*

U.S. Cl. 260—566 F **5 Claims**

1. A process for the preparation of aromatic or heterocyclic azomethines which consists essentially of reacting under carbon monoxide pressure of 50 to about 500 atmospheres and a temperature of 50°–250°C, an aromatic or heterocyclic aldehyde, and an aromatic or heterocyclic nitro compound in the presence of a solvent containing a compound selected from the group consisting of basic tertiary amines and basic tertiary amides, and of a catalyst selected from the group consisting of $[Rh(CO)_2Cl]_2$, $[Rh(OCOCH_3)_2]_2$, $Rh_4(CO)_{12}$, $Rh_6(CO)_{16}$, $RhCl[(C_6H_5)_3P]_3$, RhO_2, Rh_2O_3, $Rh(OH)_3$ and $RhCl_3$ the molar ratio of said catalyst relative to the said nitro compound being from 1:100 to 1:50,000.

3,968,160
PREPARATION OF 1,2,3-TRIS[1,2-BIS(DIFLUORAMINO)ETHOXY]PROPANE

Samuel F. Reed, Jr., Huntsville, Ala., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 27, 1964, Ser. No. 363,680

Int. Cl.² C07C *85/00*

U.S. Cl. 260—584 C **5 Claims**

1. A method for the preparation of 1,2,3-tris[1,2-bis(difluoramino)ethoxy]-propane which comprises reacting tetrafluorohydrazine and trivinoxypropane at a temperature of about 0° to about 120° C.

3,968,161
PROCESS FOR THE PREPARATION OF DAMASCENONE DERIVATIVES

Karl-Heinrich Schulte-Elte, Onex, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

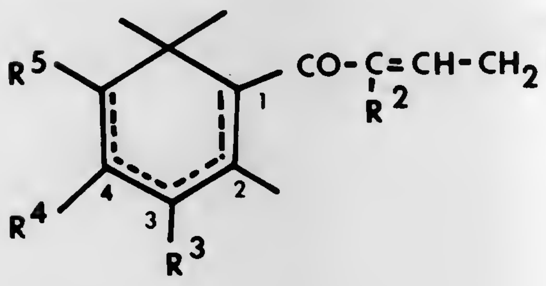
Continuation of Ser. No. 346,296, March 30, 1973, Pat. No. 3,923,896. This application July 22, 1975, Ser. No. 598,132

Claims priority, application Switzerland, Mar. 30, 1972, 4770/72

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **3 Claims**

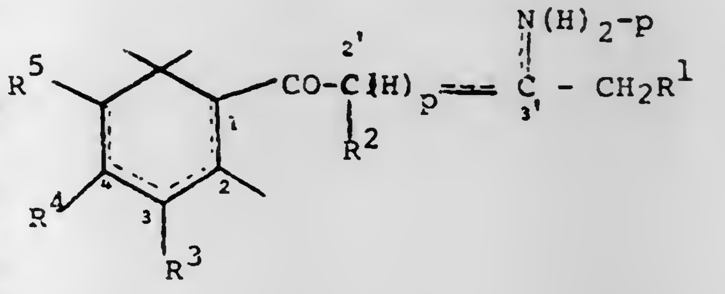
1. Process for the preparation of compounds of formula



III

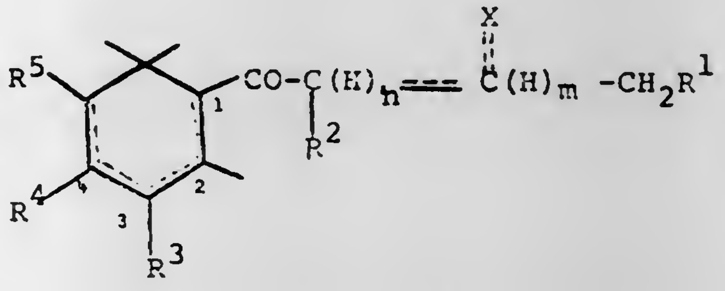
possessing one cyclic double bond at position 1, 2, 3, or 4, or two conjugated double bonds at position 1 and 3 as indicated by the dotted lines and wherein the symbols R¹ and R² represent a hydrogen atom or one of them represents a lower alkyl group containing from 1 to 6 carbon atoms, and the symbols R³, R⁴ and R⁵ all represent a hydrogen atom or one of them represents a lower alkyl group containing from 1 to 6 carbon atoms and the other ones represent a hydrogen atom, which comprises

i. hydrolizing a compound of formula



II

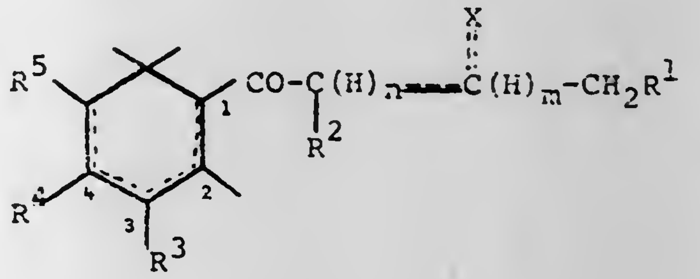
wherein the index p stands for the integers zero or 1, the dotted lines and the symbols R¹ to R⁵ possess the meaning aforeindicated and wherein the side chain has a double bond at position 2′ (p = zero) or 3′ (p = 1) in solution in an aqueous organic solvent at a temperature from about 15°C to about the boiling temperature of the chosen solvent and in the presence of an acidic agent to afford a compound of formula



I'A

wherein both indexes *m* and *n* stand for the integers zero or 1, the dotted lines and symbols R¹ and R⁵ possess the meaning aforeindicated, the side chain can contain a double bond at position 2′ or 3′ and wherein the symbol X represents an oxygen atom (*m* = zero; *n* = 1) or a hydroxyl radical (*m* and *n* = zero);

ii. reducing the keto-derivative thus obtained by means of a catalytic hydrogenation to afford a compound of formula



I'B

wherein indexes *m* and *n* both stand [illegible], the dotted lines and the symbols R¹ to R⁵ possess the meaning aforeindicated and wherein the symbol X represents a hydroxyl radical; and finally

iii. dehydrating the thus obtained hydroxy-derivative by means of an acidic or basic agent.

3,968,162
PREPARATION OF ACETOPHENONE

Guy Lartigau, Tassin-la-demi-Lune, and Pierre-Etienne Bost, Paris, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 24, 1974, Ser. No. 473,268

Claims priority, application France, May 28, 1973, 73.19289

Int. Cl.² C07C *49/78*

U.S. Cl. 260—592 **6 Claims**

1. Process for the production of acetophenone which comprises decomposing cumene hydroperoxide in a reaction medium containing water, a water-soluble cupric salt as catalyst, and alpha-methylstyrene or dimethylphenylcarbinol, the ratio of the number of mols of the hydroperoxide to the number of gram atoms of copper in the aqueous phase being between 5 and 10^4, the weight of alpha-methylstyrene or dimethylphenylcarbinol being 0.1 to 4 times in mols the weight of the hydroperoxide.

3,968,163
PREPARATION OF 4 AND 5-METHYLINDANES

William Ebenezer Solomons, and Ian William Mathison, both of Memphis, Tenn., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Aug. 19, 1974, Ser. No. 498,558

Int. Cl.² C07C *47/52*

U.S. Cl. 260—599 **1 Claim**

1. The process which comprises reacting indane with α,α-dichloromethyl methyl ether in the presence of titanium tetrachloride under anhydrous conditions and decomposing the resulting reaction mixture with water to form a mixture of 4-formylindane and 5-formylindane,

combining the mixture of 4-formylindane and 5-formylindane with aniline to form a mixture of the anilide of 4-formylindane and the anilide of 5-formylindane,

adding the mixture of the anilide of 4-formylindane and the anilide of 5-formylindane to acetonitrile in which the anilide of 5-formylindane preferentially crystallizes while the anilide of 4-formylindane remains dissolved in the acetonitrile,

hydrolyzing the separated anilide of 5-formylindane to give separated free 5-formylindane, and

hydrolyzing the separated anilide of 4-formylindane to give separated free 4-formylindane.

3,968,164
PROCESS FOR THE PRODUCTION OF ACROLEIN

John Edward Lloyd, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 625,948, March 27, 1967, Pat. No. 3,574,717. This application Apr. 9, 1971, Ser. No. 132,885

Claims priority, application United Kingdom, Apr. 7, 1966, 15653/66

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **1 Claim**

1. A process for the production of acrolein which consists essentialy of reacting water with allene at a temperature of 20°C to 180°C and a pressure from atmospheric to 10 atmospheres in the liquid phase and in the presence of a catalytic amount of a palladium salt selected from the group consisting of palladium acetate, palladium nitrate and complexes thereof with benzonitrile and a copper or iron redox system selected from the group consisting of copper carboxylate, iron carboxylate, copper nitrate and iron nitrate whereby allyl alcohol is formed as an intermediate and oxidized in situ to acrolein, the liquid phase being excess water or inert organic solvent.

3,968,165
PROCESS FOR PRODUCING ACROLEIN AND ACRYLIC ACID

Isao Ono; Tetsuo Iiguni, and Mitsumasa Akashi, all of Shin Nanyo, Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 215,906, Jan. 6, 1972, Pat. No. 3,786,000. This application Jan. 10, 1974, Ser. No. 432,388

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **10 Claims**

1. A process for producing acrolein which comprises catalytic oxidizing propylene with a gas containing oxygen and steam in the vapor phase, at a temperature of 250 to 450°C, employing a calcined catalyst having the general composition of $Mo_a\ Co_b\ Fe_c\ Bi_d\ A_e\ O_f$, wherein *a*, *b*, *c*, *d*, *e*, and *f* in the above formula are respectively the atomic amounts of each element, and when *a* is equal to 12, the values of *b*, *c*, *d*, *e*, and *f* have the respective ranges, b=7–12, c=0.3–4, d=0.4–2.5, e=0.1–3, f=47–73, and A is composed of tin alone or a composite system of tin and one or more elements selected from a group consisting of aluminum, nickel, tungsten, chromium, indium and niobium, the minimum content of tin in A being in the atomic amount of 0.1.

3,968,166
CATALYTIC PROCESS FOR THE PREPARATION OF ACROLEIN

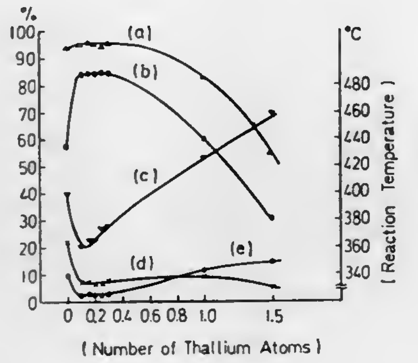
Tatsuo Shiraishi; Susumu Kishiwada; Shinkichi Shimizu; Shigeru Honmaru, all of Niihama; Akihiko Atsumi, Funabashi; Hiroshi Ichihashi, and Yoshihiko Nagaoka, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 262,489, June 14, 1972, abandoned. This application May 30, 1975, Ser. No. 582,077

Claims priority, application Japan, June 14, 1971, 46-42310

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **16 Claims**



1. A process for preparing acrolein by the vapor phase oxidation of propylene which comprises contacting propylene and oxygen at a temperature of from 200° to 550° C., a pressure of from 0.7 to 5 absolute atmospheres and a space velocity of 100 to 24,000 liter-gas/liter-catalyst/hour in a mole ratio of propylene to oxygen of 1 : 0.4 to 1 : 3 in the presence of a catalyst composition consisting essentially of a catalyst system of the formula:

$$Mo_aBi_bFe_cNi_dTl_eP_fX_gY_hO_i$$

wherein X is at least one member selected from the group consisting of Mg, Mn and Co, Y is at least one member selected from the group consisting of Cu, Ca, Sr, Zn, Cd, Sn and Pb and *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h* and *i* represent respectively the number of atoms and *a* is 12, *b* is from 0.1 to 5, *c* is from 0.1 to 12, *d* is from 0.1 to 12, *e* is 1 or less but not 0, *f* is from 0 to 5, *g* is from 0 to 12, *h* is from 0.1 to 12 and *i* is a number determined by the valence requirements of the other atoms present, provided that the sum of *b* plus *c* is from 0.2 to 12.5 and the sum of *d* plus *g* plus *h* is from 0.2 to 27.

3,968,167
METHYLOL DERIVATIVES OF POLYTHIOLS

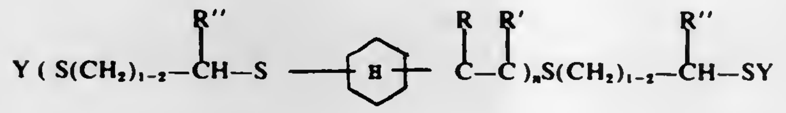
Richard A. Hickner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 548,115, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 388,714, Aug. 16, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,716

Int. Cl.² C07C *149/26*

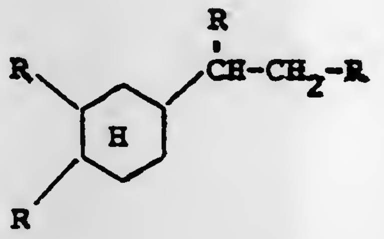
U.S. Cl. 260—609 F **2 Claims**

1. The methylol derivative of a polythiol, said derivative having the formula:



$$Y(S(CH_2)_{1-2}-\overset{R''}{\overset{|}{C}}H-S-\!\!\!-(H)-\!\!\!-(\overset{R}{\overset{|}{C}}-\overset{R'}{\overset{|}{C}})_nS(CH_2)_{1-2}-\overset{R''}{\overset{|}{C}}H-SY$$

wherein *n* is 1–3, one of R and R′ is hydrogen and the other is hydrogen or methyl, and R″ is hydrogen or methyl; or said derivative having the formula



wherein each R is —Cl, —Br, $—SR_1SY$ or $—OR_2SR_1SY$ provided that at least two of said R groups independently are of said $—SR_1SY$ or $—OR_2SR_1SY$; R_1 is an alkylene group having 2 to 10 carbon atoms or an alkylene group having 2 to 10 carbon atoms having one or more —O— or —S— ether groups and R_2 is an alkylene group of 2 to 4 carbon atoms; and wherein at least one Y is $—CH_2OH$ with any remaining Y substituents being hydrogen.

3,968,168
P-TERT-BUTYL-DIPHENYLALKANE INSECTICIDES

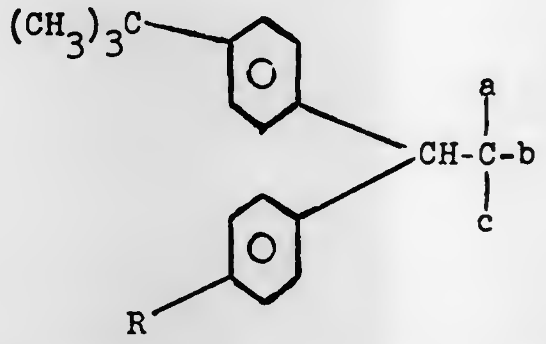
Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,875

Int. Cl.² C07C *43/20;* **A01N** *9/24*

U.S. Cl. 260—612 R **13 Claims**

1. A compound having the following general structure:



wherein R is selected from the group consisting of OCH_3, OC_2H_5, OC_3H_7 and OC_4H_9 and a, b and c are the same or different and are each selected from the group consisting of chloro, alkyl (C_1–C_3) and hydrogen.

3,968,169
PROCESS FOR PREPARING POLYBLYCEROL

Paul Seiden, Cincinnati, and James Bruce Martin, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 420,728, Nov. 30, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,471

Int. Cl.² C07C *41/10*

U.S. Cl. 260—615 R **7 Claims**

1. A process for preparing linear polyglycerol comprising:

a. heating glycerol to a temperature in the range from about 110° to about 180°C at a pressure below about 400 mm absolute mercury pressure in the presence of from about 0.03 to about 3% by weight sulfuric acid; and from about 0.1 to about 10% by weight of a glyceride compound having the formula

$$(R_1\ COO)_n.C_3H_5\ (OH)_{3-n}$$

wherein R_1 represents CH_3—, or CH_3CH_2—; and *n* represents an integer from 1 to 3 inclusive; until from about 25 to about 75 percent of the glycerol is polymerized;

b. inactivating said sulfuric acid by the addition of a substantially stoichiometric amount of a neutralizing agent; and

c. removing the unreacted glycerol by distillation.

3,968,170
HALOGENATED ACETALS

John S. Babiec, Jr., and Richard J. Turley, both of Orange, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 489,953, July 15, 1974, abandoned, which is a division of Ser. No. 400,385, Sept. 24, 1973, Pat. No. 3,843,569. This application Sept. 22, 1975, Ser. No. 615,701

Int. Cl.² C07C *43/30*

U.S. Cl. 260—615 A **5 Claims**

1. Halogenated acetals represented by the formula

$$X_aRCH(OCH_2CHClCH_2CCl_3)_2$$

wherein

R is hydrogen or alkyl of 1–3 carbon atoms,
a is an integer from 1 to 3, and
X is chlorine, bromine or a mixture thereof.

3,968,171
PROCESS FOR THE CONTINUOUS ISOLATION OF DIHYDRIC PHENOLS

Ward J. Burkholder, Houston; Glenn E. Miller, Pasadena, and Fritz J. Nagel, Houston, all of Tex., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 5, 1970, Ser. No. 16,658

Int. Cl.² C07C *39/08*

U.S. Cl. 260—621 A **32 Claims**

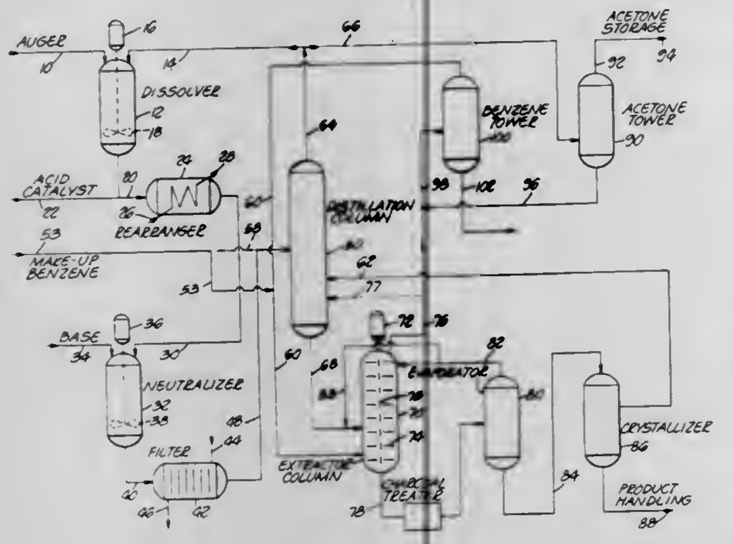
1. In a process for producing dihydric phenols by the rearrangement of dialkylbenzenehydroperoxide wherein a ketone is a byproduct of the rearrangement, the improved process for separating the ketone from the dihydric phenol product which comprises the steps of:

a. feeding a neutralized rearrangement effluent stream containing said ketone and said dihydric phenol, a hydrocarbon selected from the class consisting of benzene, toluene, xylene, ethylbenzene, diisopropylbenzene and mixtures thereof, and an aqueous feed to a distillation column, the aqueous feed comprising from about 10 to about 60 percent of the total feed to said distillation column and being primarily water;

b. supplying distillation heat to fluid in the lower section of the column;

c. removing a stream consisting essentially of the ketone from the upper section of the column;

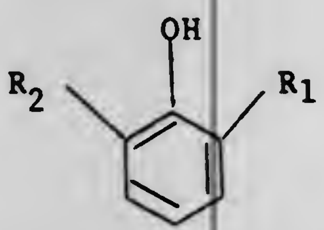
d. removing bottoms comprising an aqueous phase and hydrocarbon phase from said column;
e. separating the hydrocarbon phase from the aqueous phase in an extractor column, water and a hydrocarbon selected from the class consisting of benzene, toluene, xylene, ethylbenzene, diisopropylbenzene and mixtures thereof, being fed to said column to effect countercurrent extraction of said bottoms; and
f. recovering solid dihydric phenol product from the aqueous phase by crystallization.



3,968,172
PROCESS FOR THE PREPARATION OF 2,4,6-TRIMETHYLPHENOL

Yataro Ichikawa; Yoshiyuki Yamanaka; Tatuyuki Naruchi; Osamu Kobayashi, and Koichiro Sakota, all of Iwakuni, Japan, assignors to Teijin Limited, Osuha, Japan
Filed Oct. 2, 1973, Ser. No. 402,838
Int. Cl.² C07C *37/16*
U.S. Cl. 260—621 R **20 Claims**

1. A process for the preparation of 2,4,6-trimethylphenol by reacting a phenolic compound of the formula:



(1)

in which R_1 and R_2 each stands for hydrogen atom or methyl group, with methanol at vapor phase to methylate the former, which comprises performing the reaction at a temperature in range of from 430°–475°C., the gaseous mixture being composed essentially of the phenolic compound and methanol being contacted at a flow rate not higher than 0.4/hour, calculated as the sum weight in grams of the phenol and methanol per catalyst's weight in grams/hour, with a catalyst of which at least 90% by weight consists of magnesium oxide, said catalyst containing (1) no acidic substance of acid strength of pKa 4.8 or below and no basic substance of base strength of pKa 18.4 or above, and having (2) the ratio of basicity (k) of 60 to 100% wherein:

$$K = \frac{\text{Amount of base}}{\text{amount of base} + \text{amount of acid}} \times 100\ (\%),$$

and (3) a specific surface area of at least 15 m^2/g.

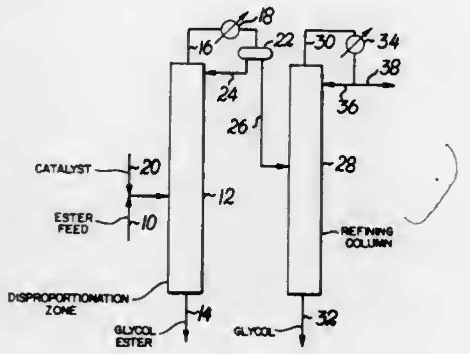
3,968,173
PROCESS FOR THE PREPARATION OF 5-ISOPROPYL-3-METHYL-PHENOL

Alfons Klein, Duesseldorf, and Karlfried Wedemeyer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Aug. 22, 1973, Ser. No. 390,449
Claims priority, application Germany, Aug. 30, 1972, 2242628
Int. Cl.² C07C *39/06*
U.S. Cl. 260—626 T **8 Claims**

1. In a process for the preparation of 5-isopropyl-3-methyl phenol comprising heating a material low in 5-isopropyl-3-methyl phenol and containing at least one of diisopropyl-3-methyl phenol and o- or p-isopropyl-3-methyl phenol at a temperature between 200°C and 400°C the improvement which comprises effecting the heating in an autoclave in the presence of synthetic aluminum silicate that has not been treated with acid as a catalyst, the catalyst being present in about 2 to 20 percent by weight of the starting methyl phenols, whereby there is produced a mixture predominantly comprising 5-isopropyl-3-methyl-phenol and low in diisopropyl-3-methyl phenols.

3,968,174
METHOD OF PRODUCING POLYHYDRIC COMPOUNDS

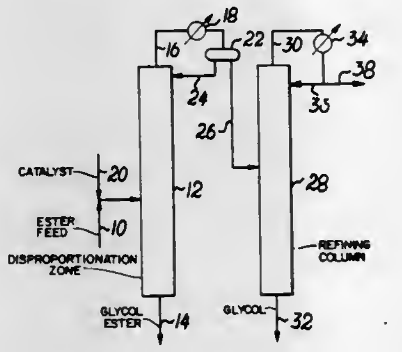
John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.
Division of Ser. No. 178,588, Sept. 8, 1971, Pat. No. 3,859,368. This application Nov. 29, 1974, Ser. No. 528,104
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 R **6 Claims**



1. A process which comprises the steps of:
a. subjecting at least one lower alkanoic diester of an alkane diol containing 2 to 6 carbon atoms to partial hydrolysis with water in a hydrolysis zone to hydrolyze at least part of said ester to produce a hydrolysis product comprising said diol, alkanoic acid, water and lower alkanoic monoester of said diol,
b. distilling said hydrolysis product to vaporize a major portion of said water and said alkanoic acid away from said diol and said ester to produce a bottoms mixture comprising said diol and said lower alkanoic monoester,
c. introducing said bottoms product into a reaction zone,
d. heating said bottoms product in said reaction zone at a temperature within the range of room temperature up to about 280°C in the presence of a basic disproportionation catalyst which is a weak base or a substance which forms a weak base in situ in the presence of said lower alkanoic ester employed in the amount of 0.001 to 5% by weight based upon the free hydroxyl-group-containing lower alkanoic ester in the feed to convert at least some of said lower alkanoic monoester to said diol and to a lower alkanoic diester of said diol, and
e. recovering said thus-produced diol from said reaction zone.

3,968,175
METHOD OF PRODUCING POLYHYDRIC COMPOUNDS

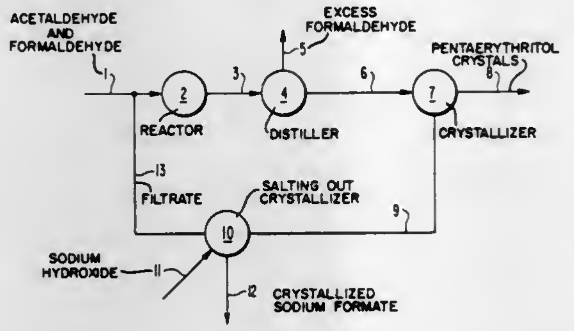
John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc., New York, N.Y.
Division of Ser. No. 178,588, Sept. 8, 1971, Pat. No. 3,859,368. This application Nov. 29, 1974, Ser. No. 528,102
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 R **4 Claims**



1. A process for producing an alkene diol containing 2 to 6 carbon atoms from a feed comprising a lower alkanoic monoester of said diol which comprises the steps of:
a. introducing said feed into a distillation zone,
b. heating said feed in said distillation zone at a temperature within the range of room temperature up to about 280°C. in the presence of a basic disproportionation catalyst which is a weak base or a substance which forms a weak base in situ in the presence of said lower alkanoic ester employed in the amount of 0.001 to 5% by weight based upon the free hydroxyl-group-containing lower alkanoic ester in the feed to convert at least some of said lower alkanoic diester of said diol and to a lower alkanoic diester of said diol, and
c. recovering said thus-produced diol from said distillation zone, said feed to said reaction zone being produced by partially hydrolyzing with water at least one lower alkanoic diester of said diol.

3,968,176
PROCESS FOR PRODUCING PENTAERYTHRITOL

Hiromi Uehama; Kei Hioki, both of Takaishi; Akira Onuki, Mohara; Kazuo Hirokawa, and Takeshi Shoji, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed July 3, 1975, Ser. No. 593,125
Claims priority, application Japan, July 5, 1974, 49-76406
Int. Cl.² C07C *27/26, 29/24*
U.S. Cl. 260—637 P **3 Claims**



1. In a process for producing pentaerythritol wherein sodium hydroxide is added to an aqueous solution containing pentaerythritol and sodium formate to allow the sodium formate to crystallize for separation and the separated solution is recirculated for use as part of the starting reaction solution, the improvement which comprises thermally treating at least a part of the reaction solution containing pentaerythritol formals in the pH range of 4.5–5.5 at a temperature of 120°–170°C., for 20–120 minutes, crystallizing and separating the resultant pentaerythritol, adding sodium hydroxide to the separated solution which contains pentaerythritol and sodium formate to crystallize the sodium formate therefrom and separating the crystallized sodium formate.

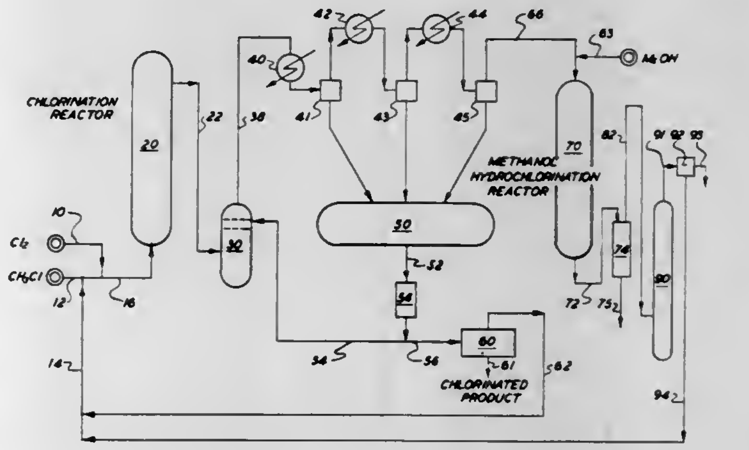
3,968,177
METHOD FOR PREPARING STRAIGHT-CHAIN PRIMARY ALCOHOLS

Manfred Kaufhold, and Harald Kett, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany
Filed Sept. 11, 1974, Ser. No. 505,044
Claims priority, application Germany, Sept. 19, 1973, 2347095
Int. Cl.² C07C *29/00*
U.S. Cl. 260—638 R **8 Claims**

1. In a process for preparing straight-chain, primary alcohols having 6 – 20 carbon atoms, the improvement comprising: reacting at a temperature of about 150° to 300°C straight-chain 1-chloroalkanes having 6 to 20 carbon atoms with alkali salts of alkanoic acids having 4 to 22 carbon atoms in the presence of 1 to 10 mole percent of alkanoic acids based on said alkali salts of the alkanoic acids to form esters, saponifying said esters in an alkaline medium to form straight-chain, primary alcohols having 6 – 20 carbon atoms and separating said straight-chain, primary alcohols.

3,968,178
CHLORINATION OF HYDROCARBONS

Robert P. Obrecht, New Canaan, and Marlin J. Bennett, Ridgefield, both of Conn., assignors to Stauffer Chemical Company, Westport, Conn.
Continuation of Ser. No. 726,804, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 681,546, Nov. 8, 1967, abandoned. This application Oct. 19, 1971, Ser. No. 190,640
Int. Cl.² C07C *17/10*
U.S. Cl. 260—658 R **8 Claims**



1. In a process of carrying out the vapor phase, thermal substitution chlorination of methyl chloride thereby producing a vaporous effluent comprising chlorine substituted materials in admixture with hydrogen chloride, the improvement comprising conducting the reaction in a first zone under substantially anhydrous conditions at a temperature between about 350° and 500°C. and under an elevated pressure between about 50 and about 200 psig., withdrawing said effluent and passing same to a partial condensation zone, maintained under an elevated pressure between about 50 and about 200 psig and low terminal temperature, to condense chlorine substituted materials and to provide a gas stream containing

substantially anhydrous hydrogen chloride and a small percentage of chlorine substituted hydrocarbons.

5. In a process of carrying out the vapor phase, thermal substitution chlorination of methyl chloride thereby producing a vaporous effluent comprising chlorine substituted materials in admixture with hydrogen chloride, the improvement comprising conducting the reaction in a first zone under substantially anhydrous conditions at a temperature between about 350°C. and 500°C. and a pressure between about 50 psig and about 200 psig, passing said effluent to a quenching zone and then to a partial condensation zone maintained at a pressure between about 50 psig and about 200 psig and a relatively low terminal temperature to separate chlorine substituted materials from a substantially anhydrous gas stream containing hydrogen chloride, passing said gas stream containing hydrogen chloride, at a pressure between about 50 psig and about 200 psig, to a separation zone to separate additional chlorine substituted materials from said gas stream to produce substantially anhydrous, purified hydrogen chloride.

3,968,179
SELECTIVE PREPARATION OF 1,2-DICHLOROETHANE

Jean-Claude Strini, St.-Auban, and Jean-Raymond Costes, Dampierre, both of France, assignors to Rhone-Progil, Paris, France

Filed Dec. 21, 1973, Ser. No. 427,373

Claims priority, application France, Dec. 27, 1972, 72.46390

Int. Cl.^{2} C07C *17/02*

U.S. Cl. 260—660 5 Claims

1. A process for the continuous liquid phase chlorination of ethylene with molecular chlorine at a temperature within the range of 20° to 80°C. in the absence of light and in the presence of liquid 1,2-dichloroethane containing ferric chloride dissolved therein to produce 1,2-dichloroethane along with less than 0.1 mole % of 1,1,2-trichloroethane based upon the ethylene converted comprising the steps of feeding to a reaction zone chlorine in an amount sufficient to provide dissolved chlorine within the range of 1 to 20 g per kg of liquid reaction mixture, maintaining the flow of ethylene to the reaction zone in an amount sufficient to provide a ratio R betwen the molar hourly flow rate of ethylene to the reaction zone and the molar hourly flow rate of ethylene which saturates the 1,2-dichloroethane contained in the reaction zone to within the range of close to 0 to 140, and recovering the 1,2-dichloroethane produced, with the ferric chloride being present in an amount within the range of 20–800 ppm by weight of the liquid reaction mixture and the molar ratio of Cl_2/C_2H_4 is within the range of 0.9 to 1.1.

3,968,180
PROCESS FOR THE PRODUCTION OF PURE CYCLOPENTENE

Friedrich-Wilhelm Kupper, and Roland Streck, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellchaft, Marl, Germany

Continuation-in-part of Ser. No. 465,515, April 30, 1974. This application Oct. 22, 1974, Ser. No. 517,022

Claims priority, application Germany, Dec. 21, 1973, 2363705

Int. Cl.^{2} C07C *3/26*

U.S. Cl. 260—666 A 8 Claims

1. In a process for the production of cyclopentene free of C_5-diene impurities, which comprises metathetically reacting cis,cis-cyclodecadiene-(1,6) with a catalytic amount of a metathesis catalyst capable of promoting the ring-opening polymerization of cyclic olefin having at least one unsubstituted ring double bond at a metathesis reaction temperature of from 0°C. up to the temperature at which said catalyst decomposes for a period of time sufficient to form said cyclopentene having a C_5-diene content of less than 0.1 weight percent of the total reaction mixture, the improvement which comprises employing a heterogeneous metathesis catalyst consisting essentially of

a. a solid catalyst support material, and
b. an oxide of molybdenum or of rhenium.

5. In a process for the production of cyclopentene free of C_5-diene impurities, which comprises metathetically reacting cis,cis-cyclodecadiene-(1,6) with a catalytic amount of a metathesis catalyst capable of promoting the ring-opening polymerization of cyclic olefin having at least one unsubstituted ring double bond at a metathesis reaction temperature of from 0°C. up to the temperaure at which said catalyst decomposes for a period of time sufficient to form a reaction product consisting essentially of said cyclopentene having a C_5-diene content of less than 0.1 weight percent of the total reaction mixture, the improvement which comprises employing a heterogeneous metathesis catalyst consisting essentially of

a. a solid catalyst support material;
b. an oxide of molybdenum or of rhenium; and
c. a catalyst activator selected from the group consisting of alcohols, epoxides, tert.-butyl hypochlorite, peroxides, carboxylic acids, aromatic nitro compounds, vinyl halides, vinyl and allyl ethers and vinyl and allyl esters.

3,968,181
MODIFIED ACRYLATE RESIN

Christopher W. Uzelmeier, Laurel Springs, and Paul D. Jones, Cherry Hill, both of N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 17, 1975, Ser. No. 559,183

Int. Cl.^{2} C08G *45/06*

U.S. Cl. 260—837 R 3 Claims

1. An ultraviolet curable acrylate resin composition with improved adhesion to metal surfaces comprising a mixture of (i) a half ester of an aliphatic monohydric alcohol and a polycarboxylic acid anhydride, (ii) acrylic acid and (iii) a polyepoxide in a ratio of between about 0.3 and about 0.9 chemical equivalents of the half ester per chemical equivalent of the polyepoxide and between about 0.7 and about 0.1 chemical equivalents of the acrylic acid per chemical equivalent of the polyepoxide wherein said polyepoxide is a glycidyl ether of 2,2-bis (4-hydroxyphenyl)propane.

3,968,182
URETHANE RUBBER COMPOSITIONS REINFORCED WITH CHOPPED ORGANIC FIBERS

Sakae Inoue, Kodaira; Toshio Nishi, Musashi-Murayama; Shoson Shibata, Tokyo; Tsutomu Matsunaga, and Yoshio Kaneko, both of Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 243,065, April 11, 1972, abandoned. This application June 5, 1974, Ser. No. 476,399

Claims priority, application Japan, Apr. 26, 1971, 46-26704

Int. Cl.^{2} C08L *75/12*

U.S. Cl. 260—858 7 Claims

1. A fiber-reinforced urethane elastomer composition characterized by improved cut-crack resistance and high modulus, and having excellent casting processability before curing, said urethane elastomer composition comprising

a. an urethane elastomer and
b. a chopped organic fiber selected from the group consisting of polyamide fiber, polyvinyl alcohol fiber, polyester fiber, rayon and polyacrylonitrile fiber, having a diameter of from 1 micron to 50 microns and an aspect ratio of 80 to 500, said chopped organic fiber being present in not more than 8% by volume based on the total volume of said elastomer composition.

3,968,183
FILM EXCELLENT IN SLIP CHARACTERISTICS AND ITS PRODUCTION

Ikuya Hayashi, Inuyama; Yukio Yamane, Ootsu; Chiyozi Hitomi, Ootsu, and Keiske Miyake, Ootsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed June 27, 1974, Ser. No. 483,707

Claims priority, application Japan, June 30, 1973, 48-74284; June 30, 1973, 48-74286

Int. Cl.^{2} C08L *67/00*

U.S. Cl. 260—860 19 Claims

1. A film of a polyester block copolymer, which has the following physical constants:

(1)	Specific gravity	1.003–1.300
(2)	Young's modulus (kg/cm^2)	not more than 1,500 (at 20°C)
(3)	Breaking strength (kg/cm^2)	150–800 (at 20°C)
(4)	Breaking elongation (%)	not less than 300 (at 20°C)
(5)	Impact strength (kg.cm/25μ)	not less than 8 (at 20°C
(6)	Thermal adhesion (kg/cm)	not less than 0.5 (at 20°C)
(7)	Oxygen permeability constant (cc.cm/cm^2.sec.cmHg)	0.5×10^{-10} –100 $\times 10^{-10}$ (at 30°C)
(8)	Clarity (%)	not less than 80
(9)	Haze (%)	not more than 2,

the polyester block copolymer comprising crystalline polyester segments and non-crystalline polymer segments in a weight ratio of 99 : 1 to 10 : 90 and having a number average molecular weight of about 10,000 to 100,000, the melting point of a high self-supporting polymer substantially constituted with the monomer components of the said crystalline polyester segments alone being not lower than about 200°C and the melting point or softening point of a polymer substantially constituted with the said non-crystalline polymer segments themselves being not higher than about 80°C, said film being prepared by melt extruding said polyester block copolymer to form a film and cooling the film in a melt state at a temperature of about 40° to 120°C to solidify it.

3,968,184
IMPACT-RESISTANT POLYVINYL CHLORIDE GRAFTED ETHYLENE-VINYL ESTERS

Dietrich Hardt; Heinrich Alberts, both of Cologne, and Herbert Bartl, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 2, 1974, Ser. No. 457,259

Claims priority, application Germany, Apr. 7, 1973, 2317652

Int. Cl.^{2} C08J *9/16;* **C08L** *51/06, 33/18, 27/06*

U.S. Cl. 260—876 R 13 Claims

1. Thermoplastic moulding compounds consisting essentially of a mixture of

A. 25–99% by weight of polyvinyl chloride and
B. 1–75% by weight of a graft copolymer of
  I. 10–70% by weight of an ethylene/vinyl ester copolymer containing 25–75% by weight of vinyl ester units as grafting substrate and
  II. 90–30% by weight of grafted polymerized units of a monomer mixture of
    a. 15–85% by weight of acrylonitrile, methacrylonitrile or a mixture thereof,
    b. 85–15% by weight of at least one aromatic vinyl compound and
    c. 0.1–10% by weight of at least one aliphatic monoolefin having 2–18 carbon atoms,

the sum of the percentage contents of (a) to (c) being 100.

3,968,185
PREPARATION OF MODIFIED ELASTOMERS

Francis P. Baldwin, 19 Winchester Road, Summit, N.J. 07901, and Alberto Malatesta, 202 Avenue Churchill, 1180 Brussels, Belgium

Filed Dec. 9, 1974, Ser. No. 530,613

Int. Cl.^{2} C08F *255/10*

U.S. Cl. 260—880 R 18 Claims

1. A method of crosslinking conjugated diene butyl rubber containing randomly distributed sites of conjugated olefinic unsaturation, which comprises reacting said elastomers with a crosslinking agent comprising at least 1 non-gaseous, soluble, free radical polymerizable monomer in the presence of at least 1 free radical initiator.

3,968,186
ADHESIVE COMPOSITIONS

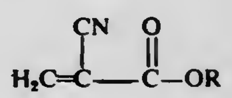
Heinz Tomaschek, Bad Homburg, and Viktor Winkovik, Oberursel, both of Germany, assignors to USM Corporation, Boston, Mass.

Filed July 19, 1974, Ser. No. 490,044

Int. Cl.^{2} C08L *33/14*

U.S. Cl. 260—881 6 Claims

1. An adhesive composition consisting essentially of one or more polymerizable esters of 2-cyanoacrylic acid according to the general formula



$$H_2C{=}\overset{\overset{\displaystyle CN}{|}}{C}-\overset{\overset{\displaystyle O}{\|}}{C}-OR$$

where R is an alkyl or alkenyl group having 1 to 16 carbon atoms, a cyclohexyl group or a phenyl group, and stabilizing additives characterized in that the adhesive includes from about 1% to about 20% by weight of the adhesive composition of a copolymer of from about 50% to about 80% by weight of a lower alkyl-2-cyanoacrylate and from about 50% to about 20% by weight of either styrene or methyl styrene to render said copolymer soluble in said ester of -2-cyanoacrylic acid, said copolymer having a reduced viscosity of from about 0.5 to 2.5 (determined using 0.4 gm. of the copolymer in 100 ml. of dimethylformamide).

3,968,187
FLAME RETARDANT HALOALKYL ESTERS OF GLYCOLS

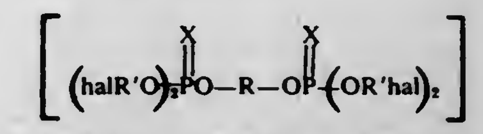
Albert W. Morgan, Collinsville, Ill., and William Vanderlinde, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1972, Ser. No. 318,448

Int. Cl.^{2} C07F *9/09, 9/165*

U.S. Cl. 260—928 5 Claims

1. A compound of the formula



$$\left[\left(halR'O\right)_2\overset{\overset{X}{\|}}{P}O-R-O\overset{\overset{X}{\|}}{P}\left(OR'hal\right)_2\right]$$

wherein R represents cycloalkylene of 5 or 6 carbon atoms or alkylenecycloalkylene of 8, 10 or 12 carbon atoms, R' represents an alkylene group of 2 to 4 carbon atoms, X represents oxygen or sulfur, and hal represents chlorine or bromine.

3,968,188

PROCESS FOR PREPARING THE PENTAERYTHRITOL ESTER OF PHOSPHOROHALIDOUS ACID

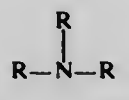
Gail H. Birum, and Michael L. Losee, both of Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 4, 1974, Ser. No. 439,504

Int. Cl.² C07F *9/15*

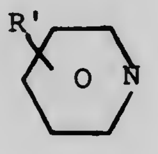
U.S. Cl. 260—976 **12 Claims**

1. In a process for the preparation of the pentaerythritol ester of phosphorohalidous acid by the reaction of pentaerythritol and a trivalent phosphorus trihalide selected from the group consisting of phosphorus trichloride and phosphorus tribromide, the improvement comprising conducting the reaction at a pentaerythritol:phosphorus trihalide molar ratio of 1:2 in the presence of a catalyst selected from the group consisting of (1) lithium chloride, sodium chloride, potassum chloride, calcium chloride and magnesium chloride, (2) a tertiary amine of the formula



$$R-\overset{\overset{\displaystyle R}{|}}{N}-R$$

wherein R represents an alkyl group of from 1 to about 12 carbon atoms or an aryl group of from 6 to 12 carbon atoms or (3) a heterocyclic nitrogen-containing compound of the formula



wherein R′ represents hydrogen or an alkyl group of 1 to 5 carbon atoms and the hydrochloride or hydrobromide salts thereof.

3,968,189

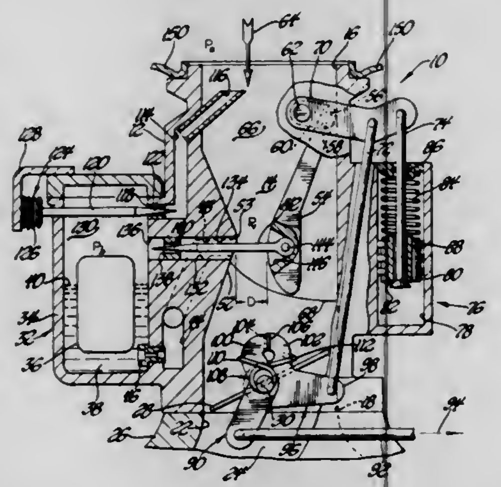
METHOD AND APPARATUS FOR VARYING FUEL FLOW FROM A VARIABLE VENTURI CARBURETOR TO COMPENSATE FOR CHANGES IN BAROMETRIC PRESSURE AND ALTITUDE

Kenneth C. Bier, Bloomfield Hills, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,325

Int. Cl.² F02M *7/24*

U.S. Cl. 261—39 A **10 Claims**



1. A method of controlling the rate of metering fuel flow in an internal combustion engine carburetor having a body, induction passage means formed through said body for communicating with said engine, fuel reservoir means for containing fuel, variable venturi means situated within said induction passage means, throttle valve means situated within said induction passage means downstream from said variable venturi means, fuel delivery means including fuel metering means communicating between the interior of said fuel reservoir means and said induction passage means adjacent said venturi, said fuel metering means being effective to meter the rate of fuel flow from said fuel reservoir means through said fuel delivery means and into said induction passage means in accordance with a metering pressure differential across said metering means, said method comprising the steps of sensing a pressure indicative of ambient pressure, sensing a pressure indicative of the velocity rate of air flow through said induction passage means, modifying the said pressure indicative of the velocity rate of air flow in accordance with the degree to which said variable venturi means is opened, and creating a control pressure within said fuel reservoir applied said fuel which is a function of both said pressure indicative of ambient pressure and said modified pressure indicative of rate of air flow in order to reduce the magnitude of said metering pressure differential to compensate for decreases in ambient pressure.

3,968,190

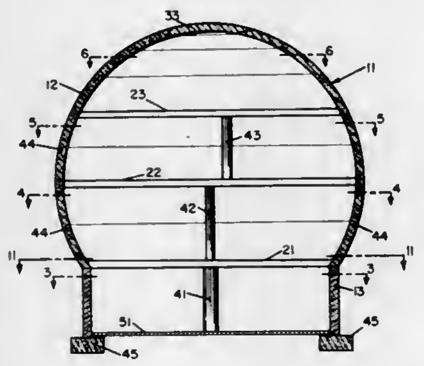
METHOD OF MOLDING A SPHERICAL STRUCTURE

James L. Stewart, 636 Church St., Logan, Ohio 43138

Filed June 26, 1974, Ser. No. 483,372

Int. Cl.² E04B *1/16*

U.S. Cl. 264—32 **2 Claims**



1. The method of constructing spherically shaped building structures wherein a plurality of annular rings composed of structural material each positioned higher than the next lower annular ring and each having a spherically shaped surface are created by

a. the successive forming for each ring below the horizontal equator of the building of a pair of adjacent annular ring forms, one ring form of each pair of ring forms having an arcuate inner surface and the other ring of each pair having an arcuate outer surface forming a portion of a spherical surface and being positioned within the first described ring form of the pair, the said inner and outer surfaces of each said pair being substantially parallel to each other, and each pair of ring forms being substantially parallel to the horizontal equator so that the annular rings to be created will also be parallel to the horizontal equator;

b. pouring suitable structural material between the surfaces of each pair of ring forms and allowing such material to harden before positioning the next higher pair of forms;

c. repeating the process until the horizontal equator is reached;

d. disassembly of the forms for the annular rings below the horizontal equator; and

e. inverting the ring forms and utilizing the inverted ring forms in reverse order to complete in similar manner annular rings of the upper portion of spherically shaped building structure.

3,968,191

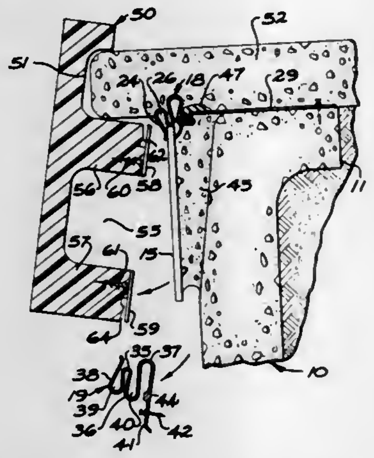
METHOD OF SETTING TILE AND FORMING SWIMMING POOL DECK

William J. Stegmeier, 1021 C Shary Circle, Concord, Calif. 94520

Continuation of Ser. No. 299,209, Oct. 20, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,949

Int. Cl.² E04B *1/16;* **E04H** *7/18*

U.S. Cl. 264—34 **15 Claims**



1. In a method of forming a side wall for a swimming pool or the like, the steps of: forming an upwardly extending concrete wall, thereafter temporarily supporting a plurality of tile units in side-by-side juxtaposition along said wall in spaced relation therewith to define a cavity having an accessible open top, substantially filling said cavity through its open top intermediate said plurality of tile units and the facing surface of said previously formed wall with a mass of mortar while said tile units are temporarily supported along said wall to bring said mortar into intimate bonding contact with the facing surfaces of said tile units and wall, maintaining said mortar mass within said cavity to enable said mortar to bond said tile units to said wall, thereafter releasing said temporary support of said tile units along said wall whereby said tiles are supported thereafter by said concrete wall, pouring a mass of concrete in overlying relation with said wall along the upper edge thereof to overhang said tile units, and maintaining said concrete mass in such overlying relation to cure and thereby define a cantilever deck along said wall.

3,968,192

METHOD OF REPAIRING LEAKY HOLLOW FIBER PERMEABILITY SEPARATORY DEVICES

Sargent Glenn Hoffman, III, Fresno, and Frank Watkins Mather, III, Orinda, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1974, Ser. No. 462,457

Int. Cl.² B32B *35/00*

U.S. Cl. 264—36 **5 Claims**

1. A process for remedying leaks in a tubesheet/hollow fiber assembly comprising a plurality of hollow fiber lengths having end portions potted in and extending through a solid body of fusible resin and opening upon an accessible surface of said body, said process comprising

1. disposing said assembly within an opening in a casing, said casing being adapted for connection to a fluid pressure source, in such manner that the accessible tubesheet surface is exposed,
2. effecting a seal between the periphery of said tubesheet and the portion of said casing adjacent said opening,
3. supplying a fluid under pressure to the volume within said casing exterior to said fiber lengths, thereby pressurizing said volume,
4. locating an opening in said accessible surface from which egress of said fluid occurs,
5. heating the assembly materials in the immediate vicinity of the opening in said accessible surface and applying pressure to the heated materials with rod means until said opening is sealed.

3,968,193

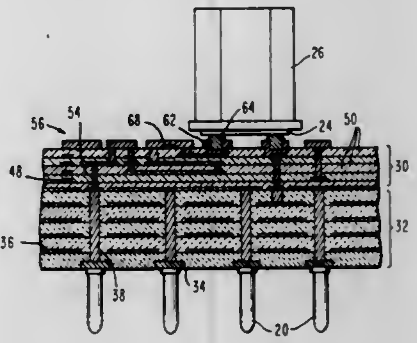
FIRING PROCESS FOR FORMING A MULTILAYER GLASS-METAL MODULE

Perry Robert Langston, Jr., and Melvin Norris Turetzky, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,529

Int. Cl.² C04B *37/04, 37/02*

U.S. Cl. 264—61 **5 Claims**



1. A process for forming a solid glass electrical interconnection package having a plurality of interposed metallized planes by sequentially depositing a plurality of successive glass layers comprising the steps:

a. providing a dielectric substrate;

b. depositing a glass slurry over the upper surface of the substrate for forming a first glass layer;

c. heating said first glass layer in a first gaseous ambient soluble in the first glass layer at a temperature capable of forming a first solution comprising a first glass layer solvent and a first gaseous ambient solute, said first gaseous ambient solute being substantially completely dissolvable in said first glass layer solvent for rendering said first layer bubble-free at the heating temperature;

d. changing the first gaseous ambient to a second gaseous ambient insoluble in said first solution for providing a concentration gradient for rapidly driving said first gaseous ambient solute from said first glass layer solvent to a concentration incapable of super-saturation therein of any remaining portion of said first gaseous ambient solute during a subsequent cooling step, and

e. cooling said first glass layer solvent for hardening and maintaining said first glass layer bubble-free.

3,968,194

DENSE POLYCRYSTALLINE SILICON CARBIDE

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 431,611, Jan. 8, 1974. This application Oct. 6, 1975, Ser. No. 619,953

Int. Cl.² C04B *35/56, 35/52, 35/14*

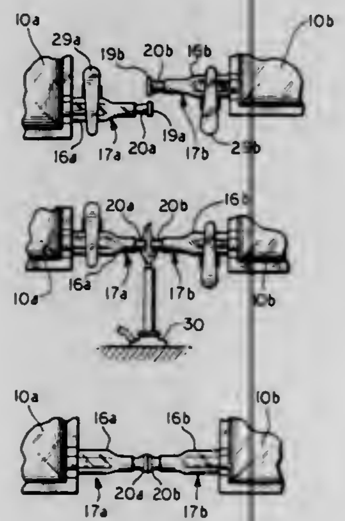
U.S. Cl. 264—65 **5 Claims**

1. A method of making a dense silicon carbide ceramic comprising the steps of

a. forming a substantially homogeneous dispersion of a submicron powder of silicon carbide, a boron containing compound selected from the group consisting of boron and boron carbide, wherein the amount of the boron containing compound is equivalent to 0.3–3.0% by weight of boron, and 3.5–10.0% by weight of silicon nitride, and

b. hot pressing the dispersion in an inert atmosphere at a temperature of about 1950°–2050°C and at a pressure of about 5,000–10,000 psi for a sufficient time to produce a high density ceramic.

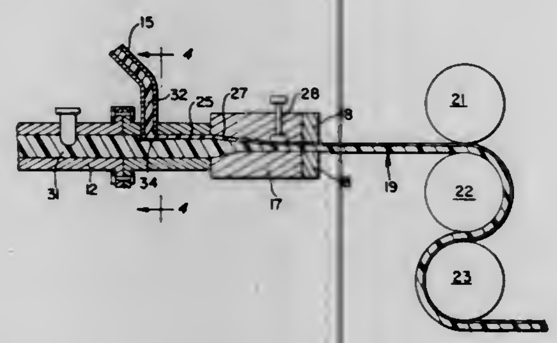
3,968,195
METHOD FOR MAKING STERILE CONNECTIONS
Marilyn Bishop, One N. 341 Indian Knoll Road, West Chicago, Ill. 60185
Filed June 17, 1974, Ser. No. 479,755
Int. Cl.² B29C *27/00*
U.S. Cl. 264—154 **14 Claims**



1. A method for making a sterile connection between first and second fluid passage means, each of said fluid passage means having a port structure including a thermoplastic tube having a free end sealed off by a thermoplastic diaphragm, comprising the following steps:

- a. aligning each free end of each tube;
- b. heat softening each free end;
- c. melting open each thermoplastic diaphragm;
- d. contacting together each free end of each tube while each free end is in a melted open condition; and
- e. cooling and solidifying the contacting free ends of each tube causing said free ends to be permanently joined.

3,968,196
METHOD OF CO-EXTRUSION OF POLYVINYLIDENE FLUORIDE/POLYSTYRENE MULTIPLE-LAYERED SHEETING
Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.
Filed Mar. 29, 1971, Ser. No. 128,939
Int. Cl.² B29D *7/02, 9/00;* **B29F** *3/08*
U.S. Cl. 264—171 **7 Claims**



1. A process for the manufacture of composite sheeting having a major layer corresponding substantially to the final composite sheeting thickness of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal copolymers of styrene containing a minor amount of another copolymerizable monomer, and a minor layer of vinylidene fluoride polymer firmly united to the exterior surface of said major layer, comprising: conveying a heat plasticized stream of said styrene polymer in a conduit having a generally circular cross section, joining to the exterior surface of said styrene polymer stream within the said conduit a second, heat plasticized stream of said vinylidene fluoride polymer, thereby forming a single stratified stream of heat plasticized material conforming to the cross section of said conduit and being characterized by distinct, contiguous layers of said polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at each end at a point on the inside surface of said conduit, adjusting the melt viscosity of the vinylidene fluoride polymer, by adjusting its temperature, to a value within the range of about 50 to 150% of the melt viscosity exhibited by said styrene polymer under extrusion conditions, conveying said stratified stream undisturbed through said conduit to a sheet-form extrusion die having its die lips generally aligned in parallel with the said interface between the two polymeric materials, and passing said stratified stream of heat plasticized material through the said die.

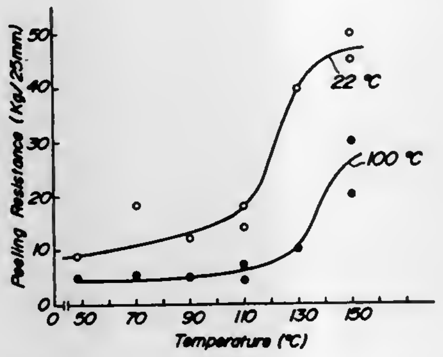
3,968,197
PROCESS FOR TREATING SODIUM SILICO FLUORIDE
Hirokazu Satoh, Tokyo, and Akira Fujimura, Urawa, both of Japan, assignors to Onoda Chemical Industry Company, Limited, Tokyo, Japan
Continuation of Ser. No. 39,965, May 25, 1970, abandoned. This application Aug. 8, 1974, Ser. No. 495,833
Claims priority, application Japan, May 29, 1969, 44-41360
Int. Cl.² C01D *3/04;* **C01B** *33/16;* **C01C** *1/16*
U.S. Cl. 423—339 **4 Claims**

1. In the process of reacting sodium silicofluoride having a particle size of less than 250 microns and ammonia in an aqueous medium to produce silica, sodium fluoride and ammonium fluoride, the improvement comprising:

- a. adding ammonia, in the form of a member selected from the group consisting of free ammonia gas and aqueous ammonium hydroxide having a concentration, calculated as free ammonia, of at least about 7.5 weight percent, at a rate such that the concentration of ammonium hydroxide in the reaction medium is less than about 5 weight percent over a period of at least about 60 minutes, until substantially all the sodium silicofluoride is reacted:
- b. agitating to a degree greater than that required to disperse sodium fluoride crystals and silica gel of said reaction medium produced in the course of said addition of ammonia and for a period of at least about 20 minutes after completion of said addition of ammonia:
- c. after completion of the reaction, adding a stoichiometric excess of said ammonia in an amount such that the total ammonium ion concentration consisting of ammonium fluoride and ammonium hydroxide in the reaction medium is more than 7.5 weight percent, calculated as free ammonia; and
- d. separating sodium fluoride crystals having a particle size of more than 100 microns and silica gel having a particle size of less than 5 microns thus prepared separately from ammonium fluoride solution.

3,968,198
METHOD FOR IMPROVING THE ADHERING ABILITY OF VULCANIZED RUBBER SURFACES
Toshio Honda; Shoji Tanaka, both of Akigawa; Yukio Fukura, Kodaira; Yoshikatsu Suzuki; Itsuo Tanuma, both of Higashi-Murayama; Koichi Iwami, Kunitachi, and Shoson Shibata, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jan. 28, 1974, Ser. No. 437,081
Claims priority, application Japan, Jan. 26, 1973, 48-10775; Feb. 16, 1973, 48-18418; May 12, 1973, 48-52885
Int. Cl.² B29C *25/00;* **C01B** *21/12*
U.S. Cl. 264—343 **8 Claims**

1. A method for improving an adhering ability of a surface of a vulcanized rubber, which comprises treating said vulcanized rubber surface with a 0.01 to 5% by weight solution of iodine isocyanate in an organic solvent in such an amount that

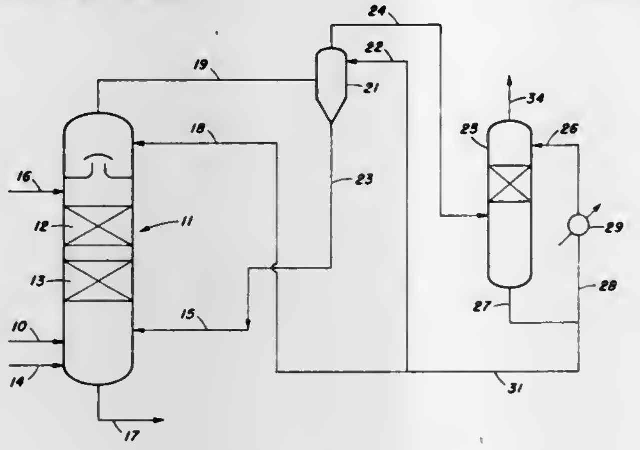


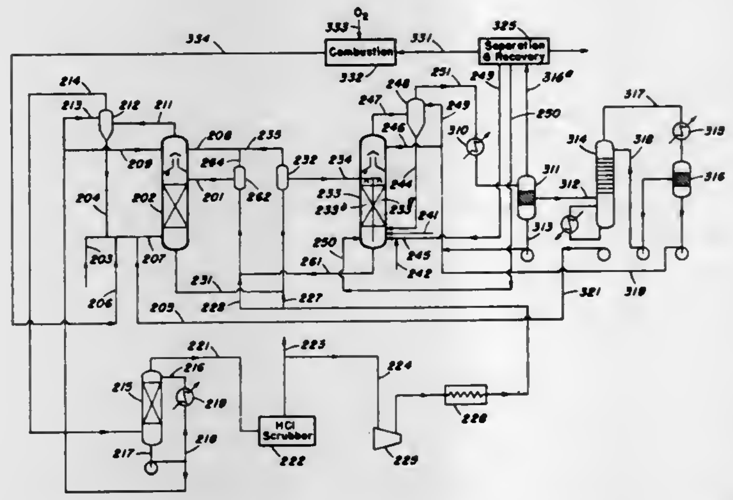
the amount of iodine isocyanate applied on the vulcanized rubber surface is 0.001 to 500 mg/cm².

3,968,199
PROCESS FOR MAKING SILANE
Carl James Bakay, Marietta, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Feb. 25, 1974, Ser. No. 445,667
Int. Cl.² C01B *33/04*
U.S. Cl. 423—347 **4 Claims**

1. The process of producing SiH_4 which comprises providing $HSiCl_3$ in a bed of an insoluble, solid anion exchange resin congtaining tertiary amino or quaternary ammonium groups bonded to carbon thereof, maintaining the temperature of the bed where $HSiCl_3$ is provided sufficient to cause said $HSiCl_3$ to be disproportionated to form vaporous products which rise in the bed, and $SiCl_4$, which is condensed, maintaining the temperature at the top of the bed above the boiling point of SiH_4 and below the boiling point of H_3SiCl and recovering SiH_4 which is substantially free of chlorosilicon hydrides from the bed.

3,968,200
REACTOR EFFLUENT QUENCH SYSTEM
Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.
Filed Mar. 27, 1972, Ser. No. 238,196
Int. Cl.² C01B *7/08;* **C01G** *3/04, 3/06*
U.S. Cl. 423—488 **12 Claims**





1. In an oxychlorination reaction, a process for recovering hydrogen chloride, comprising:

withdrawing a gas containing hydrogen chloride and water vapor from an oxychlorination reaction zone;

contacting said gas in a first quench zone with an aqueous hydrogen chloride quench liquid to cool said gas, said contacting partially vaporizing said quench liquid to produce a remaining aqueous hydrogen chloride liquid having a hydrogen chloride concentration greater than the hydrogen chloride concentration of said quench liquid;

introducing said remaining aqueous hydrogen chloride liquid into said oxychlorination reaction zone;

further cooling cooled gas from said first quench zone in a second quench zone to produce aqueous hydrogen chloride having a hydrogen chloride concentration from about 8 to about 20 percent, by weight; and

passing aqueous hydrogen chloride from said second quench zone to said first quench zone as said aqueous hydrogen chloride quench liquid.

3,968,201
DOSAGE UNIT CONTAINING A SUBSTANCE SHOWING A TOPICAL EFFECT ON THE EYE, AND A METHOD OF PREPARING SAME
Emma Marta Ryde, and Jan Erik Ekstedt, both of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden
Division of Ser. No. 416,717, Nov. 16, 1973, Pat. No. 3,868,445. This application Nov. 18, 1974, Ser. No. 525,031
Claims priority, application Sweden, Nov. 30, 1972, 15652/72
Int. Cl.² A61K *9/02, 9/06*
U.S. Cl. 424—14 **19 Claims**

1. An opthalmic composition in the form of a solid shaped body having a largest dimension between the limits of 2 – 20 mm and remaining dimensions within the range of 0.5 – 10 mm, with softly rounded corners so as not to cause eye irritation, the body being either planar or suitably molded to obtain the shape of a lens capable of fitting into the space between the eye and the surrounding tissue with a surface facing toward the eye, said solid shaped body as a result of its plasticity forming itself to the shape of the eye cavity when inserted into the eye, said body comprising a mixture of:

- a. 5 – 90% of at least one lipophilic substance having a melting point of 46° – 75°C and being selected from the group consisting of higher hydrocarbons, waxes, fats and mixtures thereof, having a melting point within the aforementioned range,
- b. 0 – 40% of at least one water-soluble or water-swellable polymer in solid, finely-divided form,
- c. 0.05 – 30% of at least one drug showing a topical effect on the eye,
- d. 0.2 – 20% of at least one water-insoluble lipophilic polymer having a softening temperature exceeding 70°C and a melting point exceeding 85°C and which is soluble in the lipophilic substance or substances in molten form to serve as stabilizer for the mixture,

the percentages relating to percent by weight calculated on the total weight of the mixture.

3,968,202
TETANUS ANTIGEN AND PROCESS FOR ITS MANUFACTURE
Philipp Stein, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany
Filed Aug. 9, 1974, Ser. No. 496,187
Claims priority, application Germany, Aug. 13, 1973, 2340911
Int. Cl.² A61K *39/02*
U.S. Cl. 424—92 **6 Claims**

1. A method for making a tetanus antigen by the inactivation of a tetanus toxin, which comprises treating a solution of

tetanus toxin with 0.005 to 5.0 mols per liter of oxymethane sulfinate at a pH between 5 and 11 and at a temperature between 0° and 40°C. until the toxicity of the tetanus toxin has disappeared.

3,968,203

AEROSOL ASTRINGENT COMPOSITION

Joseph G. Spitzer, Mamaroneck, and Lloyd Osipow, New York, both of N.Y., assignors to Jerome G. Spitzer, Mamaroneck and Marvin Small, New York, both of, N.Y., part interest to each

Continuation of Ser. No. 492,268, Oct. 1, 1965, abandoned. This application Aug. 26, 1969, Ser. No. 853,626

Int. Cl.^{2} A61K *7/38*

U.S. Cl. 424—47 **5 Claims**

1. A package for containing and dispensing an astringent and anti-perspirant agent including in combination

a. a pressure-tight metallic container having a valve-controlled opening and a valve for dispensing liquid in aerosol form, and
b. a composition in said container consisting essentially of
c. an aluminum chlorohydrate astringent in fine powder form of about 1 to 100 microns, said astringent being in an inactive state while dry but being corrosive to the metal of said container and having anti-perspirant properties in the presence of moisture, and
d. an essentially anhydrous liquid vehicle serving to maintain the composition in liquid form and free from moisture while in said container, said astringent powder being suspended and dispersed in said liquid within the container,
e. said liquid vehicle consisting essentially of
   1. A liquified propellant which is gaseous at room temperature and atmospheric pressure and non-reactive with the other components present in said package and
   2. a non-volatile, non-hygroscopic liquid, said non-hygroscopic liquid being a non-polar, organic liquid having (a) a vapor pressure less than about 24 mm of mercury at 70°F.; (b) a boiling point at atmospheric pressure not lower than 250°F.; (c) a dielectric constant not greater than 10; (d) a specific gravity between 0.7 and 1.6; and (e) a water insolubility such that it will not dissolve more than about 5% of water at 70°F.;
f. said astringent powder and non-volatile, non-hygroscopic liquid being dispensed together from the container in the form of a liquid suspension upon release of the valve and volatilization of the propellant so as to be applied to the skin in the form of a liquid suspension of the astringent powder
g. the astringent being in an amount from 0.2 – 10% by weight of the total composition, the non-volatile, non-hygroscopic liquid being in an amount from 2 to 50% by weight of the total composition and the propellant being in an amount from 50 to 98% by weight of the total composition, the relative amounts of astringent and non-volatile, non-hygroscopic liquid being in an amount from 0.01 to 1 part by weight of astringent per part by weight of the non-volatile, non-hygroscopic liquid such that the product that is applied to the skin is in the form of a liquid suspension of the astringent powder.

3,968,204

ANTIBIOTIC A-2315

Robert L. Hamill, New Ross, and William Max Stark, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 466,327, May 2, 1974, which is a continuation-in-part of Ser. No. 276,546, July 31, 1972, abandoned. This application Apr. 28, 1975, Ser. No. 572,050

Int. Cl.^{2} A61K *35/00*

U.S. Cl. 424—121 **2 Claims**

1. The method of promoting growth of animals which comprises administering orally to said animals an effective growth-promoting amount of antibiotic A-2315 factor A, said factor being a white amorphous solid having a specific rotation $[\alpha]_D^{27}$ of −132 ($c = 0.375$ in methanol); having an approximate elemental composition of 61.51 percent carbon, 7.51 percent hydrogen, 8.69 percent nitrogen, and 21.53 percent oxygen; having an approximate molecular weight of 503 as determined by mass spectrometry; having in chloroform the following distinguishable bands in its infrared absorption spectrum: 2.81, 2.99, 3.38, 5.82, 6.02, 6.20, 6.30, 6.40, 6.66, 6.82, 6.94, 7.05, 7.30, 7.71, 8.88, 9.11, 10.41, 10.89 and 11.14 microns; having in 95% ethanol solution an ultraviolet absorption maximum at 214 $m\mu$ with an absorptivity value ($E_{1cm}^{1\%}$) of approximately 799; being soluble in methanol, ethanol, and chloroform, but being only slightly soluble in water; releasing alanine upon amino-acid analysis; and containing hydroxyl groups which are capable of esterification.

3,968,205

INFUSION SOLUTION FOR THE TREATMENT OF TACHYCARDIAC DISTURBANCES OF HEART RHYTHM AND USE THEREOF

Johanna Bickel, Nurnberg, Germany, assignor to J. Pfrimmer and Co., Erlangen, Germany

Filed Jan. 23, 1975, Ser. No. 543,456

Claims priority, application Germany, Jan. 31, 1975, 2404620

Int. Cl.^{2} A61K *33/14, 33/00, 33/06, 31/165*

U.S. Cl. 424—153 **4 Claims**

1. An infusion solution for the treatment of ventricular tachycardia comprising an effective amount of lidocaine and an antiarrhythmic effective amount of potassium and magnesium ions.

3,968,206

THIOPHOSPHORIC ACID AMIDES AS NEMATOCIDES, INSECTICIDES AND ACARICIDES

Denis Varsanyi, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

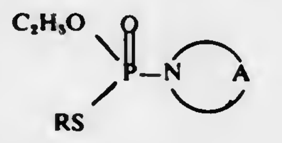
Division of Ser. No. 377,465, July 9, 1973, Pat. No. 3,883,556. This application Mar. 3, 1975, Ser. No. 554,355

Claims priority, application Switzerland, July 13, 1972, 10529/72

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—200 **3 Claims**

1. A pesticidal composition for combating insects, acarids and nematodes which comprises (1) as active ingredient a pesticidally effect amount of a compound of the formula



wherein R represents n-propyl or n-butyl, and A represents 2-butenylene or 2-pentenylene, and (2) a carrier.

3,968,207

METHOD OF CONTROLLING FLEAS AND TICKS ON CATS AND DOGS

Michael Stanley Schrider, South Bound Brook; Gordon Paul Poeschel, Kinnelon, both of N.J., and Anthony Morris Annand, St. Ives, Australia, assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 423,623, Dec. 10, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,381

Int. Cl.^{2} A61K *31/66*

U.S. Cl. 424—205 **13 Claims**

1. A method for controlling fleas and ticks on cats and dogs which comprises administering to said animals a fleaicidal or tickicidal amount of O,O,O′,O′-tetramethyl O,O′-thiodi-p-phenylene phosphorothioate.

3,968,208

FUNGICIDAL COMPOSITIONS

Jean-Claude Debourge, 3e avenue 335 D Balmont Quest - La Duchere, 69009 Lyon; Jean-Michel Gaulliard, "Le Mont", 69990 Orlienas; Jean Pierre Thiolliere, 7, rue Dr. Mouisset, 69006 Lyon; Jean Georges Abblard, 48, rue de Margnolles Bat. 8, 69300 Caluire; Guy-Bernard Lacroix, 33, Rue Louis-Blanc; Daniel Jean Pillon, 26, rue Duguesclin, both of 69006 Lyon; Jacques Joseph Ducret, 31, cours Gambetta, 69003 Lyon, and Andre Thizy, 61, rue H. Gorjus, 69004 Lyon, all of France

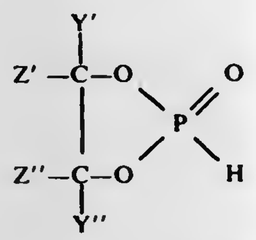
Filed Jan. 11, 1974, Ser. No. 432,492

Claims priority, application France, Jan. 12, 1973, 73.1803; Oct. 19, 1973, 73.37994

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—209 **12 Claims**

1. A fungicidal composition for controlling fungus disease in plants, comprising a fungicidally effective amount of a compound of the formula



(I)

in which: Y′, Y″, Z′ and Z″ are the same or different and represent hydrogen alkyl or halogenated alkyl containing from 1 to 5 carbon atoms and an agriculturally acceptable carrier.

3,968,209

ANTHELMINTIC USE OF PHOSPHORYLATED THIOUREAS

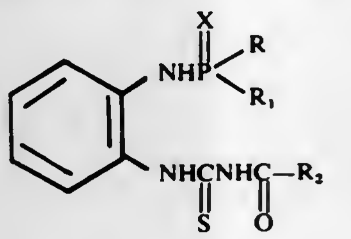
Julius J. Menn, Saratoga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 3, 1975, Ser. No. 619,261

Int. Cl.^{2} A61K *31/66*

U.S. Cl. 424—211 **3 Claims**

1. A method of controlling helminth infections in animals which comprises orally administering to said animal an anthelmintically effective amount of a compound having the formula



in which X is oxygen or sulfur, R and R_1 are independently lower alkyl or lower alkoxy, and R_2 is lower alkoxy.

3,968,210

SYNERGISTIC GERMICIDAL COMPOSITIONS CONTAINING 3,5-DIMETHYL-4-CHLOROPHENOL

Alan G. Schenkel, High Point, N.C., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 370,879, June 18, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,418

Int. Cl.^{2} A01N *9/02*

U.S. Cl. 424—235 **9 Claims**

1. A bactericidal composition comprising
a mixture of
   i. 3,5-dimethyl-4-chlorophenol with one or two of
   ii. bis-(3,5,6-trichloro-2-hydroxyphenyl)methane,
   iii. 2,4,4′-trichloro-2′-hydroxydiphenyl ether and
   iv. 3,4′,5-tribromo-salicylanilide,

the ratio of (i) to (ii) – (iv) being about 1:1 for a binary mixture and about 1:1:1 for a ternary mixture.

3,968,211

COMPOSITIONS AND METHODS OF USE OF AMIDINES FOR ANTI-ARRHYTHMIC PURPOSES

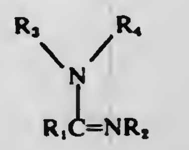
Donald W. DuCharme, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 11, 1974, Ser. No. 441,383

Int. Cl.^{2} A61K *31/535, 31/54, 31/445*

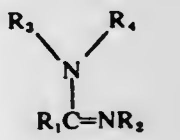
U.S. Cl. 424—248 **14 Claims**

1. A method for treating arrhythmic conditions in mammals which comprises systemically administering to a mammal in need of such treatment an anti-arrhythmic effective amount of a compound



wherein R_1 and R_2 are the same or different and are selected from the group consisting of alkyl of one to eight carbon atoms, inclusive, cycloalkyl of from five to eight carbon atoms, inclusive, adamantyl, phenyl, phenalkyl, where alkyl is from one to three carbon atoms, inclusive, and mono and di-substituted phenyl and phenyl moiety of phenalkyl wherein the substituent(s) are the same or different and are selected from the group consisting of alkyl from one to three carbon atoms, inclusive, alkoxy of from one to three carbon atoms, inclusive, halogen, and trifluoromethyl; R_3 and R_4 taken together with the nitrogen atom to which they are attached, form morpholino and a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier.

10. A pharamaceutical composition which comprises an anti-arrhythmic effective amount of a compound



wherein R_1 and R_2 are the same or different and are selected from the group consisting of alkyl of one to eight carbon atoms, inclusive, cycloalkyl of from five to eight carbon atoms, inclusive, adamantyl, phenyl, phenalkyl, where alkyl is from one to three carbon atoms, inclusive, and mono and di-substituted phenvl and phenyl moiety of phenalkyl wherein the substituent(s) are the same or different and are selected from the group consisting of alkyl from one to three carbon atoms, inclusive, alkoxy of from one to three carbon atoms, inclusive, halogen, and trifluoromethyl; R_3 and R_4 taken together with the nitrogen atom to which they are attached, form morpholino and a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier.

3,968,212

ORGANOLEPTIC CYCLOPENTAPYRAZINES AS FLAVORING AGENTS

Ivon A. Flament, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

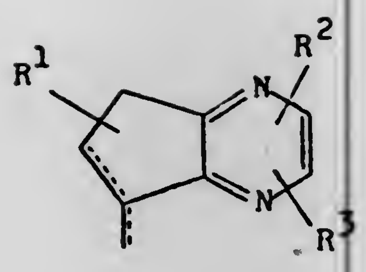
Division of Ser. No. 409,016, Oct. 23, 1973, Pat. No. 3,920,647. This application Apr. 23, 1975, Ser. No. 570,802

Claims priority, application Sweden, Oct. 26, 1972, 15690/72

Int. Cl.^{2} A61K *31/495*

U.S. Cl. 424—250 **1 Claim**

1. A flavouring composition consisting essentially as an active ingredient at least one of the compounds of formula



I

having a double bond at one of the positions indicated by the dotted lines and wherein each of the substituents R^1, R^2, and R^3 represents a hydrogen atom or alkyl having from 1 to 6 carbon atoms.

3,968,213

METHOD OF PREVENTING ASTHMATIC SYMPTOMS

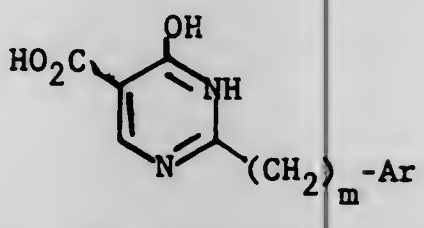
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 299,871, Oct. 24, 1972, Pat. No. 3,883,653. This application Jan. 14, 1975, Ser. No. 541,017

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **3 Claims**

1. A method of preventing asthmatic symptoms in a human who is subject to bronchoconstriction which comprises administering to said human an asthmatic symptom preventing amount of a compound of the formula



or a pharmaceutically acceptable basic salt thereof wherein Ar is furyl and *m* is an integer of 0 to 1.

3,968,214

5-METHYLTHIO-PYRIMIDINE VASODILATORS

Jean-Marie Claverie, Enghien-les-Bains; Gérard Loiseau, Sceaux; Georges Mattioda, Enghien-les-Bains; René Millischer, Pringy, and Francois Percheron, Brevannes, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

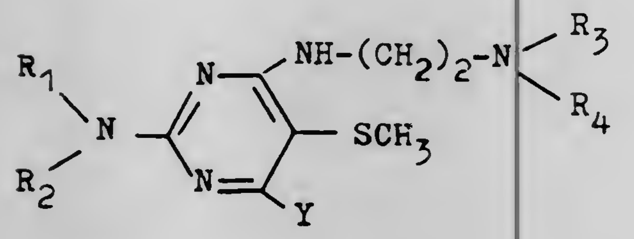
Filed Oct. 12, 1973, Ser. No. 406,129

Claims priority, application France, July 6, 1973, 73.24875

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **13 Claims**

1. A pharmaceutical composition in unit dosage form suitable for use as a vasodilator comprising a pharmaceutically acceptable carrier and 10 mg to 500 mg of a compound of the formula:



(I)

in which Y represents chlorine, R_1 is methyl, R_2 is benzyl, phenyl, chlorophenyl, methyl phenyl, trifluoromethyl phenyl or 3,4-dimethoxy phenyl, R_3 and R_4 are the same and are selected from the group consisting of methyl, ethyl and isopropyl, or a salt thereof with a pharmaceutically acceptable acid.

3,968,215

DRUG HAVING AN ANTI-AGGLUTINATING EFFECT ON PLATELETS AND HYPOCOAGULATING EFFECT

Claude Raby, Chaville, and Jean Choay, Paris, both of France, assignors to Choay S.A., Paris Cedex, France

Filed Aug. 27, 1974, Ser. No. 500,888

Claims priority, application France, Aug. 31, 1973, 73.31668

Int. Cl.² A61K *31/485*

U.S. Cl. 424—260 **21 Claims**

1. A mixture of papaverine or of a physiologically acceptable papaverine salt with a thiosulphate of a physiologically acceptable metal, the two compounds being in respective proportions effective to have an inhibiting effect on hyperadhesion and hyperagglutination on platelets in blood and also have a marked hypocoagulating effect on the kinetic and dynamic coagulability of whole blood.

3,968,216

METHOD OF INHIBITING HISTAMINE ACTIVITY WITH GUANIDINE COMPOUNDS

James Whyte Black, Hemel Hempstead; Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

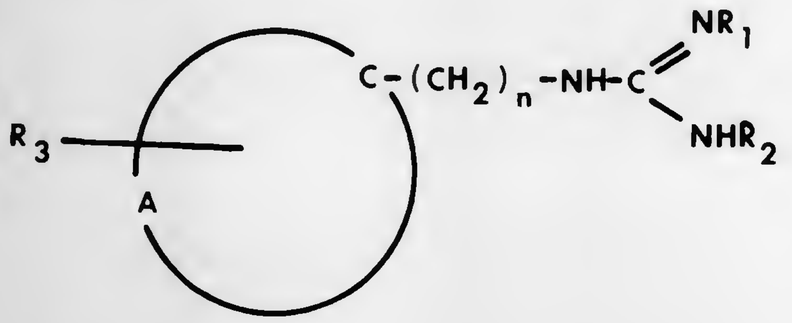
Division of Ser. No. 310,302, Nov. 29, 1972, Pat. No. 3,868,457, which is a continuation-in-part of Ser. No. 80,795, Oct. 14, 1970, abandoned. This application Nov. 25, 1974, Ser. No. 526,767

Claims priority, application United Kingdom, Oct. 29, 1969, 52891/69

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **5 Claims**

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering internally to an animal requiring inhibition of said H-2 histamine receptors in an amount sufficient to inhibit said H-2 histamine receptors a compound of the formula:



in which:
- *n* is 2 to 5;
- A taken together with the carbon and nitrogen atoms to which it is attached forms a pyridine ring;
- R_1 is hydrogen, alkyl having 1 to 4 carbon atoms or benzyl;
- R_2 is hydrogen, alkyl having 1 to 4 carbon atoms, benzyl, imidazolylethyl or amino or R_1 and R_2 together form an ethylene bridge and
- R_3 is hydrogen, alkyl having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms or amino or pharmaceutically acceptable acid addition salts thereof.

3,968,217

5-(3-)SUBSTITUTED-10,11-DIHYDRO-5H-DIBENZ[b,f]AZEPINES

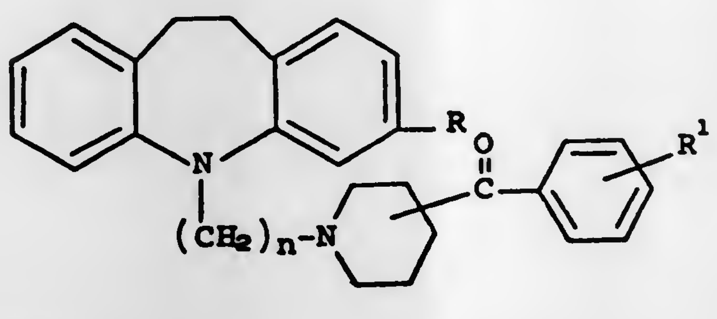
Grover C. Helsley, Pottersville, N.J., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 462,944, April 22, 1974, Pat. No. 3,886,170. This application Jan. 16, 1975, Ser. No. 541,683

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A pharmaceutical composition having antidepressant activity, in dosage unit form, comprising a pharmaceutical carrier and an antidepressant amount of a 5-(3-)substituted-10,11-dihydro-5H-dibenz [b,f] azepine having the formula:



wherein;
- R is selected from the group consisting of hydrogen, bromine, chlorine, methoxy, trifluoromethyl, sulfamoyl and N,N-dimethylsulfamoyl,
- R^1 is selected from the group consisting of hydrogen, lower alkoxy, lower alkyl, trifluoromethyl and halogen having an atomic weight less than 80,
- *n* is a positive integer from 2–4 inclusive, or a pharmaceutically acceptable acid addition salt thereof.

3,968,218

COSMETIC COMPOSITION CONTAINING A HYDROXYLATED AMINO THIOETHER FOR APPLICATION TO THE HAIR AND SKIN

Claude Bouillon, Eaubonne, and Charles Vayssie, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

Filed Sept. 27, 1973, Ser. No. 401,380

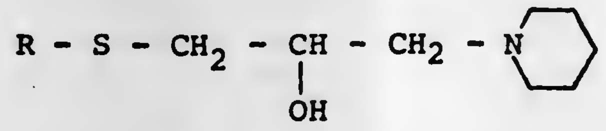
Claims priority, application Luxemburg, Sept. 29, 1972, 66207

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **18 Claims**

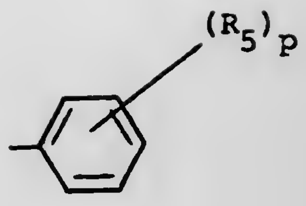
1. A cosmetic composition for combatting the greasy and unaesthetic appearance of the hair and to improve the appearance of the skin comprising in a solvent selected from the group consisting of water, lower alkanol and an aqueous solution of said lower alkanol, 0.1 to 20% by weight of an active component selected from the group consisting of:

1. a compound of the formula:

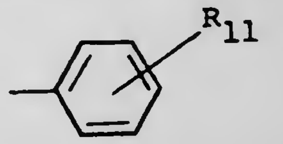


wherein

R is selected from the group consisting of
- i. linear or branched alkyl having 1–18 carbon atoms,
- ii. alkyl having 2–3 carbon atoms and substituted by 1–2 alcohol functions,
- iii. $-(CH_2)_nR_4$ wherein *n* is 0, 1 or 2 and R_4 is phenyl,
- iv. $-(CH_2)_qR'_4$ wherein *q* is 0 or 1 and R'_4 is



wherein *p* is 1, 2 or 3 in which instance R_5 is selected from the group consisting of F, Cl, Br and alkoxy having 1–5 carbon atoms or wherein *p* is 1 in which instance R_5 is selected from the group consisting of amino and dimethylamino,
- v. $-CH_2-CH_2-NH-Y$ wherein Y is selected from the group consisting of hydrogen, nicotinyl and COR_9 wherein R_9 is selected from the group consisting of hydrogen, alkyl having 1–18 carbon atoms and



wherein R_{11} is selected from the group consisting of H, F, Cl, Br and alkoxy having 1–4 carbon atoms, and
- vi. $-(CH_2)_s-COOH$ wherein *s* is 1–10, and

2. a salt of the compound in (1).

5. The composition of claim 1 wherein said active compound is 1-(2-hydroxy-3-phenylthio propyl) piperidine hydrochloride.

3,968,219

HYDROXY PHENYLBUTAZONE DERIVATIVES AND THEIR PREPARATION

Dieter Rahtz; Henning Koch, and Erich Gerhards, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

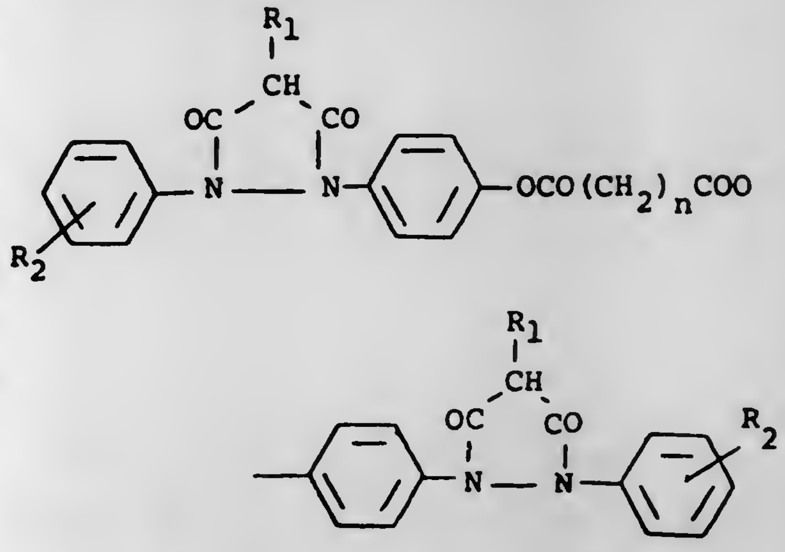
Filed July 28, 1975, Ser. No. 599,397

Claims priority, application Germany, July 29, 1974, 2436882

Int. Cl.² A61K *31/415*; **C07D** *231/34, 231/36*

U.S. Cl. 424—273 **14 Claims**

1. A hydroxyphenylbutazone derivative of the formula:



wherein *n* is an integer from 1 to 18, inclusive; R_1 is hydrocarbon of 3–9 carbon atoms, unsubstituted or substituted by oxo or interrupted by a thia, sulfinyl, or sulfonyl group, and R_2 is a hydrogen atom, a fluorine atom, a chlorine atom, alkyl of 1 to 4 carbon atoms, or trifluoromethyl.

13. A pharmaceutical composition comprising in unit dosage form an anti-inflammatory effective amount of at least one compound of claim 1 in admixture with a pharmaceutically acceptable carrier adapted for topical administration.

3,968,220
IMIDAZOLE INSECTICIDES

Patrick Mamalis, Reigate; Eric Arthur Stuart La Croix, Dorking, and Solomon Ezekiel Mhasalker, Worcester Park, all of England, assignors to Beecham Group Limited, Great Britain

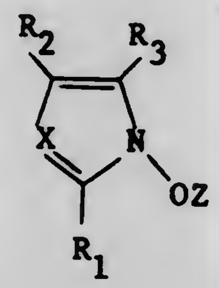
Division of Ser. No. 301,677, Oct. 27, 1972, Pat. No. 3,850,953. This application Sept. 5, 1974, Ser. No. 503,367

Claims priority, application United Kingdom, Nov. 13, 1971, 52810/71; Nov. 13, 1971, 52811/71

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—273 29 Claims

1. An insecticidal composition comprising an insecticidally effective amount of a compound of the formula:



wherein R_1 is hydrogen or alkyl of 1 to 6 carbon atoms, R_2 and R_3 are the same or different and each is hydrogen or alkyl of 1 to 6 carbon atoms,

X is N or N → 0, and

Z is $CONR_4R_5$ wherein R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, benzyl or phenyl and R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, in combination with a suitable carrier.

3,968,221
99M-TECHNETIUM LABELED TIN COLLOID RADIOPHARMACEUTICALS

Harry S. Winchell, Lafayette; Morton Barak, and Parmer Van Fleet, III, both of Walnut Creek, all of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Division of Ser. No. 250,738, May 5, 1972, Pat. No. 3,875,299. This application June 10, 1974, Ser. No. 477,864

Int. Cl.^{2} A61K *43/00;* **B65D** *25/08*

U.S. Cl. 424—1 3 Claims

1. A packaged reagent for preparing size-stabilized 99m-technetium labeled colloids consisting of a 1 millimolar colloid of hydrolyzed stannous chloride in sterile, pyrogen-free water aseptically enclosed in a nitrogen-purged ampule.

3,968,222
INSECTICIDAL O,S-DIALKYL ESTERS OF PYRIDYLTHIO-AND-PYRIDYLDITHIO-PHOSPHORIC ACIDS

Jozef Drabek; Ernst Beriger, both of Allschwil, and Beat Böhner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

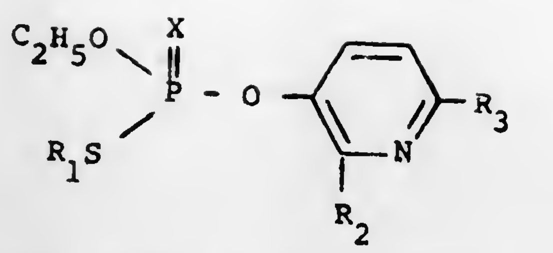
Division of Ser. No. 402,647, Oct. 1, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,539

Claims priority, application Switzerland, Oct. 13, 1972, 15040/72; Aug. 24, 1973, 12130/73

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—200 12 Claims

1. An insecticidal composition comprising (1) as active ingredient, an insecticidally effective amount of a compound of the formula



wherein

R_1 is n-propyl, isobutyl, sec.butyl or n-pentyl,

R_2 is hydrogen, chlorine, bromine, cyano, nitro, (C_1–C_4-alkoxy-carbonyl, mono(C_1–C_4-alkyl)-carbamoyl or di(C_1–C_4-alkyl) carbamoyl,

R_3 represents hydrogen, chlorine, bromine or methyl, and

X represents oxygen or sulphur, and (2) a suitable carrier.

3,968,223
CONTROL OF INSECTS AND ACARIDS WITH O-(2-VINYLPHENYL)-THIOLPHOSPHATES

Manfred Böger, Haltingen, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

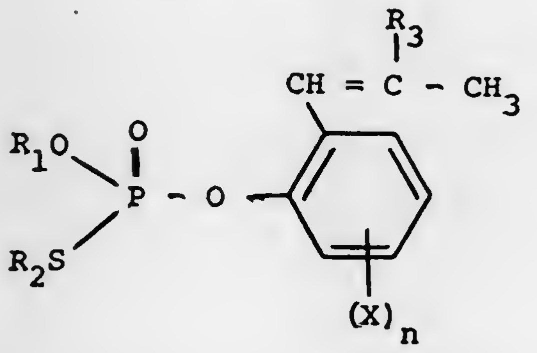
Division of Ser. No. 449,416, March 8, 1974, Pat. No. 3,898,306. This application May 27, 1975, Ser. No. 581,069

Claims priority, application Switzerland, Mar. 15, 1973, 3776/73; Jan. 30, 1974, 1261/74

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—219 10 Claims

2. A method for combatting insects or acarids which comprises applying thereto an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 represents methyl or ethyl; R_2 represents n-propyl, isopropyl, isobutyl, sec.butyl or n-amyl; R_3 repesents hydrogen or methyl; X represents hydrogen, halogen or methyl; and *n* is 1 to 3.

3,968,224
3-(4′-CHLOROPHENYL)-5-METHYL-4,5-DIHYDRO-1,2,4-OXADIAZOLE, ITS USE AS AN ANTI-INFLAMMATORY AGENT

Ferenc M. Pallos, Walnut Creek; Jack R. DeBaun, Sunnyvale, and Arnold D. Gutman, Berkeley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 572,686, April 28, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,603

Int. Cl.^{2} A61K *31/42*

U.S. Cl. 424—272 1 Claim

1. A method of treatment of an inflammatory condition in a mammal comprising administering to said mammal a therapeutically effective amount of 3-(4′-chlorophenyl)-5-methyl-4,5-dihydro-1,2,4′-oxadiazole.

3,968,225
PREPARATION OF SPHEROIDAL ALUMINA PARTICLES

Jacques Maurice Jules Ghislain André; Raymond Mark Cahen, both of Brussels; Henri Robert Debus, Meise; Rene Odon Lammers, Brussels, and Hugo Johannes van Thillo, Grimbergen, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,217

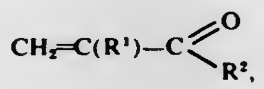
Claims priority, application Luxemburg, Feb. 18, 1974, 69408

Int. Cl.^{2} C01F *7/02*

U.S. Cl. 423—626 10 Claims

1. A process for preparing alumina beads from alumina hydrogel and alumina hydrosol comprising

a. preparing an aqueous mixture containing from 5–30% by weight alumina in the form of alumina hydrogel and alumina hydrosol in a weight ratio of hydrogel to hydrosol of between 99:1 and 50:50 and from 0.25–20% by weight of a water-soluble acrylic monomer which is polymerizable to an uncross-linked water-soluble polymer or an uncross-linked gel polymer, said acrylic monomer being of the formula



$$CH_2{=}C(R^1){-}C\begin{matrix}{=}O\\ {\setminus}R^2,\end{matrix}$$

wherein R^1 is selected from a group consisting of —H and —CH_3 and R^2 is selected from the group consisting of —OR^3 and —NR^3R^4, wherein R^3 and R^4 are selected from the group consisting of —H and a hydrophylic radical,

b. dispersing said aqueous mixture as droplets into a substantially water-immiscible fluid having a temperature of 50°–105°C. at atmospheric pressure to effect polymerization of said aqueous mixture,

c. maintaining said droplets in said fluid until individual hard beads are formed, and

d. drying and calcining said beads.

3,968,226
3-HETEROCYCLIC THIOMETHYLCEPHALOSPORINS AS ANTIBACTERIAL AGENTS

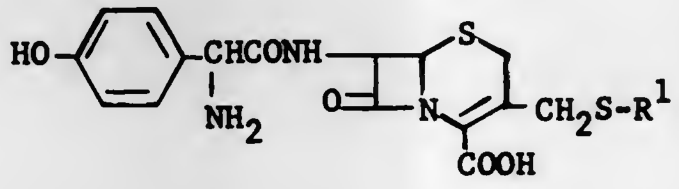
George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 262,903, June 14, 1972, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned. This application Sept. 30, 1974, Ser. No. 510,191

Int. Cl.^{2} A61K *31/54*

U.S. Cl. 424—246 10 Claims

1. A pharmaceutical composition comprising an antibacterially-effective amount of a compound of the formula



in which:

R^1 is tetrazol-5-yl, 1,3,4-thiadiazol-2-yl, 1,3,4-oxadiazol-2-yl, 1,2,4-triazol-3-yl, or 1,2,3-triazol-5-yl, each of such groups being unsubstituted or substituted with one or two lower alkyl groups of one to four carbon atoms,

or a nontoxic, pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier therefor.

3,968,227
GUANIDINO, THIOUREIDO AND ISOTHIOUREIDO DERIVATIVES CONTAINING IMIDAZOLE GROUPS

Graham John Durant, and Charon Robin Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

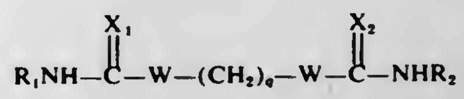
Filed Jan. 22, 1975, Ser. No. 542,971

Claims priority, application United Kingdom, Feb. 7, 1974, 5596/74

Int. Cl.^{2} C07D *233/64*

U.S. Cl. 424—273 19 Claims

1. A compound of the formula:



$$R_1NH{-}\overset{X_1}{\overset{\|}{C}}{-}W{-}(CH_2)_q{-}W{-}\overset{X_2}{\overset{\|}{C}}{-}NHR_2$$

wherein R_1 and R_2, which may be the same or different, each represent a grouping of the structure:

$$Het{-}(CH_2)_mZ\ {-}(CH_2)_n{-}$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; Z is sulphur or a methylene group; *m* is 0, 1 or 2; *n* is 2 or 3 and the sum of *m* and *n* is 3, 4 or when the adjoining X_1 or X_2 is sulphur, 2; X_1 and X_2, which may be the same or different, are each sulphur or NY wherein Y is hydrogen or lower alkyl; W is NH, and when X_1 and X_2 are NH, W may also be sulphur; and *q* is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

3,968,228
4-NITRO-5-CYANOIMIDAZOLES AS COCCIDIOSTATS

Dale R. Hoff, Basking Ridge; Peter Kulsa, Plainfield; Helmut H. Mrozik, Matawan, and Edward F. Rogers, Middletown, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 415,480, Nov. 13, 1973, abandoned, which is a continuation of Ser. No. 177,470, Sept. 2, 1971, abandoned. This application Feb. 10, 1975, Ser. No. 548,655

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 3 Claims

1. A composition useful for the prevention and treatment of coccidiosis which comprises an inert carrier vehicle and an active ingredient wherein said active ingredient is 1-methyl-2-(1-acetoxyethyl)-4-nitro-5-cyanoimidazole and said active ingredient is from about 0.00025% to 0.5% by weight of said composition.

3,968,229
ANTIMYCOTIC COMPOSITIONS

Wolfgang Krämer; Karl Heinz Büchel, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

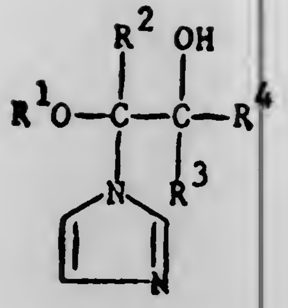
Filed June 21, 1974, Ser. No. 481,660

Claims priority, application Germany, June 30, 1973, 2333355

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 36 Claims

19. A method of treating mycoses in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable, nontoxic salt thereof, wherein
- R^1 is phenyl substituted by 1 to 3 halogen moieties;
- R^2 is hydrogen;
- R^3 is hydrogen; and
- R^4 is lower alkyl;

in combination with a pharmaceutically acceptable, nontoxic, inert diluent or carrier.

3,968,230
COMPOSITIONS CONTAINING BENZODIAZEPINDIONES AND METHOD OF USE

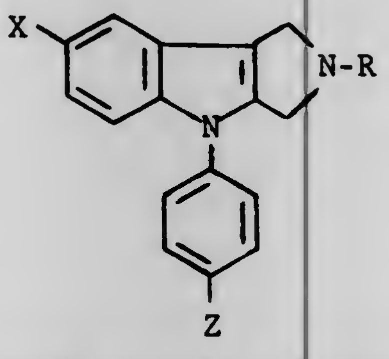
William Blythe Wright, Jr., Woodcliff Lake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 464,424, April 26, 1974, abandoned. This application June 16, 1975, Ser. No. 587,012
Int. Cl.² A61K *31/40*
U.S. Cl. 424—274 **3 Claims**

1. A method of treating anxiety in a warm-blooded animal which comprises administering internally to said warm-blooded animal an anti-anxiety amount of 1,2,3,11a-tetrahydro-10-methyl-5H-pyrrolo[2,1-c][1,4]benzodiazepin-5,11(10H)-dione and a pharmaceutically acceptable carrier therefor.

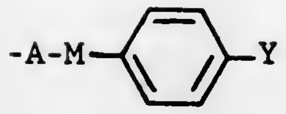
3,968,231
4-ARYL-1,2,3,4-TETRAHYDROPYRROLO(3,4-B)INDOLES FOR TREATING SCHIZOPHRENIC MANIFESTATIONS

Willard H. Welch, Jr., North Stonington, and Charles A. Harbert, Waterford, both of Conn., assignors to Bayer Aktiengesellschaft, Germany
Division of Ser. No. 456,641, April 1, 1974. This application June 23, 1975, Ser. No. 589,385
Int. Cl.² A61K *31/40*
U.S. Cl. 424—274 **6 Claims**

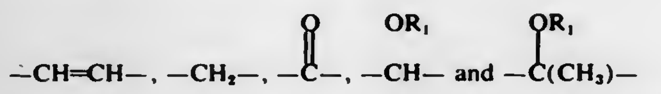
1. A method for treating schizophrenic manifestations in a mammal which comprises administering to a mammal having said manifestations, a tranquilizing amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein
- X is selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen;
- Z is selected from the group consisting of fluoro, chloro, methoxy and hydrogen; and
- R is selected from the group consisting of alkyl having 1 to 6 carbon atoms, benzyl, and substituted alkylene of the formula



wherein A is alkylene having 1 to 5 carbon atoms, M is selected from the group consisting of



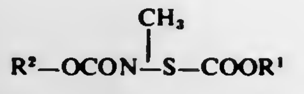
$$-CH{=}CH-,\ -CH_2-,\ -\overset{\overset{O}{\|}}{C}-,\ -\overset{OR_1}{CH}-\ \text{and}\ -\overset{\overset{OR_1}{|}}{C}(CH_3)-$$

wherein R_1 is selected from the group consisting of hydrogen and alkanoyl having 2 to 5 carbon atoms and Y is selected from the group consisting of fluoro, chloro, methyl and hydrogen.

3,968,232
N-METHYL-N-ALKOXYCARBONYLSULPHENYL-CARBAMATES

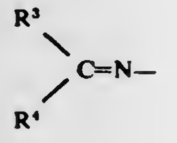
Peter Siegle, Cologne; Engelbert Kühle, Bergisch-Gladbach; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbruck, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 29, 1974, Ser. No. 518,837
Claims priority, application Germany, Nov. 20, 1973, 2357930
Int. Cl.² A01N *9/12*
U.S. Cl. 424—277 **10 Claims**

1. An N-methyl-N-alkoxycarbonylsulphenyl-carbamate of the formula



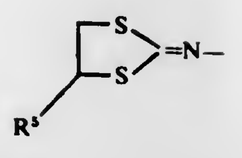
$$R^2-OCO\overset{\overset{CH_3}{|}}{N}-S-COOR^1$$

in which
- R^1 is C_{1-6} alkyl, and
- R^2 is phenyl; naphthyl; indanyl; phenyl, naphthyl or indanyl substituted by trihalomethyl, halogen, nitro, nitrile, dioxanyl, dioxolanyl, methyl-dioxanyl, methyl-dioxolanyl, alkyl, cyclopentyl, cyclohexyl, alkenyl, alkynyl, alkoxy, dialkoxymethyl, alkenoxy, alkynoxy, alkylmercapto, alkenylmercapto, alkynylmercapto or dialkylamino, with up to 6 carbon atoms in each alkyl, alkoxy, alkenyl, alkenoxy, alkynyl or alkynoxy group; a radical of the formula



$$\genfrac{}{}{0pt}{}{R^3\diagdown}{R^4\diagup}C{=}N-$$

in which
- R^3 and R^4 are each alkyl or alkylthio of 1 to 6 carbon atoms, nitrile or phenyl; or

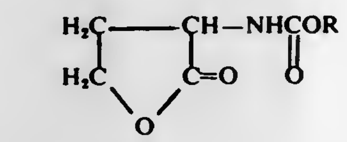


in which
- R^5 is hydrogen or C_{1-6} alkyl.

3,968,233
α-AMINO-γ-BUTYROLACTONES AS SEDATIVES

Aldo Garzia, Milan, Italy, assignor to Istituto Chemioterapico Italiano, Milan, Italy
Division of Ser. No. 421,899, Dec. 5, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,163
Int. Cl.² A61K *31/34, 31/365*
U.S. Cl. 424—279 **5 Claims**

1. A method for treating animals in need of sedation by administering thereto orally or intraperitoneally a compound represented by the formula

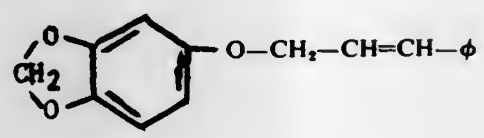


where R is alkyl of 3–5 carbon atoms, at a dosage of about 200 mg/kg to 2000 mg/kg.

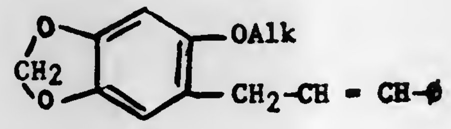
3,968,234
CINNAMYL-SESAMOL DERIVATIVES AS INSECT CHEMOSTERILANTS

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Mar. 5, 1975, Ser. No. 555,488
Int. Cl.² A01N *9/28;* **C07D** *317/06*
U.S. Cl. 424—282 **18 Claims**

1. The compound of the structure



14. A method of causing sexual sterility in flies, which comprises
providing for ingestion by the flies a food containing a compound of the structure

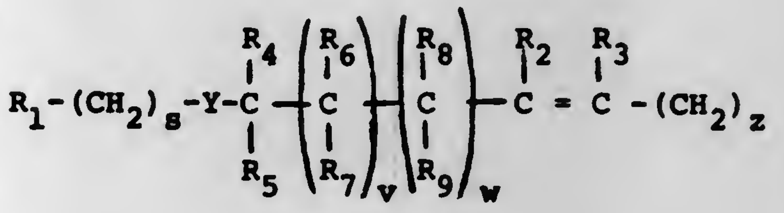


wherein Alk is an alkyl radical containing 1 to 4 carbon atoms, in an amount insufficient to kill the flies but sufficient to induce sexual sterility therein.

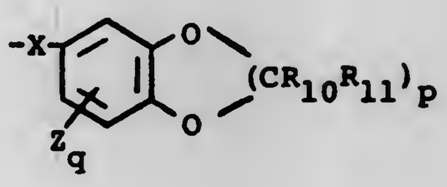
3,968,235
COMPOSITION AND METHOD FOR COMBATING INSECTS WITH ALKYLENEDIOXYPHENYL DERIVATIVES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland
Continuation-in-part of Ser. No. 207,633, Dec. 13, 1971, Pat. No. 3,829,442. This application May 23, 1974, Ser. No. 472,918
Claims priority, application Switzerland, Dec. 14, 1970, 18472/70; Sept. 17, 1971, 13599/71; Oct. 6, 1971, 14521/71; Nov. 11, 1971, 16357/71
Int. Cl.² A01N *9/28*
U.S. Cl. 424—282 **12 Claims**

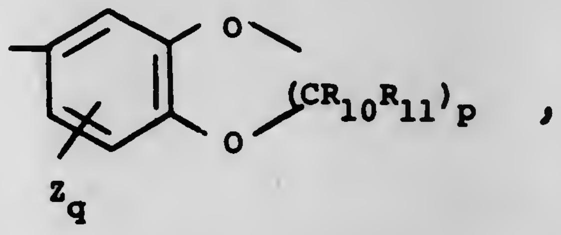
1. A method of combating insects in a locus comprising applying to the locus between 1 to 10 kilograms/hectare of a compound of the formula:



$$R_1-(CH_2)_s-Y-\overset{\overset{R_4}{|}}{\underset{\underset{R_5}{|}}{C}}-\left(\overset{\overset{R_6}{|}}{\underset{\underset{R_7}{|}}{C}}\right)_v-\left(\overset{\overset{R_8}{|}}{\underset{\underset{R_9}{|}}{C}}\right)_w-\overset{\overset{R_2}{|}}{C}=\overset{\overset{R_3}{|}}{C}-(CH_2)_z$$



wherein
- Z is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 12 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkenyloxy of 2 to 12 carbon atoms, formyl, alkyl carbonyl of 2 to 6 carbon atoms, alkoxy carbonyl of 2 to 6 carbon atoms, mono- or di-alkyl substituted carbamoyl each alkyl substituent of which being of 1 to 5 carbon atoms, alkoxy methylene of 2 to 6 carbon atoms, alkylthio of 1 to 5 carbon atoms, fluoro, chloro, bromo, cyano or nitro,
- R_{10} and R_{11} are independently hydrogen or alkyl of 1 to 5 carbon atoms,
- *p* is 1 or 2,
- *q* is 0 or 1,
- R_1 is alkyl of 1 to 11 carbon atoms, an acylcic hydrocarbon of up to 11 carbon atoms having one or two double bonds or one triple bond, cycloalkyl of 4 to 7 carbon atoms, cycloalkyl of 4 to 7 carbon atoms substituted by alkyl of 1 to 5 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms substituted by alkyl of 1 to 5 carbon atoms, phenyl or



- R hd 2, R_3, R_4, R_5, R_6, R_7, $R_8$and R_9 are independently hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 6 carbon atoms,
- Y is oxygen or sulfur,
- X is oxygen, sulfur, $-OCH_2-$ or $-SCH_2-$,
- *s*, *v* and *w* are independently 0 or 1, and
- *z* is 1, 2 or 3.

3,968,236

2-AMINOMETHYL-5-HYDROXY-4H-PYRAN-4-ONE AND DERIVATIVES THEREOF

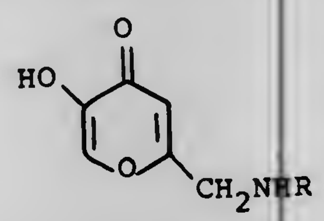
Joseph G. Atkinson, Montreal; Joshua Rokach, Laval, and Clarence S. Rooney, Beaconsfield, all of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 22, 1975, Ser. No. 542,977

Int. Cl.^{2} C07D *309/22;* A01N *9/28*

U.S. Cl. 424—283 **6 Claims**

1. A compound having the structural formula:



wherein R is hydrogen or an α-amino acid acyl moiety or a pharmaceutically acceptable salt thereof.

3,968,237

LOCAL ANAESTHETIC

Alexei Nikolaevich Grinev, ulitsa Volgina, 15, korpus 2, kv. 57, Moscow; Alexandr Alexandrovich Stolyarchuk, ulitsa R. Ljuxemburg, 1, kv. 12, Vinnitsa; Pavel Alexandrovich Galenko-Yaroshevsky, ulitsa Kosmonavtov, 52, kv. 14, Vinnitsa; Vladimir Spiridonovich Tantsjura, ulitsa Litvinenko, 2, kv. 5, Vinnitsa, and Natalya Vitalievna Arkhangelskaya, Krasnoprudnaya ulitsa, 26, kv. 36, Moscow, all of U.S.S.R.

Filed Apr. 9, 1974, Ser. No. 459,418

Claims priority, application U.S.S.R., Apr. 13, 1973, 1912333

Int. Cl.^{2} A61K *31/34*

U.S. Cl. 424—285 **3 Claims**

1. A local anaesthetic composition comprising an amount sufficient to produce a local anaesthetic effect of 2-methyl-3-carbethoxy-4-chloro-5-hydroxy-6-dimethylaminomethylbenzofuran in the form of a salt selected from the group consisting of the tartaric and hydrochloric acid salts and in a pharmaceutically acceptable aqueous solvent.

3,968,238

5-ACETYL FURFURYLESTER OF CHRYSANTHEMUMIC ACID

Yoshio Katsuda, Osaka, Japan, assignor to Dainippon Jochugiku Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 399,418, Sept. 21, 1973, which is a division of Ser. No. 112,061, Feb. 2, 1971, Pat. No. 3,796,730, which is a continuation-in-part of Ser. Nos. 691,173, Dec. 18, 1967, abandoned, and Ser. No. 809,036, March 20, 1969, abandoned, which is a division of Ser. No. 629,422, April 10, 1967, abandoned, and a continuation-in-part of Ser. No. 691,173. This application July 30, 1975, Ser. No. 600,425

Claims priority, application Japan, June 28, 1966, 41-42289; Aug. 24, 1966, 41-55930; Dec. 23, 1966, 41-84365

Int. Cl.^{2} C07D *307/12*

U.S. Cl. 424—285 **5 Claims**

1. 5-acetylfurfurylester of chrysanthemumic acid.

3,968,239

FUNGICIDAL COMPOSITIONS CONTAINING A PHTHALONITRILE

Fred E. Ferguson, and Robert J. Bell, both of Marysville, Ohio, assignors to O. M. Scott & Sons Company, Marysville, Ohio

Filed Mar. 7, 1975, Ser. No. 556,488

Int. Cl.^{2} A01N *9/20, 9/24*

U.S. Cl. 424—304 **8 Claims**

1. A fungicidal composition in granular form comprising a mixture of (a) tetrachloroisophthalonitrile, (b) for each 1275 grams of the phthalonitrile, from about 200 to 1800 ml of octyl phenoxy polyethoxy ethanol having 9 to 10 oxyethylene groups, and (c) a carrier to which the fungicide is adhered, said carrier having a bulk density of at least 20 lbs. per cu. ft.

3,968,240

α-CHLORO-O-ACYLBENZALDOXIME DERIVATIVES AS SLIME CONTROL AGENTS

Nobuyasu Takahashi, Koshigaya; Taiichi Yamaguchi, Kasuhabe; Junei Sakaguchi, Kawasaki, and Hideo Hamada, Soka, all of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan

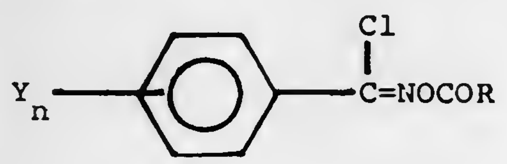
Continuation-in-part of Ser. No. 341,651, March 15, 1973, abandoned. This application May 21, 1975, Ser. No. 579,744

Claims priority, application Japan, Mar. 16, 1972, 47-26748

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—311 **26 Claims**

1. A slime control composition for paper and pulp manufacturing comprising an organic solvent selected from the group consisting of diethylene glycol monomethyl ether, trimethyl benzene, dimethylformamide, and xylene and as an effective component in said composition about 2.5 to about 40 parts per million of an α-chloro-o-acylbenzaldoxime derivative represented by the formula



wherein Y represents chlorine, nitro, methyl, isopropyl, methoxy, dimethylamino, propionyloxy or acetoxy; R· represents methyl, ethyl or monochloromethyl; and *n* represents 0 or an integer of 1–3.

3,968,241

METHOD OF TREATING CARDIAC ARRHYTHMIAS AND OF IMPROVING MYOCARDIAL CONTRACTILITY AND SYSTOLIC RHYTHM WITH CARNITIVE OR A PHARMACEUTICALLY ACCEPTABLE SALT THEREOF

Stephen L. DeFelice, 430 Topping Hill Road, Westfield, N.J. 07090

Continuation-in-part of Ser. No. 303,772, Nov. 6, 1972, Pat. No. 3,830,931. This application July 2, 1974, Ser. No. 485,301

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.^{2} A61K *31/195*

U.S. Cl. 424—319 **7 Claims**

1. A method of treating cardiac arrhythmias in humans and animals which comprises administering to a human or an animal in need thereof an amount of β-hydroxy-γ-trimethylaminobutyric acid or a pharmaceutically acceptable non-toxic salt thereof sufficient to decrease or eliminate the arrhythmia.

3,968,242

SULFONAMIDOAMINOPROPIOPHENONE INTERCEPTIVE PROCESS

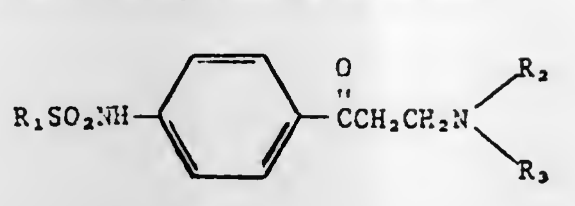
Duane G. Gallo, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 26, 1974, Ser. No. 500,808

Int. Cl.^{2} A61K *31/18*

U.S. Cl. 424—321 **6 Claims**

1. A process for interrupting pregnancy in a pregnant female mammal capable of resorbing an implanted fertilized ovum comprising orally or parenterally administering to said mammal an interceptive agent during the interceptive stage in an effective dose to cause resorption of said implanted fertilized ovum and said interceptive agent is a p-sulfonamidoaminopropiophenone of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein

R_1 is methyl or ethyl;
R_2 is methyl; and
R_3 is lower alkyl of 1 to 5 carbon atoms inclusive or aralkyl up to 10 carbon atoms inclusive.

3,968,243

SUBSTITUTED GUANIDINE COMPOUNDS IN THE TREATING OF ARRYTHMIAS

Robert Arthur Maxwell, Raleigh, N.C., and Eric Walton, Wrotham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

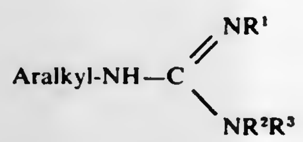
Division of Ser. No. 150,185, June 4, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 434,947

Claims priority, application United Kingdom, June 5, 1970, 27220/70; June 5, 1970, 27221/70; June 5, 1970, 27222/70

Int. Cl.^{2} A61K *31/155*

U.S. Cl. 424—326 **26 Claims**

1. A method for the treatment of cardiac arrhythmias in a mammal which has had cardiac arrythmias which comprises the administration to the mammal of a non-toxic, effective antiarrhythmic treatment amount of a pharmaceutically acceptable acid addition salt of the compound of the formula



wherein 'Aralkyl' is selected from the group consisting of unsubstituted benzyl and β-phenethyl, two of the groups R^1, R^2 and R^3 are methyl and the third group is hydrogen, provided always that R^2 and R^3 are both methyl and R^1 is hydrogen when 'Aralkyl' is unsubstituted benzyl.

3,968,244

CHEMOSTERILANT AND LARVICIDAL IMIDOTHIOCARBONATES

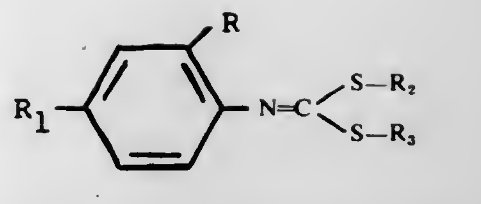
William Wayne Brand, Hopewell, and Michael Stanley Schrider, South Bound Brook, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 410,842, Oct. 28, 1973, Pat. No. 3,892,761. This application Jan. 14, 1975, Ser. No. 540,935

Int. Cl.^{2} A01N *9/20, 9/22*

U.S. Cl. 424—330 **10 Claims**

1. A method of controlling ticks which comprises contacting said ticks with a fecundity-suppresing amount of a dithioimidocarbonate ester of the formula:



wherein R is chloro or methyl, R_1 is chloro or methyl, and R_2 and R_3 are each selected from the group consisting of lower alkyl, lower alkylthiomethyl, allyl, 2-chloroallyl, 2-methylallyl, propargyl, benzyl and 4-pyridylmethyl with the proviso that R_2 and R_3 cannot both be lower alkyl.

3,968,245

SYMPATHOMIMETIC TOPICAL AND PERCUTANEOUS ADMINISTRATION WITH HALOGENATED PROMOTERS

Takeru Higuchi, Lawrence, Kans., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 406,011, Oct. 12, 1973, Pat. No. 3,891,757, which is a continuation-in-part of Ser. No. 197,919, Nov. 11, 1971, Pat. No. 3,787,571. This application May 1, 1975, Ser. No. 573,468

Int. Cl.^{2} A61K *31/135, 31/045, 47/00*

U.S. Cl. 424—330 **6 Claims**

1. A pharmaceutical composition of matter comprising a first ingredient selected from the group of pharmaceutically acceptable topical and percutaneous absorption promoters consisting of trichloroethanol, trifluoroethanol and mixtures thereof, and about 0.01 to 30% of at least one local, topically administered sympathomimetic drug as a second ingredient, and wherein when topically administered, the first ingredient is a promoter for increasing topical retention and percutaneous absorption of a therapeutically effective amount of the second sympathomimetic ingredient.

3,968,246

DISINFECTING WITH N-TRIMETHYLBENZYL ETHYLENEDIAMINE

John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 549,170, Feb. 12, 1975, which is a division of Ser. No. 360,448, May 15, 1974, Pat. No. 3,886,284, which is a continuation-in-part of Ser. No. 291,824, Sept. 25, 1972, Pat. No. 3,837,197, which is a continuation-in-part of Ser. No. 130,783, April 2, 1971, Pat. No. 3,821,407. This application July 10, 1975, Ser. No. 594,581

Int. Cl.^{2} A61K *31/135*

U.S. Cl. 424—330 **3 Claims**

1. A method of disinfecting a surface which comprises applying to said surface an effective amount sufficient to disinfect said surface of N-trimethylbenzyl ethylenediamine.

3,968,247

SUBSTITUTED OR UNSUBSTITUTED P-ALKANOYL TOLUENES AS ANTI-DIABETIC AGENTS

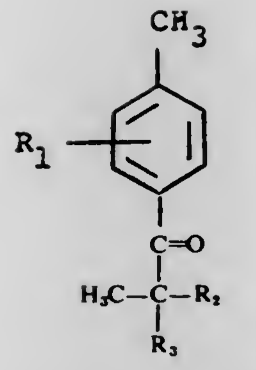
Robert S. Ho, Denville; William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, all of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 546,756, Feb. 3, 1975, Pat. No. 3,924,003, which is a continuation-in-part of Ser. No. 445,265, Feb. 25, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 605,973

Int. Cl.^{2} A61K *31/12*

U.S. Cl. 424—331 **5 Claims**

1. A method for treating diabetes which comprises administering to a mammal in need of said treatment an anti-diabetic effective amount of a compound of the formula



where

R₁ represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy, and

R₂ and R₃ each independently represent alkyl having 1 to 2 carbon atoms.

3,968,248

METHOD AND SPORICIDAL COMPOSITIONS FOR SYNERGISTIC DISINFECTION OR STERILIZATION

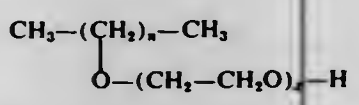
Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 155,233, June 21, 1971, abandoned. This application July 16, 1975, Ser. No. 596,372

Int. Cl.² A01N *9/24*

U.S. Cl. 424—333 **3 Claims**

1. A sterilization and disinfectant composition comprising from about 0.1% to about 5% of glutaraldehyde and from about 0.01 to 1% of a nonionic surface active agent which is an ethoxylate of isomeric linear alcohols having the following formula:



$$\begin{array}{l} CH_3-(\underset{|}{C}H_2)_n-CH_3 \\ \quad\;\; O-(CH_2-CH_2O)_x-H \end{array}$$

wherein *n* is 9 to 13 and *x* is 9 to 13.

3,968,249

METHOD OF TREATING MALIGNANT NEOPLASTIC DISEASE

Jack Bernstein, New Brunswick, and Barbara Stearns, Highland Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 253,031, Jan. 22, 1963, abandoned, which is a continuation-in-part of Ser. No. 862,452, Dec. 29, 1959, abandoned. This application May 15, 1968, Ser. No. 729,450

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **10 Claims**

1. A method of treating malignant neoplastic disease which comprises administering to a host afflicted with such disease a composition comprising about 50 mg. to about 4 gm. of hydroxyurea in pharmaceutical dosage form.

3,968,250

METHOD AND SPORICIDAL COMPOSITIONS FOR SYNERGISTIC DISINFECTION OR STERILIZATION

Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems, Inc., New York, N.Y.

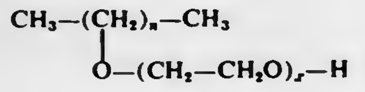
Continuation-in-part of Ser. No. 486,210, July 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 155,233, June 21, 1971, abandoned. This application July 16, 1975, Ser. No. 596,289

The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.

Int. Cl.² A01N *9/24*

U.S. Cl. 424—333 **5 Claims**

1. A method of disinfecting and sanitizing fowl eggs comprising contacting said eggs with a sufficient amount of a composition to disinfect and sanitize comprising from about 0.02% to about 5% of glutaraldehyde and from about 0.01% to 1% of a nonionic surface active agent which is an ethoxylate of isomeric linear alcohols having the following formula:



$$\begin{array}{l} CH_3-(\underset{|}{C}H_2)_n-CH_3 \\ \quad\;\; O-(CH_2-CH_2O)_x-H \end{array}$$

wherein *n* is 9 to 13 and *x* is 9 to 13.

3,968,251

ARYLACETYLENE COMPOUNDS AS ANTITHROMBOTIC AGENTS

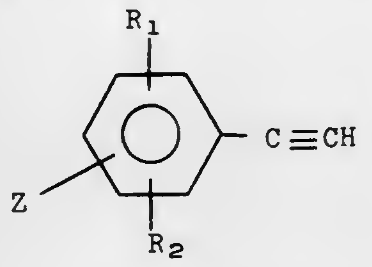
William B. Lacefield, and Winston S. Marshall, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 485,877, July 5, 1974, Pat. No. 3,928,604. This application Aug. 25, 1975, Ser. No. 607,173

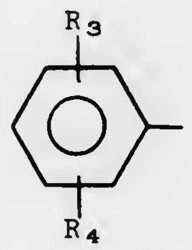
Int. Cl.² A61K *31/085, 31/09, 31/015*

U.S. Cl. 424—340 **6 Claims**

1. A method of treating vascular thrombosis in warm-blooded animals which comprises administering to a warm-blooded animal in need of such treatment an amount effective for treating vascular thrombosis of an arylacetylene of the formula,



wherein R₁ and R₂ are monovalent groups independently selected from the group consisting of hydrogen, C_1–C_3 alkyl, and C_1–C_3 alkoxy; and Z is a monovalent group of the formula,



wherein R₃ and R₄ are monovalent groups independently selected from the group consisting of hydrogen, C_1–C_3 alkyl, and C_1–C_3 alkoxy, with the proviso that at least one of R₁, R₂, R₃, and R₄ must be other than hydrogen.

3,968,252

DERIVATIVES OF CERTAIN GERANYL PHENYL ETHERS AND THEIR USE IN CONTROLLING INSECTS

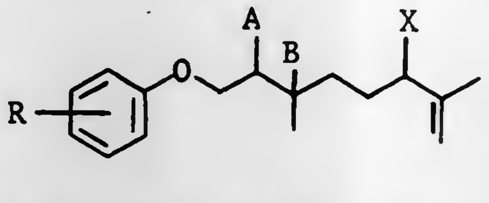
Ferenc M. Pallos, Walnut Creek, and Chien K. Tseng, El Cerriot, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 376,772, July 5, 1973, Pat. No. 3,888,987, which is a division of Ser. No. 198,018, Nov. 4, 1971, Pat. No. 3,772,365. This application Mar. 6, 1975, Ser. No. 555,764

Int. Cl.² A01N *9/12, 9/14*

U.S. Cl. 424—337 **7 Claims**

1. A method of controlling *Tenebrio molitor* comprising applying thereto at any stage of their development a metamorphosis hindering amount of a compound of the formula:



in which R is 4-alkyl having 1 to 4 carbon atoms; or 4-alkylthio having 1 to 4 carbon atoms; X is chlorine or bromine; and A and B together form a bond.

3,968,253

FEED ADDITIVE FOR RUMINANTS

Heidrun Bertram, Grossauheim; Rudolf Fahnenstich, Mombris, and Herbert Tanner, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

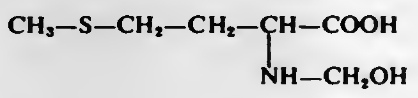
Filed Feb. 13, 1974, Ser. No. 441,983

Claims priority, application Germany, Feb. 16, 1973, 2307836

Int. Cl.² A23X *1/22*

U.S. Cl. 426—2 **5 Claims**

1. A process of supplying methionine to a ruminant comprising feeding the ruminant a basic feed composition including an additive consisting essentially of N-hydroxymethyl methionine of the formula



$$CH_3-S-CH_2-CH_2-\underset{\displaystyle NH-CH_2OH}{\underset{|}{C}H}-COOH$$

or a non-toxic salt thereof.

3,968,254

METHOD OF PREPARING FEED GRAIN COMPOSITIONS

Robert A. Rhodes; William L. Orton, and Bernard A. Weiner, all of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 23, 1975, Ser. No. 589,656

Int. Cl.² A23K *1/00*

U.S. Cl. 426—18 **10 Claims**

1. A method of preparing animal feed grain compositions comprising the steps of:

a. mixing from 2 to 15 parts dry weight basis (dwb) of animal feedlot waste (FLW) with 100 parts dwb of fragmented grain (FG) and an amount of water such that the resulting mixture contains from 35% to 45% moisture; and

b. aerobically fermenting the mixture resulting from step (a) while submitting said mixture to a tumbling action for a time sufficient to obtain a pH in the mixture of from 4 to 5.

3,968,255

METHOD OF PREPARING ANIMAL FOOD OF INCREASED PALATABILITY

Gerhard Julius Haas, Woodcliff Lake, N.J., and Joaquin Castro Lugay, Thornwood, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 461,831, April 8, 1974, Pat. No. 3,857,968, which is a continuation-in-part of Ser. No. 346,364, March 29, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,620

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.² A23K *1/10*

U.S. Cl. 426—33 **25 Claims**

1. A process for improving the palatability of an animal food which comprises:

conditioning an aqueous meat slurry, comprising fat and protein, by emulsifying the fat in the meat slurry with the water present in the slurry, and treating the meat slurry, containing the emulsified fat and the protein, with lipase and protease in amounts, under conditions of pH and temperature, and for a time, effective to cause an enzymatic reaction resulting in the production of a palatability improving composition; and

incorporating the palatability improving composition into the animal food in an amount which is effective to increase the palatability of the animal food.

3,968,256

PREPARATION OF COTTAGE CHEESE

Edmond L. Sing, 3860 Cheviot Place, Indianapolis, Ind. 46226

Continuation of Ser. No. 109,697, Jan. 25, 1971, abandoned. This application July 2, 1973, Ser. No. 375,329

Int. Cl.² A23C *19/02, 19/10*

U.S. Cl. 426—38 **11 Claims**

1. A convenient method for improving flavor and keeping characteristics of cottage cheese which comprises:

adding to the cottage cheese, or its creaming mixture, sufficient culture preparation of *Streptococcus diacetilactis*, said culture preparation selected from the group consisting of freeze dried culture, frozen concentrated cells, and freeze dried concentrated cells, to cause a concentration of cells in the cottage cheese from 1.0 × 10^6 cells per gram to 2 × 10^8 cells per gram of cottage cheese.

3,968,257

PROCESSES FOR THE PRODUCTION OF PROTEIN-CONTAINING NUTRIMENTS AND FODDERS

Hans Müller, 8708 Mannedorf, Zurich, Switzerland

Continuation-in-part of Ser. No. 392,806, Aug. 29, 1973, abandoned. This application June 9, 1975, Ser. No. 585,291

Claims priority, application Switzerland, Sept. 6, 1972, 13177/72; Oct. 13, 1972, 15058/72; Apr. 16, 1973, 5384/73

Int. Cl.² A23C *21/00*

U.S. Cl. 426—41 **5 Claims**

1. In a process for the production of an essentially solid protein-rich nutriment and fodder from whey which comprises propagating a lactose-fermenting yeast of the genus Saccharomyces in a liquid whey, the improvement which comprises cultivating the yeast in a whey containing at least a substantial portion of its original soluble proteins and, after conclusion of the propagation, separating the solids from the resulting brew by means of an ultrafilter provided with one or more ultrafiltration membranes that are essentially impervious to soluble proteins, and subsequently drying the said solids.

3,968,258
PROCESS FOR THE PRODUCTION OF HIGH-PROTEIN PASTA UTILIZING DRIED YEAST AND THE RESULTING PRODUCT

Cavit Akin, Warrenville, and Philip George Schnell, Wheaton, all of Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed June 9, 1975, Ser. No. 584,898
Int. Cl.² A23L *1/16*
U.S. Cl. 426—62 **17 Claims**

1. In a process of preparing pasta wherein flour and liquid are mixed to form a pasta dough which is thereafter shaped and dried, the improvement which comprises incorporating a protein-containing material selected from the group consisting of (1) Torutein dried yeast and (2) Torutein dried yeast and plant protein mixture, into said pasta dough; said yeast being an amount sufficient to hold the texture of the pasta together, reduce the amount of solubles lost during cooking and impart retort stability.

3,968,259
SILAGE PRESERVATIVE

Jack P. Henry, and James D. Myers, both of Eagle Grove, Iowa, assignors to M & M Livestock Products Co., Inc., Eagle Grove, Iowa
Filed Mar. 6, 1975, Ser. No. 555,812
Int. Cl.² A23K *3/03*
U.S. Cl. 426—63 **8 Claims**

1. A silage preservative comprising an enzyme mixture of protease, amylase, and gumase in combination with mixture (*a*) which contains calcium propionic and salts of potassium, sodium and magnesium, and mixture (*b*) containing phosphorus, Fe, Cu, Co, I, Mn, and Zn wherein said phosphorus is present as a phosphate, said iodine is present as iodide ion, wherein each of said Fe, Cu, Co, Mn and Zn is present as a salt or an oxide of the metal, wherein said mixture (*a*) comprises 90 to 98 percent by weight of the preservative and said mixture (*b*) comprises 1.0 to 5.0 percent by weight of the preservative; wherein said preservative is capable of effecting an 8 percent increase in the amount of digestable protein contained in silages after storage.

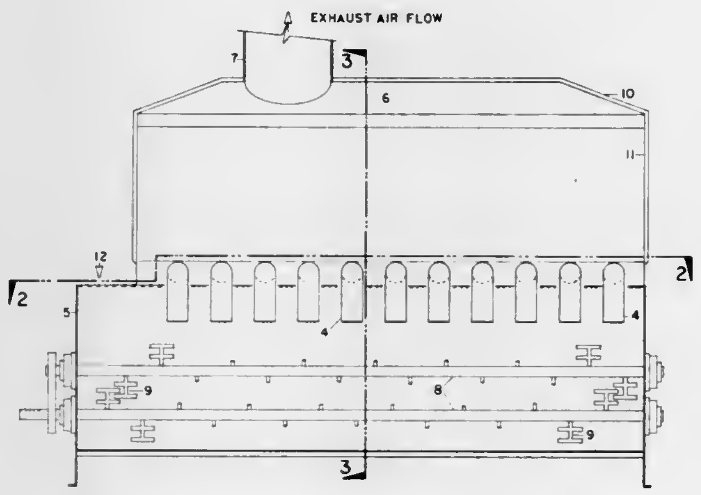
6. A method of preserving digestable protein in silages comprising mixing a preservative with silages, said silages being grain silages, haylages, oatlages or mixtures thereof;
 wherein said preservative comprises an enzyme mixture of protease, amylase, and gumase in combination with mixture (*a*) which contains calcium propionate and salts of potassium, sodium and magnesium, and mixture (*b*) containing phosphorus, Fe, Cu, Co, I, Mn, and Zn wherein said phosphorus is present as a phosphate, said iodine is present as iodide ion, wherein each of said Fe, Cu, Co, Mn and Zn is present as a salt or an oxide of the metal, wherein said mixture (*a*) comprises 90 to 98 percent by weight of the preservative and said mixture (*b*) comprises 1.0 to 5.0 percent by weight of the preservative; wherein said preservative is capable of effecting an 8 percent increase in the amount of digestable protein contained in silages after storage.

3,968,260
PRODUCT AND PROCESS FOR PRODUCING DEHYDRATED GRANULAR POTATO PRODUCT HAVING HIGH COLD WATER ADSORPTION

Mounir A. Shatila, and Robert M. Terrell, both of Blackfoot, Idaho, assignors to American Potato Company, Vacaville, Calif.
Continuation of Ser. No. 344,052, March 22, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,837
Int. Cl.² A23B *4/04*
U.S. Cl. 426—96 **29 Claims**

1. A direct process for the production of dehydrated granular potato product having a high cold water adsorption essentially consistng of the following steps:

a. preparing potatoes for cooking;
b. cooking the prepared potatoes;
c. mixing uniformly with the cooked potatoes, a starch complexing emulsifier in the concentration of about 0.30–2.0% by weight of the total solid matter, to coat the surface of the cells of the cooked potatoes with the emulsifier and directly
d. granulating the mixture of step (c) by
 1. mixing the mixture using sufficient mixing action to expose continually new surfaces for drying without rupturing the coated cells and by
 2. reducing the moisture of the mixture to about 25 to 30% by injecting heated air below about 500°F on the surfaces of the mixture so that intact potato cells and agglomerates of intact cells are separated from the mixture, performing steps (c) and (d) before any significant conditioning of said mixture can take place;
e. airlifting the granulated cells and agglomerates by entrainment in the heated air,
f. separating the airlifted materials from entrainment in the heated air; and
g. drying the separated materials to a final moisture content of about 7–8% whereby the conversion of amylose to its insoluble retrograded form is prevented.



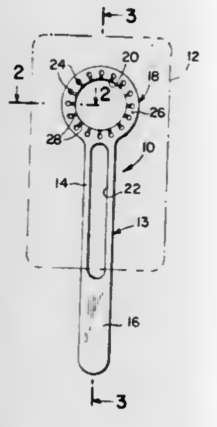
3,968,261
METHOD AND COMPOSITION FOR PREPARING A WHIPPED SALAD DRESSING

Louis P. Goodman, Lake Hiawatha, N.J., assignor to Kraftco Corporation, Glenview, Ill.
Filed July 9, 1975, Ser. No. 594,197
Int. Cl.² A23L *1/24*
U.S. Cl. 426—98 **22 Claims**

1. A dry, particulate, composition which when reconstituted and whipped is adapted for blending with pourable salad dressings to provide a whipped salad dressing said composition comprising a hard fat having an SFI in the range of from about 50 to 70 at 70°F and an I.V. in the range of from about 3 to 15, a liquid oil having an SFI in the range of from about 0 to 10 at 70°F and an I.V. in the range of from about 50 to 130, the ratio of said hard fat to said liquid oil being from about 1:1 to about 1:2 on a weight basis, monoester whipping agent, a proteinaceous film forming agent, and a hydrocolloid, said fat and said oil being encapsulated in said proteinaceous film forming agent.

3,968,262
COMBINED CONFECTION AND BUBBLE-FORMING DEVICE

Nicholas S. Hodska, Stratford, Conn., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Continuation-in-part of Ser. No. 473,348, May 28, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,061
Int. Cl.² A23G *3/00, 9/00;* A63H *33/28*
U.S. Cl. 426—134 **3 Claims**



1. In combination with a body of edible material, a support comprising: a generally planar annular head within said body, said head being characterized by generally circular outside and inside diameters, said inside diameter defining a central opening through said head thereby permitting the support to serve as a bubble forming member for use with a soap solution once said body is consumed, an elongated stem extending radially from said head, said stem including a first portion lying outside of said body serving as a handle, an array of apertures through said head at angularly spaced apart positions intermediate said inside and outside diameters for storing said soap solution; and plural radially directed angularly spaced apart grooves in the surface of said head communicating between the apertures and the central opening for conveying said soap solution to said central opening, said body of edible material extending into said central opening and into said apertures for locking said body on said support.

3,968,263
BEVERAGE MIX AND METHOD

George H. Reussner, Pearl River, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Continuation-in-part of Ser. No. 360,215, May 14, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,531
Int. Cl.² A23L *2/02*
U.S. Cl. 426—250 **10 Claims**

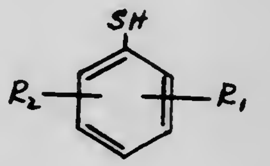
1. A dry mix for forming a low pH beverage with water, wherein each quantity of mix for preparing one quart of beverage comprises: suitably effective amounts of flavoring and coloring, from 0.08 to 0.2 gram equivalents of a food acidulent, sufficient buffering material to achieve a final beverage pH of from 2.5 to 3.5, and from 1 to 6 grams of tricalcium phosphate.

6. In a method for preparing a low pH beverage which would have a normal tendency toward demineralizing tooth enamel, each quart of beverage containing suitably effective amounts of flavoring and coloring, from 0.08 to 0.2 gram equivalents of a food acidulent, and sufficient buffering material to achieve a final beverage pH of from 2.5 to 3.5, the improvement which comprises adding from 1 to 6 grams of tricalcium phosphate to each quart of beverage to thereby reduce the tendency of the beverage toward demineralizing tooth enamel.

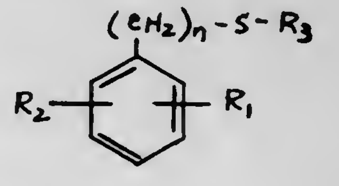
3,968,264
FLAVORING AGENT

Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland
Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,820
Int. Cl.² A23L *1/234*
U.S. Cl. 426—535 **38 Claims**

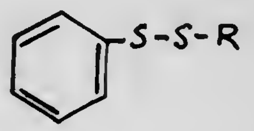
1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formulae:



wherein R1 is hydrogen, hydroxyl methyl, ethyl, methoxy, or ethoxy and R2 is methyl or hydrogen; and



wherein R1 is hydrogen, hydroxyl methyl, ethyl, methoxy or ethoxy, R2 is methyl or hydrogen, R3 is methyl or benzyl and *n* is 0, 1 or 2; and



wherein R is methyl or phenyl.

3,968,265
FREEZE-THAW STABLE, FRENCH FRY POTATO PRODUCT AND PROCESS FOR PRODUCING THE SAME

Mounir A. Shatila, and Roderick G. Beck, both of Blackfoot, Idaho, assignors to American Potato Company, Vacaville, Calif.
Filed Feb. 1, 1973, Ser. No. 328,536
Int. Cl.² A23L *1/10*
U.S. Cl. 426—550 **24 Claims**

1. The process of fabricating potato pieces suitable for freezing and which remain freeze-thaw stable prior to refrying, comprising the steps of:

a. preparing a cohesive dough of about 23–40% solids and 60–77% moisture content by mixing together the following ingredients,
 i. a source of intact cooked potato cells,
 ii. gum binder,
 iii. extracellular raw starch, and
 iv. water, the solids comprising by weight 85–95% of said source of intact cooked potato cells, 0.5–5% of said gum binder and 2–15% of said extracellular raw starch, the water being added at a temperature of 45°–200°F.,
b. forming the dough into French fry pieces
c. parfrying the pieces in fat at a temperature of about 300°–370°F., said parfrying step, gelatinizing said extra-

cellular raw starch, said parfrying taking place until the moisture content of the pieces is about 40–65% by weight
d. cooling down the parfried pieces such that said gelatinized extracellular raw starch forms a firm, gel starch matrix throughout the pieces, said gel matrix binding the water remaining in said pieces, and
e. freezing the parfried peices, said binding of the water by said gel matrix resulting in said pieces having structural rigidity after complete thawing thereof, even at room temperature, prior to refrying and serving.

3,968,266
LOW DENSITY FROZEN DESSERT

William Lewis Baugher, Logan Township, Dearborn County, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 24, 1975, Ser. No. 625,735
Int. Cl.² A23G *9/02, 9/04*
U.S. Cl. 426—566 **6 Claims**

1. A frozen dessert composition comprising:
a. from about 3% to about 10% protein solids;
b. from about 10% to about 25% saccharides;
c. from about 3% to about 15% of a triglyceride fat;
d. from about 0.1% to about 2% of a polyglycerol fatty acid ester emulsifier;
e. from about 0.1% to about 2% of a fatty acid ester of an aliphatic diol having from about 3 to about 5 carbon atoms;
f. from about 0.005% to about 0.10% of an anionic emulsifier;
g. from about 0.05% to about 0.5% of a stabilizing system comprising:
  1. from about 5 parts to about 20 parts per 100 parts of the stabilizing system of citric acid or a salt thereof;
  2. from about 15 parts to about 35 parts per 100 parts of said stabilizing system of tetrasodium pyrophosphate;
  3. from about 25 parts to about 65 parts per 100 parts of the said stabilizing system of carboxymethylcellulose;
  4. from about 10 parts to about 30 parts per 100 parts of said stabilizing system of hydroxypropyl cellulose; and
  5. from about 5 parts to about 20 parts per 100 parts of said stabilizing system of Lambda Carrageenan gum;
h. from about 55% to about 65% water.

3,968,267
CONTINUOUS PROCESS FOR PREPARING A WHIPPED-CREAM TOPPING DESSERT

Katsuhiro Ogasa, Yokohama; Shigeo Okonogi; Hiroya Yuguchi, both of Tokyo; Yoshinobu Hayashi, Kamakura, and Yusuke Miyazaki, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed June 13, 1975, Ser. No. 586,804
Claims priority, application Japan, June 14, 1974, 49-67186
Int. Cl.² A23G *3/00*
U.S. Cl. 426—570 **10 Claims**

1. A process for preparing a whipped-cream topping dessert comprising the steps of:
a. formulating an aqueous mixture containing 10 to 30 percent by weight of fat, 3 to 6 percent by weight of milk protein, 12 to 22 percent by weight of saccharide, 0.3 to 0.8 percent by weight of emulsifier. 0.05 to 0.15 percent by weight of thickening agent and 0.3 to 0.6 percent by weight of gelling agent;
b. homogenizing said mixture;
c. pasteurizing and cooling the mixture to room temperature;
d. thereafter adding an aqueous solution of a calcium salt to said mixture so that the amount of calcium ion in said mixture is 10 to 35 mg. per 1 gram of the milk protein;
e. whipping and heating the resultant mixture at a temperature of 25° to 30°C to prepare a flowable whipped-cream;
f. topping said whipped-cream onto a lower layer dessert base maintained at a temperature of 50° to 70°C which has previously been placed into a container; and
g. solidifying both layers by cooling

3,968,268
PROCESS FOR PRODUCING HYDRATABLE, TRANSLUCENT TO GLASSY, PROTEINACEOUS PRODUCTS, AND THE RESULTING PRODUCTS

Louis Sair, and Donald W. Quass, both of Evergreen Park, Ill., assignors to The Griffith Laboratories, Inc., Alsip, Ill.

Continuation-in-part of Ser. No. 77,720, Oct. 2, 1970, abandoned. This application Aug. 31, 1972, Ser. No. 285,422
Int. Cl.² A23J *3/00*
U.S. Cl. 426—580 **22 Claims**

1. The method of preparing an unpuffed, proteinaceous food product comprising subjecting water-moistened, edible proteinaceous material having at least about 40% by weight protein on a dry weight basis and an effective amount of water within the range of about 10 to 50% to working under effective mechanical pressure with added heat sufficient to convert it to a hot, moist, plastic extrudable mass and extruding said hot plastic mass through and from a length of a temperature controlled, elongated die under non-puffing conditions to provide an unpuffed, substantially homogeneous, translucent to glassy, extruded product characterized by having texture and retaining its structural integrity under retorting conditions.

3,968,269
PROTEIN FOOD PRODUCT AND METHOD OF MAKING

Bernard M. Payne, St. Charles; John R. Cloute; Edward A. Johnson, both of St. Louis, all of Mo.; Arthur V. Brown, Jr., Fultz, Ill., and Edward V. Oborsh, Ballwin, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 378,490, July 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 193,709, Oct. 29, 1971, abandoned. This application June 4, 1975, Ser. No. 583,361
Int. Cl.² A23J *3/00;* **A23L** *1/20, 1/31, 1/325*
U.S. Cl. 426—629 **16 Claims**

1. A method for the production of a porous food product having the texture and organoleptic properties of meat comprising;
a. forming a mixture consisting essentially of a vegetable protein containing material, and a meat source selected from the group consisting of raw meat and meat by-products in an amount of between about 5 to 80% by weight of said mixture; said mixture having a protein content on a dry basis of at least about 25% by weight;
b. mechanically working the mixture under elevated temperatures of at least about 212°F. and elevated pressures to convert the mixture to a flowable substance; and
c. forming an expanded, porous structure by extruding the mixture through a restricted orifice into an environment of substantially lower pressure.

3,968,270
PROCESS FOR PREPARATION OF METAL COATINGS

Takashi Hasegawa, 4-23-15, Nakabara, Isogo, Yokohama, Japan

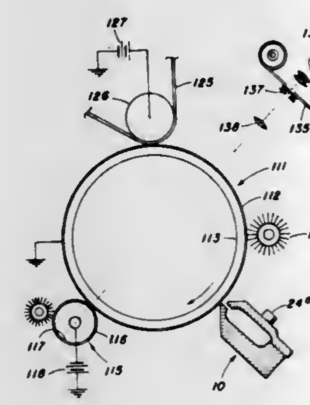
Filed Sept. 19, 1974, Ser. No. 507,490
Claims priority, application Japan, Nov. 6, 1973, 48-125084; Nov. 6, 1973, 48-125085
Int. Cl.² B05D *1/06*
U.S. Cl. 427—13 **12 Claims**

1. A process for the preparation of metal coatings which comprises positively charging a metal vapor in steam or an inert gas maintained at a low pressure and electrically depositing the metal in an electrodeposition atmosphere which is low pressure steam on the surface of a substrate which is negatively charged.

3,968,271
COATING APPARATUS AND USES THEREOF

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 209,611, Dec. 20, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 444,942
Int. Cl.² B05C *3/02*
U.S. Cl. 427—15 **2 Claims**



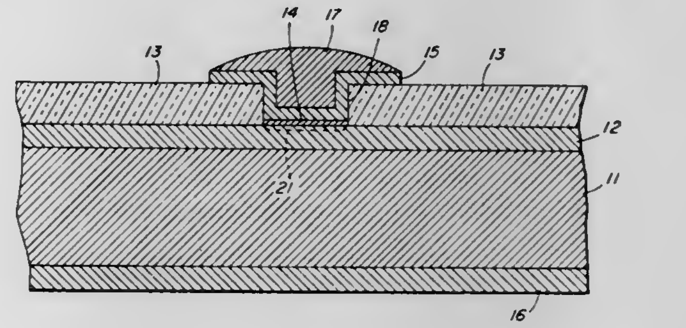
1. A coating method with apparatus comprising upper and lower members which define top and bottom walls, respectively, of a coating material reservoir and a passage for passing coating material from the reservoir to a surface to be coated, each of said members at the end of said passage including a passage surface closely adjacent the surface to be coated, one of said passage surfaces being closer to the surface to be coated than the other; means for introducing a coating material into the reservoir and through the end of said passage; two sidewalls, the inside surfaces of which contact said passage surfaces to define the end of said passage; each sidewall provided with a smooth bearing surface positioned in a plane parallel to the closer of said passage surfaces to the surface to be coated, said closer passage surface being set back from said bearing surfaces by a preselected distance which determines the desired coating thickness, the bearing surfaces adapted to be placed in contact with portions of the surface to be coated which are not to be coated comprising the steps of:
a. advancing a surface to be coated in a direction from the passage surface further from the surface to be coated toward the passage surface closest to the surface to be coated without contacting the surface to be coated with either of said first and second passage surfaces, while continuously contacting said smooth bearing surfaces to portions of the surface to be coated which are not to be coated;
b. building a bead of coating material in the space defined by the surface to be coated, the inside of said member ending in the passage surface closer to the surface to be coated and said passage surface further from the surface to be coated; and
c. coating the coating material onto the surface to be coated between the closer of said passage surfaces from the bead of coating material built in the space defined by the surface to be coated, the inside of said member ending in the passage surface closer to the surface to be coated and said passage surface further from the surface to be coated, the passage surface closest to the surface to be coated functioning as a metering face for metering coating material onto the surface to be coated.

3,968,272
ZERO-BIAS SCHOTTKY BARRIER DETECTOR DIODES

Yoginder Anand, Woburn, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Jan. 25, 1974, Ser. No. 436,431
Int. Cl.² B05D *5/12*
U.S. Cl. 427—84 **10 Claims**

1. A method of making a metal-silicide-silicon Schottky barrier diode having a barrier height about 0.15 volt, comprising the steps of:
providing a body of silicon having resistivity between about 0.1 ohm-cm and 0.3 ohm-cm to receive a metal capable of forming a silicide with said body;
maintaining said body at a first temperature not lower than approximately 100°C, and not higher than approximately 200°C;

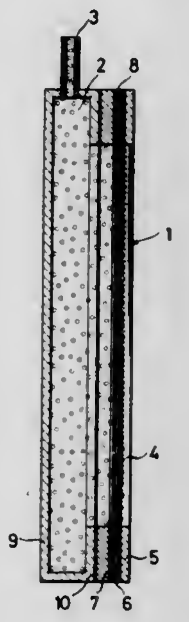


depositing on said body while said body is at said first temperature a metal having a barrier height between about 0.3 volt and 0.4 volt;
raising the temperature of said body with said metal thereon to a second temperature which is substantially less than the lowest eutectic temperature for the silicides of said metal; and
maintaining said second temperature for a time interval sufficiently long to form a silicide of said metal in said body.

3,968,273
METHOD OF MAKING ELECTRODE FOR PREPARING HYDROGEN PEROXIDE

Bertel Kastening, and Wolfgang Faul, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

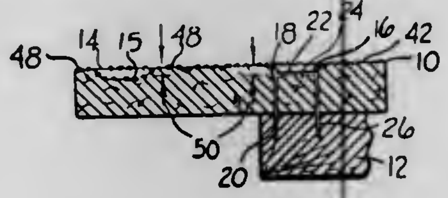
Filed Oct. 23, 1974, Ser. No. 517,199
Claims priority, application Germany, Oct. 24, 1973, 2353259
Int. Cl.² C25B *1/30, 11/12*
U.S. Cl. 427—122 **18 Claims**



1. A method of making an electrode for preparing hydrogen peroxide, which includes the steps of: glowing active carbon powder in a vacuum at a temperature above 900°C, cooling the thus treated active carbon powder in a vacuum, mixing the thus cooled active carbon powder with a solvent containing a binder and a hydrophobic additional substance, applying the thus obtained mixture onto an electrically conductive carrier structure, drying said mixture applied onto said carrier struc-

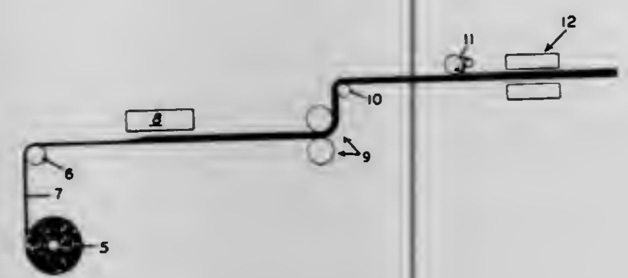
ture, and glowing said active carbon powder for a period of at least 30 minutes.

3,968,274
TEXTURAL PANEL
David Andrew Harris, Bedminster, N.J., and Bruce Edward Hart, Milton, Pa., assignors to Johns-Manville Corporation, Denver, Colo.
Division of Ser. No. 142,705, May 12, 1971, Pat. No. 3,726,056. This application Nov. 24, 1972, Ser. No. 309,302
Int. Cl.^{2} B05D *1/36, 5/00;* **E04B** *1/99*
U.S. Cl. 427—203 **1 Claim**



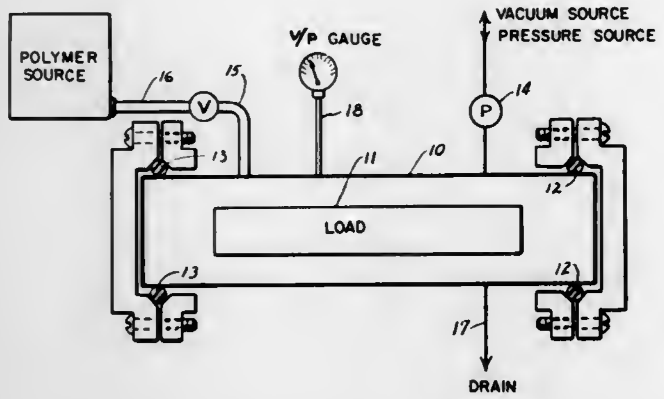
1. A process of forming a visible textural surface on a decorative acoustical panel having a fibrous body portion comprising:
  a. coating an exterior surface of the body with a film of hardening liquid;
  b. distributing individual granules of particulate material generally uniformly over a substantial portion of the coated exterior surface to provide a granular texture to said surface;
  c. coating the granules with a film of hardening liquid adhering the granules to the exterior surface, said film being insufficient to eliminate said granular texture; and
  d. thereafter indenting part of the surface on which the liquid coated granules are located, said indentations extending from the exterior surface penetrating part way into the panel body to cause displacement of said part of said surface thereby forming portions of walls, said walls including some of said coated granules, said coated granules on said exterior surface and on said walls of said indentations comprising a part of said visible textural surface of said panel.

3,968,275
NON-WOVEN FABRIC FLOOR AND METHOD FOR PRODUCTION
Martin Dees, Jr., Lancaster, and Debra M. Karcheski, Millersville, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Division of Ser. No. 360,837, May 16, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,537
Int. Cl.^{2} B32B *3/26;* **B05D** *3/02*
U.S. Cl. 427—270 **12 Claims**



1. A method of forming a decorative thermoplastic vinyl composition surface covering having a non-woven, dimensionally stable scrim reinforced, needle-punched backing layer comprising:
  a. Screen printing a backing, having a weight of about 8 ounces per square yard or greater, and bonded with from about 3 to 30% by weight latex, with plastisol inks to form a design on the face of the backing;
  b. Pressing and gelling the decorative coating to form a continuous gelled decorative layer which is firmly embedded in the backing, the surface fibers of the backing being embedded within the gelled decorative layer;
  c. Applying a thin, non-porous, plastisol clear coat; and
  d. Heating to fuse the plastisol coatings.

3,968,276
PROCESS FOR THE PRESERVATION OF WOOD
William R. Allen, Hackettstown, N.J., assignor to Diversified Wood Products, Inc., Hackettstown, N.J.
Continuation-in-part of Ser. No. 300,496, Oct. 25, 1972, abandoned. This application July 12, 1974, Ser. No. 488,020
Int. Cl.^{2} B05D *3/00, 1/18*
U.S. Cl. 427—297 **17 Claims**



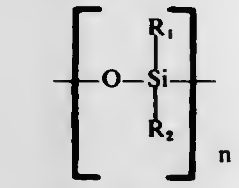
1. A process for the impregnation of wood with chemicals to the core of the heart wood of said wood which comprises,
  enclosing the wood in a chamber
  sealing said chamber,
  evacuating said chamber slowly, over a period of 20–30 minutes, to a level below 10 inches of mercury,
  admitting to said chamber sufficient liquid in the form of an aqueous solution of a resin prepolymer to immerse said wood,
  maintaining vacuum over said immersed wood for a period up to about one hour, to accomplish removal of moisture and volatiles from said wood,
  and to cause said solution to enter said wood, the end point of said condition being indicated by the cessation of any sound within the chamber,
  admitting an additional amount of said solution to said chamber and developing pressure in said chamber to the point of refusal of the wood to receive or absorb further liquid,
  removing liquid from said chamber,
  removing impregnated wood from said chamber.

3,968,277
PROCESS FOR COATING SOLID PARTICLES WITH A DIGESTIVE TRACT-SOLUBLE FILM
Muneaki Takase, Tokyo, Japan, assignor to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 20, 1974, Ser. No. 444,056
Claims priority, application Japan, Feb. 27, 1973, 48-23479; Mar. 13, 1973, 48-29221; Mar. 13, 1973, 48-29222; Mar. 13, 1973, 48-29223
Int. Cl.^{2} C08F *27/08*
U.S. Cl. 427—212 **11 Claims**

1. A process for coating solid particles with a digestive tract-soluble film which comprises causing solid particles having a water content in the range of from 15 to 30% by weight of water to said particles to roll by a rotating disk rotating at a sufficient speed to provide a peripheral speed of from 200 to 450 meters per minute and applying a coating solution containing a digestive tract-soluble material selected from the group consisting of dialkylamino-ethyl methacrylate-alkylmethacrylate copolymers, alkylvinyl pyridine-methacrylic acid-alkyl acrylate copolymers, alkyl methacrylate-methacrylic acid copolymers, polyvinylacetal dialkylamino-acetate, and dicarboxylic acid halfester of cellulose acetate in a mixed solvent of at least two solvents selected from the group consisting of lower alcohols, lower ketones and lower halogenated hydrocarbons to said rolling particles and developing a digestive tract-soluble film on said particles while subjecting said particles to heated gas to evaporate said solvent therefrom.

3,968,278
IMAGING METHOD
John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 28, 1974, Ser. No. 473,623
Int. Cl.^{2} B41M *5/00*
U.S. Cl. 427—258 **8 Claims**

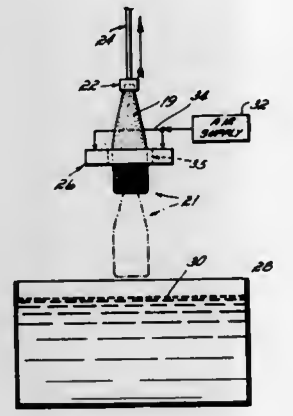
1. A method of duplicating a master comprised of a thermoplastic organic resin as marking material distributed in an imagewise manner upon a substrate which comprises:
  a. contacting the image bearing substrate with a highly viscoelastic inking composition comprised of:
    1. a silicon containing block copolymer having siloxane segments and polymeric segments of a material which is adhesive to the marking material, said siloxane segments being characterized by the formula:



$$\left[-O-\overset{R_1}{\underset{R_2}{\overset{|}{\underset{|}{Si}}}}- \right]_n$$

in which R_1 and R_2 are monovalent organic moieties which may be the same or different and n is a number representing the degree of polymerization;
    2. a coloring material; and
    3. a solvent in which the silicon containing block copolymer is soluble but which is a non-solvent for the organic marking material; and
  b. contacting under pressure the inked, image bearing substrate with a transfer member to thereby transfer ink from the image bearing substrate to the transfer member in an imagewise configuration corresponding to the image on the master.

3,968,279
METHOD FOR APPLYING PLASTISOL COATING OF UNIFORM THICKNESS TO GLASS CONTAINERS
William Brown, Amanda, and Francis J. Shonebarger, Lancaster, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 408,617, Oct. 23, 1973, Pat. No. 3,870,015. This application Sept. 19, 1974, Ser. No. 507,358
Int. Cl.^{2} B05D *3/04*
U.S. Cl. 427—348 **4 Claims**

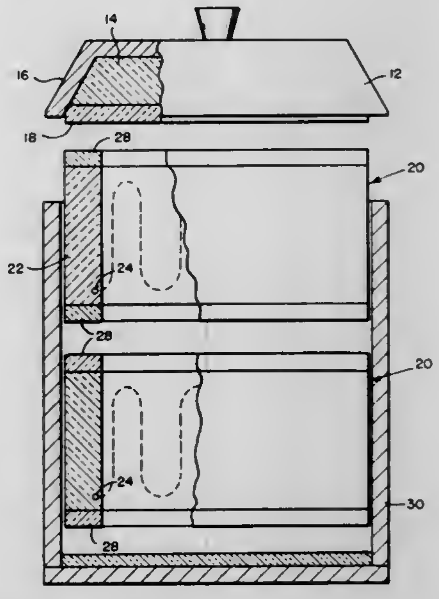


1. A method for coating a glass container with a sidewall coating of uniformly thick plastic material comprising the steps of:
  1. gripping said glass container by the finish portion thereof and dipping it into a bath containing a curable liquid coating material;
  2. forming an air knife in the shape of a downwardly angulated thin conical sheet of air flowing toward an apex;
  3. withdrawing said container from said bath with excess coating material adhering to it,
  4. passing said container with the adherent coating material thereon upwardly through said air knife along a path passing substantially through said apex while the knife strips excess coating material off the sidewall of said container, while said container is substantially upright with its longitudinal axis substantially parallel to the central axis of said conical sheet of air of said air knife,
  5. and curing the coating material remaining on said container.

3,968,280
POLYOLEFINS/POLYCARBONAMIDE POWDER COMPOSITIONS SUITABLE FOR THE PRODUCTION OF CONTINUOUS COATING ON SUBSTRATES SUCH AS GLASS OR METAL
Wassily Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed June 28, 1974, Ser. No. 483,923
Int. Cl.^{2} B32B *15/08, 17/10*
U.S. Cl. 428—35 **8 Claims**

1. A substrate bearing a layer comprising a compatible blend of from about 25 to 90 parts by weight polyolefin and from about 75 to 10 parts by weight of polycarbonamide of a dicarboxylic acid having at least 18 carbon atoms.

3,968,281
FILTER MOLDED HEATING AND/OR INSULATING MEMBER
Ronald E. Erickson, Oconomowoc, Wis., assignor to Sybron Corporation, Rochester, N.Y.
Filed July 15, 1974, Ser. No. 488,262
Int. Cl.^{2} B32B *1/04, 3/02*
U.S. Cl. 428—75 **8 Claims**

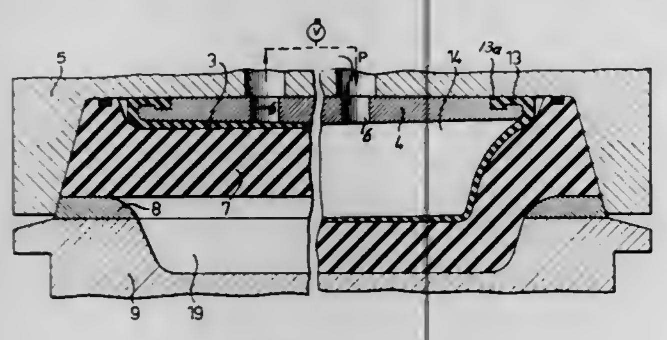


1. A insulating body comprising:
a. a pair of members, each including
  i. a first layer of an integrated mass of inorganic refractory fibers filter molded from a liquid suspension of said refractory fibers and colloidal silica, and
  ii. a second layer of ceramic fiber blanket material bonded to a surface of said first layer after the filter molding and before the drying thereof, the bonding being accomplished by colloidal silica present at the interface between said first layer and said second layer; and

b. said members resting one against the other with said layer of ceramic fiber blanket material on each member being in abutting relationship so as to form a heat sealing resilient gasket between said members.

3,968,282
PRESSURE PAD OF RUBBER OR RUBBER-LIKE MATERIALS FOR PRESSES

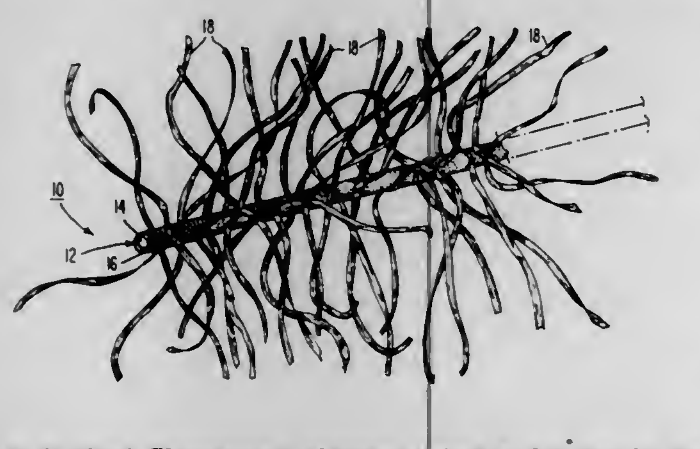
Horst Engel, Sarstedt, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Dec. 16, 1974, Ser. No. 533,240
Claims priority, application Germany, Dec. 18, 1973, 2362903
Int. Cl.² B32B *3/00;* **B30B** *5/02*
U.S. Cl. 428—156 **3 Claims**



1. An elastic pressure pad of elastomeric material having in combination a marginal curved section with a radially inwardly directed annular connecting flange for sealing engagement with a rim portion of a rigid holding member for a press, said marginal curved section being provided with circular recess means having a relatively shallow depth so as not materially to weaken the wall thickness of said curved section, said recess means forming a fillet, said recess means being arranged within the region and in the direction of the medium radius of said curved section.

3,968,283
FLOCKED FILAMENTARY ELEMENT AND STRUCTURES MADE THEREFROM

Richard W. Schutte, Newtown Square, Pa., assignor to Scott Paper Company, Philadelphia, Pa.
Filed May 21, 1974, Ser. No. 472,072
Int. Cl.² B05D *1/14, 1/16;* **B32B** *33/00*
U.S. Cl. 428—90 **18 Claims**



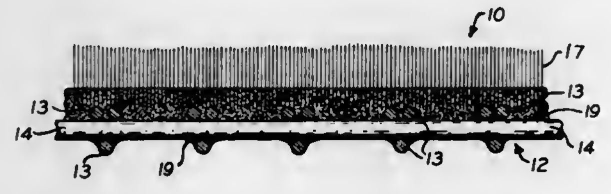
1. A flocked filamentary element suitable for use in the manufacture of textile substitutes such as webs, yarns, and the like, said filamentary element including:

A. a core-strand of at least one polymeric filament, said core-strand having a denier no greater than about 40;
B. an adhesive layer on said core-strand; and
C. substantially individualized cellulosic fibers adhered by said adhesive layer to said core-strand, said individualized cellulosic fibers being of a papermaking length less than about 6.35 millimeters and no less than about 1 millimeter, said cellulosic fibers constituting over 50% by weight of the filamentary element.

16. A textile substitute including a plurality of flocked filamentary elements each filamentary element including a core-strand of at least one polymeric filament, said core-strand having a denier no greater than about 40, and substantially individualized cellulosic fibers adhered by an adhesive layer to said core-strand, said individualized cellulosic fibers being of a papermaking length of less than about 6.35 millimeters and no less than about 1 millimeter, said cellulosic fibers being present in a sufficient concentration such that over 50% of the crossings between the flocked filamentary elements comprise spaced junctions, said flocked filamentary elements being adhered to each other at the crossing by means of their respective adhesive layers.

3,968,284
BREATHABLE FLAME RESISTANT FABRIC CONSTRUCTION AND METHOD OF MAKING SAME

Stephen George, 247 Swinton Ave., Bronx, N.Y. 10465
Filed July 1, 1974, Ser. No. 484,562
Int. Cl.² B05D *1/14, 1/16, 1/36*
U.S. Cl. 428—90 **11 Claims**



1. A flame resistant fabric construction comprising:

a porous fiberglass base fabric;
a polymeric heat responsive adhesive coating on said base fabric, said adhesive coating not extending through the interstices of the base fabric, said adhesive coating releasing flame quenching gases when said adhesive is subject to flame;
and flock fibers embedded in said adhesive coating with one end of the fibers upstanding from said adhesive coating;
said adhesive coating containing a greater concentration of plasticizer adjacent the fiberglass fabric than the portion of the adhesive in the area of the flock with a resultant gradually increasing gradient of hardness in the adhesive coating as measured in moving away from the base fabric.

3,968,285
ONE-PART FOAMABLE LATEX COMPOSITION

Perley A. Coffin, Gloucester; Philip G. Cook, Newton, and Paul D. Demerjian, Andover, all of Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.
Continuation of Ser. No. 257,398, May 26, 1972, which is a continuation-in-part of Ser. No. 124,514, March 15, 1971. This application Feb. 4, 1974, Ser. No. 439,602
The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.
Int. Cl.² B32B *5/28;* **C08J** *9/30;* **C08L** *7/02, 9/10*
U.S. Cl. 428—95 **25 Claims**

1. A one-part foamable latex composition which may be stored for extended periods of time, which latex composition comprises:

a. a natural or synthetic elastomeric latex subject to cure;
b. a curing system which comprises an ammonia-retardent dithiocarbamate accelerating agent, which agent is inhibited in accelerating function in the presence of the base;
c. a volatile nitrogen-containing base in an amount sufficient to inhibit the cure of the latex;
d. a foaming agent in an amount to permit mechanical frothing of the latex composition into a foam; and
e. the composition characterized by having a total solids content of from about 65% to 85% by weight, and the composition being free of a gelling agent capable of gelling the composition in storage, and free of a heat-sensitizing agent.

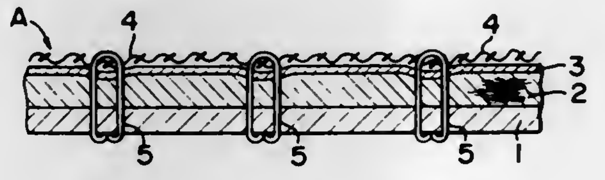
12. In a process for producing a foamable latex composition, which latex composition comprises:

a. a natural or synthetic elastomeric latex subject to cure;
b. a curing system; and
c. a volatile base in an amount sufficient to inhibit the cure of the latex, the base capable of being removed by heating, the composition being free of a gelling agent, the improvement which comprises:
incorporating an ammonia-retardant di thio carbamate accelerating agent into the latex, which agent is inhibited in an accelerating function in the presence of the volatile base, and a foaming agent in an amount to permit mechanical frothing of the latex composition into a foam, and the composition characterized by a total solids content of from about 65% to 85% by weight, and free of a heat-sensitizing agent, thereby providing a one-part foamable latex composition which may be stored for extended periods of time prior to use.

21. The process of claim 20 which includes applying the froth to the back of a tufted rug prior to heating and curing the froth.

3,968,286
STRUCTURAL TIMBER

Naomitsu Megumi, Funabashi, Japan, assignor to Tokyo Plywood Kabushiki Kaisha, Tokyo and Naomitsu Megumi, Funabashi, both of, Japan
Filed Oct. 9, 1973, Ser. No. 404,163
Claims priority, application Japan, Oct. 25, 1972, 47-106851; Oct. 25, 1972, 47-106852
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.² B32B *7/08*
U.S. Cl. 428—99 **7 Claims**



1. A structural timber for use in building construction comprising means defining a wood base material means, a felt-like material disposed on said base material means, said felt-like material consisting of a mass of inorganic fibers having air spaces therebetween, a dampproof sheet-like material disposed on said felt-like material, a metal net-like material disposed on said dampproof sheet-like material, and a plurality of spaced staples holding said materials together, said staples passing entirely through said metal net-like material, said dampproof sheet-like material, said felt-like material, and said wood base material means, said staples each having a U-shaped configuration including two leg portions joined to a connecting portion and turned-in end sections on the ends of said leg portions, said turned-in end sections being disposed on the outer surface of said wood base material means to prevent withdrawal of said staples, said connection portion of said U-shaped staples engaging said metal net-like material along spaced locations of the latter, said staples defining a substantially fixed space between said metal net-like material where the latter is engaged by said staples and said wood base material means, said dampproof sheet-like material and said felt-like material being confined within said substantially fixed spaces such that the air spaces are maintained in said felt-like material, thereby maintaining the sound and heat insulation properties thereof.

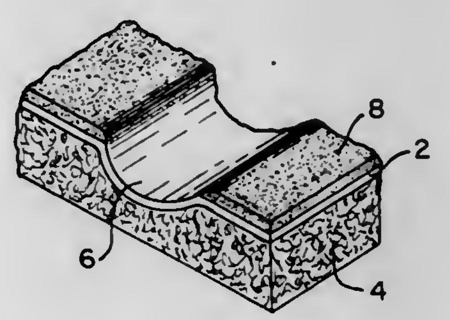
3,968,287
BONDED SLIT FOILS

Hermann Balk, Kriegsdorf, Germany, assignor to Reifenhauser KG, Troisdorf, Germany
Filed Aug. 12, 1974, Ser. No. 496,742
Claims priority, application Germany, Aug. 10, 1973, 2340545
Int. Cl.² B32B *3/10, 7/14, 27/06, 31/12*
U.S. Cl. 428—136 **1 Claim**

1. A composite foil having a hand and texture approximating that of a fabric and consisting of a laminate of at least two co-extensive synthetic resin foil sheets bonded together under heat and pressure over substantially their entire areas in contact with one another, each of said sheets being provided with a surface array equal length slits in respective parallel rows wherein the slits are spaced apart by a distance substantially less than the slit length, the rows of alternate sheets being mutually transverse and of a width equal to the slit length, the slits of each row being staggered with respect to the slits in neighboring rows such that, except for first and last slits in a row and the slits in first and last rows, each slit of a row of any sheet begins level with the ends of but between two adjacent slits of the next row and ends level with the beginnings of but between two adjacent slits of the opposed next row, said sheets being uniaxially oriented by stretching in the direction of the respective rows whereby the stretch directions of said sheets are mutually transverse.

3,968,288
METHOD OF PRODUCING EMBOSSED, TWO-COLORED SURFACE ON FIBROUS BOARD PRODUCT AND PRODUCT PRODUCED THEREBY

Robert F. Trexler, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Oct. 16, 1974, Ser. No. 515,324
Int. Cl.² B32B *3/30;* **B05D** *5/06*
U.S. Cl. 428—161 **10 Claims**



1. A method for producing an embossed, two-color appearance on the surface of a fibrous board substrate having a uniform thickness comprising the steps of coating the surface of the fibrous board substrate with an aquesus dispersion of a prime coating of a first color, applying a thermosetting resin base powder over the prime coated surface of said substrate while the prime coating is wet, said powder having a second color which is different from the color of said prime coating, embossing the coated and powdered surface of said substrate by pressing a heated embossing device into the coated and powdered surface of said substrate, said embossing device having high and low areas which produce low and high areas respectively on said surface of said substrate and being heated to a temperature such that said prime coating dries and said powder melts, sets, and becomes concentrated on the high areas of said surface of said substrate leaving only the prime coating remaining in the low areas of said surface of said substrate, and then removing said embossing device from said surface of said substrate whereby said embossed surface has a two-color appearance with the low areas having the first color and the high areas having the second color.

3,968,289
POLY(ARYLENE SULFIDE) COATING COMPOSITIONS CONTAINING POLYOXYETHYLATED VEGETABLE OIL

David E. Higbee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1974, Ser. No. 526,255

Int. Cl.² C08F *28/04*

U.S. Cl. 428—195 **20 Claims**

1. A composition comprising at least one poly(arylene sulfide) resin and at least one polyoxyethylated vegetable oil.

10. A process of coating a substrate which comprises applying to a surface of said substrate a layer of the dispersion of claim 9, and then heating the thus applied layer in the presence of oxygen to a suitable temperature for a sufficient time to fuse and cure said poly(arylene sulfide) resin.

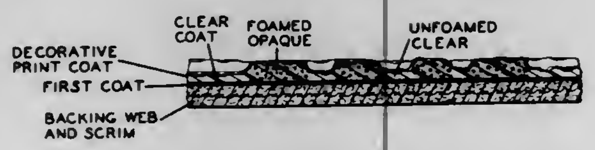
3,968,290
NON-WOVEN FABRIC FLOOR

Martin Dees, Jr., Lancaster, and Debra M. Karcheski, Millersville, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 360,837, May 16, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,358

Int. Cl.² B32B *3/00*

U.S. Cl. 428—196 **2 Claims**



1. A decorative surface covering comprising:

a. a non-woven needle-punched backing reinforced with a dimensionally stable scrim, said backing having a weight of about 8 ounces per square yard or greater, and bonded with from about 3 to 30 percent by weight latex;

b. a continuous screen-printed fused plastisol decorative layer bonded to the backing; and

c. a fused plastisol clear coat overlying and bonded to the decorative layer.

3,968,291
DECORATIVE CONSOLIDATED LAMINATES AND A PROCESS FOR THEIR PREPARATION

Marcel Chevallier, Quillan, France, assignor to Formica International Limited, London, England

Filed Jan. 9, 1974, Ser. No. 431,912

Claims priority, application France, Mar. 2, 1973, 73.07530

Int. Cl.² B32B *5/16, 3/00*

U.S. Cl. 428—203 **7 Claims**

1. In a decorative consolidated laminate consisting of a rigidity imparting core layer, a decorative paper sheet impregnated with a noble thermoset resin supported on the core layer, and a wear surface layer on the decorative sheet, the decorative paper sheet being clearly visible through the wear surface layer, the improvement wherein the wear surface layer comprises a thermoset noble resin selected from the group consisting of melamine-formaldehyde, urea-formaldehyde and melamine-urea-formaldehyde thermoset resins, particles of barium sulphate substantially all of which have particle sizes less than 10 microns and, optionally, up to 20 parts by weight per 100 parts of resin solids of a finely divided colourless abrasion-resistant material which is silica or α-alumina having a maximum particle size not greater than 50 microns.

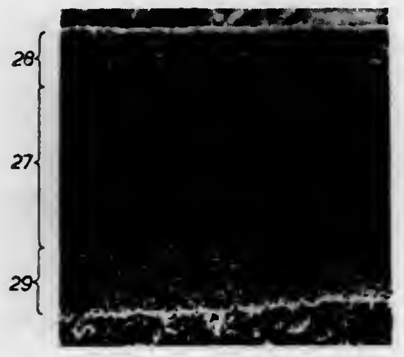
3,968,292
WATER VAPOR PERMEABLE SHEET MATERIAL

Arthur William Pearman, and Steven James Wright, both of King's Lynn, England, assignors to Porvair Limited, King's Lynn, England

Filed July 22, 1974, Ser. No. 490,402

Int. Cl.² D06N *7/04;* **B32B** *3/00, 7/02*

U.S. Cl. 428—213 **13 Claims**



1. A water vapour permeable soft flexible sheet material suitable for use as the upper of a shoe in place of leather, said sheet material being at least 0.8 mm. thick and up to 2.0 mm thick, being free from fibrous reinforcement, and having an elongation at break in excess of 200%, comprising a strength imparting porous elastomeric polymer substrate layer disposed between a porous elastomeric polymer fleshcoat layer and a porous elastomeric polymer topcoat layer, the substrate layer having a higher density than the fleshcoat or topcoat layers and being thicker than either the fleshcoat or the topcoat layers the thickness of each of said fleshcoat and topcoat layers being 10 to 95% of the thickness of said substrate layer and the combined thickness of the fleshcoat and topcoat layers being in the range 30% to 175% of the thickness of the substrate layer.

3,968,293
ARTIFICIAL LEATHER SHEET MATERIAL

Victor Ralph Cunningham, Hutton, and David Leonard Boutle, Maldon, both of England, assignors to Porvair Limited, England

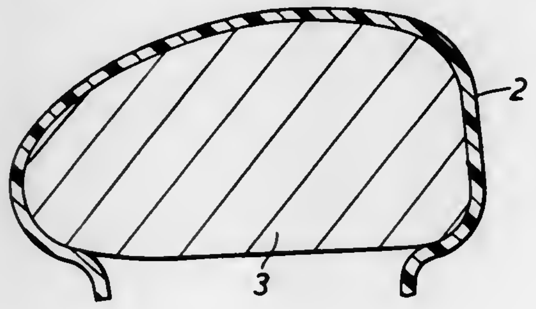
Continuation of Ser. No. 230,322, Feb. 29, 1972, abandoned, which is a continuation of Ser. No. 36,128, May 11, 1970, abandoned, which is a division of Ser. No. 819,656, April 28, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 620,793, March 6, 1967, abandoned, and Ser. No. 697,154, Jan. 11, 1968, Pat. No. 3,729,538. This application Oct. 11, 1973, Ser. No. 405,318

Claims priority, application United Kingdom, Mar. 7, 1966, 9974/66; Jan. 11, 1967, 1608/67; Jan. 11, 1967, 1609/67

The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.

Int. Cl.² B29D *27/04;* **D06M** *7/04;* **B32B** *3/00*

U.S. Cl. 428—213 **8 Claims**



1. In a water vapour permeable artificial leather sheet material which consists essentially of a strength giving base layer forming the major part of the thickness of the material and a microporous non-cellular surface layer of elastomeric polyurethane on said base layer, the improvement wherein said strength-giving base layer consists essentially of microporous water-vapour permeable elastomeric polyurethane, said microporous surface layer having a thickness of more than 0.005 inch and less than 0.05 and being more open and less dense, less tough, and more permeable to water vapour than said base layer, said layers being free of fibrous reinforcement and thereby having the elastomeric characteristics of said elastomeric polyurethane on stretching, and said material being resistant to formation of 'orange-peel' surface effects when stretched, said strength-giving base layer free from fibrous reinforcement being produced by a method which comprises forming on a support a continuous layer of a solution of elastomeric polyurethane working material in a solvent therefor, coagulating said layer, having said composition, by means of coagulating liquid, removing substantially all the solvent of said layer by washing with coagulating liquid, the coagulating liquid being a non-solvent for said elastomeric working material and being at least partially miscible with the solvent for the elastomeric working material, and drying the resulting water vapor permeable flexible sheet material, said method including the step of stripping the coagulated layer from the support.

3,968,294
LIGNOCELLULOSIC PARTICLE BOARD CURED WITH ALKALI- AND ACID-CATALYZED PHENOL ALDEHYDE THERMOSETTING RESINS

Paul Robitschek, and Ross L. Christensen, both of Eugene, Oreg., assignors to Chembond Corporation, Springfield, Oreg.

Filed Apr. 3, 1974, Ser. No. 457,438

Int. Cl.² B32B *7/02, 21/08*

U.S. Cl. 428—213 **6 Claims**

1. For use in the manufacture of hot pressed lignocellulosic particle board, a consolidatable laminar mat comprising:

a. a middle lamina comprising lignocellulose particles coated with from 3 to 15% by weight, dry solids basis, of a fast setting, acid catalyzed phenol aldehyde thermosetting resin having a pH of less than 2, and

b. surface laminae comprising lignocellulose particles coated with from 3 to 15% by weight, dry solids basis, of an alkali catalyzed phenol aldehyde thermosetting resin and having a pH of 7 to 13,

c. each surface lamina having a thickness of at least 0.025 inch.

3,968,295
PREPARATION OF RUBBERIZED CORD FABRIC

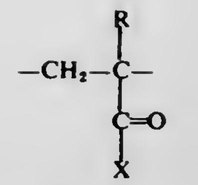
Thomas S. Solomon, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 22, 1972, Ser. No. 228,143

Int. Cl.² B32B *3/02;* **D04D** *5/00, 7/08*

U.S. Cl. 428—250 **25 Claims**

21. A rubberized fabric, consisting of textile material, which is coated with a thin film of a composition containing an adhesive diene polymer and an acrylic copolymer having most of the links in the polymer chain of the configuration



$$-CH_2-\underset{\underset{X}{|}}{\underset{C=O}{\underset{|}{\overset{\overset{R}{|}}{C}}}}-$$

in which R is H, methyl, ethyl, Cl or CN, and in which X in a majority of the links is O-alkyl where the alkyl group has from 1 to 4 carbon atoms and X in a minority of the groups is OH, and the coated fabric is embedded in rubber.

3,968,296
PRESSURE COMPENSATOR FOR HEATING PLATEN PRESSES

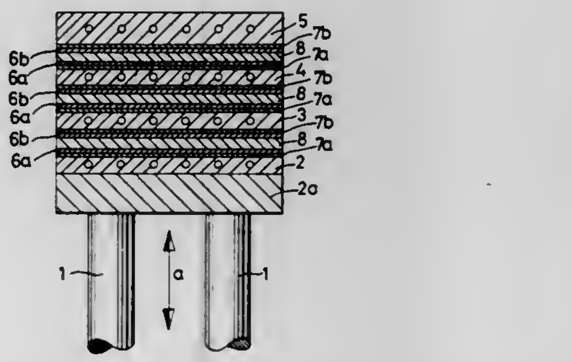
Herbert Nopper, and Wolfgang Knoch, both of Krefeld, Germany, assignors to Becker & van Hullen Niederrheinische Maschinenfabrik, Krefeld, Germany

Filed Apr. 18, 1974, Ser. No. 462,083

Claims priority, application Germany, Apr. 18, 1974, 2319593

Int. Cl.² B32B *31/20*

U.S. Cl. 428—256 **6 Claims**



1. A resilient, thermally-conductive pressure compensator for use in heating-plate presses of the type used to manufacture coated wood material panels or boards, comprising a composite sheet consisting of a woven mesh of metal wires embedded in a matrix of heat-conducting elastomeric filler material consisting of silicone rubber, said elastomeris material completely surrounding the metal wires and filling the interstices between them, and the elastomeric material being bonded to the metal wires, and having plane surfaces on opposite sides of the sheet substantially flush with the outer surfaces of the wire mesh.

3,968,297
POLYTETRAFLUOROETHYLENE COATINGS FOR GLASS FABRICS

David Allen Sauer, Dayton, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 253,338, May 15, 1972, Pat. No. 3,838,082, which is a continuation-in-part of Ser. No. 146,837, May 25, 1971, abandoned. This application Aug. 7, 1974, Ser. No. 495,502

Int. Cl.² C03C *25/02;* **B32B** *17/10*

U.S. Cl. 428—268 **12 Claims**

1. A composite structure consisting essentially of a glass fabric and a coating thereon consisting essentially of a topcoat of film-forming unsintered polytetrafluoroethylene and a base coat of the condensation product of a polyhydrolyzable compound, which condensation product is a tetravalent titanium oxide polymer, a zirconium oxide polymer, or a tin oxide polymer.

9. A process for increasing the flex life of glass fabric, comprising coating said fabric with an aqueous dispersion consisting essentially of water, film-forming unsintered polytetrafluoroethylene, and a polyhydrolyzable compound which is a compound of tetravalent organic titanium, tetravalent organic

zirconium, or tetravalent organic tin, and heating the coating to dry it and cause condensation of said compound, said heating being insufficient to cause sintering of said polytetrafluoroethylene, the proportions of polytetrafluoroethylene and said polyhydrolyzable compound in said dispersion being such that the amount of polytetrafluoroethylene in the coating is between 50 and 99.5 weight percent of the coating with the remainder being the polyhydrolyzable compound.

3,968,298

PROCESS FOR IMPARTING TO NATURAL KERATIN-CONTAINING MATERIAL A PERMANENT FINISH RENDERING THE MATERIAL RESISTANT TO DAMAGE BY INSECTS

Gerhard Reinert, Allschwil, and Alois Kleemann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

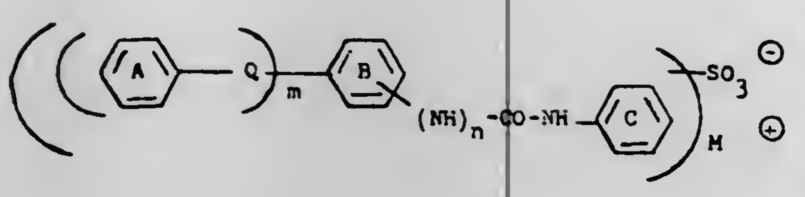
Filed Aug. 4, 1972, Ser. No. 278,081

Claims priority, application Switzerland, Aug. 19, 1971, 12143/71

Int. Cl.² A61L ***13/00;*** **D06M** ***13/40***

U.S. Cl. 428—270 **14 Claims**

1. A process for imparting a permanent insect proof finish to natural keratin-containing material, comprising the step of applying to the keratin-containing material a solution of 0.1 to 5 per cent by weight, relative to said keratin-containing material, of at least one salt of a stomach poison insecticide, said salt consisting of a compound of the formula:



wherein ring A is substituted by one or two chlorine or bromine atoms, or by a chlorine atom and a methyl group,

ring B is substituted by a chlorine or bromine atom and/or by a trifluormethyl group,

ring C is substituted by one to three chlorine or bromine atoms, or by one to two trifluoromethyl groups, or by a chlorine atom and a trifluoromethyl group, or by a chlorine atom and a p-chlorophenoxy group,

Q is a direct bond or an oxygen or a sulfur bridge,

m and *n* each independently represent 0 or 1, and

M^+ is an inorganic or organic cation, in a mixed solvent consisting essentially of

- a. 80 to 99% by weight of trichloroethylene, 1,1,1-trichloroethane, tetrachloroethylene or trifluorotrichloroethane, and
- b. 20 to 1% by weight of methanol, ethyleneglycol monomethyl ether, or dimethylformamide.

3,968,299

TWO-WAY, SELECTIVE DIRECTIONAL, IMAGE-TRANSFER SHEET

John D. Angleman, 46 E. Main St., Brookside, N.J. 07926

Filed Feb. 21, 1975, Ser. No. 551,922

Int. Cl.² B32B ***5/16;*** **B41L** ***1/20***

U.S. Cl. 428—307 **5 Claims**

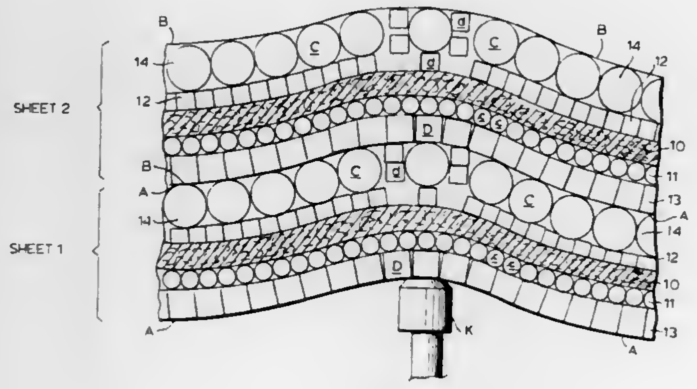
1. An image forming and transferring sheet comprising

a base sheet having

a first face and

a second face, each of said faces having

image transfer means for transferring an image to an adjacent sheet, said image transfer means including



an image forming agent on each of said faces, and

means for securing said image forming agents on said sheet for release only in a preselected direction of pressure by an imaging instrument, said securing means including screening means normally occluding passage of said image forming agents until distention thereof into an outwardly convex shape by an imaging instrument.

3,968,300

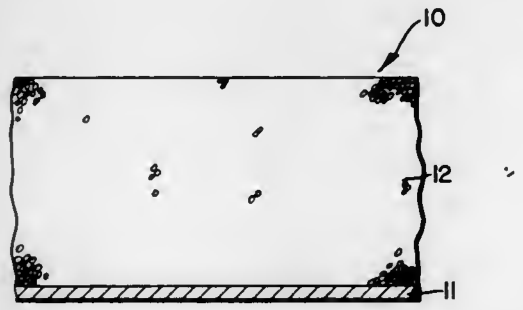
PHENOLIC POLYMER, RELATED PRODUCTS AND PROCESSES THEREOF

Ernest K. Moss, and John H. Beale, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Feb. 24, 1975, Ser. No. 552,379

Int. Cl.² B32B ***3/26***

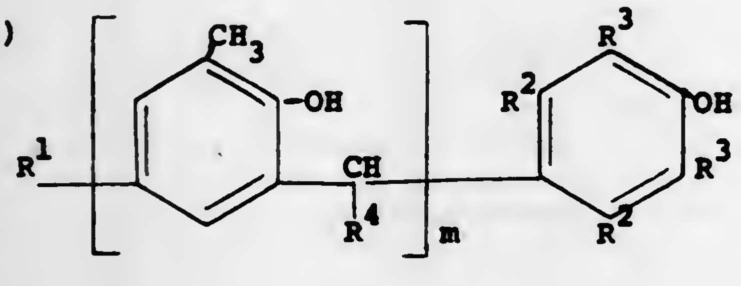
U.S. Cl. 428—310 **17 Claims**



1. A cellular material comprising the reaction product of:

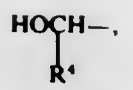
A. an alkylol group containing phenolic polymer of Formula I:

(I)



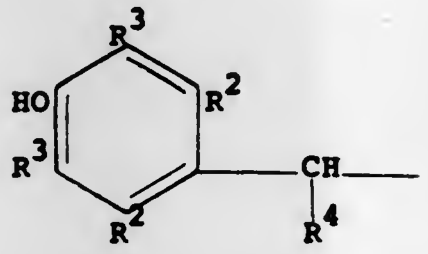
wherein:

a. R^1 is



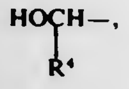
$\underset{R^4}{\mathrm{HOCH}}-,$

hydrogen or a radical of Formula II:



b. the R_2's are independently selected from the group consisting of lower alkyl, phenyl, benzyl, halo, nitro and hydrogen,

c. the R^3's are independently selected from the group consisting of



$\underset{R^4}{\mathrm{HOCH}}-,$

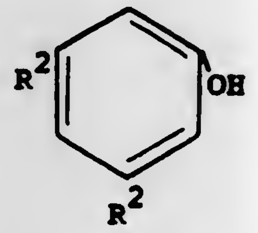
hydrogen, or a radical of Formula II,

d. the R^4's are independently selected from the group consisting of lower alkyl, hydrogen, phenyl, benzyl, or furyl,

e. *m* is an integer from 2 to 10 inclusive,

f. the phenolic polymer has a molecular weight between 200 and 2000, and

B. a compound of Formula V:



wherein the weight ratio of B:A is 1:30 to 1:2.

C. trichlorofluoromethane and 1,1,2-trichloro-1,2,2-trifluoro-ethane in a molar ratio of 1:20 to 20:1.

17. A laminated structural panel having at least one facing sheet and having the cellular material of claim 1 adhering thereto.

3,968,301

PRESSURE-SENSITIVE RECORD MATERIAL AND DYE SOLVENTS THEREFOR

James Kern Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 225,658, Feb. 11, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,309

Int. Cl.² B32B ***5/16;*** **B05D** ***5/00***

U.S. Cl. 428—323 **15 Claims**

1. A pressure-sensitive recording system comprising

- a. supporting paper sheet,
- b. mark forming components arranged in contiguous juxtaposition and supported by said paper sheet, said components comprising a chromogenic material and an electron accepting material of the Lewis acid type reactive with said chromogenic material to produce a mark when brought into reactive contact, and
- c. a pressure releasable liquid solvent for said chromogenic mark forming component, said solvent comprising partially hydrogenated terphenyls having from about 65 percent to about 85 percent aromaticity.

10. A method of marking on a paper substrate by developing a color from colorless or substantially colorless chromogenic compounds which comprises contacting said chromogenic compounds and an electron accepting material of the Lewis acid type in the presence of a liquid solvent comprising partially hydrogenated terphenyls having from about 65 percent to about 85 percent aromaticity.

3,968,302

MOLD RELEASE COMPOSITION CONTAINING TUNGSTEN DISULFIDE

Richard E. Brown, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Division of Ser. No. 444,434, Feb. 21, 1974, Pat. No. 3,915,870. This application May 30, 1975, Ser. No. 582,311

Int. Cl.² B32B ***5/16;*** **C10M** ***1/10;*** **C03B** ***39/00***

U.S. Cl. 428—328 **5 Claims**

1. A method of forming a lubricating and release coating on surfaces of molds and related parts, comprising applying an aqueous dispersion of a mixture of about 30 to about 70 weight percent tungsten disulfide having a lamellar-hexagonal crystalline structure, said tungsten disulfide having an average particle size of less than 2 microns, from about 15 to about 25 weight percent of a silicate selected from the group consisting of sodium silicate, potassium silicate, lithium silicate, guanidine silicate, tetramethylammonium silicate, tetraethanolammonium silicate, and mixtures thereof, and from about 1 to about 10 weight percent of a setting agent to the surface and part to be coated, said setting agent being a member selected from the group consisting of zinc oxide, calcium chloride, magnesium sulfate, aluminum sulfate, sodium borate, sodium metaborate, sodium fluorosilicate, kaolinitic clays and minerals, and mixtures thereof, and heating said molds and related parts to affix the silicate to the surface to form a thin coating thereon.

3,968,303

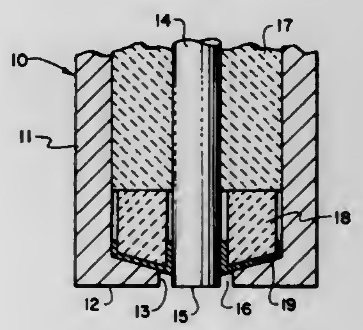
ELECTRICAL DISCHARGE DEVICE COMPRISING AN INSULATOR BODY HAVING AN ELECTRICALLY SEMI-CONDUCTING COATING FORMED THEREON

Robert C. Harris, Unadilla, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 480,199, June 17, 1974, Pat. No. 3,883,762. This application Dec. 9, 1974, Ser. No. 530,922

Int. Cl.² B32B ***9/00;*** **H01T** ***13/02***

U.S. Cl. 428—332 **3 Claims**



1. A beryllium oxide ceramic insulator body having an electrically semi-conducting coating applied thereto, said coating having a thickness of from about 0.005 to 0.010 inches prior to firing the coated insulator body comprising a mixture of from 25% to 90% by weight of lanthanum oxide, from 5% to 75% by weight of cuprous oxide and from 0% to 25% by weight of ferric oxide, the coating being bonded to the insulator body by firing the coated insulator body at an ele-

vated temperature for a time sufficient to sinter at least one of said oxides.

3,968,304

POLYESTER BONDED TO RUBBER AND METHOD FOR MAKING THE SAME

Richard M. Wise, Uniontown, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 370,129, June 14, 1973, Pat. No. 3,922,422. This application Jan. 6, 1975, Ser. No. 538,625

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.^{2} B32B *27/36, 27/38, 27/42*

U.S. Cl. 428—272 **7 Claims**

1. A polyester element useful in reinforcing a rubber compound, said element containing a total of from about 3 to 7% by weight (dry) based on the weight of said element of an adhesive composition consisting essentially of a first deposit of heat set polyallyl glycidyl ether having a number average molecular weight of from about 400 to 650 and an average of from about 2 to 6 epoxide groups and a second deposit of a heat set mixture of a major amount of a rubbery vinyl pyridine copolymer and a minor amount of a heat reactable resinous composition selected from the group consisting of:

1. a substantially heat-reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition,
2. a mixture of a heat reactable resorcinolformaldehyde resole having hydroxyl and methylol groups and a substantially heat reactable 2,6-bis(2,4-dihydroxyphenylmethyl)-4-chlorophenol composition, and
3. a mixture of a water soluble or dispersible epoxide having from 2 to 6 epoxide groups and a molecular weight up to about 650 and an epoxide amine curing agent in an amount sufficient to cure said epoxide.

3,968,305

MAR-RESISTANT SYNTHETIC RESIN SHAPED ARTICLE

Akira Oshima; Keisuke Yoshihara; Mikio Shiki, and Tuneo Ikeda, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 212,047, Dec. 27, 1971, abandoned. This application Sept. 18, 1974, Ser. No. 507,000

Claims priority, application Japan, Feb. 13, 1974, 49-17364

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 428—334 **12 Claims**

1. A synthetic resin shaped article having a mar-resistant polymer surface layer integrated with the polymer body, said polymer surface layer consisting essentially of, in polymerized form,

a. a compound having a total of at least three acryloxy ($CH_2{=}CH.CO.O{-}$) and/or methacryloxy ($CH_2{=}C(CH_3)$-$.CO.O{-}$) groups in the molecule, said acryloxy and methacryloxy groups being linked with a straight chain aliphatic hydrocarbon residue having not more than 20 carbon atoms or a straight chain aliphatic hydrocarbon residue having at least one ether linkage in the main chain and having not more than 20 carbon atoms and

b. at least one copolymerizable mono- or diethylenically unsaturated compound, the ratio by weight of compound (b)/compound (a) being 0/100 to 80/20 when compound (b) is a diethylenically unsaturated compound and 0/100 to 30/70 when compound (b) is a monoethylenically unsaturated compound, and said polymer surface layer having a mar-resistance to an extent such that no appreciable scratches are produced when a 25 mm diameter pad composed of No. 000 steel wool is rotated 100 revolutions at a rate of 40 R.P.M. while being pressed against the shaped article at a load of 1,000 g. and being prepared by completely polymerizing the monomer charge in an air-free atmosphere and in the presence of not greater than 5% by weight of an initiator, said initiator being at least one compound selected from the group consisting of azobisisobutyronitrile, benzoyl peroxide, lauryl peroxide, benzoin and benzoin alkyl ether having at most 4 carbon atoms in the alkyl group, and said polymer body being selected from the group consisting of polymethyl methacrylate, polycarbonate and a copolymer containing at least 70 % by weight of units derived from methyl methacrylate.

3,968,306

PLASTIC ARTICLES HAVING IMPROVED SURFACE CHARACTERISTICS

Toshio Yoshihara; Keisuke Yoshihara; Tuneo Ikeda; Yasuyuki Yamasaki; Akira Oshima, all of Ohtake, and Naoyuki Fukabori, Kanagawa, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed July 19, 1973, Ser. No. 380,560

Claims priority, application Japan, July 21, 1972, 47-72577

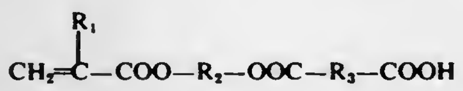
Int. Cl.^{2} B32B *27/06, 27/36*

U.S. Cl. 428—336 **7 Claims**

1. A plastic article having improved surface characteristics and comprising a plastic body having adhered thereon a cross-linked film of a composition consisting essentially of:

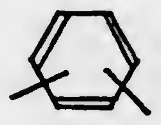
A. 10 to 90 parts by weight of a crosslinking unsaturated compound having a molecular weight of M and containing in the molecule N polymerizable ethylenically unsaturated radicals, N being an integer of at least 2, and selected from the group consisting of allyl acrylate, allyl methacrylate; methallyl acrylate; di- and tetra-esters of α,β-unsaturated carboxylic acids with polyhydric alcohols; addition products of glycidyl acrylate or methacrylate with polybasic carboxylic acids; addition products of an epoxy resin with acrylic acid, methacrylic acid and crotonic acid; polyethylene glycol dimethacrylate and polypropylene glycol dimethacrylate; the ratio of said molecular weight M to said number N of ethylenically unsaturated radicals, M/N, being about 49 to about 600;

B. 90 to 10 parts by weight of an unsaturated monomer selected from the group consisting of acrylic acid; methacrylic acid; itaconic acid; crotonic acid; unsaturated carboxylic acids represented by the formula:

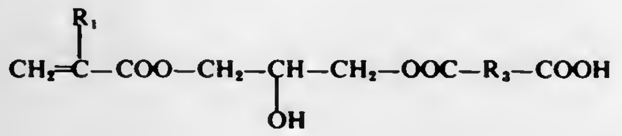


$$CH_2{=}\overset{R_1}{\overset{|}{C}}{-}COO{-}R_2{-}OOC{-}R_3{-}COOH$$

wherein R_1 is a hydrogen atom or a methyl group, R_2 is an alkylene group having 1 to 8 carbon atoms, and R_3 is an alkylene group having 1 to 8 carbon atoms, —CH═CH— or

 ;

unsaturated carboxylic acids represented by the formula:



$$CH_2{=}\overset{R_1}{\overset{|}{C}}{-}COO{-}CH_2{-}\underset{OH}{\underset{|}{CH}}{-}CH_2{-}OOC{-}R_3{-}COOH$$

wherein R_1 and R_3 are the same as defined above; styrenesulfonic acid; and monoallyl and monomethallylesters of dibasic carboxylic acids; and

C. up to 20 parts by weight of other copolymerizable unsaturated compound selected from the group consisting of monoesters of acrylic acid, methacrylic acid and crotonic acid with polyhydric alcohols; diacetone acrylamide; diacetone methacrylamide; N-methylol acrylamide and N-methylol methacrylamide; the total of (A), (B), and (C) being 100 parts by weight, at least a part of the acid radicals being converted into alkali salts thereof, said cross-linked film having a thickness of 5 to 500 μ and said plastic body being composed of homopolymers or copolymers of monovinyl monomers selected from the group consisting of methyl methacrylate, ethyl methacrylate, butyl methacrylate, cyclohexyl methacrylate, lauryl methacrylate, methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, styrene, acrylonitrile, methacrylonitrile, vinyl chloride, and vinylidene chloride; copolymers of said monovinyl monomers with small amounts of crosslinking agents selected from the group consisting of ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, trimethylol propane triacrylate, and glycerine triacrylate; and unsaturated polyesters cured by crosslinking.

3,968,307

MIXED FILAMENTS

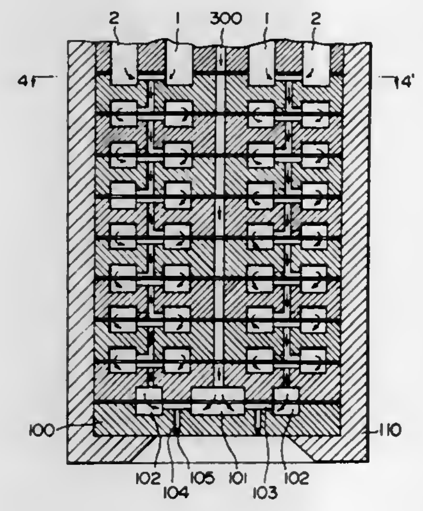
Masao Matsui, Takatsuki; Susumu Tokura, Osaka, and Masahiro Yamabe, Neyagawa, all of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Japan

Division of Ser. No. 200,423, Nov. 19, 1971, which is a continuation of Ser. No. 801,277, Feb. 24, 1969, abandoned. This application June 4, 1973, Ser. No. 366,516

Claims priority, application Japan, Oct. 8, 1968, 43-73319; Feb. 29, 1968, 43-13051; July 30, 1968, 43-53879; July 30, 1968, 43-53880

Int. Cl.^{2} D01D *5/28*

U.S. Cl. 428—373 **8 Claims**



1. A multi-component filament formed by mixing and dispersing two different spinning materials having poor affinity and selected from the group consisting of nylon-6, nylon-66, polyethylene terephthalate, polyethylene oxybenzoate, polyolefin and polyalkylene oxide in a unitary filament

having a part of its cross-section constituted with a nebular configuration and a part with no nebular configuration, a surface of the filament being occupied with at least two components forming said nebular configuration which contains at least 100 cross-sectional structures having a variety of shapes and sizes, said nebular configuration continuing substantially along the longitudinal direction of the filament, and

said cross-sectional structures being dispersed irregularly in the other spinning material,

which is obtained by subjecting repeatedly said two spinning materials to a joining step in a narrow channel and a dividing step in a reservoir or to a joining step in a reservoir and a dividing step in a narrow channel in different phase at least eight times to be layer-multiplied.

3,968,308

PROCESS FOR THE MANUFACTURE OF CHIP BOARDS USING CONDENSATION RESINS AS BINDERS AND PRODUCT

Adolf Buschfeld, Alpen; Manfred Gramse, Rheinkamp-Repelen, and Dragomir Simic, Mulheim (Ruhr), all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 16, 1974, Ser. No. 533,386

Claims priority, application Germany, Dec. 22, 1973, 2364251

Int. Cl.^{2} B29J *5/00;* **D21J** *1/18*

U.S. Cl. 428—402 **7 Claims**

1. In a process for the production of chip boards from wood chips using as the binding agent a condensation resin selected from the group consisting of phenol condensation products, urea condensation products, melamine condensation products, ketonic formaldehyde condensation products, and co-condensation products of said resins, wherein the said chips are wetted with water and then formed under heat and pressure into a chip board, the improvement comprising passing a spray of said binding agent in pulverulent form through a spray of atomized water before the spray or binding agent impinges onto said wood chips, and wherein said spray of atomized water contacts said spray of said binding agent at an angle of incidence of from about 40° to about 50°, and wherein after the spraying step, the center section chips of said chip board have a water content of from about 6 to about 9% by weight.

5. A chip board produced by the process of claim 1.

3,968,309

MOLDED ARTICLES OF PLASTICS HAVING IMPROVED SURFACE CHARACTERISTICS AND PROCESS FOR PRODUCING THE SAME

Makoto Matsuo, Chiba; Takao Suzuki, Tokyo; Keisuke Yoshihara; Tuneo Ikeda, both of Ohtake, and Kunio Chikanishi, Kawasaki, all of Japan, assignors to Dainippon Printing Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 526,727

Claims priority, application Japan, Nov. 26, 1973, 48-131756; Sept. 6, 1974, 49-101927

Int. Cl.^{2} B32B *27/30*

U.S. Cl. 428—409 **14 Claims**

1. A molded article of plastic having improved surface characteristics which comprises a molded substrate of plastic and a cured film formed on the surface of the molded substrate, characterized in that the cured film is formed from a coating material comprising at least 30 % by weight of at least one polyfunctional compound selected from the group consisting of polymethacryloyloxy compounds having at least three methacryloyloxy groups in one molecule and a molecular weight of 250 to 800 and polyacryloyloxy compounds having at least three acryloyloxy groups in one molecule and a molecular weight of 250 to 800, and a fluorine-containing surfactant, in which the fluorine atom, is bonded to a carbon atom.

3,968,310

HALF-ESTER REACTION PRODUCTS OF MALEATED ALPHA-OLEFINS AND MONOHYDRIC ALCOHOLS

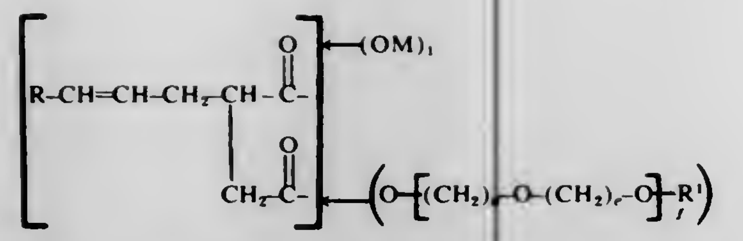
James K. Stowell, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Mar. 14, 1974, Ser. No. 451,662

Int. Cl.^{2} B32B *9/04*

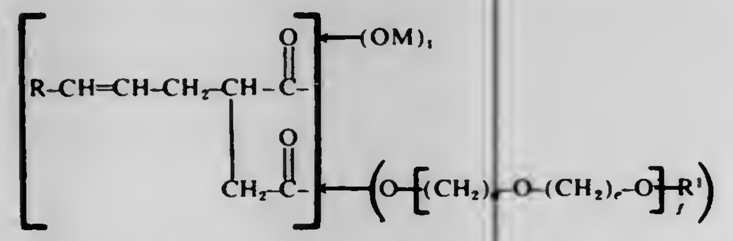
U.S. Cl. 428—411 **20 Claims**

1. A composition of the formula



wherein R and R^1 represent hydrocarbyl groups, *d* and *e* represent repeating alkylene units of 1 to 5 carbon atoms inclusive, *f* is an integer having an average value of about 2 to about 1,000 and M is a cation.

8. In a hot-melt adhesive composition containing a blend of thermoplastic substances which are suitably adapted to be converted to a molten mass by thermal treatment thereof and deposited upon a substrate and adhesively bound to a substrate upon cooling to a temperature below the melting point of the hot-melt adhesive composition, the improvement which comprises incorporating into the hot-melt adhesive composition at least 0.25% of the total hot-melt composition weight, a hot-melt additive represented by the structural formula:



(1)

wherein R and R^1 represent hydrocarbyl groups, d and e represent repeating alkylene units of 1 to 5 carbon atoms inclusive, *f* is an integer having an average value of about 2 to about 1,000 and M is a cation.

3,968,311
METAL COATED WITH COMPOSITIONS PREPARED FROM AQUEOUS DISPERSIONS OF CARBOXYLIC ACID RESIN AND AN ALIPHATIC AMINE

Ihab M. Hekal, Downers Grove, and Raymond G. Chelton, Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 395,820, Sept. 10, 1973, Pat. No. 3,904,569. This application Sept. 8, 1975, Ser. No. 611,365

Int. Cl.^{2} B32B *15/08*

U.S. Cl. 428—461 **2 Claims**

1. A metal article coated with a coating composition comprised of a mixture of about 75 to 90% by weight of (1) a carboxylic acid containing olefin copolymer having reactive carboxyl groups prepared from about 60 to about 90 percent by weight of an α-olefin having the general formula $RCH{=}CH_2$ wherein R is selected from the group having 1 to 8 carbon atoms and about 10 to about 40 percent by weight of an α, β-ethylenically unsaturated carboxylic acid having 3 to 8 carbon atoms, and about 10 to 25 percent by weight of (2) an aliphatic polyamine selected from the group consisting of hexamethylene tetramine and amines of the general formula $NH_2(C_2H_4NH)_xC_2H_4NH_2$, *x* being an integer from 0 to 20.

3,968,312
COATING FIBROUS SUBSTRATES

Heinz Abel, Reinach; Melvin Harris, Dornach, both of Switzerland, and Derek James Rowland Massy, Linton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,920

Claims priority, application United Kingdom, Sept. 1, 1972, 40648/72

Int. Cl.^{2} B32B *27/06, 9/02*; **B05D** *3/00*

U.S. Cl. 428—419 **15 Claims**

1. A process for providing leather with a wearing or decorative surface which consists of

1. coating 100 parts by weight of the leather on at least one face with 1 to 20 parts by weight of a curable composition comprising
   - i. a^1 polymercaptan containing, per average molecule, at least two and at most six mercaptan groups and having an average molecular weight of at least 182 and at most 10,000
   - ii. A polyene having an average molecular weight of at least 250 and at most 10,000, and containing, per average molecule, at least two ethylenic double bonds each α to a carbonyloxy group, the sum of the mercaptan groups in said polymercaptan and of such ethylenic double bonds in said polyene being more than 4 but at most 8, said polymercaptan being in a quantity sufficient to supply from 0.8 to 1.1 mercaptan groups per said ethylenic double bond of the polyene, and
2. curing the compositon on the leather.

15. Leather bearing thereon a wearing or decorative surface which is a cured compositon comprising

i. a polymercaptan containing, per average molecule, at least two and at most six mercaptan groups and having an average molecular weight of at least 182 and at most 10,000, and

ii. a polyene having an average molecular weight of at least 250 and at most 10000 and containing, per average molecule, at least two ethylenic double bonds each α to a carbonyloxy group, the sum of the mercaptan groups in said polymercaptan and of the ethylenic double bonds in said polyene being more than 4 but at most 8.

3,968,313
SURFACE TREATMENT

Martin B. Pearlman, 78-05 141 St., New York, N.Y. 11367

Continuation-in-part of Ser. No. 141,929, May 10, 1971, Pat. No. 3,796,608, which is a continuation-in-part of Ser. No. 630,187, April 12, 1967, Pat. No. 3,578,508. This application Dec. 27, 1973, Ser. No. 428,701

The portion of the term of this patent subsequent to Mar. 12, 1992, has been disclaimed.

Int. Cl.^{2} B32B *9/06, 15/04*

U.S. Cl. 428—450 **10 Claims**

1. Process for treating metal surfaces to improve their resistance to chemical attack which comprises bringing said surfaces into contact with an aqueous composition consisting essentially of a colloidal disperison of silica and tannin and removing said metal surface from contact with said composition before any deposit of silica visible to the naked eye is formed on said surface.

3,968,314
BENZOYLPHENYLISOTHIOUREAS

Heinrich Kolling, Haan; Arno Widdig, Blecher; Herbert Thomas, and Hans Peter Schulz, both of Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

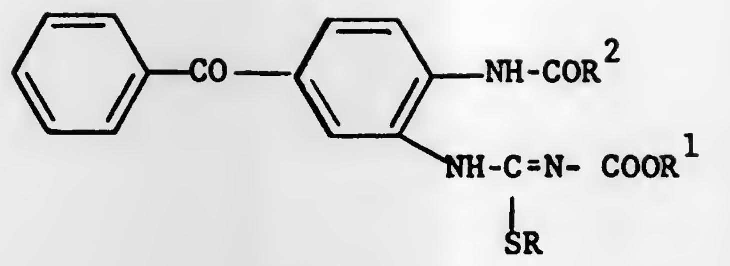
Filed Jan. 14, 1974, Ser. No. 433,084

Claims priority, application Germany, Jan. 23, 1973, 2303048

Int. Cl.^{2} C07C *157/14*

U.S. Cl. 260—470 **20 Claims**

1. A benzoylphenylisothiourea of the formula:



wherein R is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, cycloalkyl of 5 to 6 carbon atoms or benzyl;

R^1 is alkyl of 1 to 4 carbon atoms, cyclohexyl or phenyl; and

R^2 is lower alkyl, cycloalkyl of 5 or 6 carbon atoms, phenyl, tolyl, phenoxymethyl, benzyl, mono-lower alkylamino, cyano lower alkylamino, lower alkoxy lower alkylamino, benzylamino or phenylamino.

3,968,315
QUATERNARY AMMONIUM ANTISTATIC AGENTS

Richard Hochreuter, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

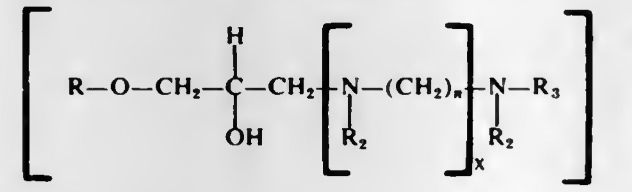
Filed Nov. 13, 1974, Ser. No. 523,264

Claims priority, application Switzerland, Nov. 20, 1973, 16334/73

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 428—474 **18 Claims**

1. A method of reducing the tendency of material to accumulate static electricity which comprises impregnating a porous material having such tendency with an aqueous solution or dispersion of a salt having a cation of the formula



$$\left[R-O-CH_2-\underset{OH}{\overset{H}{C}}-CH_2-\left[\underset{R_2}{N}-(CH_2)_n\right]_x-\underset{R_2}{N}-R_3\right]^{m(+)} \quad [R_1]_m$$

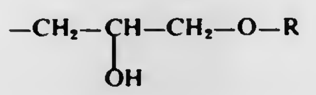
wherein

R is C_8–C_{14} alkyl, C_8–C_{14} alkenyl or mono- or di-C_4–C_9 alkyl phenyl,

each R_1 is bound to an amino centre, and is, independently, methyl, ethyl or benzyl,

each R_2 is, independently, methyl, ethyl, a group $-(CH_2CH_2O)_{q1}-H$ wherein q^1 is an integer 1 to 20, or a group $-(CHR_4-CHR_4-O)_{q2}-H$ wherein one R_4 is hydrogen and the other is methyl and q^2 is an integer 1 to 20,

R_3 has one of the significances of R_2 or is a group



$$-CH_2-\underset{OH}{CH}-CH_2-O-R$$

wherein R is defined above,

m is an integer 1 to 4,

n is an integer 3 to 6 and,

x is an integer 2 or 3,

with the provisos that

i. at least one R_2 and R_3 is a group

$$-(CH_2CH_2O)_{q1}-H$$

or a group

$$-(CHR_4-CHR_4-O)_{q2}-H \text{ and}$$

ii. the sum of all the integers q^1 and q^2 in a molecule is an interger 3 to 20.

3,968,316
PROCESS FOR THE SURFACE TREATMENT OF UNSATURATED RUBBER

Yoshio Jyo; Yoshio Wada; Mitsuyoshi Aonuma, all of Yokohama; Takeo Kobayashi, and Kyouzi Inokuchi, both of Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Japan

Filed Oct. 1, 1973, Ser. No. 402,167

Int. Cl.^{2} B32B *25/04, 25/12*

U.S. Cl. 428—492 **13 Claims**

1. A process for the surface treatment of a rubber or synthetic resin containing ethylenic unsaturation, comprising contacting said rubber, resin or mixture thereof with a treating agent consisting essentially of (A) an alkyl hypohalite selected from the group consisting of butyl hypohalites, amyl hypohalites and halogen-substituted methyl hypohalites and a compound (B) containing at least one active hydrogen and at least one functional group, said compound being selected from the group consisting of sulphuric acid, phosphoric acid, glycol, resorcin, 2-methyl-2,4-pentenediol, glycerine, malic acid, maleic acid, malonic acid, aldol, formamide, glycidol, thioglycolic acid and hydrochloric acid, the treating agent containing 0.1 – 10 moles of said compound B) per mole of the alkyl hypochlorite A.

3,968,317
WATER-DISPERSIBLE THERMOSETTABLE CATIONIC RESINS AND PAPER SIZED THEREWITH

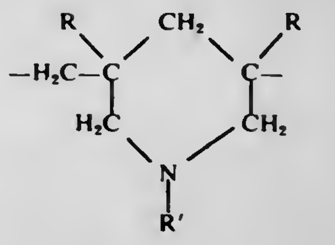
David H. Dumas, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 393,689, Aug. 31, 1973. This application Sept. 8, 1975, Ser. No. 611,589

Int. Cl.^{2} C08F *8/08*; **C08G** *18/04, 69/48*; **C08F** *126/04*

U.S. Cl. 428—537 **6 Claims**

1. Paper sized with the cured form of a water-insoluble, water-dispersible thermosettable cationic resin derived by reacting (I) an epihalohydrin and (II) a water-insoluble modified diallylamine polymer derived by reaction of (a) a diallylamine polymer consisting essentially of units of the formula



where R is hydrogen or C_1–C_4 alkyl and R′ is hydrogen, methyl, or ethyl and of the number of R's present in the polymer from 100% to 5% thereof are hydrogen and from 95% to 0% thereof are methyl or ethyl, and (b) a hydrophobizing compound selected from the group consisting of acyl halides, acid anhydrides, ketene dimers, and organic isocyanates, said hydrophobizing compound having a total of from about 12 to about 40 carbon atoms, the said modified diallylamine polymer having at least about 50% amine functionality, said reaction of (a) and (b) being carried out under a nitrogen blanket at a reaction temperature of from about 0° to about 100°C. and a pH of about 6 to 8, the amount of epihalohydrin employed being that amount sufficient to react with substantially all the amine functionalities of the water-insoluble modified diallylamine polymer.

3,968,318
DIMENSIONAL STABILIZATION OF LIGNOCELLULOSIC MATERIALS

Robert Warren Betty, Sarnia, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Feb. 25, 1974, Ser. No. 445,825

Claims priority, application Canada, Feb. 28, 1973, 164869

Int. Cl.² B32B *23/08;* **B05D** *3/02*

U.S. Cl. 428—511 **5 Claims**

1. Lignocellulosic material, of improved dimensional stability, said lignocellulosic material being dimensionally stabilized by impregnation with one or more polymerized ethylenically unsaturated monomers, at least one of which is vinyl pyrrolidone in an amount of at least 10 percent by volume.

3,968,319
PLASTIC PIGMENTS FOR PAPER COATINGS

Inder Mani, and Alexander Shand, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 10, 1974, Ser. No. 478,125

Int. Cl.² D21H *1/28;* **C08F** *33/08*

U.S. Cl. 428—511 **13 Claims**

1. A coated paper comprising a paper substrate having adhered thereto a coating composition comprising a binding amount of from about 1.3 to about 11.5 dry volume parts of a binder and an opacifying amount of 38.8 dry volume parts of a pigment, provided that at least a portion of said pigment is in the form of an amide pigment comprising a water-insoluble copolymer of an emulsion polymerizable, α,β-ethylenically unsaturated hard monomer and at least about 1 weight percent of an emulsion polymerizable, α,β-ethylenically unsaturated amide in the form of non-film forming discrete particles having an average particle diameter in the range from about 0.25 to about 1 micrometer with no more than 10 weight percent of said particles having diameters outside said range, said unsaturated amide being selected from the group consisting of acrylamide, methacrylamide, amides of fumaric acid, maleic acid, itaconic acid and citraconic acid, N-isopropylacrylamide, and N-(2-hydroxyethyl)acrylamide, said portion of amide pigment being sufficient to impart improved pick resistance as compared to a coating containing only inorganic pigment.

3,968,320
DYE SOLVENTS FOR PRESSURE-SENSITIVE RECORD MATERIAL

John F. Herber, St. Louis; James K. Sears, Webster Groves, both of Mo., and Quentin E. Thompson, Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1973, Ser. No. 393,116

Int. Cl.² B41M *5/16*

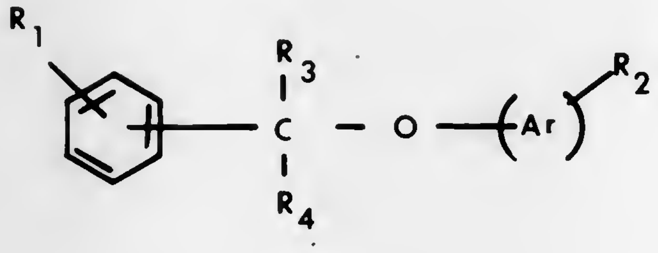
U.S. Cl. 428—537 **15 Claims**

1. A pressure-sensitive recording paper system comprising

a. a supporting web or sheet material,

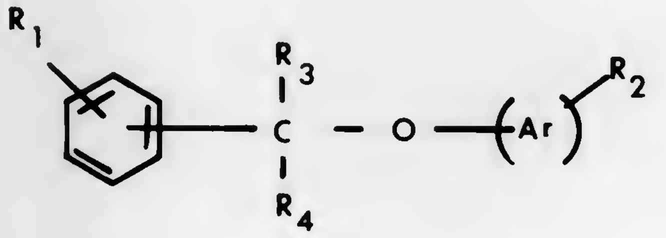
b. mark forming components arranged in contiguous juxtaposition and supported by said sheet material, said components comprising a chromogenic material and an electron accepting material of the Lewis acid type reactive with said chromogenic material to produce a mark when brought into reactive contact, and

c. a pressure releasable liquid solvent for said chromogenic mark forming component, said solvent comprising a benzyl aryl ether represented by the structure



wherein Ar is an aryl radical selected from the group consisting of phenyl, tolyl, and xylenyl; R_1, R_3 and R_4 are individually hydrogen or an alkyl group having from 1 to 4 carbon atoms; and R_2 is hydrogen or from 1 to 4 alkyl groups, alike or unlike, the total carbon atom content of R_2 being not greater than 6.

12. A method of marking on a substrate by developing a color from colorless or substantially colorless chromogenic compounds which comprises contacting said chromogenic compounds and an electron accepting material of the Lewis acid type in the presence of a liquid solvent comprising a benzyl aryl ether represented by the structure



wherein Ar is an aryl radical selected from the group consisting of phenyl, tolyl, and xylenyl, R_1, R_3 and R_4 are individually hydrogen or an alkyl group having from 1 to 4 carbon atoms; and R_2 is hydrogen or from 1 to 4 alkyl groups, alike or unlike, the total carbon atom content of R_2 being not greater than 6.

ELECTRICAL

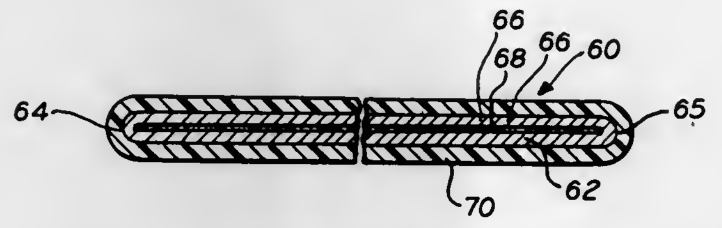
3,968,321
OFFSET "O" INTERNAL SHIELD DESIGN FOR PCM TELEPHONE CABLES

Jerzy Adam Olszewski, Edison, N.J., and Anthony P. Gabriel, Staten Island, N.Y., assignors to General Cable Corporation, New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,016

Int. Cl.² H01B *11/04*

U.S. Cl. 174—36 **14 Claims**



1. A strip for a telephone cable shield including a metal strip coated on one side with dielectric coating material and folded back on itself to form a shield having edges formed by the folds and having two layers of metal across most of its width of the shield and with two layers of dielectric coating, one on the upper and the other on the lower side of the shield, said coating extending around the folds of the metal, the original edges of the strip being at different distances from the folded edges.

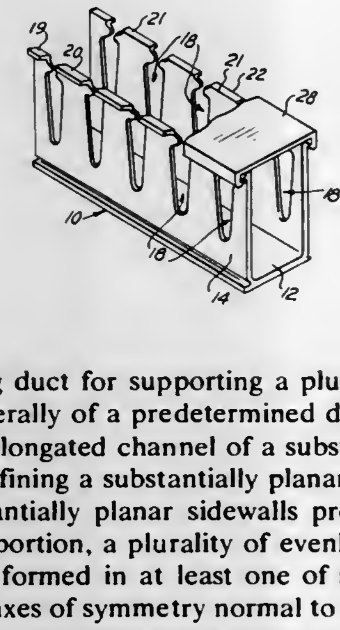
3,968,322
WIRING DUCT

Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.

Continuation of Ser. No. 166,217, July 26, 1971, abandoned, which is a continuation of Ser. No. 825,784, May 19, 1969, abandoned. This application Mar. 22, 1973, Ser. No. 343,950

Int. Cl.² H02G *3/04*

U.S. Cl. 174—72 A **10 Claims**



1. In a wiring duct for supporting a plurality of electrical conductors generally of a predetermined diameter, said duct comprising an elongated channel of a substantially U-shaped cross section defining a substantially planar base portion and a pair of substantially planar sidewalls projecting integrally from said base portion, a plurality of evenly spaced substantially alike slits formed in at least one of said sidewalls and having parallel axes of symmetry normal to a terminal edge of said sidewall and said slits being open to said edge of said sidewall, a plurality of evenly spaced substantially alike finger-like members being thusly defined between consecutive slits, each of said finger-like members being widened at the end portion thereof proximate the terminal edge of said sidewall for defining a narrow gap open end for each of said slits, said channel being made of a substantially flexible material for permitting deflection of said finger-like members in a direction generally normal to the longitudinal axis of said channel to provide widening of said narrow gap open end of said slit for passage therethrough of said electrical conductors, the side of said slit proximate said terminal edge of said sidewall being defined by a pair of aligned separate side portions of consecutive finger-like members substantially parallel to said base portion of the channel, the improvement comprising each of said slits having its opposite sides substantially straight and diverging one from the other in the direction of said terminal edge such that each of said slits is wider proximate the widened end portion of said finger-like members than proximate said base portion, said sides being disposed at an angle of the order of between 5° and 30°, said sides further being joined proximate said base portion by an arcuate side, the ratio of the width of said slit at the widest portion thereof to the width of said slit at the narrowest portion thereof being at least 1.5 to 1 and the width of the narrow gap open end of said slits being less than the width of each of said slits at the narrowest portion thereof.

7. In a wall for supporting a plurality of electrical conductors, said wall comprising a planar portion, a plurality of evenly spaced substantially alike slits formed in said planar portion and having parallel axes of symmetry normal to a terminal edge of said planar portion and said slits being open to said edge of said planar portion, a plurality of evenly spaced substantially alike finger-like members being thus defined between consecutive slits, each of said finger-like members being widened at the end portion thereof proximate the terminal edge of said planar portion for defining a narrow gap open end for each of said slits, said wall being made of a substantially flexible material for permitting deflection of said finger-like members in a direction generally normal to the plane of said planar portion to provide widening of said narrow gap open end of each of said slits for passage therethrough of said electrical conductors, the side of each of said slits proximate said terminal edge of said planar portion being defined by a pair of aligned separate side portions of consecutive finger-like members substantially parallel to said terminal edge, the improvement comprising each of said slits having its opposite sides substantially straight and diverging one from the other in the direction of said terminal edge, said sides being disposed at an angle of the order of between 5° and 30° such that the width of each of said slits is greater proximate the widened end portion of said finger-like members than proximate said base portion, and the ratio of the width of each of said slits at the widest portion thereof to the width of each of said slits at the narrowest portion thereof being at least 1.5 to 1.

3,968,323
CLAMP WITH GROUNDING MEANS FOR HOLDING CONDUCTORS BETWEEN PARALLEL SUPPORT RAILS

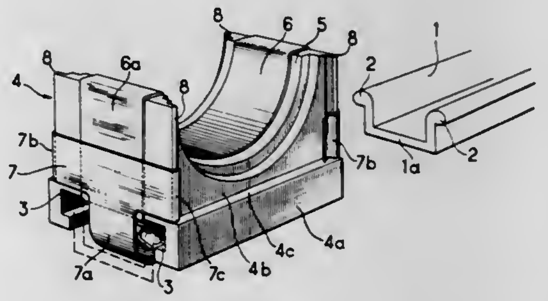
Lucien Blanchet, Le-Vesinet, France, assignor to Elhyco AG, Glarus, Switzerland

Filed Jan. 31, 1975, Ser. No. 546,181

Claims priority, application France, Feb. 5, 1974, 74.03861

Int. Cl.² H01R *3/04;* **F16L** *3/10*

U.S. Cl. 174—135 **6 Claims**



1. In an assembly comprising a pair of channel-shaped parallel rails and at least one pair of opposed jaws made of an insulating material and located between said rails to hold elongated members in a position extending transversely with respect to said rails, said jaws having gripping surfaces for engaging said elongated members, and said rails having external projections on their sides cooperating with longitudinal

retaining means on the jaws, and each jaw engaging a selected one of said rails having a channel facing said one rail, the improvement according to which the sides of each channel in a jaw define inner slots receiving said projections with a significant tolerance, and the gripping surface of one jaw of each pair of opposed jaws is provided with a metal grounding strip in electrical contact at at least one end with at least one metal member ensuring an electrical connection between said grounding strip and said one rail, said metal member having a portion which forms a generally cylindrical spring compressed between the bottom of said one rail and the bottom of the channel in said one jaw to ensure the elastic suspension of the said jaws relative to said one rail after mounting of the said elongated members.

3,968,324

CIRCUIT ARRANGEMENT FOR SYNCHRONIZING THE LETTERS/FIGURES LEVELS OF SEVERAL INPUT AND OUTPUT DEVICES IN TELEPRINTERS

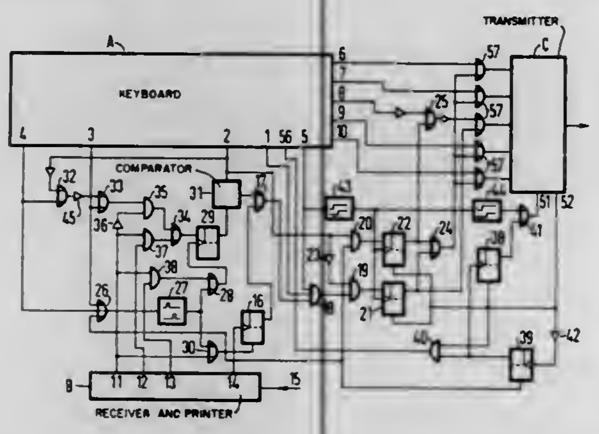
Roman Lutz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 6, 1975, Ser. No. 555,880

Claims priority, application Germany, Mar. 18, 1974, 2413013

Int. Cl.² H04L *17/02*

U.S. Cl. 178—2 R **3 Claims**



1. An arrangement for synchronizing input/output devices in teleprinters as relates to a subdivision, necessitated by the use of a five-bit code for communications transmission purposes, of the total quantity of characters into letters/figures level assignments, the teleprinter including a receiver and a transmitter, said arrangement comprising:

- a storage device connected to the transmitter and to the receiver for storing the level assignment of the last transmitted or received character from the sequence of transmitted and received characters;
- a comparator connected to said storage device for comparing the level assignment of the stored character with that of a character ready for transmission; and
- a logic arrangement connected between said comparator and the transmitter for introducing a level-related switching symbol in response to disparity determined by said comparator.

3,968,325

TELEVISION RECEIVER WITH NOISE IMMUNE AFC CIRCUIT

Louis Joseph Gerardus Beriere, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

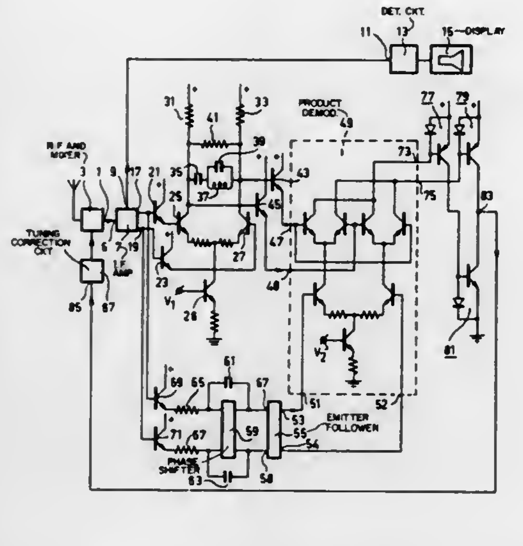
Filed July 24, 1974, Ser. No. 491,557

Claims priority, application Netherlands, Aug. 3, 1973, 7310739

Int. Cl.² H04N *5/50*

U.S. Cl. 178—5.8 AF **2 Claims**

1. An automatic tuning correction circuit for a television signal having desired video and audio frequencies, said circuit comprising a frequency correction circuit; phase detector means for generating a tuning correction signal having a first input for receiving said television signal, a second input, and an output coupled to said correction circuit; and means for eliminating erroneous tuning correction signals due to noise comprising a filter having an input means for receiving said television signal and an output coupled to said generating means second input, said filter having a response pole at the desired video frequency and a response zero at a frequency intermediate said desired video and audio frequencies.



3,968,326

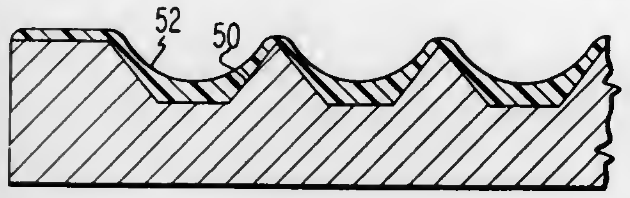
TRAPEZOIDAL SMOOTH GROOVES FOR VIDEO DISC

Richard William Nosker, Princeton, and Leonard Pincus Fox, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 331,235, Feb. 9, 1973, Pat. No. 3,882,214. This application Sept. 6, 1974, Ser. No. 503,680

Int. Cl.² H04N *5/76;* **G11B** *11/12*

U.S. Cl. 178—66 R **3 Claims**



1. A disc record suitable for recording information thereon comprising:

- a disc substrate having a spiral groove of trapezoidal cross-sectional shape formed therein; and
- a surface material coating said trapezoidal spiral groove, said coated spiral groove having a surface of regularly curved cross-sectional shape including inflection points on each wall of said coated groove located closer to the peaks than to the valley of said coated groove, the surface curvature in said valley between said inflection points substantially corresponding to an arc of a circle.

3,968,327

TELEVISION SIGNAL DISTRIBUTION SYSTEM

Ray V. Gregg, III, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

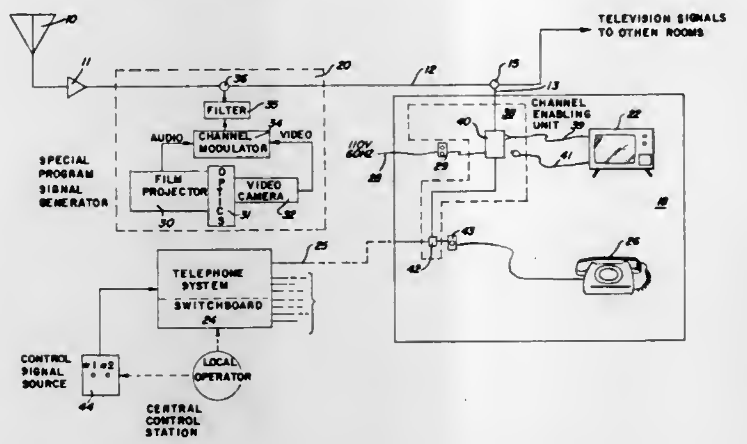
Filed June 15, 1973, Ser. No. 370,402

Int. Cl.² H04N *7/10;* **H04H** *1/08;* **H04N** *7/18*

U.S. Cl. 178—6.8 **5 Claims**

3. A television signal distribution system for a plurality of multiple channel receivers, comprising:

- a source of television signals for each of a plurality of channels;
- circuit means including a low impedance transmission line connected from said source of television signals to each of said receivers for conducting said television signals from said source to each of said receivers;
- a band suppression channel filter for at least one of said channels connected between said circuit means and each of said receivers, said filter having a series connected inductor and capacitor connected in shunt across said transmission line and resonant at the frequency of the video carrier of the television signal;
- a central control station; and
- means actuated by an operator at said central control station and operative without manipulation of any circuit control by the viewer at the receiver to disable the channel filter at a selected receiver.



3,968,328

CIRCUIT FOR AUTOMATICALLY CORRECTING THE TIMING OF CLOCK PULSE IN SELF-CLOCKED PULSE SIGNAL DECODERS

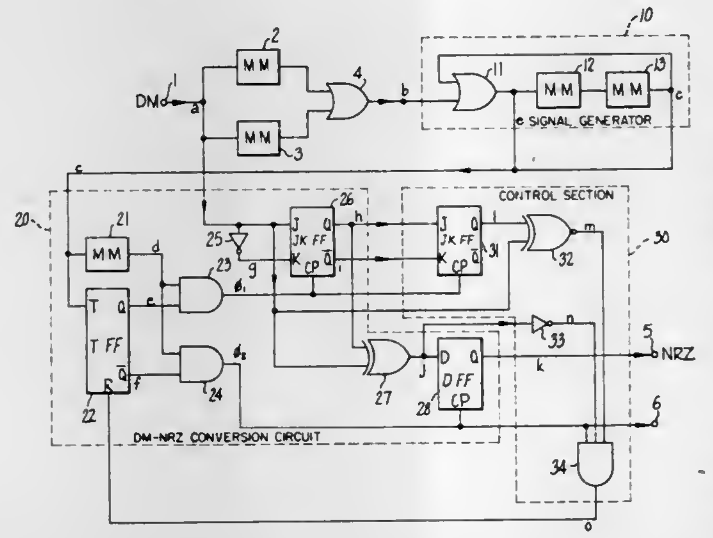
Yoshikazu Tsuchiya; Takenori Sonoda, 3, both of Tokyo, and Jun Takayama, Kokubunji, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1974, Ser. No. 533,773

Claims priority, application Japan, Dec. 18, 1973, 48-142049

Int. Cl.² H04L *25/40*

U.S. Cl. 178—88 **12 Claims**



1. A circuit for decoding a dynamically modulated non-return-to-zero signal with an encoded clock signal of a predetermined repetition rate comprising:

- A. first means connected to receive the dynamically modulated signal and to generate a continuous series of pulses at twice the repetition rate of the clock signal encoded into the dynamically modulated signal;
- B. a selector circuit connected to the first means to separate the pulses into first and second interleaved sets of pulse signals, each having a repetition rate corresponding to the repetition rate of the clock signal in the dynamically modulated signal;
- C. retaining means connected to receive the dynamically modulated signal and connected to the selector circuit to retain information concerning the state of alternate half bit cells of the dynamically modulated signal and to compare the retained information with the state of part of another half bit cell within a group of three successive bit cells to produce a first signal having one state when the states of the compared half bit cells are in the same state with respect to each other and having the opposite state when the compared half bit cells are in mutually opposite states;
- D. first comparison means to compare relative states of a second pair of half bit cells within the group of three bit cells to produce a second signal, at least one of the half bit cells of the second pair being spaced in time by at least one bit cell from one of the half bit cells used to generate the first signal; and
- E. second comparison means to compare the first and second signals, the second comparison means being connected to the selector circuit to control the operation thereof to select the correct one of the sets of interleaved pulse signals.

3,968,329

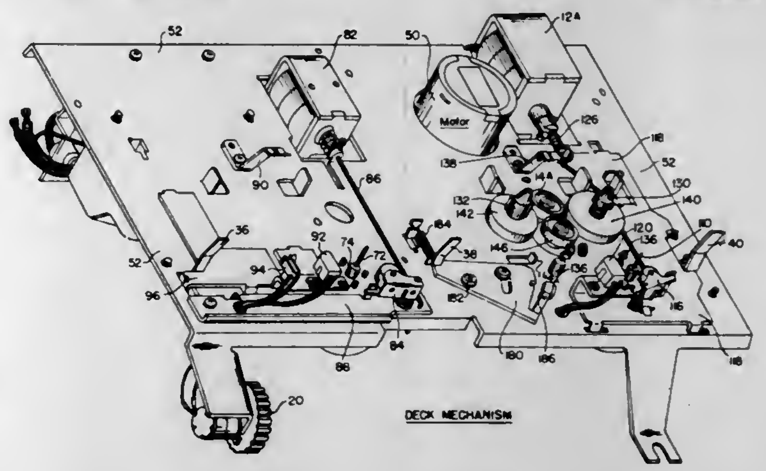
TELEPHONE ANSWERING APPARATUS

James R. Darwood, Cerritos, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Filed Feb. 10, 1975, Ser. No. 548,413

Int. Cl.² G11B *15/68, 5/54*

U.S. Cl. 179—6 R **9 Claims**



1. A telephone answering apparatus including in combination: means mounted in said apparatus for receiving a removable magnetic announcement tape unit; first capstan drive means mounted in said apparatus on one side of the path of the tape in said removable tape unit for driving the tape; a first pinch roller assembly mounted in said apparatus on the opposite side of the path of said tape; first solenoid means mechanically coupled to said first pinch roller assembly for selectively causing the first pinch roller assembly to be drawn against the tape to move the tape into driving engagement with the first capstan drive means; means mounted in said apparatus for receiving a removable cassette-type magnetic message tape unit; a second capstan drive means mounted in said apparatus on one side of the path of the tape in the message tape unit for driving the message tape; a second pinch roller assembly mounted in said apparatus on the opposite side of the path of the tape in said message tape unit; second solenoid means mechanically coupled to said second pinch roller assembly for selectively moving said second pinch roller assembly toward the second capstan drive means to move the tape in said message tape unit into driving engagement with the capstan drive means; a drive motor mounted in the apparatus and mechanically coupled to the first and second capstan drive means; first and second spindle means mounted in the apparatus for receiving the cassette-type message tape unit; mechanical coupling means for selectively coupling the drive motor to the first and second spindle means to drive the tape in the message tape unit selectively in a forward and in a rewind

direction; and third solenoid means connected to said coupling means for changing the coupling of the drive motor from one of the spindle means to the other whenever the third solenoid means is energized.

3,968,330
CODE GENERATOR FOR TELEPRINTERS OR DATA PRINTERS

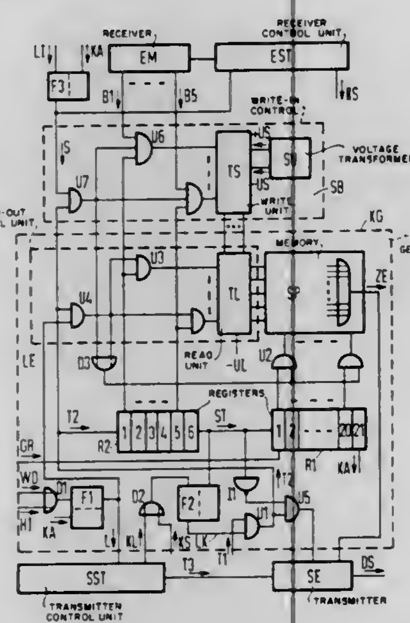
Martin Ludwig, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 16, 1975, Ser. No. 541,616

Claims priority, application Germany, Jan. 25, 1974, 2403599

Int. Cl.² H04L *15/00*

U.S. Cl. 178—79 10 Claims



1. An answer back code generator for a teleprinter or data printer and operated to generate a sequence of character signals as subscriber recognition signals when connected to another subscriber, comprising:

- a memory means for storing a sequence of characters assigned to a subscriber, including a plurality of electronically operable storage elements for storing character signals, said storage elements constructed to retain stored data unaltered upon disconnection of the operating voltage;
- a pulse generator;
- register means operably connected to said memory means and containing the addresses of particular operated storage elements, including means connected to said pulse generator for receiving pulse trains and responsive thereto to step-by-step alter the content of said register means; and
- a read-out control unit connected to said memory means and adapted to receive a reading control signal to cause reading of the characters stored in the addressed storage elements.

3,968,331
ENCODING AND DECODING SYSTEM FOR QUADRAPHONIC SOUND

Robert Nestor Joseph van Sluys, Eindhoven, Netherlands

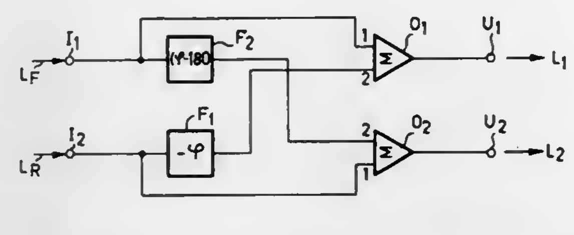
Filed July 2, 1974, Ser. No. 485,204

Claims priority, application Netherlands, July 9, 1973, 7309536

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ 7 Claims

1. Method of encoding four quadraphonically correlated signals for transmission via four channels, said method comprising combining in a first channel a first left signal with a second left signal which has been shifted in phase, combining in a second channel the second left signal with the first left signal which has been supplementarily shifted in phase with respect to the phase shift of said second left signal in said first channel, combining in a third channel a first right signal with a second right signal which has been shifted in phase, and combining in a fourth channel the second right signal with the first right signal which has been supplementarily shifted in phase with respect to the phase shift of said second right signal in said third channel.



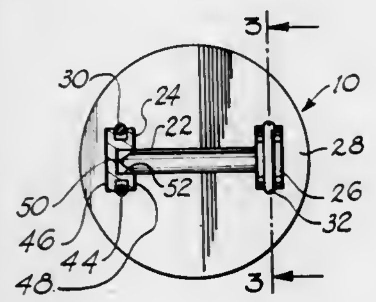
3,968,332
TOY CARBON MICROPHONE

Dinsdale Thorpe, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 5, 1975, Ser. No. 584,195

Int. Cl.² H04R *21/02*

U.S. Cl. 179—141 2 Claims



1. A resistance microphone comprising a diaphragm formed of a plastic sheet, a pair of carbon cups having outer peripheries and circular bores, means for mounting said cups on said diaphragm in spaced apart opposed relationship, a carbon cylindrical rod having generally conical opposite ends, opposite ends of the rod being held loosely in opposite bores of the cups, and a pair of leads electrically connected respectively to said pair of cups and a pair of holes in said diaphragm on opposite sides of each cup, and wherein said mounting means comprises said leads respectively wrapped around the outer periphery of said cups and through said pairs of holes.

3,968,333
BATTERY CHARGER CONTROL CIRCUIT FOR TELEPHONE TRANSMISSION SYSTEMS

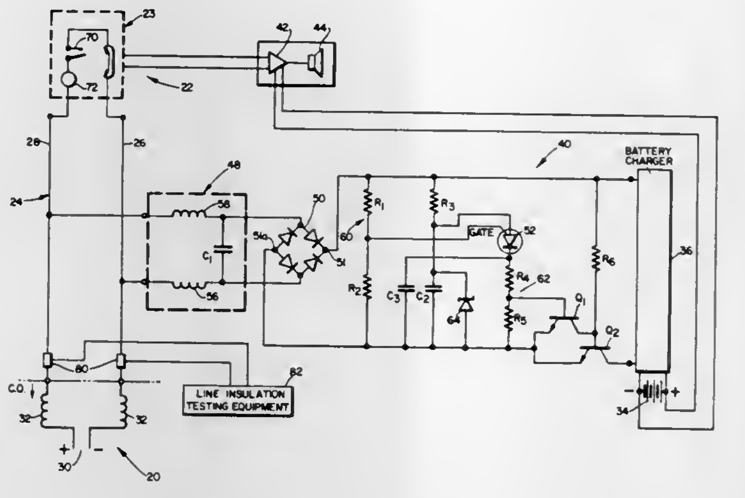
Frank L. Simokat, Euless, and LeRoy S. Baker, Grapevine, both of Tex., assignors to Superior Continental Corporation, Hickory, N.C.

Filed Sept. 18, 1973, Ser. No. 398,448

Int. Cl.² H04H *1/08;* **H04M** *1/00*

U.S. Cl. 179—16 A 22 Claims

1. A method of temporarily electrically disconnecting a rechargeable, equipment-powering battery from a plural conductor transmission line in a telephone transmission circuit in which a telephone is electrically connected by said line to a central office, and in which said battery is located remotely from the central office and is normally electrically connected to said line when said line is idle to be recharged by current fed down said line from a d.c. power source which is located at said central office, said method comprising the steps of electrically disconnecting said battery from said line and charging a capacitor either upon transferring said telephone from its on-hook condition to its off-hook condition or upon disconnecting said line from said source, and utilizing the charge stored on said capacitor to temporarily delay the reconnection of said battery to said line following establishment of a condition in which said telephone is in its on-hook condition and said line is electrically connected to a selected power source.



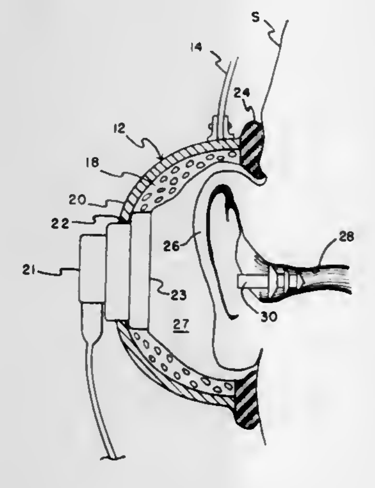
3,968,334
AUDIOMETRIC METHOD AND APPARATUS FOR TESTING THE EFFECTIVENESS OF HEARING PROTECTIVE DEVICES

Miguel Padilla, 1830 Avenida del Mundo, No. 1712, Coronada, Calif. 92118

Filed Oct. 10, 1974, Ser. No. 513,604

Int. Cl.² H04R *29/00*

U.S. Cl. 179—175 6 Claims



1. An audiometric method for testing the effectiveness of insert-type hearing protective devices in a user's ear canals comprising the steps of:

- enclosing each ear with a separate portable acoustical enclosure;
- positioning the enclosure so that each ear pinna is freely spaced from the respective enclosure to avoid distortion of the ear canals by physical contact therewith,
- attaching and sealing the enclosures to the user's head to provide a free field condition for each ear without the need to restrict movement of the head,
- applying predeterimed audiometric signals to each of said ears within the enclosures in two conditions, namely with the protective devices removed and with the protective devices present,
- ascertaining the user's hearing threshold levels in both conditions to determine the relative noise attenuation of the protective devices.

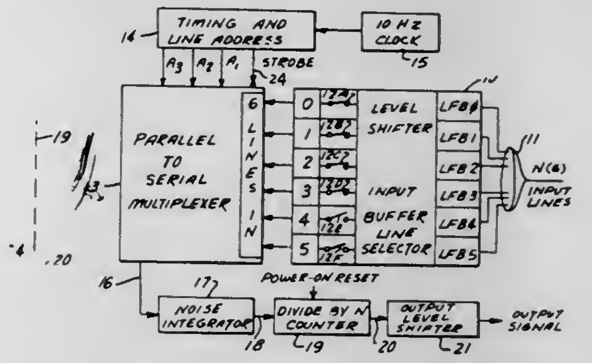
3,968,335
DIAL TONE SPEED MONITOR

Leroy H. Werner, Burlington, and Ralph I. Nagata, Berlin, both of N.J., assignors to Telesciences, Inc., Moorestown, N.J.

Filed Feb. 3, 1975, Ser. No. 546,199

Int. Cl.² H04M *3/36*

U.S. Cl. 179—175.2 C 5 Claims



1. Apparatus for monitoring the signal states on a plurality of independent signal lines and for generating signals which indicate the average condition of the signal state on all of the monitored lines, comprising in combination,

- a. parallel to serial electrical signal input multiplexer means having a plurality of independent input circuits adapted for connection to a plurality of independent input signal lines, and having an output circuit, said multiplexer means being operative to sample on a time sequential repetitive basis the signal condition on each of said input circuits and to produce at its output circuit an intermediate signal whenever a sampled input circuit is characterized by a first signal state and to produce no intermediate signal when a sampled input circuit is not characterized by said first signal state,
- b. line selection means for selecting for monitoring any number of the plurality of independent signal lines and for connecting the same to selected ones of said multiplexer means plurality of independent input circuits, and
- c. counter means having an input circuit operatively coupled to said multiplexer means output circuit to receive intermediate signals from the latter, having an output circuit, and having count selection means effective to set the counter to count a number of intermediate signals from said multiplexer equal to the number of independent signal lines selected for monitoring by said line selection means and operative to thereupon generate an output count signal at its output circuit

whereby, an output count signal can occur at most once during each multiplexer scan time so that an average condition of the signal state on all of the monitored lines is obtained from the number of output count signals which occur during any particular time interval.

3,968,336
KEYBOARD SWITCH ASSEMBLY HAVING MOVABLE CONTACT, AND SUPPORTING HELICLINE TYPE LEGS DISPOSED CO-PLANAR TO COMMON CONDUCTIVE SHEET

Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,480

Int. Cl.² H01H *13/26, 1/06*

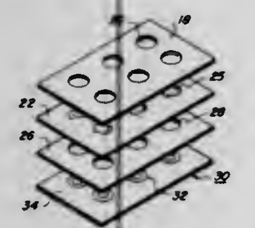
U.S. Cl. 200—5 A 50 Claims

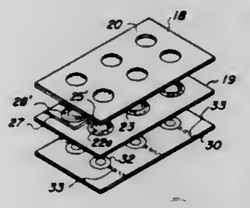
14. A keyboard switching device comprising:

- a first electrically conductive member having a plurality of planar spring-like patterns formed on separate conductive surfaces thereof, each of said patterns comprising a plurality of unconnected, curved slots radiating continuously outwardly from a common portion thereof, a plurality of conductive members, at least some of said plurality of conductive members being positioned adjacent at least some different ones of said common portions; and

electrically insulating means for normally separating said adjacent center portions and contact members but permitting each one of said adjacent common portions to effect a switching action when said one common portion is forced from the plane of said first member.

17. A keyboard for effecting an electrical change upon depression of keys by an operator, comprising:





a plurality of conductive surfaces supported in a common plane by electrically insulating support means, each of said surfaces having a plurality of unconnected, curved slots radiating continuously outward from a common portion thereof;

a contact board positioned adjacent said support means and having a plurality of electrical contacts, at least some of said plurality of contacts in axial alignment with different ones of said common portions;

said electrical insulating support means normally separating said axially aligned electrical contacts from said common portions but permitting each of said common portions to be forcibly moved toward said electrical contact in axial alignment therewith to effect a switching action.

3,968,337
DOOR-ACTUATED ALARM SWITCH
Donald G. Cole, 1528 E. Broadmoor St., Springfield, Mo. 65804
Continuation-in-part of Ser. No. 492,169, July 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 402,028, Oct. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 267,565, June 29, 1972, abandoned. This application Apr. 30, 1975, Ser. No. 573,321
Int. Cl.^{2} H01H *3/16, 3/20*
U.S. Cl. 200—61.62 **20 Claims**

1. An alarm switch for actuation by a door comprising:

a body of electrical insulation material adapted to be mounted on a wall above a door opening on the side of the wall toward which the door in the door opening swings open,

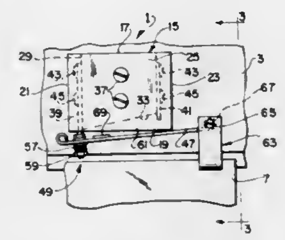
first and second electrical terminals carried by the body extending down at the bottom of the body and adapted for attachment of electrical lines thereto for connection of the switch in an alarm circuit, the lower ends of said terminals being spaced endwise of said body,

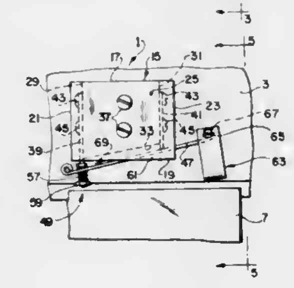
an electrically conductive switch arm,

means mounting the arm at the lower end of the first terminal for up and down swinging movement and also for swinging movement about a generally vertical axis relative to the body with said arm in electrically conductive relation with the first terminal, said arm being swingable upwardly generally in the plane of the terminals to a raised circuit-closing position engaging the lower end of the second terminal, and being biased to swing upwardly,

said arm being swingable downwardly against the bias and laterally away from its said raised circuit-closing position to a position for actuation by the door angled toward the door,

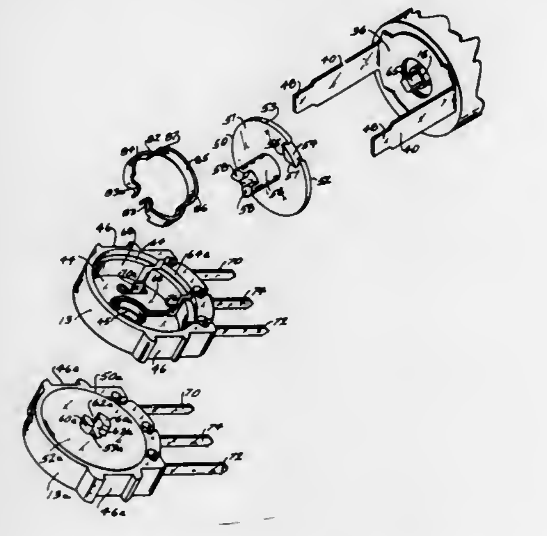
stop means extending down from the bottom of said body engageable by the arm when swung to its said angled position to hold it down against said bias,





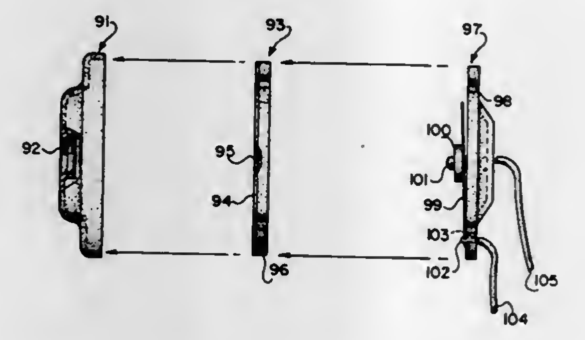
and means at the free end of the arm engageable by the door on opening of the door when the arm is in its said angled position for swinging the arm out from under said stop means, whereupon the arm swings up into engagement with said second terminal.

3,968,338
ELECTRICAL SWITCH CONTROL
John Zdanys, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.
Filed Aug. 13, 1974, Ser. No. 496,973
Int. Cl.^{2} H01H *19/32*
U.S. Cl. 200—68 **11 Claims**



1. In a tandem switch control, the combination of first and second housing sections, each housing section defining a cavity, said first housing section being provided with an aperture, an annular bearing member carried by each of said housing sections, first and second contact means disposed within each of said housing sections, a common contact means disposed between said first and second contact means in each of said housing sections, a contact spring disposed within each of said housing sections engaging said first contact means and said common contact means in a first stable position and engaging said second contact means and said common contact means in a second stable position, a first switch actuator closing the cavity of said first housing section, said first switch actuator being formed in the shape of a disk and being provided with a first surface, a pair of lugs extending forwardly from said first surface into the aperture in said first housing section, a wedge shaped cam carried by said first surface and disposed near the periphery of said first switch actuator for rotation in an interference path with the contact spring in said first housing section, a second switch actuator closing the cavity of said second housing section, said second switch actuator being formed in the shape of a disk and being provided with first and second spaced surfaces, said second spaced surface being provided with lug receiving notches engaging said pair of lugs for securing said first switch actuator to said second switch actuator, a wedge shaped cam carried by said first spaced surface of the second switch actuator and disposed near the periphery of said second switch actuator for rotation in an interference path with the contact spring disposed in said second housing section, and a shaft engaging the first switch actuator for simultaneous rotation of said switch actuators, each of said bearing members being disposed near the periphery of the housing sections and comprising a ridge member and an annular wall disposed adjacent said ridge member, said switch actuator abutting said ridge, said annular wall being disposed adjacent the periphery of said actuator.

3,968,339
APERTURED DIAPHRAGM END VALVE
Joe Heaton, 120 W. Washington St., Tipton, Ind. 46072
Filed Nov. 25, 1974, Ser. No. 527,092
Int. Cl.^{2} H01H *13/16*
U.S. Cl. 200—86 A **7 Claims**



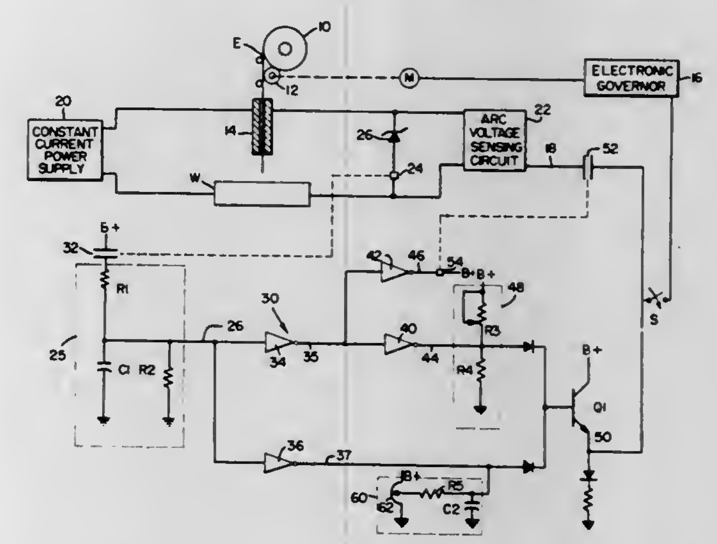
1. An apertured diaphragm end valve capable of providing controlled pressure leakage in a pneumatic system comprising:

A. an end plate containing a central aperture for connection to a pneumatic hose;
B. a diaphragm element for engagement with said end plate comprising;
  i. a rigid support ring; and
  ii. a resilient blatter defined by said support ring and having a centrally located aperture therein;
C. a backing second end plate containing:
  i. an aperture bleed port;
  ii. metal contacts for closing an electric circuit upon deflection of said diaphragm;
  iii. a metallic leaf spring which touches said metal contacts upon the closing of said electric circuit and contained thereon, a projection aligned with said aperture of said blatter.

3,968,340
MIG STARTING SYSTEM
Robert Charles Fernicola, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.
Filed July 3, 1974, Ser. No. 485,746
Int. Cl.^{2} B23K *9/12*
U.S. Cl. 219—131 F **4 Claims**

1. A starting system for establishing an inert gas shielded arc between a consumable wire electrode and a workpiece from a constant current power supply which comprises, in combination: a control circuit, said control circuit comprising:

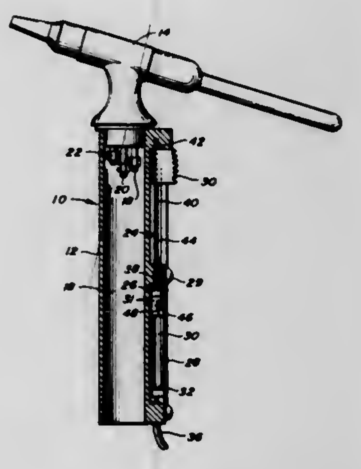
a. means responsive to the voltage across the electrode to workpiece for providing a DC output signal of a first predetermined magnitude when said voltage exceeds a first predetermined level representative of an open circuit;
b. means for decreasing said DC output signal over a predetermined time period to a second predetermined magnitude when said voltage drops below a second predetermined level representative of a short circuit; and



c. means responsive to said first predetermined magnitude for providing a first speed control signal and to said second predetermined magnitude for providing a second speed control signal; and

means for automatically advancing said wire electrode toward the workpiece at a starting rate of speed to establish the arc in response to said first speed control signal and at a normal welding rate of speed in response to said second speed control signal.

3,968,341
WELDING TORCH WITH INTEGRAL CURRENT CONTROL
Richard William Manning, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Aug. 9, 1974, Ser. No. 496,052
Int. Cl.^{2} B23K *9/10*
U.S. Cl. 219—132 **4 Claims**



1. An arc-welding torch handle comprising in combination:

a hollow elongate body having a first end and a second end said body being generally cylindrical in cross-section with a generally flat planar top portion having therein a first recess and a second recess in tandem with an aperture therebetween said second recess having as its bottom surface an electrical shielding plate;

means for mounting a welding torch head including an electrode on the first end of said body and communicating with the hollow interior of said body;

linearly actuated control means on said body, said control means comprising in combination a linear switch and linear potentiometer both of which are disposed in said second recess in said handle in tandem relationship and activated by a single linear slide;

a rail mounted linearly slidable thumb activated button mounted in said first recess in said handle said button traversing a linear path of fixed length which path can be fully traversed by a welder's thumb when gripping said body without shifting of the welder's grip;

means connecting said button to said slide through said aperture between said first and second recesses;

an insulated cover fully enclosing said second recess;

said control means being adapted, when connected between a source of welding crrent which is also connected to the electrode of a welding torch head on said body so as to enable the welder to initiate a welding arc by energizing said switch and to continuously vary electrical welding current from a low value welding current to a full source rated welding current flow position.

3,968,342

MOISTURE RESPONSIVE SYSTEM FOR REMOVING CONDENSATION

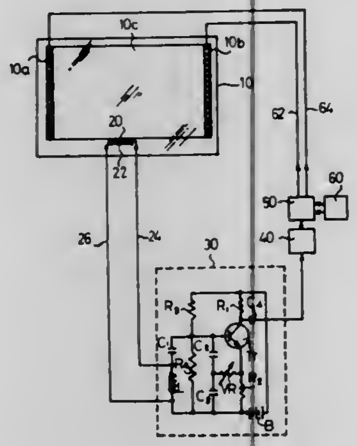
Hiroshi Inaba, Saitama, Japan, assignor to Central Glass Co., Ltd., Japan

Filed July 24, 1972, Ser. No. 274,611

Claims priority, application Japan, July 31, 1971, 46-57804

Int. Cl.² B60L *1/02*

U.S. Cl. 219—203 **2 Claims**



1. In moisture-responsive apparatus for removing vapor condensation from a transparent glass sheet having a heating element and electrical terminals, the improvement comprising:

a pair of moisture-detecting electrodes mounted on said glass sheet;

an oscillator incorporating said pair of electrodes as component parts thereof for applying an internally developed AC voltage to said electrodes, said electrodes being interconnected with said oscillator such that a change in electrical resistance between said electrodes causes a corresponding change in the output level of said oscillator; and

a relay circuit operatively connected to said oscillator for switching a current supply to said heating element on and off in accordance with the output level of said oscillator.

3,968,343

FUSER ROLL TEMPERATURE REGULATOR PROBE

Zenon Guran, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,552

Int. Cl.² H05B *1/00;* G03G *15/00*

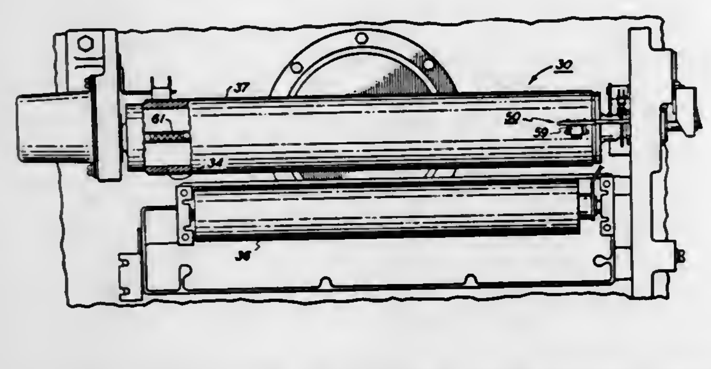
U.S. Cl. 219—216 **6 Claims**

1. Apparatus for sensing surface temperatures of a heated roll utilized for fusing toner images, said apparatus comprising:

temperature responsive means;

a thermally conductive cap member having a generally planar surface with an area protruding outwardly therefrom to form a recess for receiving said temperature responsive means;

a first support means for supporting said thermally conductive cap member, said first support means being thermally insulative, said temperature responsive means being recieved in said recess; and



second support means carrying said first support means, said second support means being pivotally mounted by a pin member whereby said protruding area can be biased into contact with the surface of said heated roll.

3,968,344

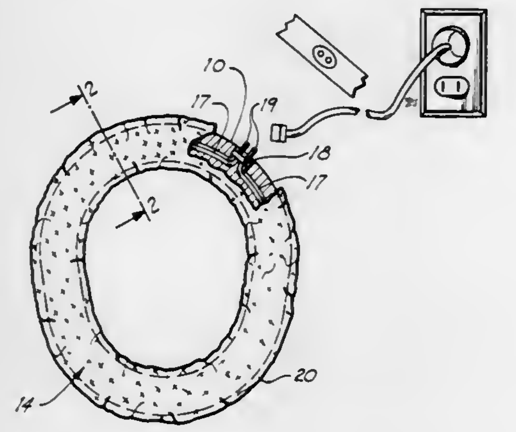
WARMTH INTO OR ON TOILET SEATS

Donald L. Gallegos, Sr., Chama, N. Mex., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 30, 1975, Ser. No. 591,346

Int. Cl.² H05B *1/00*

U.S. Cl. 219—217 **4 Claims**



1. An electrically heated toilet seat pad said pad comprising a resilient material having the configuration of a toilet seat, said pad having integrally formed inturned edges on its underside, and heating elements in said pad arranged to be connected to a wall outlet said integrally formed inturned edges comprising flexible fastening means arranged to detachably secure said pad to said toilet seat.

3,968,345

COMBINED WAX AND EDGE SHARPENING APPARATUS FOR SKIERS

Michael Kollmeder, Gorzerstr. 5, 8 Munich 80, Germany

Filed Sept. 4, 1974, Ser. No. 503,526

Claims priority, application Germany, Sept. 17, 1973, 2346717

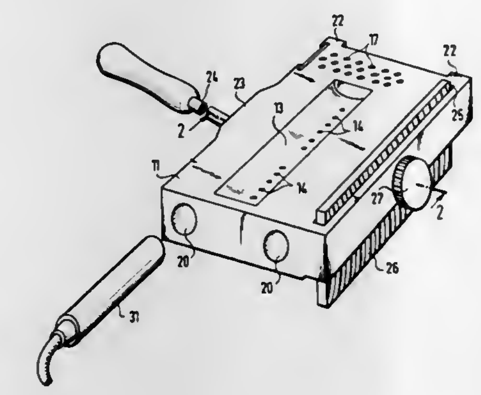
Int. Cl.² A63C *11/04;* H05B *1/00*

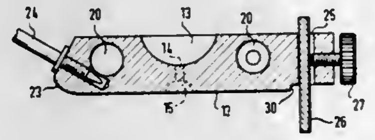
U.S. Cl. 219—228 **16 Claims**

1. A combined edge sharpener and waxing device for use with wax and heating means to wax and sharpen skis comprising:

a manually manipulable file holder carrying at least one metal file, which holder has a guide surface standing substantially perpendicularly to the cut of the metal file, and in which the metal file can be clamped in variable positions relative to the transverse direction of the file holder,

the file holder defining a heatable and flat waxing implement including means forming a wax melting container, means for receiving container heating means to heat the container to wax melting temperature, means extending from the container to the guide surface through which





melted wax can flow to the guide surface, said guide surface defining a wax distribution surface for evenly distributing the melted wax across the running surface of the ski when the combined device is pulled along said running surface.

3,968,346

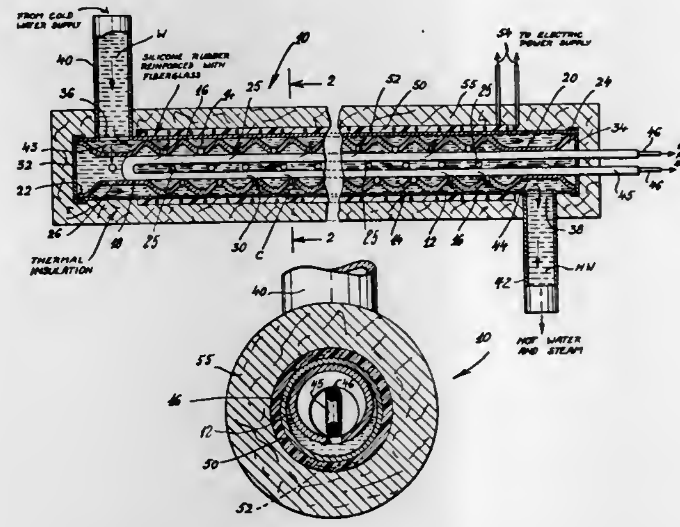
METHOD AND APPARATUS FOR ELECTRICALLY HEATING A FLUID

Ralph D. Cooksley, Great Meadow Towers, 1800 Silas Deane Highway, Rocky Hill, Conn. 06067

Filed June 1, 1973, Ser. No. 366,050

Int. Cl.² H05B *1/00;* F24H *1/12*

U.S. Cl. 219—305 **10 Claims**



1. A heat exchanger comprising a plurality of generally coaxial elongated tubes including a first inner tube providing a first inner tube longitudinally extending fluid passageway within the first tube and a second tube surrounding the first tube and defining therewith a second outer longitudinally extending fluid passageway around the first inner tube, first means for conducting fluid to one longitudinal end of each of the fluid passageways for providing flow of the fluid along each fluid passageway in a respective one longitudinal direction therein from its one longitudinal end towards its other longitudinal end respectively, outlet conduit means for conducting fluid from each of the fluid passageways comprising a plurality of longitudinally spaced openings in the first inner tube for conducting fluid from one of the fluid passageways to the other fluid passageway and second means for conducting, from said other longitudinal end of said other fluid passageway, the fluid conducted to said other fluid passageway by said first means and the fluid conducted through said longitudinally spaced openings to said other fluid passageway from said one fluid passageway, third means closing said other longitudinal end of said one fluid passageway, and heater means within said one fluid passageway for heating the fluid in said one fluid passageway whereby the fluid conducted along said one fluid passageway is first heated by the heater means and is then conducted through the longitudinally spaced openings in the first inner tube to combine with the fluid conducted along said other passageway, said first inner tube having at least one generally helical corrugation extending longitudinally therealong and forming a generally helical ridge and groove providing inner and outer generally helical channel portions in the first inner and second outer fluid passageways, and the longitudinally spaced openings being spaced along at least one of the generally helical channel portions.

3,968,347

MONOLITIC HEATING STATOR FOR THERMALLY TREATING ROLLERS

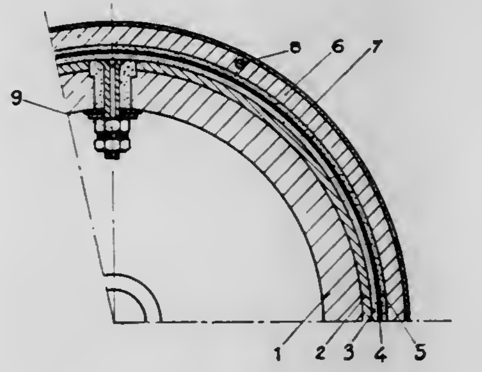
Bernard Isoard, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Feb. 7, 1975, Ser. No. 547,944

Claims priority, application France, Feb. 28, 1974, 74.07175

Int. Cl.² H05B *3/50*

U.S. Cl. 219—530 **10 Claims**



1. A monolithic stator member for rollers used for the thermal treatment of longitudinal structures, such as continuous filaments, yarns, slivers, rovings, etc., said member simultaneously acting as a heating organ and a bearing for the roller rotor, and comprising the following elements:

a cylindrical metallic support,

a first layer of mineral electrical insulator, sprayed on the support,

an electrical heating resistance, coiled around the first layer of mineral electrical insulator,

electrical connections for the resistance,

a layer of thermal insulator sprayed between the metallic support and the first layer of mineral electrical insulator,

a second layer of mineral electrical insulator, sprayed covering the first layer of mineral electrical insulator and in which the electrical resistance is embedded and

a sprayed on friction layer, said layers being concentric to and overlying the full cylindrical surface of said support for that length of it which is adapted to underlie the rotor.

3,968,348

CONTAINER HEATING JACKET

Phillip W. Stanfield, Rte. 1, Box 45, Osborne, Kans. 67473

Filed May 31, 1974, Ser. No. 474,940

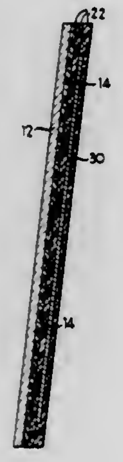
Int. Cl.² H05B *3/58*

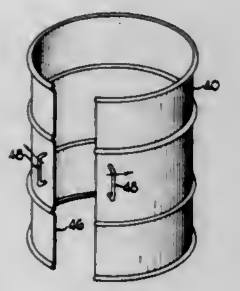
U.S. Cl. 219—535 **5 Claims**

1. A container heating jacket comprising:

a. a cylindrical wall structure defined by at least two laminated fiber glass mats bonded together by a thermosetting plastic;

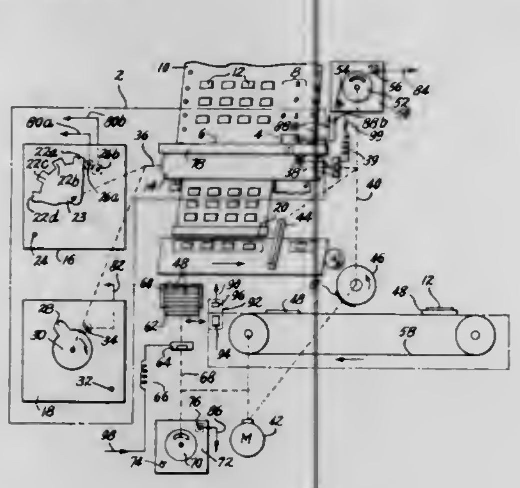
b. a resistance heating element placed between said mats and adapted for connection to a power source for generating heat; and





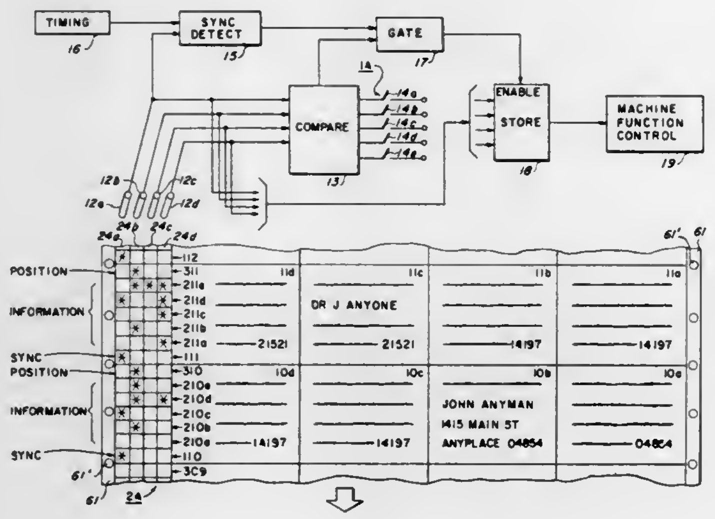
c. said wall structure being cut along a longitudinal axis to permit the jacket to be flexed and placed over a container having substantially the same dimensions as the jacket in its normal replaced condition, said wall structure having a memory for elastically holding itself to said container.

3,968,349
CONTROL LOGIC SYSTEM FOR ARTICLE-LABELING APPARATUS
Mark A. Hunter, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 26, 1974, Ser. No. 509,699
Int. Cl.^{2} G06K *13/18, 15/18, 7/14*
U.S. Cl. 235—61.6 R **14 Claims**



13. Apparatus for producing a control signal in response to a data code read from a sheet-like form, said form having a plurality of rows of labels, said rows having a plurality of labels and an adjacent data code identifying groups of labels, said form being fed to labeling means for cutting and application of said labels to conveyed articles, said apparatus comprising:
means for reading the data code adjacent the rows of labels, said reading means providing code signals,
manual means for producing an orientation signal indicative of which end of the sheet like form is first fed into the labeling means,
electronic control means responsive to said code signals and said orientation signal for providing a control signal, and
means for providing a visual indication of data code identified groups of conveyed articles labeled by said labeling means, said indication means responsive to said control signal.

3,968,350
ARTICLE LABELING APPARATUS AND LABEL FORM THEREFOR
Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 379,977, July 17, 1974. This application Oct. 22, 1974, Ser. No. 517,274
Int. Cl.^{2} G06R *19/00*
U.S. Cl. 235—61.12 N **4 Claims**



1. For use with automatic article labeling apparatus, an array of printed labels from which individual labels are derived, said array comprising:
a label field having a plurality of rows and columns of printed labels; said label field being adapted to be separated into individual labels; and
a discardable label identifying field comprised of groups of coded sense marks, each group of coded sense marks including a first portion to identify the information borne by at least one of the printed labels in at least one of said rows and a second portion to identify a predetermined one of said printed labels bearing said identified information.

3,968,351
OBJECT CLASSIFICATION AND COUNTING MACHINE HAVING CORRECTION APPARATUS FOR REMOVING BIAS FROM COUNT
James D. Baker, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 13, 1973, Ser. No. 397,047
Int. Cl.^{2} H03K *21/10*
U.S. Cl. 235—92 PC **4 Claims**

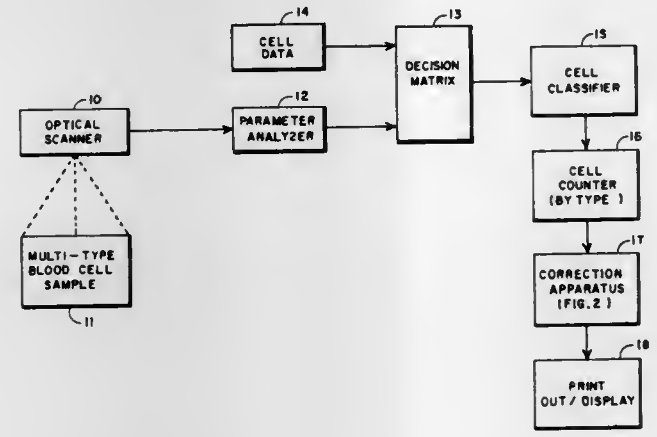
1. In a count correction apparatus for a system classifies classified objects by type to provide a signal readout of the count of the objects of each type, and further in which system there is a bias or error in the count of objects of each type because of limitations in the classifying, the average systematic errors being expressible by the matrix relation

$$\begin{pmatrix} v_1 \\ v_2 \\ \vdots \\ v_m \end{pmatrix} = \begin{pmatrix} p_{11}\, p_{12} \cdots p_{1m} \\ - - - - - \\ p_{m1}\, p_{m2} \cdots p_{mm} \end{pmatrix} \begin{pmatrix} n_2 \\ n_2 \\ \vdots \\ n_m \end{pmatrix} \qquad (1)$$

and being correctible according to the inverse matrix relation

$$\begin{pmatrix} u_1 \\ u_2 \\ \vdots \\ u_m \end{pmatrix} = \begin{pmatrix} q_{11}\, q_{12} \cdots q_{1m} \\ - - - - - \\ \\ q_{m1}\, q_{m2} \cdots q_{mm} \end{pmatrix} \begin{pmatrix} v_1 \\ v_2 \\ \vdots \\ v_m \end{pmatrix} \qquad (2)$$

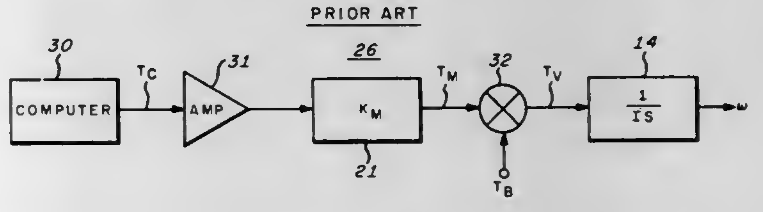
where the matrix with elements q_{ij} is the inverse of the matrix with elements p_{ij},
where
n_1, n_2, n_m is the actual number of objects of each type,
v_1, v_2, v_m is the machine count, and
u_1, u_2, u_m is the improved count, the improvement comprising:
count correction means connected to receive the signal count of objects by type comprising a network of scaling amplifiers and summing amplifiers, the number of summing amplifiers being equal to the number (m) of types of objects being counted, the number of matrix elements in the correction matrix being



equal to the square of the number of types of objects being counted, and the number of scaling amplifiers S_{11}, S_{12}, —, S_{1m}; S_{21}, S_{22}, —, S_{2m}; —; S_{m1}, S_{m2}, —, S_{mm} being at least equal to the number of non-zero elements of the correction matrix, said scaling amplifiers S_{11}, S_{12}, —, S_{1m} each connected to receive a signal the magnitude of which is a function of the count of one of said types, said scaling amplifiers S_{21}, S_{22}, —, S_{2m} each connected to receive a signal the magnitude of which is a function of the count of a second of said types, the remaining scaling amplifiers being connected in like manner to receive the count of other types, each of said scaling amplifiers corresponding in gain and sign to a different element of said correction matrix, the outputs of said scaling amplifiers S_{11}, S_{21}, — –, S_{m1} being connected to sum at one of said summing amplifiers, the outputs of said scaling amplifiers S_{12}, S_{22}, —, S_{m2} being connected to sum at the second summing amplifier, the remaining scaling amplifiers being connected in like manner to other summing amplifiers, whereby the outputs of said summing amplifiers provide, respectively, an improved accuracy count signal of each type of object.

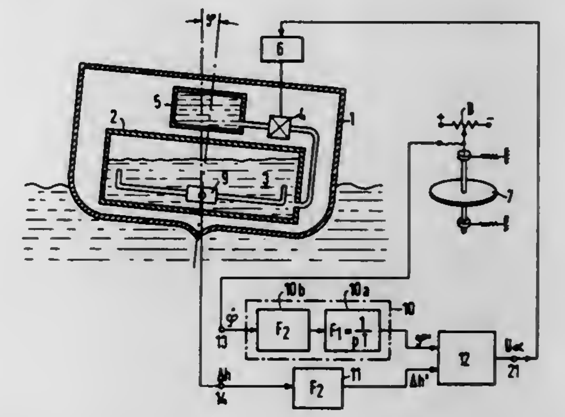
3,968,352
TORQUE CONTROL SYSTEM FOR REACTION WHEEL ASSEMBLIES AND THE LIKE
Richard E. Andeen, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 17, 1974, Ser. No. 470,879
Int. Cl.^{2} G01C *19/08*
U.S. Cl. 235—150.1 **16 Claims**

1. A control torque command circuit in a reaction wheel assembly which includes a sensitive element rotating at an angular velocity, ω, for controlling the attitude of a vehicle comprising
means for computing a desired torque command signal to control the attitude of said vehicle and providing said torque command signal at an output terminal of said computing means,
means coupled to said output terminal of said computing means for integrating said torque command signal and producing an integrated torque command output signal,
sensing means for measuring the angular velocity, ω, of said sensitive element and producing an output signal proportional thereto,



combining means having a first input terminal coupled to said integrating means for receiving said integrated torque command output signal and a second input terminal coupled to said means for measuring angular velocity for producing an output error signal proportional to the difference between said integrated torque command signal and said output error signal, and
motor means coupled to said combining means for receiving said output error signal and producing a torque output which is applied to said sensitive element thereby producing a change in said angular velocity, ω, whereby the torque applied to said sensitive element is substantially equal to said commanded torque signal and is compensated for the presence of undesired disturbance torques on said assembly and anomolies in said control circuit.

3,968,353
APPARATUS FOR DETERMINING THE PHASE DIFFERENCE BETWEEN THE ROLLING OSCILLATION OF A SHIP AND A LIQUID CONTAINED IN A STABILIZING TANK
Herbert Küller, Igelsdorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Oct. 31, 1974, Ser. No. 519,677
Claims priority, application Germany, Nov. 5, 1973, 2355202
Int. Cl.^{2} G06G *7/18;* **B63B** *39/03*
U.S. Cl. 235—150.2 **10 Claims**



1. Apparatus for determining the phase difference between the roll oscillation of a ship and the oscillation of a liquid contained in a stabilizing tank wherein means are provided to obtain an output proportional to the roll rate of the ship and the measured liquid level difference in the stabilizing tank and means provided to adjust the liquid level in the tank in response to a command signal comprising:
a. first means including the series connection of an ideal integrator and a first frequency dependent member for forming a dervied roll angle, having a frequency depen-

dent phase shift relative to the true angle, from the measured roll rate;

b. second means comprising a second frequency dependent member having a frequency response corresponding to the frequency response of said first frequency dependent member for forming a derived liquid level difference from the measured liquid level difference having the same frequency dependent phase shift as the derived roll angle relative to the true roll angle;

c. means for comparing the outputs of said first and seconds means to develop an analog measuring voltage dependent on the phase difference between the roll angle and the liquid level difference, said analog measuring voltage being the control voltage and being provided as a command single input to the means provided to adjust the liquid level in the tank.

3,968,354

TRANSVERSAL DIGITAL FILTER FOR DELTA CODED SIGNALS

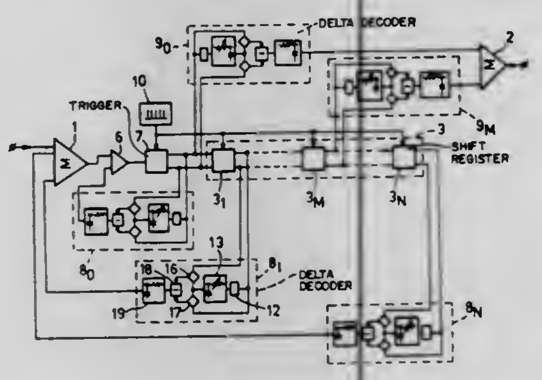
Gilbert Marie Marcel Ferrieu, Bievres, France, assignor to T.R.T. Telecommunications Radioelectriques, Paris, France

Filed July 17, 1974, Ser. No. 489,144

Claims priority, application France, July 20, 1973, 73.26734

Int. Cl.^{2} G06F *15/34*

U.S. Cl. 235—152 **8 Claims**



1. A digital filter comprising

clock pulse generator means for generating clock pulses;

input means for receiving an input signal to be processed;

delta modulator means responsive to said clock pulses for modulating the output of said input means, and having an output;

delay means connected to the output of said delta modulator means, comprising a plurality of stages, at least some of said stages having a tap;

and decoder means connected to said taps for supplying an output signal of predetermined magnitude, and a feedback signal to said input means.

3,968,355

AUTOMATIC NIGHT LIGHT STRUCTURE

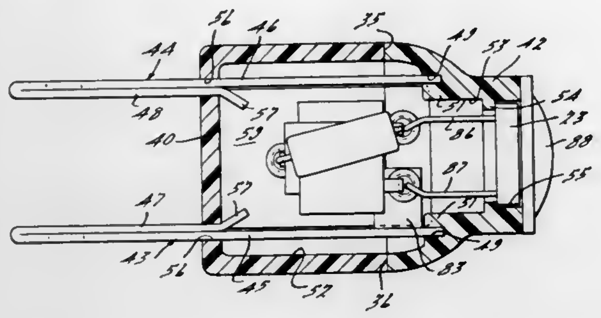
Jon Smallegan, Ann Arbor, Mich., assignor to Novo Products, Inc., Farmington, Mich.

Filed Mar. 31, 1975, Ser. No. 563,595

Int. Cl.^{2} F21V *33/00*

U.S. Cl. 240—2 R **10 Claims**

1. A night light structure comprising a housing having a circuit portion and a lamp portion extending therefrom, said circuit portion having a first wall with a pair of outlet prongs extending therefrom and an interior compartment, said prongs extending along opposite sides of said compartment, shoulder means on the side of said compartment remote from said wall, a circuit board in said compartment, means supporting said circuit board comprising portions of said prongs supporting one end of said board, said shoulder means supporting the other end of said board, the side edges of said board being disposed between the portions of said prongs within said compartment, means on the end of said circuit portion of the housing remote from said wall supporting a light-sensitive resistor, and conductive means leading from said light-sensitive resistor to said circuit board.



3,968,356

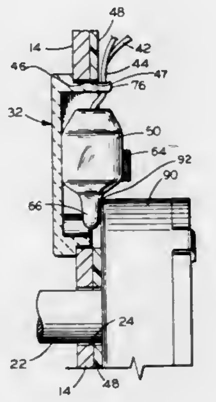
LIGHTED KNOB DIMMER

Robert L. Martin, Cranston, R.I., assignor to General Electric Company, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,391

Int. Cl.^{2} F21V *33/00*

U.S. Cl. 240—2 S **7 Claims**



1. A lighted knob dimmer comprising:

a. a dimmer having an insulating housing and a metal mounting bracket affixed to the housing for mounting the dimmer in a wall box,

b. the mounting bracket of said dimmer having located generally centrally thereof a control shaft capable of rotary motion to adjust the power level transmitted through said dimmer,

c. an opening through said mounting bracket adjacent said control shaft,

d. a light source in said opening,

e. said light source being restrained from movement through said opening by a lens member covering said bracket opening,

f. said light source being at least partially restrained from movement away from said lens member by abutment against a component element of said dimmer,

g. and said metal mounting bracket is backed by an insulating layer and wherein the opening through the mounting bracket extends also through the insulating layer.

3,968,357

ILLUMINATED EARRING WHICH IS SWITCHED ON BY SECUREMENT TO THE EAR

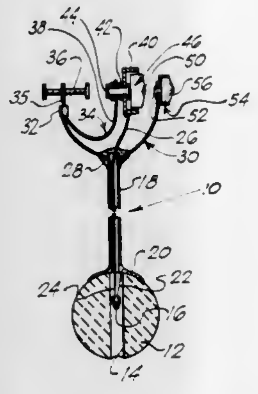
Eric Hamilton, Culver City, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 29, 1975, Ser. No. 626,828

Int. Cl.^{2} F21V *33/00*

U.S. Cl. 240—6.4 W **3 Claims**

1. An illuminated earring comprising: means for engaging the ear to secure the earring thereto, said means including a resilient U-shaped earring clip having a pair of opposed legs which are urged apart upon engaging an ear therebetween; a first electrical contact carried on one of said legs; a second electrical contact; a support secured to the earring clip carrying said second contact and maintaining it spaced opposite said first contact in a manner for said first contact to be urged toward and into contact with said second contact upon said engagement of the ear by said clip; said first and second contacts being configured and positioned for capturing a wafer battery therebetween and for contacting opposite terminals of said battery when said first contact is urged toward said second contact by said engagement with the ear; a lamp; means for carrying said lamp pendant from said support; and conductor means electrically coupling said first and second contacts to said lamp.



3,968,358

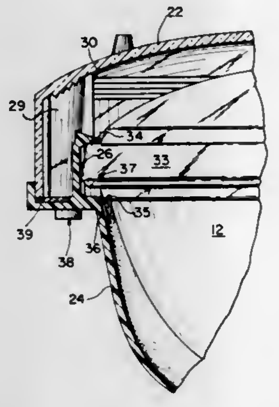
WARNING LIGHT ASSEMBLY

Joseph E. Baader, 333 Holiday Drive, Springfield, Ohio 45505

Filed May 21, 1975, Ser. No. 579,750

Int. Cl.^{2} F21V *17/00*

U.S. Cl. 240—41.55 **9 Claims**



1. A signal light assembly, of particular utility as a school bus warning light, comprising in combination:

A. A one-piece housing of a resilient material further comprising a cup-shaped body having a concave inner surface terminating at a circular rim and housing rim means further including an annular housing flange surface around and in the plane of said rim, said one piece housing further including a plurality of individual integrally formed resilient tabs, each tab comprising an elongated shaft extending substantially normally from said annular flange surface and with an inwardly directed projection surface on the distal end of said elongated shaft, and;

B. a general service sealed light bulb of the type having a circumferential lamp seal defining an upper retaining flange and with a lower seating plane surface, said bulb including electrical terminals on the rear thereof, wherein said bulb is held within said housing with said seating plane in contact with said housing rim means and said upper retaining flange in contact with at least one of said resilient tab projection surfaces, and;

C. a lens superstructure comprising a concave inner surface terminating at an annular lens mounting surface, said lens further comprising a plurality of bosses formed extending from the periphery of said inner lens surface, wherein at least one of said bosses is a combination boss including a bulb locating surface spaced from said annular lens mounting surface, whereby when said lens mounting surface is held against said housing rim means said bulb locating surface is proximate said bulb retaining flange.

3,968,359

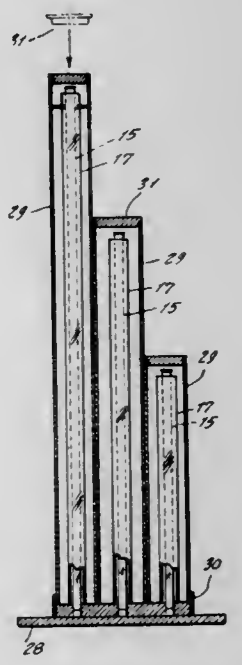
FLUORESCENT LAMP

Richard Shaffer, c/o George Spectro, 3615 Woolworth, Bldg., 233 Broadway, New York, N.Y. 10007

Filed June 3, 1974, Ser. No. 475,585

Int. Cl.^{2} H05B *33/02*

U.S. Cl. 240—51.11 R **2 Claims**



1. A fluorescent lamp device comprising a base, an elongated fluorescent lamp extending into and secured to said base, and an enclosing case for said lamp, said case including a transparent vertically extending support tube surrounding said lamp and extending into and secured to said base, and a plurality of various sized translucent outer globes mounted co-axially with and extending along the vertical axis of the tube wherein the globes are in peripheral contact with the tube and supported thereby.

3,968,360

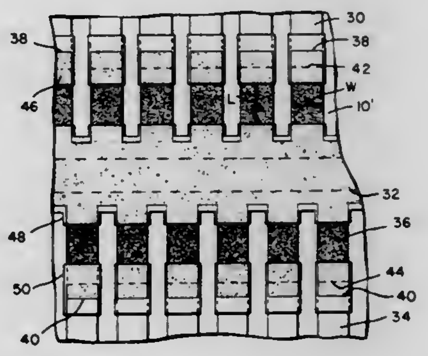
HIGH RESOLUTION PHOTOCONDUCTIVE ARRAY AND PROCESS FOR FABRICATING SAME

Milton H. Monnier, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 14, 1975, Ser. No. 567,982

Int. Cl.^{2} H01L *31/08*

U.S. Cl. 250—211 R **8 Claims**



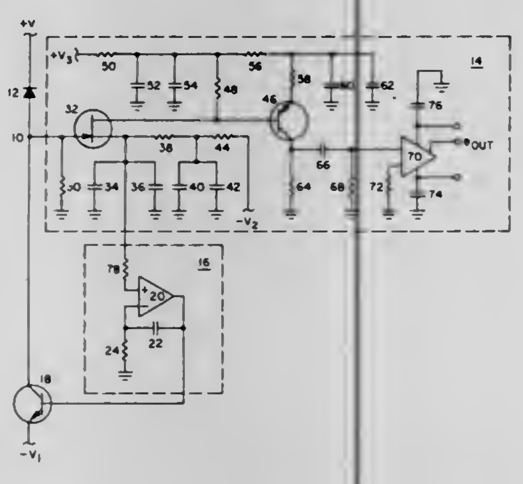
1. A photodetector array including photoresponsive elements defined by:

- a. a film of photoconductive material deposited on both an insulating substrate and on a metallization pattern thereon, and
- b. electroplated contacts overlying a portion of said photoconductive film atop metal regions in said pattern and separated a predetermined distance above a portion of said photoconductive film which is in direct contact with said substrate, and the spacing between said electroplated contacts defining one dimension of said photoresponsive elements.

3,968,361
LASER RECEIVER ANTI-SUN CIRCUIT

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 23, 1975, Ser. No. 589,503
Int. Cl.² H03F *3/08;* **H04B** *9/00*
U.S. Cl. 250—214 R **5 Claims**



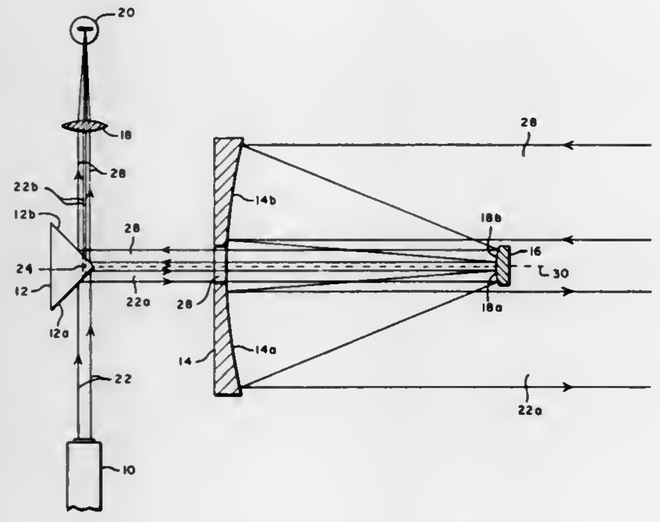
1. An electronic circuit includable within a photodetector circuit to eliminate the effects of background illumination so that detection of the illumination-of-interest is improved, comprising:
said photodetector circuit including a photodetector;
ambient illumination within the field of detection of said photodetector;
circuit means coupled to said photodetector circuit for eliminating the effects of said ambient illumination in the output of said photodetector by providing a compensating electrical current that is combined with said output of the photodetector;
wherein said photodetector circuit has first and second stages, with said first stage having the gate of a field effect transistor coupled to said photodetector, and wherein said circuit means includes an operational amplifier having negative feedback, coupled to said photodetector circuit for receiving an output from the source of said field effect transistor, and a current source means coupled to the output of said operational amplifier for controlling said compensating current in response to the output of said operational amplifier.

3,968,362
OPTICAL SYSTEM FOR LASER DOPPLER HOMODYNE DETECTION

Hans W. Mocker, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 11, 1975, Ser. No. 603,569
Int. Cl.² H01J *3/14*
U.S. Cl. 250—216 **38 Claims**

1. An optical system comprising:
light source means for producing a light beam;
roof reflector means having first and second reflecting surfaces, the first reflecting surface for separating the light beam into an output beam and a local oscillator beam, and the second reflecting surface for reflecting incident radiation;
transmitter means positioned to receive the output beam from the first reflecting surface, the transmitter means for expanding the beam diameter of the output beam and transmitting the output beam;

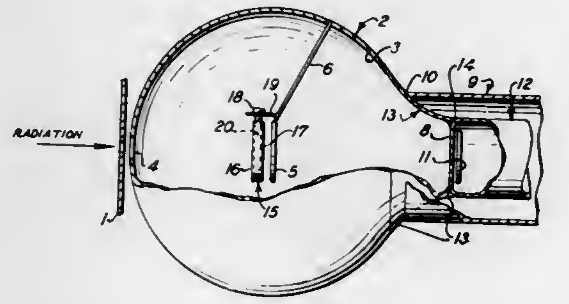


receiver means for receiving incident radiation and directing the incident radiation to the second reflecting surface; and
detector means positioned to receive the local oscillator beam and to receive the incident radiation from the second reflecting surface, the detector means for producing a signal indicative of the local oscillator beam and the incident radiation.

3,968,363
RADIATION FLUX AVERAGING DEVICE OF HIGH EFFICIENCY

Klaus D. Mielenz, Kensington; Radu Mavrodineanu, Rockville, and Edwin D. Cehelnik, Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 547,075
Int. Cl.² G01J *1/00*
U.S. Cl. 250—228 **6 Claims**

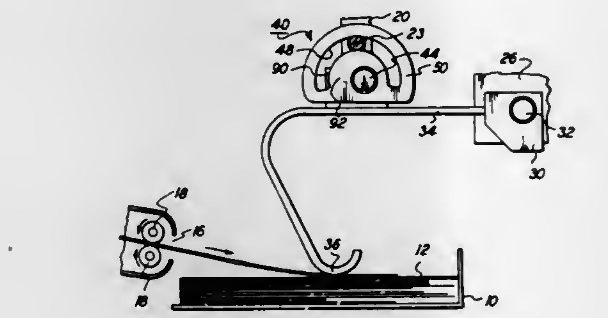


1. A radiation flux averaging device having a relatively high efficiency over ultraviolet and visible wavelengths comprising:
a hollow enclosure having an internal surface for which the diffuse reflectance over the ultraviolet portion of the spectrum is substantially less than the diffuse reflectance over the visible portion;
said enclosure having a radiation entrance opening and a radiation exit opening;
a target positioned within said enclosure facing said radiation entrance opening; and
a fluorescent material disposed between said radiation entrance opening and said target for converting entering ultraviolet radiation to visible radiation, whereby entering ultraviolet and visible radiation is averaged by said device with high efficiency.

3,968,364
HEIGHT SENSING DEVICE

Eugene F. Miller, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1975, Ser. No. 608,116
Int. Cl.² H01J *3/14*
U.S. Cl. 250—237 R **10 Claims**

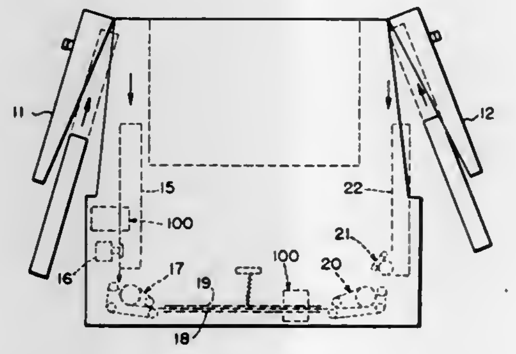


1. In a height sensing mechanism: a support, a light source and a light detector aligned with said source each fixed to said support, a sensing member pivotally mounted to said support, a beam interrupter rotatably mounted to said sensing member for rotation relative thereto, said beam interrupter having a slot therein eccentrically located about the axis of the rotational connection of said beam interrupter to said sensing member, sensing means on said sensing member, said beam interrupter being located between said light source and aid detector, and means for locking said beam interrupter in a position on said sensing member that a portion of said slot is aligned with said light source and said detector to allow a beam generated by said light source to pass therethrough at only a predetermined pivotal position of said sensing member relative to said support.

3,968,365
FILM SENSOR FOR AN X-RAY FILM LOADER

Edwin L. Sohngen, Cincinnati, Ohio, assignor to Sybron Corporation, Rochester, N.Y.

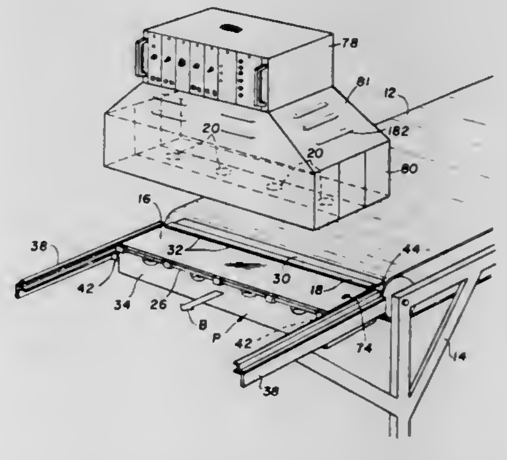
Filed Jan. 29, 1975, Ser. No. 544,875
Int. Cl.² G01J *1/00*
U.S. Cl. 250—338 **1 Claim**



1. Apparatus for sensing the presence or absence of X-ray film in a supply magazine of an automatic X-ray film loader, said apparatus being comprised of:
a supply magazine having an opening;
an infrared source for emitting infrared radiation substantially outside X-ray film spectral sensitivity;
an infrared detector for producing a signal upon receipt of said infrared radiation,
said source and said detector arranged to be in infrared communication with said opening;
a mirror for reflecting through said opening said infrared radiation from said source to said detector, said source and said detector being mounted external to said magazine on one side of a film position and said mirror is arranged internal to said magazine on the other side of the film position; and
a filter for passing infrared radiation outside the spectral sensitivity of X-ray film and blocking radiation within the spectral sensitivity of X-ray film, said filter being mounted in said opening, interposed between said infrared source and the film position.

3,968,366
APPARATUS FOR SORTING TOBACCO LEAVES

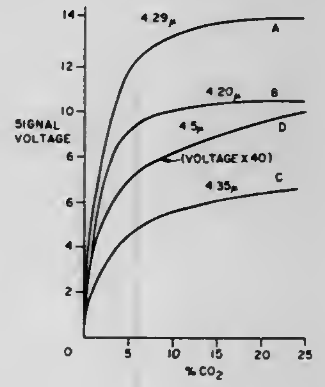
Emil S. Asfour, 21 Wengirain, 8704 Herrliberg, Switzerland
Division of Ser. No. 235,169, March 16, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,518
Int. Cl.² H01J *5/02*
U.S. Cl. 250—239 **8 Claims**



1. Apparatus for housing photosensors and lights comprising a rectangular box structure opened at its bottom and at least at one end and longitudinally divided into transverse central and outer sections, a plurality of photosensors individually removably secured in the top of said box and extending into the central section thereof, a pair of slidable trays each supporting a plurality of lights arranged longitudinally there along, means on the interior of said outer sections and said trays cooperating to slidably support and permit insertion of said trays through the open end of said respective outer sections and means for enclosing said open end and securing said trays against movement within said respective outer sections.

3,968,367
FILTER SYSTEM FOR INFRARED ANALYSIS

Richard E. Berg, Chanhassen, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of Ser. No. 506,080, Sept. 16, 1974, abandoned, which is a continuation of Ser. No. 368,131, June 8, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 621,921
Int. Cl.² G01J *1/00*
U.S. Cl. 250—339 **2 Claims**



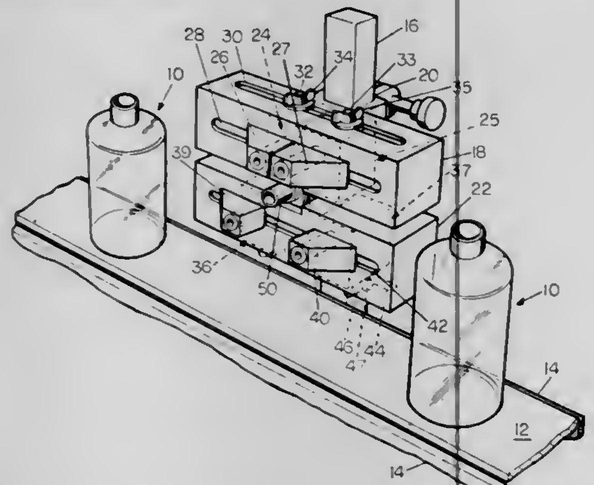
1. In a method of analyzing a gas sample for a plurality of gases of interest each of which has a characteristic infrared absorption spectrum associated therewith, wherein the analysis for each gas of interest is derived from a comparison of intensity-related signals produced by a detector means, wherein the difference in said signals is rendered dependent upon the absorption of infrared radiation from a source by

that gas of interest; wherein at least one of said is a relatively strong absorbing gas and at least one of said gases of interest is relatively weak infrared absorbing gas and wherein the composition of said sample is such that a wide range exists in the relative values between intensity-related signals produced by said strong absorbing gas and said weak absorbing gas, the improvement comprising the step of:

reducing said wide range between said relative values between intensity-related signals produced by said strong absorbing gas and said weak absorbing gas by:
  in the analysis for said strong infrared absorbing gas of interest, interposing bandpass optical filter means between said source and said detector means disposed such that radiation ultimately producing both of said intensity-related signals traverses said bandpass optical filter, said bandpass optical filter having a passband centered on an infrared wavelength which does not contain a strong absorption line of said strong infrared absorbing gas, and
  in the analysis for said weak infrared absorbing gas, interposing bandpass optical filter means between said source of infrared radiation and said detector means disposed such that said radiation ultimately producing each of said intensity-related signals traverses said bandpass optical filter, said bandpass filter having a passband centered on an infrared wavelength wherein said weak infrared absorbing gas strongly absorbs.

3,968,368
INSPECTION APPARATUS AND METHOD FOR HOT GLASS CONTAINERS

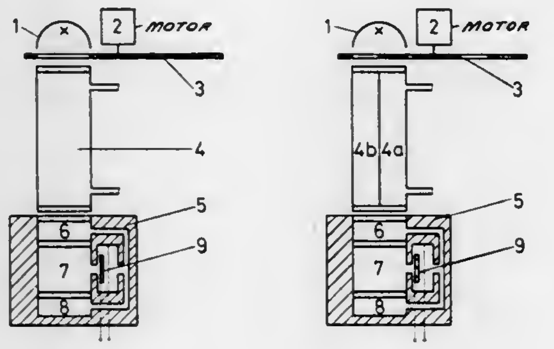
James R. Sager, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 10, 1975, Ser. No. 556,774
Int. Cl.² G01J *1/00*
U.S. Cl. 250—340 **8 Claims**



1. Apparatus for the inspection of hot glass containers having an upper portion and a lower portion, wherein said glass containers are moved in single file past said apparatus, said apparatus comprising, in combination:
- a first pair of heat-radiation sensing means, located adjacent to the path of travel of said glass containers and positioned so that both can be in a simultaneous line of sight with the upper portion of said glass containers, for generating individual signals in response to heat-radiation from said glass containers said first pair of heat-radiation sensing means each including;
- a housing;
- an elongated tube, pointed in the direction of said glass containers, connected to and in communication with the interior of said housing;
- a heat-radiation responsive lead sulfide cell mounted in the interior of said housing in a line of sight with the bore of said tube; and
- electronic amplification means, connected to said lead sulfide cell, for amplifying the output signal of said lead sulfide cell;
- a second pair of heat-radiation sensing means; located adjacent to the path of travel of said glass containers and positioned to have the downstream one of said second pair of heat-radiation sensing means in a line of sight with the lower portion of said glass containers while both of said first pair of heat-radiation sensing means are in a line of sight with said upper portion while the upstream one of said second pair of heat-radiation sensing means is out of the line of sight of said lower portion, for generating individual signals in response to heat radiation from said glass containers said second pair of heat-radiation sensing means each including;
- a housing;
- an elongated tube, pointed in the direction of said glass containers, connected to and in communication with the interior of said housing;
- a heat-radiation responsive lead sulfide cell mounted in the interior of said housing in a line of sight with the bore of said tube; and
- electronic amplification means, connected to said lead sulfide cell, for amplifying the output signal of said lead sulfide cell;
  - means for holding said first and second pairs of heat-radiation sensing means in a fixed location, said means for holding including:
- a vertical support column positioned adjacent to the path of travel of said hot glass containers;
- an upper probe carrier, slideably mounted on said support column, having a longitudinally extending slot formed therein extending along the path of travel of said glass containers, said first pair of heat-radiation sensing means tubes extending through said upper probe carrier slot; and
- a lower probe carrier, slideably mounted on said support column, having a longitudinally extending slot formed therein extending along the path of travel of said glass containers, said second pair of heat-radiation sensing means tubes extending through said lower probe carrier slot; and
- logic means, responsive to signals from said first and second heat-radiation sensing means, for generating an output signal if the signals from said first pair and second pair of heat-radiation sensing means do not occur in a preselected time related pattern.

3,968,369
NON-DISPERSIVE INFRARED GAS ANALYSIS DEVICE WITH TRIPLE LAYER RECEIVER

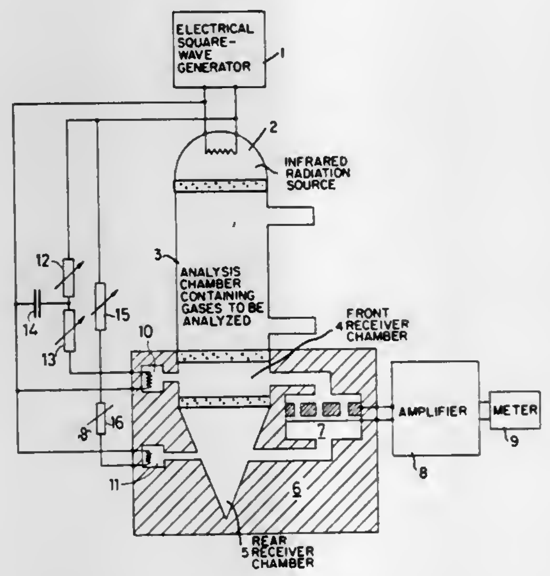
Karl Friedrich Luft, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany
Filed Nov. 15, 1974, Ser. No. 524,249
Int. Cl.² G01N *21/26*
U.S. Cl. 250—344 **5 Claims**



1. Non-dispersive infrared gas analysis device for use with a set of incoming infra-red rays, comprising
- A. a radiation receiver divided into first, second, and third receiver layers arranged in series in the path of said rays, the first and third layers being outer layers and the second layer being a middle layer, and
- B. pneumatic parallel connection means for the first and the third layers, whereby a pressure difference occurs, due to radiation absorption, between the connected first and third layers at one pressure and the middle layer at another pressure, and
- C. means for measuring the pressure difference.

3,968,370
NON-DISPERSIVE INFRARED GAS ANALYZER

Karl Friedrich Luft, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany
Filed Dec. 26, 1974, Ser. No. 536,332
Claims priority, application Germany, Jan. 3, 1974, 2400221
Int. Cl.² G01J *1/00*
U.S. Cl. 250—344 **8 Claims**


ELECTRICAL SQUARE-WAVE GENERATOR
1
2
INFRARED RADIATION SOURCE
3
ANALYSIS CHAMBER CONTAINING GASES TO BE ANALYZED
FRONT
4 RECEIVER CHAMBER
12
14
13
15
10
16
8
11
6
7
AMPLIFIER
METER
8
9
REAR
5 RECEIVER CHAMBER

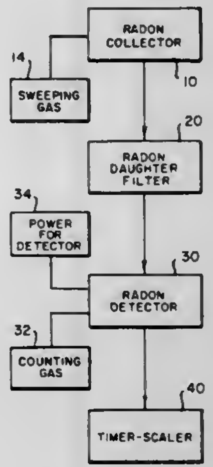
1. In a non-dispersing infrared gas analyzer comprising:
- a. a two-layer receiver including two receiver chambers,
- b. means for passing a single infrared beam having a given frequency, phase and amplitude through a test sample of gas into the two-layer receiver to produce a pressure difference in the two chambers,
- c. a modulated source of voltage for operating the single infrared beam, and
- d. means for generating an electrical difference signal substantially proportional to the pressure difference,

the improved means to compensate the difference signal comprising:
- e. at least one electrically operated pneumatic pressure generator situated in one of the two receiver chambers for producing an auxiliary pressure signal, and
- f. means for producing an electrical control signal with a phase and frequency controlled by the phase and frequency of modulated source of voltage for electrically operating the pressure generator.

3,968,371
METHOD AND APPARATUS FOR DIRECT RADON MEASUREMENT

Allen E. Greendale, Brookeville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 4, 1975, Ser. No. 610,207
Int. Cl.² G01T *7/02*
U.S. Cl. 250—380 **32 Claims**

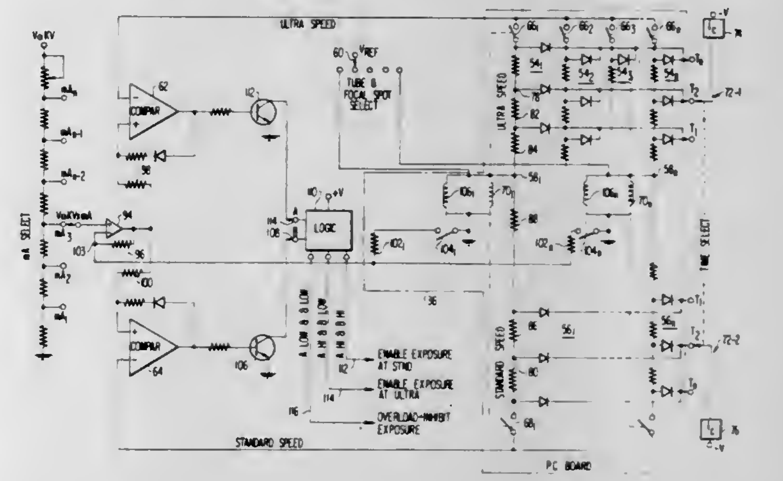
1. A direct measurement apparatus for radon comprising:
- a collector device attachable to a source of radon for collecting a sample of radon;
- a detector device for detecting the presence of and measuring the quantity of radon in a gaseous sample; and
- conduit means coupling said collector device and said detector device,
- said collector device including:
  - a containment means positionable over a source of radon to contain a volume of radon;
  - an attachment means for supporting said containment means to a source of radon; and
  - transport means to carry said radon from said containment means;



- and said detector device including:
  - a sample chamber to hold the radon-containing sample for radon detection and measurement;
  - a gas proportional counter to detect and register the presence of radon and
  - means to remove the radioactive decay by-products or daughters of radon from said proportional counter.

3,968,372
TUBE PROTECTION CIRCUIT FOR X-RAY GENERATORS

Charles Leo Laughinghouse, Linthicum, Md., assignor to CGR Medical Corporation, Baltimore, Md.
Filed Nov. 24, 1975, Ser. No. 634,316
Int. Cl.² H05G *1/30*
U.S. Cl. 250—402 **15 Claims**



1. In an X-ray tube anode protection circuit having circuit means being operated by the output of a comparator circuit which compares selected values of electrical analog voltages representative of X-ray tube rating chart curves against selected values of analog voltages corresponding to desired exposure time and anode current for preventing energization of the X-ray tube in the event the desired operating parameters exceed the rating of the X-ray tube, the improvement comprising:
- a source voltage of a predetermined reference value;
- a plurality of circuit means selectively coupled to said source voltage, each of said circuit means having a current-voltage characteristic adapted to simulate a predetermined rating chart curve which is a function of a plu-

rality of exposure times and providing a plurality of signals at selected circuit points corresponding to allowable peak power for said exposure times;
a time select switch for said plurality of circuit means and having a movable contact and a plurality of fixed contacts;
respective diode means coupling like exposure time circuit points of said plurality of circuit means to a common circuit junction coupled to respective fixed contacts of said plurality of fixed contacts, said diode means being identically poled to conduct current between the respective circuit points and said common circuit junction while blocking current flow to other like time circuit points and thereby providing isolation between said circuit means;
circuit means coupling a selected circuit point to said comparator circuit for applying an analog signal corresponding to allowable peak power; and
circuit means providing and coupling a signal proportional to the product of the desired anode voltage and beam current to said comparator circuit.

3,968,373

DEVICE, IN PARTICULAR A NEUTRON GENERATOR, HAVING A DETACHABLE HIGH-VOLTAGE CONNECTION

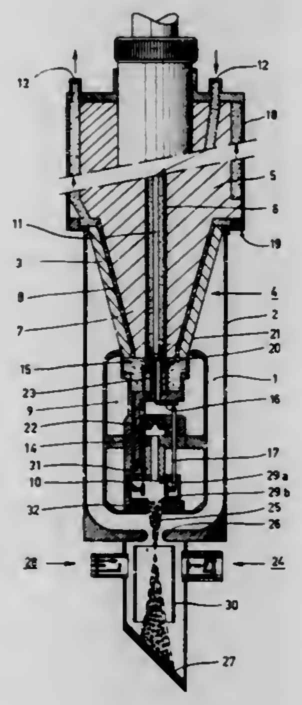
Otto Reifenschweiler, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,591

Claims priority, application Netherlands, Sept. 12, 1973, 7312546

Int. Cl.² H05G *1/02;* G21G *4/02*

U.S. Cl. 250—419 **5 Claims**



1. Apparatus for making high voltage connection to and cooling an ion source, comprising an ion source having a cooling duct, a first insulator for supporting said ion source, and a detachable high voltage connection comprising a second insulator adapted to fit in spaced relation to said first insulator with a gap therebetween in communication with one end of said cooling duct of said ion source, said second insulator having a duct connecting with the other end of said cooling duct to form a conduit for continuously carrying cooling and insulating fluid through said duct of said second insulator, said cooling duct of said ion source and said gap between said first and second insulators, and a high voltage supply conductor carried by said second insulator for connection across said conduit to said ion source.

3,968,374

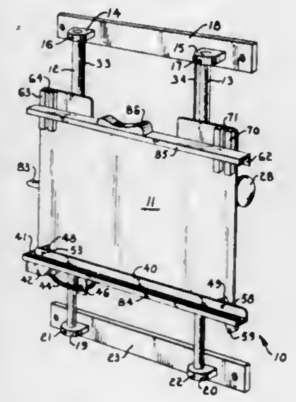
X-RAY CASSETTE HOLDER HAVING LEVER MEANS FOR POSITIONALLY ADJUSTING A CASSETTE SUPPORTING MEMBER

Charles H. Schroeder, Box 9414, 6501 Hadley, Raytown, Mo. 64133

Filed Nov. 22, 1974, Ser. No. 526,128

Int. Cl.² G11B *1/00*

U.S. Cl. 250—468 **8 Claims**



1. Apparatus for supporting and centering a substantially rectangular cassette containing film therein in the path of a substantially rectangular X-ray beam produced by X-ray equipment, said apparatus comprising:
a frame disposed in a generally vertical orientation and located in the path of said beam;
a bar member supported on said frame in a substantially horizontal orientation to support said cassette thereon and to vertically center same in the path of said beam;
lever means coupling said bar member to said frame for vertical movement between a stable upper position wherein said cassette is vertically centered in the path of the beam with its longitudinal axis oriented substantially horizontally and a stable lower position wherein said cassette is vertically centered in the path of the beam with its longitudinal axis oriented substantially vertically, said lever means also effecting horizontal movement of said bar member upon vertical movement thereof between said upper and lower positions; and
a stop member mounted rigidly on said bar member and moving laterally therewith a preselected distance in response to movement of said bar member between said upper and lower positions, said stop member being engageable with a side of said cassette to horizontally center same in the path of said beam with the longitudinal axis of said cassette oriented either horizontaliy or vertically.

3,968,375

X-RAY CASSETTE HOLDER

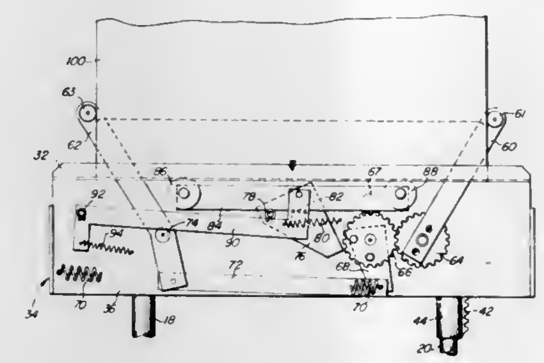
Leonard F. Peyser, Briarcliff Manor, N.Y., and Roger L. Hibbert, Bethel, Conn., assignors to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Dec. 13, 1974, Ser. No. 532,346

Int. Cl.² G03B *41/16*

U.S. Cl. 250—468 **8 Claims**

1. A film cassette holder comprising
a support member;
a pair of substantially parallel, opposing guide tracks operatively disposed on the support member for insertion of a cassette therebetween;
a pair of spaced pivotal clamping arms operatively disposed with respect to the guide tracks and suitably spaced apart for closing on opposing sides of the cassette; and
cassette positioning means operatively connected to the clamping arms for rotating the arms in respective opposite angular directions to exert substantially equal pressures on opposing sides of the cassette and thus position it transversely in the holder.



3,968,376

SOURCE OF SPIN POLARIZED ELECTRONS

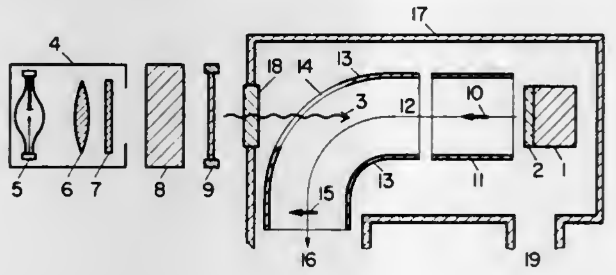
Daniel Thornton Pierce, 10120 Little Pond Place, Gaithersburg, Md.; Felix Andrea Meier, 6 Kastanienweg, Kilchberg, Zurich, and Hans-Christoph Siegmann, 21 Burstwiesenstrasse, Greifensee, Zurich, both of Switzerland

Filed June 3, 1975, Ser. No. 581,837

Claims priority, application Switzerland, Jan. 13, 1975, 597/75

Int. Cl.² G21G *4/00;* H01J *39/00*

U.S. Cl. 250—493 **9 Claims**



1. A source of spin polarized electrons comprising in combination a semiconductor photocathode, said semiconductor having a spin orbit split valence band and a lowered vacuum level, and a source of circularly polarized light, said light irradiating said photocathode to achieve photoemission of the electrons.

3,968,377

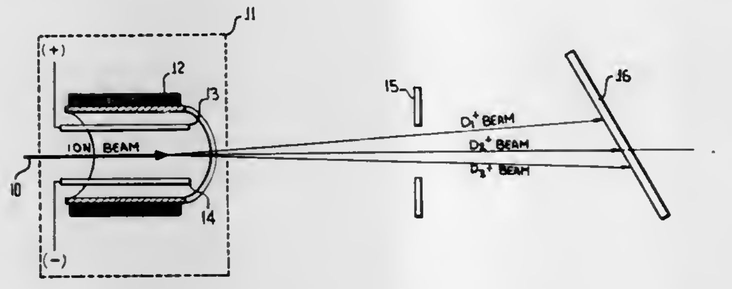
BEAM SPLITTING TO IMPROVE TARGET LIFE IN NEUTRON GENERATORS

Joseph Paul Farrell, East Setauket, N.Y., assignor to Radiation Dynamics, Inc., Westbury, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,486

Int. Cl.² G21G *4/02*

U.S. Cl. 250—499 **11 Claims**



1. Apparatus for generating neutrons with a source beam containing atomic and diatomic molecular deuterium ions, said apparatus being characterized by:
a target including material which emits neutrons when bombarded with atomic and diatomic molecular deuterium ions;
means for separating said source beam into a first beam containing substantially only atomic deuterium ions and a second beam containing substantially only diatomic deuterium ions; and
means for directing said first and second beams onto said target such that each beam strikes said target at a different location.

3,968,378

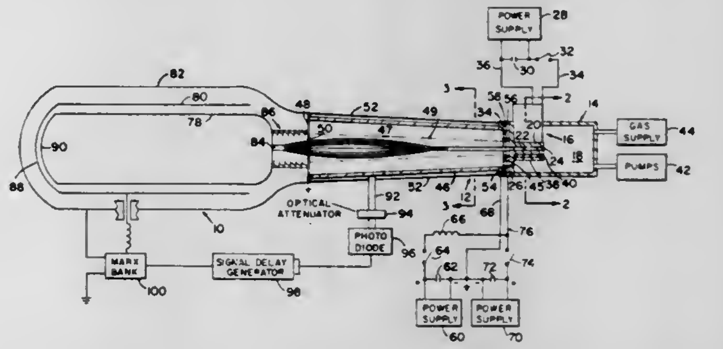
ELECTRON BEAM DRIVEN NEUTRON GENERATOR

Thomas G. Roberts; Romas A. Shatas, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,841

Int. Cl.² G21G *4/02*

U.S. Cl. 250—502 **6 Claims**



1. An electron beam driven neutron generator comprising a target holder, a target of deuterium-tritium mounted in said target holder, coil means positioned about said target forming a magnetic field about said target holder and being of such a structure as to cause confinement of energy radially from said target so that heat conduction in said target is one-dimensional, a tapered beam forming and guiding section in the form of a linear pinch tube for producing a tapered plasma column and mounted relative to said target holder at one end, a source of high energy electrons from a machine mounted at another end of said beam forming and guiding section, and control means for said beam forming and guiding section and said source of high energy electrons to cause electrons from said source of high energy electrons to be injected into said tapered plasma column and cause said tapered plasma column to guide and focus said electrons in the form of a beam to said target holder as the plasma in said plasma column contracts, said target being of such a length and diameter that the energy from said source of high energy electrons is absorbed to cause the temperature of said target to be raised to a very high value and cause neutrons to be produced for tens of nanoseconds.

3,968,379

PHOTOCELL SMOKE DETECTOR

Burke J. Crane, Lombard, Ill., assignor to Rixson-Firemark, Inc., Franklin Park, Ill.

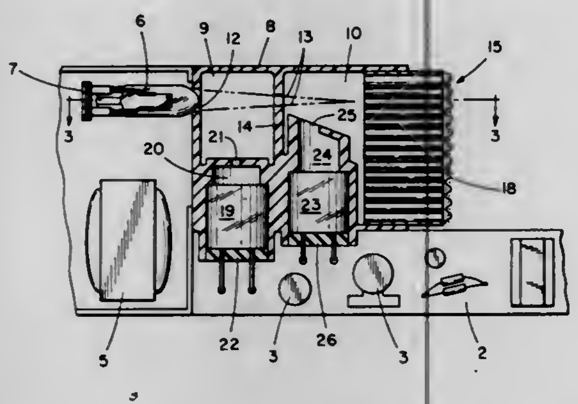
Filed Nov. 29, 1974, Ser. No. 528,010

Int. Cl.² G01N *21/26*

U.S. Cl. 250—574 **5 Claims**

1. A photocell smoke detector comprising a smoke detector housing defining in part a dual section smoke chamber having a first smoke sensing chamber and a second compensating chamber, with a smoke sensing photocell coupled to the smoke sensing chamber and a compensating photocell coupled to the second chamber, a light source coupled to the compensating chamber and transmitting a beam of light generally parallel and away from the photosensitive surfaces of the two photocells, a dividing wall containing a relatively small light transmitting aperture dividing the smoke sensing and the

compensating chambers, and a light trap also defining part of the smoke sensing chamber fabricated of a plurality of layers of corrugated media sandwiched between relatively flat parallel liners whereby light is absorbed in the flutes of the corrugated media and smoke is enabled to pass freely into and out of the smoke sensing chamber while being restricted from entry into the compensating chamber by the dividing wall.



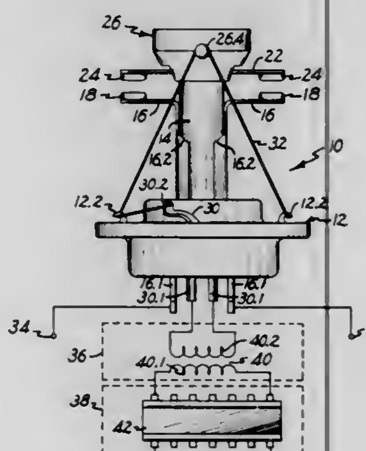
3,968,380
HIGH GAIN RELAYS AND SYSTEMS

Ernest M. Jost, Plainville; Lyle E. McBride, Jr., Norton, and Teuvo J. Santala, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 351,683, April 16, 1973, Pat. No. 3,893,055. This application Jan. 7, 1974, Ser. No. 431,539

Int. Cl.^{2} H01H *47/02*

U.S. Cl. 307—99 **11 Claims**



1. A relay system comprising a relay operable at the low power levels used in energizing integrated circuits having an insulating base, stationary contact means mounted on said base, movable contact means mounted on said base for movement between a closed circuit position engaging said stationary contact means and an open circuit position spaced from said stationary contact means, spring means mounted on said base biasing said movable contact means from one of said positions to the other of said positions, and a metal wire secured between said movable contact means and said base, said wire being of a selected nickel-titanium alloy to be deformed from an original length to a second length by said spring bias as said movable contact means is moved from said one position to said other position by said spring bias while said alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original length and to display a relatively higher modulus of elasticity to move said movable contact means back to said one position against said spring bias with a force of at least about 15 grams when said wire is heated to said transition temperature, said wire having a selected cross-sectional size corresponding to a diameter of less than about 0.004 inches and a selected length to be heated from room temperature to said transition temperature by passing electrical current through said wire with a power input of less than about 2 watts for permitting operation of said relay with a gain of at least about 500 to 1 at power levels used in energizing integrated circuits; integrated circuit means energizable at low power levels to supply a control pulse; a power source for energizing said integrated circuit means to supply said control pulse; transistor switch means connected in series with said relay wire to direct relay energizing current from said power source through said nickel-titanium wire when said transistor switch means is rendered conductive, said transistor switch means being connected to said integrated circuit means for receiving said control pulse to selectively render said transistor switch means conductive for operating said relay.

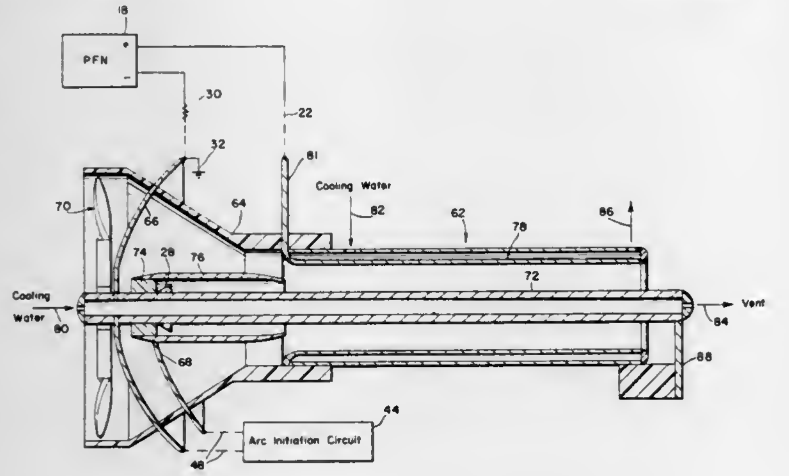
3,968,381
ARC TYPE SWITCH

Arthur K. Wickson, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 526,670

Int. Cl.^{2} H02H *7/22;* **H01H** *33/00*

U.S. Cl. 307—137 **20 Claims**



1. A switch for closing, or completing, an electrical circuit to pass current that increases in value very abruptly wherein the switch is closed by means for injecting an electrical arc between the two electrodes of the switch, the combination comprising accelerating electrode means and main electrode means, means to mount said accelerating electrode means in tandem before said main electrode means, arc initiation means at one end of said accelerating electrode means for starting an arc at said one end and to permit motion of said arc towards the opposite end of said accelerating electrode means, and means to introduce electrical energy pulses to said main electrode means at the end thereof in closely spaced tandem relationship to said opposite end of said accelerating means, whereby a shot of plasma is produced at said one end of said main electrode means and on said moving arc from said accelerating means to thereby sweep said plasma over said main electrode means and to avoid any dwell of said plasma on said main electrode means.

3,968,382
PROTECTIVE CIRCUIT FOR FIELD EFFECT TRANSISTOR AMPLIFIER

Katsuaki Tsurushima, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,257

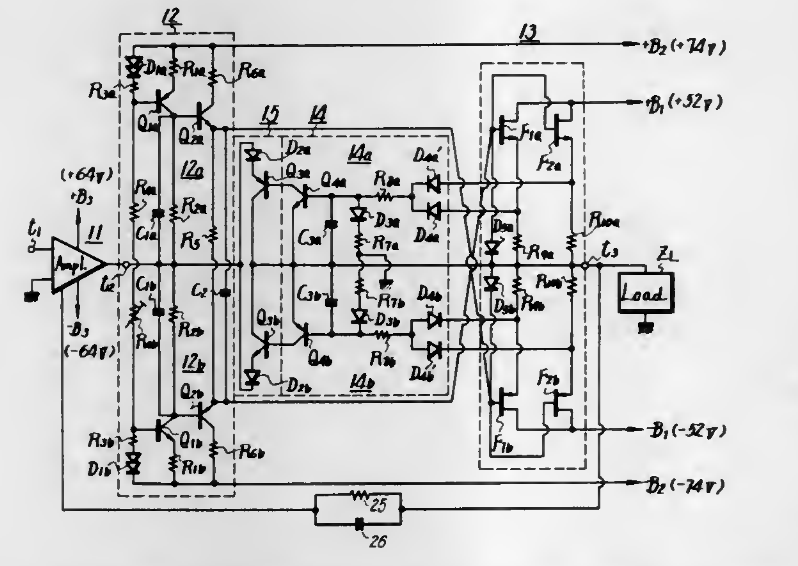
Claims priority, application Japan, Oct. 16, 1973, 48-120204

Int. Cl.^{2} H02H *9/04, 7/20;* **H03F** *3/16, 3/185*

U.S. Cl. 307—202 R **10 Claims**

1. A field effect transistor amplifier comprising: a voltage source for supplying an operating voltage; at least a first depletion-type field effect transistor having gate, source and drain electrodes; means for applying said operating voltage across said drain and source electrodes through a load; input circuit means for applying an input signal to be amplified to said gate electrode of the field effect transistor; biasing circuit means

for applying a predetermined DC gate bias voltage between said gate and source electrodes; protective circuit means for preventing damage to said field effect transistor by an excessive input signal including a source resistor connected in series with said source electrode, and constant voltage means connected between said gate electrode and the side of said source resistor remote from said source electrode, the resistance value of said source resistor and the voltage value of said constant voltage means being selected so that the maximum drain-source current of said field effect transistor, when operated with an input signal applied to its gate electrode, does not exceed the maximum drain-source current of said field effect transistor in the absence of any gate-source voltage applied thereto, shunting means operative to shunt said input signal directly to said load while said field effect transistor continues to have said predetermined DC gate bias voltage applied thereto; and detecting means for detecting an overload condition of said field effect transistor including a capacitor, a first rectifying circuit means having a diode and a resistor connected between said source resistor and said capacitor for applying to the latter a first DC voltage of one polarity which is proportional to the voltage across said source resistor, a second rectifying circuit means having a diode and a resistor connected between said capacitor and the load for applying to said capacitor a second DC voltage of the opposite polarity which is proportional to the voltage across said load so that the DC voltage across said capacitor is proportional to the impedance of said load, and means responsive to said DC voltage across the capacitor for operating said shunting means when said DC voltage across the capacitor is indicative of a predetermined low value of the load impedance.



3,968,383
NOISE LIMITER

John F. Smith, Warminster, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

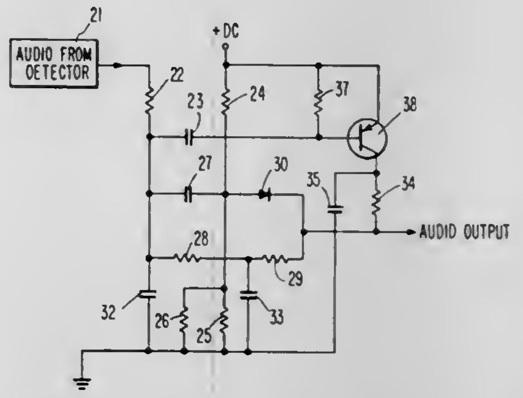
Filed July 10, 1974, Ser. No. 486,968

Int. Cl.^{2} H03K *5/08*

U.S. Cl. 307—237 **4 Claims**

1. In a radio receiver having an AGC circuit and an audio detector, which audio detector delivers signals having both audio and noise components, noise limiter apparatus comprising:

a. input means for connecting said detector signals to said noise limiter apparatus;
b. output means for providing an output signal;
c. clipping means connected between said input means and said output means for clipping input signals above a predetermined level while normally passing said delivered signals which are below said level;
d. differentiating means connected to said input means for differentiating said input signal so as to block transmission of said audio component and to detect presence of said noise component;
e. back bias means for connecting a back bias to said clipping means, said back bias means having an input connected to the output of said differentiating means and controlled by the differentiating means signal; and



f. holding means for holding said back bias on said clipping means for a predetermined time period following connection of said back bias to said clipping means by said back bias means.

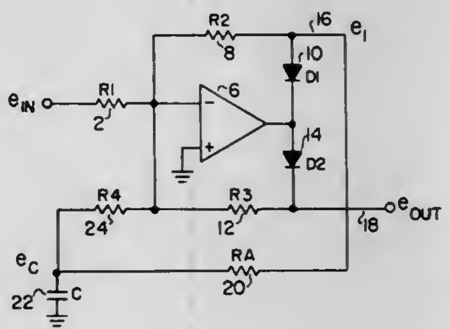
3,968,384
CONSTANT PERCENTAGE CLIPPING CIRCUIT

Robert J. Tracey, San Mateo, and Ronald J. Violet, Belmont, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 21, 1974, Ser. No. 516,835

Int. Cl.^{2} H03K *5/08*

U.S. Cl. 307—237 **3 Claims**



1. A circuit for clipping an alternating current waveform so that the same percentage of the waveform is clipped regardless of the input amplitude of the waveform, which comprises:

- input means;
- an operational amplifier having its inverting input connected to the input means and its noninverting input connected to a common reference point;
- nonlinear feedback means connected between the output of said operational amplifier and its inverting input, said feedback means comprising:
  - unilateral conducting means having a plurality of terminals, a first terminal thereof being connected to the output of said operational amplifier; and
  - resistance means having a plurality of terminals, a first terminal thereof being connected to the inverting input of the operational amplifier and a second terminal thereof being connected to a second terminal of said unilateral conducting means;
- and floating bias means connected to said input means and said feedback means, said bias means comprising:
  - a capacitor having one terminal connected to the common reference point;
  - a first resistor having one terminal connected to the other terminal of said capacitor and the other resistor terminal connected to a junction of the unilateral conducting means and resistance means of said feedback means; and

a second resistor having one terminal connected to the other terminal of the capacitor and having the other second resistor terminal connected to the inverting input of said operational amplifier.

3,968,385
SOLID-STATE STORAGE DRIVE

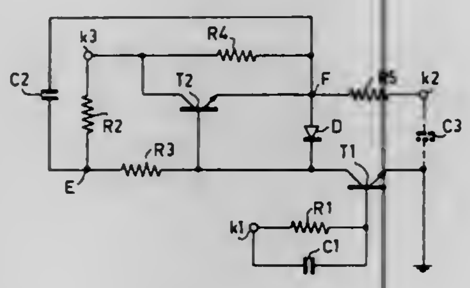
Willem Cornelis Van Tol, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,619

Claims priority, application Netherlands, Nov. 7, 1973, 7315229

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—270 **4 Claims**



1. A drive unit comprising
an input terminal;
a capacitively loaded output terminal;
a charging transistor connected between said supply terminal and said output terminal being connected through a rectifying member to said input terminal;
a discharge circuit connected between said rectifying member and said input terminal, comprising a transistor having one electrode connected to said rectifying member, and another electrode connected to ground;
said input terminal being connected to the base of said transistor in said discharge circuit by means of a differentiating network comprising a resistor and a capacitor connected in parallel between said input terminal and said base of said transistor in said discharge circuit;
said output terminal being connected, through a capacitive member, to a center tapping of a voltage distribution circuit connected between said supply terminal and a control electrode of said charging transistor so that when said charging transistor is conductive, an additional control voltage is applied to said control electrode.

3,968,386
ARRANGEMENT FOR ACTUATING DOT-PRODUCING PRINTING ELEMENTS OF A MOSAIC PRINTING HEAD

Joachim Heinzl, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

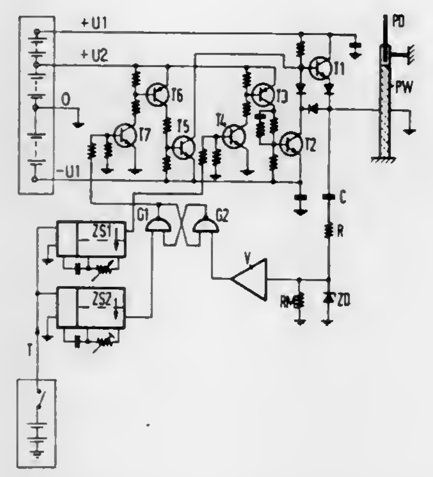
Filed Aug. 5, 1974, Ser. No. 494,707

Claims priority, application Germany, Aug. 31, 1973, 2344065

Int. Cl.^{2} H01L *41/08*

U.S. Cl. 310—8.1 **6 Claims**

1. An arrangement for actuating dot-producing printing elements in a mosaic printing head utilizing piezoelectric transducers which may be set in either an elongated or a contracted state by the application of suitable electric fields over electrical circuit means, and by means of which the print producing printing elements on the transition from the contracted state into the elongated state are accelerated whereby, as a result of their own mass inertia, move towards the printing position, and are returned from the printing position, by rebound and spring resetting energy, into their initial position, comprising an actuating circuit for each piezoelectric transducer, which has controlled circuit elements operative to effect an elongation of the cooperable piezoelectric transducer, and circuit elements which are controlled, in dependence upon the return of the operated dot-producing printing element to the piezoelectric transducer, operative to contract such transducer.



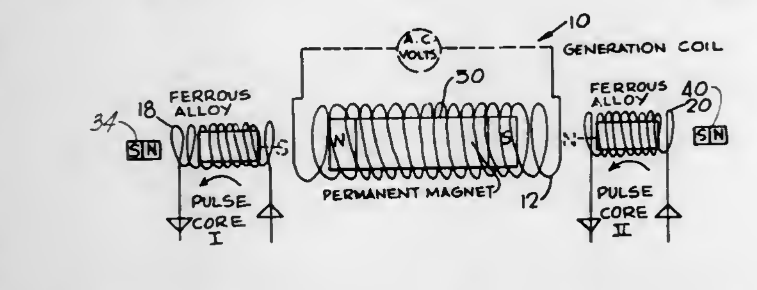
3,968,387
LINEAR MAGNETIC GENERATOR

David Scarff, Agincourt, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 16, 1975, Ser. No. 578,214

Int. Cl.^{2} H02K *35/02*

U.S. Cl. 310—16 **4 Claims**



1. A generator which includes a generating coil having a generally cylindrical form and which includes an axial bore therethrough, said generating coil having a pulse core winding in coaxial relationship disposed at each axial extremity thereof, a permanent magnet carried for axial movement within said generating coil, and permanent stationary magnets carried proximate to each pulse core windings.

3,968,388
ELECTRIC MACHINES, PARTICULARLY TURBOGENERATORS, HAVING LIQUID COOLED ROTORS

Dietrich Lambrecht, and Erich Weghaupt, both of Mulheim, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

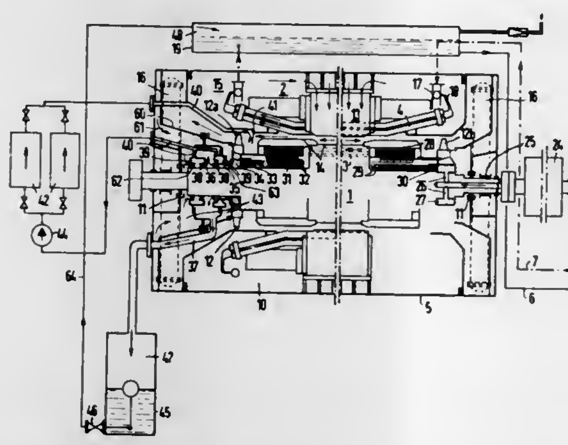
Continuation of Ser. No. 366,769, June 4, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,421

Claims priority, application Germany, June 14, 1972, 2228993

Int. Cl.^{2} H02K *9/00*

U.S. Cl. 310—53 **8 Claims**

1. In an electrical machine having a housing, a shaft extending through the housing, a rotor mounted on the shaft within the housing, electrical conductors disposed within the housing, electric generating means mounted on the shaft externally to and to one side of the housing, and a coolant water distribution chamber located on the shaft at the one side of the housing, a coolant water receiving chamber surrounding the rotor, means for conducting coolant water in heat transfer relationship with the electrical conductors in the housing from the coolant water distribution chamber to the coolant water receiving chamber, axially extending channel means at the surface of the shaft connecting said coolant water receiving chamber to a collecting chamber located adjacent thereto, contact-free sealing means comprising labyrinth sealing rings sealing said collecting chamber from surrounding space within said housing, means for supplying hydrogen as cooling gas to the housing, and blower means for moving a flow of said hydrogen cooling gas as a barrier gas into said labyrinth sealing rings so as to block contamination of the coolant water in said collecting chamber by ambient oxygen in said surrounding space within the housing, both said collecting chamber and said labyrinth sealing rings being disposed within the housing.



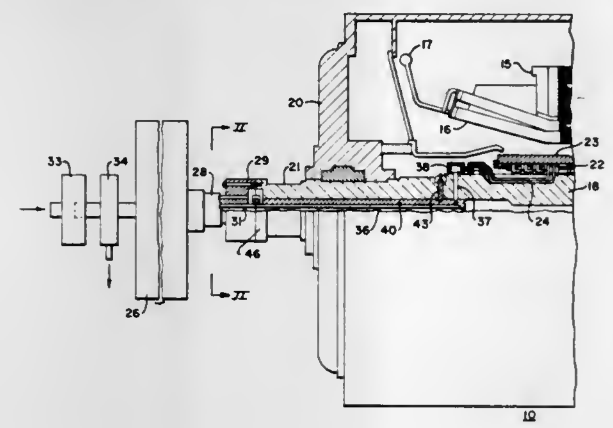
3,968,389
DYNAMOELECTRIC MACHINE WITH WATER-COOLED ROTOR

Jacques E. Albaric, Pittsburgh, Pa., and James E. Adamson, Plantation, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1974, Ser. No. 479,070

Int. Cl.^{2} H02K *1/32*

U.S. Cl. 310—61 **7 Claims**



1. An electric generating unit comprising:
a main generator and an exciter therefor having axially aligned shafts, each of said shafts having a central bore extending axially therethrough:
at least one tube disposed in each shaft bore for passage of a coolant liquid, two insulated conductors disposed in each bore, the tubes and conductors of the generator shaft and of the exciter shaft being axially aligned, said tubes terminating in abutting radial flanges adjacent the abutting ends of the shafts;
means for sealing disposed between said flanges;
clamping means external to said flanges for clamping said radial flanges together to form a liquid-tight seal, said clamping means having surfaces engaging at least one of said radial flanges, actuation of said flanges applying an axial force to said flanges to clamp them together;
means for making electrical connections between corresponding conductors of the generator and exciter shafts;
coupling means for mechanically coupling together the generator and exciter shafts, said coupling means enclosing said clamping means and said electrical connections, said coupling means having openings therein; and,
means for actuating said clamping means, said actuating means being operable in cooperative association with said openings in said coupling means to engage said clamping means for actuation thereof from outside said coupling means.

3,968,390
SYNCHRONOUS MOTOR

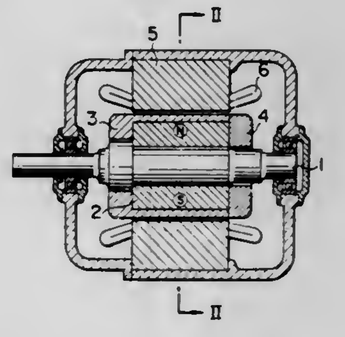
Izuru Yasuda; Hironori Okuda, and Kunio Miyashita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 5, 1974, Ser. No. 448,277

Claims priority, application Japan, Mar. 19, 1973, 48-31004

Int. Cl.^{2} H02K *21/14*

U.S. Cl. 310—156 **9 Claims**



1. A synchronous motor comprising a rotor including magnetic pole means composed of permanent magnet means fixedly mounted around a rotor shaft, and a stator facing the outer periphery of said rotor with an air gap therebetween, a guard ring made of a non-magnetic, conductive material having low resistivity of $10^{-6}(\Omega - m)$ or more and fitly disposed on the outer periphery of said permanent magnet means.

3,968,391
BRUSH HOLDER FOR ELECTRICAL APPARATUS

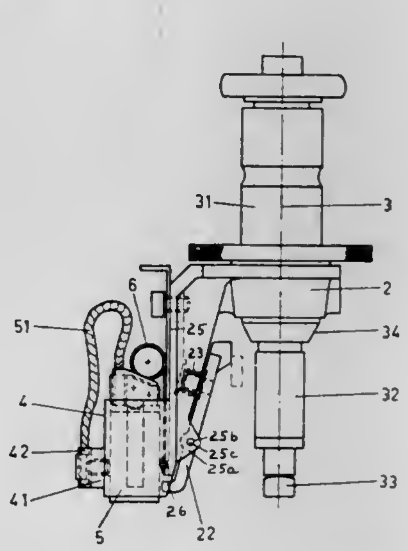
Karl Blank, Mannheim, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sept. 30, 1974, Ser. No. 510,596

Claims priority, application Germany, Oct. 8, 1973, 2350456

Int. Cl.^{2} H02K *13/00*

U.S. Cl. 310—240 **13 Claims**



1. A removable brush holder structure for use in conjunction with a dynamoelectric machine in which electrical contact is established between the brush and the surface of a collector ring or commutator component on the rotor of the machine for current transfer therebetween comprising an electrically conductive support member having at least one depending leg portion directed towards the rotor, at least one open bottom brush box secured to the outer side of said leg

portion, a brush located in said brush box, an electrical connection from a wire lead on said brush to said leg portion, spring means engageable with the upper end of said brush for loading the lower end of said brush into contact with the collector ring or commutator, a brush retaining lever pivotally mounted intermediate the ends thereof at the inner side of said leg portion, spring loading means for said lever, said electrically conductive support member including a bore for receiving and securing at least one combined brush holder mounting and plug-in device insertable into a bore provided in a stationary brush holder rail mounted on the machine and extending axially of the machine, and means for releasably locking said combined brush holder mounting and plug-in device when inserted into place in said brush rail, said spring loading means for said brush retaining lever serving to force the lower end of said lever into engagement with the side of said brush to maintain the position of the brush within the brush box when said combined brush holder mounting and plug-in device has been withdrawn from said brush rail, and the upper end of said brush retaining lever being engageable with a lever deflecting surface on said brush rail upon insertion of said combined brush holder mounting and plug-in device into said brush rail to disengage the lower end of said lever from said brush.

3,968,392

PULSE DISCHARGE LAMP, IN PARTICULAR AN ELECTRONIC FLASH TUBE

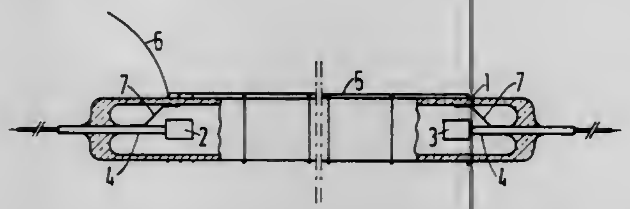
Hans Peter Buchta, Bremthal, and Josef Zimlich, Taunusstein, both of Germany, assignors to Heimann GmbH, Germany

Filed Oct. 29, 1974, Ser. No. 518,725

Claims priority, application Germany, Dec. 21, 1973, 2364016

Int. Cl.² H01J *65/00*

U.S. Cl. 313—198 **4 Claims**



1. A pulse discharge lamp comprising: a gas filled substantially cylindrical discharge vessel; a pair of electrically conducting pins extending through respective ends of said vessel; a pair of electrodes mounted on respective ones of said pins, each of said electrodes spaced a uniform interval from the internal surface of said vessel; an ignition electrode carried on the external surface of said vessel and extending substantially along the interval between and electrically insulated from said electrodes; and a pair of metal bands electrically connected to respective ones of said electrodes, each of said metal bands extending to a respective point which is a shorter distance from said ignition electrode than the respective electrode and including an end at that point which bears against the internal surface of said vessel.

3,968,393

SPARK GAP DEVICE FOR A LIGHTNING ARRESTOR

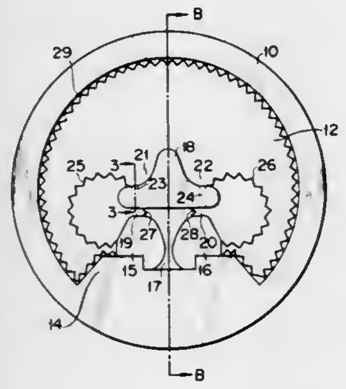
Minoru Murano, Tokyo; Satoru Yanabu; Susumu Nishiwaki, both of Yokohama; Soji Kojima, Yokosuka, and Teiichi Ueki, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 27, 1975, Ser. No. 562,770

Int. Cl.² H01J *17/00, 21/00*

U.S. Cl. 313—325 **12 Claims**

1. A spark gap device for a lightning arrestor comprising an arc extinguishing chamber defined by arc extinguishing plates; a pair of main electrodes disposed within said arc extinguishing chamber to form a spark starting gap between facing surface portions thereof; an auxiliary electrode having a first surface facing said pair of main electrodes and a pair of second surface portions opposite to said first surface, said first surface forming a pair of reigniting spark gaps with respect to said main electrodes respectively at a first space portion between said first surface and said main electrodes, and said second surface portions each serving as a temporary arc foot point of an arc extended between said second surface portion and one of said main electrodes; said pair of second surface portions defining respective second space portions adjacent to said second surface portions and remote from said first space portion, and heated gas passing means for conducting heated gas between said second space portions and said first space portion and for causing reigniting sparks at said reigniting spark gap when the amount of each expanded arc current exceeds a predetermined value.



3,968,394

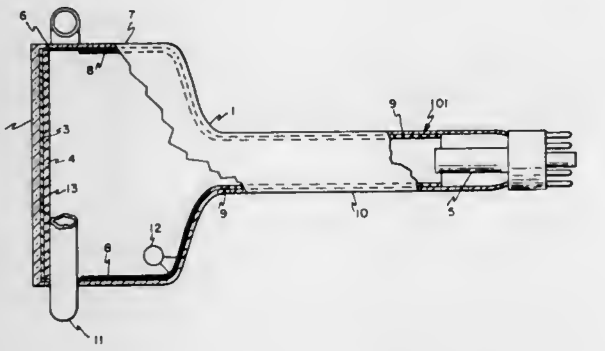
CATHODE RAY TUBE EMPLOYING FACEPLATE-DEPOSITED CATHODOCHROMIC MATERIAL AND ELECTRON BEAM ERASE

Lee T. Todd, Jr., Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 1, 1974, Ser. No. 457,111

Int. Cl.² H01J *29/12;* **G02B** *5/23;* **G02F** *1/23*

U.S. Cl. 313—465 **12 Claims**



1. For use in a cathode ray tube, an image screen that comprises a thermal buffer layer of unsensitized particles upon a substrate and a layer of sensitized cathodochromic sodalite supported by the buffer layer and thermally insulated from the substrate by the buffer layer.

3,968,395

TWO FILAMENT ELECTRIC BULB TRAFFIC LIGHT

Anton Obermaier, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

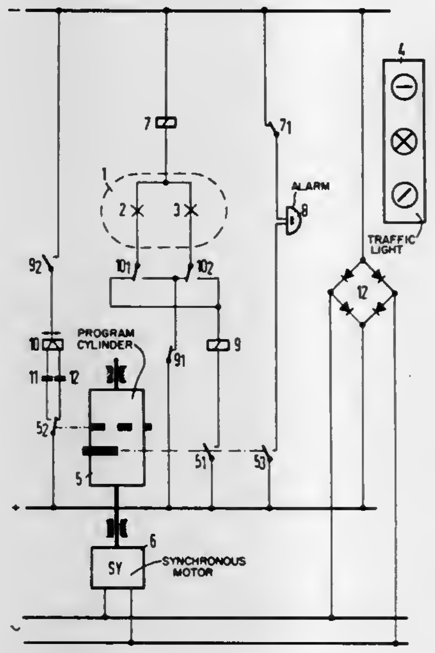
Continuation of Ser. No. 397,882, Sept. 17, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 563,060

Claims priority, application Germany, Sept. 25, 1972, 2246914

Int. Cl.² H01J *7/44;* **B60Q** *9/00*

U.S. Cl. 315—65 **3 Claims**

1. A traffic control arrangement for a traffic light, comprising: a halogen electric lamp, said halogen electric lamp including two filaments which are subject to the tungsten-halogen cyclic process; and control means connected to each of said filaments and operable to periodically and alternately energize said filaments for approximately equal periods of time which are within the interval within which the tungsten halogen process does not become effective, said control means including detecting means connected to said filaments to detect filament failure and means connected to said detecting means and to said filaments for operating the lamp on one filament in response to detection of failure of the other filament.



3,968,396

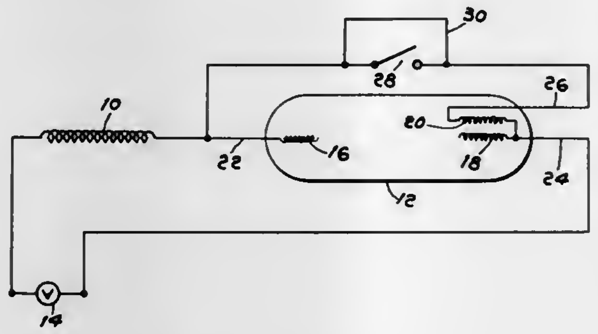
SELF BALLASTED LAMP INCLUDING A FUSEABLE DEVICE

James P. Clune, Danvers, and Robyn N. Frost, Lynn, both of Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 385,923, Aug. 6, 1973, abandoned. This application May 23, 1974, Ser. No. 472,576

Int. Cl.² H01J *7/44;* **H05B** *37/00;* **H01J** *9/46*

U.S. Cl. 315—74 **15 Claims**



1. A self ballasted lamp, comprising:

an arc tube of the type having a pair of electrodes and a starting coil;

a filament coil connected in series with said arc tube, said filament coil forming a ballast for the arc tube;

a temperature responsive switch connecting the starting coil in series with the filament coil at temperatures below a predetermined level; and

a fuseable conducting element connected across the temperature responsive switch, wherein said fuseable element provides a series connection between the filament coil and the starting coil until the element is melted and separated by the application of a predetermined voltage to said lamp.

11. A method for processing a self-ballasted lamp of the type having an arc discharge tube and a resistive filament mounted within the lamp envelope and including a temperature responsive switch in series with said resistive filament comprising the steps of:

a. connecting a fusible conducting element across said temperature responsive switch for providing a series connection between said filament coil during lamp processing; and
b. causing said fusible conducting element to melt by the application of a sufficient voltage to said filament coil.

3,968,397

FIRING APPARATUS FOR A PLURALITY OF ELECTRIC VALVES

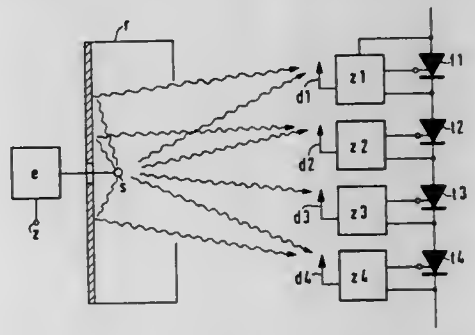
Stefan Frese, Vienna, and Franz Mayerhofer, Modling, both of Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,722

Claims priority, application Germany, Dec. 5, 1973, 2360653

Int. Cl.² H05B *37/02;* **E04G** *17/06*

U.S. Cl. 315—155 **11 Claims**



1. An apparatus for the simultaneous firing of a plurality of controllable semi-conductor rectifiers in a current rectifier for high voltages including a transmitter for electromagnetic radiation having radiating means and a reflector and a detector for each of the plurality of semi-conductor rectifiers, the individual detectors coupled to the firing circuits of their associated semi-conductor rectifiers, the improvement comprising:

a. a reflector in the form of an elliptical partial cylinder;
b. the radiator positioned at the first focus line of the elipse of said elliptical cylinder; and
c. the plurality of detectors positioned at the second focus line of said elipse.

3,968,398

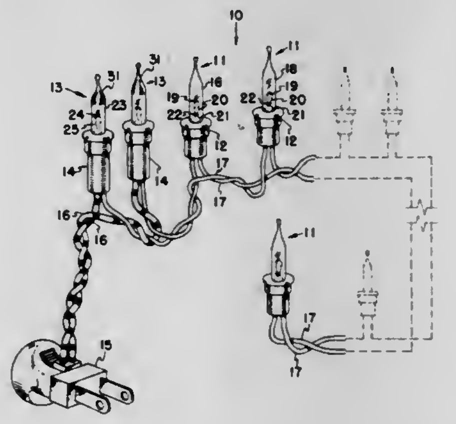
FUSED DECORATIVE STRING SET

Louis E. Lehmann, Geneva, and Ralph J. Luft, Aurora, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 397,957, Sept. 17, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,402

Int. Cl.² H05B *37/03*

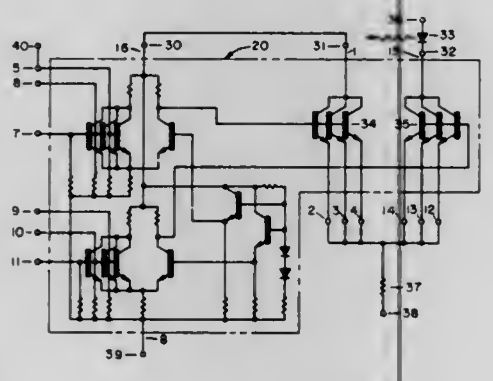
U.S. Cl. 315—185 S **8 Claims**

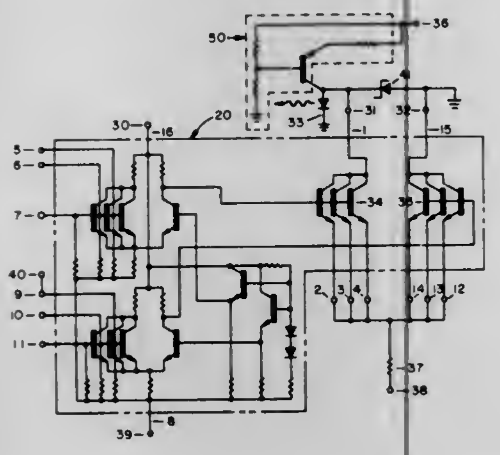


1. A string set of series-connected incandescent lamps comprising:

a plurality of lamps in a plurality of lamp sockets;
first conductor means interconnecting said sockets to form a string of series-connected sockets between two end sockets;
second conductor means connecting said end sockets to a plug;
said second conductor means having higher current capacity than said first condutor means; and
the lamps in at least the end sockets are the unshunted type and the remainder of said plurality of lamps are shunted lamps, whereby excessive current causes at least one of said unshunted end lamps to open-circuit to prevent overheating in the circuit formed with said first conductor means.

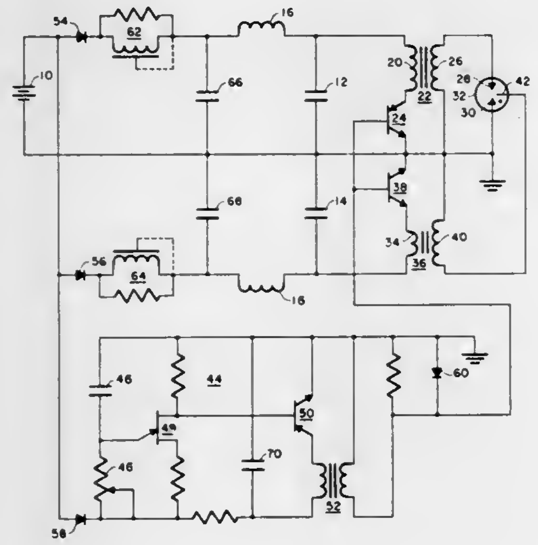
3,968,399
METHOD FOR DRIVING A LED AT HIGH SPEED
Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 19, 1975, Ser. No. 559,944
Int. Cl.^{2} H05B *37/00*
U.S. Cl. 315—200 R **9 Claims**





1. A circuit for driving a diode photon emitting device at frequencies up to 200 MHz comprising:
at least two high speed emitter-coupled logic gates, wherein each gate has a plurality of inputs connected to at least one output transistor through a plurality of logic transistors, and wherein the emitter outputs of said output transistors of said logic gates are all wired together to provide full current drive capability of the multiple gate structure, and wherein at least one input of one gate receives the input data signal;
a current setting resistor connected to the wire-ORed emitters of said output transistors of said logic gates;
a diode photon emitting device connected at its cathode to the collector of the output transistor of at least one gate in a current-switch configuration;
means for applying a bias voltage to the anode of said diode photon emitting device; and
means for applying operating voltages to said logic gates whereby application of a high speed signal to an input of at least one of said logic gates, will drive said diode photon emitting device at high speed.

3,968,400
FLASH TUBE MODULATOR
Wayne C. Weinreich, Corona, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 30, 1965, Ser. No. 444,092
Int. Cl.^{2} H05B *37/02*
U.S. Cl. 315—209 R **6 Claims**

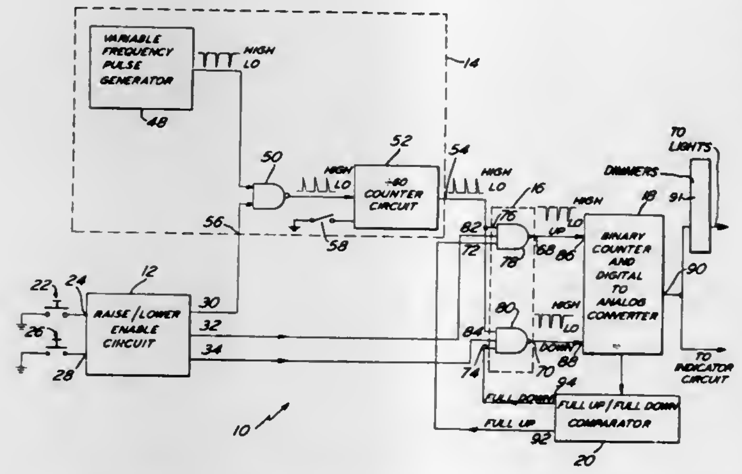


1. A flashtube modulator circuit comprising:
a. a flashtube having an anode, cathode and trigger electrode,
b. a current transformer having a secondary winding coupled across said anode and cathode of said flash tube and having a primary winding,
c. a first resonant discharging circuit including an on-off switch connected in series with said high current transformer primary winding across a first capacitor,
d. a first resonant charging circuit including a charging inductor connected in series with said first capacitor,
e. a source of direct current coupled across said resonant charging circuit,
f. a high voltage transformer having a secondary winding connected between the trigger electrode and cathode of said flashtube,
g. a second resonant discharging circuit including the primary winding of said high voltage transformer connected in series with an on-off switch across a second capacitor,
h. a second resonant charging circuit including a charging inductor connected in series with said second capacitor across said direct current power supply,
i. circuit control means coupled to said on-off switches for simultaneously discharging said capacitors through said transformer primary windings when said capacitors are charged to a maximum voltage,
j. whereby through successive resonant charging and discharging of said first and second capacitors the peak voltage developed across each of said primary windings is at least twelve times the amplitude of said input voltage.

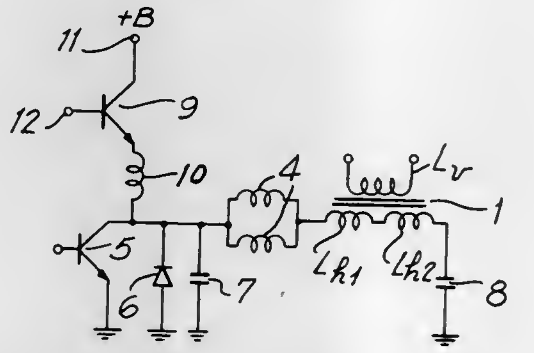
3,968,401
APPARATUS FOR CONTROLLING THE INTENSITY OF A LIGHT SOURCE
Doyle D. Bryant, Granada Hills, Calif., assignor to Strand Century Incorporated, Elmwood Park, N.J.
Filed Nov. 27, 1974, Ser. No. 527,923
Int. Cl.^{2} H05B *41/392*
U.S. Cl. 315—293 **11 Claims**

1. Apparatus for generating a control signal for controlling the intensity of a light source, comprising:

an enabling circuit for selectively generating first, second and third enabling signals;
pulse generator means electrically connected to said enabling circuit for generating a train of clock pulses in response to said first enabling signal;
up/down counter means having an up input terminal and a down input terminal;
gating means for applying said clock pulses to said up input terminal in response to said second enabling signal and for applying said clock pulses to said down input terminal in response to said third enabling signal, said gating means electrically connected to said pulse generator means and said enabling circuit;
said up/down counter means for evaluating the difference between the number of said clock pulses applied to said up input terminal and the number of said clock pulses applied to said down input terminal and for generating a digital signal representing said evaluation;
digital to analog converter means for converting said digital signal to an analog control signal.

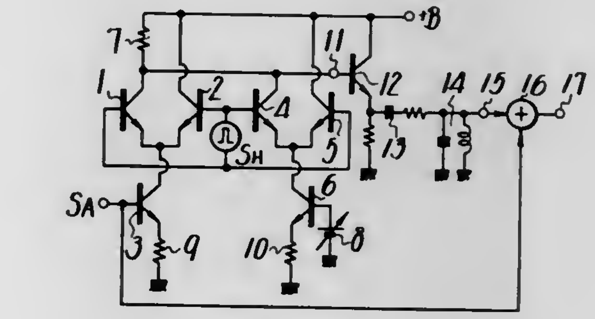


3,968,402
RASTER DISTORTION CORRECTING CIRCUIT
Hiroshi Sahara, Tokyo, and Tooru Kumagai, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 23, 1974, Ser. No. 499,974
Claims priority, application Japan, Aug. 25, 1973, 48-99975[U]
Int. Cl.^{2} H01J *29/56*
U.S. Cl. 315—370 **7 Claims**



1. A raster distortion correcting circuit for a television receiver including a cathode ray tube in which at least one electron beam is directed against a screen, a deflection yoke associated with said tube and having horizontal and vertical deflection windings, and horizontal and vertical deflection circuits for supplying horizontal and vertical deflection currents to said horizontal and vertical deflection windings, respectively, so that the resulting magnetic fields cause each said beam to scan horizontally and vertically for forming a raster on the screen: said raster distortion correcting circuit comprising a power supply source for supplying a power supply voltage to said horizontal deflection circuit; an active element having first and second electrodes and a control electrode for varying the effective resistance between said first and second electrodes in dependence on a control signal applied to said control electrode; a saturable reactor having input and output windings, means for generating a correction signal at the vertical scanning rate of said vertical deflection current; circuit means for connecting said first and second electrodes of the active element between said power supply source and said horizontal deflection circuit to connect said active element, said horizontal deflection winding of the yoke and said output winding of the saturable reactor in a series circuit connected to said power supply source; and circuit means for applying said correction signal to said control electrode of the active element as the control signal for the latter and to said input winding of said saturable reactor so that said active element and saturable reactor combine to correct a distortion of said raster over all portions of the latter.

3,968,403
CIRCUIT FOR CORRECTING DEFLECTION DISTORTION
Yoshiaki Ogawara, Inagi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 17, 1974, Ser. No. 480,204
Claims priority, application Japan, June 25, 1973, 48-75198[U]
Int. Cl.^{2} H01J *29/56*
U.S. Cl. 315—371 **10 Claims**



1. A circuit for correcting deflection distortion in the image displayed on the screen of a cathode ray tube, comprising:
first and second transistors interconnected at their controlled electrodes, respectively,
a third transistor connected at its output electrode to a connection point of the controlled electrodes of said first and second transistors,
fourth and fifth transistors interconnected at their controlled electrodes, respectively,
a sixth transistor connected at its output electrode to a connection point of the controlled electrodes of said fourth and fifth transistors,
a common load means connected to output electrodes of said first and fourth transistors,
a variable DC supply means coupled to said sixth transistor,
means for supplying a saw-tooth signal having a frequency equal to the vertical deflection frequency to said third transistor at its control electrode; and
means for differentially supplying a switching signal having a frequency equal to the horizontal deflection frequency to said first and fifth transistors and to said second and fourth transistors to differentially switch said first and fifth transistors and said second and fourth transistors at said horizontal deflection frequency so as to derive from said load means a saw-tooth signal modulated by said switching signal for effecting a vertical pincushion distortion correction.

3,968,404

ARRANGEMENT FOR CONTROLLING THE VERTICAL DEFLECTION OF A FLYING SPOT TUBE

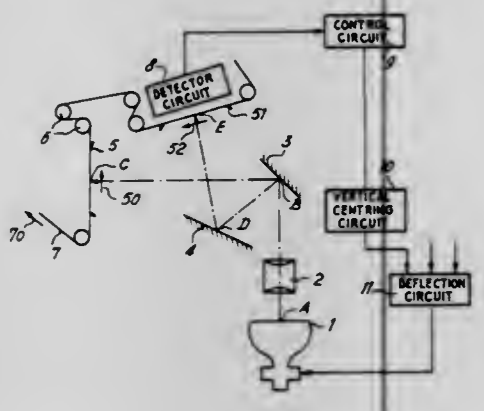
Serge Vidal, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 20, 1974, Ser. No. 481,405

Claims priority, application France, June 26, 1973, 73.23298

Int. Cl.² H01J *29/54*

U.S. Cl. 315—398 **3 Claims**



1. An arrangement for controlling the vertical deflection of a flying spot tube having a vertical deflection device, in order to effect correct vertical scanning, in a fixed gate, of the frames of a film comprising a band of markers associated with said frames in a one-to-one relationship, said markers being formed by perforations of the film, said arrangement comprising: deflecting means for imparting to the spot of said tube, in the course of each horizontal blanking interval a vertical motion causing an image of said spot to meet the marker associated with the film frame being scanned; generating means for generating a pulse signal each time said image reaches said marker; first means for receiving the pulse signals generated by said generating means and the scanning horizontal and vertical sync. signals and generating error signals representative of the errors in the vertical position of the successive scanning lines relatively to the vertical position corresponding to said correct scanning; and second means controlled by said first means for correcting the vertical centering of said flying spot tube.

3,968,405

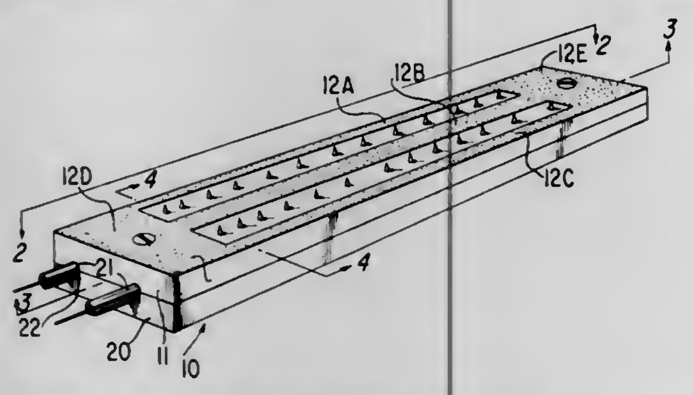
STATIC ELECTRICITY SUPPRESSOR WITH PATTERNED COATING AND METHOD OF MAKING

Anthony Q. Testone, P.O. Box 414, Lee, Mass. 01238

Filed Apr. 14, 1975, Ser. No. 568,107

Int. Cl.² H05F *3/00*

U.S. Cl. 317—2 F **12 Claims**



1. A static electricity suppressor comprising:

a. a sheet of electrically non-conductive material,

b. elongate electrically conductive emitter means extending transversely through said sheet, having an ionizing point outwardly of a first surface of said sheet and an opposite end adjacent a second surface of said sheet,

c. first electrically conductive coating pattern means on said first surface of said sheet in spaced relation to said point means and being exposed to atmosphere with said point means,

d. second electrically conductive pattern means on said second surface of said sheet electrically coupled to said point means,

e. means for connecting said second conductive coating pattern means to electrical source means to thereby cause said emitter to emit ions into the atmosphere, and

f. means for connecting said first conductive coating pattern means to ground to thereby provide a path to ground for ions engaging said first conductive coating pattern means.

3,968,406

DIRECT CURRENT ELECTROMAGNETIC ASSEMBLY OPERATING ON ALTERNATING-CURRENT MAINS

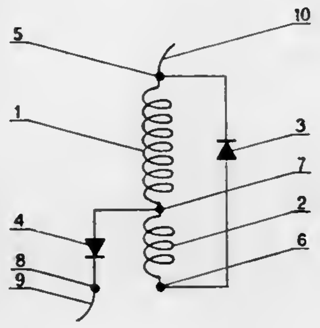
Daniel Arnoux, Paris, France, assignor to Chauvin Arnoux, Paris, France

Filed Jan. 20, 1975, Ser. No. 542,093

Claims priority, application France, Jan. 21, 1974, 74.01963

Int. Cl.² H02H *7/04*

U.S. Cl. 317—14 B **5 Claims**



1. An electromagnet of the direct-current type having rectifying means for supplying direct-current thereto from a source of alternating current, which comprises a first winding, a first diode mounted in series with said first winding, the series circuit consisting of said first winding and said first diode being connectable across an external source of alternating current for the direct feed of said electromagnet during one half-wave of the alternating current, a second winding and a second diode mounted in series with said second winding, said first and second windings being made of the same wire wound in the same direction without any break, the series circuit consisting of said second winding and second diode being connected across the terminals of said first winding for allowing a self-induction current to loop through said second winding, said second diode and said first winding, during the other half-wave of said alternating current, whereby a current due to a surge-voltage in said alternating current source and flowing through anyone of said two diodes in the reverse direction is forcibly caused to flow likewise through at least one of said first and second windings.

3,968,407

REDUNDANT INTRINSIC SAFETY BARRIER

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation

Continuation of Ser. No. 455,173, March 27, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,095

Int. Cl.² H02H *3/20, 3/08*

U.S. Cl. 317—16 **6 Claims**

1. A redundant intrinsic safety barrier interposed within a signal line carrying bipolar d.c. voltage signals and bidirectional current flows whereby power transmitted on the signal line is limited to a safe magnitude irrespective of the voltage polarity of the signals or current flow direction, the barrier comprising:

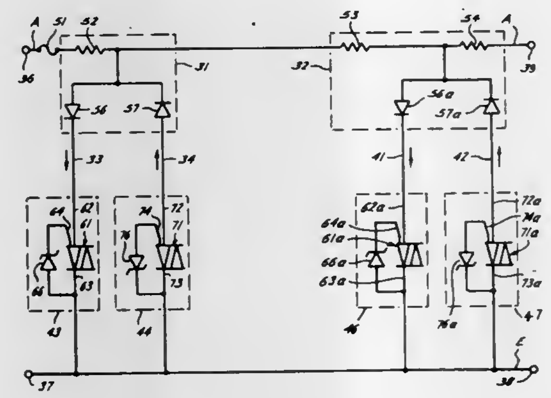
a. a signal conductor including first and second terminals connectable into the signal line, and a circuit common;

b. fuse means and first, second and third resistances series connected in said signal conductor between said first and second terminals;

c. a first pair of unidirectional current circuits of opposite flow directions being parallel connected between the junction of said first and second resistances in said signal conductor and circuit common;

d. a second pair of unidirectional current circuits of opposite flow directions being parallel connected between the junctions of said second and third resistances in said signal conductor and circuit common;

e. said unidirectional current circuits having substantially identical, like components, each said unidirectional current circuit containing a rectifier means in series with the main terminals of a triac and circuit common, and a zener diode in series between the gate of said triac and circuit common, and said rectifier means and zener diode both connected with like anodes or cathodes as the case may be to said signal conductor and circuit common, respectively;



f. each pair of said unidirectional current circuits having said rectifier means and zener diodes connected in parallel but with reverse polarity; and

g. said first and third resistances providing for current limiting functions in said signal conductor whereby excessive bidirectional current flows on said signal conductor or bipolar voltages above the predetermined magnitude at either said first and second terminals will bias into low impedance conduction one of said corresponding triacs in said first and second pairs of said unidirectional current circuits to provide redundant power limiting in addition to said fuse means.

3,968,408

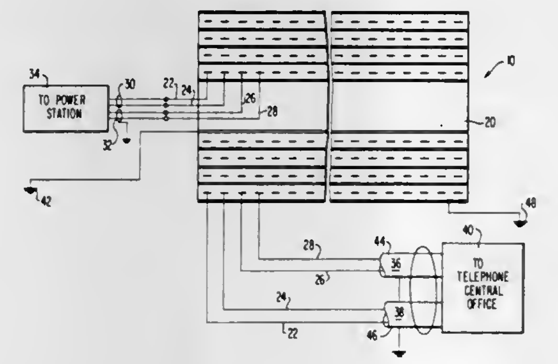
NEUTRALIZING TRANSFORMER

Gordon Y. R. Allen, 4 Ireland Court, Islington, Ontario, Canada

Filed Oct. 2, 1974, Ser. No. 511,361

Int. Cl.² H02H *3/20*

U.S. Cl. 317—17 **3 Claims**



1. A neutralizing transformer comprising:

a plurality of conductors embedded in a dielectric and forming a flat ribbon-like cable,

a flexible conductor shield coextensive with the width and length of said cable,

said cable and shield being wound around a core to form a transformer,

said shield forming the primary winding and the plurality of conductors forming the secondary windings, and

said primary winding coupled between two spaced-apart grounds whereas said secondary windings are individually coupled to a plurality of frequency sources and frequency receivers.

3,968,409

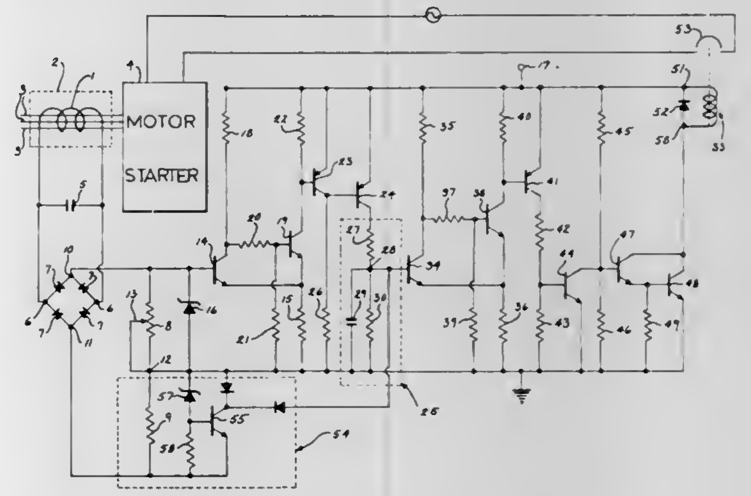
GROUND FAULT DETECTOR CIRCUIT WITH HIGH CURRENT INHIBIT

Harold W. Windler, Hales Corners, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 10, 1975, Ser. No. 548,295

Int. Cl.² H02H *7/085*

U.S. Cl. 317—32 **7 Claims**



1. A ground fault detection circuit for a motor starter, the combination comprising:

a current transformer coupled to the power lines leading to the motor starter and operable to generate a current in its secondary winding which is proportional to the ground fault current in the power lines;

a trip current level detector circuit coupled to the secondary winding and operable to generate a selected output voltage when the ground fault current reaches a first preselected level;

a time delay circuit coupled to the trip current level detector to receive the selected output voltage and operable to impart a time delay thereto;

an output circuit coupled to the time delay circuit to receive the delayed output voltage, said output circuit being coupled to the motor starter to deenergize the same when the delayed output voltage is received; and

a high current level detector circuit coupled to the secondary winding and operable to generate a disabling voltage which inhibits the application of said delayed output voltage to said output circuit when the ground fault current reaches a second preset level which is substantially higher than the first preset level.

3,968,410

STATIC OVERCURRENT RELAYS

Daniel J. Graham, Glenolden, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 10, 1974, Ser. No. 504,785

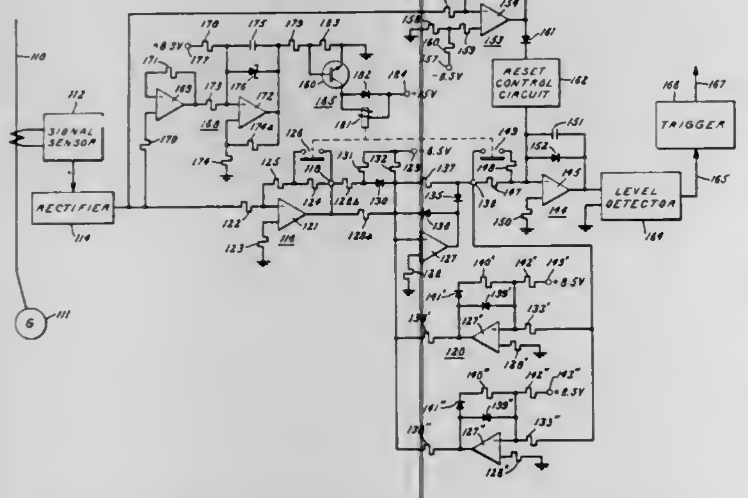
Int. Cl.² H02H *3/08*

U.S. Cl. 317—36 TD **6 Claims**

6. A protective relay adapted to be coupled to an alternating current circuit in order to produce a trip signal in delayed

response to the value of a circuit quantity becoming excessive, said relay comprising:

- a. means for deriving from said circuit a unipolar voltage input signal of variable amplitude representative of said quantity,
- b. amplifying means connected to said input signal deriving means for providing a modified input signal the amplitude of which is related to the amplitude of said input signal by the gain of said amplifying means;
- c. function generating means having an input terminal to which said modified input signal is supplied and an output terminal at which is produced an output signal related to said modified input signal by a first substantially constant gain so long as the magnitude of said modified input signal is within a first predetermined range, by a second substantially constant gain higher than said first gain when the magnitude of said modified input signal is within a second predetermined range whose minimum limit equals the maximum limit of said first range, and by a third substantially constant gain higher than said second gain when the magnitude of said modified input signal is within a third predetermined range whose minimum limit equals the maximum limit of said second range,
- d. integrating means having an input terminal to which said output signal is supplied and being operative whenever said quantity becomes excessive for producing an integrated output signal which increased in magnitude at a rate dependent upon the value of said integrating means;
- e. range changing means for automatically changing the gain of said amplifying means from a first relatively high amount to a second lower amount and for simultaneously changing the time constant of said integrating means from a first relatively long value to a second shorter value whenever the magnitude of said input signal exceeds a predetermined value; and
- f. means connected to said integrating means for producing a trip signal whenever the magnitude of said integrated output signal exceeds a preselected level.



3,968,411

TRANSMITTER-RECEIVER PROTECTION DEVICE

Heinz G. Mueller, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 27, 1975, Ser. No. 562,627

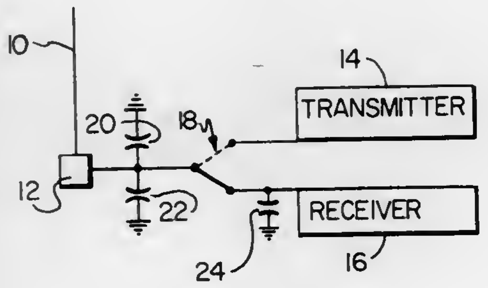
Int. Cl.^{2} H02H *7/20*

U.S. Cl. 317—61.5 **2 Claims**

1. In a transmitter-receiver system having an antenna, a TR switch, a transmitter and a receiver, an improvement comprising a protection device having a housing;

two spark gap devices connected in parallel, each of said spark gap devices having first terminals connected to the base of said antenna between said antenna and said TR switch and second terminals connected to said housing at separate and distinct points of common potential; and

additional spark gap means having a first terminal connected between said TR switch and said receiver and a second terminal connected to a point of common potential.



3,968,412

THICK FILM CAPACITOR

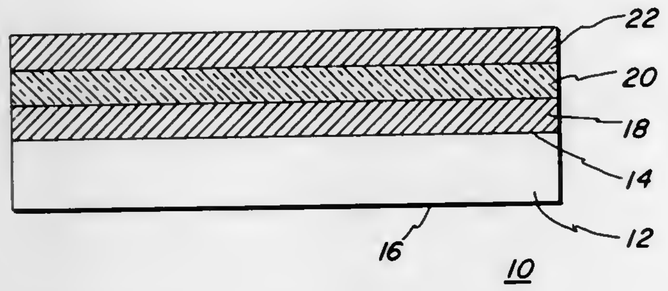
Roland T. Girard, Scotia, and George A. Rice, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 383,280, July 27, 1973, Pat. No. 3,878,443. This application Dec. 13, 1974, Ser. No. 532,454

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.^{2} H01G *4/12*

U.S. Cl. 317—258 **15 Claims**



1. A capacitor comprising

a substrate having two opposed major surfaces;

a first layer of an electrically conductive metal disposed on one of the major surfaces of the substrate to form a first electrode disposed thereon;

a layer of dielectric material having a composition which includes a barium titanate material which is one selected from the group consisting of chemically pure barium titanate and chemically pure barium titanate modified with from about 0.125% to about 5.0% by weight of a metal oxide additive and from 3 percent to 7 percent by weight of a alkali-free binder having at least the electropositive element barium present therein, disposed on the first electrically conductive metal layer, the alkali-free glass binder has the following formulation:

Ingredient	% by weight
BaO	38 to 46
ZnO	7 to 11
SiO_2	35 to 45
B_2O_3	6 to 8
Al_2O_3	2 to 5

a second layer of an electrically conductive metal disposed on the layer of dielectric material to form a second electrode disposed thereon.

3,968,413

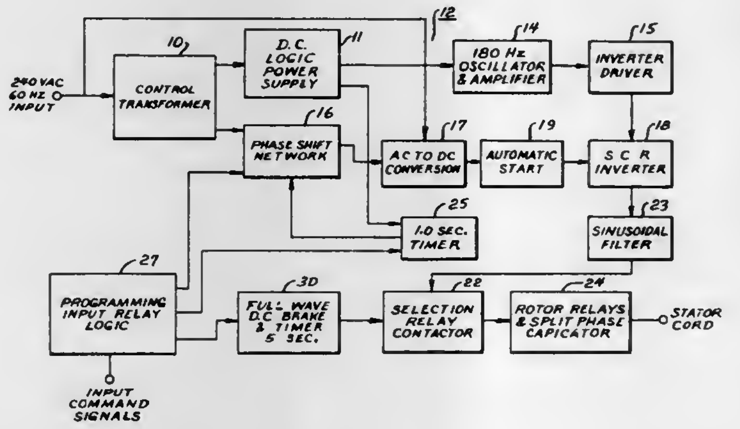
VARIABLE SPEED STARTER FOR X-RAY TUBES

Louis L. Fiocca, Bensenville, Ill., assignor to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Oct. 21, 1974, Ser. No. 516,752

Int. Cl.^{2} H02P *7/42*

U.S. Cl. 318—230 **4 Claims**



1. A system operable from an alternating current source, for controllably providing power to an induction motor for driving rotating anodes of X-ray tubes, said motor being operable to selectively drive the anode within a given speed range at a first low rate of speed and at a second higher rate of speed, a drive control circuitry for controlling the operation of the motor at the low speed operation and said same drive control circuitry controlling the operation of the motor at the higher speed operation, analog operating means for said control circuitry for providing voltages at selected first levels to the motor to thereby accelerate the anode to the selected speed within the given range, and said analog operating means providing voltages at selected second levels to the motor to maintain the anode rotating at the selected speed.

3,968,414

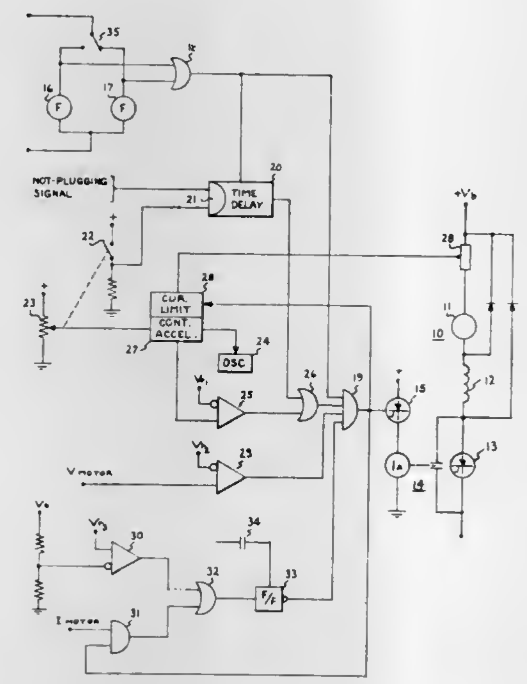
BYPASS CONTACTOR CONTROL

Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,717

Int. Cl.^{2} H02P *1/00*

U.S. Cl. 318—341 **13 Claims**



1. A bypass switch actuating system for an electric vehicle time ratio control having electronic switching means for varying the average voltage impressed across a traction motor in response to signals from a speed control means, directional switch means for determining the direction of torque produced by the motor, plugging sensor means for indicating the presence of plugging activity and bypass switch means for electrically bypassing said electronic switching means, comprising:

means for sensing the state of the directional switching means and outputting a first signal in response thereto;
switch means coupled to the speed control means;
time delay means coupled to said plugging sensor and said switch means and operable to produce a second signal a predetermined period of time after the closing of said switch means, in the absence of plugging activity;
means coupled to the speed control for outputting a third signal when the mark-space ratio of the electronic switching means exceeds a predetermined value;
circuit means for producing a fourth signal in response to either said second or said third signal;
voltage sensing means for outputting a fifth signal when the voltage across the load exceeds a predetermined value; and
means for energizing the bypass switch in response to the presence of said first, fourth and fifth signals.

3,968,415

APPARATUS FOR EFFECTING AND CONTROLLING THE INDEXING OF TOOL TURRETS IN MACHINE TOOLS

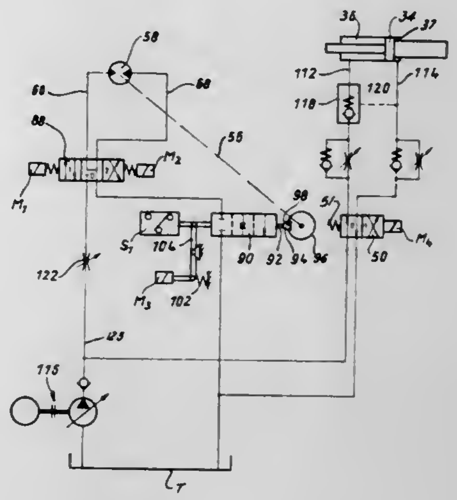
Dietmar Hafla, Hohengehren, and Kurt Abele, Nenningen, both of Germany, assignors to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Filed Dec 31, 1974, Ser. No. 537,787

Claims priority, application Germany, Jan. 10, 1974, 2401083

Int. Cl.^{2} G05B *19/18*

U.S. Cl. 318—569 **17 Claims**

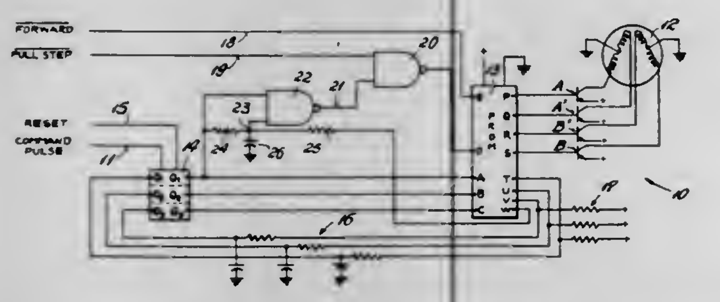


1. Apparatus for effecting and controlling the movements of a component to a plurality of successive predetermined positions, particularly for effecting and controlling angular movements of a tool supporting device in a machine tool to a plurality of successive positions which are selected in accordance with a predetermined program, comprising a control unit including a prime mover which is rotatable clockwise and counterclockwise at a plurality of speeds, an output member rotatable by said prime mover, means for transmitting motion from said output member to said component, speed regulating means for said prime mover including a cam driven by said output member, a control element movable between a first end position in which said prime mover is free to rotate said output member at a maximum speed and a second end position in which said prime mover is arrested, means for biasing said control element against said cam, said cam having a portion which effects a gradual movement of said control element to said second end position under the action of said biasing means, and disengaging means operable to move said

control element to said first end position; and a decoding unit having means for selecting the direction of rotation of said prime mover so as to effect a movement of said component from a preceding position to the next following position along the shorter of two possible routes including clockwise and counterclockwise rotation of said prime mover and means for timing the deceleration of said prime mover from said maximum speed, said timing means including means for deactivating said disengaging means to thus enable said biasing means to move said control element from said first end position.

3,968,416
MOTOR CONTROL FOR A STEPPING MOTOR

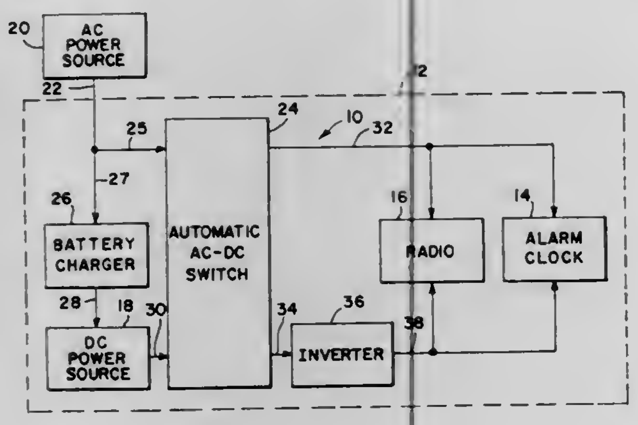
Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.
Filed July 1, 1974, Ser. No. 484,990
Int. Cl.^{2} H02K *37/00*
U.S. Cl. 318—696 **11 Claims**



1. A motor control for a stepping motor having windings that are differently energizable in a repeating sequence with each change of energization producing an incremental movement and in which each change results from the receipt of a command pulse, said control comprising memory means having an input and an output, said output being adapted to produce a plurality of different conditions with there being one output condition for each different energization, said input being adapted to receive one of a plurality of different input conditions with each input condition producing only one output condition whereby for each different input condition there is produced only its associated output condition, means for receiving a portion of the output to energize the windings in accordance with the condition thereof, said output having a second portion and means for receiving a command pulse and applying the second portion to the input upon receipt of the pulse.

3,968,417
CLOCK-RADIO WITH AUTOMATICALLY SELECTED BATTERY POWER

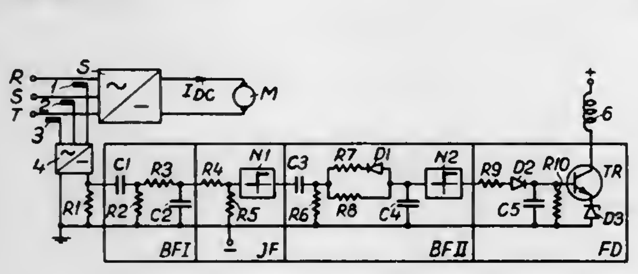
Donald Dials, San Rafael, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 8, 1975, Ser. No. 575,808
Int. Cl.^{2} H02J *7/00*
U.S. Cl. 320—2 **1 Claim**



1. In combination with alarm clock apparatus, a housing for said alarm clock apparatus, said housing being adapted to receive a battery and connecting means carried by said housing for drawing electric power from a wall outlet, the improvement within said housing comprising: a battery charger fed by said connecting means and having an output connected for charging said battery; an inverter adapted to be fed by said battery, said inverter having an output port connected to a power input port of said alarm clock apparatus; and means for applying power to said alarm clock apparatus from said connecting means when voltage is present on said connecting means and for applying power to said alarm clock apparatus from said battery via said inverter when voltage is not present on said connecting means, wherein said applying means comprises a single relay having a coil connected across said connecting means, said relay having normally open contacts connected between said connecting means and said power input port of said alarm clock apparatus, said relay also having normally closed contacts connected between said battery and an input port of said inverter.

3,968,418
CONVERTOR CONNECTION WITH ASYMMETRY INDICATING MEANS

Per Kain, and Kjeld Thorborg, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 12, 1974, Ser. No. 532,210
Claims priority, application Sweden, Jan. 7, 1974, 7400131
Int. Cl.^{2} H02H *7/10*
U.S. Cl. 321—12 **3 Claims**

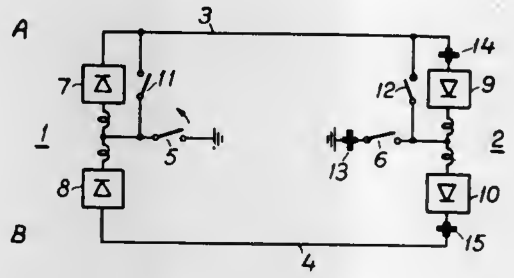


1. Convertor connection for connection to a DC circuit and comprising current-sensing members (1, 2, 3, 4, R1) for forming a quantity corresponding to the direct current (I_{DC}) of the convertor connection, the convertor connection comprising an indicating means (BFI, JF, BFII, FD) for indicating asymmetrical operating conditions, said indicating means comprising a first band pass filter means (BFI) connected to said current-sensing members and including means to let through frequencies within a broad frequency band located between a frequency greater than the frequency zero and the fundamental frequency of the AC component present in the direct current during undisturbed operation, but excluding these frequencies, means (JF, BFII, FD) for emitting an asymmetry indicating signal when the output signal of the first filter means exceeds a predetermined amplitude value, and means to supply the output signal of the first filter means to the signal emitting means.

3,968,419
DIRECT CURRENT TRANSMISSION AND METHOD OF OPERATING THE SAME

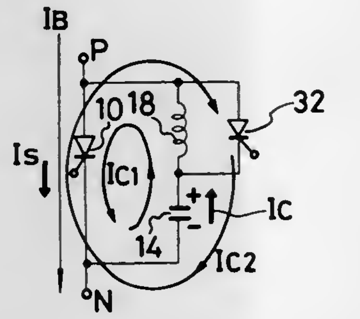
Ake Ekstrom, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 13, 1975, Ser. No. 558,158
Claims priority, application Sweden, Mar. 15, 1974, 7403479
Int. Cl.^{2} H02M *7/00*
U.S. Cl. 321—27 R **9 Claims**

1. In the operation of a bipolar direct-current transmission system comprising bipolar convertor stations (1,2) with earthed center taps (5,6) and connected to each other by means of two transmission lines (3,4), one for each polarity (A,B), and in which in the event of disconnection of one pole of the station the corresponding pole of the transmission line is connected as a return conductor for the remaining pole, the method which comprises, for loading said return conductor with current and discharging the ground connection between the stations, the step of increasing the current of the corresponding pole in one of the stations to the same value as in the pole in operation, and thereafter interrupting the ground connection in one station.



3,968,420
CHOPPER CIRCUIT ARRANGEMENT

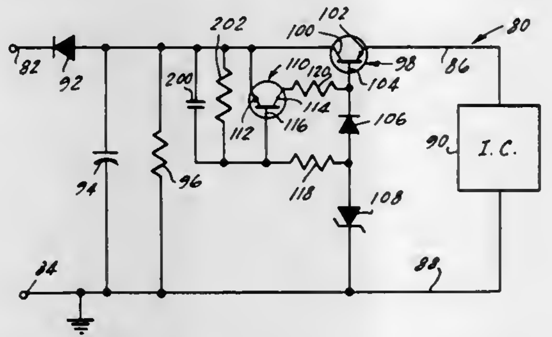
Susumu Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed Oct. 4, 1974, Ser. No. 512,323
Int. Cl.^{2} H02M *7/515*
U.S. Cl. 321—45 C **10 Claims**



1. A circuit arrangement comprising a load circuit arrangement, a first switching means connected to said load circuit arrangement, a resonating circuit which comprises a capacitance element and an inductance element, a second switching means connected to said inductance element, and means for aiding the commutation capacity of said capacitance element in response to the load current of said load circuit arrangement.

3,968,421
DELAYED ON QUICK OFF REGULATOR CIRCUIT FOR APPLIANCE CONTROL

Roque Denis Marcade, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 30, 1974, Ser. No. 537,076
Int. Cl.^{2} G05F *3/14, 5/00*
U.S. Cl. 323—19 **9 Claims**

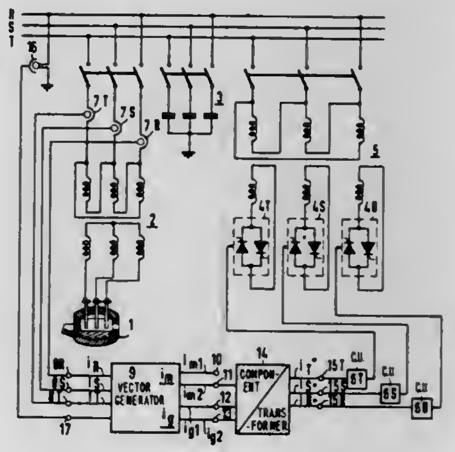


1. In a regulator circuit of an appliance, which regulator circuit is connected between a voltage source and an integrated control circuit powered by the voltage source, and which includes a regulator transistor having its collector-emitter circuit connected in series with the voltage source and the integrated control circuit, and its base-emitter circuit, including a Zener diode, connected across the integrated control circuit, the improvement therein comprising:

switch means, including a switch transistor having a base-emitter circuit connected in series with said Zener diode across the voltage source and a collector-emitter circuit connected across the collector-base circuit of the regulator transistor, for preventing application of potentials to the integrated control circuit which are below a predetermined level.

3,968,422
METHOD AND APPARATUS FOR THE STATIC COMPENSATION OF REACTIVE POWER

Hermann Waldmann, Weiher, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Mar. 5, 1975, Ser. No. 555,540
Claims priority, application Germany, Mar. 27, 1974, 2414807
Int. Cl.^{2} H02J *3/18*
U.S. Cl. 323—102 **6 Claims**



1. A method for carrying out static reactive power compensation of a three phase system having a three phase load, a three phase capacitor battery and a three phase converter set having short circuited, controlled reactive power converters, by deriving the control variables for the reactive power converters from the load currents by steps comprising:

a. converting the load current into a line frequency oscillation with orthogonal components;
b. obtaining from each of the orthogonal components of the oscillation two components of a current vector rotating with the line frequency;
c. developing a vector having two components from one phase of the three phase system;
d. transforming the components of the current vectors into d-c quantities by adding to said components the components of said vector derived from one phase of the three phase system;
e. developing from the d-c quantities a co-rotating vector and a counter-rotating vector each have an active and reactive component; and
f. converting the components of the counter-rotating vector and the reactive component of the co-rotating vector into control variables for the individual reactive power converters.

3,968,423
NUCLEAR MAGNETIC RESONANCE APPARATUS OF FOURIER TRANSFORM TYPE

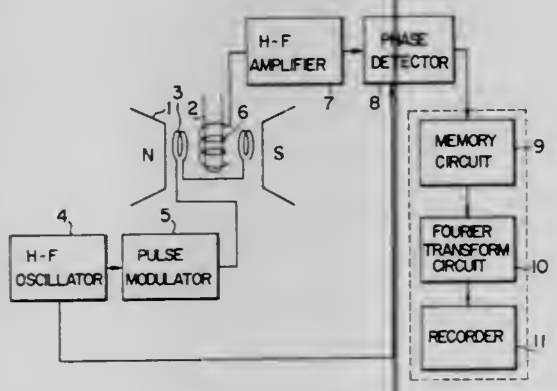
Yasutaka Hoshino; Yoshiharu Utsumi; Nobuhiko Aoki, and Hiroshi Yokokawa, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 10, 1974, Ser. No. 513,774

Claims priority, application Japan, Oct. 12, 1973, 48-113937

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 AC **8 Claims**



1. A nuclear magnetic resonance apparatus of Fourier transform type, comprising memory means to store a nuclear resonance signal induced from a sample disposed in an intense unidirectional magnetic field and further exposed to an h-f impulse magnetic field; read-out means to repeatedly read out the stored resonance signal; Fourier transform means to subject the repeatedly read-out resonance signal to Fourier transform using a periodic function; and synchronizing means to synchronize the period of the repeated read-out of the stored resonance signal with that of the oscillation and stopping of the periodic function.

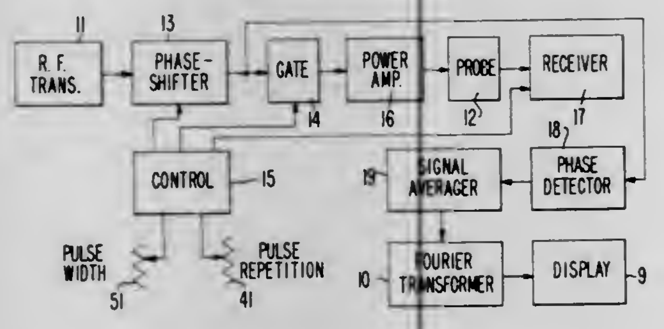
3,968,424
FOURIER TRANSFORM NMR SPECTROSCOPY EMPLOYING A PHASE MODULATED RF CARRIER

Richard R. Ernst, Winterthur, Switzerland, assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 1, 1974, Ser. No. 494,017

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 AC **16 Claims**



1. In a magnetic resonance spectrometer:

means for generating a band of radio frequency energy for irradiation of a sample of matter to be analyzed, such band of energy having a sufficient bandwidth to cover the spectral lines of the sample to be analyzed for simultaneously exciting radio frequency magnetic resonance of different resonance spectral lines, if any, within the sample;

means for detecting the excited resonance of the sample to obtain a composite resonance signal therefrom for analysis of the sample;

means for repetitively time scanning, sampling and storing a multiplicity of successive time displaced components of the composite resonance signal in a multiplicity of respective channels;

means for reading out the signal components stored in such channels; and

said means for generating the band of radio frequency energy for irradiation of the sample including, means for generating a radio frequency carrier signal, and means for periodically shifting the phase of said carrier signal from one phase to another of at least three different relative phases in accordance with a predetermined sequence.

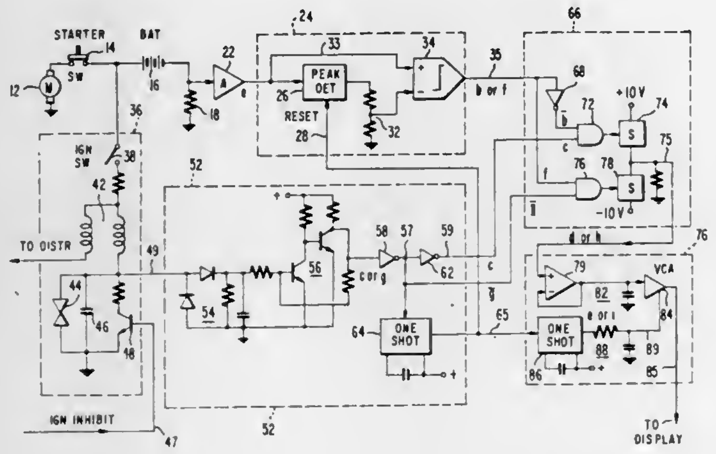
3,968,425
MEASURING IGNITION TIMING USING STARTER CURRENT

Richard Eric Hanson, Winchester, and William Fulmer Fordyce, Arlington, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,951

Int. Cl.² F02P *17/00*

U.S. Cl. 324—16 T **10 Claims**



1. Apparatus for measuring the ignition timing of an internal combustion engine while cranking the engine with the starter motor, comprising

means coupled to the starter motor circuit to derive a waveform representing starter motor current fluctuations having peaks due to compression in individual cylinders,

means to generate from said waveform a current peaks signal indicating the times of current peaks,

means coupled to the ignition circuit to generate a points openings signal indicating the times of points openings, and

means to compare said signals to obtain a time difference signal representing the lead or lag of the ignition relative to the starter current peaks, which are displaced known amounts at given cranking speeds from times of top dead center.

3,968,426
METHOD OF A.C. INSULATION TESTING UTILIZING A VARIABLE INDUCTIVE REACTOR IN PARALLEL WITH A TEST SPECIMEN

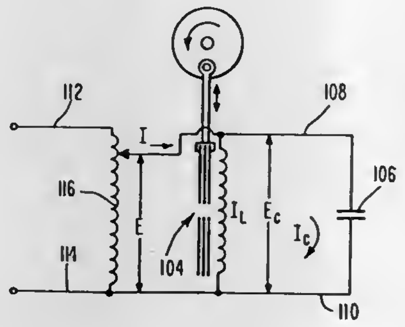
Charles F. Ward, Jr., Malvern, Pa., and Norman L. Smith, Haddonfield, N.J., assignors to James G. Biddle Company, Plymouth Meeting, Pa.

Division of Ser. No. 462,634, April 22, 1974, Pat. No. 3,883,836. This application Dec. 5, 1974, Ser. No. 529,707

Int. Cl.² G01R *31/12*

U.S. Cl. 324—54 **3 Claims**

1. The method of destructive testing of a.c. insulation comprising connecting a variable inductive reactor across a voltage supply in parallel with a test specimen, monitoring the current supplied to the parallel circuit by said voltage supply, varying the inductance of the variable inductive reactor until its reactance equals that of, the specimen as indicated by the supply current to the parallel circuit becoming of minimum value, and adjusting the supply voltage to a predetermined greater magnitude so as to cause, upon breakdown of the insulation, a detectable burning thereof at the point of failure.



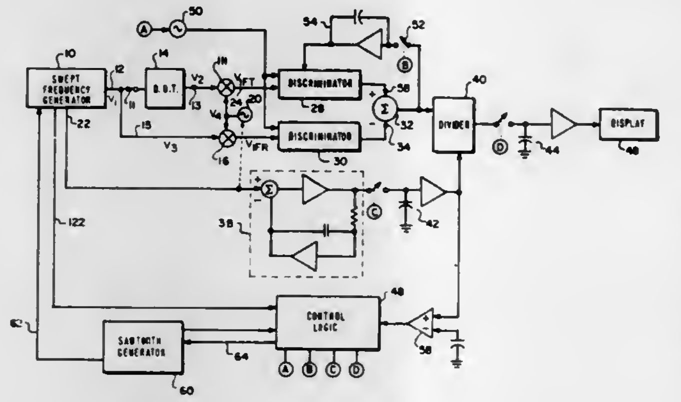
3,968,427
GROUP DELAY MEASUREMENT APPARATUS AND METHOD

David D. Sharrit, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 11, 1975, Ser. No. 603,821

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 SS **11 Claims**



1. A method of measuring the group delay of a device under test comprising the steps of:

generating an a.c. signal that is varied from a first to a second frequency;

generating a control signal that varies in accordance with the frequency of the a.c. signal;

supplying the a.c. signal to a device under test;

receiving an output signal from the device under test;

determining the instantaneous frequency difference between the a.c. signal and the output signal;

determining the instantaneous rate of change of the control signal; and

dividing the instantaneous frequency difference by the instantaneous rate of change of the control signal to produce a signal indicative of the group delay of the device under test.

3,968,428
PORTABLE SOIL MOISTURE TESTER

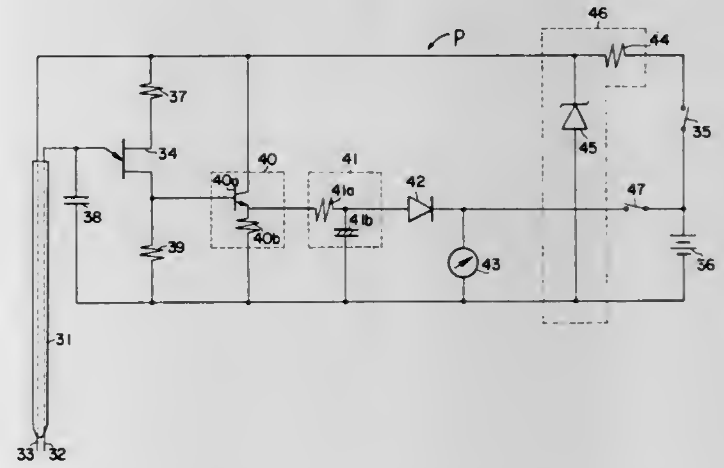
Minoru Numoto, 23-14, Takanawa 3 Chome, Minato, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,484

Int. Cl.² G01R *27/20*

U.S. Cl. 324—65 R **5 Claims**

1. In a test device for testing a condition of soil, said device including a probe having a tip adapted to be inserted into soil to be tested, spaced electrode means at said probe tip, and adjustable means for limiting the insertion of said tip into the soil to any one of a plurality of preselected depths, the improvement comprising: battery operated circuit means connected to said electrode means including a waveform shaping circuit for applying a pulsed accurately regulated voltage between said electrode means to cause a pulsed current flow, the frequency of which varies as a function of the resistance between said electrode means, and means including an integration circuit for producing a direct current the voltage of which corresponds to the resultant frequency of said pulsed current flow between said electrode means; and a direct current voltmeter responsive to said direct current to provide an accurate indication of the soil resistance between the inserted probe electrode means at said preselected depth.



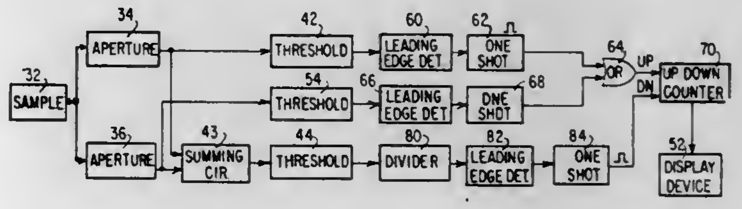
3,968,429
PARTICLE ANALYZER OF THE COULTER TYPE INCLUDING COINCIDENCE ERROR CORRECTION CIRCUITRY

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 443,428, Feb. 19, 1974, Pat. No. 3,940,691. This application July 9, 1975, Ser. No. 594,209

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 CP **16 Claims**



1. In a particle analyzer subject to coincidence errors in counting particle pulses the combination including:

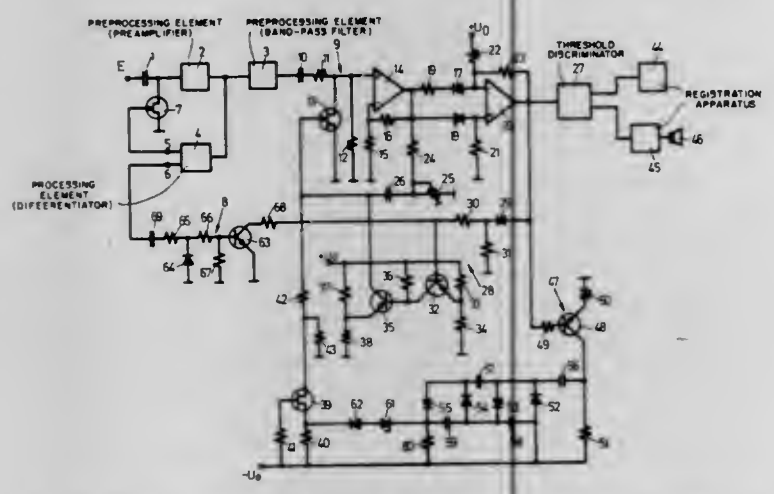
at least first and second sensing means each having substantially the same dimensions and each generating a train of particle pulses in response to passage through each of said sensing means of a sample containing a plurality of particles to be counted,

summing circuit means coupled to each of said sensing means for summing together each of said generated trains of particle pulses to develop a summed train of pulses, and

circuit means coupled to said summing means and to each of said sensing means for receiving separately said each generated train of particle pulses and said summed train of particle pulses, said circuit means being operative to mathematically change at least the number of particle pulses in said summed train of pulses in accordance with a particular mathematical formula, and to accumulate said numbers of pulses in said generated trains of pulses received and said mathematically changed summed train of pulses to produce an error corrected particle pulse count.

3,968,430
INSTALLATION FOR THE DETECTION AND PROCESSING OF ELECTRICAL SIGNALS

Michael Maas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Dec. 6, 1974, Ser. No. 530,354
Claims priority, application Germany, Dec. 13, 1973, 2362063
Int. Cl.² G01R *23/16*
U.S. Cl. 324—77 B **21 Claims**

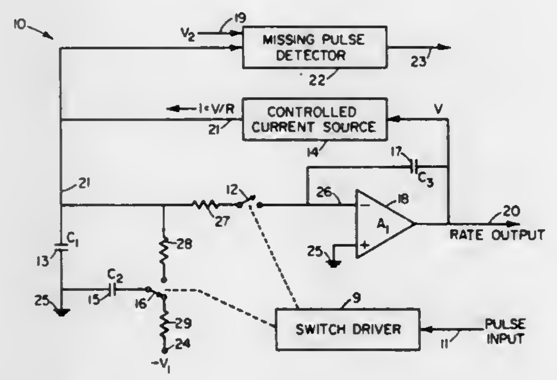

PREPROCESSING ELEMENT (PREAMPLIFIER)
PREPROCESSING ELEMENT (BAND-PASS FILTER)
PROCESSING ELEMENT (DIFFERENTIATOR)
THRESHOLD DISCRIMINATOR
REGISTRATION APPARATUS
E
+U₀
-U₀
2
3
7
9
10
11
14
17
22
27
44

1. In an installation for the detection and processing of electrical signals, in particular physiological measuring signals such as EKG, including a filter arrangement located in the measuring signal channel which is determinative of the desired frequency components of the signals; and a threshold discriminator for the filter output signals, the improvement comprising: said filter arrangement including a voltage divider having a voltage-controlled variable resistance, said voltage divider forming control means for varying the frequency range and the filter damping of passed-through signal components; a control voltage generator, said control voltage generator generating a control signal at signal amplitudes above the threshold of said threshold discriminator for displacing the variable resistance in the voltage divider of said filter arrangement so that the signal components previously lying above the threshold of said threshold discriminator are damped below the threshold by said voltage divider while the frequency range of said filter arrangement is concurrently displaced to higher frequencies, and at signal amplitudes lying continually below the threshold of said threshold discriminator the control signal of said control voltage generator disappears whereby, with the disappearance of said control signal, said filter arrangement is controlled to lower degrees of transmission damping through the variable resistance of said voltage divider for raising the lower signal components in a direction towards the threshold of said threshold discriminator while concurrently displacing the frequency range of said filter arrangement towards lower frequencies.

3,968,431
MEASURING REPETITION RATE

Philip A. Ekstrom, Seattle, Wash., assignor to Board of Regents, University of Washington, Seattle, Wash.
Filed May 30, 1974, Ser. No. 474,829
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 E **11 Claims**

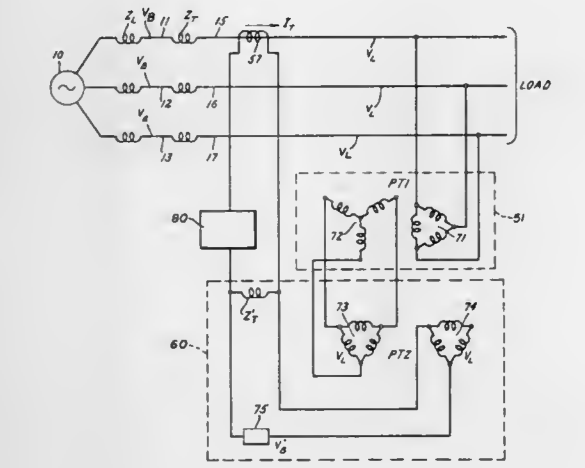
1. Apparatus for measuring the repetition rate of a series of electrical input pulses, comprising:
- reference means for providing a first electrical reference quantity of predetermined value;
- ramp generator means for generating ramp signals in response to the receipt of said input pulses, each of said ramp signals being initiated by the receipt of one input pulse and terminated at a peak value of the ramp signal in response to the receipt of the next input pulse, said ramp signal increasing in amplitude from a predetermined initial value to said maximum value at a ramp rate;
- comparator means for comparing said ramp signal with said reference value to provide a control signal output proportional to the difference between said peak ramp value and said reference value; and



- negative feedback means connected from the output of said comparator means to said ramp generator means, for changing said ramp rate in accordance with the value of said control signal to reduce said difference to zero and thereby cause said control signal to be proportional to the repetition rate of said input pulse.

3,968,432
REMOTE VOLTAGE SENSOR FOR POWER SYSTEM REGULATION

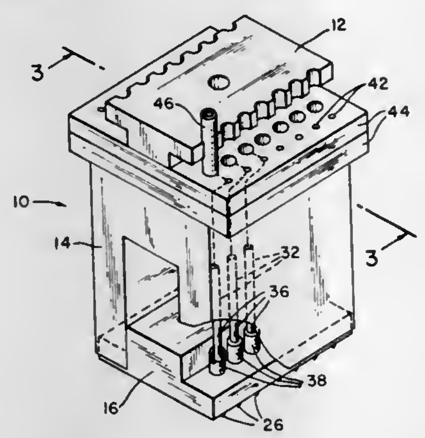
Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company, Phila., Pa.
Division of Ser. No. 406,139, Oct. 12, 1973. This application Oct. 9, 1974, Ser. No. 513,378
Int. Cl.² G01R *19/00, 1/22*
U.S. Cl. 324—107 **2 Claims**



1. In voltage measuring apparatus for a three conductor three phase electric transmission line including reactive impedance between a measuring location and a remote point, transformer means for deriving from the three transmission line conductors at said measuring location a first voltage signal having the phase position of line-to-neutral voltage on at least one phase conductor of said transmission line at said measuring location, a reactive replica impedance proportional to said reactive impedance in the phase associated with said phase conductor, means responsive to line current in said phase conductor for developing across said replica impedance a second voltage signal proportional in phase and magnitude to the voltage drop in the said reactive impedance in such phase, and means for adding said first and second voltage signals to derive a resultant projected voltage signal having the phase position of line-to-neutral voltage at said remote point.

3,968,433
FIXTURE FOR TESTING FLATPACK MODULES

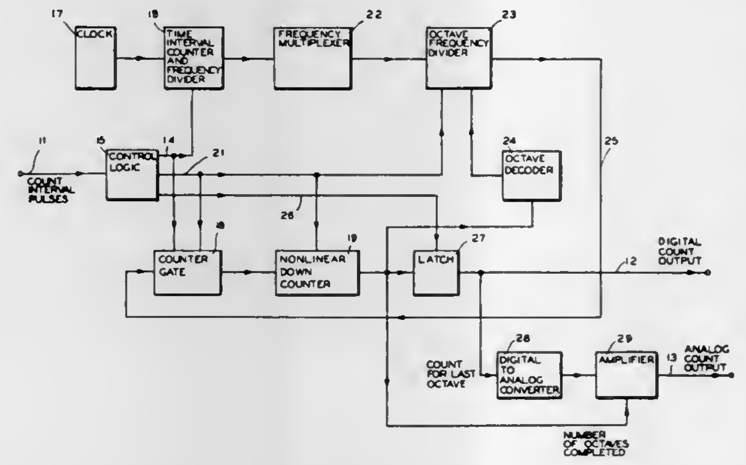
Joseph Dobarganes, Fords, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 22, 1974, Ser. No. 499,511
Int. Cl.² G01R *31/02, 1/06*
U.S. Cl. 324—158 F **4 Claims**



1. A fixture for testing a flatpack having a rectangular body with contact strips projecting from the sides of the body in a single plane comprising: a plug section having a recess configured for engagement about the body of the associated flatpack, said plug section having a plurality of first contacts disposed in a single plane on at least two sides of said recess for engagement with said contact strips, a center section having a generally inverted "U-shaped" cross-section with two leg sections disposed in generally parallel relationship and spaced a distance substantially equal to the distance between said sides of said recess having said first contacts disposed adjacent thereto, said center section having elongated electrically conducting members therein, each of said members being selectively connected to one of said first contacts in said plug section, and a third section dimensioned and configured for engagement with said center section and having a plurality of second contacts engaging said electrically conducting members, said second contacts being disposed at a greater transverse distance from the axis of said center section than said electrically conducting members.

3,968,434
DIGITAL TACHOMETER

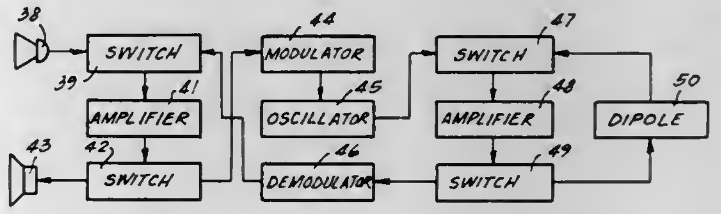
George Scott Dixon, Ann Arbor, and Lawrence F. Flaczynski, Ypsilanti, both of Mich., assignors to Reliance Electric Company, Euclid, Ohio
Filed July 19, 1974, Ser. No. 489,988
Int. Cl.² G01P *3/48;* G01R *23/02*
U.S. Cl. 324—166 **33 Claims**



1. An apparatus for generating output signals representing velocity as a function of the time required for an object to travel a predetermined distance comprising:
- means for defining a time interval representing the time required for said body to travel a predetermined distance;
- clock means responsive to said means for defining a time interval for generating a train of clock pulses at a predetermined frequency;
- frequency generating means responsive to said clock pulse train for generating said clock pulses in a predetermined series of plurality of predetermined rates; and
- counting means responsive to said clock pulses in a predetermined series of a plurality of predetermined rates for generating a series of discrete values which define a stepped approximation of a velocity versus time curve for said output signal.

3,968,435
COMMUNICATION SYSTEM

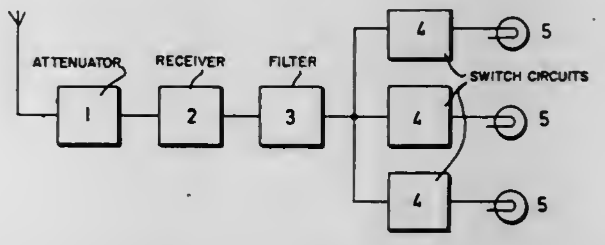
Harris A. Stover, 10306 Mountington Court, Vienna, Va. 22180
Filed Feb. 6, 1975, Ser. No. 547,578
Int. Cl.² H04B *5/02*
U.S. Cl. 325—16 **5 Claims**



1. A near field radiating energy integral receiver-transmitter communication system wherein said transmitter comprises a microphone, a first amplifier connected to the microphone, a modulator connected to said first amplifier, a low frequency oscillator connected to said modulator, a second amplifier connected to said oscillator, a radiating dipole connected to said second amplifier, said receiver comprising first and second receiving dipoles mounted noncoplanar relative to each other, a third amplifier connected to said first receiving dipole, a first demodulator connected to said third amplifier, a fourth amplifier connected to said second receiving dipole, a second demodulator connected to said fourth amplifier, a summing network connected to first and second demodulators, a fifth amplifier connected to said summing network, a loudspeaker connected to said fifth amplifier, a head gear, and said receiver, said transmitter and said radiating dipole and said first and second receiving dipoles mounted on said head gear, and said loudspeaker mounted near a user's ear and said microphone mounted near a user's mouth.

3,968,436
APPARATUS FOR TESTING THE OPERABILITY OF EMERGENCY VEHICULAR RADIO TRANSMITTERS

Frantisek Hajek; Miroslav Studnicka, and Jaroslav Kavalir, all of Prague, Czechoslovakia, assignors to Tesla, Prague, Czechoslovakia
Filed Dec. 4, 1974, Ser. No. 529,399
Claims priority, application Czechoslovakia, Dec. 5, 1973, 8371-73
Int. Cl.² H04B *17/00*
U.S. Cl. 325—67 **4 Claims**



1. In a wireless emergency call system for vehicles on public highways having a radio transmitter adapted on actuation to emit a signal in a selected one of plurality of modes, apparatus for testing the operability of said transmitter in each mode

selected, comprising an antenna for the reception of the emitted signal, an adjustable attenuator connected to the output of said antenna for suppressing spurious signals and interference, a receiver connected to the output of said attenuator for receiving said emitted signal, a filter connected to the output of said receiver for distinguishing the mode of said emitted signal, signal indicia indicative of each said modes, and switch means interposed between said filter and said signal indicia for operation of selected one of said signal indicia corresponding to the signal mode emitted by said transmitter, said apparatus being located in an enlarged housing having an entry and exit for said vehicle including means for screening the exit of the emitted signal of the vehicle transmitter from said housing and means for screening the entry of signals from without said housing.

3,968,437
RECEIVER INCLUDING AN AUTOMATIC TUNING CORRECTION SUPPRESSION CIRCUIT COUPLED TO A TUNING MEMBER

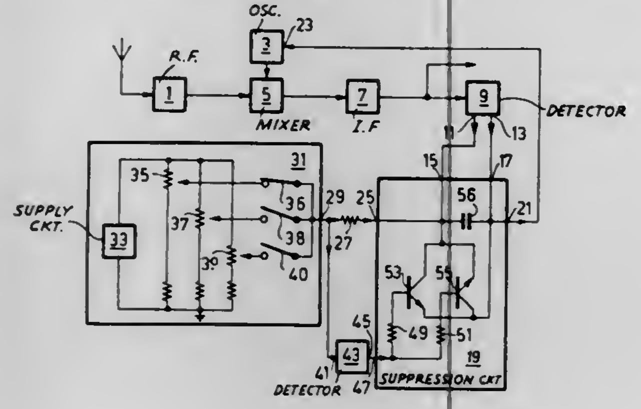
Kian Kie Ong, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 413,814, Nov. 8, 1973, abandoned. This application May 21, 1975, Ser. No. 579,307

Claims priority, application Netherlands, Nov. 15, 1972, 7215429

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—422 **5 Claims**



1. Tuning means for an oscillator tuning member, said tuning means comprising automatic tuning correction means, automatic tuning correction suppression means for coupling to said tuning member and said automatic tuning correction means, said suppression means having a suppression activation input terminal, a tuning signal level adjusting circuit, means for applying a voltage to said adjusting circuit, tuning signal level variation detector including a differentiator coupled to said adjusting circuit and said suppression activation input to render said automatic tuning correction means inactive when said adjusting circuit output is varied.

3,968,438
OFF CHANNEL GAIN CONTROL CIRCUIT

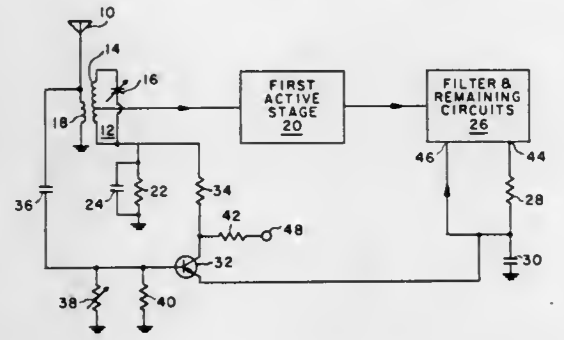
Harry Thanos, Greenville, R.I., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,542

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—319 **8 Claims**

1. A circuit comprising a signal path including a tuned circuit input means for receiving an input signal, a first active stage coupled to said input means and a filter means coupled to said active stage for defining on channel signals within the passband of the filter and off channel signals outside of said passband, off channel gain control means having an input coupled to said tuned circuit input means for receiving strong signals across said tuned circuit and an output means coupled to said active stage for controlling the gain thereof in accordance with the strength of an off channel signal, and an on channel gain control means having an input coupled to said path after said filter and an output coupled to said active stage through said tuned circuit input means.



3,968,439
RADIO RECEIVER HAVING A PRESELECTION CIRCUIT TUNED BY A VARACTOR WITH A VARIABLE LIMITER THRESHOLD CIRCUIT TO ATTENUATE LARGE AMPLITUDE SIGNALS

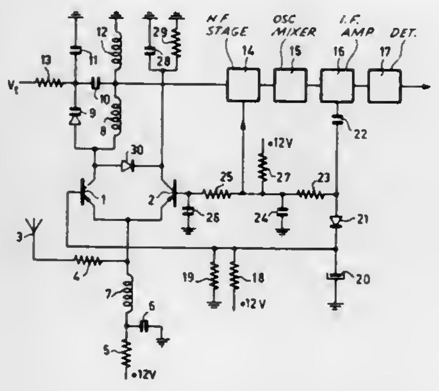
Adalbertus Hermanus Jacobus Nieveen van Dijkum, and Johannes Gerardus Albertus Kropman, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,538

Claims priority, application Netherlands, May 10, 1974, 7406291

Int. Cl.^{2} H04B *1/18*

U.S. Cl. 325—319 **2 Claims**



1. A circuit for a radio receiver having an intermediate frequency amplifier, said circuit comprising a control stage having an input means for receiving an input signal; a varactor tuned preselection circuit coupled to said control stage; a variable threshold limiter circuit coupled to said preselection circuit for limiting the received signal applied to said preselection circuit; and means for deriving from said amplifier a control voltage and for applying it to said control stage and said limiter to increase said threshold as the amplitude of the intermediate frequency increases.

3,968,440
SOLID STATE TELEVISION CHANNEL SELECTION SYSTEM

George John Ehni, III, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 25, 1974, Ser. No. 509,190

Int. Cl.^{2} H04B *1/34;* **H04N** *5/50*

U.S. Cl. 325—417 **8 Claims**

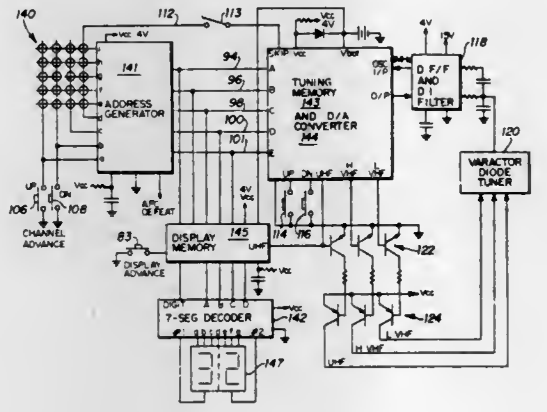
1. A broadcast receiver tuning system comprising:

a memory for storing digital tuning words,

means responsive to said digital tuning words for tuning said receiver to a desired position,

programming switches operable to change the stored digital tuning words in said memory, and

speed control means operable in response to said switches for providing fine tuning of said receiver by slow progressive change of said words in said memory for a preset time interval and thereafter providing course tuning of said receiver by faster progressive change of said words in said memory.



3,968,441
RECEIVER TUNING CIRCUIT WITH AUTOMATIC SEARCH AND AFC USING COMMON CAPACITOR

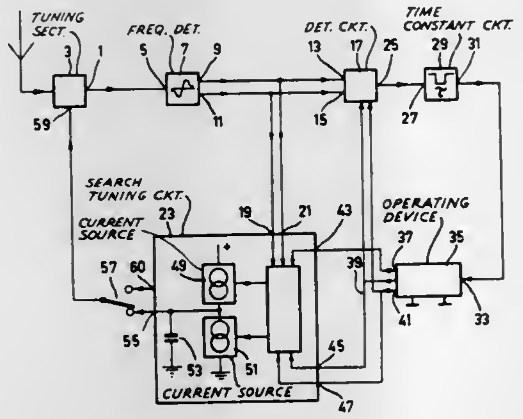
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,803

Claims priority, application Netherlands, Oct. 4, 1973, 7313625

Int. Cl.^{2} H04B *1/32*

U.S. Cl. 325—420 **3 Claims**



1. A receiver tuning circuit for a tuner comprising means for detecting the presence of a received signal having an input means for coupling to said tuner; a search tuning circuit having a capacitor means for a tuning voltage for said tuner, and an automatic frequency control circuit coupled to said capacitor, said tuning circuit and said automatic frequency control circuit charging said capacitor when activated; an operating device means coupled to said detecting means and said search tuning circuit for activation of said search tuning circuit and for subsequent deactivation of said search tuning circuit and activation of said automatic frequency control circuit upon detection of a received signal; and time constant circuit means coupled between said detecting means and said operating device means for repeatedly activating said search tuning circuit and deactivating said automatic frequency control circuit a selected time after said search tuning circuit has been deactivated.

3,968,442
RECEIVER TUNING CIRCUIT

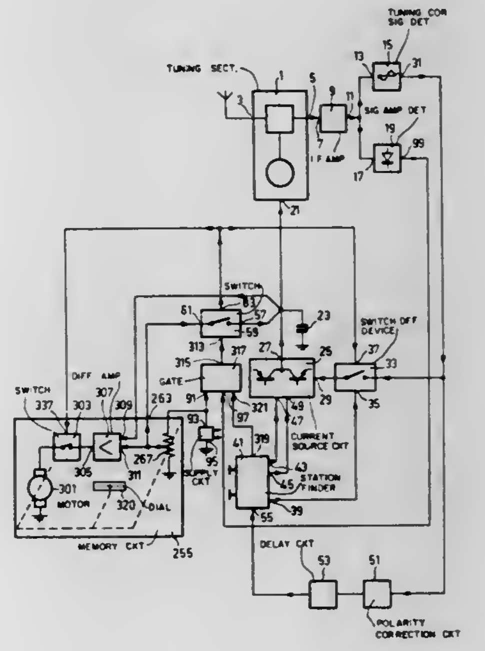
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,644

Claims priority, application Netherlands, Feb. 27, 1974, 7402624

Int. Cl.^{2} H04B *1/34*

U.S. Cl. 325—422 **4 Claims**



1. A receiver tuning circuit for a receiver having a tuning section and means for providing a tuning correction signal and a signal representative of a received signal amplitude; said circuit comprising a capacitor means for applying a tuning signal to said tuning section; a current source for supplying said tuning signal to said capacitor and further controlled by said tuning correction signal; a potentiometer having a pair of end means for receiving a voltage thereacross and a tap; a differential amplifier having a first input coupled to said capacitor, a second input coupled to said tap, and an output; a motor means coupled to said amplifier output and to said tap for adjusting the position of said tap on said potentiometer; and a switch means coupled between said tap and said capacitor for temporarily applying a tuning voltage to said capacitor to immediately tune to a desired frequency when said received signal amplitude falls below a selected level, said switch means having a control signal input means for receiving said amplitude representative signal.

3,968,443
SOLID STATE TELEVISION CHANNEL SELECTION SYSTEM

Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 25, 1974, Ser. No. 508,968

Int. Cl.^{2} H04N *5/50*

U.S. Cl. 325—455 **8 Claims**

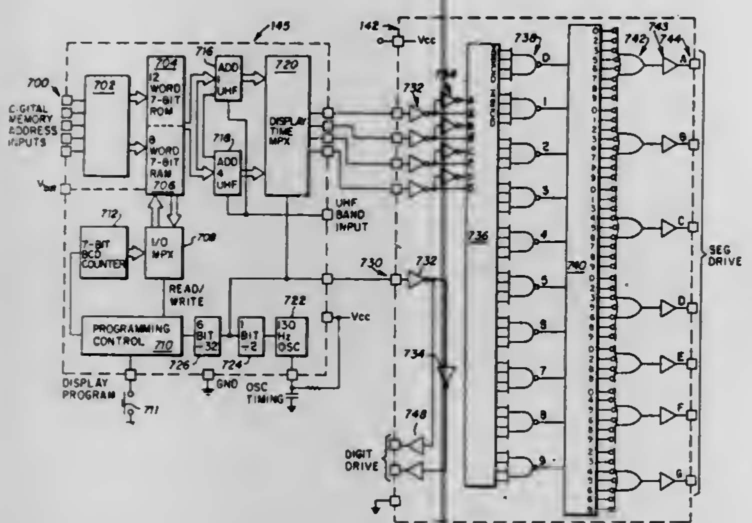
1. A television channel-number display circuit having reduced bit storage requirements comprising:

means for generating address signals representative of a selected television channel,

storage means containing a plurality of digital UHF channel-number display words and responsive to said address signals for outputting selected ones of said UHF channel-number words,

means for adding a predetermined digital quantity to said UHF channel-number display words output from said

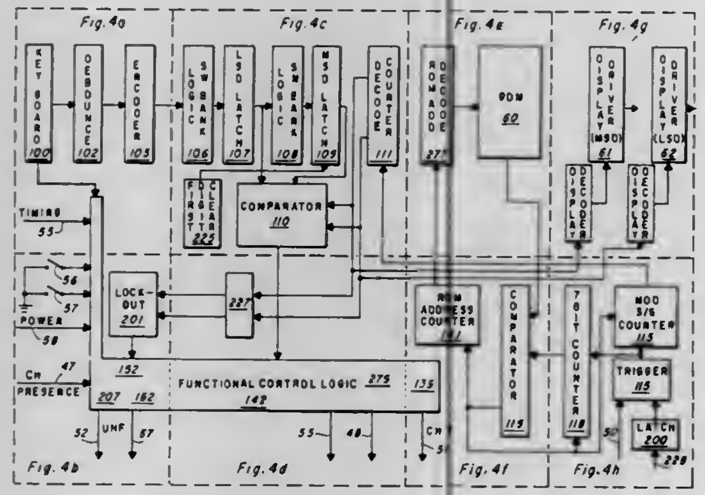
storage means, and
a display responsive to said UHF channel-number display



words and said predetermined quantity for displaying the number of the selected UHF channel.

3,968,444
SKIP BAND TUNER

Ralph F. Tenny, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 11, 1974, Ser. No. 522,675
Int. Cl.^{2} H04B *1/32*
U.S. Cl. 325—470 **18 Claims**

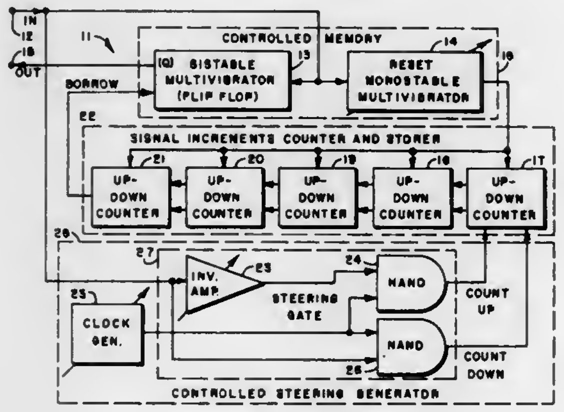


1. In a tuner for the selection of one of a plurality of broadcast channels of the same type and standard bandwidth located in a plurality of noncontiguous frequency bands within a frequency spectrum, the channels within each band being continuous, said tuner being adapted to tune continuously and repeatedly through said frequency spectrum containing all of said channels and to produce regularly spaced frequency markers while tuning through said spectrum, a control system comprising:

a. a keyboard to receive manual entry of the digits of the selected channel number and to produce electrical indicia thereof,
b. means to receive and store said channel number indicia,
c. means to initiate tuning traversals of said spectrum by said tuner,
d. means to receive and count said frequency markers generated during said traversals,
e. means to receive said frequency markers and produce a channel count indication each time the number of frequency markers receiver indicates tuner traversal of a channel bandwidth,
f. means to receive and compare said channel count indications and said stored channel number indicia and to arrest the traversal of said tuner when the comparison indicates the selected channel has been tuned by said tuner,
g. means storing indications of frequency bands within said spectrum not containing channels of said same type, and
h. means to receive and compare the stored indications and said frequency marker count and to interrupt the reception of said frequency markers by said last mentioned means to receive said frequency markers when this comparison indicates said tuner is traversing said frequency bands within said spectrum not containing channels of said same type.

3,968,445
DIGITAL PULSE WIDTH DOUBLER

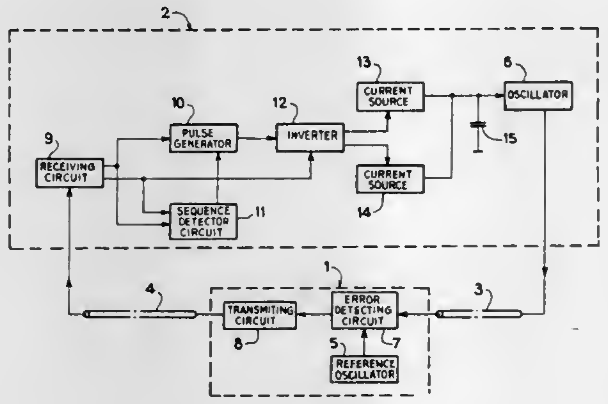
Walter R. Sherman, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 29, 1974, Ser. No. 466,430
Int. Cl.^{2} H03K *5/04, 1/18*
U.S. Cl. 328—58 **15 Claims**


CONTROLLED MEMORY
BISTABLE MULTIVIBRATOR (FLIP FLOP)
RESET MONOSTABLE MULTIVIBRATOR
BORROW
SIGNAL INCREMENTS COUNTER AND STORER
UP-DOWN COUNTER
CLOCK GEN.
INV. AMP
STEERING GATE
NAND
COUNT UP
COUNT DOWN
CONTROLLED STEERING GENERATOR

1. A pulse-width doubler, comprising in combination:
means, having a first input, a second input, and an output, for producing a first signal at the output thereof in response to a predetermined second signal being supplied to the first input thereof, and for producing a third signal that is different from said first signal at the output thereof in response to a predetermined fourth signal being supplied to the second input thereof;
means, having an up-count input, a down-count input, a zero reset input, and an output, with the output thereof connected to the aforesaid second input of said first and third signals producing means, for up-counting the pulses of a pulsed fifth signal being supplied to the up-count input thereof, for down-counting the pulses of said up-counted pulses in response to a pulsed sixth signal being supplied to the down-count input thereof, and for producing the aforesaid fourth signal at the output thereof immediately after the aforesaid down-counting of said up-counted pulses has been completed;
means, having an input and a pair of outputs, with the input thereof connected for response to the aforesaid predetermined second signal, and with the pair of outputs thereof respectively connected to the up-count and down-count inputs of the aforesaid up-counting and down-counting means, for respectively generating and supplying said pulsed fifth and sixth signals thereto in response to said second signal; and
means, having an input connected for response to said second signal and an output connected to the zero reset input of said up and down pulse counting means for supplying a zero reset signal thereto in immediate response to said second signal.

3,968,446
FREQUENCY AND PHASE CONTROL SYSTEM

Jean-Jacques Thiebaut, Paris, France, assignor to Thomson-CSF, Paris, France
Filed May 10, 1974, Ser. No. 468,996
Claims priority, application France, May 14, 1973, 73.17384
Int. Cl.^{2} 178 *69.5 DC;* H04B *1/02*
U.S. Cl. 328—134 **2 Claims**



1. A frequency and phase control system for synchronizing a basic signal from a first oscillator with a reference signal delivered by a reference oscillator located in a central station, said first oscillator being located in a station remote from said central station, said control system comprising:

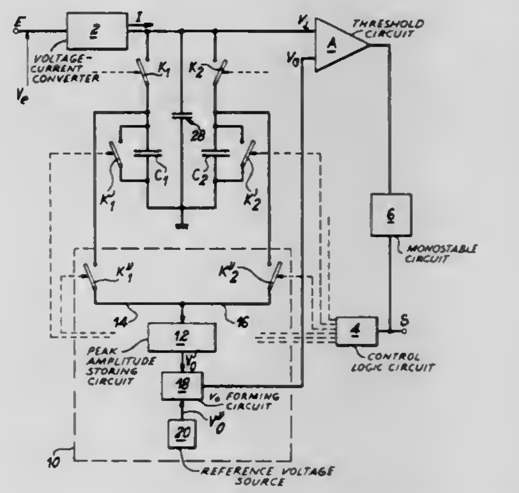
in said central station, means for receiving said basic signal, a phase and frequency error detecting circuit, fed by said received basic signal and said reference signal, for delivering a two valve digital phase difference signal representative of the sign of the phase difference between said reference signal and said basic signal, and a permanent two value frequency difference signal representative of the sign of the frequency difference of said reference signal and said basic signal, the values of said frequency difference signal successively reproducing selected values of said digital phase difference signal, and a transmitting circuit for periodically transmitting, with a period of recurrence T, the values of said frequency difference signal to said remote station;

in said remote station, a receiving circuit for receiving each transmitted value of the frequency difference signal, and a correcting circuit, coupled to said receiving circuit, said correcting circuit including first means for temporarily storing each received value of the frequency difference signal and second means for generating, for each received value of the frequency difference signal, a corresponding correction signal, the sign of which is determined by this received value, and the amplitude of which differs according to whether this received value differs or not from the preceding one.

3,968,447
METHOD OF AMPLITUDE-FREQUENCY CONVERSION AND A CONVERTER WHICH OPERATES IN ACCORDANCE WITH SAID METHOD

Bernard Baylac, Sassenage; Robert Poujois, Grenoble, and Jacques Ripert, Saint-Martin-d'Heres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 13, 1973, Ser. No. 424,202
Claims priority, application France, Dec. 29, 1972, 72.47081
Int. Cl.^{2} H03K *1/16, 3/72*
U.S. Cl. 328—151 **12 Claims**

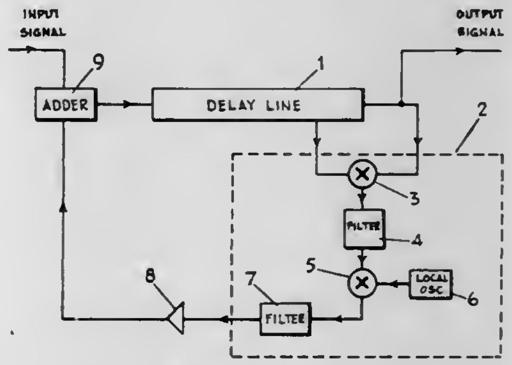
1. A method for converting the amplitude of an electrical signal into a frequency in which:
said amplitude is converted into a current of proportional intensity,
said current is integrated in an integrating circuit and an integration voltage is developed at the terminals of said circuit,
there is produced a signal for initiating the stopping of said current integration and a signal for initiating the start of a following integration at the instant when the integration voltage attains a threshold value V_0, actual stopping of



the integration being intended to take place only after a time-delay θ whilst the integration voltage exceeds the value V_0 and attains a maximum value V'_0,
wherein:
the threshold voltage V_0 is adjusted so as to ensure that said maximum value V'_0 is controlled in dependence on a reference voltage V''_0 which is higher than V_0.

3,968,448
ELECTRICAL FILTERS

Luis Charles Stenning, Beaconsfield, England, assignor to The General Electric Company Limited
Filed Oct. 10, 1974, Ser. No. 513,778
Claims priority, application United Kingdom, Oct. 17, 1973, 48445/73
Int. Cl.^{2} H03B *1/00, 1/04;* H03K *5/00;* H04B *1/10*
U.S. Cl. 328—167 **4 Claims**



1. An electric filter comprising:
A. an analogue delay line;
B. means for applying to the input of the delay line an input signal containing a pseudo-random sequence signal;
C. feedback means for producing a feedback signal in response to the signals appearing at two or more points along the length of the delay line; and
D. combining means for combining said feedback signal with said input signal;
E. the positions of said points along the length of the delay line being so phase related to said pseudo-random sequence signal and
F. said feedback means being so constructed in dependence on said pseudo-random sequence that, at the input of the delay line, said pseudo-random signal in said input signal is reinforced by said feedback signal while all the other signals are not.

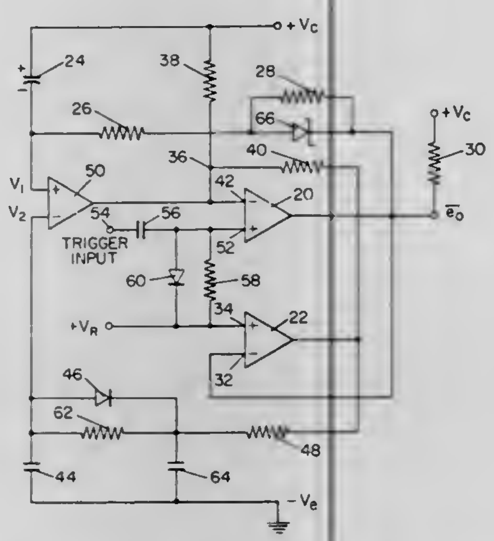
3,968,449
RATE COMPENSATING MONOSTABLE MULTIVIBRATOR

Curtis R. Dunnam, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 16, 1974, Ser. No. 533,033

Int. Cl.^{2} H03K *3/10*

U.S. Cl. 328—207 **11 Claims**



1. A self-compensating, time variable monostable multivibrator circuit comprising:

bistable switching means having an even number of inputs for receiving input trigger pulses on one of said inputs and two outputs, one of which outputs is coupled to a load;

a pair of time constant networks having unequal time constants to which the other of said outputs of the bistable switching means is coupled for generating a pair of control voltage signals;

comparator means for comparing said pair of control voltage signals and for generating a comparison voltage; and

means for coupling said comparison voltage to another of said inputs of said bistable switching means for providing self-compensation of said multivibrator.

3,968,450
TRANSISTOR AMPLIFIER

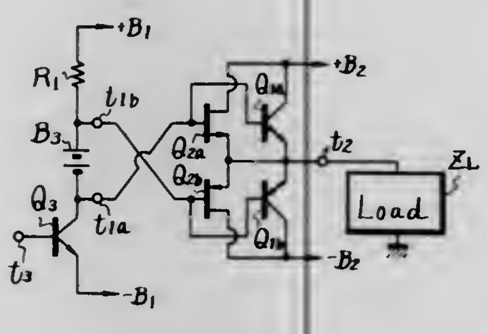
Tadao Suzuki, Tokyo, and Kazuhiko Kamimura, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1975, Ser. No. 560,512

Claims priority, application Japan, Mar. 29, 1974, 49-35282; Apr. 25, 1974, 49-46939

Int. Cl.^{2} H03F *3/16, 3/26*

U.S. Cl. 330—15 **24 Claims**



1. A transistor amplifier, comprising:

a field effect transistor having triode-type dynamic characteristics in combination with a bipolar transistor, said field effect transistor including drain, gate and source electrodes, and having a current flowing therein that is a function of an input signal, said bipolar transistor including collector, base and emitter electrodes and having at least one of said collector and emitter electrodes connected directly to at least one of said drain and source electrodes, said bipolar transistor being substantially nonconductive until said field effect transistor current reaches a threshold level and then having a current flowing therein that is a function of said input signal once said field effect transistor current reaches said threshold level;

means connected to said combination for supplying at least a portion of the summation of said field effect and bipolar transistor currents to a load; and

means for supplying said input signal to said combination.

3,968,451
TRANSISTOR AMPLIFIER

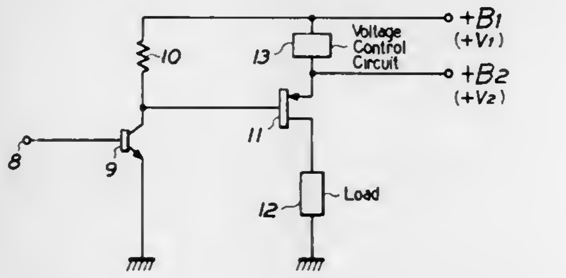
Kazuhiko Kamimura, Yokohama, and Tadao Yoshida, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,194

Claims priority, application Japan, May 21, 1974, 49-57006

Int. Cl.^{2} H03F *3/16*

U.S. Cl. 330—22 **21 Claims**



1. A transistor amplifier comprising:

a transistor having an input electrode for receiving an input signal and first and second output electrodes;

a field effect transistor having triode-type dynamic characteristics, the gate electrode of said field effect transistor being coupled to one output electrode of said transistor for receiving a voltage and the source and drain electrodes of said field effect transistor being connected to a load impedance;

power supply means including first means for supplying a first operating voltage to said one output electrode of said transistor and second means for supplying a second operating voltage to said field effect transistor; and

voltage control means coupled to said first and second means and responsive to fluctuations in said second operating voltage for causing said first operating voltage to change such that said voltage received by said gate electrode is correspondingly modified to thereby stabilize a bias current flowing through said field effect transistor, notwithstanding said second operating voltage fluctuations.

3,968,452
SIGNAL LEVEL CONTROL CIRCUIT

Hiroshi Sahara, Tokyo, and Yutaka Tanaka, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,394

Claims priority, application Japan, Nov. 13, 1973, 48-127460; Dec. 14, 1973, 48-140525; Dec. 15, 1973, 48-140842

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—29 **8 Claims**

7. A signal level control circuit comprising:

A. an input signal source;

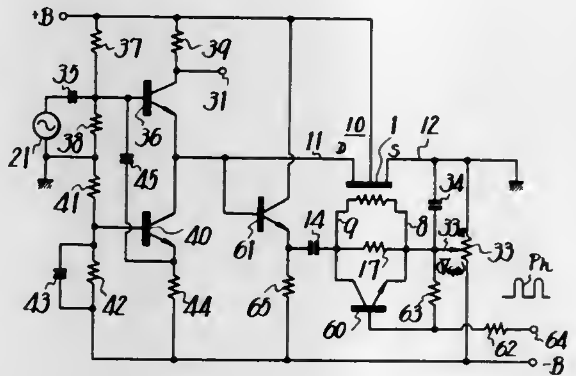
B. a resistive layer insulator semiconductor field effect transitor comprising:
  1. a semiconductor substrate of one impurity type,
  2. two spaced regions of opposite conductivity type in respect to said substrate in one face thereof providing source and drain regions respectively,
  3. a layer of insulating material overlying said one face,

  4. a layer of resistive material overlying said insulating layer,
  5. source and drain electrodes making ohmic contact with said source and drain regions respectively, and
  6. first and second gate electrodes making ohmic contact with the portions of said resistive layer which overlies said source and drain regions respectively;

C. circuit means for making the A.C. potential at the first gate electrode of said field effect transistor substantially same as the A.C. potential at the source electrode thereof;

D. circuit means including a condenser for connecting the second gate electrode of said field effect transistor to the drain electrode thereof;

E. circuit means for connecting the drain and source path of said field effect transistor in series with said input signal source;



F. signal output means connected to said circuit means for connecting the drain-source path of said field effect transistor in series with said input signal source;

G. control means for applying a control voltage to the first and second gate electrodes of said field effect transistor to control the equivalent impedance between the drain and source electrodes and thereby to control the signal level obtained from said signal output means; and

H. constant current source means connected between said control means and said circuit means including a condenser for connecting the second gate of said field effect transistor to the drain electrode thereof for varying the voltage at the drain side of said condenser in the same direction as the voltage at said second gate side of said condenser when said control voltage varies.

3,968,453
GAIN CONTROL CIRCUIT

Masayuki Hongu, Komae, and Tsutomu Niimura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1974, Ser. No. 528,935

Claims priority, application Japan, Dec. 1, 1973, 48-135093; May 9, 1974, 49-51565

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—29 **4 Claims**

1. A gain control circuit comprising:

a differential amplifier including first and second differentially connected transistors, a base input circuit connected to the base of at least said first transistor and an output circuit;

an input transistor;

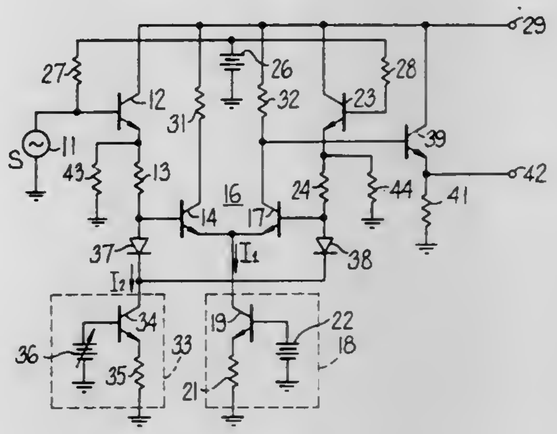
an impedance connecting the emitter of said input transistor to the base input circuit of the differential amplifier;

an input signal voltage source connected to the base of said input transistor;

a constant current source connected in series with the collector-emitter paths of said first and second differentially connected transistors between a power supply source and ground;

a controllable current source;

variable impedance means connecting said controllable current source to said base input circuit of said differential amplifier, the impedance value of said variable impedance means being controlled as a function of the current of said controllable current source so that the gain of said differential amplifier is determined by the ratio of the current of said constant current source to said current of the controllable current source; and



current conducting circuit means connected to said emitter of said input transistor to carry part of the emitter current of said input transistor and thereby maintain a substantially low output impedance of said input transistor, as measured at said emitter thereof, even when said current of the controllable current source is reduced to a substantially small value for maximum gain of said differential amplifier.

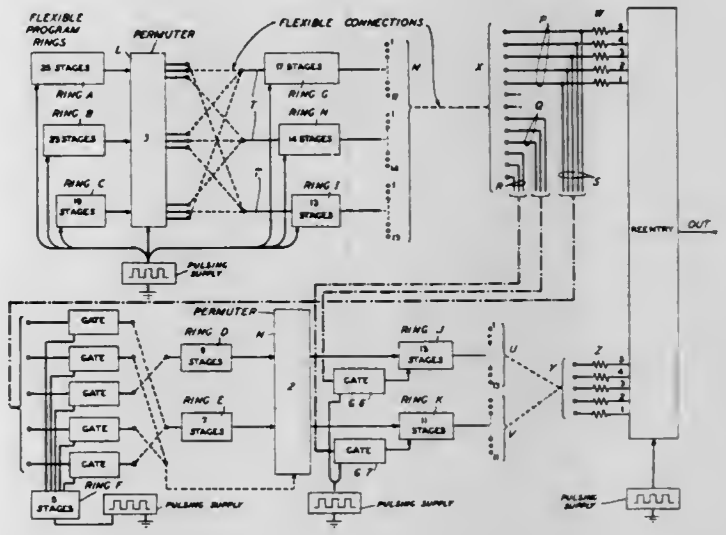
3,968,454
SIGNALING CIRCUIT

Aloysius J. Busch, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1944, Ser. No. 555,914

Int. Cl.^{2} H04L *9/04*

U.S. Cl. 331—78 **19 Claims**



1. In a pulse-producing system, a plurality of space discharge tube ring circuits each comprising a different number of stages, the numbers of stages in the rings having no common factor greater than one, means to cause said rings to step in unison, means to derive output voltage pulses from certain stages of individual rings and spaces from the other stages, and means to combine the outputs of all of said rings in a common utilization circuit.

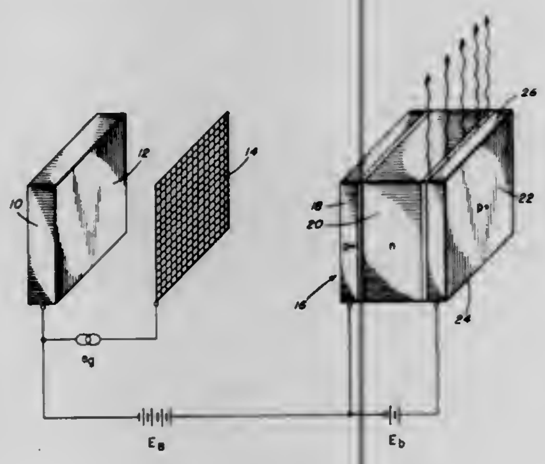
3,968,455
INJECTION LASER WITH INTEGRAL MODULATOR

Max N. Yoder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 3[illegible]5,978, Feb. 26, 1973, abandoned. This application Mar. 5, 1974, Ser. No. 448,303

Int. Cl.^{2} H01S *3/00*

U.S. Cl. 331—94.5 H **9 Claims**



1. A semiconductor laser comprising:

a first p-type semiconductor layer,

a second n-type semiconductor layer adjacent said first layer,

a third p-type semiconductor layer adjacent said second layer on the opposite side of said second layer from said first layer,

means to apply an electric field across said three layers so that the junction between said first and second layers is reverse-biased and the junction between said second and third layers is forward-biased, and

means for directing an electron beam onto said first layer to cause current to flow through said junctions causing laser light to be emitted from the region of said forward-biased junction.

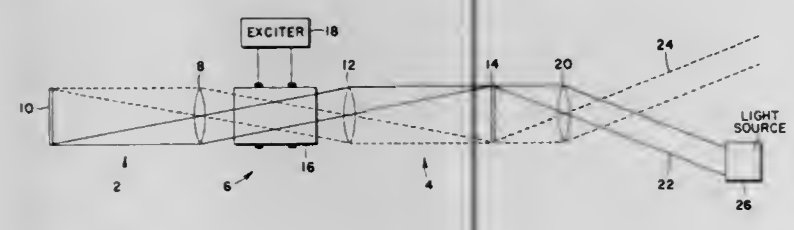
3,968,456
REGENERATIVE LASER DEVICE

Albert B. Welch, Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Nov. 24, 1967, Ser. No. 686,383

Int. Cl.^{2} H01S *3/05, 3/09*

U.S. Cl. 331—94.5 C **8 Claims**



1. A laser device comprising:

a body of material capable of energy state population inversion;

a first retrodirective member positioned adjacent one end of said body and formed of a converging lens and a highly transmissive mirror which reflects less than half of the radiation incident thereon;

a second highly reflective retrodirective member positioned adjacent the opposite end of said body and cooperating with said first retrodirective member to define a resonant cavity having a plurality of transverse modes;

a collimating lens located outside of said resonant cavity and positioned with the focal plane of said collimating lens extending coincident with said highly transmissive mirror to cause light occurring in the field of view defined by said collimating lens to be focused on said highly transmissive mirror;

excitation means for exciting said body of material to an energy level such that the loop gain of said device is substantially equal to unity; and

energy source means located outside of said resonant cavity for supplying additional energy through said collimating lens and said transmissive mirror to increase radiation in at least one of the transverse modes in said resonant cavity.

3,968,457
MICROWAVE NON-RECIPROCAL JUNCTION DEVICE

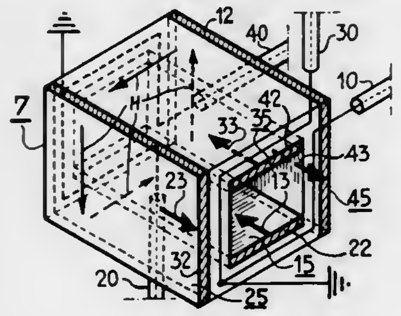
Bernard Desormiere, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 11, 1975, Ser. No. 549,051

Claims priority, application France, Feb. 12, 1974, 74.04657

Int. Cl.^{2} H01P *1/34, 1/38*

U.S. Cl. 333—1.1 **6 Claims**



1. A microwave multiple channel non-reciprocal junction device having first, second . . . m^{th} junctions and first, second, . . . n^{th} channels, m and n, being integers greater than 1 and $n \leq m \leq n+1$, for the propagation of spin surface waves from the p^{th} channel $(1 < p < n-1)$ to the $(p+1)^{th}$ channel through the p^{th} junction, said junctions having linear parallel propagation axes, said junction device comprising:

a ferrimagnetic material having a substantially constant thickness, said material having major opposite faces and two end parallel lateral faces orthogonal to said major faces, said propagation axes being orthogonal to said end faces;

inductor means for applying, within said ferrimagnetic material, a DC magnetic field within said major faces, parallel to said end faces;

m parallel successive metal strips alternately located on parts of said major opposite faces along a direction parallel to said propagation axes, said parallel metal strips defining in said ferrimagnetic material adjacent underlying portions, two of said underlying portions consecutive one another having their corresponding metal strips respectively located on one and the other of said major faces, one of said metal strips and the corresponding underlying portion forming one of said junctions;

electrical means for coupling said p^{th} channel and said $(p+1)^{th}$ channel to said p^{th} junction, located on said end faces, said electrical means being adapted for emitting and receiving said spin surface waves.

3,968,458
MICROWAVE POWER REFLECTOR USING EDGE-GUIDED MODE

Joseph W. McGowan, Monmouth, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

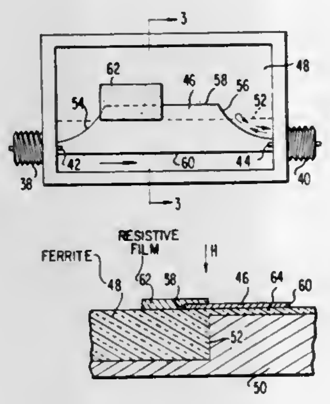
Filed Sept. 26, 1975, Ser. No. 617,209

Int. Cl.^{2} H01P *1/36*

U.S. Cl. 333—24.2 **12 Claims**

1. A microwave transmission device having a planar stripline conductor coupled between a pair of signal ports, being

formed on a ferromagnetic substrate contiguous with a ground plane and having a biasing magnetic field of a predetermined magnitude applied thereto transverse to said ground plane to effect energy travel along at least one edge of said stripline conductor between said signal ports, the improvement comprising:



a discontinuity in the thickness of the substrate in the region of said one edge whereby an impedance mismatch is produced causing energy traveling along said one edge to be reflected back in the direction from whence it came.

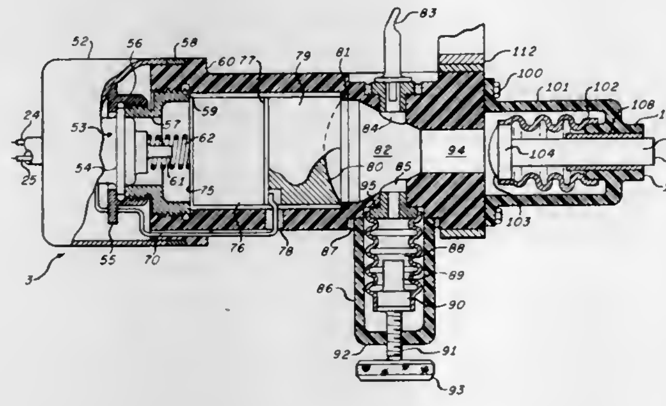
3,968,459
ULTRASONIC DRIVER TRANSDUCER

Peter E. Jacobson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 544,979

Int. Cl.^{2} H03H *9/04, 9/10, 9/14;* **H01L** *41/10*

U.S. Cl. 333—30 R **13 Claims**



1. An electromechanical transducer comprising:

piezoelectric driver means having a radiating surface for radiating ultrasonic waves,

acoustic lens means for receiving said radiated ultrasonic waves through a first surface,

said acoustic lens means having a second surface of concave shape for converging ultrasonic waves passing through said acoustic lens,

hollow container means for enclosing said piezoelectric driver means and said acoustic lens means,

said hollow container means defining an interior cavity extending from said concave second surface along the axis thereof, and

ultrasonic wave coupler means extending along said axis through said hollow container means and having a wave input face opposite said concave face within said interior cavity and a wave output face external of said hollow container means,

said interior cavity being filled with liquid for propagating said converging ultrasonic waves from said acoustic lens into said wave input face of said ultrasonic wave coupler means substantially without reflection.

3,968,460
ACOUSTIC SURFACE-WAVE DEVICES

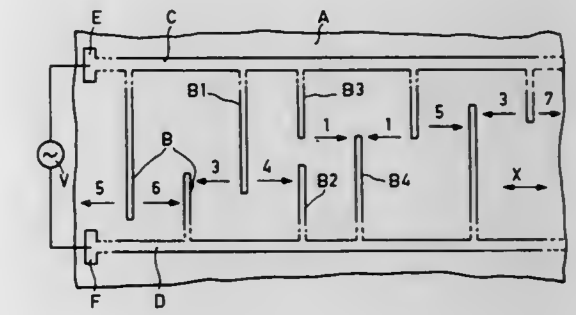
Kenneth William Moulding, Horley, and David William Parker, Reigate, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,559

Claims priority, application United Kingdom, Aug. 3, 1973, 36940/73

Int. Cl.^{2} H03H *9/02, 9/26, 9/32*

U.S. Cl. 333—72 **7 Claims**



1. An acoustic surface-wave device comprising a body of piezoelectric material on one surface of which is formed a launching or receiving transducer including an interdigital array of electrodes which includes at least one set of four spaced electrodes, in which set the first and second electrodes are spaced apart along the line of acoustic surface-wave propagation through the transducer and overlap transverse to said propagation line, the third electrode is aligned with the second electrode and is electrically connected in common with the first electrode, and the fourth electrode is spaced apart from the second and third electrodes in said line of propagation, overlaps the third electrode transverse to said propagation line and is electrically connected in common with the second electrode, and means for applying an electric potential to said array of electrodes such that in operation the electrical field between the overlapping third and fourth electrodes has the same direction as the electrical field between the overlapping first and second electrodes.

3,968,461
ACOUSTIC SURFACE-WAVE DEVICES

Richard Frank Mitchell, Kingston; David William Parker, Reigate, and Bernard David Rapson, Newdigate, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,506

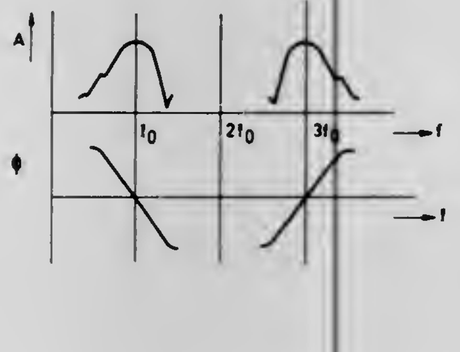
Claims priority, application United Kingdom, Aug. 31, 1973, 41024/73

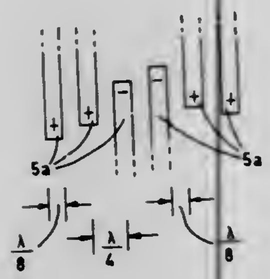
Int. Cl.^{2} H03H *9/20, 9/32*

U.S. Cl. 333—72 **4 Claims**

1. An acoustic surface wave device comprising a body of piezoelectric material, a transducer disposed on a surface of said body and including an interdigital array of parallel electrodes, said electrodes having a dimension according to the Fourier transform of a function which corresponds to a predetermined frequency response of the array, said predetermined response including a non-symmetrical passband amplitude-frequency response about a frequency f_o, a non-symmetrical passband amplitude-frequency response about a frequency $f_o + 2x$ which is the mirror image of the amplitude-frequency response about the frequency f_o, wherein x is a selected constant and f_o is a selected frequency, and a stopband extending between the two passbands about f_o and $f_o + 2x$, each electrode of the array being spaced from its adjacent electrodes at half a wavelength of acoustic surface waves corresponding to the frequency $f_o + x$, at least some pairs of immediately adja-

cent electrodes being electrically connected in common, and for at least some of the said pairs of immediately adjacent





electrodes which are electrically connected in common, the two electrodes of those pairs being of unequal length.

3,968,462

ELECTROMECHANICAL RESONANCE DEVICE AND ITS APPLICATION TO FILTERING OF TELEVISION SIGNALS

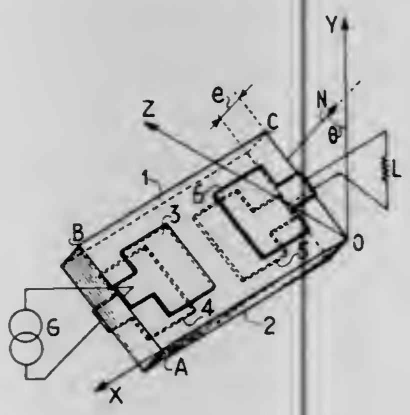
Gérard Coussot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 15, 1975, Ser. No. 596,100

Claims priority, application France, July 19, 1974, 74.25171

Int. Cl.^{2} H03H *9/26, 9/32;* **H01L** *41/18;* **H10L** *41/08*

U.S. Cl. 333—72 **5 Claims**



1. An electromechanical resonator device comprising: a piezo-electric plate cut from a lithium niobate crystal, and positioned on the two principal parallel faces of said piezo-electric plate, at least one pair of mutually opposite electrodes delimiting a resonator element; said piezo-electric plate constituting in relation to the direct system of rectangular crystallographic axes X, Y and Z of said lithium niobate crystal, a y + 37° cut; the normal to said principal parallel faces forming in relation to the Y axis of said system an angle; the positive value of said angle being substantially equal to 37°; the X axis of said system being substantially parallel to said principal parallel faces.

3,968,463

COAXIAL CABLE WITH IMPROVED PROPERTIES

Robert L. Boysen, Lebanon, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 386,749, Aug. 8, 1973, abandoned. This application July 24, 1974, Ser. No. 491,345

Int. Cl.^{2} H01P *3/06*

U.S. Cl. 333—96 **5 Claims**

1. A coaxial cable having improved mechanical and electrical properties comprising an inner conductor; an outer inert gas blown cellular ethylene or propylene polymer dielectric layer having in unexpanded form a density of about 0.86 to 0.96 grams per cubic centimeter, a melt index of about 0.05 to 10 decigrams per minute and an expanded density up to 0.6 grams per cubic centimeter, said dielectric layer having a dissipation factor value of ≤ 250 microradians at an electrical transmission frequency range of from 50 to 300 mega Hertz; and an outer coaxial conductor.

3,968,464

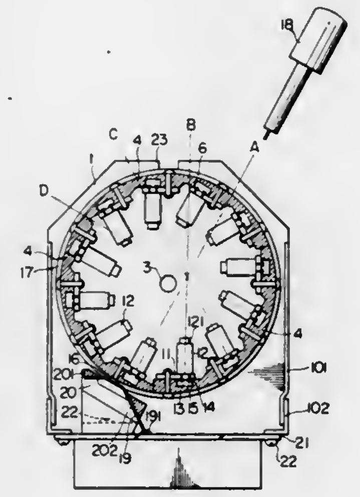
MULTIPLE TUNING SYSTEM

Yoshinori Okada, Kadoma; Terumi Toyoshima, Hirakata, and Eizo Mori, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1974, Ser. No. 511,526

Int. Cl.^{2} H03J *5/30, 1/06*

U.S. Cl. 334—50 **6 Claims**



1. A multiple band tuning system, comprising:

a pair of mutually-facing support plates mounted on a rotatable shaft;

a plurality of base members, each having an arcuately-shaped outer surface;

means releasably mounting said base members to said support plates, said base members forming a substantially cylindrical outer surface when mounted to said support plates;

a plurality of frequency tuning printed circuit bases mounted on the inner surface of each base member; said circuit bases each having a frequency tuning circuit mounted thereon for tuning a given frequency,

a plurality of electrical contact members connected to each said printed circuit base and extending to the outer arcuate surface of the base member on which said circuit base is mounted; and

contact means mounted on a frame for engaging corresponding contact members on said base members to connect a predetermined one of said frequency tuning circuits to a further circuit mounted on said frame;

whereby said frequency tuning circuits arranged on one of said base members are adjusted by removing another of said base members opposite said one of said base members.

3,968,465

INDUCTOR AND METHOD FOR PRODUCING SAME

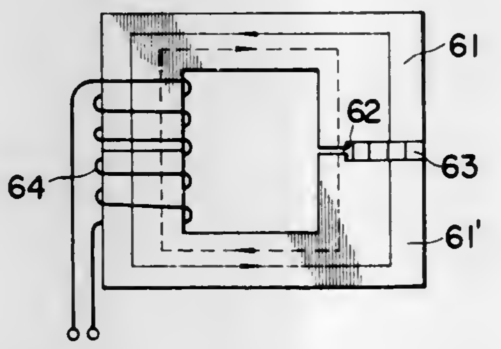
Masahiko Fukui, Kumagaya; Hiromi Sako, Fukaya, and Masao Ogata, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,157

Claims priority, application Japan, May 18, 1973, 48-54625; July 23, 1973, 48-80924; July 23, 1973, 48-80925; July 20, 1973, 48-80588; Jan. 30, 1974, 49-112060[U]; Feb. 22, 1974, 49-120819[U]

Int. Cl.^{2} H01F *21/00*

U.S. Cl. 336—110 **11 Claims**



1. An inductor device comprising:

a magnetic circuit made of soft magnetic material and end faces defining a gap in one position in said circuit;

a coil wound around a portion of said magnetic circuit; and

a plurality of permanent magnet pieces disposed in said gap between said end faces said permanent magnet pieces being substantially disposed in a common plane and spaced in said plane in each of two orthogonal directions, the poles of said permanent magnet pieces being aligned in like directions in said plane.

3,968,466

PRESSURE TRANSDUCER

Hiroshi Nakamura; Kouji Tsukada, and Susum Sugiyama, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Oct. 9, 1974, Ser. No. 513,301

Claims priority, application Japan, Oct. 9, 1973, 48-113601

Int. Cl.^{2} H01C *7/16*

U.S. Cl. 338—42 **20 Claims**

1. A pressure transducer comprising:

a semiconductor diaphragm having a predetermined conductivity and including a strain sensitive region adapted to be elastically deformed by means of pressure applied thereto and a fixing region;

strain sensitive elements insulatingly disposed upon said diaphragm and relative to the crystallographic directions of said diaphragm so as to exhibit high sensitivity and within the vicinity of the central and peripheral portions of said strain sensitive region;

lead portions, for transmitting electrical signals, insulatingly mounted upon said diaphrahm and extending from said strain sensitive region to one side of an end portion in said fixing region for electrically interconnecting said central and peripheral strain sensitive elements in order to form a bridge circuit which includes said central and outer strain sensitive elements and said lead portions;

electrodes respectively provided upon said lead portions within said one side of the end portion in said fixing region;

a supporting member including a supporting portion for supporting said semiconductor diaphragm by means of said fixing region of said diaphragm and a leading portion for conducting said electrical signals therethrough; and

lead wires, connected to said electrodes and to external processing apparatus, disposed within and through said leading portion of said supporting member.

whereby said electrical signals detected by means of said strain sensitive elements are conducted to said electrodes by said lead portions and further conducted outwardly of said transducer by said lead wires.

3,968,467

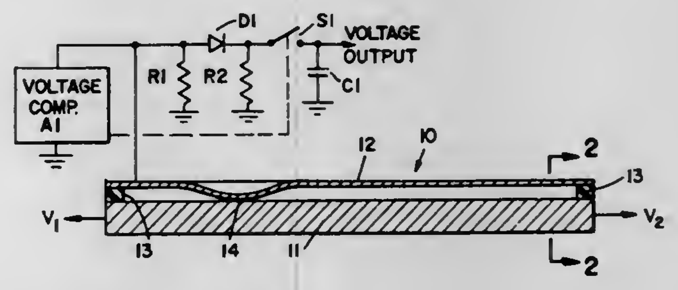
TOUCH CONTROLLED VOLTAGE-DIVIDER DEVICE

Stephen H. Lampen, San Francisco, and William E. Hearn, Berkeley, both of Calif., assignors to Stephen H. Lampen, San Francisco, Calif.

Division of Ser. No. 394,161, Sept. 4, 1973, Pat. No. 3,895,288. This application Nov. 1, 1974, Ser. No. 519,825

Int. Cl.^{2} H01C *10/30*

U.S. Cl. 338—119 **2 Claims**



1. In a voltage-divider device:

a. a resistive member having an elongated resistive surface;

b. a conductive member having an elongated conductive surface mounted in close spaced substantially coextensive relationship with said resistive surface;

c. means for selectively establishing galvanic contact between each of a plurality of points along the length of said resistive surface and the point corresponding thereto along the length of said conductive surface by a touch of the finger;

d. elongated voltage responsive visual indication means physically located along the length of said elongated resistive and conductive surfaces in close spaced substantially coextensive relationship therewith and adapted to produce a different visual indication in response to each of a plurality of different voltages corresponding to each of said plurality of points along the length of said resistive surface;

e. terminal means for making electrical connection to opposite ends of said elongated resistive surface; and

f. terminal means for making electrical connection from the conductive member to said elongated voltage responsive visual indication means.

3,968,468

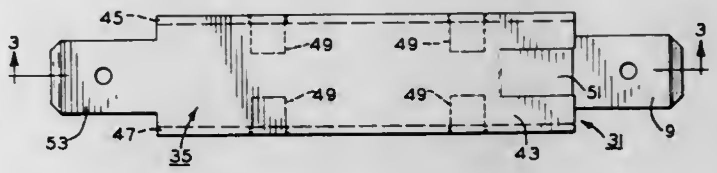
ELECTRICAL SWITCH AND METHOD OF CALIBRATING

Edward O. Andersen, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 10, 1974, Ser. No. 477,828

Int. Cl.^{2} H01H *61/02, 63/013, 65/00*

U.S. Cl. 337—107 **27 Claims**

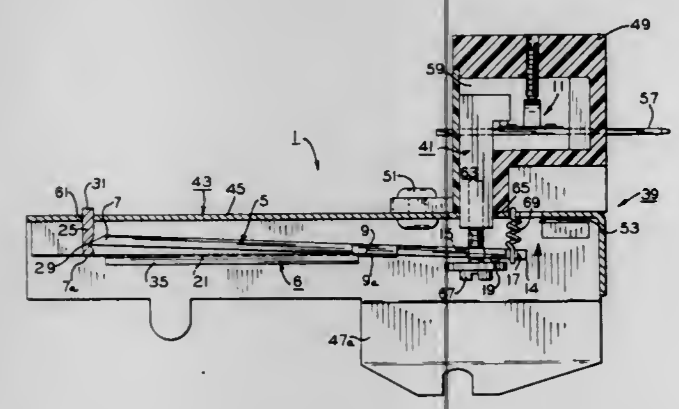


1. An electrical switch comprising supporting means, movable means on said supporting means and operable generally in response to heat supplied thereto between a pair of circuit controlling positions, said movable means being adapted to deflect upon subjection to a selected calibrating temperature toward a generally free predetermined configuration on said supporting means in one of the circuit controlling positions,

means subjected to the selected calibrating temperature for fixedly assembling a portion of said movable means to said supporting means when said movable means is deflected toward its generally free predetermined configuration, and means disposed on said supporting means for heating said movable means to effect its operation between the circuit controlling positions upon energization of said electrical switch.

3,968,469
DETECTOR FOR RADIANT HEAT

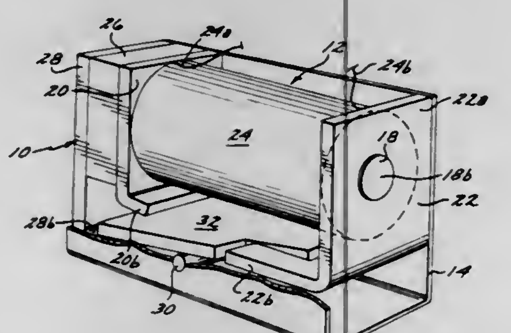
Stanley J. Budlane, Fulton, Ill., assignor to General Electric Company, Fort Wayne, Ind.
Filed Apr. 23, 1974, Ser. No. 463,299
Int. Cl.² H01H *71/18*
U.S. Cl. 337—139 **21 Claims**



1. A detector for radiant heat comprising a housing, means movable in said housing between positions for controlling an electrical circuit therethrough, means disposed in the housing for actuating said controlling means including a pair of generally metallic strips disposed at least part in overlaying relation and having adjacent portions thereof respectively interconnected, said housing including means for subjecting one of said strips directly to the radiant heat with said one strip generally shielding at least in part the other of said strips from direct subjection to the radiant heat, means in said housing and spaced from said interconnected adjacent portions of said strips for separating them, said one strip being elongatable in response to the direct subjection of radiant heat thereto with respect to said shielded other strip for effecting conjoint pivotal movement of said strips generally about said separating means, and means between said actuating means and said controlling means for effecting movement of said controlling means to at least one of its circuit controlling positions upon the conjoint pivotal movement of said strips.

3,968,470
MAGNETIC MOTOR

Jack M. Brown, Costa Mesa, Calif., assignor to Esterline Electronics Corporation, Costa Mesa, Calif.
Filed Mar. 13, 1975, Ser. No. 557,959
Int. Cl.² H01F *7/08*
U.S. Cl. 335—230 **6 Claims**

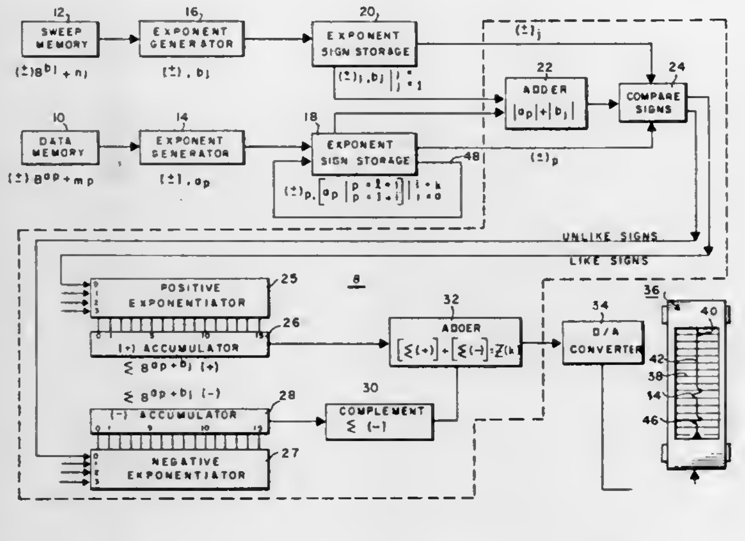


1. A magnetic motor comprising in combination,

an elongated core member having opposite end portions,
a winding on said core member to be electrically energized to afford electromagnetic flux in said core member,
a first pole piece fixed to one end portion of said core member,
a second pole piece fixed to the other end portion of said core member,
a permanent magnet adjacent said second pole piece,
a third pole piece adjacent said permanent magnet opposite said second pole piece thereat,
and an armature and pivotal support means therefor for pivotal movement of said armature about an axis intermediate first and second end portions thereof, said first armature end portion being substantially coplanar with at least a portion of said first pole piece for magnetic cooperation therewith and said second armature end portion being movable between magnetic cooperation with said second and third pole pieces alternatively,
said first armature end portion and said first pole piece being spaced from each other throughout pivotal movement of said armature and being complementally shaped to provide an irregular air gap therebetween.

3,968,471
METHOD FOR SUPPRESSING SIDE LOBES IN CORRELATION PROCESSES

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.
Continuation-in-part of Ser. No. 218,284, Jan. 17, 1972, Pat. No. 3,863,058. This application Nov. 10, 1972, Ser. No. 305,623
Int. Cl.² G01V *1/28, 1/36*
U.S. Cl. 340—15.5 CC **21 Claims**



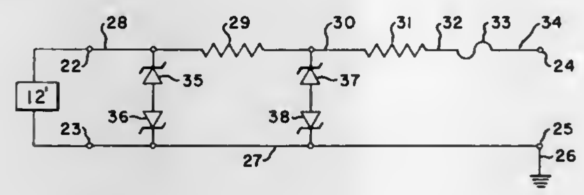
1. A method of geophysical exploration comprising:
introducing into the earth a first vibratory signal,
detecting its return signal from the earth,
cross-correlating the return signal with a representation of the first signal, and
randomly varying the level of the representation of the first signal prior to cross-correlation.

3,968,472
VIBRATION DETECTION AND ANALYSIS SYSTEM EMPLOYING AN INTRINSIC SAFETY BARRIER

James K. Taylor, Columbus, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio
Division of Ser. No. 145,420, May 20, 1971, abandoned. This application June 14, 1973, Ser. No. 369,993
Int. Cl.² G01S *3/80;* **H02H** *1/02*
U.S. Cl. 340—16 R **6 Claims**

1. A vibration analysis system adapted for use in remote vibration measurements in combustible hazardous zones comprising:
an electromechanical vibration transducer mounted within the said hazardous zone and adapted to generate alternating current signals in response to mechanical vibrations;

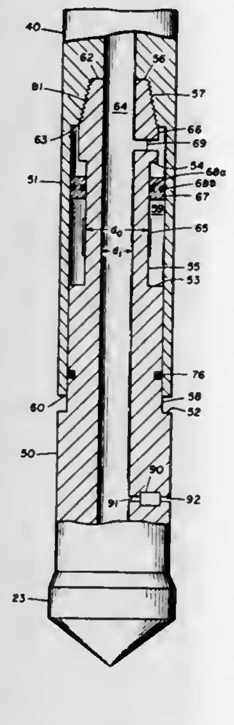
signal responsive means mounted in a non-hazardous zone which is remote from said hazardous zone and adapted to convert an alternating alert signal into visible or mechanical phenomena;
conductor means joining the said transducer and the said signal responsive means, said conductor means passing from the said hazardous zone to the said non-hazardous zone;



an intrinsic safety barrier device comprising more than one semiconductor interposed in the said conductor means to permit substantially undistorted signal transmission from the said transducer means to the said signal responsive means and further adapted to prevent transmission of substantial electrical energy from the said signal responsive means into the said hazardous zone.

3,968,473
WEIGHT-ON-DRILL-BIT AND TORQUE-MEASURING APPARATUS

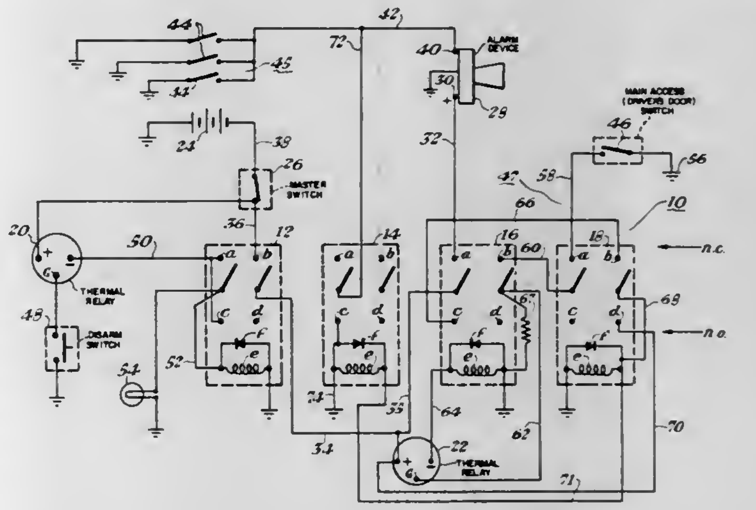
Bobbie J. Patton, Dallas, and Vasel R. Slover, Irving, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 448,123, March 4, 1974, abandoned. This application July 7, 1975, Ser. No. 593,354
Int. Cl.² G01V *1/40*
U.S. Cl. 340—18 LD **6 Claims**



1. A logging-while-drilling tool comprising:
a. a drill collar,
b. means for affixing a drill bit to the lower end of said drill collar,
c. means for converting axial motion transmitted to said drill collar by said drill bit during drilling operations within a borehole to a weight-on-drill-bit measurement,
d. means for detecting the pressure differential across said drill bit, and
e. means for compensating said weight-on-drill-bit strain measurement for the effect on said measurement caused by said pressure differential across the drill bit.

3,968,474
ALARM SYSTEM HAVING DELAY CHARACTERISTIC

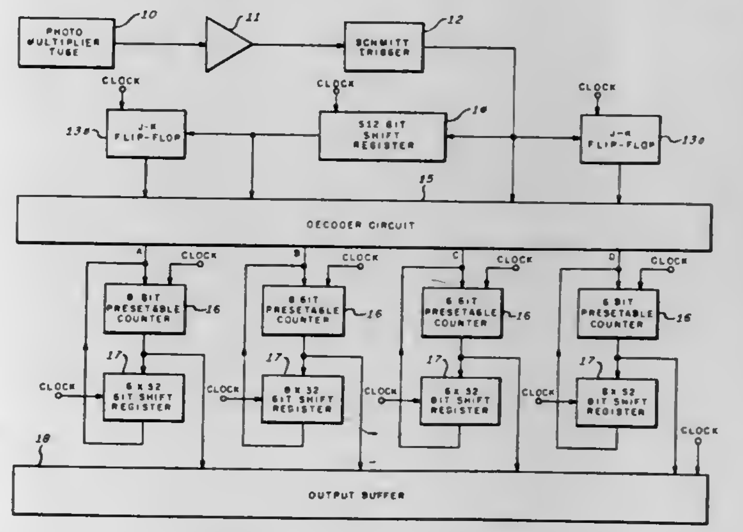
David W. Danahey, 128 E. Neshannock Ave., New Wilmington, Pa. 16142
Filed July 3, 1974, Ser. No. 485,329
Int. Cl.² B60R *25/10;* **G08B** *19/00*
U.S. Cl. 340—63 **14 Claims**



1. An alarm system for indicating unauthorized use or entry of a facility protected thereby, said facility having access means and a source of electric potential, said alarm system comprising an alarm device, first switching means including a circuit path coupled between said source and said alarm device, second switching means having a normally conductive first circuit path coupled between said source and said alarm device for supplying an energizing potential to said alarm device for arming said alarm system, a time delay circuit including delay actuating means, sensing means sensitive to opening of said access means, a normally conductive second circuit path through said second switching means and a normally conductive circuit path through third switching means connected in series between said delay actuating means and said sensing means, said time delay circuit when actuated energizing said second switching means to interrupt said second switching means first path for temporarily disarming said alarm device during an actuated interval of said time delay circuit for a predetermined delay period.

3,968,475
DIGITAL PROCESSOR FOR EXTRACTING DATA FROM A BINARY IMAGE

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 11, 1974, Ser. No. 522,666
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 E **7 Claims**

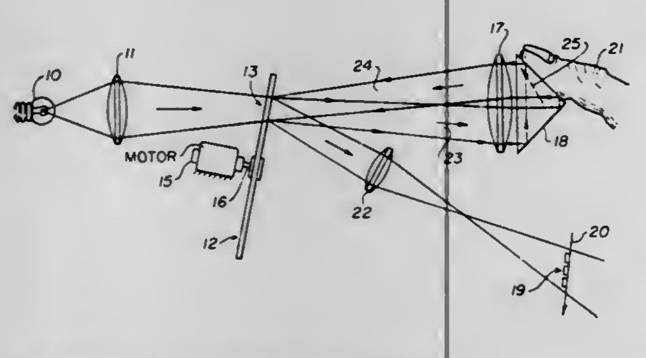


1. A digital processor for extracting data from an image contained within an array of binary data spaces comprising:

means for detecting data contained in each of said binary data spaces and for providing an output representative thereof;
means for storing binary data having an input responsive to said output of said detecting means and providing a plurality of outputs each of which is representative of the binary data in one of said binary data spaces, said outputs and said output of said detecting means collectively representative of a rectangular sample space consisting of data spaces in adjacent rows and columns of said array, said sample space having a configuration that is determined by the binary data of said data spaces comprising said sample space;
decoder means for receiving data from said detecting means and said storage means and providing therefrom data representative of said sample space configuration having a plurality of inputs, one responsive to said output of said detecting means and each of the remaining plurality of inputs responsive to one of said plurality of outputs of said storage means and a plurality of outputs each representative of a predetermined sample space configuration; and
plurality of counting means each having an input responsive to one of said plurality of outputs of said decoder means for providing a count of each of said predetermined sample space configuration contained within a predetermined multiplicity of sample spaces, said multiplicity of sample spaces forming a sample area consisting of a predetermined sub-array of data spaces.

3,968,476
SPURIOUS SIGNAL REMOVAL IN OPTICAL PROCESSOR FINGERPRINT IDENTIFICATION APPARATUS

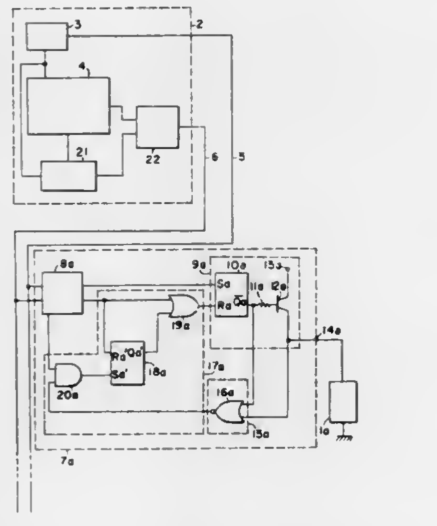
Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.
Filed July 17, 1974, Ser. No. 489,212
Int. Cl.² G06K *9/13*
U.S. Cl. 340—146.3 E **5 Claims**



1. In pattern recognition apparatus:
rotatable support means having a regular array of alternating parallel elongate spaced light transmitting and reflecting elements,
light source means for illuminating said regular array,
retroreflective means including focusing means for forming an image of said regular array in substantial but imperfect alignment with said regular array,
elongate light absorbing elements disposed between each of said alternate parallel elongate light transmitting and reflecting elements for substantially eliminating light misdirected because of said imperfect alignment,
said retroreflective means including surface means for supporting an input pattern to be recognized in the light received by said retroreflective means from said regular array of elongate elements,
said input pattern being characterized by light transmissive or reflective lines of varying orientation over the area of said input pattern and having the effect, when present at said input pattern supporting surface means and when said rotatable means is rotating, of variably diffracting light from said image of said regular array onto said regular array, and
signal processing means responsive to the position of said rotatable support means and to said variably diffracted light directed by said regular array for determining the angular orientation of said rotatable support means with respect to a reference position thereof at the instants of extremum values of light intensity of said variably diffracted light.

3,968,477
CONTROL APPARATUS FOR ELECTRICAL DEVICES

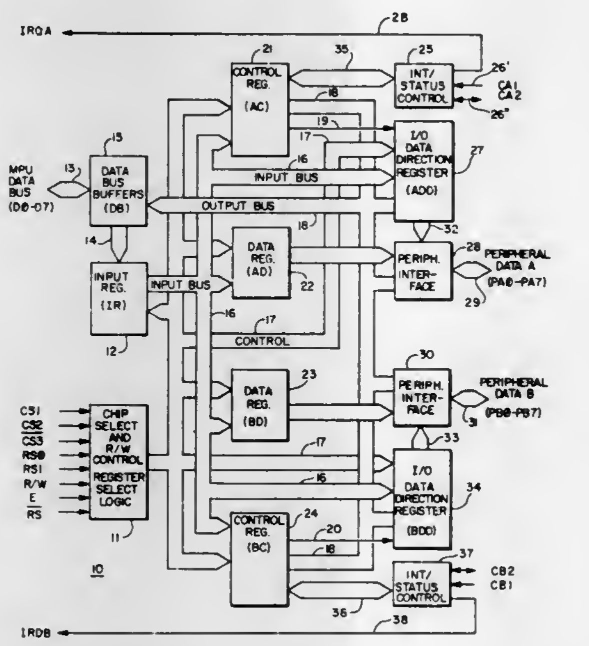
Shizuo Sumida; Kazuo Nii, both of Hiroshima; Osamu Shimizu, Himeji; Atsushi Ueda, Himeji, and Mitsuaki Ishii, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Toyo Kogyo Co., Ltd., both of, Japan
Filed July 29, 1974, Ser. No. 492,724
Claims priority, application Japan, July 27, 1973, 48-84740
Int. Cl.² H04Q *9/16*
U.S. Cl. 340—167 R **5 Claims**



1. A control apparatus for controlling a plurality of electrical devices comprising:
a plurality of electrical devices,
a central operation device for generating a plurality of control signals for controlling the electrical devices, the plurality of control signals comprising a first signal for driving a first electrical device and a second signal delayed in time from the first signal to permit discontinuance of the driving of the first electrical device if a high current is detected passing therethrough,
a terminal operation device for each electrical device,
a signal transmission line for transmitting the plurality of control signals from the central operation device to the terminal operation devices,
a first terminal operation device for driving the first electrical device comprising:
a signal division circuit for dividing from the plurality of control signals said first and second signals,
a driving circuit connected to the signal division circuit for driving the first electrical device in response to said first signal,
a state detecting circuit for detecting a high current in the first electrical device,
a state signal generating circuit connected to the state detecting circuit, the signal division circuit and the driving circuit for deactivating the driving circuit to discontinue the driving of the first electrical device only upon receipt of a signal from the state detecting circuit indicating high current in the first electrical device and receipt at the same time of said second signal,
said second signal being delayed in time from said first signal so that high transient starting current in the first electrical device has subsided by the time of said second signal so that driving of the first electrical device will be discontinued when high current is present therein with the exception of the presence of high transient starting current.

3,968,478
CHIP TOPOGRAPHY FOR MOS INTERFACE CIRCUIT

William D. Mensch, Jr., Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed Oct. 30, 1974, Ser. No. 519,148
Int. Cl.² G06F *13/00;* **H01L** *25/00*
U.S. Cl. 340—172.5 **8 Claims**

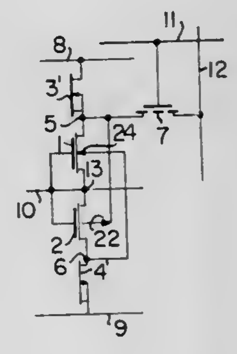


1. An MOS peripheral interface adaptor chip comprising:
peripheral interface circuitry on a surface of said MOS peripheral interface adaptor chip adapted to be coupled to external peripheral devices by means of an external bidirectional peripheral data bus for sending data to and receiving data from said external peripheral devices;
data bus interface circuitry on said surface adapted to be coupled to an external bidirectional data bus of a data processing system for receiving data from and sending data to said data processing system;
register circuitry means on said surface coupled to said data bus interface circuitry for receiving data from said data bus interface circuitry for controlling a direction of data on a conductor of said external bidirectional peripheral data bus independently of the direction of data on another conductor of said external bidirectional peripheral data bus; and
said data bus interface circuitry including data input-output circuits disposed along a first edge of said MOS peripheral interface adaptor chip, said peripheral interface circuitry including buffer circuits disposed along second and third edges of said MOS peripheral interface adaptor chip, and said third edge of said chip being opposite said first edge, said register circuitry being disposed substantially between said data bus interface circuitry and said peripheral interface circuitry.

3,968,479
COMPLEMENTARY STORAGE ELEMENT

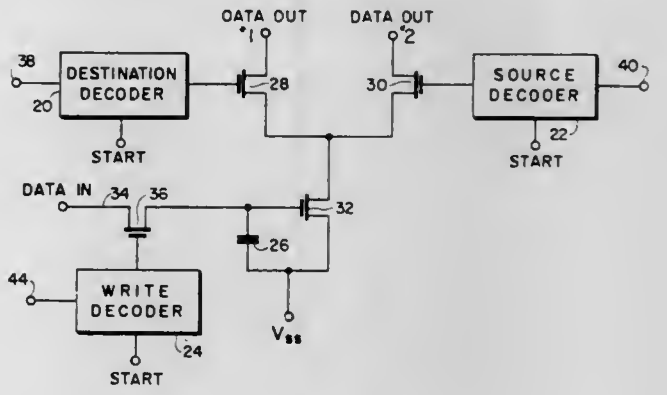
Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Nov. 29, 1974, Ser. No. 528,094
Claims priority, application Germany, Dec. 6, 1973, 2360887
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 FF **6 Claims**

1. A complementary storage element comprising first and second FET switching inverters and a FET selector element, said FET inverters being complementary to each other, first and second load elements, a pair of voltage supply lines, said FET inverters and said elements being serially connected with one end of said first load element connected to one of said voltage supply lines and with its other end connected to the drain terminal of said first FET inverter, with the source terminals of said FET inverters connected together, and with one end of said second load element connected to the other of said voltage supply lines and the other end connected to the drain terminal of said second FET inverter, there being a first junction point between said first load element and said first FET inverter and a second junction point between said second load element and said second FET inverter, a digit line, a word line, said FET selector element being connected to one of said junction points and to said digit line, the gate terminal of said FET selector being connected to said word line, the gate terminal of said second FET inverter being connected to said first junction point and the gate terminal of said first FET inverter being connected to said second junction point.



3,968,480
MEMORY CELL

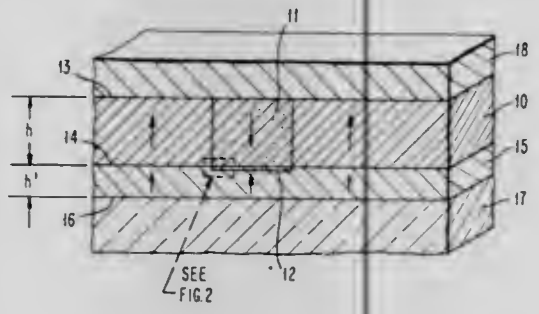
Jeffrey P. Stein, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of Ser. No. 463,895, April 25, 1974, abandoned. This application Mar. 20, 1975, Ser. No. 560,217
Int. Cl.² G11C *13/00, 11/40*
U.S. Cl. 340—173 FF **10 Claims**



1. A memory system comprising:
a data storage element,
a first output terminal,
a first readout means connecting said data storage element to said first output terminal,
a second output terminal,
a second readout means concurrently connecting said data storage element to said second output terminal,
a first decoder means arranged to respond to a memory read operation to energize said first read out means, and,
a second decoder arranged to respond to a memory read operation to concurrently energize said second readout means.

3,968,481
METHOD OF, AND APPARATUS FOR, ESTABLISHING SELF-BIASED SINGLE WALL DOMAINS

Philip J. Grundy, Sale, England, and Yeong S. Lin, Mount Kisco, N.Y., assignors to International Business Machines (IBM), Armonk, N.Y.
Filed July 25, 1974, Ser. No. 491,918
Int. Cl.^{2} G11C *11/15*
U.S. Cl. 340—174 TF **19 Claims**



6. A self-biased single wall domain supporting structure comprising,

a substrate,

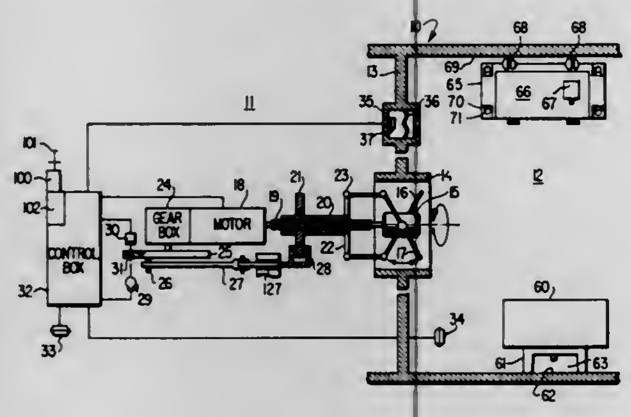
a storage layer of magnetic material with thickness *h* and material length *l*, capable of supporting stable single wall domains in a suitable external field,

and a bias layer of uniaxial magnetic material exchange coupled to said storage layer of thickness *h'* and material length *l'* where *h'* is sufficiently small to maintain a single domain state and $h'/l' < h/l$,

whereby said bias layer provides magnetic forces simulatiing said external field.

3,968,482
PRESSURE MODULATED ALARM SYSTEM

Mark Schuman, 101 G St. Southwest, Washington, D.C. 20024
Continuation-in-part of Ser. No. 360,049, May 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 213,994, Dec. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 141,171, May 7, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,511
Int. Cl.^{2} G08B *21/00*
U.S. Cl. 340—240 **54 Claims**



1. In an enclosure having at least one boundary region defining at least one bounded region, a monitoring system for detecting movement of, or substantial opening of, an object within said enclosure and forming at least a portion of said boundary region, such as furniture, appliances, closets or the like; comprising:

means for inducing a predetermined variation in pressure with respect to time within at least one bounded region of said enclosure;

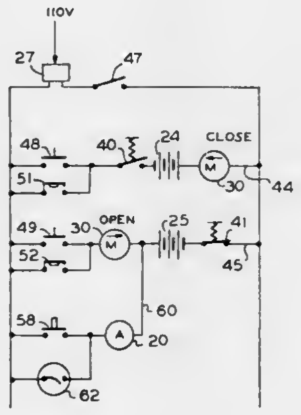
means including a portion of said boundary region defining a chamber which is normally substantially closed off from communication with said bounded region, said chamber being defined at least in part by said object; and

pressure sensing means operatively located in said chamber;

wherein the movement or opening of the object causes a substantial opening of said chamber such that communication of said chamber with the bounded region is substantially increased, the increased communication causing a substantial increase in penetration of the pressure variation into said chamber, whereby said pressure sensing means senses the increased penetration of the induced pressure variation into said chamber thereby detecting the movement or opening of said object.

3,968,483
BURGLAR AND FIRE ALARM SYSTEM

Leonard Jolley, 665 SE. Terra Circle, Corvallis, Oreg. 97330
Filed Jan. 8, 1975, Ser. No. 539,295
Int. Cl.^{2} G08B *13/08*
U.S. Cl. 340—274 R **9 Claims**



1. In a burglar alarm system adapted for use with an entrance door of a building, and with said door including a door-locking system including a door handle-operated latch movable between retracted and extended positions between said door and an adjacent wall of said building, and a door bolt slidable between a retracted position and an extended locking position between said door and said wall,

said alarm system including:

electrically operated alarm means connected in an electrical alarm circuit,

reversible electric motor means, connected in an electrical motor circuit means,

drive means interconnecting said motor means and said bolt for sliding said bolt between said extended and retracted bolt positions,

limit switch means for deactivating said motor means and limiting sliding movement of said bolt in opposite directions,

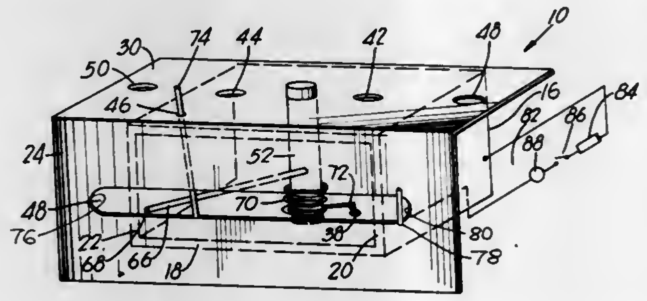
switch means accessible from inside said building including master switch means for energizing said system and motor switch means in said motor circuit means for operating said motor means in a selected direction to slide said bolt,

door latch-operated switch means in said alarm circuit operable with said latch retracted, said bolt extended, and said master switch means closed to energize said alarm means and operable with said latch extended to de-energize said alarm means,

and hidden switch means embedded at a secret location on or adjacent said building and operable by an actuator means directed toward said switch means from outside said building, said hidden switch means being in said motor circuit means in parallel with said motor switch means for operating said motor means and sliding said bolt between its extended and retracted positions.

3,968,484
SPRING-ACTUATED SECURITY ALARM FOR A DOOR

Frank X. Weber, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Mar. 19, 1975, Ser. No. 559,966
Int. Cl.^{2} G08B *13/08*
U.S. Cl. 340—274 R **5 Claims**

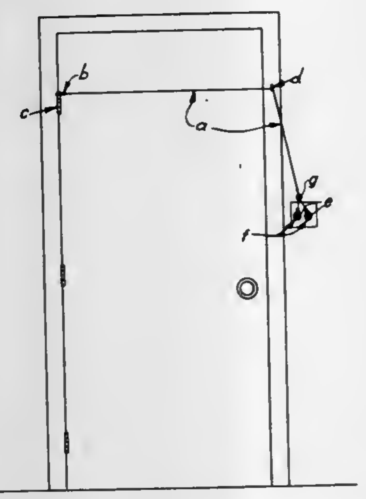


1. A security alarm device in combination with a door frame and door, which comprises:

a. a housing having a base, a pair of end walls, a top, and a front face with a longitudinally aligned slot aperture therethrough, said base having a central threaded hole therethrough as well as a small pinhole therethrough, and said top having a central circular-shaped therethrough and a small aperture therethrough;
b. a rod member of electrically conductive material having a threaded outer surface at one end, and a central transverse aperture therethrough, said threaded end of said rod member threadably engaging said threaded central hole, said other end of said rod member adapted to engage said central opening;
c. an elongated bar member of electrically conductive material having a pair of ends, one said end of said bar member affixed in said central transverse aperture, and the other end of said bar member protruding through said slot aperture adapted to engage said door, said bar member rotating in said slot aperture as said rod member rotates;
d. a mounting plate affixed onto said housing adapted to be mounted onto said door frame;
e. means tending to rotate said rod member and said attached bar member;
f. means for restricting rotation of said bar member; and
g. an electrical series circuit consisting of said rod member, said bar member, a power source, an alarm, and a contact point cooperating with said bar member.

3,968,485
BURGLAR WARNING DEVICE

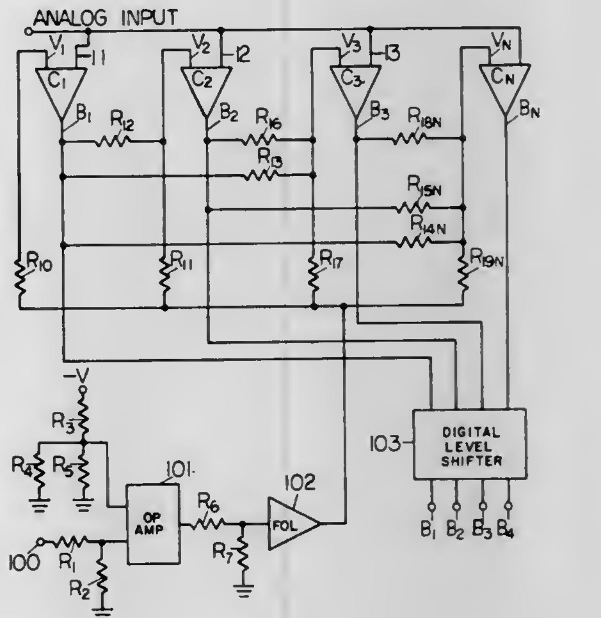
Harry I. DeHart, P.O. Box 508, Radford, Va. 24141
Filed July 2, 1975, Ser. No. 572,412
Int. Cl.^{2} G08B *13/08*
U.S. Cl. 340—274 R **5 Claims**



1. A burglar warning device to be installed across a doorway or the like and activated by the opening of the door comprising in combination a cord or line to be stretched across the doorway, means at one end of the cord for securing to a fixed position on said doorway, means at the other end for loosely engaging a light control switch, and means for directing the line in a vertically downward direction to assure an upward pull on said switch.

3,968,486
ANALOG TO DIGITAL CONVERTER

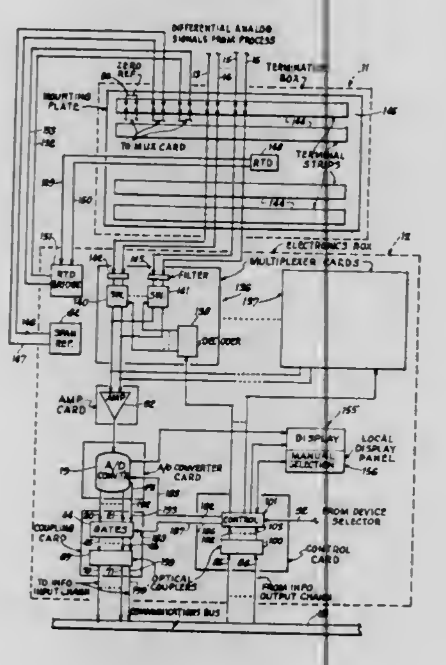
Richard C. Gerdes, 7333 E. 34th St., Tucson, Ariz. 85710
Filed June 20, 1974, Ser. No. 481,158
Int. Cl.^{2} H03K *13/175*
U.S. Cl. 340—347 AD **2 Claims**



1. An analog to digital converter of the asynchronous type comprising first, second, third, and fourth voltage comparators having two voltage inputs whose voltages are compared and a voltage output, a first input to each said comparators being the input analog voltage, the second input to the first voltage comparator resistively connected to a pre-determined reference voltage; said pre-determined reference voltage comprising the output of a voltage follower, the voltage follower having an input operably connected to the output of a dual operational amplifier, said dual operational amplifier having two inputs, one an exterior reference voltage and the other a negative power supply voltage; the output of said first voltage comparator connected to the input of a digital level shifter, resistively connected to the second input of the second voltage comparator, resistably connected to the second input of the third voltage comparator, and resistably connected to the second input of the fourth voltage comparator; the second input to the second voltage comparator additionally resistably connected to the output of the voltage follower; the output of the second voltage comparator operably connected to the input of the digital level shifter, resistably connected to the second input of the third voltage comparator, and resistably connected to the second input of the fourth voltage comparator; the second input of the third voltage comparator additionally resistably connected to the output of the voltage follower; the output of said third voltage comparator operably connected to the input of the digital level shifter, and resistably connected to the second input of the fourth voltage comparator; said fourth voltage comparator second input additionally resistably connected to the output of the voltage follower and the output of the fourth voltage comparator operably connected to the input of the digital level shifter, wherein the output of the digital level shifter comprise the digital outputs of the analog to digital converter.

3,968,487
MULTIPLEXER-ANALOG/DIGITAL CONVERSION SYSTEM

William M. Herring, Elburn, and Dennis B. Walling, Darien, both of Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Oct. 15, 1974, Ser. No. 514,495
Int. Cl.^{2} G06F *3/00*
U.S. Cl. 340—347 AD **17 Claims**



1. A multiplexer analog/digital conversion system, useful at a local area for cycles of operation, each cycle interrogating by local selector means at the local area or by a computer located at a remote area, an individual one of a number of analog signals provided by sources at the local area, providing an analog/digital conversion of the analog signal selected during each cycle at the local area, and locally displaying the multi-bit binary information from the conversion, when there is a local selection of the analog signal, or providing that information to a communications bus connecting the system and the computer, when there is a computer selection of the analog signal, which comprises:

- a number of switch means, each connectable to a different source of analog signal at the local area and each switch means being responsive to a signal to provide an output signal corresponding to the analog signal;
- analog/digital converter means including an analog/digital converter having a number of outputs to provide mutli-bit binary information, input means to receive an analog signal, and a trigger input to receive a pulse that at the leading edge of the pulse resets said converter and at the trailing edge of the pulse initiates a conversion operation for a short period of time to provide at said number of outputs multi-bit binary information representative of the analog signal at said input means, and a status output to provide a pulse during the conversion operation of said analog/digital converter, said input means of said converter being connected to each said number of switch means to receive from the signalled switch means an analog signal, during one cycle of operation of the system, for a conversion of that signal, in response to a pulse to said trigger input of said converter, to provide at said a number of outputs of said converter multi-bit binary information representative of the analog signal from the signalled switch means; and
- logic means including:
  - selector means having a decoder/demultiplexer that is responsive to a multi-bit binary information at a number of inputs of said decoder/demultiplexer to provide at one of its number of mutually exclusive outputs a signal, that output being dependent upon that binary information, said decoder/demultiplexer having said number of outputs connected to different switch means of said number of switch means to provide a signal to one of them in accordance with the binary information received by said number of inputs of said decoder/-demultiplexer;
  - gate means comprising a number of gates and an additional gate, each having a first input and a second input and an output, said outputs of said number of gates being connected to different inputs of said decoder/-demultiplexer and said number of gates having said first inputs;
  - means including a number of separate lines corresponding in number to said number of gates, each line being connected only to a different first input of said number of gates and said means being constructed to provide, by said number of lines, to said first inputs of said number of gates signals corresponding to different bits of multi-bit binary information, from signal sources connectable to said number of lines, corresponding, during one cycle of operation, to that information identifying the switch means selected for operation;
  - means including a line connected to said first input of said additional gate and connectable to a pulse source to provide a pulse to said first input of said additional gate during an early part of the cycle of operation of the system;
  - means including a line connected to each of said second inputs of said number of gates and said additional gate, said means being connectable to a signal source to provide to these second inputs of said number of gates and said additional gate of said gate means a signal for the period of the cycle of operation of the system to open said additional gate, and to open said number of gates to provide to said decoder/demultiplexer, from said outputs of said number of gates, signals corresponding to the multi-bit binary information provided at said first inputs of said number of gates and to provide a pulse at said output of said additional gate when a pulse is applied to said line connected to said first input of said additional gate; and
  - a monostable multivibrator having an input and an output, said input being connected to said output of said additional gate to receive said pulse from the output of said additional gate to provide at its output a pulse for a predetermined period beginning at the trailing edge of the pulse from said additional gate, said output of said multivibrator being connected to said trigger input of said converter to provide that pulse from said output of said multivibrator to said convertor to reset said converter at the leading edge of said pulse and to initiate at the trailing edge of said pulse from said multivibrator the operation of said converter for a period of time, within the cycle of operation of the system, for the analog/digital conversion to provide the multi-bit binary information to said number of outputs of said converter and to provide a pulse at the status output of said converter during the conversion operation of said converter.

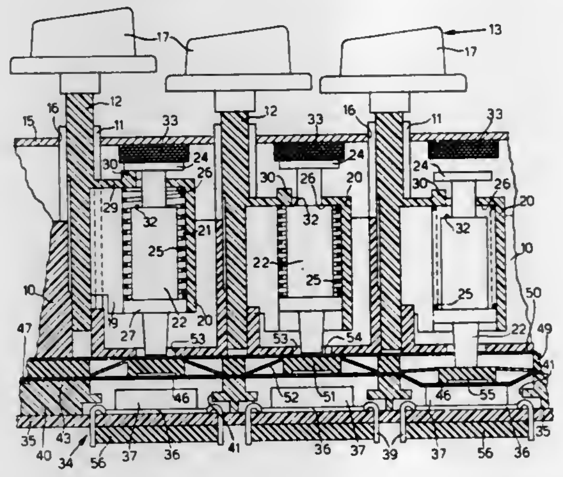
3,968,488
ELECTRONIC KEYBOARD

Michele Bovio, Banchette, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Sept. 5, 1975, Ser. No. 610,700
Claims priority, application Italy, Sept. 18, 1974, 69815/74
Int. Cl.^{2} G08C *1/00*
U.S. Cl. 340—365 C **12 Claims**

1. In an electronic keyboard for a typewriter, calculating machine, accounting machine or similar office machine, comprising a frame having an upper wall and a lower wall which defere a space therebetween, said frame having a plurality of slot means, a plurality of depressable keys, each one comprising a stem lodged in one corresponding of said slot means, a

plurality of actuators individually associated to said keys, and a plurality of circuit means comprising each one a capacitor having a fixed armature and a movable armature opposite to said fixed armature, each actuator including an elongated member having a first end for actuating the movable armature of the corresponding capacitor to generate corresponding electrical signals, the combination comprising:

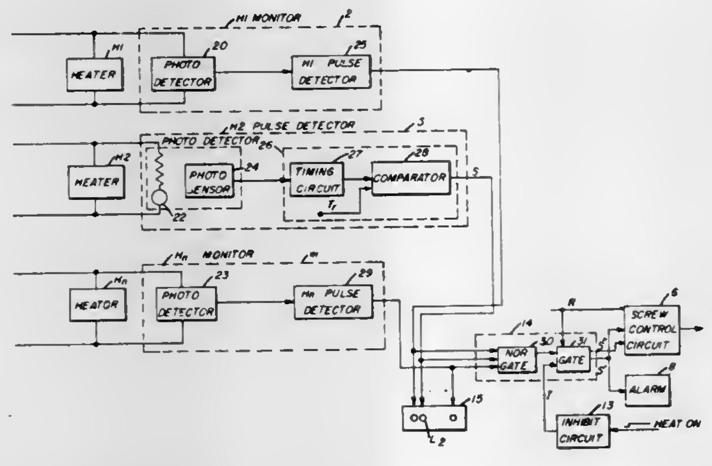
- a supporting member putting out from each one of said stems and having a cavity therein in which one corresponding of said actuators is slidably supported;
- a second end of each one of said actuators opposite to said first end and supporting a ferromagnetic element thereon;



- magnetic retaining means lodged in said space and supported by said upper wall to hold the second end of the elongated member in a rest position of said actuator;
- a first and a second shoulder element adjacent to the first and respectively to the second end of said elongated member; and
- a plurality of helicoidal springs each one lodged in said cavity to surround said elongated member and compressed between said first shoulder element and an internal surface of said cavity to arrest said second shoulder against said supporting member to push the first end of said actuator toward said movable armature when the ferromagnetic element of said actuator releases said magnetic retaining means upon the depression of said keys.

3,968,489
APPARATUS FOR MONITORING THE OPERATION OF HEATER CONTROLLERS

James J. Richards, and Francis A. Russell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 15, 1974, Ser. No. 443,066
Int. Cl.^{2} G08B *21/00*
U.S. Cl. 340—417 **5 Claims**

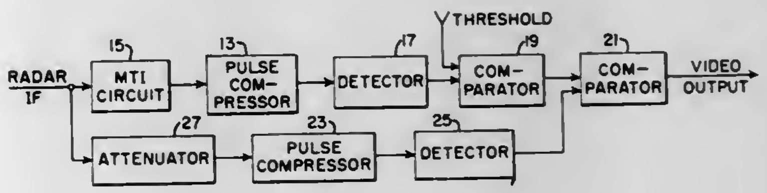


1. In combination:

- a heater;
- temperature sensing means for measuring the temperature of a material heated by said heater;
- a controller responsive to said temperature sensing means for sequentially generating heater signals that periodically activate said heater;
- means actuated by said heater signals for monitoring the rate at which said heater signals are generated, said means comprising:
  - illumination means actuated by said heater signals for generating light pulses;
  - a photosensor for converting the light pulses into corresponding electrical signals, and
  - a timing circuit responsive to each of said electrical signals for establishing the rate of electrical signal generation;
- means responsive to the monitored rate for generating an output signal when said monitored rate is less than a selected rate; and
- an alarm responsive to said output signal for signalling the occurrence of improper controller operation.

3,968,490
RADAR MTI PROCESSOR WITH CFAR

Judson J. Gostin, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed May 3, 1974, Ser. No. 466,730
Int. Cl.^{2} G01S *7/30, 9/42*
U.S. Cl. 343—7.7 **3 Claims**



1. For use with a pulse doppler radar, a received signal processor affording MTI operation and CFAR capability comprising:

a. MTI cancellation circuit means having said received signals applied thereto and providing an MTI signal of level in accordance with a first predetermined gain factor (α) at the MTI cancellation frequency and of substantially higher level at frequencies displaced therefrom;

b. blanking circuit means having said received signals applied thereto and providing a blanking signal of level in accordance with a second predetermined gain factor (β) which is substantially uniform with frequency, the magnitude of β being significantly greater than that of α;

c. pulse compression means and video detection means having applied thereto said MTI and blanking signals, and providing MTI video and blanking video signals by compression and detection of signals from said cancellation circuit and said blanking circuit means respectively;

d. first threshold means connected to receive at least the MTI video signal from said detection means and operative to pass only such thereof as exceeds a first threshold; and

e. second threshold means connected to receive said MTI video signal and operative to pass only such thereof as exceeds said blanking video signal as a second threshold, whereby false alarms which might otherwise result from high clutter levels in said MTI video signal are prevented by the correspondingly high levels of said blanking video signal applied as said second threshold.

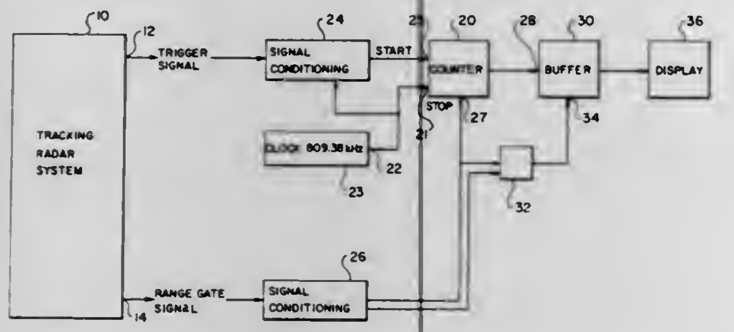
3,968,491
RADAR RANGEMETER

Jeffrey L. Silberberg, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1974, Ser. No. 526,998

Int. Cl.² G01S *9/04, 9/06*

U.S. Cl. 343—12 R **3 Claims**



1. A range determining and display circuit for use with reflected energy ranging systems producing a first signal upon the occurence of transmission of a detection signal and a second signal upon the return target reflection comprising:
first conditioning means for receiving said first signal;
second conditioning means for receiving said second signal;
digital clock means for generating timing signals spaced apart in time at intervals corresponding to the propagation time necessary for said detection signal to travel twice the distance of the lowest discrete range distance to be displayed, said timing signals being coupled to said first conditioning means as an input;
digital counting means for counting said timing signals, having a first input terminal connected to the output of said first conditioning means, a second input terminal connected to the output of said second conditioning means, and a clock input terminal connected to the output of said digital clock means;
buffer means connected to the output of said clock means for storing a selected output signal from said counting means; and
digital display means connected to the output of said buffer means for displaying in numerical format the corresponding decimal value of said stored selected counting means output signal stored in said buffer means;
whereby said first signal enables said counting means to begin counting said timing signals, and said second signal dis-enables said counting means thereby causing the range of said target to be displayed directly in digital numerical format.

3,968,492
ADAPTIVE PARAMETER PROCESSOR FOR CONTINUOUS WAVE RADAR RANGING SYSTEMS

Gerald Stanley Kaplan, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,558

Claims priority, application United Kingdom, Mar. 18, 1974, 12006/74

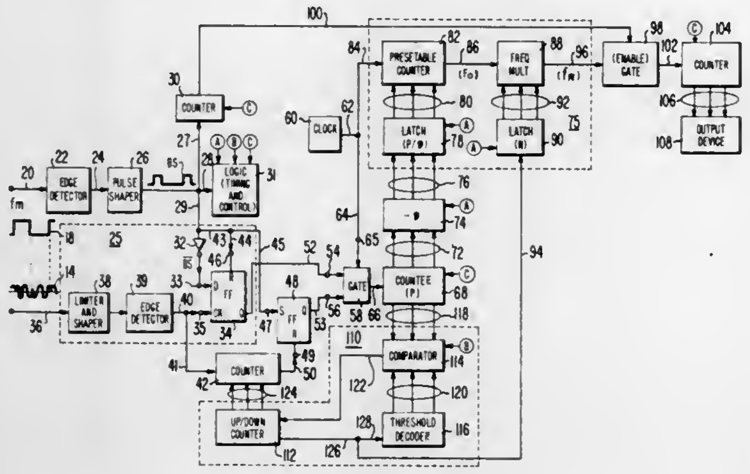
Int. Cl.² G01S *9/24*

U.S. Cl. 343—14 **9 Claims**

1. In a continuous wave radar ranging system, wherein a signal is transmitted in the direction of a target and is reflected from said target back to the source of said transmitted signal, said transmitted signal being frequency modulated in accordance with a given periodic waveform, said ranging system including means for deriving from said transmitted signal and said reflected signal a difference signal indicative of the frequency difference of said reflected signal from the instantaneous frequency of said transmitted signal, a signal processor comprising:

a. blanking means, receptive of signals indicative of said modultion waveform, for generating a train of blanking pulses in synchronism with the extrema of said modulation waveform; said blanking pulses having a width at least as great as the duration of any phase reversal region in said difference signal;

b. zero crossing detector means, responsive to said blanking pulses and a signal indicative of a variable number and receptive of said difference signal for generating signals indicative of zero crossings in said difference signal occurring respectively a predetermined number and said variable number of zero crossings after a blanking pulse, said variable number being determined from the last range measurement of said target;



c. accumulator means, responsive to said predetermined and variable number zero crossing signals, for producing a signal indicative of the duration of the time period between the respective occurrence of said predetermined number zero crossing and said variable number zero crossing; and

d. conversion means, receptive of said duration signal, for deriving from said duration the range of said target and producing a signal indicative of said range.

3,968,493
DIGITAL PHASE COMPARATORS

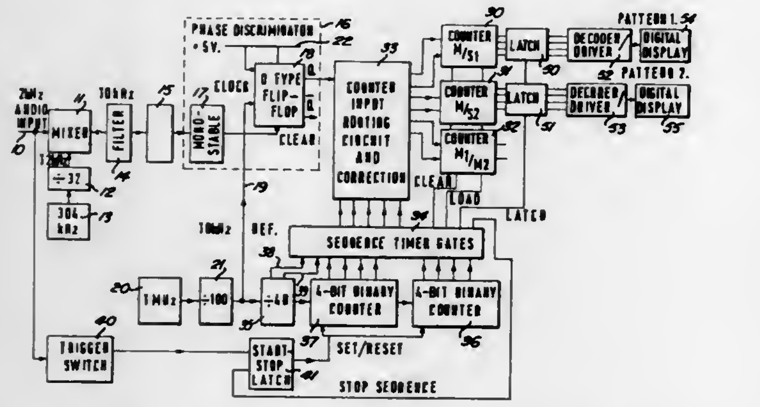
James David Last, Llanfairfechan, and Emyr Wyn Roberts, Bangor, both of Wales, assignors to University of North Wales, Caernarvon, Wales

Filed Sept. 18, 1974, Ser. No. 507,185

Claims priority, application United Kingdom, Sept. 19, 1973, 44018/73

Int. Cl.² G01S *1/30;* G01R *25/00*

U.S. Cl. 343—105 R **9 Claims**



1. A digital phase comparator for determining the phase relationship between a first signal and a further signal of the same frequency which signals are available sequentially in a regular cyclic sequence comprising a reference oscillator of a frequency equal to or approximately equal to the frequency of said signals, digital phase determining means arranged to determine the phase relationships between a signal from the reference oscillator and each of the first and the further signals and including subtracting means arranged to determine the difference between these two phase relationships, means arranged to determine the rate of phase change between the first signal and the reference signal, and correction means utilising the rate information as a measure of the rate of phase change of the reference signal to correct the phase difference determination between the further signal and the reference signal in accordance with this rate and the time period between the determinations of the phase relationships between the first signal with respect to the reference and the further signal with respect to the reference signal for any change in the phase of the reference signal with respect to the first signal during that time period.

3,968,494
ANALYZER DEVICE FOR A VOR NAVIGATIONAL RECEIVER

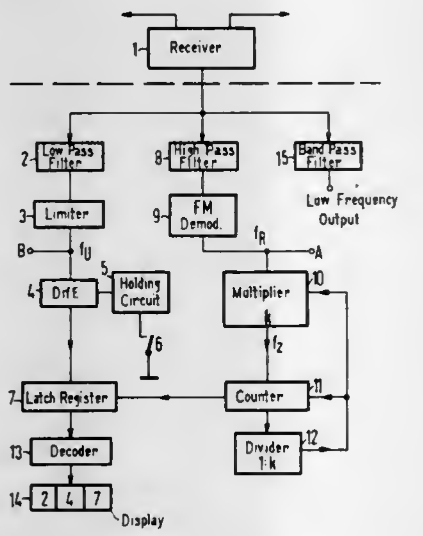
Walter Freter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 5, 1975, Ser. No. 574,633

Claims priority, application Germany, May 6, 1974, 2421772

Int. Cl.² G01S *1/44*

U.S. Cl. 343—106 R **13 Claims**



1. In a VOR receiver which receives VOR signals including a reference phase in the form of a frequency modulation and a rotational phase in the form of an amplitude modulation, a first receiver section providing the reference phase as a demodulated reference signal, a second receiver section providing an amplitude demodulated rotating signal, and means for comparing the reference and rotational signals to obtain angular information in the azimuthal plane including an analyzer device comprising:
a frequency multiplier in one of said receiver sections for multiplying the frequency of one of the demodulated signals by a factor *k*, where *k* is selected as a whole number multiple or as a fraction of 360;
counting means for converting the multiplied signal to a number of counting increments corresponding to the difference between the reference and rotational signals; and
display means for displaying the counting increments as the angular deviation from the reference direction.

3,968,495
INSTRUMENT LANDING SYSTEM

Rudolf Clemens Hergenrother, Rte. 2, 45 Hidden River Lane, Sarasota, Fla. 33870

Filed Mar. 6, 1975, Ser. No. 555,967

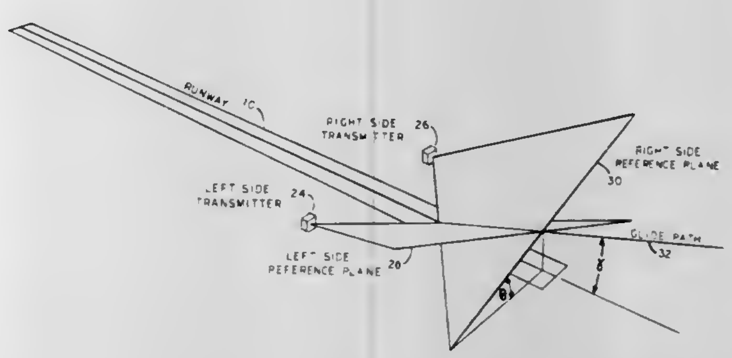
Int. Cl.² G01S *1/16, 1/18*

U.S. Cl. 343—108 R **5 Claims**

1. An aircraft instrument landing system for use on an aircraft runway to guide approaching aircraft along a glide path comprising in combination:

a. first and second directional transmitters to be disposed on the left and right sides of a runway for transmitting directional radio signals in two reference planes at angles to the horizontal which will intersect to define a glide path including a high frequency oscillator complex for supplying a high frequency output carrier signal from each transmitter and modulator means for each transmitter supplying a pair of modulation signals for each transmitter which are different and identifiable;

b. receiver means on the aircraft disposed to receive said carrier signals and including narrow band pass filter means for separating the four identifiable modulation signals;



c. detector means coupled to said filter means including resistor divider means to adjust the intensity of said signals and means to add and subtract the received signals; and,

d. display means coupled to said detector means and resistor divider means including indicator means visibly showing the position of the aircraft relative to a phantom glide slope reference plane, azimuth reference plane and visibly showing the signal displacement from said planes.

3,968,496
STABILIZED ANTENNA PLATFORM

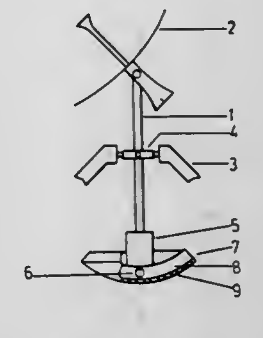
Geir Brunvoll, Slattum, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,226

Claims priority, application Norway, Mar. 4, 1974, 731/74

Int. Cl.² H01Q *1/18*

U.S. Cl. 343—765 **7 Claims**



1. A stabilized antenna platform wherein there is provided an antenna dish having elevation and azimuth control means, as well as counterweight means, said antenna platform mounted upon an antenna mounting shaft, said antenna mounting shaft supported by a universal joint bearing, comprising:
at least one closed container symmetrically arranged around said mounting shaft containing a liquid and provided with internal liquid flow damping means, said closed container forming a small mass system mechanically coupled to said platform for damping the movements of said antenna platform.

3,968,497

ANTENNA WITH A PERISCOPE ARRANGEMENT

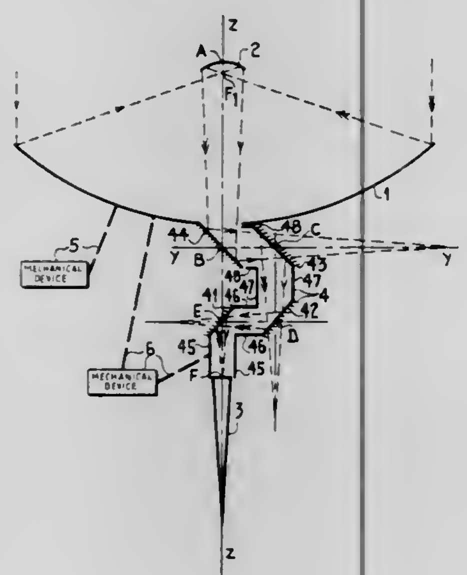
Nhu Bui Hai, Paris, France, assignor to Thomas-CSF, Paris, France

Filed Mar. 14, 1975, Ser. No. 558,545

Claims priority, application France, Mar. 19, 1974, 74.09212

Int. Cl.² H01Q *19/14*

U.S. Cl. 343—781 CA **6 Claims**



1. An antenna comprising, in series, for defining a radiation path: a primary source, a periscope arrangement with *n* (n being a positive integer) successive mirrors, said *n* mirrors being successively arranged along said path and being all plane mirrors, an auxiliary reflector having first and second foci, the distance between said first focus and the auxiliary reflector being smaller than the distance between said second focus and the auxiliary reflector, and a main reflector having a reflecting face; said main reflector being physically located between said auxiliary reflector and said periscope arrangement; said first and second foci being respectively located in front of and behind the reflecting face of said main reflector and said distance between said second focus and said auxiliary reflector being substantially equal to the length of that part of said radiation path which is comprised between said auxiliary reflector and said primary source.

3,968,498

X-Y PLOTTER INCORPORATING NON-IMPACT, LIQUID JET RECORDING INSTRUMENT

Tadamitsu Uchiyama, Tokyo, Japan, assignor to Research and Development Laboratories of Ohno Co., Ltd., Yokohama, Japan

Filed June 3, 1974, Ser. No. 476,109

Claims priority, application Japan, July 27, 1973, 48-85093; July 27, 1973, 48-85096; July 30, 1973, 48-85677; July 31, 1973, 48-86024; Aug. 3, 1973, 48-87265

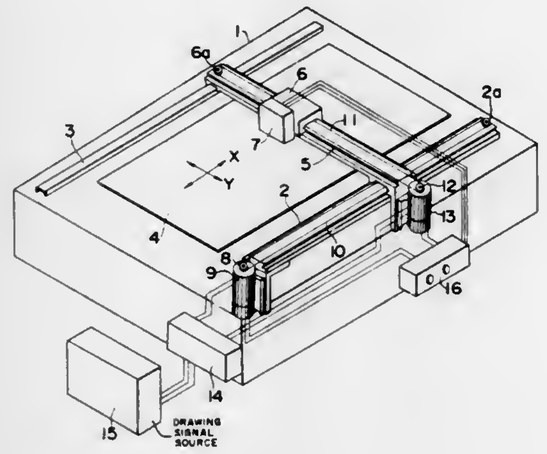
Int. Cl.² G01D *9/40, 15/18*

U.S. Cl. 346—29 **19 Claims**

1. A non-impact, liquid jet recording apparatus for use in an X-Y plotter of a type which comprises a support table adapted to support a recording medium thereon, an X-axis carriage mounted for parallel movement across said support table in the direction of the X-ordinate, a Y-axis carriage mounted on said X-axis carriage for movement in the direction of the Y-ordinate, a first drive unit for moving said X-axis carriage and a second drive unit for moving said Y-axis carriage, said apparatus comprising:

a recording head rigidly carried by said Y-axis carriage and including a nozzle through which a liquid marking medium is jetted onto the recording medium, means for supplying said liquid marking medium to the exit of said nozzle, and an electrode member spaced from the exit of said nozzle and situated above said recording medium;

electrical means coupled to said electrode and said nozzle for applying a potential between said nozzle and said electrode member for establishing therebetween an electrostatic field required to attract said liquid marking medium from the exit of said nozzle; and



circuit means for controlling said electrical means to cause said electrical means to operate in such a manner as to jet said liquid marking medium in a varying amount substantially proportional to the recording velocity which is defined by the square root of the sum of the second powers of the velocities of movement of said carriages.

3,968,499

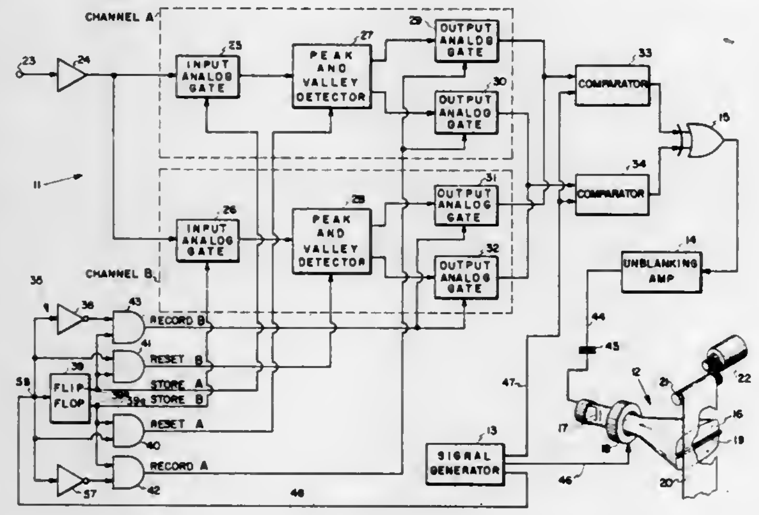
APPARATUS FOR PRODUCING CONTINUOUS GRAPHIC DISPLAYS FROM INTERMITTANTLY SAMPLED DATA

Peter R. Lowe, Englewood, and Tommy N. Tyler, Broomfield, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 19, 1975, Ser. No. 550,984

Int. Cl.² G01D *9/42*

U.S. Cl. 346—110 R **14 Claims**



1. Apparatus for producing a graphic display of the variations in amplitude of a data signal, comprising

first means connected to the source of the signal for deriving in successive periods two values, representing, respectively, the minimum value and the maximum value of said signal in each of said periods, and

second means connected to said first means for producing successive parallel line segments on a display medium during successive ones of said periods, each of said line segments being continuous and extending between two points, the positions of which represent, respectively, the minimum value and the maximum value of said signal derived during a previous one of said periods.

3,968,500

ELECTRODE PRINTING HEAD AND METHOD FOR MAKING THE SAME

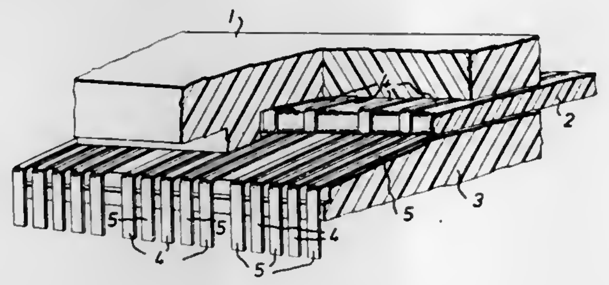
Gerhard Meisel, Ulm (Danube); Helmut Süssenbach, Thalfingen, and Harry Zimmermann, Oberelchingen, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 24, 1974, Ser. No. 508,868

Claims priority, application Germany, Sept. 27, 1973, 2348556

Int. Cl.² G01D *15/08*

U.S. Cl. 346—139 C **5 Claims**



1. In an electrode printing head having a plurality of strip-shaped electrodes arranged in a row in a juxtapositioned, mutually insulated, spaced relationship and being supported in insulating means forming part of the printing head, the improvement wherein said row of electrodes being constituted by electrodes of identically shaped first and second sheet metal parts, said first sheet metal part being in a reversed position with respect to said second sheet metal part and the electrodes of said first sheet metal part being in an intermeshing relationship with the electrodes of said second sheet metal part, whereby each electrode of said first sheet metal part being situated, without touching, in the space provided between adjacent electrodes of said second sheet metal part.

3,968,501

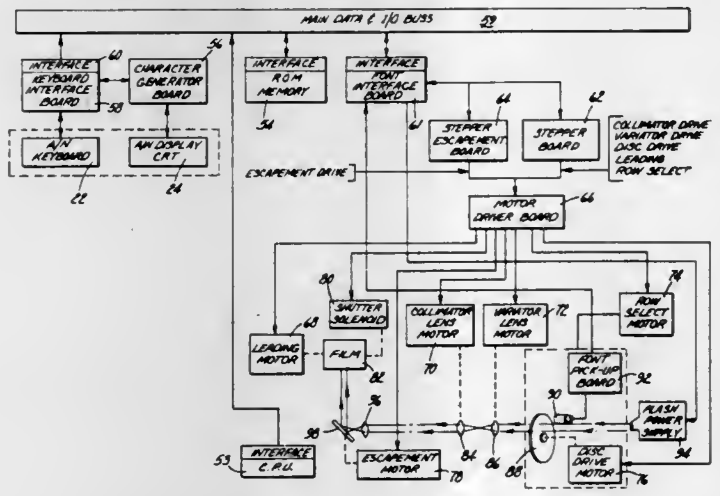
PHOTOCOMPOSITION MACHINE WITH IMPROVED LENS CONTROL SYSTEM

Barry D. Gilbert, Succasunna, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Nov. 14, 1974, Ser. No. 523,557

Int. Cl.² G03B *15/00*

U.S. Cl. 354—7 **8 Claims**



1. A photocomposition machine comprising:

input peripheral means for providing data representative of selected input commands, values and type characters, said input commands including point size commands for specified type characters within a type line,

memory means for storing entered data,

input/output means for entering and reading from said memory means data including said point size command and associated value data provided from said input peripheral means,

means for storing an optically accessible plurality of predetermined type characters,

photosensitive means for recording selected type characters,

controllable flash means in operative relationship with said character storage means for exposing said photosensitive means with images of selected characters of said character storage means,

controllable optical means for projecting said selected characters in the form of images onto said photosensitive means and including first and second movable lens means for determining the image size of the selected type characters projected onto said photosensitive means,

first and second motive means for moving said first and second lens means, respectively, in response to corresponding lens position control signals,

said memory means including means for storing data corresponding to the previously selected point size value,

control means for providing first and second lens control signals, each representative of the difference between the lens position of the previously selected point size value and the lens position of the newly selected point size value, and

said first and second motive means moving said first and second lens means respectively to corresponding new positions in response to said corresponding lens position control signals.

3,968,502

ELECTRIC SHUTTER CIRCUIT

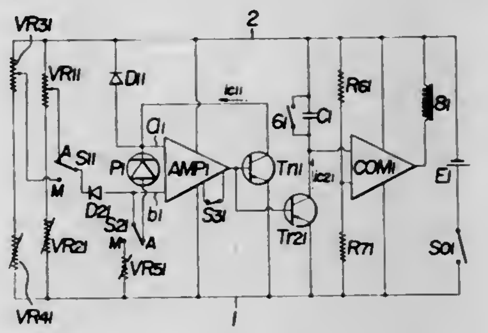
Kazuo Shiozawa, Hachioji, and Junji Kajiwara, Kadoma, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,174

Claims priority, application Japan, July 26, 1973, 48-83667; Nov. 12, 1973, 48-126334

Int. Cl.² G03B *7/08*

U.S. Cl. 354—24 **10 Claims**



1. An electric shutter circuit with means for setting the exposure time automatically as well as manually, comprising a differential amplifier, a photoelectric element, a negative feedback circuit connected between the output and one of the inputs of said differential amplifier, a first manually variable bias voltage source indicative of the aperture setting, a second manually variable bias voltage source indicative of the exposure time setting, change-over switch means for connecting said first bias voltage source to the other input of said differential amplifier and said photoelectric element across both inputs of said differential amplifier and alternatively for disconnecting said photoelectric element and connecting said second bias voltage source to said other input of said differential amplifier, converter means interconnected with said differential amplifier for causing the current in said feedback circuit to be an exponential function of the output of said second bias voltage source, control means for producing a charging current approximately proportional to the current in said feedback circuit, a capacitive circuit connected to be charged by said charging current, shunt switch means for keeping said capacitive circuit discharged until released, means for releas-

ing said shunt switch means when the shutter is opened to begin the charging of said capacitive circuit, detector means connected to produce a control output indicative of the charging of said capacitive circuit to a predetermined trigger level, means responsive to the control output of said detector means for causing said shutter to close, whereby said shutter remains open for a predetermined interval determined by said first manually variable bias voltage source and said photoelectric element in the case of automatic exposure time setting, and by said second manually variable bias voltage source in the case of manual exposure time setting.

3,968,503

SHUTTER FOR PHOTOGRAPHIC CAMERAS WITH A FLASH EQUIPMENT

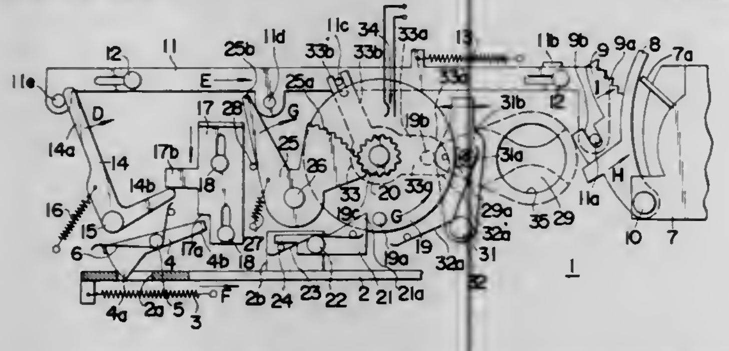
Hirokazu Kaneko, and Hiroo Nakano, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Japan

Filed May 23, 1975, Ser. No. 580,214

Claims priority, application Japan, May 23, 1974, 49-58205[U]; May 23, 1974, 49-58206[U]

Int. Cl.² G03B *7/16*

U.S. Cl. 354—33 **3 Claims**



1. A shutter for photographic cameras with a flash equipment including flash means adapted to be actuated by an electrical signal, said shutter comprising, in combination, diaphragm blade means operable to set the diaphragm aperture to a proper value in accordance with the brightness of an object to be photographed; blade drive means movable between a fixed position, in which said blade means is maintained in a closed position, and a variable position, in which said blade means is maintained in an open position; a fly wheel adapted to be driven from a first position to a second position, said fly wheel having an actuating pin means and stop means operable to maintain said blade drive means in its fixed position when said fly wheel is in its first position; means operable, responsive to release of said shutter, to engage said actuating pin means to drive said fly wheel; cam means operatively associated with said blade drive means and operable to set the variable position of said blade drive means properly in accordance with the brightness of the object; control lever means, movable responsive to release of said shutter, from a fixed position to a variable position which latter is determined in accordance with the brightness of the object, said control level means having pin means operable to set said cam means and to set said second position of said fly wheel; and means mounted in the path of movement of said actuating pin means for producing said electrical signal when said fly wheel rotates through an angle greater than a predetermined angle of rotation.

3,968,504

INTERCHANGEABLE LENS BARREL STRUCTURE

Yoshio Komine, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1974, Ser. No. 498,041

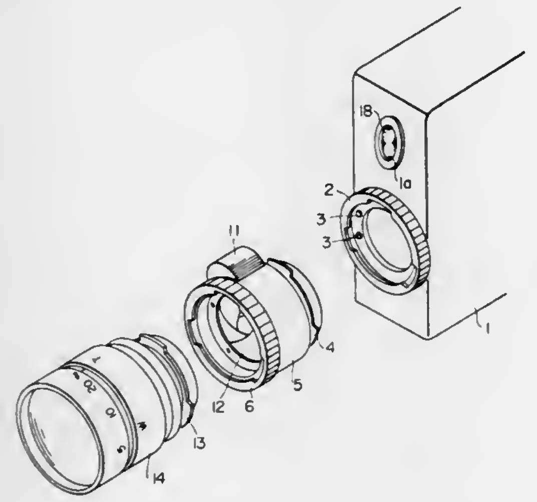
Claims priority, application Japan, Aug. 28, 1973, 48-96503

Int. Cl.² G03B *7/20*

U.S. Cl. 354—46 **6 Claims**

1. An improvement in a camera system comprising in combination:

a camera unit housing having an opening at a front plane thereof for allowing incident light into said housing; a first attaching and detaching means positioned near said opening; a power source provided within said camera unit housing; an object brightness detection means for detecting the brightness of an object outside of said camera unit housing, said detection means being provided within said camera unit housing and electrically connected with said power source; a circuit for determining the amount of light entering said housing, said circuit being provided within said housing and electrically connected to said detection means in order to generate a signal corresponding to the output of said detection means; and a first electric connector means having a first end connected to the output of said circuit and a second end connected to said first attaching and detaching means; an interchangeable lens unit which can be selectively attached to or detached from said camera unit housing comprising a rear barrel section having a first and second open end; a lens system mounted within said rear barrel section; second attaching and detaching means mounted on said first end of said rear barrel section for attaching said rear barrel section to said first attaching and detaching means; a third attaching and detaching means mounted on said second end of said rear barrel section; blades mounted in said rear barrel section forming an opening allowing the passage of light therethrough, said opening being variable to control the amount of light passing therethrough; driving means for said blades for controlling the opening formed thereby; a second electric connector means having a first end connected to said driving means and a second end connected to said second attaching and detaching means; a front barrel section for selective attachment to or detachment from said rear barrel section having a first and second open end; a photographing optical system positioned within said front barrel section; a forth attaching and detaching means mounted on said first end of said front barrel section for engagement with said third attaching and detaching means so that said front barrel section may be secured to or removed from said rear barrel section, whereby said driving means is controlled by the output from said cicuit and the amount of light entering the camera housing through said front barrel section is controlled.



3,968,505

DATA RECORDING SYSTEM FOR AUTOMATIC CAMERAS

John J. Kauneckas, 2301 E St. NW., Apt. A806, Washington, D.C. 20037

Filed Jan. 14, 1975, Ser. No. 540,835

Int. Cl.² G03B *17/24*

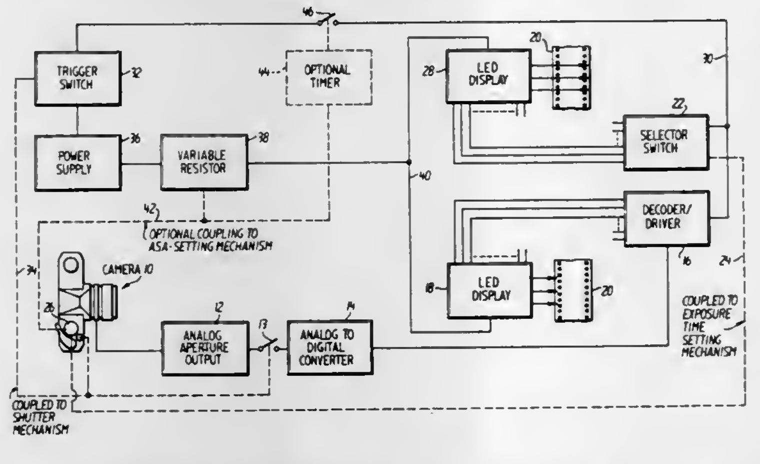
U.S. Cl. 354—106 **9 Claims**

1. A system for recording on photographic film electronically controlled exposure settings of an automatic camera comprising:

circuit means adapted to be coupled to the exposure control electronic circuitry of said camera for obtaining analog control signals representing said electronically controlled exposure settings;

analog-to-digital converter means coupled to said circuit means for converting said analog signals to digital form;

decoder means coupled to said analog-to-digital converter means for decoding the output thereof; and,



first recording means adapted to be positioned adjacent an edge portion of said photographic film within said camera, said first recording means including first electroluminescent display means coupled to said decoder means for recording on the edge portion of said film in a predetermined code said electronically controlled camera exposure settings.

3,968,506

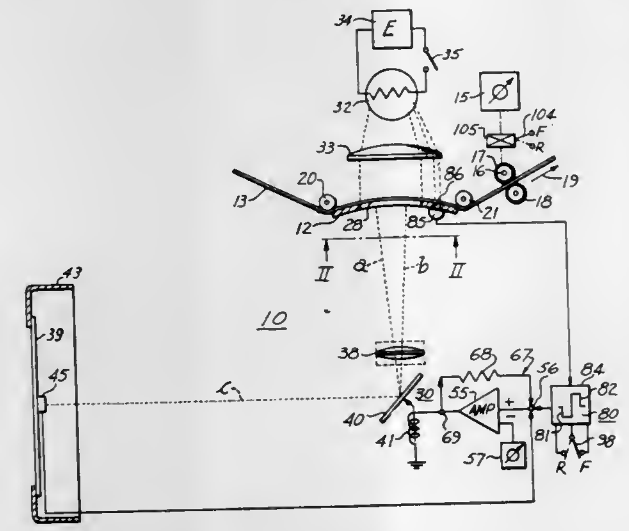
IMAGE DISPLAY FROM CONTINUOUSLY MOVING IMAGE CARRIER

Joseph H. Lancor, Jr., deceased, late of Arcadia, Calif. (by Ellen B. Lancor, administratrix), and Leonard A. Ferrari, San Clemente, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 89,323, Nov. 13, 1970. This application Dec. 19, 1972, Ser. No. 316,604

Int. Cl.² G03B *41/10*

U.S. Cl. 352—109 **19 Claims**



1. In apparatus for displaying images of a succession of recordings from a carrier, the improvement comprising in combination:

means coupled to said carrier for substantially continuously moving the carrier;

electrically powered optical compensator means including a repeatedly advanceable and resettable driven compensator part for compensating for the continuous carrier movement, said driven compensator part being constructed and mounted for advance in accordance with substantially the following equation of motion:

$$F(t) = J\frac{d^2x}{dt^2} + b\frac{dx}{dt}$$

where

$F(t)$ = force for advancing the driven compensator part;

J = mass-moment of inertia of the driven compensator part;

b = damping coefficient of the driven compensator part;

dx/dt = velocity of the driven compensator part;

d^2x/d^2 = acceleration of the driven compensator part;

means operatively associated with said carrier and said optical compensator means for displaying said images by way of said driven compensator part;

means for sensing relative movements of each displayed image;

means connected between said sensing means and said compensator means for controlling the application of electric power to said electrically powered compensator means in response to sensed image movements, whereby to render the display of each image substantially stationary;

means for providing for each reset of said driven compensator part electric resetting power comprising an electric power pulse doublet; and

means connected between said resetting power-providing means and said compensator means for applying said electric resetting power comprising said electric power pulse doublet to said compensator means, whereby to reset said driven compensator part preparatory to the display of a succeeding image;

said resetting power-providing means including adjustable means for providing said power pulse doublet with a net energy sufficient to initiate an advance of said driven compensator part after completion of a resetting operation.

3,968,507

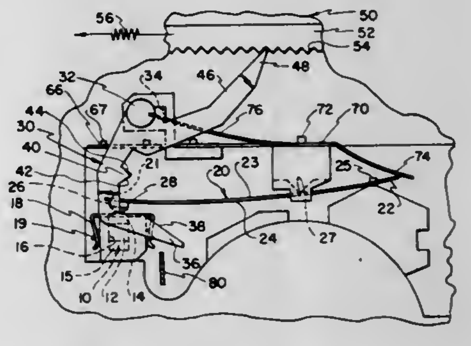
FILM ADVANCE-FLASH INTERLOCK MECHANISM

Jeffrey R. Stoneham, Hilton, and Thomas E. Dussinger, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,305

Int. Cl.² G03B *15/04*

U.S. Cl. 354—135 **4 Claims**



1. A photographic camera comprising:

means, including a first member movable from a rest position, for advancing film within said camera;

means, including a piezoelectric crystal, for generating electrical energy;

a second member movable from a latched position to strike said generating means and generate electrical energy;

means for releasably retaining said second member in said latched position;

means, coupling said first and second movable members, for moving said second member to its latched position in response to movement of said first member from its rest position; and

means, including a blocking member, for preventing return of said first member to its rest position prior to movement of said second member to its latched position.

3,968,508
PHOTOGRAPHIC CAMERA WITH MULTIPLE EXPOSURE MEANS

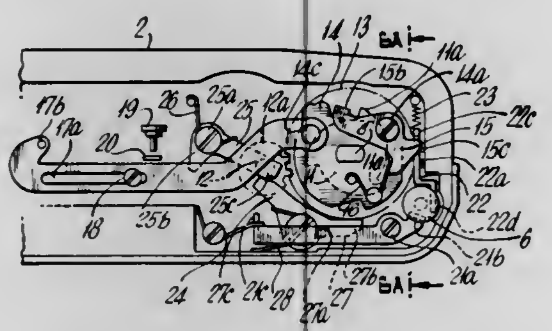
Takeshi Ikeuchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 23, 1974, Ser. No. 491,093

Claims priority, application Japan, July 24, 1973, 48-86963[U]; June 17, 1974, 49-68170

Int. Cl.² G03B *19/02*

U.S. Cl. 354—209 **10 Claims**



4. A photographic camera for multiple exposure comprising film winding means having at least one engaging portion; shutter cocking means movable from a rest position to an advanced position for shutter cocking and further returnable to said rest position, said shutter cocking means having an engaging member movable between a first position engageable with said engaging portion upon the movement of said shutter cocking means from said rest to advanced position and a second position unengageable with the same for operating said film winding means in association with the operation of said shutter cocking means between said engaging portion and said engaging member in said first position, mode changing means for changing said engaging member from said first to second position with said shutter cocking means in said rest position for allowing said shutter cocking means to initiate the movement from said rest to advanced position without the operation of said film winding means, said mode changing means being further related with said shutter cocking means for allowing said engaging member to return from said second to first position in the course of the movement of said shutter cocking means from said rest to advanced position, and means for retaining said engaging member in said second position before said mode changing means allows said engaging member to return to said first position, said retaining means further cooperating with the movement of said shutter cocking means to allow said engaging member to return from said second to first position in the course of the return of said shutter cocking means from said advanced to rest position.

3,968,509
FILM ADVANCE AND METERING MECHANISM FOR CAMERAS

Alfred Winkler, Munich, and Rolf Schröder, Baldham, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Aug. 30, 1974, Ser. No. 502,010

Claims priority, application Germany, Aug. 31, 1973, 2343890

Int. Cl.² G03B *1/16*

U.S. Cl. 354—213 **9 Claims**

1. In a photographic apparatus for use with photographic roll film having a row of perforations, one for each film frame, a combination comprising means for transporting the film lengthwise along a predetermined path; control means movable from a first position to a second position to thereby terminate the transport of film along said path; displacing means movable from a first to a second position to thereby move said control means to said second position; first means for biasing said displacing means to said second position thereof; blocking means movable from a first to a second position in which said blocking means respectively prevents and permits the movement of said displacing means from the first to the second position of said displacing means; a mobile feeler having a scanning portion in line with the row of perforations of the film in said path; and second means for biasing said scanning portion against the film in said path so that said scanning portion enters an oncoming perforation only under the action of said second biasing means during transport of the film in said path and the film moves said feeler from a first to

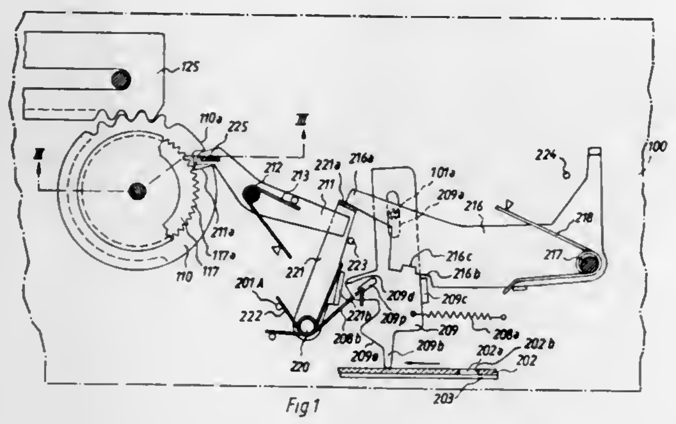


Fig 1

a second position in response to further transport of the film along said path, said feeler having a second portion which moves said blocking means from said first to said second position not later than when said feeler reaches said second position thereof, said displacing means having a portion which bears against said feeler and urges said scanning portion into the adjacent perforation of the film in said path only in said second position of said displacing means whereby said scanning portion is urged into the adjacent perforation by said first as well as by said second biasing means.

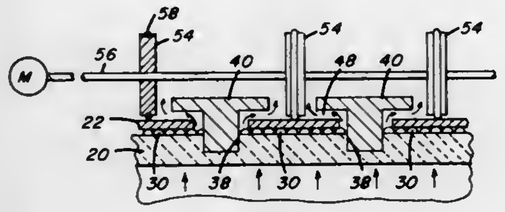
3,968,510
CONDUIT FOR PROCESSING WEBS WITH A LIQUID SOLUTION

Robert F. Allen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 375,576, July 2, 1973, abandoned. This application July 19, 1974, Ser. No. 490,155

Int. Cl.² G03D *5/00*

U.S. Cl. 354—319 **24 Claims**



1. In a photographic processing apparatus for processing webs, the combination comprising:

a conduit having openings extending from the inner surface of said conduit to the outer surface of said conduit at least along a helical path;

means connected to said conduit for continuously directing a liquid processing solution through said openings to form a continuous liquid solution cushion on said outer surface along said helical path; and

means for guiding a web helically around said conduit with one surface of said web in engagement with said helical liquid solution cushion for processing said web, said liquid solution cushion further supporting said web during processing with said one surface of said web held out of engagement with the outer surface of said conduit.

3,968,511
SEMICONDUCTOR DEVICE WITH ADDITIONAL CARRIER INJECTING JUNCTION ADJACENT EMITTER REGION

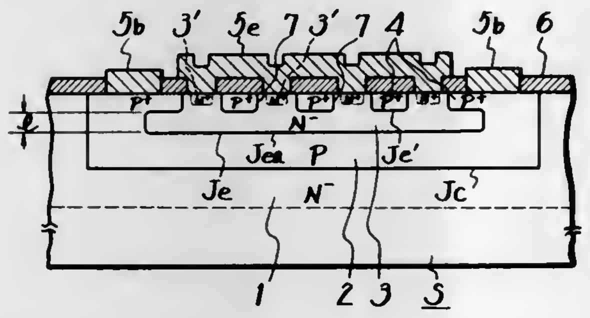
Hajime Yagi, Tokyo; Tadaharu Tsuyuki, Isehara; Kotaro Koma, and Yoshihiro Miyazawa, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,773

Claims priority, application Japan, Nov. 19, 1973, 48-129924

Int. Cl.² H01L *29/72*

U.S. Cl. 357—36 **5 Claims**



1. A semiconductor device comprising:
- a. a first region of a first conductivity type;
- b. a second region of a second conductivity type interfaced with said first region;
- c. a third region of said first conductivity type and predetermined impurity concentration interfaced with said second region and remote from said first region;
- d. a fourth region of said second conductivity type remote from said second region and interfaced with said third region to form an additional junction therewith and having a plurality of windows therein;
- e. a distance between said fourth region and said second region being selected shorter than the diffusion length of minority carriers in said third region injected from said second region; and
- f. a plurality of ohmic contact portions formed in said windows of said fourth region.

3,968,512
THYRISTOR

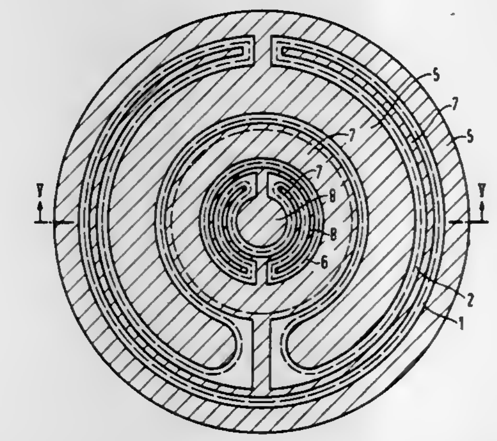
Peter Voss, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 6, 1974, Ser. No. 521,387

Claims priority, application Germany, Nov. 14, 1973, 2356906

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **14 Claims**



1. In a thyristor with a semiconductor element, which includes a main thyristor and at least one auxiliary arrangement which amplifies the control current, the main thyristor having a main emitter and the auxiliary arrangement having an auxiliary emitter, and a base which is common to the main thyristor and the auxiliary arrangement, with pn-junctions lying between the base and the emitters, emitter electrodes being disposed on the emitters, and a control electrode connected to the base wherein the edge lengths of the emitters of the main thyristor and the auxiliary arrangement have ratio such that the current i_e is greater than $i_{\ddot{u}}$, where i_e is determined by the product of the emitter edge length and the line current density j_e which has a value in the range between 0.3 and 1.0 amperes per milimeter of emitter edge length, and the current $i_{\ddot{u}}$ is that load current at which the voltage across the thyristor has fallen to 10% or less of the breakover voltage.

3,968,513
SYSTEM FOR RECORDING A COLOR TELEVISION SIGNAL WITH REDUCED BANDWIDTH

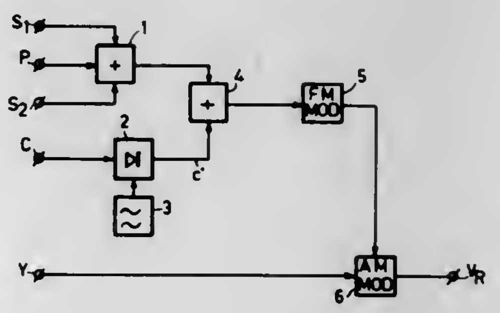
Maarten Rutger de Haan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 476,785

Claims priority, application Netherlands, Feb. 28, 1974, 7402692

Int. Cl.² H04N *5/76, 9/02*

U.S. Cl. 358—4 **13 Claims**



1. A disc-shaped record carrier provided with a spiral track on which a colour television signal is recorded, wherein said colour television signal is recorded in the track as a trackwidth modulation, the chrominance signal being recorded as a frequency modulation of a carrier and the luminance signal as an amplitude modulation of said frequency modulated carrier.

2. A system for recording a color television signal having luminance and chrominance components, said system comprising a frequency modulator having an input means for receiving said chrominance component and an output means for supplying a frequency modulated first carrier signal; and an amplitude modulator having a first input means for receiving said luminance component, a second input coupled to said frequency modulator output, and an output means for supplying said frequency modulated signal amplitude modulated by said luminance component.

3,968,514
MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Hisaaki Narahara, Musashino, and Yoshio Ishigaki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,454

Claims priority, application Japan, Dec. 28, 1973, 49-3349; Dec. 28, 1973, 49-3352

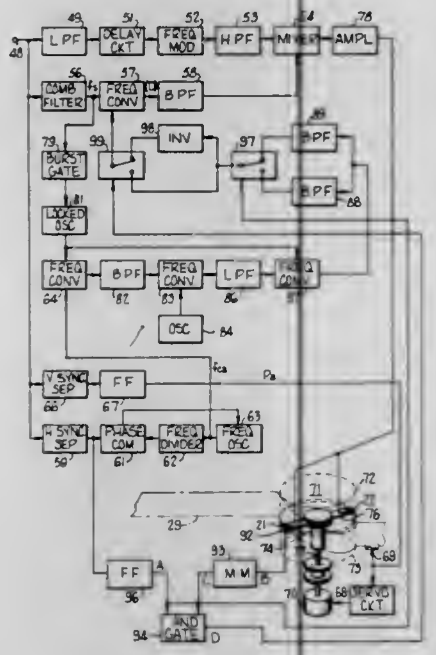
Int. Cl.² H04N *5/79*

U.S. Cl. 358—4 **10 Claims**

1. In a recording system for recording PAL color television signals in a plurality of parallel tracks on a recording medium, the PAL signals being divided into line and field intervals and including a chrominance portion modulated on a PAL signal sub-carrier the phase of which is reversed for each line interval, and each of said tracks being divided into line interval areas, apparatus comprising:

A. a frequency converter, the chrominance signal portion of the PAL signal being applied to the frequency converter;

B. means to generate a first frequency converting sub-carrier at a first frequency equal to the sum of the sub-carrier frequency of the PAL color television signal plus a conversion sub-carrier frequency and a second frequency converting sub-carrier at a second frequency equal to the difference between the PAL color television sub-carrier frequency and a conversion sub-carrier frequency, the first and second frequencies differing from each other by an odd integral multiple of one-half the line repetition frequency of the PAL color television signal; and



C. connecting means for applying the first and second frequency converting sub-carriers alternately, each for a line interval at a time, to the frequency converter to convert the PAL color television chrominance signal to an NTSC-type chrominance signal in a frequency band including the respective frequency converted chrominance sub-carrier frequency, said connecting means connecting the first and second frequency converting sub-carriers in one order during the recording of alternate ones of the tracks and in a different order during the remaining alternate tracks.

3,968,515

SINGLE FRAME COLOR ENCODING/DECODING SYSTEM

Joseph Peter Bingham, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 11, 1975, Ser. No. 557,412

Int. Cl.^{2} H04N *5/84;* **G02B** *5/18*

U.S. Cl. 358—5 **14 Claims**

1. A single frame color encoding/decoding system comprising:

A. an image plate;

B. means for scanning an image developed on said image plate; and said scanning means having a passband such that only frequencies below an upper cutoff frequency are directly resolved by said scanning means;

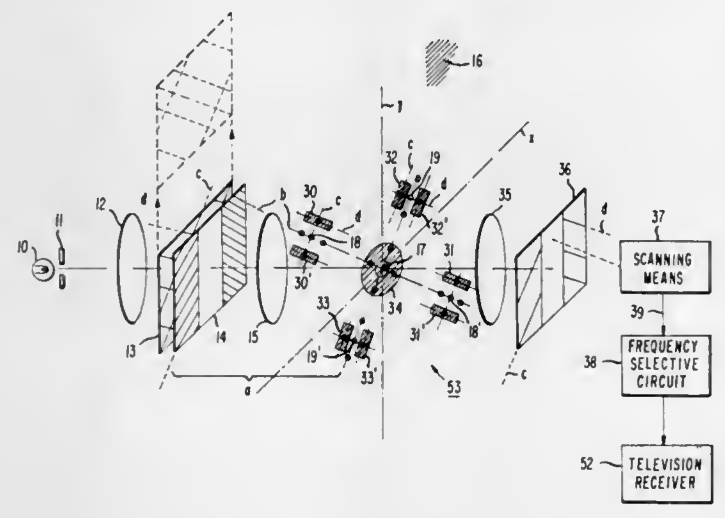
C. a source of sufficiently limited bandwidth and spatially bounded radiant energy for projecting a transparency;

said transparency carrying individual information components on separate, relatively high frequency, spatial carriers oriented in different directions; and the frequencies of said relatively high frequency spatial carriers being above said upper cutoff frequency of said scanning means;

D. a grating rigidly fixed to said scanning means positioned adjacent to said transparency in the path of said radiant energy; said grating consisting of superposition of a plurality of unmodulated, relatively low frequency, spatial carriers also disposed in different orientations; and the frequencies of said relatively low frequency spatial carriers being below said upper cutoff frequency of said scanning means;

E. means positioned in the path of said radiant energy for obtaining a diffraction pattern of the product of said encoded transparency and said grating on a transform plane;

F. means for masking in said transform plane so as to limit each individual information component, encoded in said transparency, to remain on only one of said relatively low frequency spatial carriers of said grating in the output of said masking means;



G. means for imaging the output of said masking means on said image plate, wherein said scanning means translates said low frequency spatial carriers on said image plate into corresponding temporal electrical carriers in the output of said scanning means; and

H. frequency responsive means coupled to the output electrode of said scanning means for obtaining therefrom signals representative of said individual information components.

3,968,516

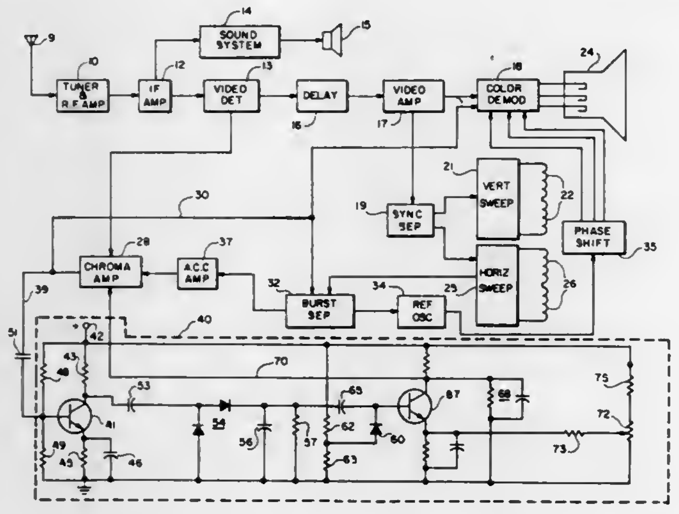
AUTOMATIC GAIN CONTROL CIRCUIT

Paul A. Dal Santo, Woodridge, and Charles J. Marik, Chicago, both of Ill., assignors to Quasar Electronics Corporation, Franklin Park, Ill.

Filed June 3, 1974, Ser. No. 475,565

Int. Cl.^{2} H04N *9/535*

U.S. Cl. 358—27 **12 Claims**



1. A selective frequency automatic gain control circuit for a signal amplifier including in combination:

input circuit means for receiving an amplitude modulated carrier signal having a first predetermined frequency,

a detector-filter network coupled with the output of said input circuit means and having circuit parameters selected to partially detect said carrier signal to produce an output signal comprising the modulation waveform and a portion of the carrier signal;

second detector circuit means including high-pass filter means coupled with the output of said detector-filter network for detecting signals having frequencies above a second predetermined frequency, which is within the frequency range of the information portion of the modulated waveform and which is below said first predetermined frequency, and including means for blocking the detection of signals having a frequency below said second predetermined frequency; and means coupling said second detector circuit with said signal amplifier for supplying gain control signals thereto.

3,968,517

APPARATUS FOR MAGNETICALLY RECORDING AND/OR REPRODUCING VIDEO SIGNALS AND WHICH HAS A STILL MOTION REPRODUCING MODE OF OPERATION

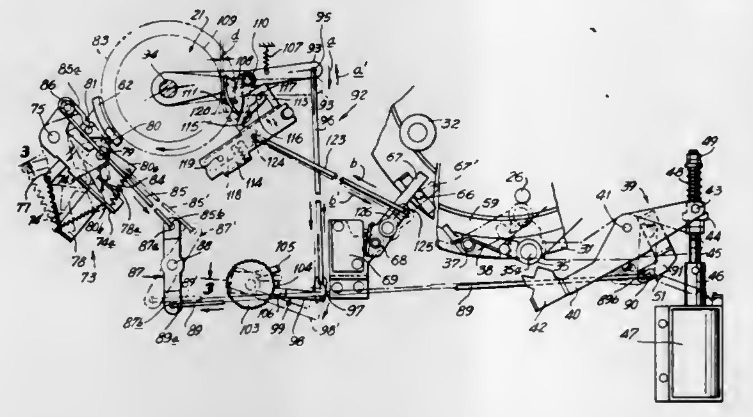
Toshihiko Chimura, and Hirokimi Iwata, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,758

Claims priority, application Japan, Nov. 15, 1973, 48-131978[U]

Int. Cl.^{2} H04N *5/78;* **G11B** *15/42*

U.S. Cl. 360—10 **13 Claims**



1. An apparatus for magnetically recording and/or reproducing video signals on a magnetic tape which is wound on, and extends between supply and take-up reels; comprising a cylindrical tape guide drum having rotary magnetic head means moved in a circular path substantially coinciding with the periphery of the drum, rotatable supply and take-up reel support members engageable by said supply and take-up reels, reel drive means for urging said take-up reel support member to rotate in the direction for winding the tape on said take-up reel, and thereby unwinding the tape from said supply reel, during normal recording and reproducing operations of the apparatus, a capstan spaced from said guide drum, tape guiding means engageable with the tape between said reels for guiding the tape in a helical path about at least a portion of said periphery of the drum and past said capstan, a pinch roller movable toward and away from said capstan with the tape therebetween, actuating means moving said pinch roller against said capstan for driving of the tape by the latter during said normal recording and reproducing operations and moving said pinch roller away from said capstan during a still motion reproducing operation of the apparatus for interrupting the driving of the tape by said capstan, brake means frictionally applied to said supply reel support member during said still motion reproducing operation for holding the supply reel against turning in response to the urging of said take-up reel support member in said direction for winding the tape on said take-up reel, and manually actuable means disposed adjacent said supply reel support member and having an engaging portion thereof normally spaced from said supply reel support member, said manually actuable means being actuable during said still motion reproducing operation so that said engaging portion thereof is urged into secure engagement with said supply reel support member and is responsive to manual control for overriding said brake means to turn the supply reel support member against the frictional resistance of said brake means and thereby displace said tape along said helical path so as to adjust the longitudinal position of the tape in respect to said circular path of the rotary head means.

3,968,518

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS FOR VIDEOTAPE EDITING

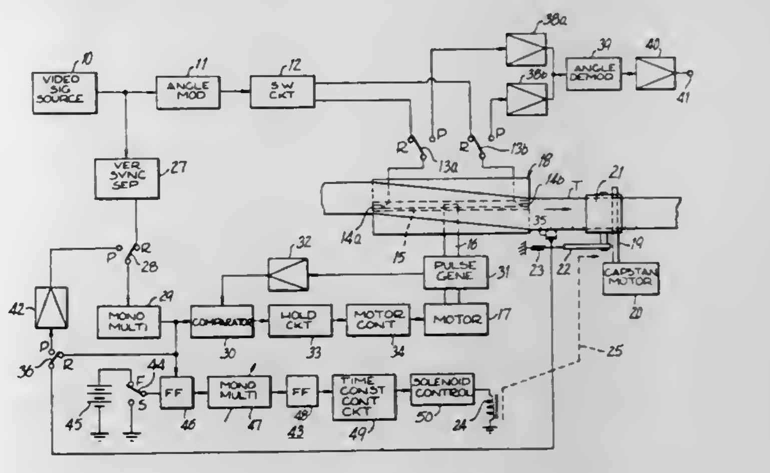
Nobutoshi Kihara, Tokyo, and Tsuguo Miki, Tachikawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 384,577, Aug. 1, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,107

Claims priority, application Japan, Aug. 4, 1972, 47-78102

Int. Cl.^{2} G11B *27/02*

U.S. Cl. 360—14 **17 Claims**



1. In a magnetic recording and reproducing apparatus having rotary head means moved in a circular path for selectively recording and reproducing video signals in respective tracks extending obliquely across a magnetic tape as the latter is transported in one longitudinal direction of the tape; the combination of drive means for effecting the longitudinal transport of the tape including a rotated capstan and a pinch roller movable toward and away from said capstan with the tape therebetween for starting and stopping, respectively, the operation of said drive means and hence the transporting of the tape in said one longitudinal direction, means for producing reference signals in correspondence to the video signals recorded in each of said tracks, means for producing rotational reference signals indicative of the rotational position of said rotary head means, comparator means for compraring the phase of said rotational reference signals with the phase of the first mentioned reference signals at least during the recording operation of the apparatus, means for controlling the rotational movements of said rotary head means in dependence on the phase comparison of said first and rotational reference signals at least during said recording operation of the apparatus so as to record predetermined periods of the video signals in said respective tracks, control means selectively actuable between first and second positions for initiating the starting and stopping, respectively, of the operation of said drive means, detecting means conditioned by actuation of said control means for detecting the occurrence of a predetermined one of said first reference signals following an actuation of said control means, and means controllable by said detecting means upon the detection by the latter of said predetermined first reference signal for selectively stopping and starting the operation of said drive means in dependence upon the positioning of said control means in said second and first positions, respectively, so that, on stopping the operation of the drive means, the tape is brought to rest in a predetermined position in respect to said circular path and, on starting said operation of the drive means, at least during said recording operation, the commencement of the movement of the tape from said position of rest occurs with said rotary head means in a predetermined rotational position.

3,968,519

AMPLIFIER WITH HOWLING-PREVENTING CIRCUIT

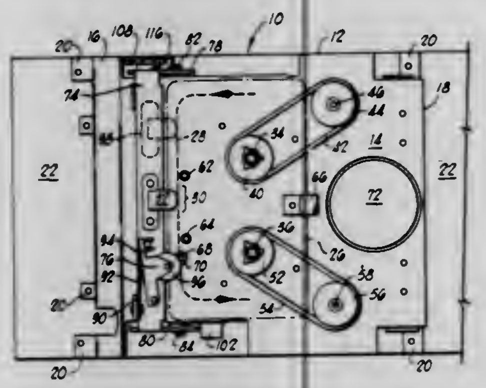
Juho Yoneya, and Isamu Inagaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,286

Claims priority, application Japan, June 12, 1974, 49-68082[U]

Int. Cl.² G11B *15/02, 5/02*

U.S. Cl. 360—62 **13 Claims**



1. The combination of an amplifying circuit, a first smoothing power circuit adapted to be connected to an AC power source for supplying DC power to said amplifying circuit so as to operate the latter and having a relatively large discharging time constant when disconnected from said AC power source, change-over switch means having first and second states, actuating means for said change-over switch means energizable to drive said change-over switch means to said first state and permitting the return of said change-over switch means to said second state upon deenergizing of said actuating means, a second smoothing power circuit also adapted to be connected to the AC power source for supplying DC power to energize said actuating means and having a relatively small discharging time constant when disconnected from said AC power source, and holding circuit means for holding said change-over switch means in said first state thereof for a predetermined time after said first and second smoothing power circuits are disconnected from said AC power source.

3,968,520

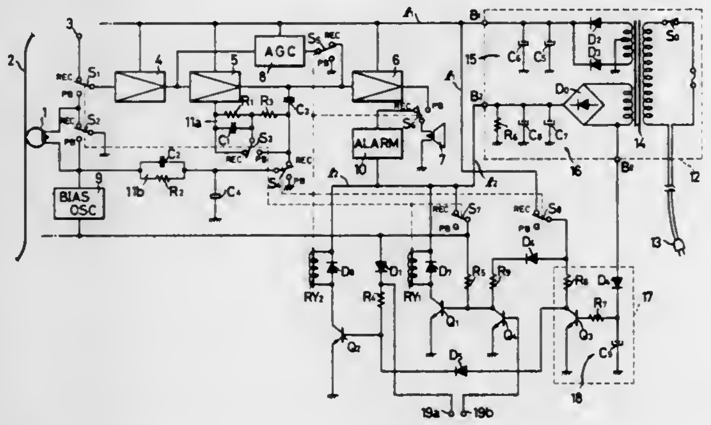
AUTOMATIC CONTROL CIRCUITRY FOR TAPE TRANSDUCING APPARATUS

Lawrence R. DeBell, Bethany, and David D. Price, Jr., Oklahoma City, both of Okla., assignors to The Economy Company; David D. Price, Jr. and Ford C. Price, all of Oklahoma City, Okla., part interest to each

Filed Mar. 28, 1975, Ser. No. 563,136

Int. Cl.² G11B *5/55, 15/18, 21/08*

U.S. Cl. 360—71 **13 Claims**



1. A control circuit for tape transducer apparatus of the type powered by an electrical source and having a forward drive reel moving record tape past a fixed position from a reverse reel which may be selectively reverse driven, and which includes a transducer head selectively engageable in operative position at said fixed position, comprising:

means energizable to drive said forward drive reel;

switching means having plural inputs and actuatable to provide plural outputs including a first output to energize said means to drive and a second output latching voltage;

reactance means for actuating said switching means when said reactance means is conductive, said reactance means receiving said second output latching voltage thereby to maintain conduction;

circuit means connected to said means to drive said forward drive reel which generates a voltage indicative of tape motion for input to said switching means as said latching voltage; and

second switching means actuatable to initiate conduction of said reactance means.

DESIGN PATENTS

GRANTED JULY 6, 1976

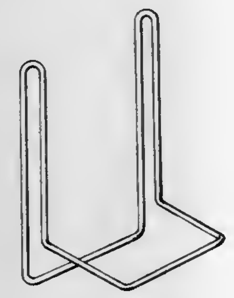
ERRATA

For CLASS	See PATENT NO.
009-060	240,391
025-056	240,419
016-061	240,457
016-063	240,458
016-030	240,459
016-017	249,460

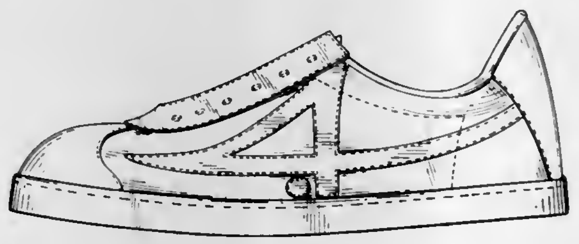
DESIGNS

JULY 6, 1976

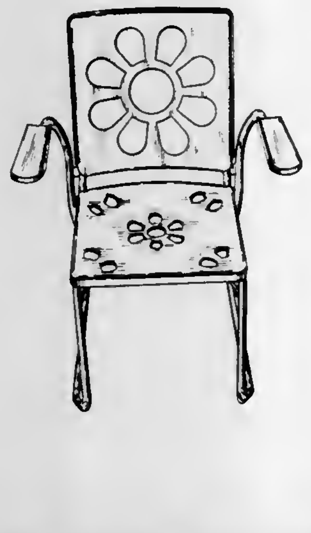
240,370
BELT-ATTACHED TOOL HOLDER
George E. Kuehl, 616 E. 16th Ave.,
Eugene, Oreg. 97401
Filed Sept. 23, 1974, Ser. No. 508,086
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



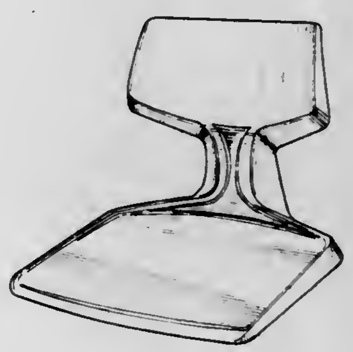
240,371
ATHLETIC SHOE
Bruce L. Shelly, Canton Ohio, and Michael L. Oliver, Temperance, Mich., assignors to Point Four Limited, Inc.
Filed Dec. 16, 1974, Ser. No. 530,971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



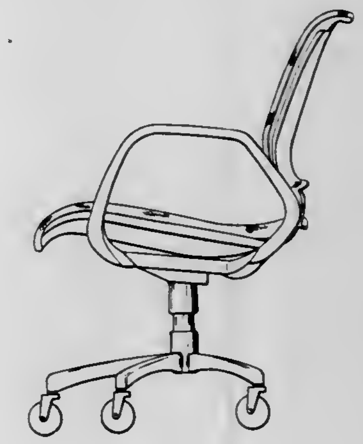
240,372
CHAIR
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation S.A., Poteaux, Hauts-de-Seine, France
Filed Nov. 9, 1973, Ser. No. 414,335
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



240,373
CHAIR SHELL
Philip Hugh Morton, Kidderminster, England, assignor to Pel Limited, Oldbury, Warley, England
Filed Feb. 6, 1974, Ser. No. 440,073
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



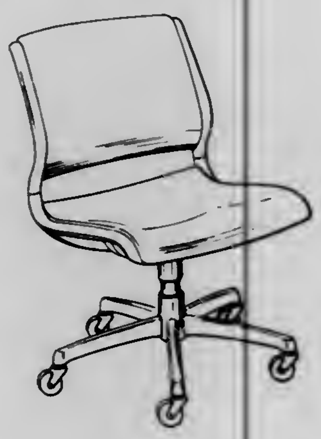
240,374
CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Apr. 22, 1974, Ser. No. 463,193
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



240,375
CHAIR

Randall P. Buhk, Wyoming, Mich., assignor to
Steelcase, Inc., Grand Rapids, Mich.
Filed Apr. 22, 1974, Ser. No. 463,194
Term of patent 14 years
Int. Cl. D6—*01*

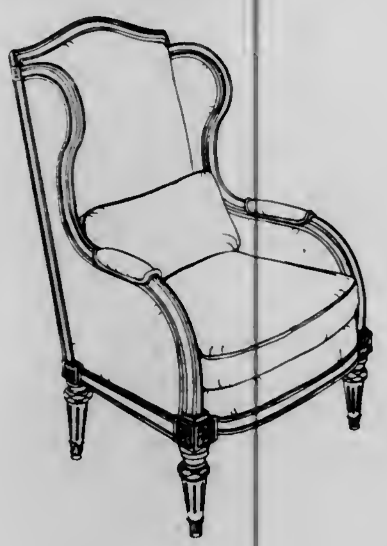
U.S. Cl. D6—30



240,376
ARMCHAIR OR THE LIKE

Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 23, 1974, Ser. No. 463,290
Term of patent 14 years
Int. Cl. D6—*01*

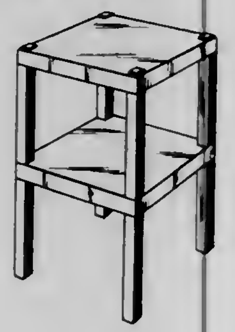
U.S. Cl. D6—68



240,377
TELEPHONE STAND

George V. Goulder, 2707 Eaton Road,
Shaker Heights, Ohio 44118
Filed July 5, 1974, Ser. No. 485,961
Term of patent 14 years
Int. Cl. D6—*179*

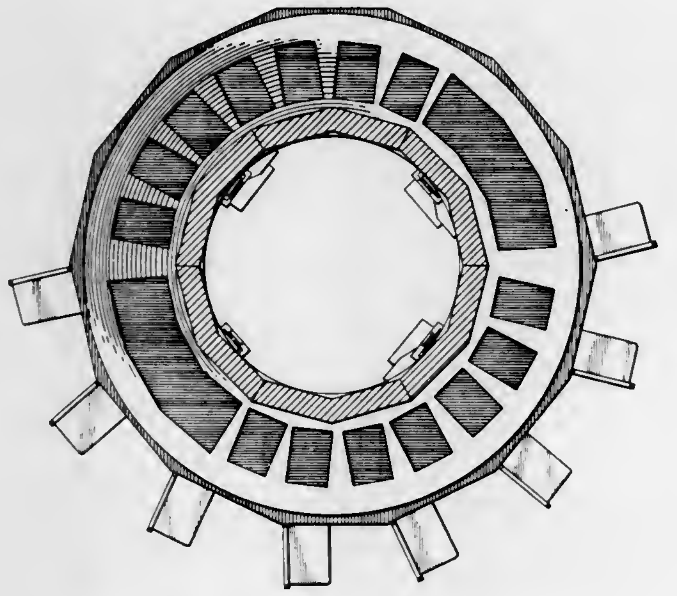
U.S. Cl. D6—179

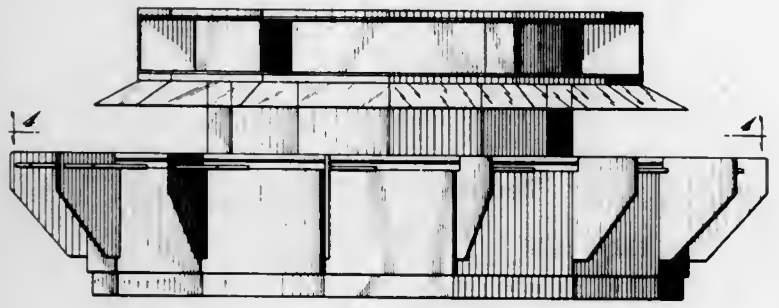


240,378
COMBINED ROTATING CAFETERIA TYPE FOOD SERVICE COUNTER AND DISPLAY CASE

Elmer R. Weddendorf, Cincinnati, Ohio, assignor to
B/W Metals Company, Inc., Fairfield, Ohio
Filed Sept. 3, 1974, Ser. No. 503,028
Term of patent 14 years
Int. Cl. D6—*04*

U.S. Cl. D6—146

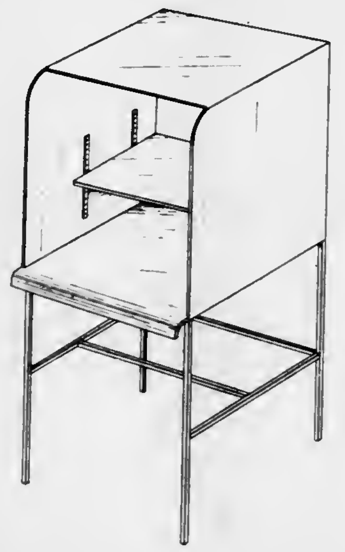




240,379
STUDENT CARREL

Norman R. Selinger, 401 Southlawn Lane,
Rockville, Md. 20850
Filed Dec. 27, 1974, Ser. No. 536,745
Term of patent 3½ years
Int. Cl. D6—*99*

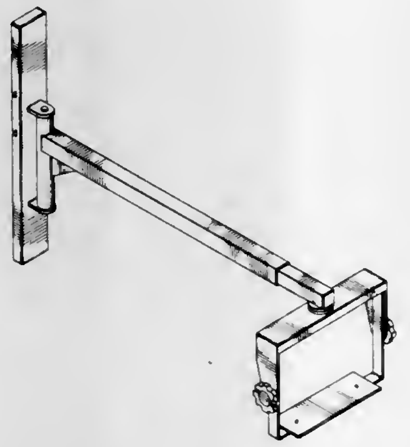
U.S. Cl. D6—181



240,380
WALL MOUNTED SUPPORT FOR TELEVISIONS OR THE LIKE

Henry E. Jepsen, Whittier, Calif., assignor to
Corvex Corporation, Santa Fe Springs, Calif.
Filed Jan. 13, 1975, Ser. No. 540,326
Term of patent 14 years
Int. Cl. D6—*04*

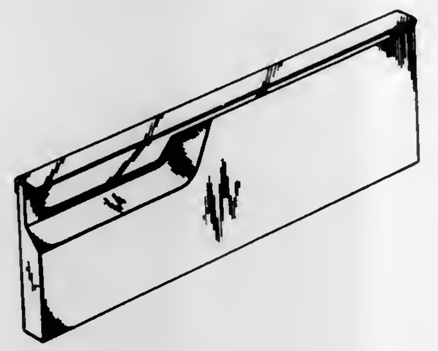
U.S. Cl. D6—114



240,381
COMBINED DRAWER FRONT AND PULL THEREFOR

Michiharu Tazaki, Yokohama, Japan, assignor to
Kyoei Kogyo Kabushiki Kaisha
Filed Mar. 3, 1975, Ser. No. 555,058
Term of patent 14 years
Int. Cl. D6—*06*

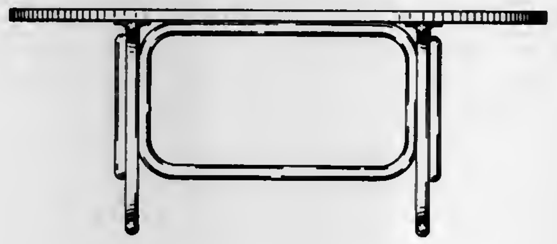
U.S. Cl. D6—192



240,382
TABLE

Philip J. Hendrickson, and Richard J. Resch, Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.
Filed Apr. 21, 1975, Ser. No. 569,910
Term of patent 14 years
Int. Cl. D6—*03*

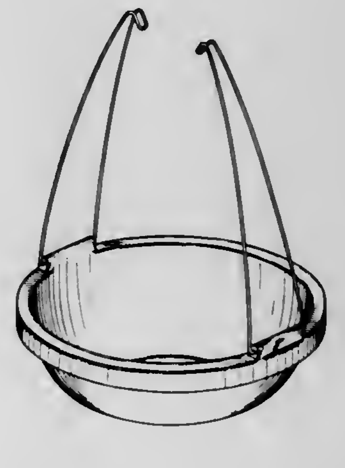
U.S. Cl. D6—146



240,383
PENDANT DRIP RECEPTACLE FOR HANGING POTTED PLANTS

Del G. Connell, 22915 Dolorosa St.,
Woodland Hills, Calif. 91364
Filed June 30, 1975, Ser. No. 591,621
Term of patent 14 years
Int. Cl. D11—*02*

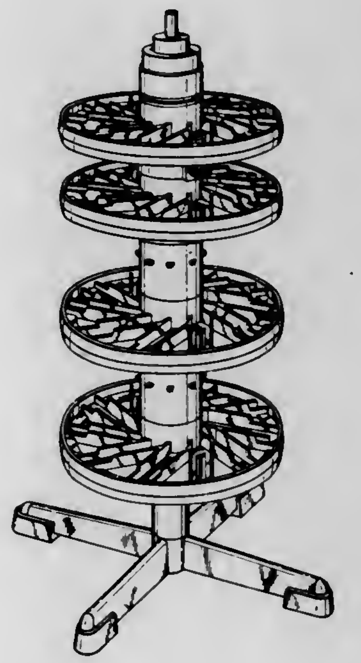
U.S. Cl. D6—113



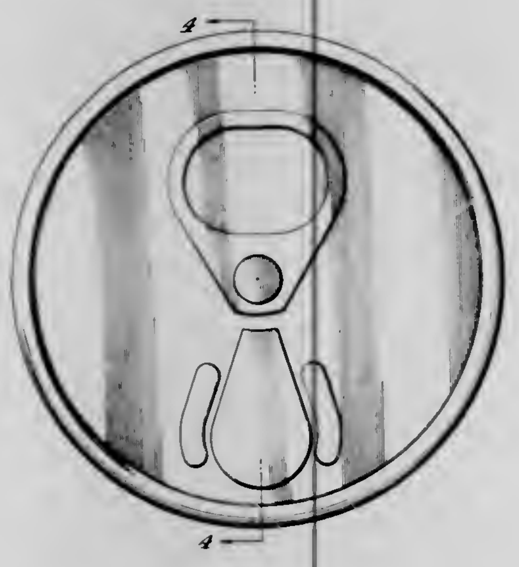
240,384
ROTARY DISPLAY STAND

Richard Roy Rumble, and Clive St. John Rumble, London, England, and Patrick J. Henderson, Larne, Northern Ireland, assignors to Fittall Products Limited London, England
Filed Feb. 26, 1975, Ser. No. 553,440
Claims priority, application Great Britain Aug. 30, 1974
Term of patent 14 years
Int. Cl. D20—*02*

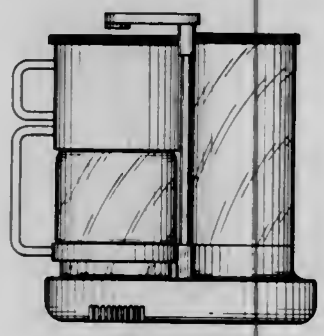
U.S. Cl. D6—29



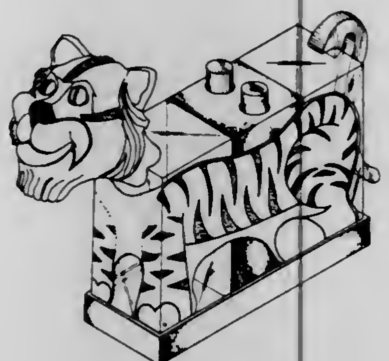
240,385
CONTAINER COVER
James K. Pfleider, Anoka, Minn., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jun. 11, 1973, Ser. No. 368,711
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—131



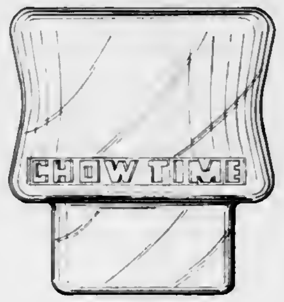
240,386
COFFEEMAKER
Franz Alban Stuetzer, Mueblheim, am Main, Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Germany
Filed July 26, 1974, Ser. No. 492,124
Claims priority, application Germany Jan. 29, 1974
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



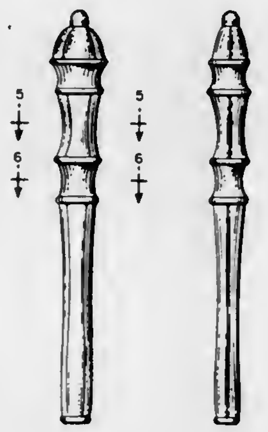
240,387
COMBINED SALT AND PEPPER DISPENSER
John W. Downey, Warren, Pa., assignor to Whirley Industries, Inc., Warren, Pa.
Filed Aug. 16, 1974, Ser. No. 497,845
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—56



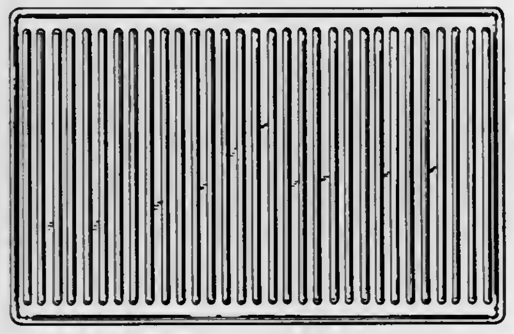
240,388
DRINKING GLASS
John M. Werling, 209 E. 36th St., Apartment #3, Kansas City, Mo. 64111
Filed Sept. 18, 1974, Ser. No. 506,959
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—15



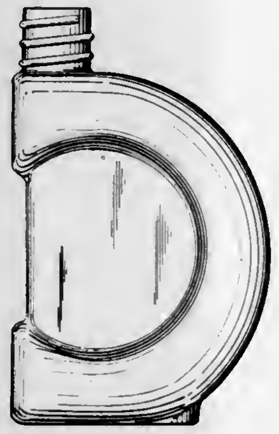
240,389
HANDLE FOR FLATWARE
Theodore Merry, Byfield, Mass., assignor to Towle Manufacturing Company, Newburyport, Mass.
Filed Feb. 18, 1975, Ser. No. 550,198
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—152



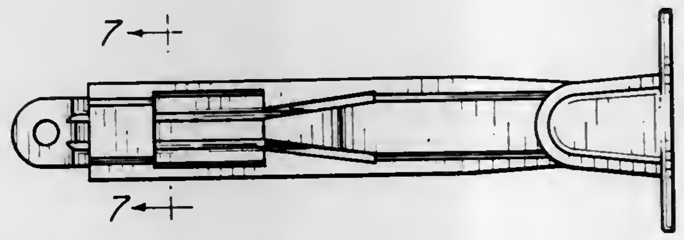
240,390
KITCHEN CUTTING BOARD
Franklin G. Smith, Portland, Oreg., assignor to Manufacturers Consultants, Inc., Portland, Oreg.
Substitute for application Ser. No. 381,889, July 23, 1973. This application Mar. 5, 1975, Ser. No. 555,521
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



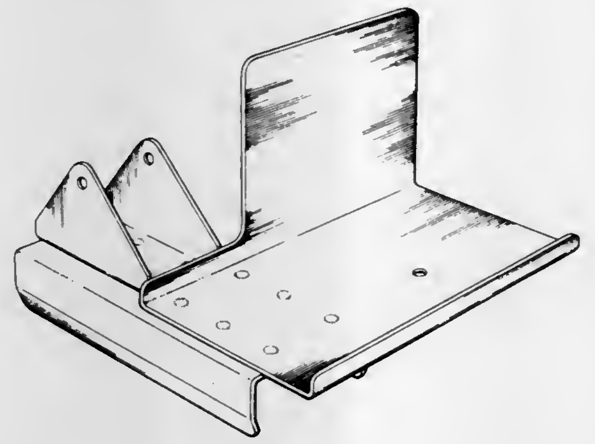
240,391
BOTTLE OR SIMILAR ARTICLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 25, 1975, Ser. No. 561,811
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60



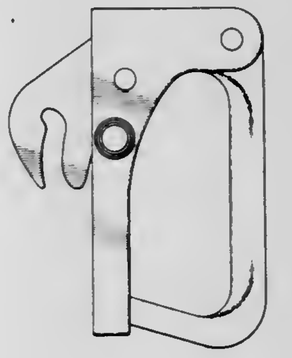
240,392
DOOR SUPPORT
Howard B. Gorton, San Gabriel, George D. Read, Glendora, and Keith E. Ridgeway, West Covina, Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.
Filed May 17, 1974, Ser. No. 470,925
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—203



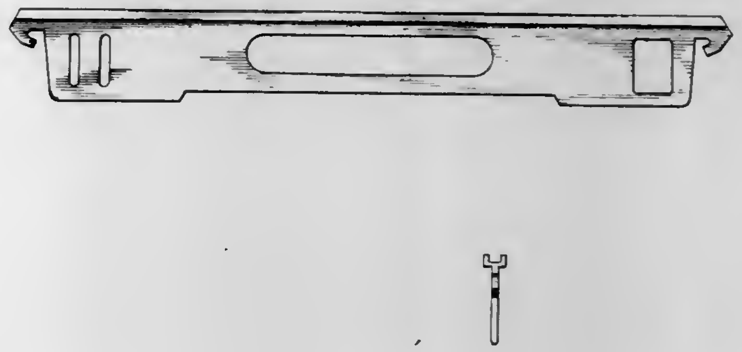
240,393
DRAFTSMAN'S TOOL HOLDER FOR A DRAFTING MACHINE
Mark T. Donahue, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Filed Oct. 29, 1974, Ser. No. 518,761
Term of patent 14 years
Int. Cl. D6—*03;* D8—*08*
U.S. Cl. D8—71



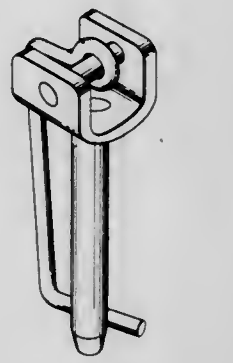
240,394
LOCKING DRAWER HANDLE
Larry A. Geer, Upland, and Ralph L. Sheffer, Arcadia, Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.
Filed Dec. 2, 1974, Ser. No. 528,644
Term of patent 14 years
Int. Cl. D8—*06;* D8—*07*
U.S. Cl. D8—150



240,395
SUSPENSION HANDLE FOR DATA BINDERS
Walter Feldmahr, Highland Park, Ill., assignor to Acco International Inc., Chicago, Ill.
Filed Dec. 17, 1974, Ser. No. 533,681
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154



240,396
HITCH PIN
Marvin E. Gray, R.R. #2, Gallatin, Mo. 64640
Filed Feb. 24, 1975, Ser. No. 552,446
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—265

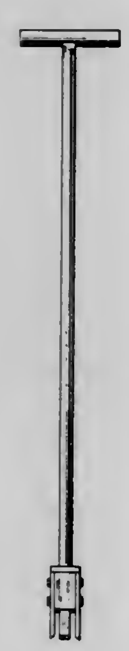


240,397

STUD STABILIZER

David M. Robinson, 6710 NW. 8th St.,
Margate, Fla. 33063
Filed Feb. 27, 1975, Ser. No. 553,581
Term of patent 14 years
Int. Cl. D8—*05*

U.S. Cl. D8—14

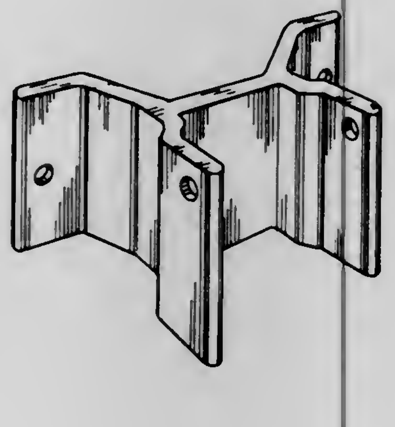


240,398

BRACKET FOR A RETRACTABLE AWNING

Donald S. McKee, Louisville, Colo., assignor to The
Scott & Fetzer Company, Lakewood, Ohio
Filed Mar. 24, 1975, Ser. No. 561,329
Term of patent 14 years
Int. Cl. D8—*08*

U.S. Cl. D8—208

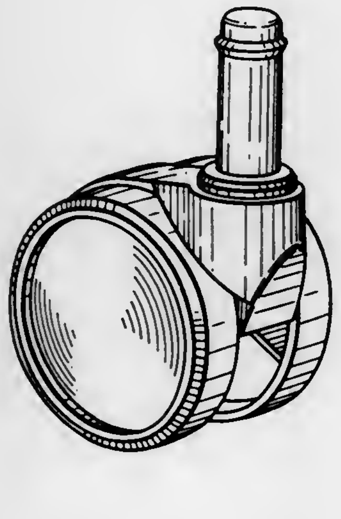


240,399

DUAL WHEEL CASTER ASSEMBLY

Donald C. Crescenzi, Branford, and Frank J. Fontana,
Stratford, Conn., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed June 6, 1975, Ser. No. 584,378
Term of patent 14 years
Int. Cl. D8—*09*

U.S. Cl. D8—226

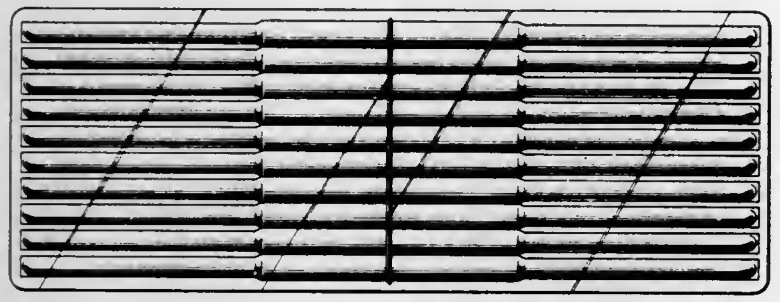


240,400

PACKAGING CONTAINER FOR ELECTRONIC THERMOMETER PROBES

Michael J. Marino, Lynn, Mass., assignor to
ROI Corporation, Peabody, Mass.
Filed Dec. 13, 1973, Ser. No. 424,361
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D9—193

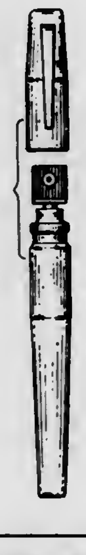


240,401

AEROSOL DISPENSER

John C. Armstrong, 1031 Canton Ave.,
Milton, Mass. 02186
Filed June 10, 1974, Ser. No. 477,662
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—23

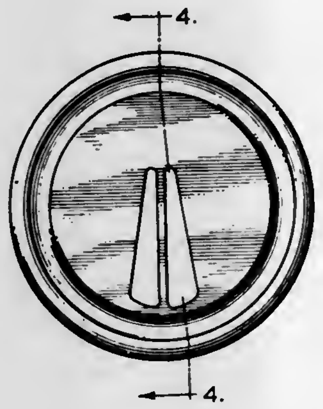


240,402

CONTAINER END PANEL

Fred C. Newman, La Grange Park, Ill., assignor to
Continental Can Company, Inc., New York, N.Y.
Filed Dec. 6, 1974, Ser. No. 530,462
Term of patent 14 years
Int. Cl. D9—*99*

U.S. Cl. D9—253

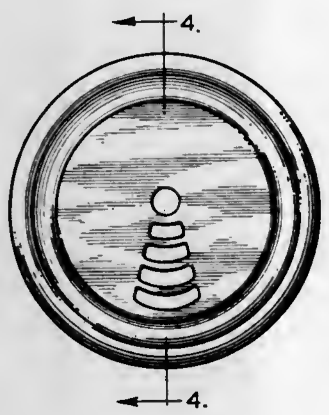


240,403

CONTAINER END PANEL

Fred C. Newman, La Grange Park, Ill., assignor to
Continental Can Company, Inc., New York, N.Y.
Filed Dec. 6, 1974, Ser. No. 530,465
Term of patent 14 years
Int. Cl. D9—*99*

U.S. Cl. D9—253

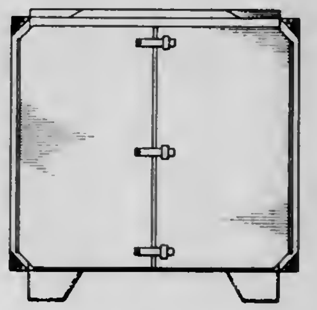


240,404

MODULAR SHIPPING CONTAINER

Frederic J. Singer, 715 S. Nakama Drive,
Santa Ana, Calif. 92704
Filed Jan. 20, 1975, Ser. No. 542,203
Term of patent 14 years
Int. Cl. D9—*04*

U.S. Cl. D9—246

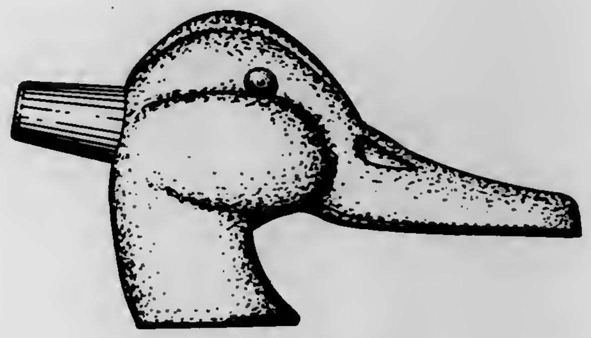


240,405

WATER FOWL HEAD GAME CALL

Walter Erhart, Box 36, Kirkwood, Del. 19708
Filed Apr. 25, 1975, Ser. No. 571,748
Term of patent 14 years
Int. Cl. D10—*06*

U.S. Cl. D10—120

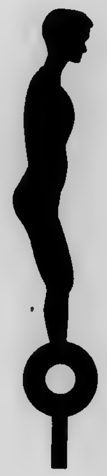


240,406

HAND FOR A WATCH

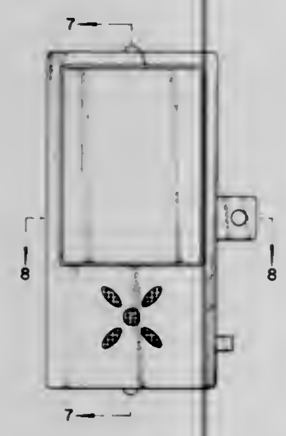
Paulette G. Kelman, 19264 Pacific Coast Highway,
Malibu, Calif. 90265
Filed Nov. 27, 1970, Ser. No. 26,203
Term of patent 14 years
The term of this patent subsequent to Dec. 6, 1988,
has been disclaimed
Int. Cl. D10—*07*

U.S. Cl. D10—127



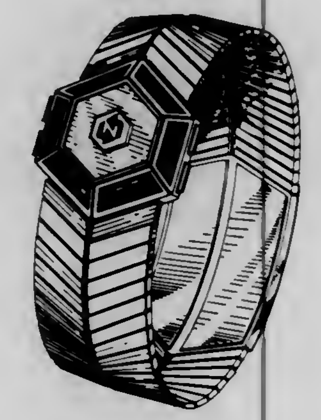
240,407
CLOCK DIAL

Roman J. Szalek, La Salle, Ill., assignor to General Time Corporation, Thomaston, Conn.
Filed Dec. 17, 1974, Ser. No. 533,665
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



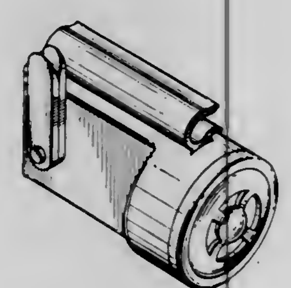
240,408
CLOCK DIAL

Roman J. Szalek, La Salle, Ill., assignor to General Time Corporation, Thomaston, Conn.
Filed Dec. 18, 1974, Ser. No. 534,061
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



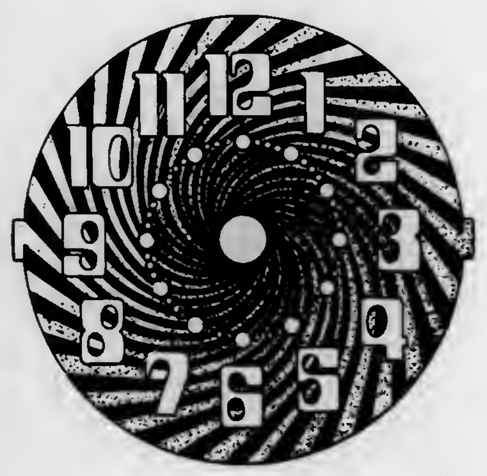
240,409
DIGITAL MULTIMETER

Derek David Roberts, Berkhamsted, England, assignor to The Solartron Electronic Group Ltd., Farnborough, England
Filed Jan. 20, 1975, Ser. No. 542,399
Claims priority, application United Kingdom July 27, 1974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



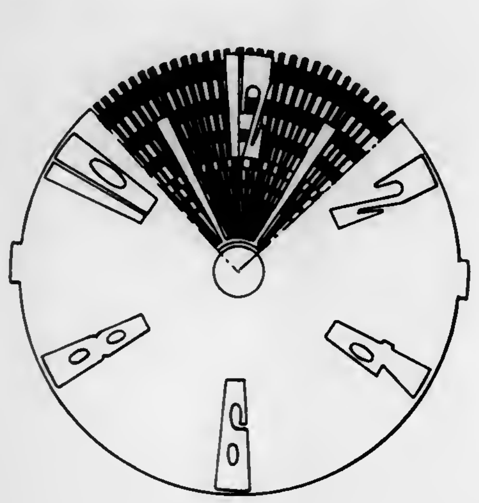
240,410
INTRUSION ALARM

Akinobu Fujiwara, 593–38 Naganuma-cho, Hachioji, Tokyo, Japan
Filed Jan. 20, 1975, Ser. No. 543,010
Claims priority, application Japan Sept. 4, 1974
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



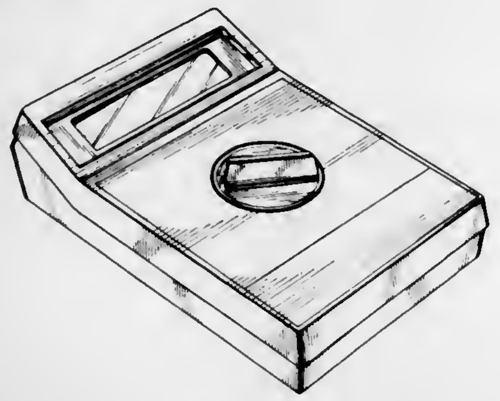
240,411
WRIST WATCH

Terry M. Haber, 3050 S. Bristol, 8C, Santa Ana, Calif. 92707
Filed Mar. 3, 1975, Ser. No. 554,690
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



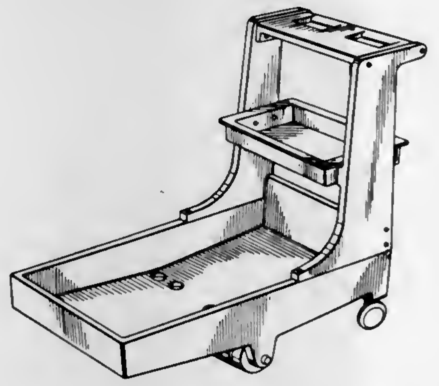
240,412
FISHING SIGNAL

Theodore Montgomery, Box 43, and Wayne T. Wise, Box 175, both of Frankfort, S. Dak. 57440
Filed Mar. 6, 1975, Ser. No. 555,745
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



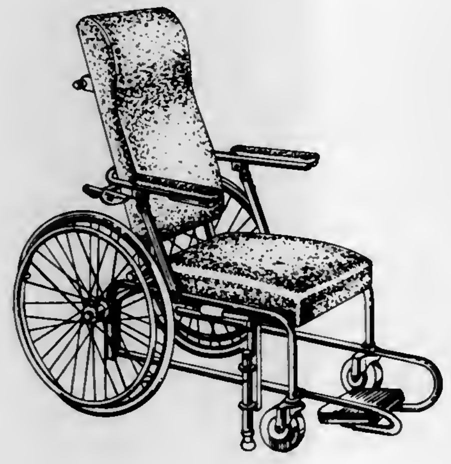
240,413
NURSERY CART

Calvin D. Swalm, deceased, late of San Diego, Calif., by Geraldine F. Swalm, executrix, 8930 Heraldry St., San Diego, Calif. 92123
Filed Apr. 4, 1974, Ser. No. 457,781
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



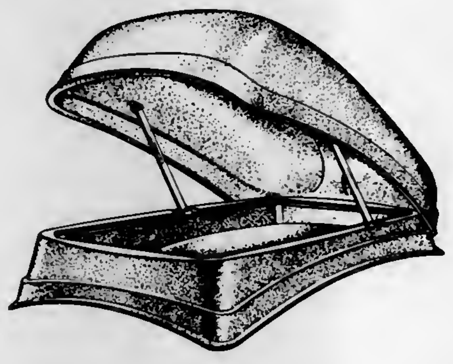
240,414
ADJUSTABLE WHEELCHAIR

Morton I. Thomas, Monroe, N.Y., assignor to Temco Products, Inc.
Filed Sept. 23, 1974, Ser. No. 508,066
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



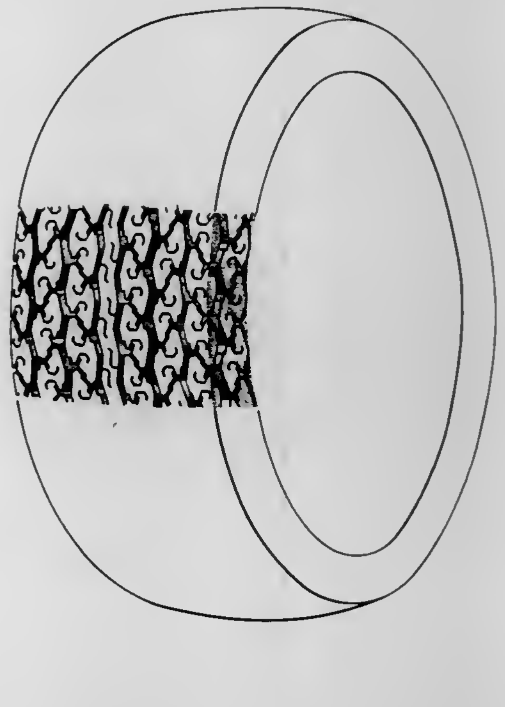
240,415
CAR TOP LUGGAGE CARRIER

Edward J. Schoening, 9726 S. Charles St., Chicago, Ill. 60621
Filed Jan. 20, 1975, Ser. No. 542,171
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



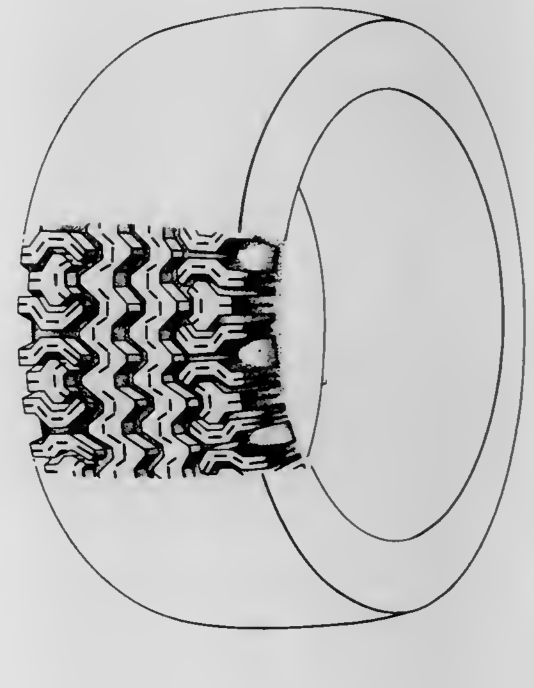
240,416
PNEUMATIC TIRE TREAD AND BUTTRESS

Gerassimos C. Candiliotis, Agawam, Mass., assignor to Uniroyal, Inc.
Filed Mar. 10, 1975, Ser. No. 556,832
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



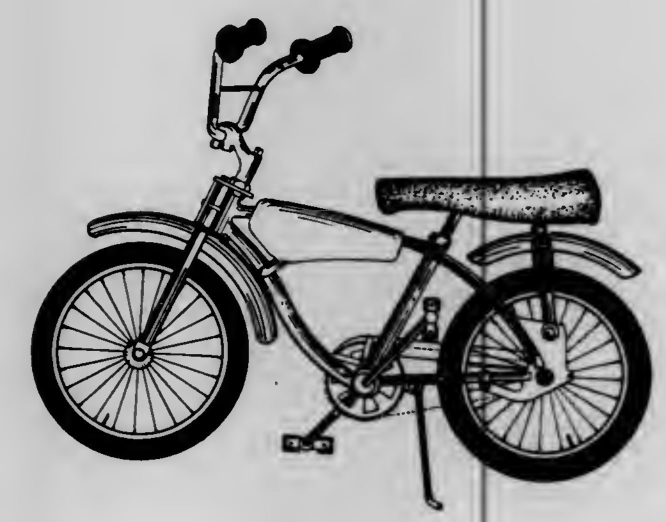
240,417
PNEUMATIC TIRE TREAD AND BUTTRESS

Gerassimos C. Candiliotis, Agawam, Mass., assignor to Uniroyal, Inc.
Filed Mar. 24, 1975, Ser. No. 561,566
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



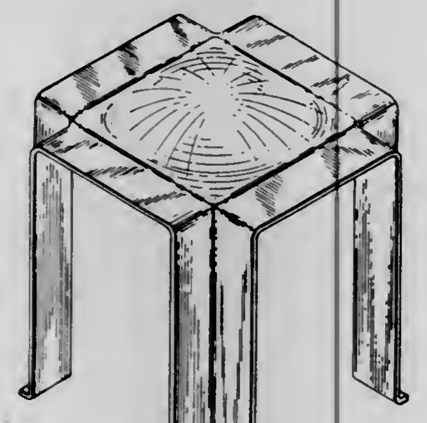
240,418
BICYCLE

Tetsuo Hirano, Hammatsu, Japan, and Danny H. Shumate, La Mirada, Calif., assignors to U.S. Suzuki Motor Corporation, Santa Fe Springs, Calif.
Continuation-in-part of abandoned design application Ser. No. 381,043, July 20, 1973. This application Apr. 23, 1975, Ser. No. 570,732
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



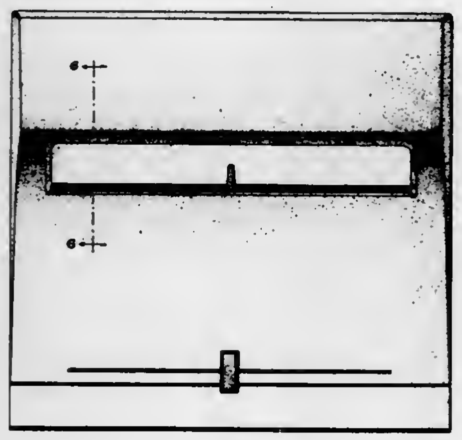
240,419
SHELTER FOR RAPID TRANSIT AND BUS STATIONS

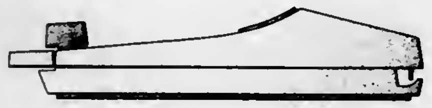
William B. Cooke, 40 Fitzgerald Road, Marlboro, Mass. 01752
Filed Oct. 2, 1974, Ser. No. 511,483
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56



240,420
TELEPHONE INDEX

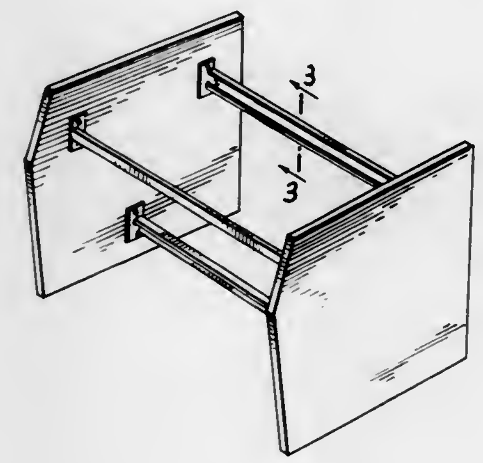
Manfred Hegemann, Nyack, N.Y., assignor to The Bates Manufacturing Company, Orange, N.J.
Filed Sept. 9, 1974, Ser. No. 504,115
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76





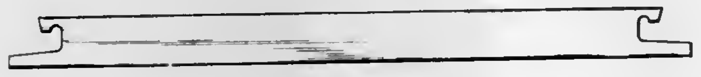
240,421
RACK FOR SUSPENSION OF DATA BINDERS

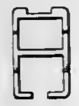
Allen J. Rose, Long Grove, Ill., assignor to Acco International Inc., Chicago, Ill.
Filed Dec. 17, 1974, Ser. No. 533,679
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D19—90



240,422
TRACK FOR SUSPENSION OF DATA BINDERS

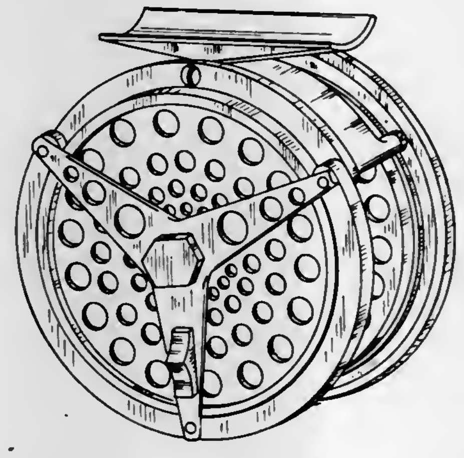
Walter Feldmahr, Highland Park, Ill., assignor to Acco International Inc., Chicago, Ill.
Filed Dec. 17, 1974, Ser. No. 533,680
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—99





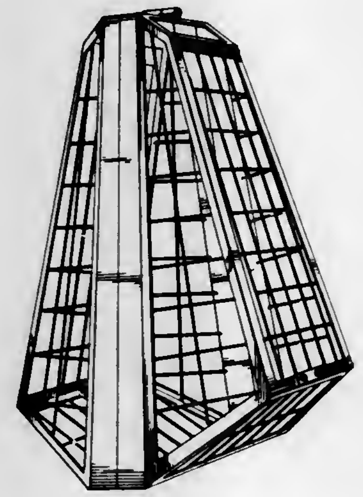
240,423
REEL FOR FLY FISHING

Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Aug. 1, 1974, Ser. No. 493,986
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



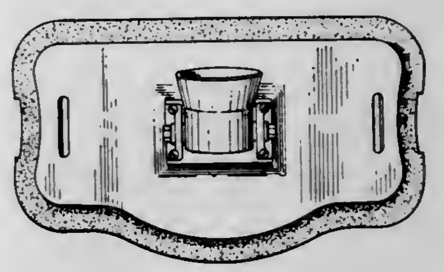
240,424
TRAP FOR CRABBING AND FISHING

Thomas McSherry, Bayport, N.Y., assignor to Woodstream Corporation, Lititz, Pa.
Filed Dec. 11, 1974, Ser. No. 531,777
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



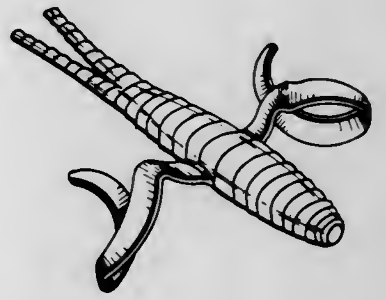
240,425
FISHING POLE HOLDER

Donald Joseph Gurgiolo, Islamorado, Fla., assignor to Gonfishin Products, Inc.
Filed June 10, 1975, Ser. No. 585,687
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



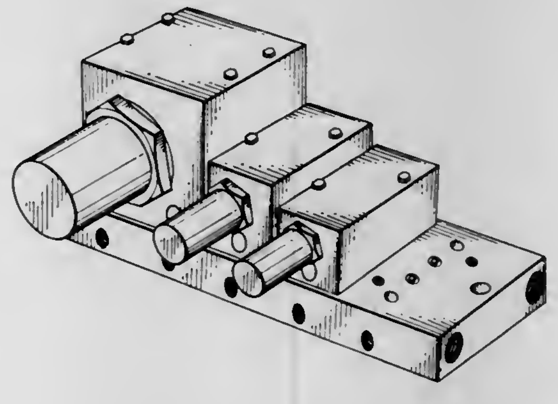
240,426
FISHING LURE

C. Paul Haven, Beaver Dam, Ky., assignor to Nationwide Lure Manufacturing Co., Inc.
Filed Oct. 2, 1975, Ser. No. 619,012
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



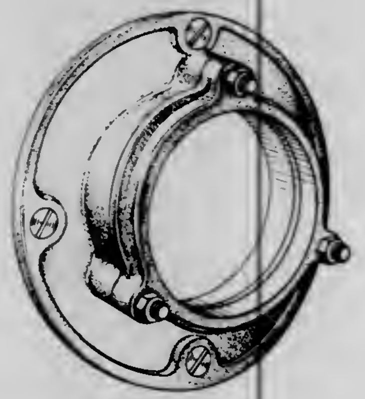
240,427
MANIFOLD COMPRISING MODULE UNITS FOR A CENTRAL LUBRICATION SYSTEM

Alpo E. Ikonen, Korpilahti, and Kauko S. Hytonen, Muurame, Finland, assignors to Oy Safematic Ltd., Muurame, Finland
Filed Feb. 13, 1974, Ser. No. 442,009
Claims priority, application Finland Aug. 16, 1973
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



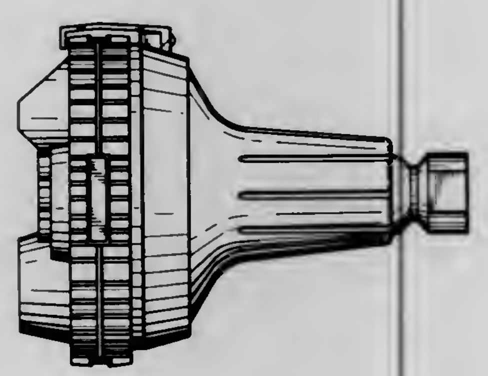
240,428
PIPE ADAPTER

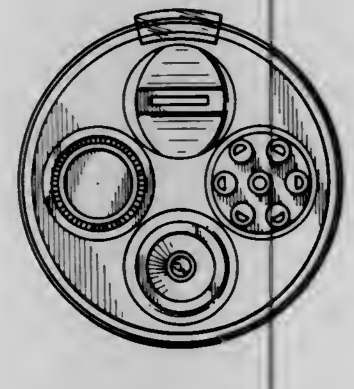
John J. Hoffman, South Bend, Ind., assignor to Jackel Company, Inc., South Bend, Ind.
Filed Nov. 13, 1974, Ser. No. 523,243
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



240,429
SHOWER HEAD

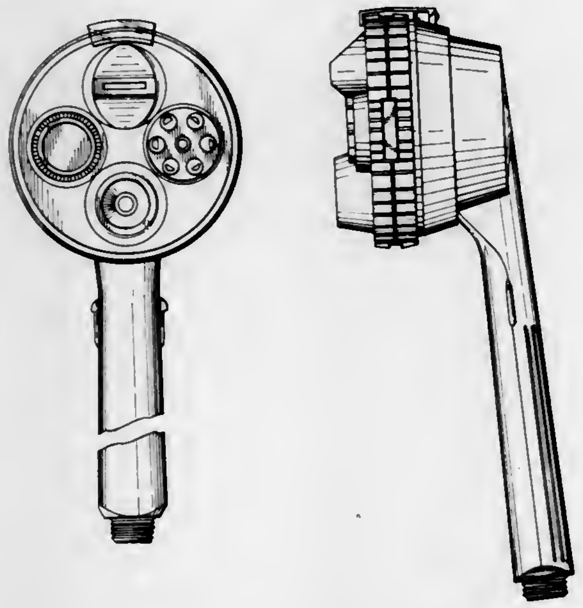
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Incorporated
Filed Aug. 18, 1975, Ser. No. 605,262
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35





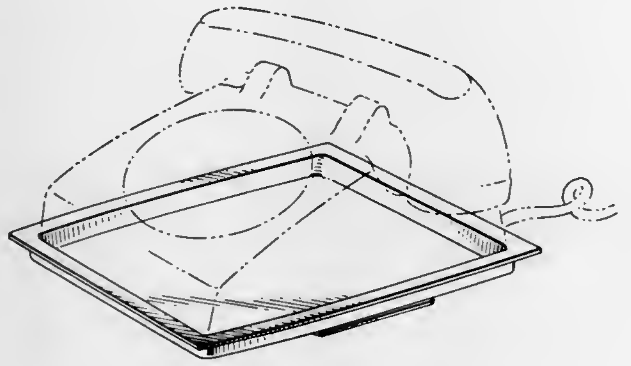
240,430
HAND-HELD SHOWER HEAD

Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Incorporated
Filed Aug. 18, 1975, Ser. No. 605,263
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—35



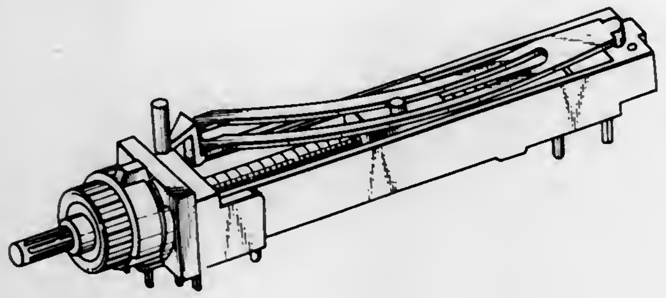
240,431
TELEPHONE STAND

Henry P. Stapp, 1401 Leroy, Berkeley, Calif. 94708
Filed Aug. 5, 1974, Ser. No. 494,844
Term of patent 14 years
Int. Cl. D6—*03;* D14—*03*
U.S. Cl. D26—14 A



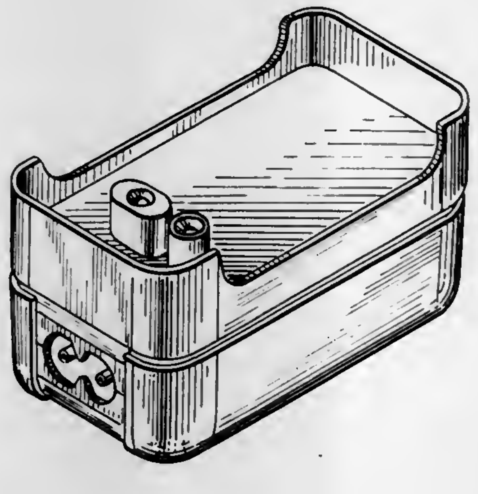
240,432
VARIABLE RESISTOR

Shunzo Oka, Hirakata, Osaka, and Akitoshi Moyashita, Suita, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 20, 1974, Ser. No. 534,921
Claims priority, application Japan June 20, 1974
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



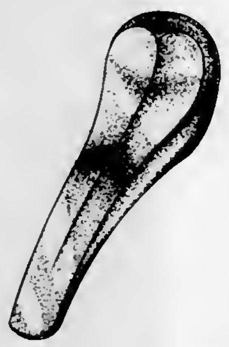
240,433
ELECTRIC SHAVER BATTERY CHARGING STAND

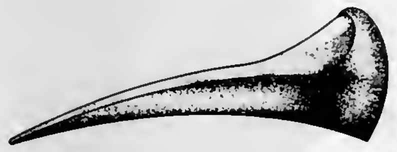
Jacob A. Krapowicz, Ridgefield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Feb. 24, 1975, Ser. No. 552,631
Term of patent 14 years
Int. Cl. D13—*02;* D28—*03*
U.S. Cl. D26—15 B



240,434
SHOULDER SUPPORT FOR TELEPHONES

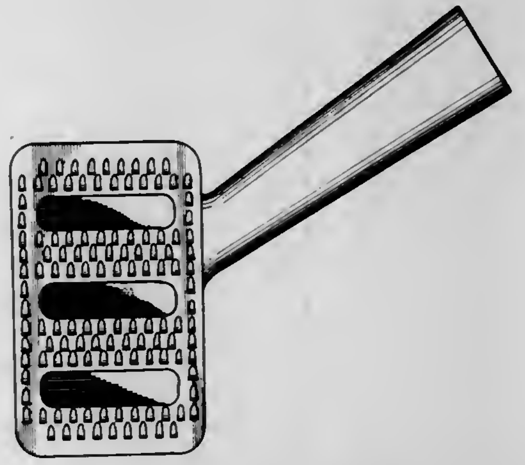
Lyle J. Martinsen, 315 E. 6310 South
Murray, Utah 84107
Filed Mar. 10, 1975, Ser. No. 556,764
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

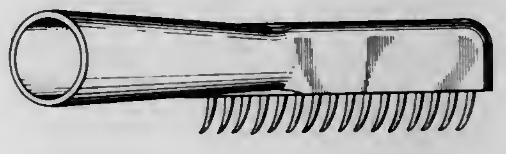




240,435
DOG BRUSH

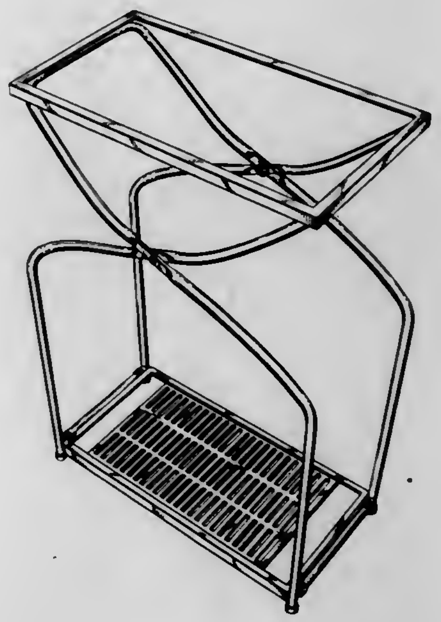
Jerry Remijas, Chicago, Ill., assignor to Corporate Products Research, Inc., Chicago, Ill.
Filed Sept. 6, 1974, Ser. No. 506,281
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—40



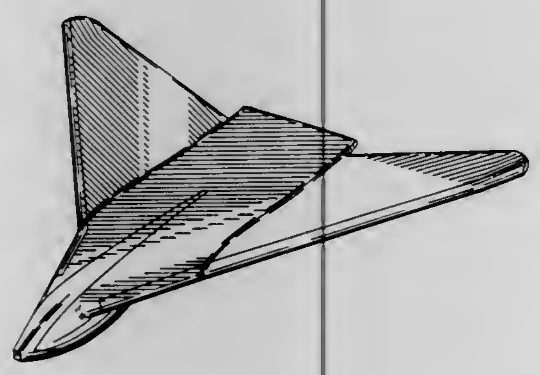


240,436
AQUARIUM STAND

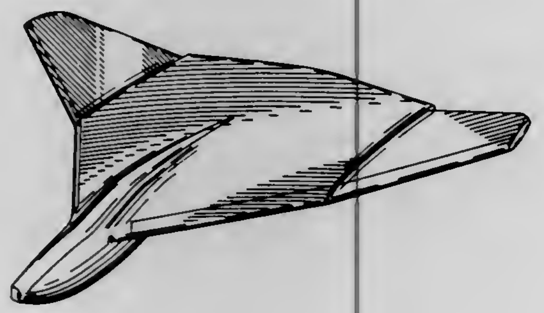
Samuel Rosenberg, Brooklyn, N.Y., assignor to Excelsior Pet Products, Inc., Brooklyn, N.Y.
Filed Mar. 10, 1975, Ser. No. 556,627
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D30—12



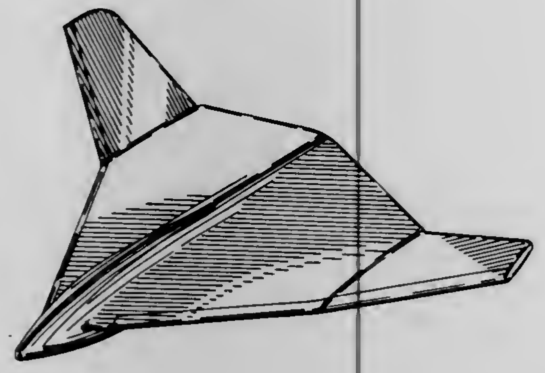
240,437
MODEL GLIDER
Earl Rizzo, Lakewood, Ohio, assignor to
Cosmo, Inc., Cleveland, Ohio
Filed July 10, 1974, Ser. No. 486,957
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



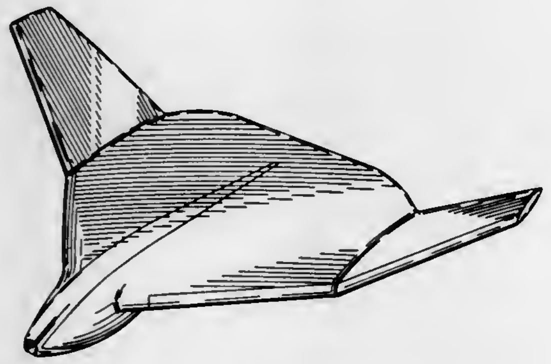
240,438
MODEL GLIDER
Earl Rizzo, Lakewood, Ohio, assignor to
Cosmo, Inc., Cleveland, Ohio
Filed July 10, 1974, Ser. No. 486,958
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



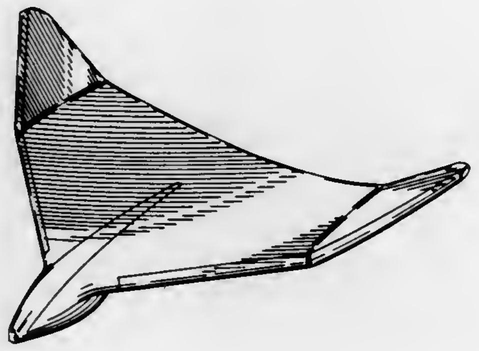
240,439
MODEL GLIDER
Earl Rizzo, Lakewood, Ohio, assignor to
Cosmo, Inc., Cleveland, Ohio
Filed July 10, 1974, Ser. No. 486,959
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



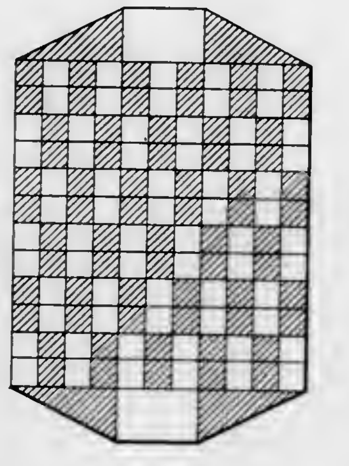
240,440
MODEL GLIDER
Earl Rizzo, Lakewood, Ohio, assignor to
Cosmo, Inc., Cleveland, Ohio
Filed July 10, 1974, Ser. No. 487,046
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



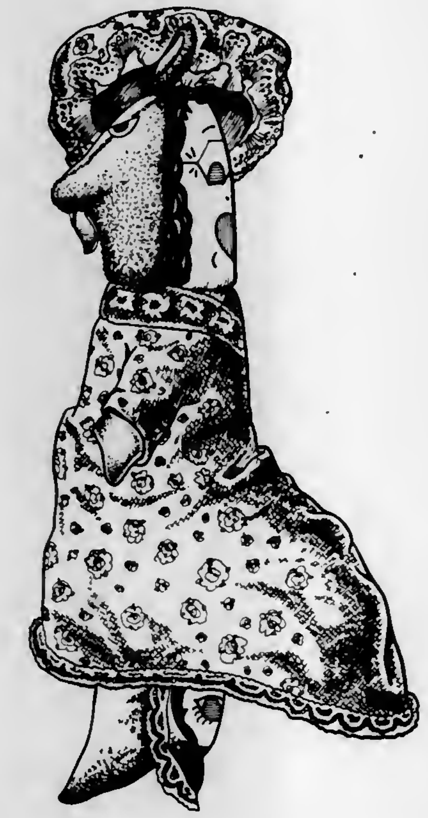
240,441
MODEL GLIDER
Earl Rizzo, Lakewood, Ohio, assignor to
Cosmo, Inc., Cleveland, Ohio
Filed July 10, 1974, Ser. No. 487,383
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



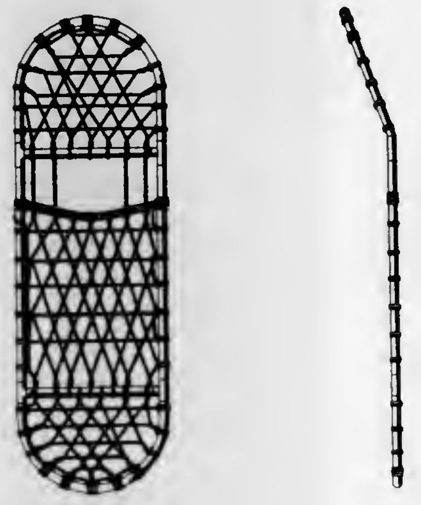
240,442
GAME BOARD
Erik Yngvar Iversby, Solliruta N-1720, Greaker, Norway
Filed Aug. 26, 1974, Ser. No. 500,736
Claims priority, application Norway Feb. 25, 1974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



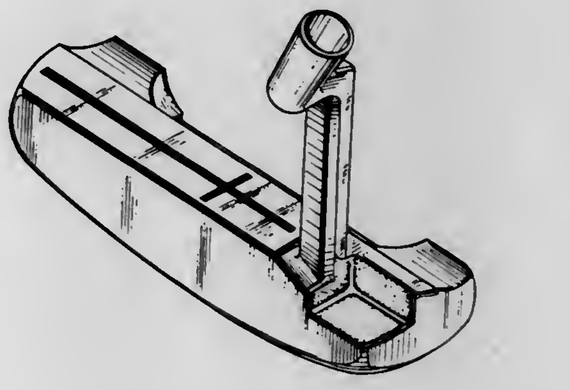
240,443
REVERSIBLE RED RIDING HOOD DOLL
Barbara J. Andresen, 738 E. Palmaire,
Phoenix, Ariz. 85020
Filed Sept. 25, 1974, Ser. No. 509,094
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



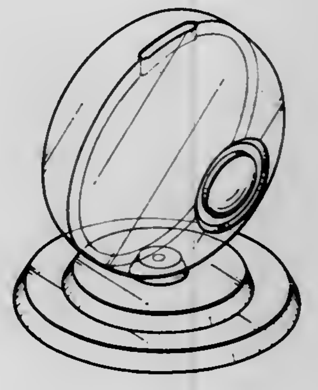
240,444
SNOWSHOE
John E. Butler, P.O. Box 1007,
Nevada City, Calif. 95959
Filed Dec. 9, 1974, Ser. No. 530,530
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D34—14 D



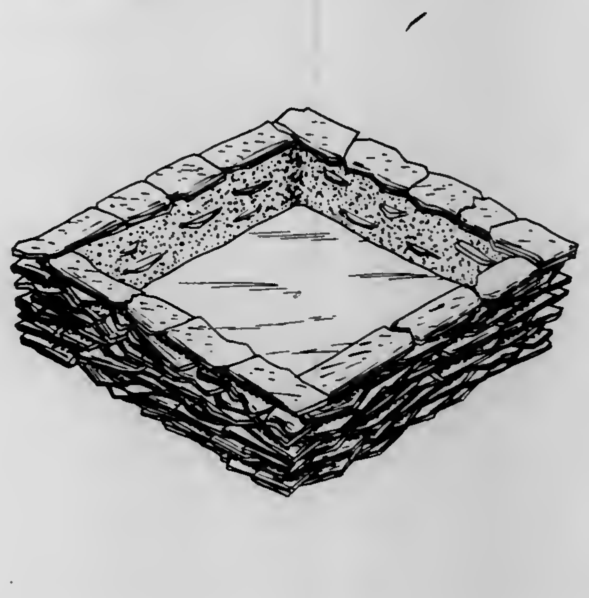
240,445
GOLF PUTTER HEAD
Jerome E. Becker, 3285 Woodbine St.,
Los Angeles, Calif. 90064
Filed Jan. 23, 1975, Ser. No. 543,227
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



240,446
COIN BANK
Tony Robert, 5701 Southwest Freeway,
Houston, Tex. 77057
Filed Feb. 21, 1975, Ser. No. 551,531
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



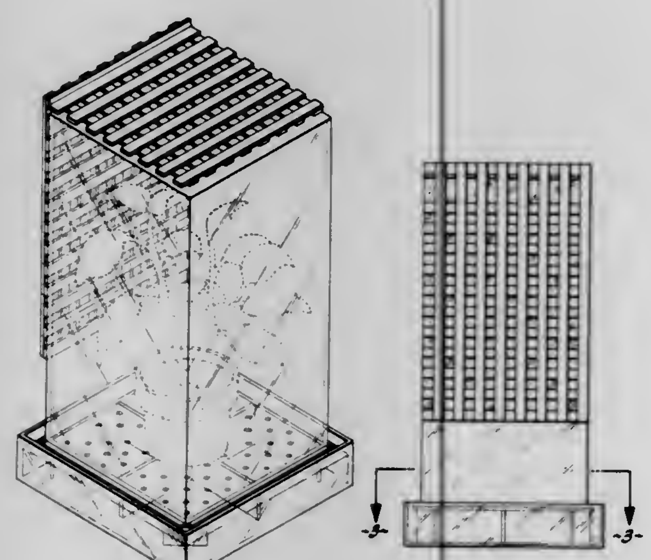
240,447
PLANTER
Marshall D. Le Vine, 8359 Colesville Road,
Silver Spring, Md. 20910
Filed June 11, 1975, Ser. No. 585,783
Term of patent 14 years
Int. Cl. D11—*02;* D23—*01*
U.S. Cl. D35—3 B



240,448
COMBINED MINIATURE GREENHOUSE AND HUMIDIFYING RESERVOIR THEREFOR

Kanji Hitomi, 1216 56th Ave., Sacramento, Calif. 95831
Filed Aug. 27, 1975, Ser. No. 608,029
Term of patent 14 years
Int. Cl. D11—*02*

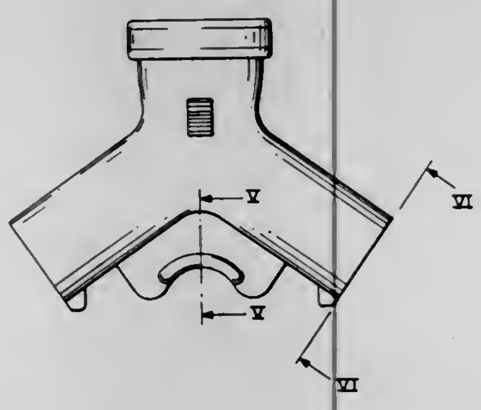
U.S. Cl. D35—3 A



240,449
FLASHLIGHT

Howard T. Livingston, 700 Leisure Drive 32, Fort Worth, Tex. 76112
Filed May 14, 1975, Ser. No. 577,302
Term of patent 14 years
Int. Cl. D26—*02*

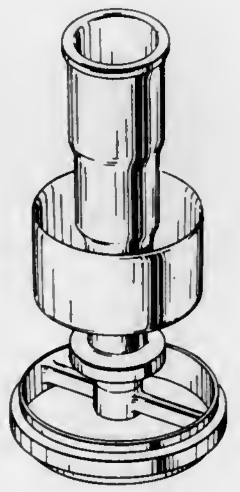
U.S. Cl. D48—24 A



240,450
CANDLESTICK

Prentice Clyde Webb, Jr., 16920 El Tiro Road, Marana, Ariz. 85238
Filed Aug. 8, 1975, Ser. No. 602,968
Term of patent 14 years
Int. Cl. D26—*01*

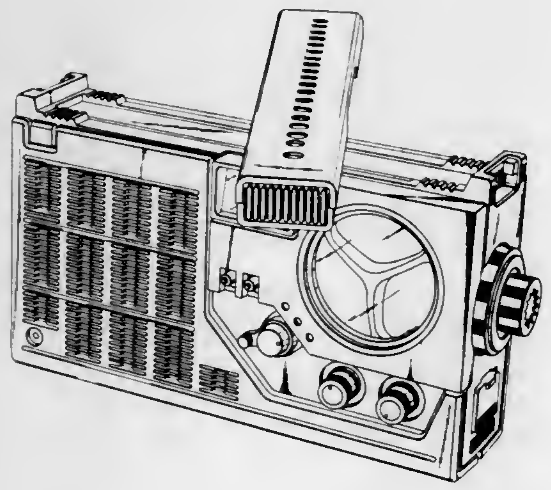
U.S. Cl. D48—2



240,451
RADIO RECEIVER

Takao Okada, Kyoto, Ken Kawamura, Ibaragi, Osaka, and Hironosuke Koda, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed June 19, 1974, Ser. No. 480,787
Claims priority, application Japan Dec. 25, 1973
Term of patent 14 years
Int. Cl. D14—*03*

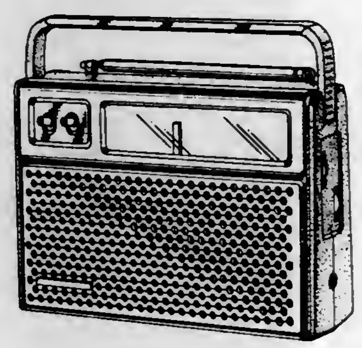
U.S. Cl. D56—4 B



240,452
PORTABLE RADIO

Shuhei Taguchi, Moriguchi, Osaka, Hironosuke Koda, Kyoto, and Tsutomu Murakami, Neyagawa, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Oct. 30, 1974, Ser. No. 519,175
Claims priority, application Japan June 25, 1974
Term of patent 14 years
Int. Cl. D14—*03*

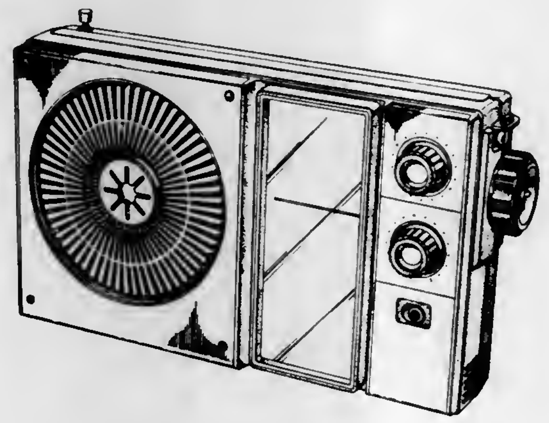
U.S. Cl. D56—4 B



240,453
RADIO RECEIVER

Takao Okada, Kyoto, Ken Kawamura, Ibaragi, Osaka, and Hironosuke Koda, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Nov. 5, 1974, Ser. No. 521,019
Claims priority, application Japan June 7, 1974
Term of patent 14 years
Int. Cl. D14—*03*

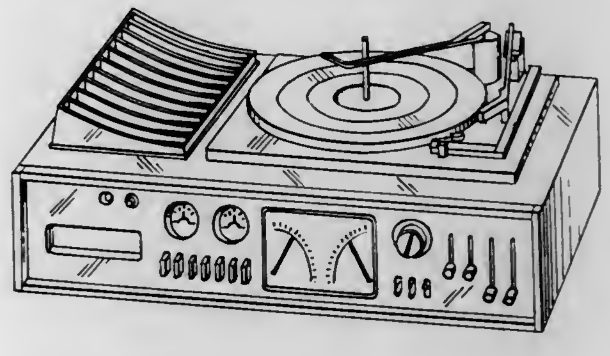
U.S. Cl. D56—4 B



240,454
COMBINED PHONOGRAPH AND CARTRIDGE PLAYER

Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 5, 1974, Ser. No. 521,229
Term of patent 14 years
Int. Cl. D14—*01*

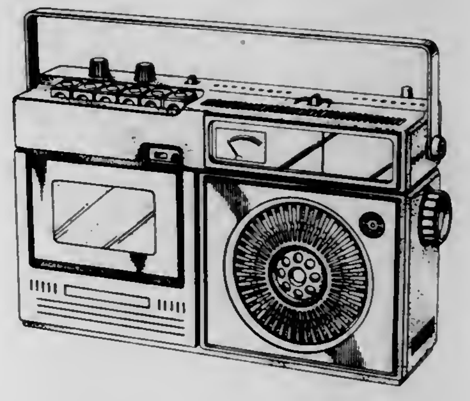
U.S. Cl. D56—4 R



240,455
COMBINED PORTABLE RADIO AND CASSETTE PLAYER

Takeyoshi Kawano, Kyoto, and Keizo Kushida, Moriguchi, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Nov. 7, 1974, Ser. No. 521,802
Claims priority, application Japan June 19, 1974
Term of patent 14 years
Int. Cl. D14—*03*

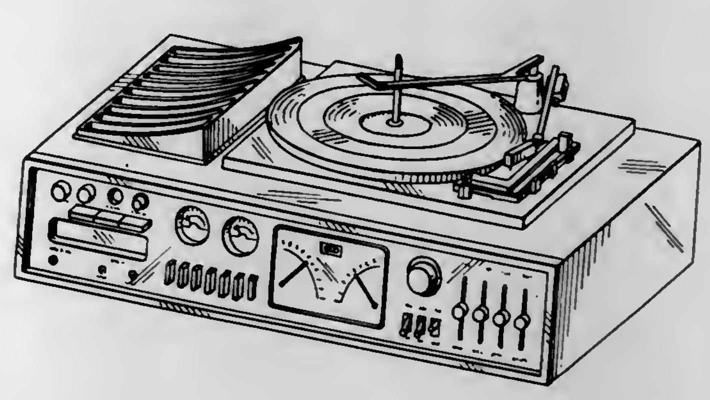
U.S. Cl. D56—4 B



240,456
COMBINED PHONOGRAPH AND CARTRIDGE PLAYER

Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 25, 1974, Ser. No. 526,519
Term of patent 14 years
Int. Cl. D14—*01*

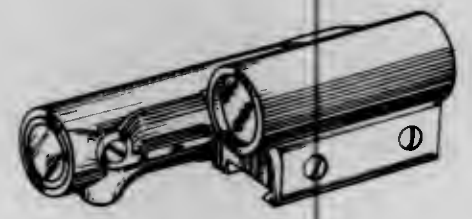
U.S. Cl. D56—4 R



240,457
OPTICAL SIGHT FOR FIREARMS

Norman D. Dunlap, New Bremen, Ohio, and Glenn E. Ricket, Huntington, Ind., assignors to Precision Tool and Machine Co., New Bremen, Ohio
Filed Nov. 19, 1974, Ser. No. 525,094
Term of patent 14 years
Int. Cl. D16—*06*

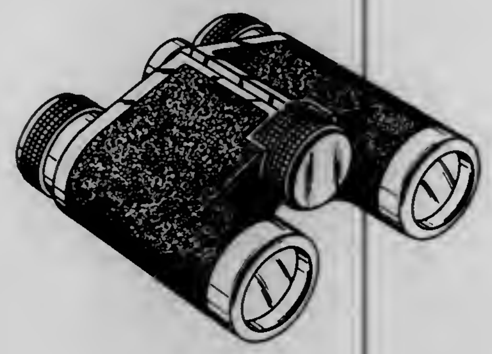
U.S. Cl. D16—61

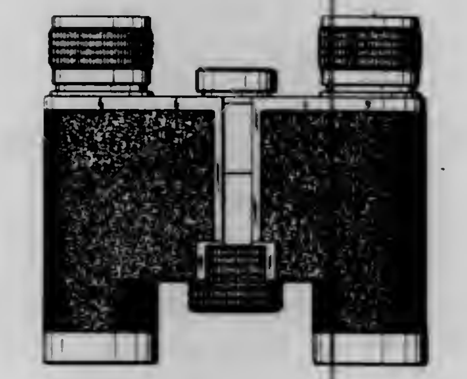


240,458
BINOCULARS

Sataro Takahashi, Saitama, and Tadayuki Kirigaya, Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha
Filed June 5, 1975, Ser. No. 583,976
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—63

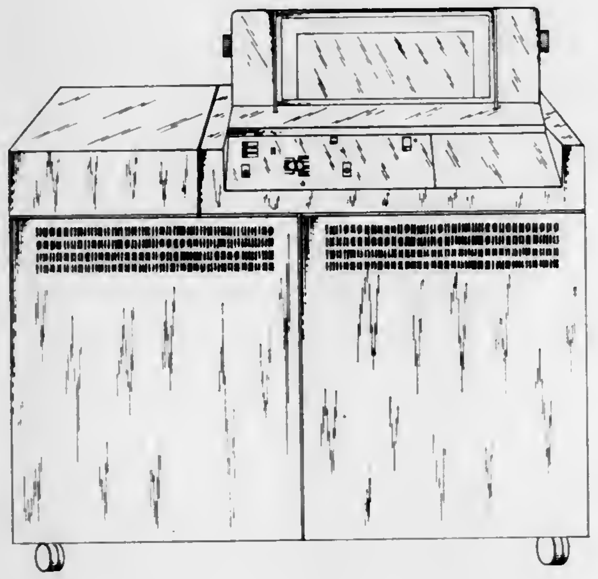




240,459
CONTROL UNIT WITH PRINTER

Ronald I. Conway, Port Ewen, John J. Natoli, Woodstock, and John V. Stram, Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,737
Term of patent 14 years
Int. Cl. D16—*03*

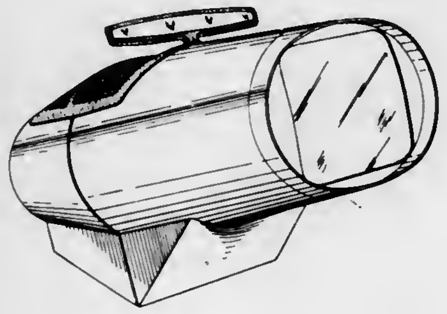
U.S. Cl. D16—30



240,460
REAR PROJECTION TRANSPARENCY VIEWER

Robert M. Simonelli, Palatine, Ill., assignor to GAF Corporation, New York, N.Y.
Filed Dec. 18, 1974, Ser. No. 534,145
Term of patent 14 years
Int. Cl. D16—*02*

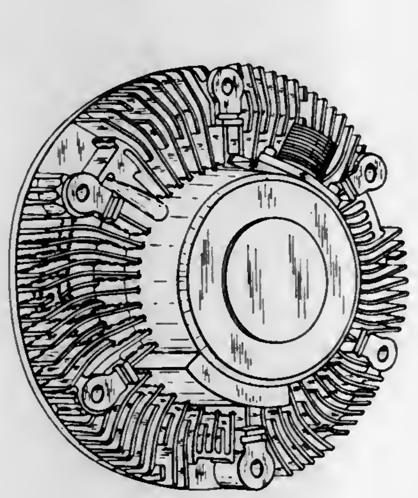
U.S. Cl. D16—17



240,461
VISCOUS FAN DRIVE

Wayne K. Leichliter, Rodney H. Detty, and John B. Hill, Marshall, Mich., assignors to Eaton Corporation
Filed Nov. 18, 1974, Ser. No. 524,441
Term of patent 14 years
Int. Cl. D15—*01*

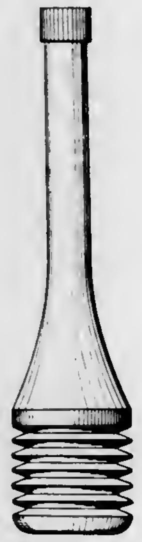
U.S. Cl. D77—1 A



240,462
MEDICINAL APPLICATOR OR THE LIKE

Barry H. Dash, Englewood Cliffs, N.J., assignor to American Home Products Corp., New York, N.Y.
Filed May 8, 1974, Ser. No. 468,050
Term of patent 14 years
Int. Cl. D24—*04*

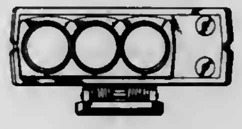
U.S. Cl. D83—12 A

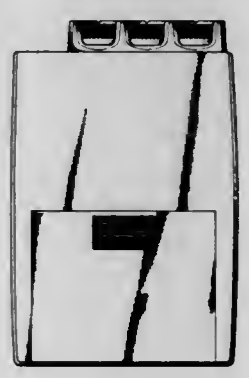


240,463
MEDICAL ELECTRICAL EQUIPMENT CASE

Robert L. Jordan, Coon Rapids, Minn., assignor to Medtronics, Inc., Minneapolis, Minn.
Filed Jan. 10, 1975, Ser. No. 539,998
Term of patent 14 years
Int. Cl. D24—*01*

U.S. Cl. D83—1 F

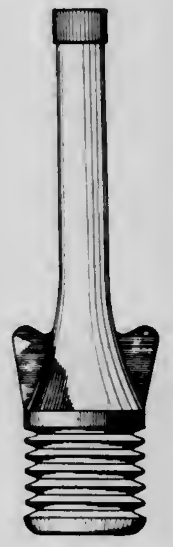




240,464
MEDICINAL APPLICATOR OR THE LIKE

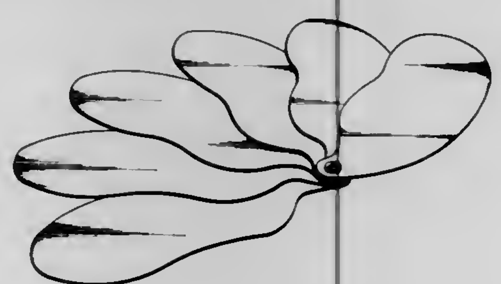
Barry H. Dash, Englewood Cliffs, N.J., assignor to American Home Products Corp., New York, N.Y.
Original design application May 8, 1974, Ser. No. 468,050. Divided and this application Sept. 22, 1975, Ser. No. 615,323
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D83—12 A



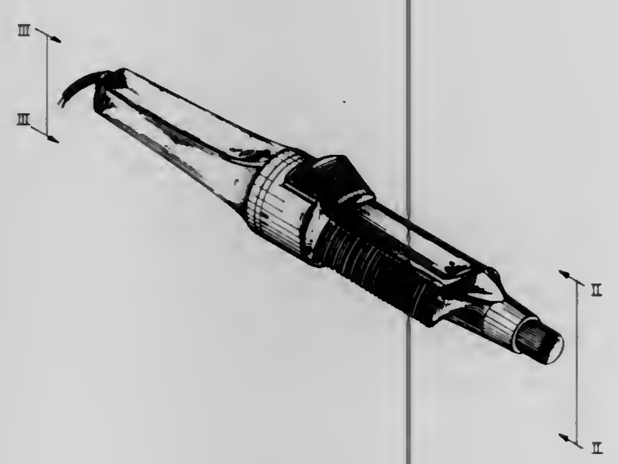
240,465
SET OF CARDS FOR DISPLAYING IDENTIFYING SKIN CONDITION INDICIA FOR COSMETIC PURPOSES

Isozo Yoshida, Tokyo, Japan, assignor to Kanebo Ltd.
Filed Oct. 23, 1973, Ser. No. 408,507
Term of patent 7 years
Int. Cl. D28—*02*
U.S. Cl. D86—10 A



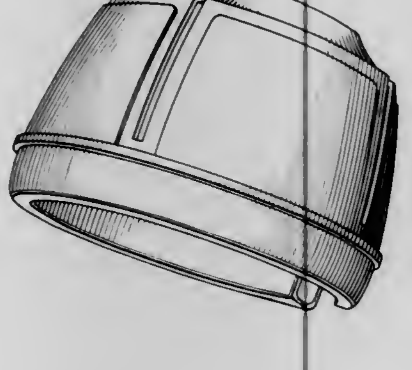
240,466
CURLING IRON

Joseph A. Rinaldi, Oradell, N.J., assignor to
The Gillette Company, Boston, Mass.
Filed Dec. 16, 1974, Ser. No. 533,206
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



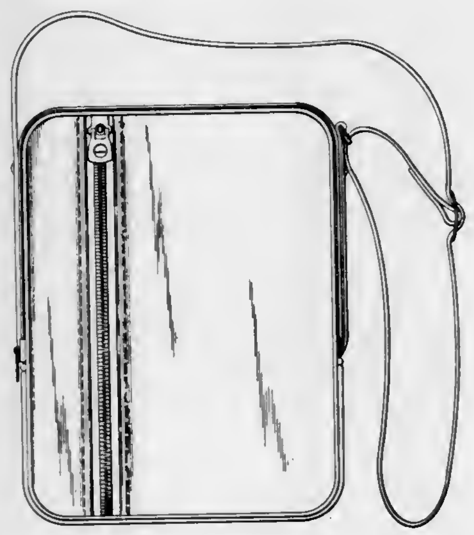
240,467
HAIR DRYER HOOD

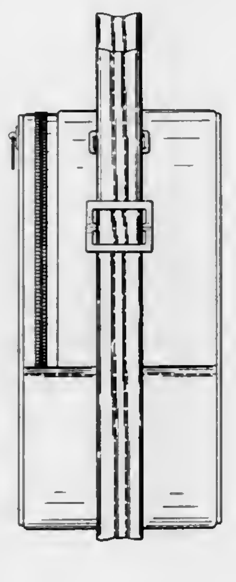
Norman A. Steinkamp, Chicago Heights, and Bernard B. Bluestein, Des Plaines, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 10, 1975, Ser. No. 540,018
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



240,468
CARRYING CASE FOR A CAMERA OR THE LIKE

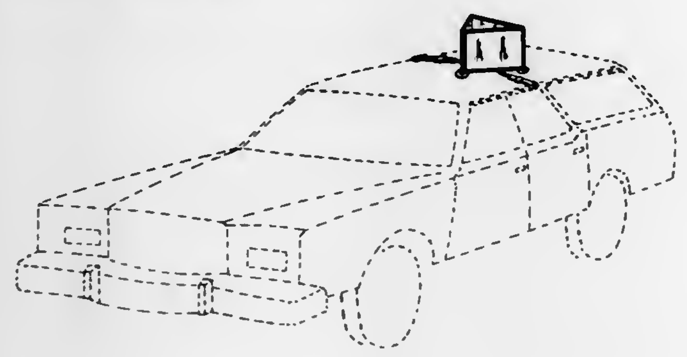
Dianne B. Ainslie, Rochester, N.Y., assignor to
Eastman Kodak Company, Rochester, N.Y.
Filed May 22, 1974, Ser. No. 472,406
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 E





240,469
AUTOMOBILE ROOF TOP DISPLAY SIGN OR SIMILAR ARTICLE

Harry E. Bissell, Murrysville, Pa., assignor to
IDL Inc., Pittsburgh, Pa.
Filed Apr. 29, 1975, Ser. No. 572,904
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: *See—*
  - Stowell, James K., 3,968,310.
- A. Ehrenreich & Cie.: *See—*
  - Schmidt, Andreas, 3,967,907.
- A. H. Robins Company, Incorporated: *See—*
  - Helsley, Grover C., 3,968,217.
- A. Menarini S.A.S.: *See—*
  - Ghelardoni, Mario; Pestellini, Vittorio; Volterra, Giovanna; and Pisanti, Nicola, 3,968,145.
- AB Hydro Betong: *See—*
  - Georgii, Hans Christer, 3,967,675.
- Abblard, Jean Georges: *See—*
  - Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 3,968,208.
- Abbott, Roy W.: *See—*
  - Pohl, Walter John; and Abbott, Roy W., 3,967,489.
- Abdulla, Riaz F.; and Soper, Quentin F., to Eli Lilly and Company. 3,5-Diphenyl-4(1H)-pyridazinones(thiones). 3,967,952, Cl. 71-92.000.
- Abel, Heinz; Harris, Melvin; and Massy, Derek James Rowland, to Ciba-Geigy Corporation. Coating fibrous substrates. 3,968,312, Cl. 428-419.000.
- Abele, Kurt: *See—*
  - Hafla, Dietmar; and Abele, Kurt, 3,968,415.
- Aberg, Jan. Animal trap. 3,967,408, Cl. 43-87.000.
- Abex Corporation: *See—*
  - Born, Ellis H.; Meisel, William H.; and Viles, Alan H., 3,967,541.
- Acrison, Inc.: *See—*
  - Ferrara, Angelo, 3,967,758.
- Adachi, Keiichi; Mikawa, Akikazu; Horie, Ikutaro; and Shiraishi, Hisashi, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material containing anti-fogging agent. 3,967,965, Cl. 96-76.00R.
- Adams, Phillip: *See—*
  - Merianos, John J.; and Adams, Phillip, 3,968,246.
- Adamson, James E.: *See—*
  - Albaric, Jacques E.; and Adamson, James E., 3,968,389.
- Addmaster Corporation: *See—*
  - Busch, Richard E., 3,967,550.
- Addressograph Multigraph Corporation: *See—*
  - Gilbert, Barry D., 3,968,501.
- Advanced Instrument Development, Inc.: *See—*
  - Fiocca, Louis L., 3,968,413.
- Aerojet-General Corporation: *See—*
  - Steele, Roger B.; and Katzakian, Arthur, Jr., 3,968,135.
- Aeronca, Inc.: *See—*
  - Logsdon, Hillard Glenn, 3,967,642.
  - Logsdon, Hillard Glenn, 3,967,779.
- Affeldt, Richard B., to Union Carbide Corporation. Closure for galvanic dry cells. 3,967,977, Cl. 136-133.000.
- AGFA-Gevaert, A.G.: *See—*
  - Himmelmann, Wolfgang; Balle, Gerhard; Nittel, Fritz; and Saleck, Wilhelm, 3,967,966.
  - Winkler, Alfred; and Schroder, Rolf, 3,968,509.
- Aida Engineering Kabushiki Kaisha: *See—*
  - Kuroyahagi, Moritaka; Kimura, Yoshinobu; Takeuchi, Hirotoku; and Takegami, Masao, 3,967,483.
- Air Products and Chemicals, Inc.: *See—*
  - Cormier, Thomas E.; and McAuley, William J., 3,967,464.
  - Manning, Richard William, 3,968,341.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Torii, Nozomu; and Furuya, Yosikatsu, 3,967,844.
- Akashi, Mitsumasa: *See—*
  - Ono, Isao; Iiguni, Tetsuo; and Akashi, Mitsumasa, 3,968,165.
- Akeley, Lloyd T., to Beckman Instruments, Inc. Differential pressure transmitter with low side overrange protection. 3,967,504, Cl. 73-407.00R.
- Akin, Cavit; and Schnell, Philip George, to Standard Oil Company. Process for the production of high-protein pasta utilizing dried yeast and the resulting product. 3,968,258, Cl. 426-62.000.
- Aktiebolaget Svenska Flaktfabriken: *See—*
  - Pain, Barrie Reginald Kirby; and Wilhelmsson, Gunnar Robert, 3,967,942.
- Aktiengesellschaft Oederlin & Cie: *See—*
  - Amblank, Robert, 3,967,649.
- Albaric, Jacques E.; and Adamson, James E., to Westinghouse Electric Corporation. Dynamoelectric machine with water-cooled rotor. 3,968,389, Cl. 310-61.000.
- Albert, Kenneth J., to Thermo Seal. Drinking receptacle valve means. 3,967,748, Cl. 220-90.400.
- Alberts, Heinrich: *See—*
  - Hardt, Dietrich; Alberts, Heinrich; and Bartl, Herbert, 3,968,184.
- Albertson, Noel F., to Sterling Drug Inc. 1,2,3,4,5,6,7,8,9,10-Decahydro-8-oxo-2,6-methano-3-benzazocines. 3,968,114, Cl. 260-293.540.
- Albrecht, Leonard N., to Tab Products Company. Tape reel hanger. 3,967,733, Cl. 211-113.000.
- Aledyne Corporation: *See—*
  - Northcutt, Michael E., 3,967,690.
- Allen-Bradley Company: *See—*
  - Windler, Harold W., 3,968,409.
- Allen, Gordon Y. R. Neutralizing transformer. 3,968,408, Cl. 317-17.000.
- Allen, Kenneth M.; and Fijalkowski, Brian R., to Allen, Kenneth M. Apparatus for orienting tapered articles. 3,967,724, Cl. 198-268.000.
- Allen, Robert F., to Eastman Kodak Company. Conduit for processing webs with a liquid solution. 3,968,510, Cl. 354-319.000.
- Allen, William R., to Diversified Wood Products, Inc. Process for the preservation of wood. 3,968,276, Cl. 427-297.000.
- Allington, Robert W., to Instrumentation Specialties Company. Heat of interaction detector. 3,967,492, Cl. 73-61.10C.
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- Amblank, Robert, to Aktiengesellschaft Oederlin & Cie. Mixing valve assembly. 3,967,649, Cl. 137-636.300.
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- Anacker, Charles D. Multi purpose table. 3,967,562, Cl. 108-12.000.
- Anand, Yoginder, to Microwave Associates, Inc. Zero-bias Schottky barrier detector diodes. 3,968,272, Cl. 427-84.000.
- Anania, James A., Sr. Educational game having a random number selector. 3,967,825, Cl. 273-135.00B.
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  - Seeley, Clarence E., 3,967,943.
- Andeen, Richard E., to Sperry Rand Corporation. Torque control system for reaction wheel assemblies and the like. 3,968,352, Cl. 235-150.100.
- Andersen, Edward O., to General Electric Company. Electrical switch and method of calibrating. 3,968,468, Cl. 337-107.000.
- Anderson, Ray C. Fish lure. 3,967,406, Cl. 43-42.240.
- Andre, Jacques Maurice Jules Ghislain; Cahen, Raymond Mark; Debus, Henri Robert; Lammers, Rene Odon; and van Thillo, Hugo Johannes, to Labofina S.A. Preparation of spheroidal alumina particles. 3,968,225, Cl. 423-626.000.
- Andreades, Sam; and Baird, Richard L., to Du Pont de Nemours, E. I., and Company. Perfluoralkylcyanocyclopropenes. 3,968,137, Cl. 260-464.000.
- Anfruns, Luis Sentis. Shoe. 3,967,390, Cl. 36-94.000.
- Angleman, John D. Two-way, selective directional, image-transfer sheet. 3,968,299, Cl. 428-307.000.

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- Asselman, George Albert Apolonia; Van Mal, Harmannus Hinderikus; and Mijnheer, Andries, to U.S. Philips Corporation. Container for storing and transporting a liquefied gas. 3,967,465, Cl. 62-48.000.
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- Baker, Howard W. Reusable containers for citrus fruit and the like. 3,967,772, Cl. 229-18.000.
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- Baker, John. Controlling the supply of electric current to a room. 3,967,545, Cl. 98-43.00A.
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  - Luft, Karl Friedrich, 3,968,370.
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- Bernstein, Jack; and Stearns, Barbara, to E. R. Squibb & Sons, Inc. Method of treating malignant neoplastic disease. 3,968,249, Cl. 424-322.000.
- Bertram, Heidrun; Fahnenstich, Rudolf; and Tanner, Herbert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Feed additive for ruminants. 3,968,253, Cl. 426-2.000.
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- Bier, Kenneth C., to Colt Industries Operating Corporation. Method and apparatus for varying fuel flow from a variable venturi carburetor to compensate for changes in barometric pressure and altitude. 3,968,189, Cl. 261-39.00A.
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- Bingham, Joseph Peter, to RCA Corporation. Single frame color encoding/decoding system. 3,968,515, Cl. 358-5.000.
- Birglechner, Georg; and Botzenhardt, Leonard, to Licentia Patent-Verwaltungs-G.m.b.H. Method of contacting contact points of a semiconductor body. 3,967,366, Cl. 29-588.000.
- Birkenstock, Dieter; and Jager, Otto, to Gebr. Hofmann KG. System for compensating the unbalance of a rotating body, especially of a grinding wheel. 3,967,416, Cl. 51-169.000.
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- Bishop, Marilyn. Method for making sterile connections. 3,968,195, Cl. 264-154.000.
- Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Method of inhibiting histamine activity with guanidine compounds. 3,968,216, Cl. 424-263.000.
- Blackwell, Henry Wayne, to Dresser Industries, Inc. Stuffing box control system. 3,967,678, Cl. 166-53.000.
- Blanchet, Lucien, to Elhyco AG. Clamp with grounding means for holding conductors between parallel support rails. 3,968,323, Cl. 174-135.000.
- Blank, Karl, to BBC Brown Boveri & Company Limited. Brush holder for electrical apparatus. 3,968,391, Cl. 310-240.000.
- Blatz, Glenroy G.: *See—*
  - Brock, Herbert; Blatz, Glenroy G.; and Honn, James B., 3,967,544.

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Bock, Manfred Klaus Joachim, deceased (by Bock, Ingrid Alida Anni, heiress), to Heyl & Co. Chemisch-Pharmazeutische Fabrik, Firma. Method of producing penicillamine. 3,968,154, Cl. 260-534.00S.
Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
  Henninger, Heinz Willi; Riethmuller, Lothar; Kiefer, Hans Walter; and Spreitzhofer, Ernst Gunther Robert, 3,967,900.
Boduch, Stanley W., to Dart Industries Inc. Stackable lid and container. 3,967,731, Cl. 206-508.000.
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  Groot, Theodorus Cornelis; and Bogaard, Johan Josephus Hendricus, 3,967,945.
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Bohner, Beat: *See*—
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Boiten, Ebbe, to U.S. Philips Corporation. Shaving head for a dry-shaving apparatus. 3,967,374, Cl. 30-43.920.
Bolan, Joseph A., to Drackett Company, The. Drain cleaning compositions. 3,968,048, Cl. 252-157.000.
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Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Radiation curable inks. 3,968,056, Cl. 252-514.000.
Bolssens, Frans Pharailda Jozef; and Franck, Guy Charles Joseph Leon Gilbert Ghislain Marie, to International Standard Electric Corporation. Wire skinning and wrapping tool. 3,967,357, Cl. 29-203.00D.
Bonaddio, Robert M., to PPG Industries, Inc. Glass scoring head and method. 3,967,517, Cl. 83-7.000.
Bonfiglioli, Sergio. Process and machine for wrapping and packaging items in stretchable foil material. 3,967,433, Cl. 53-30.00R.
Booth, Raymond E., to Sam Stein Associates, Inc. Compact in-line breading machine. 3,967,583, Cl. 118-16.000.
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  Morgan, Janice Elaine; and Boothe, Jerry Emile, 3,968,037.
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Born, Ellis H.; Meisel, William H.; and Viles, Alan H., to Abex Corporation. Control system for axial piston fluid energy translating device. 3,967,541, Cl. 92-12.200.
Bosa, Primo: *See*—
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Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridines. 3,968,117, Cl. 260-295.50R.
Bost, Pierre-Etienne: *See*—
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Boucher, Raymond Marcel Gut, to Wave Energy Systems, Inc. Method and sporicidal compositions for synergistic disinfection or sterilization. 3,968,250, Cl. 424-333.000.
Bouillon, Claude; and Vayssie, Charles, to L'Oreal. Cosmetic composition containing a hydroxylated amino thioether for application to the hair and skin. 3,968,218, Cl. 424-267.000.
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Boyd, Mervin S., to Lawrence Peska Associates, Inc.; and Krystic, Allan, part interest to each. Baby feeding device. 3,967,333, Cl. 5-317.00R.
Boynton, Kenneth G., to Hollis Engineering, Inc. System for cleaning work pieces with solvent. 3,968,013, Cl. 202-170.000.
Boysen, Robert L., to Union Carbide Corporation. Coaxial cable with improved properties. 3,968,463, Cl. 333-96.000.
Bradfield, C. C. Floating dock boat lift. 3,967,570, Cl. 114-45.000.
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Brand, William Wayne; and Schrider, Michael Stanley, to American Cyanamid Company. Chemosterilant and larvicidal imidothiocarbonates. 3,968,244, Cl. 424-330.000.
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Brody, Frank A.; Merz, Emil K.; and Van den Houten, Peter, to United States of America, Army. Propellant grain support apparatus. 3,967,558, Cl. 102-99.000.
Brooks, Barry R. Time telling teaching aid. 3,967,389, Cl. 35-39.000.
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Brown, Jack M., to Esterline Electronics Corporation. Magnetic motor. 3,968,470, Cl. 335-230.000.
Brown, Richard E., to Ball Brothers Research Corporation. Mold release composition containing tungsten disulfide. 3,968,302, Cl. 428-328.000.
Brown, William; and Shonebarger, Francis J., to Anchor Hocking Corporation. Method for applying plastisol coating of uniform thickness to glass containers. 3,968,279, Cl. 427-348.000.
Brown, William E. Accessory for a bird bath. 3,967,588, Cl. 119-26.000.
Brown, William G. Hydraulic valve lifter for reciprocating internal combustion engines. 3,967,602, Cl. 123-90.550.
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Burke, Oliver W., Jr., to Exxon Research and Engineering Company. Process for preparing high polymer latices from organic solvent dispersions. 3,968,067, Cl. 260-29.60R.
Burkholder, Ward J.; Miller, Glenn E.; and Nagel, Fritz J., to Goodyear Tire & Rubber Company, The. Process for the continuous isolation of dihydric phenols. 3,968,171, Cl. 260-621.00A.

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Busch, Aloysius J., to Bell Telephone Laboratories, Incorporated. Signaling circuit. 3,968,454, Cl. 331-78.000.
Busch, Richard E., to Addmaster Corporation. Squeeze printer for papers or stacks of papers of varying thicknesses. 3,967,550, Cl. 101-93.180.
Buschfeld, Adolf; Gramse, Manfred; and Simic, Dragomir, to Deutsche Texaco Aktiengesellschaft. Process for the manufacture of chip boards using condensation resins as binders and product. 3,968,308, Cl. 428-402.000.
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Canata, Pierluigi; and Longobardi, Giampiero, to Compagnia Tecnica Industrie Petroli S.p.A.; and Liquichimica S.p.A. Process and an equipment for producing crystalline citric acid from solutions of alkaline citrates. 3,968,017, Cl. 204-180.00P.
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Cheng, Bao-Ding, to Colgate-Palmolive Company. Free flowing nonionic inclusion compounds. 3,968,058, Cl. 252-544.000.
Cherrington, Martin D., to Tidril Corporation. Reaming apparatus. 3,967,689, Cl. 175-391.000.
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- Chimura, Toshihiko; and Iwata, Hirokimi, to Sony Corporation. Apparatus for magnetically recording and/or reproducing video signals and which has a still motion reproducing mode of operation. 3,968,517, Cl. 360-10.000.
- Chittom, Charles N. Fan assembly. 3,967,916, Cl. 416-167.000.
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  - Raby, Claude; and Choay, Jean, 3,968,215.
- Choi, Sam Kwon, to Chevron Research Company. Polymerization of 2-pyrrolidone. 3,968,087, Cl. 260-78.00P.
- Christensen, Donald E., to Gladhart, David, a part interest. Clamp for flexible rope. 3,967,349, Cl. 24-134.0KC.
- Christensen, Leon F.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 8-Substituted cyclic nucleotides by free radical alkylation and acylation. 3,968,101, Cl. 260-211.50R.
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- Christoffel, Julius M., Jr., to Gayla Industries, Inc. Box-like kite. 3,967,798, Cl. 244-153.00R.
- Christopoulos, John, to Singer Company, The. Circular knitting machine for producing interlock fabric. 3,967,468, Cl. 66-20.000.
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- Clauss, Karl; Pietsch, Hartmut; Schmidt, Erwin; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide and its use as sweetener. 3,968,106, Cl. 260-243.00R.
- Clauss, Karl; Schmidt, Erwin; Pietsch, Hartmut; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide. 3,968,107, Cl. 260-243.00R.
- Claverie, Jean-Marie; Loiseau, Gerard; Mattioda, Georges; Millischer, Rene; and Percheron, Francois, to Produits Chimiques Ugine Kuhlmann. 5-Methylthio-pyrimidine vasodilators. 3,968,214, Cl. 424-251.000.
- Claxton, H. Hugh, to Northern Electric Company Limited. Self-closing book holder and support. 3,967,807, Cl. 248-447.000.
- Closmann, Philip J.; and Tham, Min Jack, to Shell Oil Company. Producing shale oil from a cavity-surrounded central well. 3,967,853, Cl. 299-4.000.
- Cloute, John R.: *See—*
  - Payne, Bernard M.; Cloute, John R.; Johnson, Edward A.; Brown, Arthur V., Jr.; and Oborsh, Edward V., 3,968,269.
- Clune, James P.; and Frost, Robyn N., to International Telephone and Telegraph Corporation. Self ballasted lamp including a fuseable device. 3,968,396, Cl. 315-74.000.
- Cmolik, Charles F., to Lawrence Peska Associates, Inc., a part interest. Windshield wiper pressure distribution block. 3,967,340, Cl. 15-250.420.
- Coffey, Fred Simms; Weaver, Harold Lloyd; and Johnson, Howard Beattie, to Pittsburgh Corning Corporation. Process for making a shaped fibrous article by a vacuum forming process and the shaped fibrous article made thereby. 3,968,004, Cl. 162-152.000.
- Coffield, Thomas H.; and Keblys, Kestutis A., to Ethyl Corporation. Method of winning copper, nickel, and other metals. 3,967,958, Cl. 75-103.000.
- Coffin, Perley A.; Cook, Philip G.; and Demerjian, Paul D., to General Latex and Chemical Corporation. One-part foamable latex composition. 3,968,285, Cl. 428-95.000.
- Coffman, Fredrick M.: *See—*
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- Cohen, William A., to Sphero International Company. Anti-friction pressure seal. 3,967,866, Cl. 308-187.100.
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- Cole, Carroll R.; Guhl, Richard E.; and Logemann, Larry R., to Caterpillar Tractor Co. Interlock system for parking brake and transmission control. 3,967,709, Cl. 192-4.00A.
- Cole, Donald G. Door-actuated alarm switch. 3,968,337, Cl. 200-61.620.
- Colgate-Palmolive Company: *See—*
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- Collins, Terrence, to American Filtrona Corporation. Circumference gauge and recording method. 3,967,383, Cl. 33-179.000.
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- Comer, William T.: *See—*.
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- Comley, Peter Nigel, to Lucas Electrical Company Limited, The. Engine control systems. 3,967,596, Cl. 123-32.0EA.
- Commissariat a l'Energie Atomique: *See—*
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- Compagnia Tecnica Industrie Petroli S.p.A.: *See—*
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- Conway, John P., to United States of America, Interior. Controlled yielding rock bolt. 3,967,455, Cl. 61-45.00B.
- Cook, Philip G.: *See—*
  - Coffin, Perley A.; Cook, Philip G.; and Demerjian, Paul D., 3,968,285.
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- Cooksey, George E., to United States of America, Army. Manually-operated firearm with forward-moving barrel and pivoted breech block. 3,967,402, Cl. 42-10.000.
- Cooksley, Ralph D. Method and apparatus for electrically heating a fluid. 3,968,346, Cl. 219-305.000.
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- Coulon, Andre; and Perrin, Rene, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Compound turbine rotor. 3,967,919, Cl. 416-198.00A.
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- Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Particle analyzer of the Coulter type including coincidence error correction circuitry. 3,968,429, Cl. 324-71.0CP.
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- Coutts, Barbara, to Lawrence Peska Associates, Inc., a part interest. Bicycle safety warning flag. 3,967,575, Cl. 116-35.00A.
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- Cros, Pierre, to Spie-Batignolles; and Societe Generale de Techniques et d'Etudes. Method and an installation for improving the energy balance of installations for processing chemical process streams and especially petroleum refineries. 3,968,030, Cl. 208-347.000.
- Croset, Michel; and Nouailles, Noel, to Sescosem- Societe Europeenne des Semi-Conducteurs et de Microelectronique. Methods of manufacturing multilayer interconnections for integrated circuits and to integrated circuits utilizing said method. 3,967,371, Cl. 29-625.000.
- Crowe, Kenneth, to Torin Corporation. Method for making a scroll type housing for a centrifugal blower. 3,967,352, Cl. 29-156.40R.
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- Cudzik, Daniel F., to Reynolds Metals Company. Easy-open wall. 3,967,750, Cl. 220-266.000.
- Cudzik, Daniel F., to Reynolds Metals Company. Easy-open wall. 3,967,752, Cl. 220-269.000.
- Cudzik, Daniel F., to Reynolds Metals Company. Easy-open wall. 3,967,753, Cl. 220-269.000.
- Cugini, John A., to Rockwell International Corporation. Weft control device. 3,967,657, Cl. 139-450.000.
- Culbertson, Donald L., to National-Standard Company, Wagner-Litho Machinery Division. Utilization of heat pipes for cooling radiation curing systems. 3,967,385, Cl. 34-4.000.
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- Cunningham, Victor Ralph; and Boutle, David Leonard, to Porvair Limited. Artificial leather sheet material. 3,968,293, Cl. 428-213.000.
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- Curzon, James E., to Phillips Petroleum Company. Repair of cement sheath around well casing. 3,967,681, Cl. 166-277.000.
- Cuscurida, Michael; and Speranza, George Phillip, to Jefferson Chemical Company, Inc. Polymer-prepolymer composition prepared by polymerizing an ethylenically unsaturated monomer in the presence of an isocyanate-terminated prepolymer. 3,968,089, Cl. 260-859.00R.
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- D. Wickham and Company Limited: *See—*
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- Davidsohn, Uryon S., to Motorola, Inc. Diffusion guarded metal-oxide-silicon field effect transistors. 3,967,988, Cl. 148-187.000.
- Davis, Daniel L., to Lawrence Peska Associates, Inc., a part interest. Interlock for eye setting machine. 3,967,770, Cl. 227-2.000.
- Davis, Lewis M., to Sealed Power Corporation. Loading device for installation of rotary engine oil sealing rings. 3,967,359, Cl. 29-235.000.
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- DeBell, Lawrence R.; and Price, David D., Jr., to Economy Company, The; Price, David D., Jr.; and Price, Ford C., part interest to each. Automatic control circuitry for tape transducing apparatus. 3,968,520, Cl. 360-71.000.
- Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre. Fungicidal compositions. 3,968,208, Cl. 424-209.000.
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- Dees, Martin, Jr.; and Karcheski, Debra M., to Armstrong Cork Company. Non-woven fabric floor. 3,968,290, Cl. 428-196.000.
- Deeter, Ronald C.; Lora, Thad A.; and Pozniko, John M., to Salem Tool Company, The. Latching and latch releasing mechanism for auger string couplings. 3,967,909, Cl. 403-322.000.
- DeFelice, Stephen L. Method of treating cardiac arrhythmias and of improving myocardial contractility and systolic rhythm with carnitive or a pharmaceutically acceptable salt thereof. 3,968,241, Cl. 424-319.000.
- de Haan, Maarten Rutger, to U.S. Philips Corporation. System for recording a color television signal with reduced bandwidth. 3,968,513, Cl. 358-4.000.
- DeHart, Harry I. Burglar warning device. 3,968,485, Cl. 340-274.00R.
- De Jager, Donald, to Eastman Kodak Company. Three element objective lens. 3,967,884, Cl. 350-226.000.
- DeJong, Jan, to Lockheed Petroleum Services Ltd. Method and apparatus for joining a subsea pipeline to an offshore platform riser. 3,967,462, Cl. 61-72.300.
- Deletzke, Norman E. H., Jr. Tape winding system. 3,967,789, Cl. 242-56.00R.
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- Dickens, Elmer Douglas, Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,968,081, Cl. 260-45.75N.
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- Dobarganes, Joseph, to Lawrence Peska Associates, Inc., a part interest. Fixture for testing flatpack modules. 3,968,433, Cl. 324-158.00F.
- Doherty, George O. P.; and Fuhr, Kenneth H., to Eli Lilly and Company. 1H-imidazo(4,5-b)pyridine compounds. 3,968,116, Cl. 260-295.0AM.
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- Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. 3-Heterocyclic thiomethylcephalosporins as antibacterial agents. 3,968,226, Cl. 424-246.000.
- Dunn, John A.; and Frank, Leonard, to United States of America, Army. Method of producing a cavity in the bursting charge of a high explosive projectile. 3,967,527, Cl. 86-20.00B.
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- Edwards, Gerald L., to CX Corporation. Camera filmstrip processor controlled by film marks. 3,967,518, Cl. 83-210.000.
- Edwards, Hans Alexander. Apparatus and method for manufacturing leather beading line and the novel product made thereby. 3,967,474, Cl. 69-21.000.
- Edwards, Thomas C., to Rovac Corporation, The. Air conditioning system having super-saturation for reduced driving requirement. 3,967,466, Cl. 62-402.000.
- Egnaczak, Raymond K., to Xerox Corporation. Coating apparatus and uses thereof. 3,968,271, Cl. 427-15.000.
- Egner, Ronald J., to Textron, Inc. Clinch type fastener. 3,967,669, Cl. 151-41.730.
- Egyesult Izzolampa Es Villamossagi Resvenytarsasag: *See—*
  - Kerekes, Bela, 3,967,871.
- Ehni, George John, III, to Texas Instruments Incorporated. Solid state television channel selection system. 3,968,440, Cl. 325-417.000.
- Eickmann, Karl. Rotor, pistons, piston shoes and associated means in fluid handling devices. 3,967,540, Cl. 91-488.000.
- Eiselt, Gunter; and Hossbach, Rudolf, to Eiselt, Gunter. Upholstering body having a supported core in the form of a yieldable plate of synthetic material and a resilient layer on the core. 3,967,852, Cl. 297-452.000.
- Eiwa Denki Co., Ltd.: *See—*
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- Ekstedt, Jan Erik: *See—*
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- Ekstrom, Ake, to Allmanna Svenska Elektriska Aktiebolaget. Direct current transmission and method of operating the same. 3,968,419, Cl. 321-27.00R.
- Ekstrom, Philip A., to Board of Regents, University of Washington. Measuring repetition rate. 3,968,431, Cl. 324-78.00E.
- Electronics Corporation of America: *See—*
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- Elmslie, Keith W.: *See—*
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- Emmett, John Colin: *See—*
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- Emms, Desmond John, to Lucas Electrical Company Limited, The. Roller clutch drive component. 3,967,507, Cl. 74-6.000.
- Enami, Toyoichiro; Kurasawa, Kazuo; Ii, Masaktaka; and Hashimoto, Masaru, to Nissan Motor Co., Ltd. Photodensitometer for measuring optical fringe patterns. 3,967,903, Cl. 356-167.000.
- Eng, Jeffrey D.; Harke, Cyril J.; Bosa, Primo; and Figueras, Wilfredo E., to Hooker Chemicals & Plastics Corporation. Electrolytic cell seal. 3,968,022, Cl. 204-279.000.
- Engel, Horst, to Continental Gummi-Werke Aktiengesellschaft. Pressure pad of rubber or rubber-like materials for presses. 3,968,282, Cl. 428-156.000.
- Engineering Technology Analysts, Inc.: *See—*
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- Ensinozo, Juan Saavedra. Equine hoofwear. 3,967,683, Cl. 168-4.000.
- Epic Metals Corporation: *See—*
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- Erickson, Ronald E., to Sybron Corporation. Filter molded heating and/or insulating member. 3,968,281, Cl. 428-75.000.
- Erickson, Wayne K., to Phillips Petroleum Company. Finishing agent and nonscroopy polyolefin fibers. 3,968,042, Cl. 252-8.900.
- Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Clutch shifter. 3,967,710, Cl. 192-98.000.
- Ernst, Richard R., to Varian Associates. Fourier transform NMR spectroscopy employing a phase modulated rf carrier. 3,968,424, Cl. 324-.5AC.
- Eschbaugh, John T.; and Lindahl, Herbert S., to Gulf & Western Metals Forming Company. Refrigeration expansion valve. 3,967,782, Cl. 236-92.00B.
- Eskesen, John H.: *See—*
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- Farrell, Joseph Paul, to Radiation Dynamics, Inc. Beam splitting to improve target life in neutron generators. 3,968,377, Cl. 250-499.000.
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- Feichtinger, Heinrich, to Leybold-Heraeus-Verwaltung G.m.b.H. Method and means for drawing samples from melts. 3,967,505, Cl. 73-425.600.
- Ferguson, Fred E.; and Bell, Robert J., to O. M. Scott & Sons Company. Fungicidal compositions containing a phthalonitrile. 3,968,239, Cl. 424-304.000.
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- Finkenauer, Hans-Jakob: *See—*
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- Focht, John Richard, to Precision Valve Corporation. Clip mounted aerosol dispenser actuator. 3,967,763, Cl. 222-402.150.
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- Foley, Donald E. Clean up/cut spoon. 3,967,376, Cl. 30-150.000.
- Folgero, Kare M.; Fredriksson, Bengt; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, to Uddeholms Aktiebolag. Method for treating a metal melt. 3,967,955, Cl. 75-12.000.
- Fonseca, Anthony G.; and Every, Richard L., to Continental Oil Company. Method of transporting a sulfur-hydrocarbon slurry in a pipeline. 3,967,860, Cl. 302-66.000.
- Fonseca, Anthony G., to Continental Oil Company. Aqueous ammonia oxidative leach and recovery of metal values. 3,967,957, Cl. 75-103.000.
- Fordyce, William Fulmer: *See—*
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- Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., to Gulf Research & Development Company. Hydrodesulfurization process with parallel first stages in series with a unified second stage. 3,968,026, Cl. 208-210.000.
- Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., to Gulf Research & Development Company. Multi-stage hydrodesulfurization utilizing a second stage catalyst promoted with a group IV-B metal. 3,968,027, Cl. 208-210.000.
- Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., to Gulf Research & Development Company. Process for onstream regeneration of a hydrodesulfurization catalyst. 3,968,028, Cl. 208-210.000.
- Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., to Gulf Research & Development Company. Desulfurization process employing multi-catalyst reactor. 3,968,029, Cl. 208-216.000.
- Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., to Gulf Research & Development Company. Multi-stage hydrodesulfurization process utilizing multi-cycle second stage promoted catalyst. 3,968,031, Cl. 208-210.000.
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- Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable plastics containing haloolefins. 3,968,094, Cl. 526-914.000.
- Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable plastics containing an N-halo amide. 3,968,095, Cl. 526-914.000.
- Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable polyolefins containing an halogenated nitrile. 3,968,096, Cl. 526-914.000.
- Frehn, Fritz, to Deutsche Edelstahlwerke Gesellschaft mit beschrankter Haftung. Corrosion and wear resistant steel sinter alloy. 3,967,935, Cl. 29-182.700.
- Frese, Stefan; and Mayerhofer, Franz, to Siemens Aktiengesellschaft. Firing apparatus for a plurality of electric valves. 3,968,397, Cl. 315-155.000.
- Freter, Walter, to Siemens Aktiengesellschaft. Analyzer device for a VOR navigational receiver. 3,968,494, Cl. 343-106.00R.
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- Gallo, Duane G.; and Comer, William T., to Mead Johnson & Company. Sulfonamidoaminopropiophenone interceptive process. 3,968,242, Cl. 424-321.000.
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- Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver tuning circuit with automatic search and AFC using common capacitor. 3,968,441, Cl. 325-420.000.
- Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver tuning circuit. 3,968,442, Cl. 325-422.000.
- Garzia, Aldo, to Istituto Chemioterapico Italiano. α-Amino-γ-butyrolactones as sedatives. 3,968,233, Cl. 424-279.000.
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  - Wise, Richard M., 3,968,304.
- George, Stephen. Breathable flame resistant fabric construction and method of making same. 3,968,284, Cl. 428-90.000.
- Georgii, Hans Christer, to AB Hydro Betong. Method and device for exploiting the geothermal energy in a submarine volcano. 3,967,675, Cl. 165-1.000.
- Gerdes, Richard C. Analog to digital converter. 3,968,486, Cl. 340-347.0AD.
- Gerhards, Erich: *See—*
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- Gessler, Albert M.; and Baldwin, Francis P., to Exxon Research and Engineering Company. Covulcanization of conjugated diene-containing butyl with halobutyl and butyl rubber. 3,968,076, Cl. 260-42.350.
- Getsch, Edward W.; and Puerner, Gale N., to Pako Corporation. Continuous multi-layered packaging assembly. 3,967,776, Cl. 229-69.000.
- Ghelardoni, Mario; Pestellini, Vittorio; Volterra, Giovanna; and Pisanti, Nicola, to A. Menarini S.A.S. Methyl 2(1 chloronaphth-2-yloxy)propionate. 3,968;145, Cl. 260-473.00F.
- Giamei, Anthony F.; and Kear, Bernard H., to United Technologies Corporation. Composite single crystal article. 3,967,355, Cl. 29-194.000.
- Giger, Walter, Jr.: *See—*
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- Gilbert, Barry D., to Addressograph Multigraph Corporation. Photocomposition machine with improved lens control system. 3,968,501, Cl. 354-7.000.
- Girard, Roland T.; and Rice, George A., to General Electric Company. Thick film capacitor. 3,968,412, Cl. 317-258.000.
- Girardier, Jean-Pierre, to Sofretes-Societe Francaise d'Etudes Thermiques et d'Energie Solaire. Power-generation system comprising an engine actuated by the expansion of a liquefiable gaseous fluid. 3,967,450, Cl. 60-657.000.
- Gladhart, David: *See—*
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- Glassman, Arthur R., to De Lamar Bed Spring Corporation. Springless bed spring. 3,967,331, Cl. 5-236.00R.
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- Goedl, Edmund V. Flycasting reel. 3,967,792, Cl. 242-84.10R.
- Goettl, Adam D.; and Goettl, Bruce A., to Amoy Research and Development Co. Fluid containing structure. 3,967,322, Cl. 4-172.000.
- Goettl, Bruce A.: *See—*
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- Gold, Daniel H.: *See—*
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- Goodman, Louis P., to Kraftco Corporation. Method and composition for preparing a whipped salad dressing. 3,968,261, Cl. 426-98.000.
- Goodyear Tire & Rubber Company, The: *See—*
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- Goser, Karl, to Siemens Aktiengesellschaft. Complementary storage element. 3,968,479, Cl. 340-173.0FF.
- Gostin, Judson J., to General Electric Company. Radar MTI processor with CFAR. 3,968,490, Cl. 343-7.700.
- Goto, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Stratified-combustion type internal combustion engine with pre-combustion-chamber. 3,967,611, Cl. 123-191.00S.
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- Gould Inc.: *See—*
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- Governale, Bernard C., to Peachtree Doors, Inc. Adjustable threshold. 3,967,412, Cl. 49-468.000.
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- Goyarts, Wynand M. J. M., to Clark Equipment Company. Extensible reach load lifting mechanism. 3,967,744, Cl. 214-770.000.
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- Grandori, Carlo, to Robbins Company, The. Continuous tunnel boring machine and method. 3,967,463, Cl. 61-85.000.
- Graube, Andrejs, to Hughes Aircraft Company. Bleached holographic material and process for the fabrication thereof using halogens. 3,967,963, Cl. 96-27.00H.
- Gravesteyn, Elbert, to Heineken Technisch Beheer B.V. Capsulating machine. 3,967,436, Cl. 53-315.000.
- Gray, Allan Poe, to IIT Research Institute. Prolonged release of antifertility drugs. 3,968,105, Cl. 260-239.500.
- Green, Michael J.; and Shue, Ho-Jane, to Schering Corporation. (17R-)-Spiro-[androstane-17,1'-cyclobutan]-2'-ones, methods for their manufacture and intermediates useful therein. 3,968,132, Cl. 260-397.300.
- Greendale, Allen E., to United States of America, Navy. Method and apparatus for direct radon measurement. 3,968,371, Cl. 250-380.000.
- Gregg, James S.; Scott, Charles J.; Suiter, Donna A.; Sullivan, James P.; Woodburn, Joseph A.; and Workman, David E., to Samsonite Corporation. Luggage case. 3,967,708, Cl. 190-41.00B.
- Gregg, Ray V., III, to Sundstrand Data Control, Inc. Television signal distribution system. 3,968,327, Cl. 178-6.800.
- Gregorio, Guglielmo; and Montrasi, Giorgio, to Montedison S.p.A. Process for recovering catalyst systems from raw hydroformylation products. 3,968,134, Cl. 260-429.00R.
- Gregory, Roy, to Urocare Products, Inc. Check valve for urine collection device. 3,967,645, Cl. 137-525.100.
- Griesing, John E.; and Weissmann, Dan, to Monsanto Company. Trimming blow molded plastics articles. 3,967,516, Cl. 82-47.000.
- Griffin, Harry Charles; Holden, Thomas Edwin; and Upton, Orland Edgar, to Hewlett-Packard Company. Method of manufacturing a multicontact switch. 3,967,370, Cl. 29-622.000.
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- Grinev, Alexei Nikolaevich; Stolyarchuk, Alexandr Alexandrovich; Galenko-Yaroshevsky, Pavel Alexandrovich; Tantsjura, Vladimir Spiridonovich; and Arkhangelskaya, Natalya Vitalievna. Local anaesthetic. 3,968,237, Cl. 424-285.000.
- Groot, Theodorus Cornelis; and Bogaard, Johan Josephus Hendricus, to U.S. Philips Corporation. Method of sealing glass objects to one another by passing a current through them. 3,967,945, Cl. 65-40.000.
- Grosch, George S., to Curt G. Joa, Inc. Method and apparatus for producing defibrated cellulose fluff from bales of compacted wood pulp sheets. 3,967,785, Cl. 241-28.000.
- Groux, Michel John Arthur; Dalan, Ernesto; Kruseman, Jan; and Bertschy, Pierre Yves, to Societe d'Assistance Technique pour Produits Nestle S.A. Vegetable protein extraction at a pH 1-5-3 using gel filtration. 3,968,097, Cl. 260-123.500.
- Gruber, Wilhelm Franz, to Du Pont de Nemours, E. I., and Company. Use of aromatic furfuryl polycarbamates as chloroprene polymer vulcanization accelerators. 3,968,092, Cl. 526-17.000.
- Grundy, Philip J.; and Lin, Yeong S., to International Business Machines (IBM). Method of, and apparatus for, establishing self-biased single wall domains. 3,968,481, Cl. 340-174.0TF.
- GTE Automatic Electric Laboratories Incorporated: *See—*
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- Guenther, Manfred H. Crankcase oil drainage and collection device. 3,967,697, Cl. 184-1.500.
- Guerin, Jean, to Produits Chimiques Ugine Kuhlmann. Process for prepared perchloromethyl mercaptan by chlorination of carbon disulfide. 3,968,155, Cl. 260-543.00H.
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  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,027.
  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,028.
  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,029.
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- Gundlach, Robert W., to Xerox Corporation. Duplicating system. 3,967,818, Cl. 270-18.000.
- Gunthner, Franz, to Jenaer Glaswerk Schott & Gen. Method of making a hollow glass article. 3,967,947, Cl. 65-70.000.
- Guran, Zenon, to Xerox Corporation. Fuser roll temperature regulator probe. 3,968,343, Cl. 219-216.000.
- Gusakov, Vyacheslav Nikolaevich: *See—*
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- Haberli, Roland; and Mollet, Hans, to Ciba-Geigy Corporation. Solid, non-dusty dyestuff-foams of any desired shape and size. 3,967,921, Cl. 8-93.000.
- Habert, Roger Jean. Speed sensitive switching device. 3,967,603, Cl. 123-118.000.
- Hafla, Dietmar; and Abele, Kurt, to Index-Werke KG Hahn & Tessky. Apparatus for effecting and controlling the indexing of tool turrets in machine tools. 3,968,415, Cl. 318-569.000.
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- Hajek, Frantisek; Studnicka, Miroslav; and Kavalir, Jaroslav, to Tesla. Apparatus for testing the operability of emergency vehicular radio transmitters. 3,968,436, Cl. 325-67.000.
- Halbasch, Gerald K. Fishing floater. 3,967,407, Cl. 43-44.900.
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- Hall, Mitchell A., to Monarch Tool & Manufacturing Company. Slide actuator and means controlling movement of same between fully retracted and fully advanced positions. 3,967,713, Cl. 194-92.000.
- Hall, Richard W.; Schutte, Daniel A.; and Sonnenberg, Sven, to Kelsey-Hayes Company. Hydraulic intensifier. 3,967,542, Cl. 92-85.00B.
- Hallanger, Lawrence W.; and Tucker, Leroy W., to United States of America, Navy. Gas vent system for operation in any arbitrary spatial orientation. 3,967,633, Cl. 137-43.000.
- Halliburton Company: *See—*
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- Hanazono, Masanobu; Asai, Osamu; Fuyama, Moriaki; Iimura, Masao; Yagi, Hideyuki; and Okamura, Masahiro, to Hitachi, Ltd. Method of manufacturing low power loss semiconductor device. 3,968,019, Cl. 204-192.000.
- Hancart, Michel Aime: *See—*
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- Hara, Junji; Togami, Shigenori; and Tsuruta, Masami, to Mitsui Toatsu Chemicals, Incorporated. Process for producing fiber-glass reinforced plastics. 3,968,073, Cl. 260-42.180.
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- Harnisch, Horst, to Bayer Aktiengesellschaft. Vic-triazole compounds. 3,968,119, Cl. 260-308.00A.
- Harper, James T. Ambulatory rocking device. 3,967,820, Cl. 272-70.000.
- Harralson, Joseph H.; and Wurzbach, William F., to Brunswick Corporation. Exhaust relief silencing apparatus for marine propulsion systems. 3,967,446, Cl. 60-312.000.
- Harrington, Richard P.; and Harrington, Russell J. Multiple dial combination lock. 3,967,477, Cl. 70-131.000.
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- Hart, Joseph M. Tie attachment for coat hanger. 3,967,766, Cl. 223-85.000.
- Hasegawa, Akira; and Ozoe, Hiromichi, to Nippon Kokan Kabushiki Kaisha. Self-running and automatic cleaning coating machine for internal wall of pipe. 3,967,584, Cl. 118-72.000.
- Hasegawa, Masao; Furuno, Akihisa; Ishikawa, Haruhiko; and Ogawa, Yasuo, to Nitto Chemical Industry Co., Ltd. Process for producing partially hydrolyzed polyacrylamide in the presence of alkali metal hydroxide and boric acid. 3,968,093, Cl. 526-303.000.
- Hasegawa, Takashi. Process for preparation of metal coatings. 3,968,270, Cl. 427-13.000.
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- Hawthorne, Marion F., to Rohm and Haas Company. High energy propellant compositions including vinyl decaborane-polyester copolymer binder. 3,967,989, Cl. 149-19.200.
- Hayashi, Ikuya; Yamane, Yukio; Hitomi, Chiyozi; and Miyake, Keiske, to Toyo Boseki Kabushiki Kaisha. Film excellent in slip characteristics and its production. 3,968,183, Cl. 260-860.000.
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- Hays, Herbert G.; and Maxwell, Richard D., to Amana Refrigeration, Inc. Heat exchange control system. 3,967,590, Cl. 122-4.00R.
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- Hegel, Robert W., to Monroe Auto Equipment Company. Hydraulic master-slave clutch system. 3,967,447, Cl. 60-572.000.
- Hegenbart, Horst, to Gebr. Hofmann KG. Multi-column lifting apparatus and synchronization control device for same. 3,967,701, Cl. 187-29.00R.
- Heidrich, Paul F.; and Powell, Carl G., to International Business Machines (IBM). Coupler for coupling optical energy transmitted by optical fiber to optical waveguide and method of manufacture. 3,967,877, Cl. 350-96.00C.
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- Heinzl, Joachim, to Siemens Aktiengesellschaft. Arrangement for actuating dot-producing printing elements of a mosaic printing head. 3,968,386, Cl. 310-8.100.
- Hekal, Ihab M.; and Chelton, Raymond G., to Continental Can Company, Inc. Metal coated with compositions prepared from aqueous dispersions of carboxylic acid resin and an aliphatic amine. 3,968,311, Cl. 428-461.000.
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- Helwig, Lawrence E.; and Neish, Richard A., to United States Steel Corporation. Method for treating coated ferrous substrates. 3,967,984, Cl. 148-6.160.
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- Henninger, Heinz Willi; Riethmuller, Lothar; Kiefer, Hans Walter; and Spreitzhofer, Ernst Gunther Robert, to Bodenseewerk Perkin-Elmer & Co. GmbH. Signal gating device. 3,967,900, Cl. 356-88.000.
- Henry, Jack P.; and Myers, James D., to M & M Livestock Products Co., Inc. Silage preservative. 3,968,259, Cl. 426-63.000.
- Henze, Walter J.; and Thein, San, to Penn Fishing Tackle Mfg. Co. Trolling apparatus. 3,967,405, Cl. 43-27.400.
- Hepperle, Phillip, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitting machine with improved thread feeding apparatus. 3,967,469, Cl. 66-84.00A.
- Herber, John F.; Sears, James K.; and Thompson, Quentin E., to Monsanto Company. Dye solvents for pressure-sensitive record material. 3,968,320, Cl. 428-537.000.
- Hercules Incorporated: *See—*
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- Hergenrother, Rudolf Clemens. Instrument landing system. 3,968,495, Cl. 343-108.00R.
- Herring, William M.; and Walling, Dennis B., to Standard Oil Company. Multiplexer-analog/digital conversion system. 3,968,487, Cl. 340-347.0AD.
- Herrmann, Gunther; and Pill, Adam, to Pill, Adam. Arrangement for the fluid treatment, especially etching, of objects in assembly-line-like fashion. 3,967,632, Cl. 134-83.000.
- Hess, Ernst P., to Qume Corporation. Cartridge drive apparatus. 3,967,790, Cl. 242-67.200.
- Hessel, Frank J.: *See—*
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- Hickner, Richard A., to Dow Chemical Company, The. Methylol derivatives of polythiols. 3,968,167, Cl. 260-609.00F.
- Higbee, David E., to Phillips Petroleum Company. Poly(arylene sulfide) coating compositions containing polyoxyethylated vegetable oil. 3,968,289, Cl. 428-195.000.
- Higuchi, Takeru, to Alza Corporation. Sympathomimetic topical and percutaneous administration with halogenated promoters. 3,968,245, Cl. 424-330.000.
- Hild, Theodor: *See—*
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  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,028.
  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,029.
  - Frayer, James A.; Hildebrand, Richard E.; and Paraskos, John A., 3,968,031.
- Hill, Raymond G. Horticulture spraying systems. 3,967,920, Cl. 417-63.000.
- Hills, Roger G.: *See—*
  - Bedard, Joseph A.; and Hills, Roger G., 3,967,641.
- Himmelmann, Wolfgang; Balle, Gerhard; Nittel, Fritz; and Saleck, Wilhelm, to AGFA-Gevaert, A.G. Photographic gelatine layers with improved physical and photographic properties. 3,967,966, Cl. 96-114.000.
- Hinata, Masanao; Takei, Haruo; Sato, Akira; and Iwamoto, Atsuo, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,967,967, Cl. 96-124.000.
- Hioki, Kei: *See—*
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- Hirano, Itsuro; Uchiyama, Mitsuru; and Satoh, Masao, to BF Kogyo Kaisha, Ltd. Apparatus for cooling and dehumidication of compressed air. 3,967,940, Cl. 55-122.000.
- Hirasawa, Shigemi: *See—*
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- Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, to Juki Co., Ltd. Cloth feeding device for sewing machine and method thereof. 3,967,565, Cl. 112-208.000.
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- Hirono, Yoshihiko; Ishikawa, Hisao; Yamada, Shozo; Kano, Saburo; and Nomura, Osami, to Nippon Soda Company Limited. Selective herbicides. 3,967,951, Cl. 71-90.000.
- Hirono, Yoshihiko: *See—*
  - Kano, Saburo; Nomura, Osami; Hirono, Yoshihiko; Ishikawa, Hisao; and Yamada, Shozo, 3,967,950.
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- Ho, Robert S.; Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Substituted or unsubstituted p-alkanoyl toluenes as anti-diabetic agents. 3,968,247, Cl. 424-331.000.
- Hobbs, James W., to Phillips Petroleum Company. Absorption process method and apparatus. 3,967,937, Cl. 55-18.000.
- Hobday, Cyril; and Price, Ian Michael, to Ciba-Geigy Corporation. Composition for use in the dyeing of polyester fibers. 3,967,924, Cl. 8-169.000.
- Hochreuter, Richard, to Sandoz Ltd. Quaternary ammonium antistatic agents. 3,968,315, Cl. 428-474.000.
- Hodogaya Chemical Co., Ltd.: *See—*
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- Hodska, Nicholas S., to Lawrence Peska Associates, Inc., a part interest. Combined confection and bubble-forming device. 3,968,262, Cl. 426-134.000.
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- Hoffman, Elmer H. Snowmobile suspension system. 3,967,692, Cl. 180-5.00R.
- Hoffman, Robert, to Lawrence Peska Associates, Inc., a part interest. Curtain rod support assembly. 3,967,805, Cl. 248-262.000.
- Hoffman, Sargent Glenn, III; and Mather, Frank Watkins, III, to Dow Chemical Company, The. Method of repairing leaky hollow fiber permeability separatory devices. 3,968,192, Cl. 264-36.000.
- Hoffmann, Lawrence C., Jr.: *See—*
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- Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for moving fuel elements and control bars from one place to another place in a core reactor. 3,967,741, Cl. 214-27.000.
- Hoffschmidt, Edward J. Razor construction. 3,967,375, Cl. 30-47.000.
- Hofmann, Heinrich: *See—*
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- Hollis Engineering, Inc.: *See—*
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- Holm, Melvin M., to Chevron Research Company. Hydrocarbon conversion process. 3,968,025, Cl. 208-135.000.
- Holt, Harley Raymond, to Bunker Ramo Corporation. Insertion tool operable in accordance with a predetermined program to insert a plurality of conductors in insulation-piercing contacts disposed on opposite sides of an electrical connector. 3,967,356, Cl. 29-203.0MW.
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- Honda, Toshio; Tanaka, Shoji; Fukuura, Yukio; Suzuki, Yoshikatsu; Tanuma, Itsuo; Iwami, Koichi; and Shibata, Shoson, to Bridgestone Tire Company Limited. Method for improving the adhering ability of vulcanized rubber surfaces. 3,968,198, Cl. 264-343.000.
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- Hunter, Gordon E.; Rau, James E.; and Van Wyk, Rogell, to Rockwell International Corporation. Anti-skid control system employing integral-plus-proportional control of pulsed modulation. 3,967,862, Cl. 303-21.00P.
- Hunter, Mark A., to Xerox Corporation. Control logic system for article-labeling apparatus. 3,968,349, Cl. 235-61.60R.
- Hunwick, Richard James, to Dorr-Oliver Incorporated. Centrifugal separator. 3,967,778, Cl. 233-7.000.
- Huston, Norman E., to United States of America, Energy Research and Development Administration. Neutronic reactor construction. 3,968,007, Cl. 176-41.000.
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  - Kano, Saburo; Nomura, Osami; Hirono, Yoshihiko; Ishikawa, Hisao; and Yamada, Shozo, 3,967,950.
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- Jacobson, Peter E., to Sperry Rand Corporation. Ultrasonic driver transducer. 3,968,459, Cl. 333-30.00R.
- Jager, Otto: *See—*
  - Birkenstock, Dieter; and Jager, Otto, 3,967,416.
- Jakesch, Rudolf, to Bulten-Kanthal Aktiebolag. Fastener package. 3,967,727, Cl. 206-344.000.
- Jakob Muller, Forschungs-und Finanz AG: *See—*
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  - Ward, Charles F., Jr.; and Smith, Norman L., 3,968,426.
- Jarrett, Bobby R., to United States of America, Navy. Method for driving a LED at high speed. 3,968,399, Cl. 315-200.00R.
- Jasch, Erich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hoisting apparatus, particularly for a cooling tower. 3,967,699, Cl. 187-2.000.
- Jaspers, Hendrik Alphons, to U.S. Philips Corporation. Heat exchanger. 3,967,354, Cl. 29-157.30D.
- Jefferson Chemical Company, Inc.: *See—*
  - Cuscurida, Michael; and Speranza, George Phillip, 3,968,089.
- Jeffery, Thomas C.: *See—*
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  - Clauss, Karl; Schmidt, Erwin; Pietsch, Hartmut; and Jensen, Harald, 3,968,107.
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- Jeter, John Doise, to Texas Dynamatics, Inc. Method and apparatus for actuating a downhole device carried by a pipe string. 3,967,680, Cl. 166-250.000.
- Jewett, Gary L.: *See—*
  - Schmidt, Donald D.; Jewett, Gary L.; Melcher, Richard G.; and Wessling, Ritchie A., 3,967,928.
- Jin, Jung Il: *See—*
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- Jines, Michael Dwain: *See—*
  - Scherer, William C.; and Jines, Michael Dwain, 3,967,634.
- Johannesen, Donald D.; and Colpaert, James J., to Bendix Corporation, The. Application adjuster for disc brake. 3,967,705, Cl. 188-71.900.
- John R. Nalbach Engineering Company, Inc.: *See—*
  - Warner, Graeme W.; Svagdis, Victor M.; Petrzelka, James W.; and Nalbach, John C., 3,967,659.
  - Warner, Graeme W., 3,967,662.

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  - Dunmire, Paul George, 3,967,839.
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- Johnson, Charles H.; and Wallace, Edward A., to Oscar Mayer & Co. Inc. Apparatus for removing magazines from a closed loop of continuously indexed magazines and reinserting the magazines into the loop. 3,967,559, Cl. 104-88.000.
- Johnson, David H.: *See—*
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- Johnson, Edward A.: *See—*
  - Payne, Bernard M.; Cloute, John R.; Johnson, Edward A.; Brown, Arthur V., Jr.; and Oborsh, Edward V., 3,968,269.
- Johnson, Frank. Advertising and sales promotion method and apparatus. 3,967,880, Cl. 350-133.000.
- Johnson, Howard Beattie: *See—*
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- Johnson & Johnson: *See—*
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  - Roeser, Stephen, 3,967,726.
  - Tanner, John Clinton, II, 3,967,729.
- Johnson, Keith O.; and Coffman, Fredrick M., to Exxon Nuclear Company, Inc. Plenum chamber length measurement system for nuclear fuel. 3,967,382, Cl. 33-125.00R.
- Johnson, Odean J. Automobile wheel cover. 3,967,855, Cl. 301-37.00R.
- Johnson, Wendell C., to Xerox Corporation. Keyboard switch assembly having movable contact, and supporting helicline type legs disposed co-planar to common conductive sheet. 3,968,336, Cl. 200-5.00A.
- Jolley, Leonard. Burglar and fire alarm system. 3,968,483, Cl. 340-274.00R.
- Jones, Addison Brooke; and Matare, Herbert F., to Globe-Union Inc. Epitazy of heterojunction devices. 3,967,987, Cl. 148-171.000.
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- Jones, Jay A. Aerosol bacterial contamination test kit. 3,968,012, Cl. 195-142.000.
- Jones, Paul D.: *See—*
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- Jones, Thomas W. Shear plates. 3,967,431, Cl. 52-753.00L.
- Joseph Gamell Industries, Incorporated: *See—*
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- Joslyn, Larry James, to Sybron Corporation. Method and apparatus for detecting entrapped air in a steam sterilizer. 3,967,494, Cl. 73-29.000.
- Jost, Ernest M.; McBride, Lyle E., Jr.; and Santala, Teuvo J., to Texas Instruments Incorporated. High gain relays and systems. 3,968,380, Cl. 307-99.000.
- Judice, Clay. Golf putter. 3,967,826, Cl. 273-167.00F.
- Juki Co., Ltd.: *See—*
  - Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, 3,967,565.
- Julian, Randall K., to Sunbeam Plastics Corporation. Self-positioning child-resistant closure. 3,967,745, Cl. 215-216.000.
- Jurak, Ivan. Sanding devices. 3,967,417, Cl. 51-170.0TL.
- Jurd, Leonard, to United States of America, Agriculture. Cinnamylsesamol derivatives as insect chemosterilants. 3,968,234, Cl. 424-282.000.
- Juvet, Richard S., Jr.; and Mowery, Richard A., Jr., to Research Corporation. Flame aerosol detector for liquid chromatography. 3,967,931, Cl. 23-230.0PC.
- Jyo, Yoshio; Wada, Yoshio; Aonuma, Mitsuyoshi; Kobayashi, Takeo; and Inokuchi, Kyouzi, to Nippon Zeon Co., Ltd. Process for the surface treatment of unsaturated rubber. 3,968,316, Cl. 428-492.000.
- Kabushiki Kaisha Meidensha: *See—*
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- Kabushiki Kaisha Suwa Seikosha: *See—*
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- Kain, Per; and Thorborg, Kjeld, to Allmanna Svenska Elektriska Aktiebolaget. Convertor connection with assymmetry indicating means. 3,968,418, Cl. 321-12.000.
- Kaiser Aluminum & Chemical Corporation: *See—*
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- Kamov, Nikolai Ilich; Priorov, Nikolai Nikolaevich; Kovalev, Anatoly Fedorovich; Kupfer, Mark Alexandrovich; Satarov, Alexandr Georgievich; Sherman, Iosif Shulimovich; Vakulenko, Anatoly Filippovich; Kovyryalkin, Igor Ivanovich; Stetsenko, Stanislav Ivanovich; Golstman, Vladimir Borisovich; and Guskov, Konstantin Nikolaevich. Method of manufacture of hollow pieces. 3,967,996, Cl. 156-156.000.
- Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, to Boehringer Mannheim G.m.b.H. Azidophenol amine compounds and therapeutic compositions. 3,968,129, Cl. 260-349.000.
- Kane, William Paul, to Du Pont de Nemours, E. I., and Company. Polyethylene terephthalate/paperboard laminate and method of making it, container blank formed from such laminate and container formed from such blank, and cooking method using such container. 3,967,998, Cl. 156-226.000.
- Kanegafuchi Boseki Kabushiki Kaisha: *See—*
  - Matsui, Masao; Tokura, Susumu; and Yamabe, Masahiro, 3,968,307.
- Kaneko, Hirokazu; and Nakano, Hiroo, to Ricoh Co., Ltd. Shutter for photographic cameras with a flash equipment. 3,968,503, Cl. 354-33.000.
- Kaneko, Takashi: *See—*
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- Kano, Saburo; Nomura, Osami; Hirono, Yoshihiko; Ishikawa, Hisao; and Yamada, Shozo, to Nippon Soda Company Limited. Combating weeds in rice with benzothiazole derivatives. 3,967,950, Cl. 71-90.000.
- Kano, Saburo: *See—*
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- Kaplan, Gerald Stanley, to RCA Corporation. Adaptive parameter processor for continuous wave radar ranging systems. 3,968,492, Cl. 343-14.000.
- Karcheski, Debra M.: *See—*
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- Kastening, Bertel; and Faul, Wolfgang, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of making electrode for preparing hydrogen peroxide. 3,968,273, Cl. 427-122.000.
- Kastinger, Hermann. Skiing boot. 3,967,391, Cl. 36-50.000.
- Kato, Michio: *See—*
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- Katzakian, Arthur, Jr.: *See—*
  - Steele, Roger B.; and Katzakian, Arthur, Jr., 3,968,135.
- Kaufhold, Manfred; and Kett, Harald, to Chemische Werke Huls Aktiengesellschaft. Method for preparing straight-chain primary alcohols. 3,968,177, Cl. 260-638.00R.
- Kaufmann, David P. Storage method employing severable walled container having a continuously mergible cover. 3,967,773, Cl. 229-51.0DB.
- Kauneckas, John J. Data recording system for automatic cameras. 3,968,505, Cl. 354-106.000.
- Kavalir, Jaroslav: *See—*
  - Hajek, Frantisek; Studnicka, Miroslav; and Kavalir, Jaroslav, 3,968,436.
- Kawamoto, Hiroshi, to Hitachi, Ltd. Method of manufacturing semiconductor devices. 3,967,364, Cl. 29-578.000.
- Kawashima, Teruaki, to Yoshida Kogyo Kabushiki Kaisha. Slider for heavy duty slide fasteners. 3,967,350, Cl. 24-205.14R.
- Kaye, Gordon E., to P. R. Mallory & Co. Inc. Battery and case for application in random mode to supply proper polarity to apparatus to be energized. 3,967,979, Cl. 136-173.000.
- Kaye, Stanton H.: *See—*
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- Kear, Bernard H.: *See—*
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- Kel-Win Manufacturing Company, Inc.: *See—*
  - Keller, Robert J., III, 3,967,811.
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- Keller, Raymond J.: *See—*
  - Keller, Helen; and Keller, Raymond J., 3,967,944.
- Keller, Robert J., III, to Kel-Win Manufacturing Company, Inc. All plastic valve construction. 3,967,811, Cl. 251-175.000.
- Kelley, Charles S.; and Westlund, James A. Automatic grab crane. 3,967,394, Cl. 37-71.000.
- Kelley Company, Inc.: *See—*
  - Artzberger, Thomas G., 3,967,337.
- Kelley, Fred W., Jr., to General Electric Company. Remote voltage sensor for power system regulation. 3,968,432, Cl. 324-107.000.
- Kelly, Nathan: *See—*
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- Kelsey-Hayes Company: *See—*
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- Kendrick, William D.; and Frazier, Bruce J., to Halliburton Company. High pressure tubular swivel joint. 3,967,841, Cl. 285-276.000.
- Kendrick, William D., to Halliburton Company. High pressure tubular swivel joint. 3,967,842, Cl. 285-276.000.
- Keraus, Roman; Schulz, Gerhard; von Munchhofen, Caspar; and Hofmann, Heinrich, to Messerschmitt-Bolkow-Blohm GmbH. Flammability promoting ammunition for use against airborne targets. 3,967,553, Cl. 102-66.000.
- Kerekes, Bela, to Egyesult Izzolampa Es Villamossagi Resvenytarsasag. Process for manufacturing tubeless vacuum electric discharge lamps. 3,967,871, Cl. 316-4.000.
- Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
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- Kienlen, Loren C.; and Poppler, Jack H., to Doormaid, Inc. Collapsible trivet. 3,967,803, Cl. 248-152.000.
- Kihara, Nobutoshi; and Miki, Tsuguo, to Sony Corporation. Magnetic recording and/or reproducing apparatus for videotape editing. 3,968,518, Cl. 360-14.000.
- Kikugawa, Kiyomi: *See—*
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- King, Raymond J., to Northwest Engineering Company. Material handling apparatus with improved fail-safe brake system. 3,967,706, Cl. 188-170.000.
- Kinoshita, Hiroshi: *See—*
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- Klein, Enrique J.: *See—*
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- Klein, Richard G.: *See—*
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- Kloefkorn, Earl W.; and Kloefkorn, Melvin L. Combine conveyor means. 3,967,719, Cl. 198-175.000.
- Kloefkorn, Melvin L.: *See—*
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- Knauff, Karl-Georg: *See—*
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- Kneile, Karl, to Robert Krause KG Zweiniederlassung Weilheim/Teck. Frame structure for furniture, especially table frame structure. 3,967,804, Cl. 248-188.200.
- Knifton, John F., to Texaco Inc. Carboxylation process for preparing linear fatty acids or esters. 3,968,133, Cl. 260-410.90R.
- Knoch, Wolfgang: *See—*
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- Knudson, Gary A. Building method. 3,967,430, Cl. 52-745.000.
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- Kokaly, Joseph, to Caterpillar Tractor Co. Forward-reverse valve for elevating scraper drive. 3,967,532, Cl. 91-420.000.
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- Kolblin, Rolf: *See—*
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- Kollar, John, to Halcon International, Inc. Method of producing polyhydric compounds. 3,968,174, Cl. 260-635.00R.
- Kollar, John, to Halcon International, Inc. Method of producing polyhydric compounds. 3,968,175, Cl. 260-635.00R.
- Kolling, Heinrich; Widdig, Arno; Thomas, Herbert; and Schulz, Hans Peter, to Bayer Aktiengesellschaft. Benzoylphenylisothioureas. 3,968,314, Cl. 260-470.000.
- Kollmeder, Michael. Combined wax and edge sharpening apparatus for skiers. 3,968,345, Cl. 219-228.000.
- Koma, Kotaro: *See—*
  - Yagi, Hajime; Tsuyuki, Tadaharu; Koma, Kotaro; and Miyazawa, Yoshihiro, 3,968,511.
- Komine, Yoshio; Hosoe, Kazuya; Shimazaki, Mamoru; Ichiyanagi, Toshikazu; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Motion picture camera capable of synchronized sound recording. 3,967,886, Cl. 352-29.000.
- Komine, Yoshio, to Canon Kabushiki Kaisha. Interchangeable lens barrel structure. 3,968,504, Cl. 354-46.000.
- Kondo, Tetsuya, to Kokusan Denki Co., Ltd. Device for preventing an internal combustion engine from revolving at more than the predetermined speed. 3,967,604, Cl. 123-118.000.
- Konishiroku Photo Industry Co., Ltd.: *See—*
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- Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. Synthesis of penniclavine and elymoclavine. 3,968,112, Cl. 260-285.500.
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- Kosal, Kathleen M. Fingernail cap. 3,967,631, Cl. 132-73.000.
- Koster, William Henry; and Dolfini, Joseph Edward, to E. R. Squibb & Sons, Inc. Production of 2-(thio substituted)cephalosporin sulfoxides and 2-(thio substituted)cephalosporins. 3,968,109, Cl. 260-243.00C.
- Kovalev, Anatoly Fedorovich: *See—*
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- Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic compositions. 3,968,229, Cl. 424-273.000.
- Kramming, Erik, to Bengt Lundin AB. Method of storing handle bags. 3,967,775, Cl. 229-54.00R.
- Krauss-Maffei Aktiengesellschaft: *See—*
  - Schwarzler, Peter, 3,967,561.
- Krolik, Paul P., to Alston, Inc. Mechanical gum massager. 3,967,617, Cl. 128-36.000.
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- Krystic, Allan: *See—*
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- Kubacki, Edward F.; Backe, Bengt S.; Gold, Vance B.; Jessogne, Harold J.; Kudert, Frederick G.; Lemke, Harold C.; and Timmins, William D., to American Can Company. Production of closed bottom shells. 3,967,482, Cl. 72-7.000.

- Kubota, Kanemitsu; and Nagasaki, Jin, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device having extended service life. 3,967,882, Cl. 350-160.0LC.
- Kubota Tekko Kabushiki Kaisha (Kubota, Ltd.): *See*—
  - Inujima, Kazuo; Tokunaga, Kiyohiko; and Sotobayashi, Yoshiyuki, 3,968,039.
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- Kukolja, Stjepan P.; and Lammert, Steven R., to Eli Lilly and Company. Process for preparing a desacetoxycephalosporin from a penam and/or a cepham compound. 3,968,108, Cl. 260-243.00C.
- Kuller, Herbert, to Siemens Aktiengesellschaft. Apparatus for determining the phase difference between the rolling oscillation of a ship and a liquid contained in a stabilizing tank. 3,968,353, Cl. 235-150.200.
- Kulsa, Peter: *See*—
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- Kumagai, Naoki, to Itogihan Company, Ltd. Apparatus for supplying thin, flat articles. 3,967,739, Cl. 214-6.00C.
- Kumagai, Tooru: *See*—
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- Kunz, Bernard L., to Emerson Electric Co. Electrically operated expansion valve for refrigeration control. 3,967,781, Cl. 236-68.00R.
- Kunzelmann, Hans: *See*—
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- Kupper, Friedrich-Wilhelm; and Streck, Roland, to Chemische Werke Huls Aktiengesellchaft. Process for the production of pure cyclopentene. 3,968,180, Cl. 260-666.00A.
- Kurasawa, Kazuo: *See*—
  - Enami, Toyoichiro; Kurasawa, Kazuo; Ii, Masaktaka; and Hashimoto, Masaru, 3,967,903.
- Kuroyahagi, Moritaka; Kimura, Yoshinobu; Takeuchi, Hirotoku; and Takegami, Masao, to Aida Engineering Kabushiki Kaisha; and Zaidan Hojin Kikai Shinko Kyokai. Device for adjusting a preload and additionally compensating the slide in a press. 3,967,483, Cl. 72-21.000.
- Kuznetsov, Jury Igorevich: *See*—
  - Rozenfeld, Iosif Lvovich; Persiantseva, Viveya Pavlovna; Kuznetsov, Jury Igorevich; and Petrov, Nikolai Mikhailovich, 3,967,926.
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- Lacefield, William B.; and Marshall, Winston S., to Eli Lilly and Company. Arylacetylene compounds as antithrombotic agents. 3,968,251, Cl. 424-340.000.
- La Charite, George J., to La Charite, Rolland G. C.; and Rowley, Gene V., part interest to each. Motorcycle lifting device. 3,967,834, Cl. 280-291.000.
- La Charite, Rolland G. C.: *See*—
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- Lam, Henry W.: *See*—
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- Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,968,110, Cl. 260-247.10E.
- Lambrecht, Dietrich; and Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Electric machines, particularly turbogenerators, having liquid cooled rotors. 3,968,388, Cl. 310-53.000.
- Lammers, Rene Odon: *See*—
  - Andre, Jacques Maurice Jules Ghislain; Cahen, Raymond Mark; Debus, Henri Robert; Lammers, Rene Odon; and van Thillo, Hugo Johannes, 3,968,225.
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- Lancor, Ellen B., administratrix: *See*—
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- Lancor, Joseph H., Jr., deceased (by Lancor, Ellen B., administratrix); and Ferrari, Leonard A., to Bell & Howell Company. Image display from continuously moving image carrier. 3,967,888, Cl. 352-109.000.
- Lancor, Joseph H., Jr., deceased (by Lancor, Ellen B., administratrix); and Ferrari, Leonard A., to Bell & Howell Company. Image display from continuously moving image carrier. 3,968,506, Cl. 352-109.000.
- Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., to Warner-Lambert Company. Sputter coating method. 3,968,018, Cl. 204-192.000.
- Langberg Associates, Inc.: *See*—
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- Langston, Perry Robert, Jr.; and Turetzky, Melvin Norris, to International Business Machines Corporation. Firing process for forming a multilayer glass-metal module. 3,968,193, Cl. 264-61.000.
- Lanz, William Edwin: *See*—
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- Last, James David; and Roberts, Emyr Wyn, to University of North Wales. Digital phase comparators. 3,968,493, Cl. 343-105.00R.
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- Laughinghouse, Charles Leo, to CGR Medical Corporation. Tube protection circuit for X-ray generators. 3,968,372, Cl. 250-402.000.
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- Lee, Bernard S.: *See*—
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- Leenhouts, Albert C., to Superior Electric Company, The. Motor control for a stepping motor. 3,968,416, Cl. 318-696.000.
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- Lehmann, Louis E.; and Luft, Ralph J., to General Electric Company. Fused decorative string set. 3,968,398, Cl. 315-185.00S.
- Lehmann, Rudiger, to Dual Gebruder Stiedinger, Firma. Synchronized induction motor. 3,967,827, Cl. 274-1.00E.
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- Lesner, Richard S.; and MacDonald, Murdo A., to Chicago Pneumatic Tool Company, a part interest. Power driven screw driver with a screw holding nosepiece. 3,967,664, Cl. 144-32.00R.
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- Lever Brothers Company: *See*—
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- Liljestrand, Walter Emanuel, to Smith International, Inc. Mud saver valve. 3,967,679, Cl. 166-224.00A.
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- Logsdon, Hillard Glenn, to Aeronca, Inc. Air volume regulator for air conditioning systems. 3,967,642, Cl. 137-499.000.
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- Lohaus, Gerhard; and Dittmar, Walter, to Hoechst Aktiengesellschaft. Process for the manufacture of 1-hydroxy-2-pyridones. 3,968,118, Cl. 260-297.00Z.
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- Looney, John H.; Jones, Hugh L.; and Tickner, Donald R., to Rank Xerox Ltd. Variable edge fadeout apparatus for electrostatic reproduction machines. 3,967,896, Cl. 355-14.000.
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- Luft, Karl Friedrich, to Bergwerksverband GmbH. Non-dispersive infrared gas analysis device with triple layer receiver. 3,968,369, Cl. 250-344.000.
- Luft, Karl Friedrich, to Bergwerksverband GmbH. Non-dispersive infrared gas analyzer. 3,968,370, Cl. 250-344.000.
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- Majewicz, Edward J., to Xerox Corporation. Illuminating apparatus. 3,967,893, Cl. 355-4.000.
- Malata, Peter; Buchsteiner, Josef; and Rosenstatter, Otto, to Dentalwerk Burmoos Gesellschaft m.b.H. Clamping mechanism for reciprocating dental tool. 3,967,380, Cl. 32-27.000.
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- Mancini, Derek, to Portion Packaging Limited. Cartonning apparatus. 3,967,434, Cl. 53-186.000.

- Manfredi, Frank A. Exhaust purifier system. 3,967,445, Cl. 60-279.000.
- Mani, Inder; and Shand, Alexander, to Dow Chemical Company, The. Plastic pigments for paper coatings. 3,968,319, Cl. 428-511.000.
- Manning, Richard William, to Air Products and Chemicals, Inc. Welding torch with integral current control. 3,968,341, Cl. 219-132.000.
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- Marcon, Christian, to VCA Corporation. Actuators for pressurized containers. 3,967,760, Cl. 222-153.000.
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- McMurtry, Davis Roberts, to Rolls-Royce (1971) Limited. Turbofan engine with flexible, variable area nozzle. 3,967,443, Cl. 60-226.00R.
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- Meisel, Gerhard; Sussenbach, Helmut; and Zimmermann, Harry, to Licentia Patent-Verwaltungs-G.m.b.H. Electrode printing head and method for making the same. 3,968,500, Cl. 346-139.00C.
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- Mennesson, Francois, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel feed devices for internal combustion engines. 3,967,608, Cl. 123-139.0AW.
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- Meyerhofer, Dietrich; and Sussman, Alan, to RCA Corporation. Liquid crystal devices of the surface aligned type. 3,967,883, Cl. 350-160.0LC.
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- National Distillers and Chemical Corporation: *See—*
  - Mottram, Charles P., 3,967,639.
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- NCR Corporation: *See—*
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- Neuss, Norbert; and Tafur, Susan S., to Eli Lilly and Company. Conversion of leurosine to vincathicine. 3,968,113, Cl. 260-287.00P.
- Newell, Fred T.; and Smith, Gerald B., to Dresser Industries, Inc. Shaft seal for corrosion resistant butterfly valve. 3,967,812, Cl. 251-214.000.
- Newman, C. Ray, to Rol-Dri, Inc. Roller for removing water from and simultaneously drying hard surfaces. 3,967,339, Cl. 15-244.00A.
- Niederhauser, Marc: *See—*
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- Nix, Donald James. Stage safety stabilizer. 3,967,696, Cl. 182-142.000.
- Nixon, Ralph Alan, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Underwater solids collecting apparatus. 3,967,393, Cl. 37-58.000.
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- Noorlander, Daniel O. Diaphragm teat cup assembly for milking. 3,967,586, Cl. 119-14.530.
- Noorlander, Daniel O. Teat cup inflation. 3,967,587, Cl. 119-14.490.
- Nopper, Herbert; and Knoch, Wolfgang, to Becker & van Hullen Niederrheinische Maschinenfabrik. Pressure compensator for heating platen presses. 3,968,296, Cl. 428-256.000.
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- Obrecht, Robert P.; and Bennett, Marlin J., to Stauffer Chemical Company. Chlorination of hydrocarbons. 3,968,178, Cl. 260-658.00R.
- Ogasa, Katsuhiro; Okonogi, Shigeo; Yuguchi, Hiroya; Hayashi, Yoshinobu; and Miyazaki, Yusuke, to Morinaga Milk Industry Co., Ltd. Continuous process for preparing a whipped-cream topping dessert. 3,968,267, Cl. 426-570.000.
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- Ogden, Dennis Henry, to British Industrial Plastics Limited. Vehicle decelerating means. 3,967,704, Cl. 188-32.000.
- Oguchi, Atsushi; Otaguchi, Minoru; Nobuki, Minoru; and Kaieda, Yoshinari, to National Research Institute for Metals. Method for extruding brittle materials. 3,967,485, Cl. 72-60.000.
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- Ohnemuller, Walter; and Solf, Alexander, to Reimbold & Strick. Synthetic wollastonite and a process for its manufacture. 3,967,974, Cl. 106-306.000.
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  - Walter, Lothar; Burkl, Erich; Schurger, Rainer; and Olschewski, Armin, 3,967,865.

Olszewski, Jerzy Adam; and Gabriel, Anthony P., to General Cable Corporation. Offset "O" internal shield design for PCM telephone cables. 3,968,321, Cl. 174-36.000.
O'Malley, James J., to Xerox Corporation. Developing with toner polymer having crystalline and amorphous segments. 3,967,962, Cl. 96-15.00D.
O'Meara, Thomas R., to Hughes Aircraft Company. Method and apparatus for maintaining far field spatial coherency in electromagnetic transmitting systems. 3,967,899, Cl. 356-5.000.
Ong, Kan Kie, to U.S. Philips Corporation. Receiver including an automatic tuning correction suppression circuit coupled to a tuning member. 3,968,437, Cl. 325-422.000.
Ono, Isao; Iiguni, Tetsuo; and Akashi, Mitsumasa, to Rohm and Haas Company. Process for producing acrolein and acrylic acid. 3,968,165, Cl. 260-604.00R.
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Pain, Barrie Reginald Kirby; and Wilhelmsson, Gunnar Robert, to Aktiebolaget Svenska Flaktfabriken. Purifying apparatus. 3,967,942, Cl. 55-223.000.
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Pallos, Ferenc M.; and Tseng, Chien K., to Stauffer Chemical Company. Derivatives of certain geranyl phenyl ethers and their use in controlling insects. 3,968,252, Cl. 424-337.000.
Palmer, David Nelson, to Combustion Engineering, Inc. Method of preparing conductive room temperature vulcanizing material. 3,968,055, Cl. 252-506.000.
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Patton, Bobbie J.; and Slover, Vasel R., to Mobil Oil Corporation. Weight-on-drill-bit and torque-measuring apparatus. 3,968,473, Cl. 340-18.0LD.
Pauwels, Edward M., to Bendix Corporation, The. Valve for force-reversing modulator. 3,967,636, Cl. 137-106.000.
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Pierce, Arthur W.; and Stoehr, Robert A., to Cincinnati Floor Company. Portable floor construction. 3,967,428, Cl. 52-582.000.
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Piget, Maurice. Complex light metal framework produced by combining sectional pieces interconnected in a detachable manner by means of flexible strips having a novel structure. 3,967,427, Cl. 52-502.000.
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Potma, Theodorus Gerhardus; and Gijzen, Wilhelmus Adrianus Henricus, to U.S. Philips Corporation. Matrix printer having detachable elements. 3,967,714, Cl. 197-1.00R.
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Pucher, Janos; and Schmieder, Antal, to Nikex Nehezipari Kulkereskedelmi Vallalat. Process and equipment for lifting secondary liquids with the energy of primary liquids. 3,967,917, Cl. 417-54.000.
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Rahtz, Dieter; Koch, Henning; and Gerhards, Erich, to Schering Aktiengesellschaft. Hydroxy phenylbutazone derivatives and their preparation. 3,968,219, Cl. 424-273.000.
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Reed, Samuel Franklin, Jr., to Rohm and Haas Company. Nitrogen- and fluorine-containing compounds. 3,968,139, Cl. 260-467.000.
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Rhoden, Ivan E., to FMC Corporation. Belt drive conveyor system. 3,967,721, Cl. 198-195.000.
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Seeley, Clarence E., to Anchor Hocking Corporation. Method of improving glass batch melting by use of water glass. 3,967,943, Cl. 65-27.000.
Seglin, Leonard; and Eddinger, Ralph Tracy, to Cogas Development Company. Synthesis gas manufacture. 3,968,052, Cl. 252-373.000.
Seiden, Paul; and Martin, James Bruce, to Procter & Gamble Company, The. Process for preparing polyblycerol. 3,968,169, Cl. 260-615.00R.
Seiler, Wolfgang, to Staubli Ltd. Spring hook for the harness pull of a double-lift open-shed jacquard machine. 3,967,652, Cl. 139-59.000.
Seiter, Charles, to Kaye, Stanton H., a part interest. Telltale device. 3,967,579, Cl. 116-114.500.
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Serio, Jeannette H. Therapeutic constant flow bath. 3,967,323, Cl. 4-173.00R.
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Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nikolaevich; Goyovin, Oleg Semenovich; Mastjukova, Alexei Egorovich, deceased; and by Mastjukova, Maria Pavlovna, heir at law. Method of preparation of material for lubrication of external surface of drilling pipe. 3,968,043, Cl. 252-56.00R.
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- Soldano, Michael J., to Lawrence Peska Associates, Inc., a part interest. Cork remover. 3,967,512, Cl. 81-3.340.
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- Solodar, Arthur John, to Monsanto Company. Asymmetric reduction of ketones to form optically active alcohols. 3,968,147, Cl. 260-482.00C.
- Solomon, Thomas S., to B. F. Goodrich Company, The. Preparation of rubberized cord fabric. 3,968,295, Cl. 428-250.000.
- Solomons, William Ebenezer; and Mathison, Ian William, to Marion Laboratories, Inc. Preparation of 4 and 5-methylindanes. 3,968,163, Cl. 260-599.000.
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- Steele, Roger B.; and Katzakian, Arthur, Jr., to Aerojet-General Corporation. Chromium salt catalysts. 3,968,135, Cl. 260-438.50R.
- Stegmeier, William J. Disposable mold form and method of molding. 3,967,422, Cl. 52-169.00R.
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- Stein, Jeffrey P., to Honeywell Inc. Memory cell. 3,968,480, Cl. 340-173.0FF.
- Stein, Nathan; and Heller, John P., to Mobil Oil Corporation. Method of producing hydrocarbons from an unconsolidated formation. 3,967,682, Cl. 166-278.000.
- Stein, Philipp, to Behringwerke Aktiengesellschaft. Tetanus antigen and process for its manufacture. 3,968,202, Cl. 424-92.000.
- Steinberg, Izchak Zevi, to Yeda Research & Development Co. Ltd. Method and apparatus for investigating the conformation of optically active molecules by measuring parameters associated with their luminescence. 3,967,902, Cl. 356-114.000.
- Stenning, Luis Charles, to General Electric Company Limited, The. Electrical filters. 3,968,448, Cl. 328-167.000.
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- Stoneham, Jeffrey R.; and Dussinger, Thomas E., to Eastman Kodak Company. Film advance-flash interlock mechanism. 3,968,507, Cl. 354-135.000.
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- Stout, Dean, to Winamac Steel Products Division McIntosh Corporation. Automatic apparatus and method for simultaneously forming eyes on each end of a leaf spring blank. 3,967,487, Cl. 72-305.000.
- Stover, Harris A. Communication system. 3,968,435, Cl. 325-16.000.
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- Tajbl, Daniel G.; Lee, Bernard S.; Schora, Frank C., Jr.; and Lam, Henry W., to United States of America, Energy Research and Development Administration. Methanation process utilizing split cold gas recycle. 3,967,936, Cl. 48-197.00R.
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- Takahashi, Soji; and Okada, Hiroshi, to Hitachi Electronics, Ltd.; and Hitachi, Ltd. Method of manufacturing a low energy-loss waveguide circuit element. 3,967,484, Cl. 72-47.000.
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- Van Fleet, Parmer, III: *See—*
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- Waldmann, Hermann, to Siemens Aktiengesellschaft. Method and apparatus for the static compensation of reactive power. 3,968,422, Cl. 323-102.000.
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- Warner, Graeme W.; Svagdis, Victor M.; Petrzelka, James W.; and Nalbach, John C., to John R. Nalbach Engineering Company, Inc. Container filling apparatus. 3,967,659, Cl. 141-79.000.
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- Wells, John B., to Xerox Corporation. Imaging method. 3,968,278, Cl. 427-258.000.
- Wells, Royzell F. Precision positioning device for tool blades and the like. 3,967,377, Cl. 30-320.000.
- Wells, Thomas R., to Bell & Howell Company. Carriage mechanism for microfiche reader. 3,967,890, Cl. 353-27.00A.
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- Whisler, Edwin Lee, to Deere & Company. Vandal latch for preventing removal of a pop-out type vehicle window. 3,967,859, Cl. 296-28.00C.
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- Windler, Harold W., to Allen-Bradley Company. Ground fault detector circuit with high current inhibit. 3,968,409, Cl. 317-32.000.
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- Wirth, Armin, to Wirth, Gallo and Company. Mass and force measuring instrument. 3,967,691, Cl. 177-230.000.
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- Yan, Tsoung-Yuan, to Mobil Oil Corporation. Production of lubricating oils. 3,968,023, Cl. 208-86.000.
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- Yasuda, Izuru; Okuda, Hironori; and Miyashita, Kunio, to Hitachi, Ltd. Synchronous motor. 3,968,390, Cl. 310-156.000.
- Yasuzuka, Katsumi; Matsuo, Takaaki; and Fujiwara, Hachiro, to Unitika Ltd. Yarns and process for production thereof. 3,967,441, Cl. 57-140.00J.
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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687.

- Attwood, Terence E., J. L. Freeman, and R. J. Hoy, to Imperial Chemical Industries Ltd. Polymer compositions. T948,008, 7–6–76, Cl. 260—45.
- Bouknecht, Max A., M. I. Davis, and M. J. Mitchell, Jr., to International Business Machines Corp. Multiprocessor interfacing apparatus. T948,012, 7–6–76, Cl. 340—172.
- Brownlee, John L., to Monsanto Co. Radial carcass plies containing loosely twisted nylon or polyester strands. T948,013, 7–6–76, Cl. 152—356.
- Casey, James O., and B. M. Phillips. Process for temporarily reducing number of spinning orifices in spinneret. T948,004, 7–6–76, Cl. 264—40.
- Davis, Michael I.. *See—*
  - Bouknecht, Max A., Davis, and Mitchell. T948,012.
- Dombroski, John R. Alkali metal compound as polyesterification catalyst for unsaturated polyesters based on 2 2,4-trimethyl-1,3-pentanediol. T948,007, 7–6–76, Cl. 260—750.
- Dow Chemical Co., The: *See—*
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- Firestone Tire & Rubber Co., The: *See—*
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- Freeman, John L.: *See—*
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- Greminger, George K., Jr., and G. S. Newhouse, to The Dow Chemical Co. Hydraulic cement-hydroxypropyl methylcellulose compositions. T948,009, 7–6–76, Cl. 106—93.
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  - Bouknecht, Max A., Davis, and Mitchell. T948,012.
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- Keeler, Eugene R., to Timex Corp. Quartz crystal oscillator. T948,002, 7–6–76, Cl. 331—116.
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- Lino, David C., and J. J. McCoy. Catalytic vapor phase oxidation of isobutylene. T948,005, 7–6–76, Cl. 260—604.
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- Phillips, Bobby M.: *See—*
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- Woodrum, Luther J., to International Business Machines Corp. Directory insertion and deletion method and means. T948,010, 7–6–76, Cl. 444—1.

LIST OF REISSUE PATENTEES

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- Adkison, Archie D., Jr. Door lock. Re. 28,893, Cl. 292-292.000.
- Borel, Joseph; and Robert, Jacques, to Commissariat a l'Energie Atomique. Liquid crystal display device. Re. 28,891, Cl. 350-160.0LC.
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- Ingram, Brian; Harries, David Anthony; and Phoenix, Lancelot, to Girling Limited. Actuator assemblies for hydraulic braking systems. Re. 28,890, Cl. 303-21.00F.
- Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., to Reactor Centrum Nederland. Method for the preparation of concentrated anion-deficient salt solutions. Re. 28,894, Cl. 252-301.100.
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Hendrickson, Philip J., and Resch. 240,382.

Ricket, Glenn E.: *See*—
Dunlap, Norman D., and Ricket. 240,457.

Ridgway, Keith E.: *See*—
Gorton, Howard B., Read, and Ridgway. 240,392.

Rinaldi, Joseph A., to The Gillette Co. Curling iron. 240,466, 7–6–76, Cl. D86—10.

Rizzo, Earl, to Cosmo, Inc. Model glider. 240,437, 7–6–76, Cl. D34—15.

Rizzo, Earl, to Cosmo, Inc. Model airplane. 240,438, 7–6–76, Cl. D34—15.

Rizzo, Earl, to Cosmo, Inc. Model airplane. 240,439, 7–6–76, Cl. D34—15.

Rizzo, Earl, to Cosmo, Inc. Model airplane. 240,440, 7–6–76, Cl. D34—15.

Rizzo, Earl, to Cosmo, Inc. Model airplane. 240,441, 7–6–76, Cl. D34—15.

Robert, Tony. Coin bank. 240,446, 7–6–76, Cl. D34—11.

Roberts, Derek D., to The Solartron Electronic Group Ltd. Digital multimeter. 240,409, 7–6–76, Cl. D10—57.

Robinson, David M. Stud stabilizer. 240,397, 7–6–76, Cl. D8—14.

Rose, Allen J., to Acco International Inc. Rack for suspension of data binders. 240,421, 7–6–76, Cl. D19—90.

Rosenberg, Samuel, to Excelsior Pet Products, Inc. Aquarium stand. 240,436, 7–6–76, Cl. D30—12.

Rowenta-Werke GmbH: *See*—
Stuetzer, Franz A. 240,386.

Rumble, Richard R., and P. Henderson, to Fittall Products Ltd. Rotary display stand. 240,384, 7–6–76, Cl. D6—29.

Schoening, Edward J. Car top luggage carrier. 240,415, 7–6–76, Cl. D12—157.

Scott & Fetzer Co. (The): *See*—
McKee, Donald S. 240,398.

Selinger, Norman R. Student carrell. 240,379, 7–6–76, Cl. D6—181.

Sheffer, Ralph L.: *See*—
Geer, Larry A., and Sheffer. 240,394.

Shelly, Brue L., and M. L. Oliver, to Point Four Ltd., Inc. Athletic shoe. 240,371, 7–6–76, Cl. D2—309.

Shumate, Danny H.: *See*—
Hirano, Tetsuo, and Shumate. 240,418.

Simonelli, Robert M., to GAF Corp. Rear projection transparency viewer. 240,460, 7–6–76, Cl. D16—17.

Singer, Frederic J. Modular shipping container. 240,404, 7–6–76, Cl. D9—246.

Smith, Franklin G., to Manufacturers Consultants Inc. Kitchen cutting board. 240,390, 7–6–76, Cl. D7—46.

Solartron Electronic Group Ltd., The: *See*—
Roberts, Derek D. 240,409.

Sperry Rand Corp.: *See*—
Krapowicz, Jacob A. 240,433.

Stapp, Henry P. Telephone stand. 240,431, 7–6–76, Cl. D26—14.

Steelcase Inc.: *See*—
Buhk, Randall P. 240,374.
Buhk, Randall P. 240,375.

Steinkamp, Norman A., and B. B. Bluestein, to Sunbeam Corp. Hair dryer hood. 240,467, 7–6–76, Cl. D86—10.

Stewart-Warner Corp.: *See*—
Crescenzi, Donald C., and Fontana. 240,399.

Stuetzer, Franz A., to Rowenta-Werke, GmbH. Coffeemaker. 240,386, 7–6–76, Cl. D7—62.

Sunbeam Corp.: *See*—
Steinkamp, Norman A., and Bluestein. 240,467.

Swalm, Calvin D., deceased by G. F. Swalm. Nursery cart. 240,413, 7–6–76, Cl. D12—29.

Swalm, Geraldine F.: *See*—
Swalm, Calvin D. 240,413.

Szalek, Roman J., to General Time Corp. Clock dial. 240,407, 7–6–76, Cl. D10—126.

Szalek, Roman J., to General Time Corp. Clock dial. 240,408, 7–6–76, Cl. D10—126.

Taguchi, Shuhei, H. Koda, and T. Murakami, to Matsushita Electric Industrial Co., Ltd. Portable radio. 240,452, 7–6–76, Cl. D56—4.

Takahashi, Sataro, and T. Kirigaya, to Asahi Kogaku Kogyo Kabushiki Kaisha. Binoculars. 240,548, 7–6–76, Cl. D16—63.

Tazaki, Michiharu, to Kyoei Kogyo Kabushiki Kaisha. Combined drawer front and pull therefrom. 240,381, 7–6–76, Cl. D6—192.

Temco Products, Inc.: *See*—
Thomas, Morton I. 240,414.

Towle Mfg. Co.: *See*—
Merry, Theodore. 240,389.

Uniroyal, Inc.: *See*—
Candiliotis, Gerassimos C. 240,416.
Candiliotis, Gerassimos C. 240,417.

U.S. Suzuki Motor Corp.: *See*—
Hirano, Tetsuo, and Shumate. 240,418.

Vrignaud, Guy, to Allibert Exploitation S.A. Chair. 240,372, 7–6–76, Cl. D6—69.

Webb, Prentice C., Jr. Candlestick. 240,450, 7–6–76, Cl. D48—2.

Weddendorf, Elmer R., to B/W Metals Co., Inc. Combined rotating cafeteria type food service counter and display case. 240,378, 7–6–76, Cl. D6—146.

Werling, John M. Drinking glass. 240,388, 7–6–76, Cl. D7—15.

Whirley Industries: *See*—
Downey, John W. 240,387.

Wise, Wayne T.: *See*—
Montgomery, Theodore, and Wise. 240,412.

Woodstream Corp.: *See*—
McSherry, Thomas. 240,424.

Yoshida, Isozo, to Kanebo Ltd. Set of cards for displaying identifying skin condition indicia for cosmetic purposes. 240,465, 7–6–76, Cl. D86—10.

CLASSIFICATION OF PATENTS

ISSUED JULY 6, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3	
1.1	3,967,321
CLASS 4	
172	3,967,322
173R	3,967,323
207	3,967,324
245	3,967,325
252R	3,967,326
CLASS 5	
9B	3,967,327
81R	3,967,328
92	3,967,329
114	3,967,330
236R	3,967,331
286	3,967,332
317R	3,967,333
319	3,967,334
338	3,967,335
CLASS 8	
93	3,967,921
	3,967,922
149.1	3,967,923
169	3,967,924
173	3,967,925
CLASS 11	
1AC	3,967,336
CLASS 14	
71.7	3,967,337
CLASS 15	
185	3,967,338
244A	3,967,339
250.42	3,967,340
345	3,967,341
CLASS 16	
48	3,967,342
CLASS 17	
1A	3,967,343
	3,967,344
CLASS 21	
2.5B	3,967,926
74R	3,967,927
CLASS 23	
230PC	3,967,931
230R	3,967,932
232E	3,967,933
232R	3,967,928
253R	3,967,934
288F	3,967,929
296	3,967,930
CLASS 24	
16PB	3,967,345
73B	3,967,346
74A	3,967,347
90E	3,967,348
134KC	3,967,349
205.14R	3,967,350
230SC	3,967,351
CLASS 29	
156.4R	3,967,352
156.8R	3,967,353
157.3D	3,967,354
182.7	3,967,935
194	3,967,355
203MW	3,967,356
203D	3,967,357
204R	3,967,358
235	3,967,359
252	3,967,360
267	3,967,361
407	3,967,362
434	3,967,363
578	3,967,364
579	3,967,365
588	3,967,366
594	3,967,367
603	3,967,368
622	3,967,369
	3,967,370
625	3,967,371
CLASS 30	
34.1	3,967,372
43.92	3,967,373
	3,967,374
47	3,967,375
150	3,967,376
320	3,967,377
383	3,967,378
CLASS 32	
14A	Re.28,889
14B	3,967,379
27	3,967,380
CLASS 33	
1H	3,967,381
125R	3,967,382
179	3,967,383
324	3,967,384
CLASS 34	
4	3,967,385
124	3,967,386
CLASS 35	
12P	3,967,387
18R	3,967,388
39	3,967,389
CLASS 36	
50	3,967,391
67B	3,967,392
94	3,967,390
CLASS 37	
58	3,967,393
71	3,967,394
104	3,967,395
	3,967,396
117.5	3,967,397
141R	3,967,398
142A	3,967,399
CLASS 40	
2.2	3,967,400
63A	3,967,401
CLASS 42	
10	3,967,402
	3,967,403
25	3,967,404
CLASS 43	
27.4	3,967,405
42.24	3,967,406
44.9	3,967,407
87	3,967,408
CLASS 46	
111	3,967,409
116	3,967,410
CLASS 48	
197R	3,967,936
CLASS 49	
68	3,967,411
468	3,967,412
CLASS 51	
163.1	3,967,413
165.77	3,967,414
168	3,967,415
169	3,967,416
170TL	3,967,417
334	3,967,418
CLASS 52	
16	3,967,419
127	3,967,420
146	3,967,421
169R	3,967,422
200	3,967,423
208	3,967,424
237	3,967,425
252	3,967,426
502	3,967,427
582	3,967,428
744	3,967,429
745	3,967,430
753L	3,967,431
758D	3,967,432
CLASS 53	
30R	3,967,433
186	3,967,434
254	3,967,435
315	3,967,436
CLASS 55	
18	3,967,937
30	3,967,938
108	3,967,939
122	3,967,940
222	3,967,941
223	3,967,942
CLASS 56	
10.2	3,967,437
113	3,967,438
314	3,967,439
CLASS 57	
34TT	3,967,440
140J	3,967,441
CLASS 58	
23R	3,967,442
CLASS 60	
226R	3,967,443
255	3,967,444
279	3,967,445
312	3,967,446
572	3,967,447
641	3,967,448
	3,967,449
657	3,967,450
CLASS 61	
.5	3,967,451
15	3,967,452
30	3,967,453
41A	3,967,454
45B	3,967,455
46	3,967,456
46.5	3,967,457
	3,967,458
70	3,967,459
72.3	3,967,460
	3,967,461
	3,967,462
85	3,967,463
CLASS 62	
13	3,967,464
48	3,967,465
402	3,967,466
CLASS 65	
27	3,967,943
36	3,967,944
40	3,967,945
68	3,967,946
70	3,967,947
CLASS 66	
4	3,967,467
20	3,967,468
84A	3,967,469
147	3,967,470
161	3,967,471
191	3,967,472
CLASS 68	
5D	3,967,473
CLASS 69	
21	3,967,474
CLASS 70	
18	3,967,475
58	3,967,476
131	3,967,477
144	3,967,478
276	3,967,479
	3,967,480
431	3,967,481
CLASS 71	
29	3,967,948
76	3,967,949
90	3,967,950
	3,967,951
92	3,967,952
97	3,967,953
CLASS 72	
7	3,967,482
21	3,967,483
47	3,967,484
60	3,967,485
69	3,967,486
305	3,967,487
355	3,967,488
367	3,967,489
CLASS 73	
29	3,967,494
32A	3,967,490
41	3,967,491
61.1C	3,967,492
71	3,967,493
118	3,967,495
141R	3,967,496
	3,967,497
146	3,967,498
178R	3,967,499
194EM	3,967,500
304C	3,967,501
352	3,967,502
379	3,967,503
407R	3,967,504
425.6	3,967,505
CLASS 74	
2	3,967,506
6	3,967,507
128	3,967,508
230.17M	3,967,509
575	3,967,510
625	3,967,511
CLASS 75	
1T	3,967,954
12	3,967,955
101BE	3,967,956
103	3,967,957
	3,967,958
CLASS 81	
3.34	3,967,512
52.5	3,967,513
63	3,967,514
CLASS 82	
2B	3,967,515
47	3,967,516
CLASS 83	
7	3,967,517
210	3,967,518
455	3,967,519
CLASS 84	
1.01	3,967,520
254	3,967,521
334	3,967,522
422R	3,967,523
CLASS 85	
13	3,967,524
79	3,967,525
CLASS 86	
19	3,967,526
20B	3,967,527
CLASS 89	
1.5B	3,967,528
1.819	3,967,529
135	3,967,530
CLASS 90	
78	3,967,531
CLASS 91	
49	3,967,533
189R	3,967,534
197	3,967,535
371	3,967,536
372	3,967,537
391R	3,967,538
404	3,967,539
420	3,967,532
488	3,967,540
CLASS 92	
12.2	3,967,541
85B	3,967,542
CLASS 93	
35SB	3,967,544
36.01	3,967,543
CLASS 96	
1PE	3,967,960
1PS	3,967,959
1.2	3,967,961
15D	3,967,962
27H	3,967,963
48R	3,967,964
76R	3,967,965
114	3,967,966
124	3,967,967
CLASS 98	
43A	3,967,545
CLASS 99	
286	3,967,546
421H	3,967,547
CLASS 100	
229A	3,967,548
CLASS 101	
1	3,967,549
93.18	3,967,550
93.31	3,967,551
CLASS 102	
38	3,967,552
66	3,967,553
70.2GA	3,967,555
	3,967,556
70.2R	3,967,554
	3,967,557
99	3,967,558
CLASS 104	
88	3,967,559
94	3,967,560
148LM	3,967,561
CLASS 106	
38.28	3,967,968
39.6	3,967,969
41	3,967,970
45	3,967,971
74	3,967,972
183	3,967,973
288B	3,967,563
306	3,967,974
CLASS 108	
12	3,967,562
CLASS 111	
7	3,967,564
CLASS 112	
208	3,967,565
219A	3,967,566
240	3,967,567
252	3,967,568
CLASS 114	
.5F	3,967,569
45	3,967,570
66.5S	3,967,571
206R	3,967,572
CLASS 115	
6	3,967,573
29	3,967,574
CLASS 116	
35A	3,967,575
63P	3,967,576
65	3,967,577
114R	3,967,578
114.5	3,967,579
115	3,967,580
CLASS 118	
2	3,967,581
5	3,967,582
16	3,967,583
72	3,967,584
CLASS 119	
2	3,967,585
14.49	3,967,587
14.53	3,967,586
26	3,967,588
CLASS 122	
4R	3,967,589
	3,967,590
32	3,967,591
CLASS 123	
8.09	3,967,592
8.45	3,967,593
	3,967,594
32EA	3,967,596
	3,967,598
32JV	3,967,597
32SP	3,967,595
44D	3,967,599
75B	3,967,600
90.4	3,967,601
90.55	3,967,602
118	3,967,603
	3,967,604
119B	3,967,605
139AJ	3,967,606
139AW	3,967,607
	3,967,608
179G	3,967,610
191S	3,967,611
196CP	3,967,612
CLASS 124	
24R	3,967,609
CLASS 126	
41R	3,967,613
229	3,967,614
369.2	3,967,615
CLASS 127	
23	3,967,975
CLASS 128	
1C	3,967,616
36	3,967,617
130	3,967,618
145.8	3,967,619
214C	3,967,620
216	3,967,621
287	3,967,622
	3,967,623
	3,967,624
326	3,967,625
352	3,967,626
400	3,967,627
417	3,967,628
CLASS 131	
144	3,967,629
CLASS 132	
40	3,967,630
73	3,967,631
CLASS 134	
83	3,967,632
CLASS 136	
75	3,967,976
133	3,967,977
146	3,967,978
173	3,967,979
176	3,967,980
CLASS 137	
43	3,967,633
99	3,967,634
102	3,967,635
106	3,967,636
110	3,967,637
216	3,967,638
234.5	3,967,639
269	3,967,640
344	3,967,641
499	3,967,642
512.1	3,967,644
525.1	3,967,645
562	3,967,643
596.12	3,967,646
614.11	3,967,647
625.65	3,967,648
636.3	3,967,649
CLASS 138	
144	3,967,650
145	3,967,651
CLASS 139	
59	3,967,652
88	3,967,653
291R	3,967,655
370.2	3,967,656
450	3,967,657
452	3,967,654
CLASS 140	
92.1	3,967,658
124	3,967,661
CLASS 141	
79	3,967,659
95	3,967,660
148	3,967,662
CLASS 144	
2Z	3,967,663
32R	3,967,664
144.5R	3,967,665
CLASS 148	
1.5	3,967,981
	3,967,982
2	3,967,983
6.16	3,967,984
6.35	3,967,985
105	3,967,986
171	3,967,987
187	3,967,988
CLASS 149	
19.2	3,967,989

109.4	3,967,990
CLASS 150	
1	3,967,666
1.5R	3,967,667
52R	3,967,668
CLASS 151	
41.73	3,967,669
CLASS 152	
337	3,967,670
CLASS 156	
64	3,967,994
85	3,967,991
	3,967,992
86	3,967,993
	3,967,995
156	3,967,996
201	3,967,997
226	3,967,998
258	3,968,000
273	3,967,999
523	3,968,001
CLASS 159	
13A	3,968,002
48R	3,968,003
CLASS 160	
232	3,967,671
CLASS 162	
152	3,968,004
158	3,968,005
198	3,968,006
CLASS 164	
82	3,967,673
181	3,967,672
297	3,967,674
CLASS 165	
1	3,967,675
2	3,967,676
162	3,967,677
CLASS 166	
53	3,967,678
224A	3,967,679
250	3,967,680
277	3,967,681
278	3,967,682
CLASS 168	
4	3,967,683
CLASS 172	
311	3,967,684
573	3,967,685
CLASS 173	
22	3,967,686
32	3,967,687
137	3,967,688
CLASS 174	
36	3,968,321
72A	3,968,322
135	3,968,323
CLASS 175	
391	3,967,689
CLASS 176	
41	3,968,007
78	3,968,008
CLASS 177	
25	3,967,690
230	3,967,691
CLASS 178	
2R	3,968,324
5.8AF	3,968,325
6.8	3,968,327
66R	3,968,326
79	3,968,330
88	3,968,328
CLASS 179	
1GQ	3,968,331
6R	3,968,329
16A	3,968,333
141	3,968,332
175	3,968,334
175.2C	3,968,335
CLASS 180	
5R	3,967,692
CLASS 181	
33G	3,967,693
CLASS 182	
82	3,967,694
86	3,967,695
142	3,967,696
CLASS 184	
1.5	3,967,697
15A	3,967,698
CLASS 187	
2	3,967,699
29R	3,967,700
	3,967,701
	3,967,702
78	3,967,703
CLASS 188	
32	3,967,704
71.9	3,967,705
170	3,967,706
284	3,967,707
CLASS 190	
41B	3,967,708
CLASS 192	
4A	3,967,709
98	3,967,710
108	3,967,711
CLASS 193	
1	3,967,712
CLASS 194	
92	3,967,713
CLASS 195	
98	3,968,009
103.5R	3,968,010
	3,968,011
142	3,968,012
CLASS 197	
1R	3,967,714
16	3,967,715
CLASS 198	
24	3,967,716
31AA	3,967,717
127R	3,967,718
175	3,967,719
193	3,967,720
195	3,967,721
213	3,967,722
235	3,967,723
268	3,967,724
CLASS 200	
5A	3,968,336
61.62	3,968,337
68	3,968,338
86A	3,968,339
CLASS 202	
170	3,968,013
263	3,968,014
CLASS 204	
159.15	3,968,015
159.16	3,968,016
180P	3,968,017
192	3,968,018
	3,968,019
203	3,968,020
256	3,968,021
279	3,968,022
CLASS 206	
108	3,967,725
306	3,967,726
344	3,967,727
364	3,967,728
440	3,967,729
461	3,967,730
508	3,967,731
521	3,967,732
CLASS 208	
86	3,968,023
111	3,968,024
135	3,968,025
210	3,968,026
	3,968,027
	3,968,028
	3,968,031
216	3,968,029
347	3,968,030
CLASS 209	
166	3,968,032
403	3,968,033
CLASS 210	
8	3,968,034
15	3,968,035
	3,968,036
47	3,968,037
225	3,968,039
	3,968,040
242S	3,968,041
275	3,968,038
CLASS 211	
113	3,967,733
199	3,967,734
CLASS 212	
3	3,967,735
42	3,967,736
CLASS 214	
1BB	3,967,737
1S	3,967,738
6C	3,967,739
16.4C	3,967,740
27	3,967,741
390	3,967,743
766	3,967,742
770	3,967,744
CLASS 215	
216	3,967,745
260	3,967,746
CLASS 217	
26.5	3,967,747
CLASS 219	
131F	3,968,340
132	3,968,341
203	3,968,342
216	3,968,343
217	3,968,344
228	3,968,345
305	3,968,346
530	3,968,347
535	3,968,348
CLASS 220	
90.4	3,967,748
265	3,967,749
266	3,967,750
268	3,967,751
269	3,967,752
	3,967,753
273	3,967,754
CLASS 221	
3	3,967,755
45	3,967,756
CLASS 222	
5	3,967,757
58	3,967,758
145	3,967,759
153	3,967,760
194	3,967,761
321	3,967,762
402.15	3,967,763
536	3,967,764
554	3,967,765
CLASS 223	
85	3,967,766
CLASS 225	
96	3,967,767
CLASS 226	
115	3,967,768
194	3,967,769
CLASS 227	
2	3,967,770
10	3,967,771
CLASS 229	
14B	Re.28,892
18	3,967,772
51DB	3,967,773
51TC	3,967,774
54R	3,967,775
69	3,967,776
CLASS 233	
3	3,967,777
7	3,967,778
CLASS 235	
61.12N	3,968,350
61.6R	3,968,349
92PC	3,968,351
150.1	3,968,352
150.2	3,968,353
152	3,968,354
CLASS 236	
49	3,967,779
	3,967,780
68R	3,967,781
92B	3,967,782
CLASS 239	
102	3,967,783
583	3,967,784
CLASS 240	
2R	3,968,355
2S	3,968,356
6.4W	3,968,357
41.55	3,968,358
51.11R	3,968,359
CLASS 241	
28	3,967,785
CLASS 242	
4R	3,967,786
25R	3,967,787
55.19A	3,967,788
56R	3,967,789
67.2	3,967,790
84.1R	3,967,792
84.21R	3,967,791
96	3,967,793
107.4R	3,967,794
125.1	3,967,795
189	3,967,796
222	3,967,800
CLASS 244	
151B	3,967,797
153R	3,967,798
181	3,967,799
CLASS 246	
34R	3,967,801
CLASS 248	
117.4	3,967,802
152	3,967,803
188.2	3,967,804
262	3,967,805
287	3,967,806
447	3,967,807
CLASS 250	
211R	3,968,360
214R	3,968,361
216	3,968,362
228	3,968,363
237R	3,968,364
239	3,968,366
338	3,968,365
339	3,968,367
340	3,968,368
344	3,968,369
	3,968,370
380	3,968,371
402	3,968,372
419	3,968,373
468	3,968,374
	3,968,375
493	3,968,376
499	3,968,377
502	3,968,378
574	3,968,379
CLASS 251	
46	3,967,808
61	3,967,809
146	3,967,810
175	3,967,811
214	3,967,812
298	3,967,813
CLASS 252	
8.9	3,968,042
56R	3,968,043
62.1L	3,968,044
68	3,968,045
95	3,968,046
	3,968,047
157	3,968,048
171	3,968,049
187R	3,968,050
300	3,968,051
301.1	Re.28,894
373	3,968,052
439	3,968,053
468	3,968,054
506	3,968,055
514	3,968,056
516	3,968,057
544	3,968,058
CLASS 254	
8B	3,967,814
CLASS 259	
148	3,967,815
CLASS 260	
2.5AJ	3,968,060
2.5AN	3,968,061
5	3,968,062
17.4SG	3,968,063
23XA	3,968,064
23.5R	3,968,065
29.2TN	3,968,066
29.6RB	3,968,068
29.6F	3,968,069
29.6R	3,968,067
37N	3,968,071
40R	3,968,072
42.18	3,968,073
42.24	3,968,074
42.25	3,968,075
42.35	3,968,076
45.75N	3,968,081
45.8A	3,968,077
45.8N	3,968,078
45.8R	3,968,079
45.85H	3,968,082
45.9QB	3,968,080
47CP	3,968,083
47EN	3,968,084
75N	3,968,085
78P	3,968,087
86.1E	3,968,059
123.5	3,968,097
208	3,968,098
	3,968,099
210AB	3,968,100
211.5R	3,968,101
	3,968,102
	3,968,103
239.3R	3,968,104
239.5	3,968,105
243C	3,968,108
	3,968,109
243R	3,968,106
	3,968,107
247.1E	3,968,110
285.5	3,968,111
	3,968,112
287P	3,968,113
293.54	3,968,114
293.62	3,968,115
295AM	3,968,116
295.5R	3,968,117
297Z	3,968,118
308A	3,968,119
309	3,968,120
326.13R	3,968,121
326.5FL	3,968,122
327C	3,968,123
340.5	3,968,124
345.3	3,968,125
346.1M	3,968,126
346.8A	3,968,127
347.8	3,968,128
348R	3,968,070
349	3,968,129
369	3,968,130
380	3,968,131
397.3	3,968,132
410.9R	3,968,133
429R	3,968,134
438.5	3,968,135
449L	3,968,136
464	3,968,137
465E	3,968,138
467	3,968,139
468D	3,968,140
468K	3,968,141
469	3,968,142
470	3,968,314
473A	3,968,144
473F	3,968,145
473G	3,968,143
481R	3,968,146
482C	3,968,147
486D	3,968,150
486R	3,968,148
	3,968,149
501.2	3,968,151
515P	3,968,152
526N	3,968,153
534S	3,968,154
543H	3,968,155
543P	3,968,156
551P	3,968,157
553R	3,968,158
566F	3,968,159
584C	3,968,160
586R	3,968,161
592	3,968,162
599	3,968,163
604R	3,968,164
	3,968,165
	3,968,166
609F	3,968,167
612R	3,968,168
615A	3,968,170
615R	3,968,169
621A	3,968,171
621R	3,968,172
626T	3,968,173
635R	3,968,174
	3,968,175
637P	3,968,176
638R	3,968,177
658R	3,968,178
660	3,968,179
666A	3,968,180
837R	3,968,181
858	3,968,182
859R	3,968,089
860	3,968,183
876R	3,968,184
880R	3,968,185
881	3,968,186
928	3,968,187
976	3,968,188
CLASS 261	
39A	3,968,189
77	3,968,086
CLASS 264	
32	3,968,190
34	3,968,191
36	3,968,192
61	3,968,193
65	3,968,194
154	3,968,195
171	3,968,196
343	3,968,198
CLASS 269	
9	3,967,816
32	3,967,817
CLASS 270	
18	3,967,818
CLASS 272	
70	3,967,820
CLASS 273	
11C	3,967,821
26R	3,967,822
95R	3,967,823
103	3,967,819
110	3,967,824
135B	3,967,825
167F	3,967,826
CLASS 274	
1E	3,967,827
10D	3,967,828
CLASS 277	
149	3,967,829
CLASS 279	
16	3,967,830
23R	3,967,831
CLASS 280	
11.12	3,967,832
291	3,967,834
639	3,967,833
CLASS 282	
27.5	3,967,835
CLASS 285	
12	3,967,836
112	3,967,837
190	3,967,838
199	3,967,839
222	3,967,840
276	3,967,841
	3,967,842
CLASS 292	
273	3,967,843
292	Re.28,893
336.3	3,967,844
340	3,967,845
359	3,967,846
CLASS 294	
31.2	3,967,848
64A	3,967,849
116	3,967,847
CLASS 296	
28C	3,967,859
146	3,967,850
CLASS 297	
416	3,967,851
452	3,967,852
CLASS 299	
4	3,967,853
40	3,967,854
CLASS 301	
37R	3,967,855
105B	3,967,856
125	3,967,857
CLASS 302	
2R	3,967,858
66	3,967,860
CLASS 303	
6C	3,967,861
21F	Re.28,890
21P	3,967,862
24C	3,967,863
81	3,967,864
CLASS 307	
99	3,968,380
137	3,968,381
202R	3,968,382
237	3,968,383
	3,968,384
270	3,968,385
CLASS 308	
6C	3,967,865
187.1	3,967,866
207R	3,967,867
CLASS 310	
8.1	3,968,386
16	3,968,387
53	3,968,388
61	3,968,389
156	3,968,390
240	3,968,391
CLASS 312	
201	3,967,868
270	3,967,869
330SM	3,967,870
CLASS 313	
198	3,968,392
325	3,968,393
465	3,968,394
CLASS 315	
65	3,968,395
74	3,968,396
155	3,968,397
185S	3,968,398
200R	3,968,399
209R	3,968,400
293	3,968,401
370	3,968,402
371	3,968,403
398	3,968,404
CLASS 316	
4	3,967,871
CLASS 317	
2F	3,968,405
14B	3,968,406
16	3,968,407
17	3,968,408
32	3,968,409
36TD	3,968,410
61.5	3,968,411
258	3,968,412
CLASS 318	
230	3,968,413
341	3,968,414
569	3,968,415
696	3,968,416

CLASS 320	
2	3,968,417
CLASS 321	
12	3,968,418
27R	3,968,419
45C	3,968,420
CLASS 323	
19	3,968,421
102	3,968,422
CLASS 324	
.5AC	3,968,423
	3,968,424
16T	3,968,425
54	3,968,426
57SS	3,968,427
65R	3,968,428
71CP	3,968,429
77B	3,968,430
78E	3,968,431
107	3,968,432
158F	3,968,433
166	3,968,434
CLASS 325	
16	3,968,435
67	3,968,436
319	3,968,438
	3,968,439
417	3,968,440
420	3,968,441
422	3,968,437
	3,968,442
455	3,968,443
470	3,968,444
CLASS 328	
58	3,968,445
134	3,968,446
151	3,968,447
167	3,968,448
207	3,968,449
CLASS 330	
15	3,968,450
22	3,968,451
29	3,968,452
	3,968,453
CLASS 331	
78	3,968,454
94.5C	3,968,456
94.5H	3,968,455
CLASS 333	
1.1	3,968,457
24.2	3,968,458
30R	3,968,459
72	3,968,460
	3,968,461
	3,968,462
96	3,968,463
CLASS 334	
50	3,968,464
CLASS 335	
230	3,968,470
CLASS 336	
110	3,968,465
CLASS 337	
107	3,968,468
139	3,968,469
CLASS 338	
42	3,968,466
119	3,968,467
CLASS 339	
14L	3,967,872
95D	3,967,873
112R	3,967,874
263R	3,967,875
CLASS 340	
15.5CC	3,968,471
16R	3,968,472
18LD	3,968,473
63	3,968,474
146.3E	3,968,475
	3,968,476
167R	3,968,477
172.5	3,968,478
173FF	3,968,479
	3,968,480
174TF	3,968,481
240	3,968,482
274R	3,968,483
	3,968,484
	3,968,485
347AD	3,968,486
	3,968,487
365C	3,968,488
417	3,968,489
CLASS 343	
7.7	3,968,490
12R	3,968,491
14	3,968,492
105R	3,968,493
106R	3,968,494
108R	3,968,495
765	3,968,496
781CA	3,968,497
CLASS 346	
29	3,968,498
110R	3,968,499
139C	3,968,500
CLASS 350	
54	3,967,876
96C	3,967,877
	3,967,878
99	3,967,879
133	3,967,880
150	3,967,881
160LC	Re.28,891
	3,967,882
	3,967,883
226	3,967,884
CLASS 351	
46	3,967,885
CLASS 352	
29	3,967,886
92	3,967,887
109	3,967,888
	3,968,506
174	3,967,889
CLASS 353	
27A	3,967,890
CLASS 354	
7	3,968,501
24	3,968,502
33	3,968,503
46	3,968,504
106	3,968,505
135	3,968,507
209	3,968,508
213	3,968,509
319	3,968,510
CLASS 355	
3DD	3,967,892
3R	3,967,891
4	3,967,893
	3,967,894
8	3,967,895
14	3,967,896
32	3,967,897
110	3,967,898
CLASS 356	
5	3,967,899
88	3,967,900
103	3,967,901
114	3,967,902
167	3,967,903
201	3,967,904
CLASS 357	
36	3,968,511
38	3,968,512
CLASS 358	
4	3,968,513
	3,968,514
5	3,968,515
27	3,968,516
CLASS 360	
10	3,968,517
14	3,968,518
62	3,968,519
71	3,968,520
CLASS 401	
51	3,967,905
CLASS 403	
2	3,967,906
133	3,967,907
219	3,967,908
322	3,967,909
402	3,967,910
CLASS 404	
48	3,967,911
84	3,967,912
109	3,967,913
CLASS 415	
90	3,967,914
209	3,967,915
CLASS 416	
141	3,967,918
167	3,967,916
198A	3,967,919
CLASS 417	
54	3,967,917
63	3,967,920
CLASS 423	
339	3,968,197
347	3,968,199
488	3,968,200
626	3,968,225
CLASS 424	
1	3,968,221
14	3,968,201
47	3,968,203
92	3,968,202
121	3,968,204
153	3,968,205
200	3,968,206
	3,968,222
205	3,968,207
209	3,968,208
211	3,968,209
219	3,968,223
235	3,968,210
246	3,968,226
248	3,968,211
250	3,968,212
251	3,968,213
	3,968,214
260	3,968,215
263	3,968,216
267	3,968,217
	3,968,218
272	3,968,224
273	3,968,219
	3,968,220
	3,968,227
	3,968,228
	3,968,229
274	3,968,230
	3,968,231
277	3,968,232
279	3,968,233
282	3,968,234
	3,968,235
283	3,968,236
285	3,968,237
	3,968,238
304	3,968,239
311	3,968,240
319	3,968,241
321	3,968,242
322	3,968,249
326	3,968,243
330	3,968,244
	3,968,245
	3,968,246
331	3,968,247
333	3,968,248
	3,968,250
337	3,968,252
340	3,968,251
CLASS 426	
2	3,968,253
18	3,968,254
33	3,968,255
38	3,968,256
41	3,968,257
62	3,968,258
63	3,968,259
96	3,968,260
98	3,968,261
134	3,968,262
250	3,968,263
535	3,968,264
550	3,968,265
566	3,968,266
570	3,968,267
580	3,968,268
629	3,968,269
CLASS 427	
13	3,968,270
15	3,968,271
84	3,968,272
122	3,968,273
203	3,968,274
212	3,968,277
258	3,968,278
270	3,968,275
297	3,968,276
348	3,968,279
CLASS 428	
35	3,968,280
75	3,968,281
90	3,968,283
	3,968,284
95	3,968,285
99	3,968,286
136	3,968,287
156	3,968,282
161	3,968,288
195	3,968,289
196	3,968,290
203	3,968,291
213	3,968,292
	3,968,293
	3,968,294
250	3,968,295
256	3,968,296
268	3,968,297
270	3,968,298
272	3,968,304
307	3,968,299
310	3,968,300
323	3,968,301
328	3,968,302
332	3,968,303
334	3,968,305
336	3,968,306
373	3,968,307
402	3,968,308
409	3,968,309
411	3,968,310
419	3,968,312
450	3,968,313
461	3,968,311
474	3,968,315
492	3,968,316
511	3,968,318
	3,968,319
537	3,968,317
	3,968,320
CLASS 526	
17	3,968,092
88	3,968,090
283	3,968,088
303	3,968,093
914	3,968,094
	3,968,095
	3,968,096
CLASS 528	
503	3,968,091

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D2—	309	240,371
	400	240,370
D6—	29	240,384
	30	240,375
	31	240,374
	68	240,376
	69	240,372
	113	240,383
	114	240,380
	146	240,378
		240,382
	179	240,377
	181	240,379
	192	240,381
	197	240,373
D7—	15	240,388
	46	240,390
	56	240,387
	62	240,386
	131	240,385
	152	240,389
D8—	14	240,397
	71	240,393
	150	240,394
	154	240,395
	203	240,392
	208	240,398
	226	240,399
	265	240,396
D9—	23	240,401
	60	240,391
	193	240,400
	246	240,404
	253	240,402
		240,403
D10—	32	240,411
	57	240,409
	106	240,410
	120	240,405
		240,412
	126	240,407
		240,408
	127	240,406
D12—	29	240,413
	111	240,418
	131	240,414
	146	240,417
	147	240,416
	157	240,415
D16—	17	240,460
	30	240,459
	61	240,457
	63	240,458
D19—	76	240,420
	90	240,421
	99	240,422
D22—	13	240,425
	22	240,424
	25	240,423
	27	240,426
D23—	35	240,429
		240,430
	40	240,427
		240,428
D25—	56	240,419
D26—	1D	240,432
	14A	240,431
		240,434
	15B	240,433
D30—	12	240,436
	40	240,435
D34—	4R	240,443
	5GA	240,445
	SS	240,442
	11R	240,446
	14D	240,444
	15HH	240,437
		240,438
		240,439
		240,440
		240,441
D35—	3A	240,448
	B	240,447
D48—	2	240,450
	24A	240,449
D56—	4B	240,451
		240,452
		240,453
		240,455
	R	240,454
		240,456
D77—	1A	240,461
D83—	F	240,463
	12A	240,462
		240,464
D86—	10	240,465
	E	240,466
	F	240,467
D87—	5E	240,468
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	604R	T948,005
264—	40	T948,004
	311	T948,001
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PATENTS

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3,967,582
3,967,736
3,967,948
3,967,989
3,968,139
3,968,150
3,968,158
3,968,160
3,968,378
2 : 3,967,854
4 : 3,967,322
3,967,360
3,967,384
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3,967,532
3,967,931
3,967,988
3,968,203
3,968,352
3,968,459
3,968,478
3,968,486
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3,967,793
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3,967,331
3,967,334
3,967,336
3,967,338
3,967,367
3,967,370
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3,967,449
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3,968,001
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3,968,007
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3,968,075
3,968,094
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3,968,400
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3,968,427
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3,968,445
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3,967,845
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3,967,637
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3,967,662
3,967,695
3,967,709
3,967,729
3,967,737
3,967,738
3,967,746
3,967,749
3,967,754
3,967,759
3,967,781
3,967,789
3,967,805
3,967,821
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3,967,855
3,967,875
3,967,890
3,967,908
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3,968,053
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3,967,949
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3,967,685
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3,967,567
3,967,578
3,967,589
3,967,657
3,967,671
3,967,731
3,967,904
3,967,946
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3,968,272
3,968,380
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3,968,396
3,968,405
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3,967,664
3,967,669
3,967,712
3,967,744
3,967,820
3,967,830
3,967,834
3,967,848
3,967,849
3,967,863
3,967,868
3,967,914
3,967,927
3,967,928
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3,968,144
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3,968,351
3,968,355
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3,968,434
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3,967,817
3,967,980
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3,967,556
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3,967,668
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3,967,756
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3,967,765
3,967,770
3,967,777
3,967,792
3,967,800
3,967,825
3,967,833
3,967,883
3,967,906
3,967,994
3,968,005
3,968,023
3,968,036
3,968,050
3,968,058
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3,968,082
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3,968,110
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3,968,152
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3,968,261
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3,968,299
3,968,321
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3,968,335
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3,968,492
3,968,501
3,968,515
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3,967,325
3,967,343
3,967,351
3,967,353
3,967,354
3,967,376
3,967,431
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3,967,494
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3,967,635
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3,967,676
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3,967,763
3,967,780
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3,967,818
3,967,828
3,967,864
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3,967,872
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3,967,884
3,967,891
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3,967,961
3,967,962
3,967,964
3,967,979
3,968,010
3,968,045
3,968,052
3,968,056
3,968,066
3,968,078
3,968,083
3,968,114
3,968,121
3,968,133
3,968,193
3,968,194
3,968,248
3,968,250
3,968,263
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3,968,303
3,968,313
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3,968,359
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3,968,412
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3,968,489
3,968,490
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3,967,541
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3,967,583
3,967,614
3,967,667
3,967,718
3,967,723
3,967,774
3,967,782
3,967,822
3,967,847
3,967,870
3,967,909
3,967,943
3,967,973
3,967,977
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3,968,064
3,968,065
3,968,068
3,968,080
3,968,081
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3,968,297
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3,967,860
3,967,916
3,967,937
3,967,957
3,968,000
3,968,151
3,968,289
3,968,520
41 : Re.28,889
3,967,328
3,967,641
3,967,687
3,967,724
3,968,294
3,968,483
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3,967,405
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3,967,464
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3,967,517
3,967,528
3,967,651
3,967,673
3,967,757
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3,967,812
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3,967,915
3,967,944
3,967,953
3,967,972
3,967,984
3,967,990
3,968,004
3,968,016
3,968,021
3,968,024
3,968,026
3,968,027
3,968,028
3,968,029
3,968,031
3,968,037
3,968,054
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3,968,283
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3,967,678
3,967,679
3,967,680
3,967,682
3,967,722
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3,967,798
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3,967,869
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3,967,587
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50 : 3,967,381
51 : 3,967,522
3,967,554
3,967,750
3,967,752
3,967,753
3,967,811
3,967,815
3,967,858
3,967,898
3,967,998
3,968,006
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3,968,455
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3,967,799
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3,967,700
3,967,706
3,967,732
3,967,766
3,967,773
3,967,810
3,967,814
3,967,837
3,967,851
3,968,141
3,968,281
3,968,409
56 : 3,967,665

DESIGN PATENTS

4 : 240,443
240,450
6 : 240,380
240,383
240,392
240,393
240,394
240,404
240,406
240,411
240,413
240,431
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240,445
240,448
8 : 240,398
9 : 240,399
240,433
10 : 240,405
12 : 240,397
240,425
17 : 240,395
240,402
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18 : 240,428
19 : 240,423
21 : 240,426
24 : 240,376
240,379
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25 : 240,389
240,400
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240,416
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26 : 240,371
240,374
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240,461
27 : 240,385
240,463
29 : 240,388
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34 : 240,454
240,456
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39 : 240,377
240,378
240,437
240,438
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240,440
240,441
240,457
41 : 240,370
240,390
42 : 240,387
240,469
46 : 240,412
48 : 240,446
240,449
49 : 240,434
55 : 240,382

PLANT PATENTS

3 : 03,932
6 : 03,931
03,934
03,935
12 : 03,936
39 : 03,933

DEFENSIVE PUBLICATIONS APPLICATIONS

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1 : T948,013
12 : T948,012
22 : T948,011
26 : T948,009
27 : T948,003
36 : T948,010
39 : T948,001
42 : T948,002
T948,005
47 : T948,004
T948,007

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PATENTS

July 13, 1976

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I. J. ROTKIN,
Chairman.

June 14, 1976.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,574,043, Luber and Clutton, REFLECTIVE MATERIAL AND METHOD OF MAKING SAME; **3,585,381**, Hodson, Cartmell, Churchill and Jones, ENCAPSULATED CHOLESTERIC LIQUID CRYSTAL DISPLAY DEVICE; **3,637,291**, Kessler and Trzaska, DISPLAY DEVICE WITH INHERENT MEMORY; **3,647,280**, Klein and Caplan, LIQUID CRYSTAL DISPLAY DEVICE; **3,720,623**, Cartmell and Churchill, ENCAPSULATED LIQUID CRYSTALS; **3,802,945**, B. G. James, HEAT SENSITIVE NOVELTY DEVICE, **filed** Oct. 6, 1975, D.C., S.D.N.Y., Doc. 75–C–4896, *Seymour Rosen, doing business as Seymour Rosen Co.* v. *Hattie Carnegie Jewelry Enterprises, Ltd.* Action dismissed with prejudice, Nov. 17, 1975.

3,585,381. (See 3,574,043.)

3,598,727, C. B. Willock, ARTIFICIAL KIDNEY, **filed** Mar. 3, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–0474, *David Kopf Systems, Inc.* v. *DWS, Inc.*

3,605,225, Gibson and Protzmann, METHOD OF TREATING YARNS TO PROVIDE KINKING AND/OR MOTTLED EFFECTS IN FABRIC, **filed** Feb. 10, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–76–469–LTL, *H.G.P. Corporation* v. *R.H.S. Carpet Mills, Inc and Colormaster of California.*

3,637,291. (See 3,574,043.)

3,647,096, J. H. Holland, MATERIAL DELIVERY SYSTEM; **3,724,692**, same; **3,731,825**, Holland and Fox, SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM; **3,788,504**, J. H. Holland, MATERIAL DELIVERY SYSTEM; **3,791,511**, same, CONVEYOR SYSTEM; **3,794,194**. same, SELF-UNLOADING MATERIAL DELIVERY SYSTEM; **3,857,502**, Holland and Fox, SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM; **D.220,174**, J. H. Holland, SEMI-TRAILER, **filed** June 20, 1973, D.C. Minn. (Minneapolis), Doc. 4–73–C–324, *Orcon Industries, Inc.* v. *J. H. Holland Company et al.* Consent decree, plaintiff is hereby permanently enjoined from infringing any of said patents. All claims and counterclaims are hereby dismissed with prejudice, Dec. 18, 1975.

3,647,280. (See 3,574,043.)

3,658,327, G. S. Thiede, PULL TYPE EXERCISING DEVICE; **Reg. No. 971,804** (DYNA-GYM), Marcy Gymnasium Equipment Co., **filed** Apr. 25, 1975, D.C., S.D. Calif. (San Diego), Doc. 75–0227–T, *Marcy Gymnasium Equipment Co. and Clifford S. Thiede* v. *Total Gym, Inc.* Final judgment by consent of both parties. Case settled and dismissed, Feb. 12, 1976.

3,720,623. (See 3,574,043.)

3,724,692. (See 3,647,096.)

3,731,825. (See 3,647,096.)

3,743,793, S. T. Emerson, ANALOG SIGNAL RECORDING AND PLAYBACK METHOD AND SYSTEM; **3,754,264**, W. T. Blackband, RADIO DIRECTION FINDING APPARATUS, **filed** Jan. 20, 1976, D.C.N.J. (Camden), Doc. C–1813–73, *Periphonics Corporation* v. *All Systems, Inc. and Applied Information Industries, Inc.* Default judgment, defendant hereby restrained and enjoined from infringing said patents. Defendant's counterclaims under the anti-trust laws and for a declaratory judgment of patent invalidity and non-infringement are hereby dismissed. Judgment is entered in favor of plaintiff, Jan. 19, 1976.

3,754,264. (See 3,743,793.)

3,776,473, Casey and Badia, HIGHLY REFLECTIVE ALUMINUM FLAKE; **3,901,688**, same, **filed** Jan. 15, 1976, D.C. Pa. (Philadelphia), Doc. 76–135, *Silberline Manufacturing Co., Inc.* v. *International Nickel Co., Inc. and Alcan Aluminum Corp.*

3,788,504. (See 3,647,096.)

3,791,511. (See 3,647,096.)

3,794,194. (See 3,647,096.)

3,802,945. (See 3,574,043.)

3,802,945, B. G. James, HEAT SENSITIVE NOVELTY DEVICE, **filed** Oct. 10, 1975, D.C., S.D.N.Y., Doc. 75–C–5019, *Raymond Myers* v. *Hattie Carnegie Jewelry Enterprises, Inc.*

3,824,365, W. R. Tapper, MIROWAVE OVEN CONTROL SYSTEM, **filed** May 19, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1598, *Litton Systems, Inc.* v. *The Tappan Company.* Ordered that this cause is dismissed with prejudice as to all activities complained of in the complaint and counterclaim herein which have occurred prior to the date of this order, but otherwise without prejudice, Mar. 11, 1976.

3,846,944, H. Lambert, STRUCTURAL SELF-SUPPORTING SYSTEM; **Reg. No. 995,289** (RIVETIER), Barton-King Systems Corporation, doing business as Bassett Mfg. Corp., **filed** Jan. 22, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–158–SAW, *Barton-King Systems Corp.* v. *San Jose Systems.*

3,852,846, L. E. Slaybaugh, DOOR HOLD OPEN ATTACHMENT FOR A DOOR CHECK, **filed** Mar. 4, 1976, D.C.N.C. (Charlotte), Doc. C–C–76–77, *Republic Industries, Inc.* v. *Eaton Corporation.*

3,853,222, J. D. Helms, PRESSURIZATION APPARATUS, **filed** Mar. 4, 1976, D.C., N.D. Tex. (Dallas), Doc. CA–3–76–0346G, *Matchpoint Industries, Inc.* v. *O. T. Tatum.*

3,857,502. (See 3,647,096.)

3,887,268, Golden and Kennedy, FLASHING REFLECTOR SYSTEM, **filed** Oct. 28, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3622, *Beatrice Foods Co.* v. *Sate-Lite Mfg. Co.*

3,887,768, Forney, Jr. and Gallager, SIGNAL STRUCTURES FOR DOUBLE SIDE BAND-QUADRATURE CARRIER MODULATION, **filed** Jan. 26, 1976, D.C., C.D. Calif. (Los Angeles), Doc. 76–293–WMB, *Milgo Electronic Corporation and International Communications Corp.* v. *Codex, Inc.*

3,901,688. (See 3,776,437.)

3,916,265, J. J. Friedman, ADJUSTABLE SIGNAL HANGER AND DOUBLE DOOR TERMINAL DISCONNECT HOUSING, **filed** Mar. 15, 1976, D.C., S.D. Fla. (Miami), Doc. 76–515–C–NCR, *Cost Cast, Inc.* v. *Engineered Castings, Inc. and Jack J. Friedman.*

D.220,174. (See 3,647,096.)

D.220,644, L. D. Robinson, MONEY BOX, **filed** Aug. 7, 1975, D.C., E.D. Calif. (Sacramento), Doc. F–75–144–C, *L. Elsworth Robinson and Leva Delores Rabinson, individually and doing business as Cash Caddy Corporation* v. *Interstate Restaurant Supply Company, Inc.* Order of court dismissing the cause conditionally, Feb. 3, 1976.

Reg. No. 971,804. (See 3,658,327.)

Reg. No. 995,289. (See 3,846,944.)

3,789,833, N. Bom, HEART EXAMINATION BY MEANS OF ULTRASOUND WAVES, **filed** July 3, 1975, D.C. Conn. (Bridgeport), Doc. B–75–213, *Organon Teknika B.V.* v. *Hoffrell Instruments, Inc. and Russel Uphoff.* **Same, filed** Sept. 10, 1975, D.C. Ariz. (Phoenix), Doc. C–75–619–PHX, *Organon Teknika B.V.* v. *Advanced Diagnostic Research Corp. and Martin H. Wilcox.*

3,808,090, Logan and Luhde, MECHANICAL ABRASION OF WOOD PARTICLES IN THE PRESENCE OF WATER AND IN AN INERT GASEOUS ATMOSPHERE, **filed** Apr. 4, 1975, D.C., S.D.N.Y., Doc. 75–C–1650, *American Defibrator, Inc.* v. *Anglo Paper Prod. Ltd.*

3,814,725, Zimmerman and Isaacson, POLYALKYLENE TEREPHTHALATE MOLDING RESIN, **filed** June 6, 1975, D.C., S.D. Ind. (Evansville), Doc. CV–75–75–C, *Celanese Corporation* v. *General Electric Company.*

3,814,725, Zimmerman and Isaacson, POLYALKYLENE TEREPHTHALATE MOLDING RESIN; **3,873,491**, J. S. Gall, POLYALKYLENE TEREPHTHALATE MOLDING RESIN AND PROCESS FOR MAKING SAME, **filed** Oct. 21, 1975, D.C., S.D.N.Y., Doc. 75–C–5197, *Hooker Chemicals & Plastics Corp.* v. *Celanese Corporation.*

3,823,468, N. Hascoe, METHOD OF FABRICATING AN HERMETICALLY SEALED CONTAINER, **filed** June 4, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0698–C, *Semi-Alloys Incorporated* v. *Metalized Ceramics Corporation.* **Same, filed** July 21, 1975, D.C., W.D.N.Y. (Buffalo), Doc. 75–300, *Williams Gold Refining Company Incorporated* v. *Semi-Alloys Incorporated.*

3,823,468, N. Hascoe, METHOD OF FABRICATING AN HERMETICALLY SEALED CONTAINER; **3,874,549**, same, HERMETIC SEALING COVER FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE, **filed** May 5, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0549–C, *Semi-Alloys Incorporated* v. *Plessey Incorporated and Plessey Industries, Inc.*

3,837,292, D. Wiebe, HYDRAULIC TRUCK SNUBBER, **filed** Mar. 17, 1976, D.C. Pa. (Philadelphia), Doc. C.A. 76–800, *Railroad Dynamics, Inc.* v. *A. Stucki Company.*

3,858,874, B. Wieder, PUSH-PULL TYPE OF EXERCISING DEVICE, **filed** Dec. 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–4294–F, *Wieder Health & Fitness* v. *Beacon Enterprises.*

3,865,402, D. Zenser, BICYCLE, **filed** Apr. 17, 1975, D.C., S.D. Tex. (Houston), Doc. 75–H–600, *Yamaha International Corporation* v. *Cycle Trend Corporation et al.*

3,858,874, B. Wieder, A PUSH-PULL TYPE OF EXERCISING DEVICE, **filed** Dec. 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–4294–F, *Wieder Health & Fitness* v. *Beacon Enterprises.*

3,867,517, C. Ling, DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES, **filed** Feb. 18, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–555 AAH, *Abbott Laboratories* v. *Curtis Laboratories.*

3,869,358, Nobel and Ostrow, ELECTROLYTES FOR THE ELECTROLYTIC DEPOSITION OF ZINC, **filed** Nov. 21, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4000, *Lea-Ronal, Inc.* v. *Richardson Co.*

3,869,731, Waugh, Smith, Anzel and Orofino, ARTICULATED TWO-PART PROSTHESIS REPLACING THE KNEE JOINT, **filed** Aug. 22, 1975, D.C., Md. (Baltimore), Doc. H–75–1174, *The Regents of the University of California and Wright Manufacturing Company* v. *Howmedica, Inc.* **Same, filed** Mar. 9, 1976, D.C., N.J. (Newark), Doc. 76–449, *The Regents of the University of California et al.* v. *Howmedica, Inc.*

3,873,491. (See 3,814,725.)

3,874,549. (See 3,823,468.)

PATENT NOTICES

Certificates of Correction for the Week of July 13, 1976

Re. 28,600
Re. 28,797
D. 239,473
3,709,493
3,746,541
3,755,159
3,775,654
3,776,618
3,794,673
3,799,758
3,801,596
3,810,233
3,810,868
3,813,417
3,816,385
3,818,980
3,822,254
3,823,180
3,832,611
3,835,425
3,840,617
3,844,655
3,851,143
3,854,084
3,867,257
3,869,932
3,873,954
3,874,241
3,874,431
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3,883,112
3,885,028
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3,904,677
3,906,306
3,906,790
3,907,580
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3,912,862
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3,944,288
3,944,449
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3,944,562
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3,955,105
3,955,252
3,955,451
3,955,952
3,956,062
3,956,255
3,956,395
3,956,779
3,957,016

Patents Available for Licensing or Sale

3,095,861. METHOD AND APPARATUS FOR EXTRACTING HEAT FROM THE HOT EXHAUST GASES OF INTERNAL COMBUSTION ENGINES. Mr. A. Norris, 43 Highfield Drive, Hurstpierpoint, Sussex, BN6 9AU, England.

3,316,954. WRIGHT TIRE. Winston F. Wright, 2660 Fair Circle. Reno, Nev., 89503.

3.677,409. SEWAGE TREATMENT SYSTEM. Carl W. Ferm and Fred R. Sechler. Correspondence to: Mason, Fenwick & Lawrence, Suite 310, 1730 Rhode Island Ave., NW., Washington, D.C., 20005.

3,680,237. OUTDOOR ILLUMINATED SIGNS. John G. Finnerty, Sr., 100 Polifly Road, Hackensack, N.J., 07601.

3,807,707. EXTERIOR ADJUSTMENT METERING JET INSERT PLATE FOR CARBURETORS AND CARBURETOR MODIFYING METHOD. Harley D. Johnson. Correspondence to: Sherman Levy, Suite, 636, Washington Building, 11th New York Ave., NW., Washington, D.C., 20005.

3,837,197. KEY OPERATED LOCK. Pedro Lopez, 2295 De Londres, St. Laurent, Quebec, Canada, H4L 3A5.

3,848,915. TREE BALLING SPADE. Bernard Wherry, % Wherry Nurseries, P.O. Box 148, St. Marys, W. Va., 26170.

3,856,192. STEREO TAPE CARTRIDGE RACK. Charles R. Nelson, RD #1, Box 128, Duanesburg, N.Y., 12056

3,861,484. HYDRID VEHICULAR POWER SYSTEM. Kenneth Joslin, 11223 West Lilac Road, Escondido, Calif., 92025.

3,874,174. GEOTHERMAL HEAT EXCHANGE METHOD AND APPARATUS. Clarence Kirk Greene, 100 N. Arlington Ave., Reno, Nev., 89501.

3,878,700. LOCK OPERATED BY AN AXIALLY BITTED KEY. Pedro Lopez, 2295 De Londree, Quebec, Canada, H4L 3A5.

3,911,752. REMOTE CONTROL CHANNEL CHANGER FOR TELEVISION RECEIVERS. Stephen A. Lazorcak, P.O. Box 33082, District Heights, Md., 20028.

3,915,323. VERSATILE BOAT LOADING APPARATUS USED ON RECREATIONAL VEHICLES. Oscar E. Underhill, 1009 Barrow St., Anchorage, Alaska, 99501.

3,928,879. INFLATABLE TUBE BODIES. Metzeler Kautschut AG, Munich, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,930,116. ELECTRIC OUTLET SAFETY PLATES OR COVERS. Theodore Richards, 1936 Sloat Blvd., San Francisco, Calif., 94116.

3,935,874. UMBRELLA ASSEMBLY. Helen Cohen, 251 Valentine St., Fall River, Mass., 02720.

3,937,224. COLOSTOMY CATHETER. Ronald L. Uecker, 915 Grant St., Wausau, Wis., 54401. Correspondence to: Jacques M. Dulin, Esquire, Suite 600, 135 South La Salle St., Chicago, Ill., 60603.

3,944,499. NON-AQUEOUS CLEANING COMPOSITION. Sabina Staniek, N.J. Correspondence to: Laurence, Stokes, & Neilan, Crystal Plaza One, Suite 805, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

3,945,058. COLLAPSIBLE SAUNA BATH KIT. Kent A. Gardner, 210 S. Glenn Drive, Yakima, Wash., 98902.

3,947,641. USE OF PUBLIC SUBSCRIBER TELEPHONE NETWORK: METHOD AND APPARATUS. Anders E. Trell, Polhemsgatan 20, B4 112 36 Stockholm, Sweden.

3,957,053. DETACHABLY CONNECTED ACCUPUNCTURE NEEDLES. Yen-Kong Woo, 1545 Geary Bl. #1, San Francisco, Calif., 94115.

3,958,387. TRANSVERSE ROOFING STRIP. Sadao Kandabashi, Tokyo, Japan. Correspondence to: Y. Toyoda International Patent Office, No. 204, Sanshin Bldg. 4–1 Yurakucho, 1–Chome Chiyoda-ku, Tokyo, Japan.

3,960.344. PRECISION MOBILE GRAVITY SURVEY AND GUIDENCE SYSTEM. Virgil H. Dugan, 1614 East 47th St., Chattanooga, Tenn., 37407.

The following 8 patents are offered by: Larry Harold Kline, Attorney at Law, P. A., Suite 805, 18 Broad St., Charleston, S.C., 29401, A/C 803 577–7715.

3,913,637. HAROLD SEALS, REVOLVING BAGGING MACHINE.
3,913,635. HAROLD SEALS, BAG HOLDING AND FILLING DEVICE.
3,913,638. HAROLD SEALS, TAKE-OFF DEVICE.
3,933,185. HAROLD SEALS, SPILL COLLECTION DEVICE.
3,937,369. HAROLD SEALS, HOUSING FOR AN IMPELLER.
239,831. STEPHEN J. BAUMRIND, COMBINED SPLASH-GUARD AND HOLDER FOR BATHROOM ACCESSORIES.
3,955,789. STEPHEN J. BAUMRIND, TUBE HOLDER.
3,737,921. STEPHEN J. BAUMRIND, PERMANENT OR MOBILE SPLASH-GUARD.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 6 patents upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,719,365. SEAL STRUCTURE.
3,726,604. COOLED JET FLAP VANE.
3,727,515. PARALLEL CHAIN DRIVE DEVICE.
3,728,584. SEMICONDUCTOR DEVICE MOUNTING ADAPTER.
3,736,069. TURBINE STATOR COOLING CONTROL.
3,718,364. VEHICLE BODY AND FRAME CONSTRUCTION.

General Electric Company is prepared to grant non-exclusive licenses under the following 1 patent on reasonable terms, to domestic manufacturers.

Applications for licenses under the following patent may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,955,131. CIRCUIT FOR CONTROLLING THE REVERSE CURRENT IN A CONTROLLED RECITIFIER.

Application for licenses under the following 1 patent may be addressed to: General Electric Company, Transportation System Business Division, 2901 East Lake Road, Erie, Pa., 16531.

3,899,725. BRAKING EFFORT CONTROL.

Application for licenses under the following 3 patents may be addressed to: Patent Counsel, Gas Turbine Products Division, General Electric Company, 1 River Road, Bldg. No. 500–2nd Floor, Schenectady, N.Y., 12345.

3,852,099. DENSE SILICON CARBIDE CERAMIC AND METHOD OF MAKING SAME.
3,853,566. HOT PRESSED SILICON CARBIDE.
3,928,901. FORMING A CLADDING SHEET TO A CONVEX/CONCAVE SUBSTRATE.

Application for license should be addressed to Division Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,580,860. INFRARED-EXCITABLE ALKALINE EARTH THORIUM FLUORIDE LUMINESCENT MATERIALS.
3,630,945. DIVALENT EUROPIUM ACTIVATED ALKALINE EARTH ALUMINUM FLUORIDE LUMINESCENT MATERIALS AND PROCESS.
3,635,833. MANGANESE ACTIVATED MAGNESIUM-LITHIUM ALUMINO-GALLATE LUMINESCENT MATERIAL.
3,666,674. URANYL-ACTIVATED STRONTIUM ZINC PYROPHOSPHATE PHOSPHORS.
3,676,361. TERNARY ALKALINE-EARTH PYROSILICATE LUMINESCENT MATERIALS ACTIVATED WITH DIVALENT EUROPIUM.
3,692,689. PHOSPHOR COMPRISING LANTHANUM CERIUM THORIUM PHOSPHATE.
3,702,828. EUROPIUM-ACTIVATED BARIUM AND STRONTIUM, CALCIUM ALUMINUM FLUORIDE PHOSPHORS.
3,790,490. EUROPIUM AND MANGANESE ACTIVATED STRONTIUM CHLOROSILICATE PHOSPHOR.

Application for licenses under the following 2 patents may be addressed to: General Electric Company, Division Patent Counsel, Switchgear & Distribution Transformer Division, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,951,712. METHOD FOR APPLYING HIGH-VOLTAGE ELECTRICAL INSULATION BY FILTERING OUT SUSPENDED PARTICLES FROM A SLURRY.
3,955,043. HIGH VOLTAGE CABLE SPLICE USING FOAM INSULATION WITH THICK INTEGRAL SKIN IN HIGHLY STRESSED REGIONS.

Applications for licenses under the following patents may be addressed: General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

3,024,731. ARRANGEMENT FOR ADJUSTING THE DISPLACEMENT OF A PISTON.
3,513,354. LIGHTNING ARRESTER WITH HIGH SURGE ENERGY ABSORBING CAPABILITY.
3,517,300. POWER CONVERTER CIRCUITS HAVING A HIGH FREQUENCY LINK.
3,619,721. TRIGGERED VACUUM GAP KEEP-ALIVE CIRCUIT.

Applications for licenses under the following patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,630,000. ELECTROSTATIC AIR CLEANER.
3,742,173. METHOD AND EQUIPMENT FOR COOKING ELECTRONICALLY BY SPECIFYING WATTS SETTING.
3,761,667. OUTPUT POWER CONTROL OF INDUCTION COOKING INVERTER.
3,764,793. LIGHTED CONTROL CONSOLE WITH INFORMATION CENTER.
3,767,883. CONTROL AND POWER SUPPLY SYSTEMS FOR MAGNETRON DEVICE.
3,785,433. AIR CONDITIONING SYSTEM INCLUDING INDOOR FAN SPEED CONTROL.
3,919,638. MICROWAVE DETECTION INSTRUMENT.
3,924,601. WALL OVEN EXHAUST DUCT SYSTEM.
3,927,658. SELF-LOCKING TRIM FRAME FOR BUILT-IN COOKTOP.
3,930,193. SCR INVERTER SYSTEMS.
3,931,496. ELECTRICAL HEATING PLATE WITH TERMINAL MEANS FOR HIGH TEMPERATURE FILM HEATER.
3,931,620. TEMPERATURE-RESPONSIVE ALARM CONTROL CIRCUIT.
3,932,849. SELF-CONTAINED, CONDITION RESPONSIVE CIRCUIT.
3,939,817. OVEN DOOR HANDLE CONSTRUCTION.
3,940,861. CONDENSER APPARATUS.

Application for licenses under the following patents may be addressed to: General Electric Company, Transportation System Business Division, 2901 E. Lake Road, Erie, Pa. 16501, attn.: Patent Counsel.

3,859,579. PROTECTION CIRCUIT FOR POWER CONVERTER SYSTEMS.
3,890,551. REGENERATIVE BRAKING CIRCUIT.
3,911,340. METHOD AND APPARATUS FOR AUTOMATIC IR COMPENSATION.
3,916,275. ACCURATE MOTOR SLIP CONTROL SYSTEM WITH SPEED RATE LIMITED.
3,919,620. INVERTER ADAPTIVE LOCK-OUT TECHNIQUE.

Applications for licenses under the following patents may be addressed to: Patent Counsel, Turbine Operations, Turbine Patent Operation, General Electric Company, 1 River Road, Building 43—Room 115, Schenectady, N.Y., 12345.

Re. 28,478. WINDING SUPPORT SYSTEM FOR A DYNAMOELECTRIC MACHINE.
3,826,592. SPLIT LOCKING PIECE FOR CIRCUMFERENTIAL DOVETAIL ON TURBINE WHEEL.
3,861,818. THRUST WEAR DETECTOR.
3,861,827. DIAPHRAGM SUPPORT LUGS.
3,864,803. CARTRIDGE BRUSH HOLDER.
3,866,073. COMPOSITE CONFORMABLE SUPPORT STRUCTURE ELEMENT.
3,878,868. EXPANSION JOINT.
3,885,420. METHOD AND APPARATUS FOR MEASURING SMALL VARIATIONS IN THE SPEED OF ROTATING SHAFTS.
3,886,387. FLUX SHIELD FOR DYNAMOELECTRIC MACHINES.
3.886,449. POWER MEASUREMENT CIRCUIT.
3,891,875. SUPERCONDUCTING ROTOR.
3,894,253. VERY HIGH CURRENT FIELD WINDING FOR DYNAMOELECTRIC MACHINE ROTOR.
3,903,442. ROTATABLE BUS RINGS FOR COLLECTORS.
3,906,265. HONEYCOMB STATOR INSERTS FOR IMPROVED GENERATOR COOLING.
3,911,731. NON-CONTACTING SELF-CALIBRATING VIBRATION SENSOR.
3,916,671. GAS CHROMATOGRAPHIC ANALYSIS OF PYROLYSIS PRODUCTS.
3,942,804. TURBOMACHINE SEAL.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,954,272. SIGNAL PICKUP RETURN MECHANISM.
3,954,337. METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER.
3,954,404. DIPHENYL CONTINUOUS FOAM DYEING WITH FABRIC RUNNING OVER ROLLS IN FOAM BATH.
3,955,047. D.C. REINSERTION IN VIDEO AMPLIFIER.
3,955,095. METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER.
3,955,108. TRANSISTOR AMPLIFIER STAGE WITH DEVICE IN ITS TEMPERATURE COMPENSATED BIAS NETWORK USED AS PRELIMINARY AMPLIFIER.
3,955,155. AMPLITUDE MODULATION SYSTEM.
3,955,158. MICROWAVE DELAY LINE.
3,955,160. SURFACE ACOUSTIC WAVE DEVICE.
3,956,535. METAL PLATED OR PLATABLE ARTICLE.
3,956,581. PICKUP ARM APPARATUS.
3,956,631. PROCESS FOR NON-DESTRUCTIVE INSPECTION.
3,956,715. AMPLITUDE MODULATION SYSTEM.
3,956,820. METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LEAD BONDED TO A SURFACE THEREOF.
3,957,216. COIL WINDING MACHINE.
3,957,354. DIFFRACTIVE SUBTRACTIVE COLOR FILTERING TECHNIQUE.
3,958,135. CURRENT MIRROR AMPLIFIERS.
3,958,180. VARACTOR TUNER FREQUENCY CONTROLLER.

3,958,210. CHARGE COUPLED DEVICE SYSTEMS.
3,958,247. RF POWER COUPLING NETWORK EMPLOYING A PARALLEL PLATE TRANSMISSION LINE.
3,958,266. DEEP DEPLETION INSULATED GATE FIELD EFFECT TRANSISTORS.
3,959,025. METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR.
3,959,522. METHOD FOR FORMING AN OHMIC CONTACT.
3,959,747. METALLIZED LITHIUM NIOBATE AND METHOD OF MAKING.
3,959,807. PLANAR TRANSFERRED ELECTRON DEVICE WITH INTEGRAL NONLINEAR LOAD RESISTOR.
3,959,811. SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER.
3,947,934. METHOD OF TUNING A TUNABLE MICROELECTRONIC LC CIRCUIT.
3,948.468. REPLACEABLE SOLAR ARRAY PANELS.
3,949,146. PROCESS FOR DEPOSITING TRANSPARENT ELECTRICALLY CONDUCTIVE TIN OXIDE COATINGS ON A SUBSTRATE.
3,949,244. REFERENCE SIGNAL GENERATOR FOR TAPE TENSION SERVOMECHANISM.
3,949,390. HIGH VOLTAGE AEROSOL DETECTOR.
3,950,173. ELECTRON BEAM RECORDING ARTICLE WITH O-QUINONE DIAZIDE COMPOUND.
3,950,657. TIMER CIRCUITS.
3,950,669. ERASING METHOD FOR STORAGE TUBE EMPLOYING RASTER SCAN.
3,950,673. GATING CIRCUIT FOR TELEVISION SCR DEFLECTION SYSTEM.
3,950.708. GAIN-CONTROLLED AMPLIFIER.
3,950,720. ADJUSTABLE SPRING MOUNT FOR A CATHODE RAY TUBE YOKE.
3,951,663. ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA COMPRISING AN ALPHA DI-KETONE.
3,951.708. METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE.
3,951,846. NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES.
3,952,145. PICKUP ARM CARTRIDGE APPARATUS.
3,952,147. PICKUP ARM CARTRIDGE.
3,952,222. PICKUP TUBE TARGET.
3,952,224. IN-LINE ELECTRON GUNS HAVING CONSECUTIVE GRIDS WITH ALIGNED VERTICAL. SUBSTANTIALLY ELLIPTICAL APERTURES.
3,952,226. CRT COMPRISING STRONTIUM METAL GETTER FILMS AND METHOD OF PREPARATION.
3,952,257. CURRENT PROPORTIONING CIRCUITS.
3,952,586. DETERMINING ENGINE COMPRESSION FROM STARTER MOTOR CURRENT.
3,953,209. METHOD FOR PREPARING SUPPLEMENTAL FILTER FOR LIGHTHOUSE.
3,953,624. METHOD OF ELECTROLESSLY DEPOSITING NICKEL PHOSPHORUS-ALLOYS.
3,953,654. TEMPERATURE-STABLE NON-MAGNETIC ALLOY.
3,953,733. METHOD OF OPERATING IMAGERS.
3,953.743. LOGIC CIRCUIT.
3,953,767. GROUND FAULT DETECTION APPARATUS.
3,953,807. CURRENT AMPLIFIER.
3,953,809. INJECTION LASER MODULATOR.
3,953,822. WAVE-ENERGY IMAGING TECHNIQUE.
3,953,878. CONSTANT TEMPERATURE CONTROL FOR TRANSFERRED ELECTRON DEVICES.
3,941,630. METHOD OF FABRICATING A CHARGED COUPLE RADIATION SENSING DEVICE.
3,941,715. SUBSTITUTED ZIRCONIUM PYROPHOSPHATE PHOSPHORS.
3,941,940. TRANSIENT SUPPRESSOR.
3,942,046. LOW OUTPUT IMPEDANCE VOLTAGE DIVIDER NETWORK.
3,942,062. METAL VAPOR LASER DISCHARGE DEVICE.
3,942.129. CONTROLLED GAIN AMPLIFIER.
3,942,133. GAS LASER TUBE WITH STRAY LIGHT RESTRICTION.
3,942,134. ASTABLE MULTIVIBRATOR.
3,942,365. POWER TEST MEANS AND METHOD FOR INTERNAL COMBUSTION ENGINES.
3,942.378. FLUID FLOW MEASURING SYSTEM.
3,943,275. PRECISION TURNTABLE ROTATION IN A VACUUM ATMOSPHERE.
3,943,302. ELECTRON BEAM RECORDING IN THICK MATERIALS.
3,943,346. DIGITAL INTERPOLATOR FOR REDUCING TIME QUANTIZATION ERRORS.
3,943,347. DATA PROCESSOR REORDER RANDOM ACCESS MEMORY.
3,943,379. SYMMETRICAL ODD MODULUS FREQUENCY DIVIDER.
3.943,380. KEYED COMPARATOR.
3,943,469. MECHANICAL STRUCTURE FOR MOUNTING MICROWAVE DIODE PACKAGES.
3.943,491. ULTRASONIC DIGITAL RECEIVER.
3,943,512. SIDELOBE LOCK-ON DISCRIMINATING METHOD FOR SEARCH-TRACK MONOPULSE RADAR.
3,943,522. CIRCULARLY POLARIZED ANTENNA SYSTEM USING A COMBINATION OF TURNSTILE AND VERTICAL DIPOLE RADIATORS.
3,943,527. NONCONTACTING MARKER.
3,943,551. LSI ARRAY USING FIELD EFFECT TRANSISTORS OF DIFFERENT CONDUCTIVITY TYPE.
3,943.555. SOS BIPOLAR TRANSISTOR.
3,944,420. GENERATION OF PERMANENT PHASE HOLOGRAMS AND RELIEF PATTERNS IN DURABLE MEDIA BY CHEMICAL ETCHING.
3,944,684. PROCESS FOR DEPOSITING TRANSPARENT, ELECTRICALLY CONDUCTIVE TIN CONTAINING OXIDE COATINGS ON A SUBSTRATE.
3,944,859. BRIDGE-BALANCE DETECTION CIRCUIT.
3.944,883. RETRACE PULSE GENERATOR HAVING IMPROVED NOISE IMMUNITY.
3,944,926. TIMING TECHNIQUE FOR NRZ DATA SIGNALS.
3,944,936. ZERO CROSSOVER DETECTOR.
3,945,825. METHOD FOR PRODUCING WIDTH-MODULATED SURFACE RELIEF PATTERNS.
3,945,864. METHOD OF GROWING THICK EXPITAXIAL LAYERS OF SILICON.
3,945,902. METALLIZED DEVICE AND METHOD OF FABRICATION.
3,946,126. METHOD OF ELECTROLESS NICKEL PLATING.
3,946,274. SIDE PINCUSHION CORRECTION CIRCUIT.
3,946,325. TRANSISTOR AMPLIFIER.
3,946,327. AMPLIFIER EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS.
3,946,379. SERIAL TO PARALLEL CONVERTER FOR DATA TRANSMISSION.
3,946,429. SELF-FUSING TRANSCALENT ELECTRICAL DEVICE.
3,947,632. START-UP POWER SUPPLY FOR A TELEVISION RECEIVER.
3,947,717. PHOTOCONDUCTOR OF CADMIUM SELENIDE AND ALUMINUM OXIDE.
3,947,727. PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS.
3,947,773. CHANNEL NUMBER MEMORY FOR TELEVISION TUNERS.
3,947,781. LASER DEVICE.
3,947,793. MULTI-LAYER TOROIDAL DEFLECTION YOKE.
3,947,801. LASER-TRIMMED RESISTOR.
3,947,845. ALTITUDE CODING FOR COLLISIONS AVOIDANCE SYSTEM.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 19, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-8-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-22-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-16-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-4-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-19-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-22-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-16-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	3-31-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-9-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,893,005 to 2,897,499 inclusive
Plant Patents	Numbers 1,850 to 1,855 inclusive

REISSUES

JULY 13, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

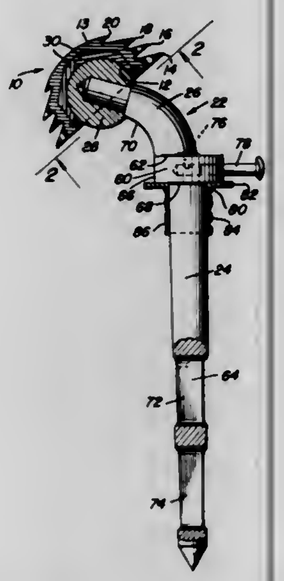
Re. 28,895
ARTIFICIAL HIP JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, Baltimore, Md.

Original No. 3,848,272, dated Nov. 19, 1974, Ser. No. 217,540, Jan. 13, 1972. Application for reissue May 19, 1975, Ser. No. 579,006

Int. Cl.^{2} A61F *1/24*

U.S. Cl. 3—1.912 **24 Claims**



14. An artificial hip joint comprising: an acetabulum prosthesis of the cotyloid cavity defining an aperture having screw threads on the inner surface thereof;
at least one insert having an outer threaded surface and an inner bearing surface inserted into said aperture and threadedly connected by means of said threads to said acetabulum prosthesis to form a socket, the outer surface of said at least one inert engaging and being supported by the inner surface of said aperture; and
a prosthesis of the head of the femur movably interconnected with said acetabulum prosthesis and including a pin to be driven into the bone-marrow channel of the femur, a [curved] neck integral with the pin, and a hip ball positioned on the neck, movably located within said socket and in movable contact with said insert, said socket enveloping more than one-half of the hip ball to prevent withdrawal of the hip ball from the socket, said artificial hip joint composed of surgical grade materials suitable for implantation into the body.

Re. 28,896
CUTTING TOOL ASSEMBLY

Patrick J. Gleason, Lum, Mich., assignor to Lumco Manufacturing Company, Lum, Mich.

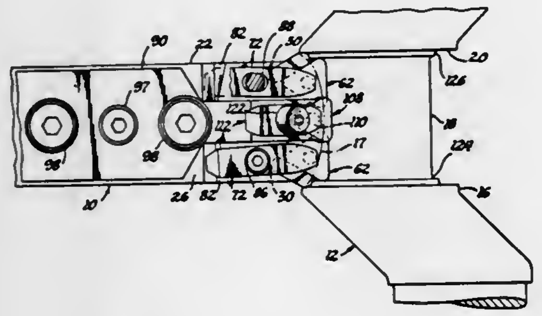
Original No. 3,760,425, dated Sept. 25, 1973, Ser. No. 280,600, Aug. 14, 1972. Application for reissue June 13, 1974, Ser. No. 478,912

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—97 **38 Claims**

1. A cutting tool assembly comprising a cutter body including a mounting surface and a cutting end having cutter blade mounting means on opposite sides thereof, each mounting means including a slot opening outwardly from the cutting end and being so arranged as to have a certain angular relationship with the mounting surface for establishing desired cutting angles; the cutter body also including a pair of inclined surfaces each displaced from a respective one of the pair of slots and being provided with an inclination having a predetermined relationship with the certain angular relationship of each of the pair of slots; a pair of side cutter blades respectively positioned within the slots so that in the operative position thereof the cutting edges thereof project from the side of the cutter body; a pair of front cutter blades respectively positioned within the slots so that in the operative position thereof each front cutter blade is in a certain cutting alignment relative to the other and a respective one of the side cutter blades and is also arranged so as to be in engagement with a respective one of the pair of side cutter blades; and a pair of clamp elements respectively adjustably positioned on the cutter body adjacent the pair of front cutter blades so as to have a predetermined angular relationship with a respective one of the pairs of slots, each clamp element in the clamping position thereof having an inclined surface in engagement with a respective one of the pair of inclined surfaces on the cutter body and a cutter blade engaging portion in engagement with a respective one of the pair of front cutter blades so as to maintain a respective one of the pair of front cutter blades and a respective one of the pair of side cutter blades in the operative positions thereof for cutting a certain profile.

18. A cutting tool assembly of the type that is fed in one direction into a workpiece during a single step machining operation to provide on the workpiece when the single step machining operation is completed at least two distinct surfaces, comprising: a cutter body having at least one cutter blade mounting slot opening outwardly from said cutter body, said mounting slot having at least two sidewalls at least in part spaced from each other and converging generally rearwardly from the outward opening of said slot in a direction generally opposite to said one direction in which said cutter body is fed into a workpiece, first and second cutter blades each having a cutting edge thereon and sidewalls extending generally rearwardly of said cutting edge, said first and said second cutter blades being removably juxtaposed in said slot between the sidewalls thereof with said cutting edges displaced from each other to each produce in said single step machining operation a respective one of said two distinct surfaces, at least one of the cutter blades having a pair of sidewalls converging generally rearwardly from said outward opening of said mounting slot and rearwardly from its cutting edge in a direction generally opposite to said one direction with one of said converging sidewalls being juxtaposed with and bearing on a sidewall of the other cutter blade to wedge both said cutter blades between said two sidewalls of said mounting slot, and means retaining said one cutter blade in said mounting slot in engagement with said other cutter blade whereby both the cutter blades are retained on said cutter body by a wedging action of said one cutter blade.



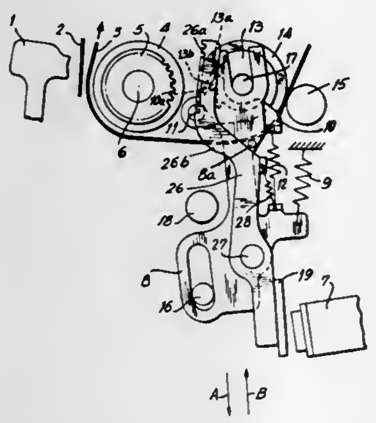
Re. 28,897
MOTION TRANSFORMING MECHANISM

Machito Natori, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Original No. 3,818,773, dated June 25, 1974, Ser. No. 378,357, July 11, 1973. Application for reissue Apr. 10, 1975, Ser. No. 567,227

Int. Cl.^{2} F16H *27/00*

U.S. Cl. 74—112 **7 Claims**



1. A motion-transforming mechanism comprising a rotor, a reciprocatable member proximate said rotor and movable in first and second directions opposite to each other, first and second stops positioned for guiding and limiting the excursion of said reciprocatable member, a trunion mounted on said reciprocatable member, a cam member mounted pivotably on said trunion, said cam member having a contacting portion engageable with said rotor and having a camming portion, first spring means normally holding said contacting portion disengaged from said rotor, second spring means normally holding said reciprocatable member against said first stop, trigger means for rotating said contacting portion of said cam member into engagement with said rotor by exerting a [pulsed] force moment greater than the force moment exerted by said first spring means, said rotor rotating in such a direction that engagement of said contacting portion with said rotor moves said cam member and thereby said trunion and said reciprocatable member toward said second stop, and a guide proximate said cam member, said guide being so positioned that as said reciprocatable member carrying said cam member moves toward said second stop, said camming portion engages said guide, the shape of said camming portion being such that on engaging said guide, said cam member is rotated away from said rotor by movement of said reciprocating member toward said second stop, thereby disengaging said contacting portion [form] *from* said rotor [, said trigger means being adapted to terminate exertion of said pulse moment at or shortly after the disengagement of said contacting portion from said rotor thereby] *and* allowing said second spring means to draw said reciprocating member to said first stop, and said first spring means to hold said contacting portion disengaged from said rotor.

Re. 28,898
SELF-ALIGNING TRACTION ASSEMBLY FOR VEHICLES

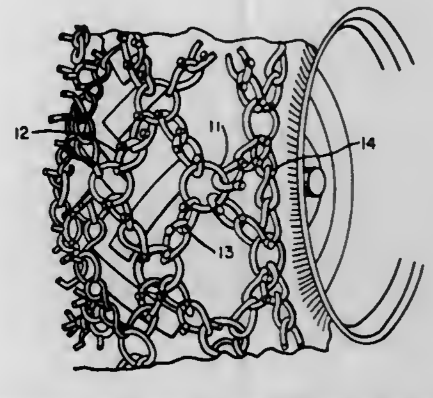
Roger L. Gower, 21 Coburn Ave., Skowhegan, Maine 04976

Original No. 3,768,534, dated Oct. 30, 1973, Ser. No. 214,067, Dec. 30, 1971. Application for reissue Apr. 16, 1975, Ser. No. 568,763

Int. Cl.^{2} B60C *27/06*

U.S. Cl. 152—239 **15 Claims**

1. In a traction assembly for mounting upon the tire of a self-powered vehicle, a succession of rings connected together by lengths of chain having links unidirectionally distorted in the longitudinal plane thereof; said lengths of chain being so connected as to form a succession of polygonal patterns across the width of the tire, in such manner that tension exerted upon any part of such assembly creates reacting tension upon the remainder thereof, said assembly being susceptible of expansion either laterally or linearly and thus effecting a snug emplacement of said assembly upon the said vehicle tire.



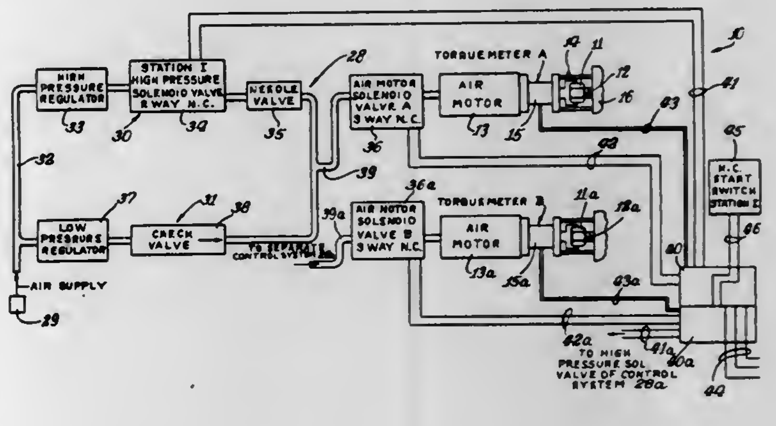
Re. 28,899
TORQUE CONTROL APPARATUS

Sydney Himmelstein, Lake Forest, and Richard S. Tveter, Barrington, both of Ill., assignors to S. Himmelstein and Company, Elk Grove Village, Ill.

Original No. 3,827,506, dated Aug. 6, 1974, Ser. No. 318,864, Dec. 27, 1972. Continuation-in-part of Ser. No. 288,379, Sept. 12, 1972, abandoned. Application for reissue Apr. 2, 1975, Ser. No. 564,272

Int. Cl.^{2} B25B *23/14*

U.S. Cl. 173—12 **30 Claims**



HIGH PRESSURE REGULATOR
STATION I HIGH PRESSURE SOLENOID VALVE 2 WAY N.C.
NEEDLE VALVE
AIR MOTOR SOLENOID VALVE A 3 WAY N.C.
TORQUEMETER A
AIR MOTOR
LOW PRESSURE REGULATOR
CHECK VALVE
TO SEPARATE CONTROL SYSTEM
AIR MOTOR SOLENOID VALVE B 3 WAY N.C.
TORQUEMETER B
AIR MOTOR
N.C. START SWITCH STATION I
AIR SUPPLY
TO HIGH PRESSURE SOL VALVE OF CONTROL SYSTEM 28a
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29

1. In a torque-applying apparatus having torque means for forcibly threading a first threaded member into tightened association with a second threaded member, control means for controlling the operation of said torque means comprising:
seating means for causing said torque means to develop a force in threading the first member into a seated association with said second threaded member;
means for sensing the amount of torque applied between said threaded members; and
setting means responsive to said sensing means for causing said torque means to develop a gradually increasing higher [force] *torque* for applying a preselected maximum torque between said seated threaded members to provide a preselected tightened condition of said threaded members.

Re. 28,900
DRILL BIT DEVICE

John E. Byers, 2130 Choteau St., Helena, Mont. 59601, and Wells H. Claussen, 4523 S.W. Seattle St., Seattle, Wash. 98116

Original No. 3,687,565, dated Aug. 29, 1972, Ser. No. 119,525, Mar. 1, 1971. Application for reissue Aug. 26, 1974, Ser. No. 500,341

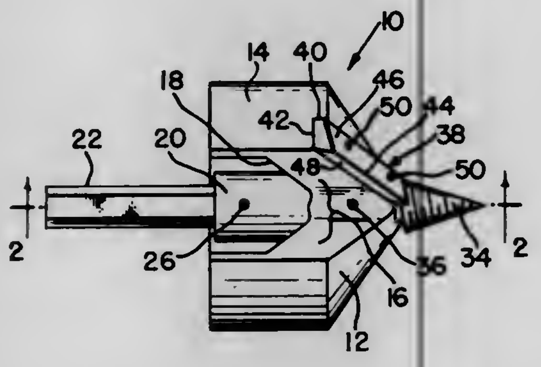
Int. Cl.^{2} B23B *51/00, 51/02*

U.S. Cl. 408—201 **19 Claims**

1. A boring [took] *tool,* comprising
a. a generally circular drill bit body having a work face and a back end, said work face defining a substantially cone-

shaped surface extending rearwardly and outwardly at an angle of about 30°, said body also having a lead screw cavity in said work face generally centrally thereof and a pair of generally opposed cut-away segments extending from said work face to the back end of said body,

b. a detachable lead screw including a shank portion received in said lead screw cavity,



c. said body also having a center section extending rearwardly and including a shaft cavity for mounting said body on a shaft for rotation by drill means,

d. a cutting edge means in each of said segments, and

e. means in the center section of said body for detachably securing said lead screw to said body and said body to said shaft.

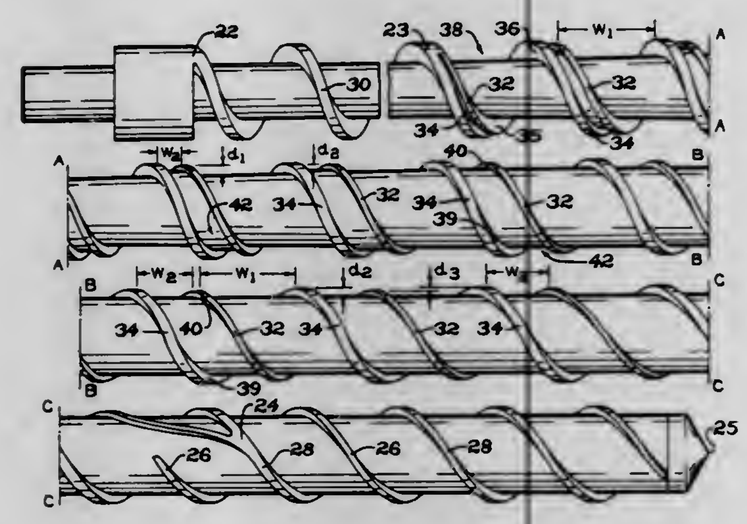
Re. 28,901
APPARATUS FOR REFINING POLYMERIC MATERIAL

Heung T. Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Original No. 3,867,079, dated Feb. 18, 1975, Ser. No. 279,697, Aug. 10, 1972. Application for reissue Apr. 23, 1975, Ser. No. 570,710

Int. Cl.^{2} B29F *3/02*

U.S. Cl. 425—208 **6 Claims**



1. In a machine for processing polymeric material comprising a cylinder; said cylinder having die means at one end thereof; a feed screw rotatably mounted in said cylinder and extending longitudinally therethrough for moving plastic material therethrough to progressively change said plastic material from the solid phase to a fluent phase for extrusion therefrom; said feed screw having first means for operatively exerting continuous pressure on said plastic material for moving said plastic material; second means integral with said feed screw for continuously leading off the fluent phase progressively from said first means as the plastic material is changed from the solid phase by contact with said cylinder, said fluent phase being directed away from and not through the remaining solid phase; [and] said first means defines a groove having a constant axial width with decreasing radial depth in the direction of said die means providing a constant amount of surface area exposed to said cylinder for material carried by said groove; *and said second means defines a second groove having an increasing axial width with increasing radial depth in the direction of said die means.*

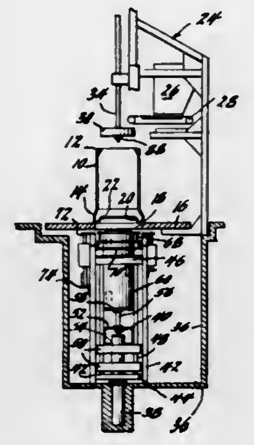
Re. 28,902
VIBRATORY CORE FOR CONCRETE PIPE MAKING MACHINE

Ferdinand A. Trautner, Wellesley Hills, Mass., and LeRoy E. Kent, Sioux City, Iowa, assignors to Concrete Pipe Machinery Company, Sioux City, Iowa

Original No. 3,752,626, dated Aug. 14, 1973, Ser. No. 867,344, Oct. 17, 1969. Continuation-in-part of Ser. No. 638,010, May 12, 1967, abandoned. Application for reissue Aug. 1, 1975, Ser. No. 601,036

Int. Cl.^{2} B28B *21/28*

U.S. Cl. 425—262 **22 Claims**



1. In a concrete pipe forming apparatus adapted for forming pipe from zero-slump concrete including a pipe form, a platform for supporting said pipe form, a rotating packerhead material distributor comprising a rollerhead for forming the pipe, and a powered main lift mechanism for raising said rollerhead as the pipe is formed, the improvement comprising:

a. a non-rotating core;

b. means for vibrating material forming the pipe as the pipe is formed;

c. means interengaging said core with said rollerhead; and

d. an upwardly movable guide system for said core [.] ,

said means for vibrating material forming the pipe as the pipe is formed comprising means attached to the core for vibrating the core.

Re. 28,903
PHOSPHATIDE SEPARATION

Rajindra Aneja, Welwyn Garden City, and Jaswinder Singh Chadha, London, both of England, assignors to Lever Brothers Company, New York, N.Y.

Original No. 3,752,833, dated Aug. 14, 1973, Ser. No. 175,731, Aug. 27, 1971. Application for reissue Nov. 25, 1974, Ser. No. 526,764

Claims priority, application United Kingdom, Sept. 23, 1970, 45295/70

Int. Cl.^{2} A23J *7/00;* **C07F** *9/02*

U.S. Cl. 260—403 **14 Claims**

1. A process for separating an N-acylcephalin and a phosphatide without an acylatable amino group from a mixture comprising them which comprises adding to the mixture a sufficient amount of an acid to provide the equivalent of pH less than 3.5 under aqueous conditions, extracting the mixture with acetone or methyl acetate, and separating the phases containing the N-acylcephalin and the phosphatide without an acylatable amino group.

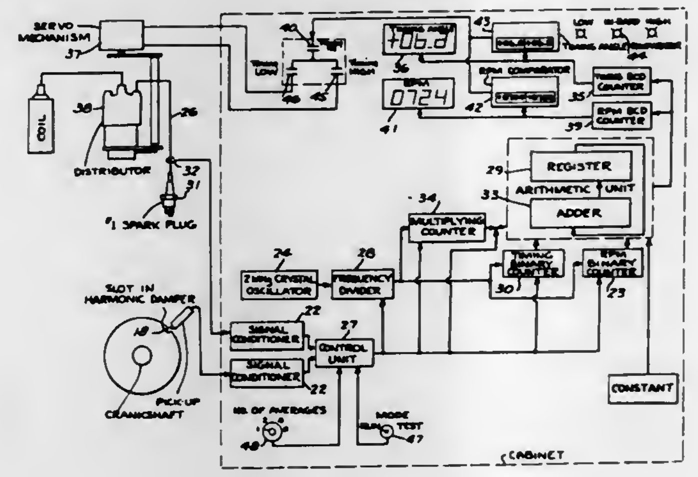
Re. 28,904
METHOD AND APPARATUS FOR TESTING INTERNAL COMBUSTION ENGINES

Richard C. Maisonville, Detroit, Mich., assignor to Scans Associates, Inc., Livonia, Mich.

Original No. 3,763,420, dated Oct. 2, 1973, Ser. No. 200,974, Nov. 22, 1971. Application for reissue Sept. 29, 1975, Ser. No. 617,366

Int. Cl.^{2} F02P *17/00*

U.S. Cl. 324—16 R **37 Claims**



24. A method of measuring the timing angle of an internal combustion engine having at least one cylinder, a piston, a spark plug, and a crankshaft connected to said piston; selecting one cylinder as the base cylinder, running the engine and determining the time required for one full and exact revolution of the engine from top dead center to top dead center, simultaneously determining the time elapsed between the firing of the spark plug in said base cylinder and the moment the piston in said base cylinder reaches its top dead center position, determining the time required for one degree of engine rotation for the revolution of the engine just measured, and dividing the time elapsed between the spark plug firing and the moment the piston in said base cylinder reaches its top dead center position by the time required for one degree of engine rotation, thereby determining the timing angle.

Re. 28,905
FIELD EFFECT TRANSISTOR MEMORY CELL

David Albert Hodges, Berkeley, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,540,007, dated Nov. 10, 1970, Ser. No. 676,491, Oct. 19, 1967. Application for reissue Aug. 24, 1971, Ser. No. 174,571

Int. Cl.^{2} G11C *13/00, 11/40*

U.S. Cl. 340—173 R **20 Claims**

1. A memory cell comprising:

first and second unipolar conducting devices each having a gate electrode and first and second controlled electrodes,

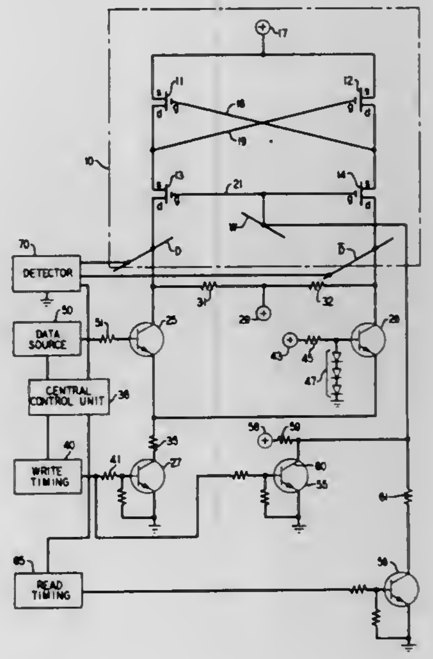
a source of reference potential,

means applying the reference potential to the first controlled electrode of the first device and to the first controlled electrode of the second device,

means coupling the gate electrode of the first device to the second controlled electrode of the second device.

means coupling the gate electrode of the second device to the second controlled electrode of the first device,

third and fourth unipolar conducting devices each having a gate electrode, a controlled electrode, and a threshold voltage,



means coupling the controlled electrode of the fourth device to the second controlled electrode of the second device,

a source producing three different potential level signals, all of said level signals having a potential different from the reference potential by a magnitude exceeding the threshold voltage of the third and fourth devices, and

means coupling the three level source to the gate electrodes of the third and fourth devices,

means coupling the controlled electrode of the third device to the second controlled electrode of the first device,

PATENTS

GRANTED JULY 13, 1976

ERRATA

For CLASS	See PATENT NO.
052–758 F	3,968,624
084–473	3,968,721
226–188	3,968,920
428–332	3,969,130
428–316	3,969,131
204–014 N	3,969,195
252–008.1	3,969,230
252–008.8	3,969,231
252–012.6	3,969,232
252–022	3,969,233
252–033	3,969,234
252–042.7	3,969,235
252–049.5	3,969,236
252–049.9	3,969,237
252–062.1 L	3,969,238
526-011.1	3,969,326
526–001	3,969,327
526–320	3,969,328
526–014	3,969,330
526–066	3,969,331
526–128	3,969,332
526–154	3,969,333
526–017	3,969,334
526–154	3,969,335
260–287 T	3,969,463
260–395	3,969,464
260–527	3,969,465
260–554	3,969,466
260–570.9	3,969,467
260–574	3,969,468
260–891	3,969,469
260–897 A	3,969,470
426–005	3,969,513
426–090	3,969,514
252–457	3,969,542
264–284	3,969,565
174–035 MS	3,969,572
178–066 R	3,969,590
200–314	3,969,609
250–527	3,969,631

PATENTS

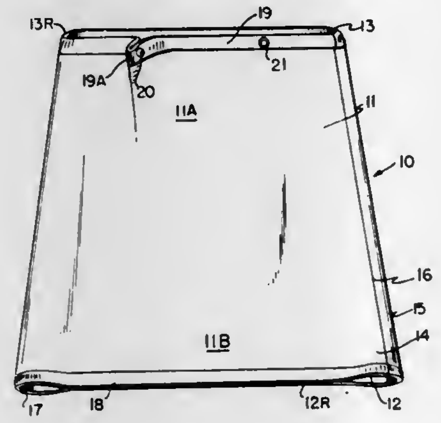
GRANTED JULY 13, 1976

GENERAL AND MECHANICAL

3,968,521

COMBINED HEAD AND NECK WEAR

Joy Anne Bashlow, 54 Sherman St., Passaic, N.J. 07055
Filed Feb. 26, 1973, Ser. No. 335,646
Int. Cl.^{2} A42B *1/04*
U.S. Cl. 2—203 **9 Claims**

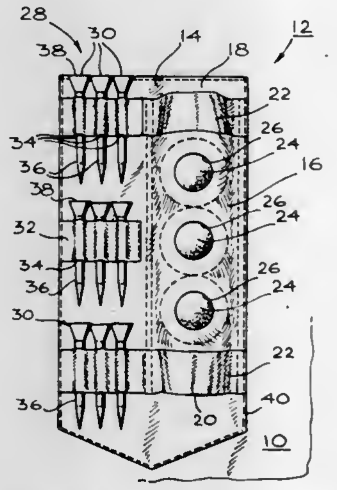


1. A protective garment for covering the head, neck, and shoulders of a wearer and for allowing the wearer's face to be exposed, and appropriate also for wearing in a fashion to cover only the shoulders and surround the neck and not cover the head, said protective garment comprising a truncated conically shaped sleeve of flexible material having a large diameter open end and a small diameter open end; said truncated conical sleeve having a trapezoidal cross-section at all cross-sections of said sleeve through both of its said open ends; said truncated conical sleeve having a length longer than the distance from just below the shoulder of a wearer to the top of the head of the wearer; said large diameter end having a periphery large enough to fit snugly around the shoulders of a wearer; said small diameter end having a periphery large enough to snugly receive the face of a wearer; said protective garment, when worn as a hood, having a plurality of randomly spaced folds along the lower edge, said folds constituting a draping.

3,968,522

GOLF BALL POCKET AND IMPROVED GOLF GARMENT

Karl Riess, 800 N. Mariposa Ave., Los Angeles, Calif. 90029
Filed Sept. 12, 1975, Ser. No. 612,848
Int. Cl.^{2} A41D *27/20*
U.S. Cl. 2—250 **18 Claims**



1. An improved golf ball pocket, said pocket being adapted for securing to the exterior of a garment, said pocket comprising, in combination.

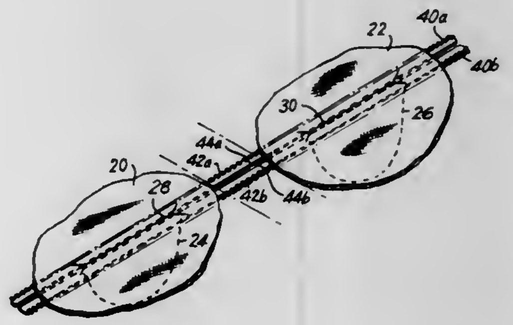
a. a flexible front sheet of extended surface area shaped to define an open-bottomed and open-topped closed sided golf ball-receiving tube; and

b. elastic means secured to one side of said front sheet and releasably closing said open top and said open bottom of said tube.

3,968,523

METHOD FOR PRODUCING A ZIPPER CLOSABLE GARMENT POCKET AND A POCKET PROVIDED THEREBY

Sydney Newman, 1245 Avenue X, Brooklyn, N.Y. 11235
Filed Jan. 20, 1975, Ser. No. 542,224
Int. Cl.^{2} A41D *27/20*
U.S. Cl. 2—252 **10 Claims**



1. A method for mass producing in a plurality of garments at predetermined pocket locations therein closable pocket entries each having a zipper closure means therefor comprising the steps of initially providing a unitary substantially continuous fastener tape means having a spaced apart pair of substantially continuous zipper teach chains along each of a pair of the outermost longitudinally extending extremities thereof; securing said continuous zipper fastener tape means to said plurality of garments at said predetermined locations adjacent each of said zipper teeth chains with said securements for each of said zipper teeth chains being spaced apart; cutting each of said plurality of garments at said predetermined locations of said secured zipper fastener tape to each provide a substantially continuous slit for said pocket entry, said fastener tape means and each of said garments being longitudinally slit along the longitudinal axis of said fastener tape means to provide a secured spaced apart pair of opposed extremity zipper teeth chains at each of said pocket entry slits, the width of each of said pocket entry slits being dependent on said zipper teeth chain securement spacing; bending each of said pair of opposed extremity zipper teeth chains until said pair of zipper teeth chains are in opposed adjacent relationship; providing means on said opposed adjacent zipper teeth chains for completing the formation of said secured closable zipper at said pocket entry for providing said zipper closure means therefor; and thereafter cutting said plurality of garments at each of said secured fastener tape means at the extremities of each of said pocket entry slits to simultaneously separate said garments into individual separate garments while providing finished individual separate pocket entry zipper closures therefor; whereby the finishing of the individual zipper pockets also serves to separate the plurality of garments into individual separate garments.

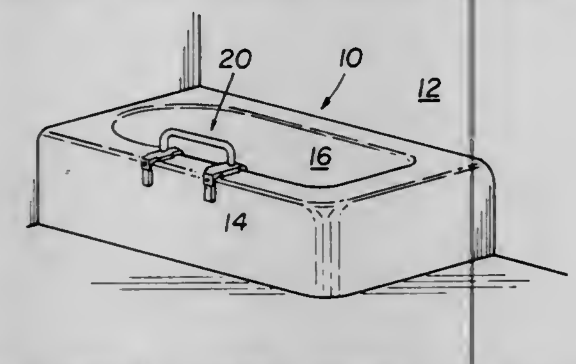
3,968,524

BATHTUB SAFETY GRIPPING RAIL

Leo Zentman, c/o Orthopedic Splints, Inc., 147 Albany Ave., Lindenhurst, N.Y. 11757
Filed Nov. 13, 1975, Ser. No. 631,455
Int. Cl.^{2} A47K *3/12*
U.S. Cl. 4—185 H **5 Claims**

1. In combination, a safety gripping rail for attachment to a bathtub wall of the type including a substantially U-shaped body adapted to be oriented in alignment with said bathtub

wall with opposite ends thereof in fixed position in relation to said bathtub wall, and a clamp for achieving said fixed position of each said rail body opposite end, each said clamp comprising a cooperating pair of L-shaped clamping members slidably interconnected for closing movement when positioned transversely of said bathtub wall against opposite surfaces of said bathtub wall, an elongated connector having threads therealong operatively associated with one said L-shaped clamping member, and threads for threadably engaging said elongated connector operatively arranged on said



other L-shaped clamping member, said other L-shaped clamping member having a groove of semi-circular configuration in cross section to receive said connector and said threads being formed in the wall bounding said groove and of a corresponding semi-circular configuration, whereby threadable adjustment of said connector within said threads is effective to urge the one said L-shaped clamping member through closing movement in relation to said other L-shaped clamping member to achieve clamping engagement of said clamps to said bathtub wall.

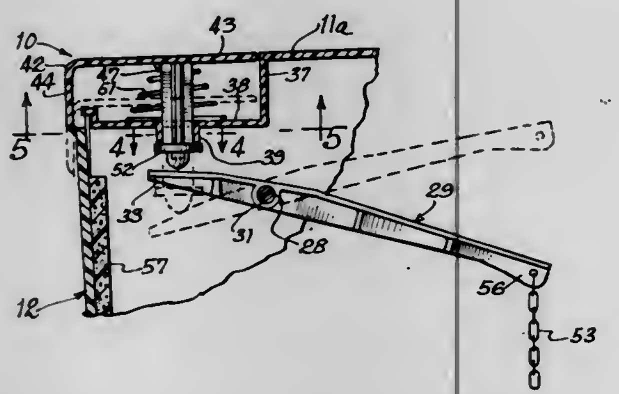
3,968,525
ACTUATING MEANS FOR WATER CLOSET FLUSH TANK

Fred C. Alexander, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.

Filed Dec. 5, 1974, Ser. No. 529,720

Int. Cl.^{2} E03D *1/012*

U.S. Cl. 4—67 R **4 Claims**



1. In combination, a flush tank having a discharge outlet and a flush valve controlling said discharge outlet, a lever pivoted intermediate its ends to a wall of said tank, means connecting one end of said lever to said flush valve, a removable cover for said tank, said cover including a top wall and a depending peripheral flange, said cover having a recess of substantial area in said top wall at a corner thereof, said recess being defined by vertical and bottom wall portions with the bottom wall portion having an aperture therein, an actuating member of similar substantial area movable in said recess, said actuating member including a depending stem slidable in said aperture, the lower end of said stem engaging the other end of said lever, the outer surfaces of said actuating member when said member is disposed in non-operating position being substantially co-planar with corresponding adjacent outer surfaces of said top wall and depending flange and means for biasing said actuating member to non-operating position.

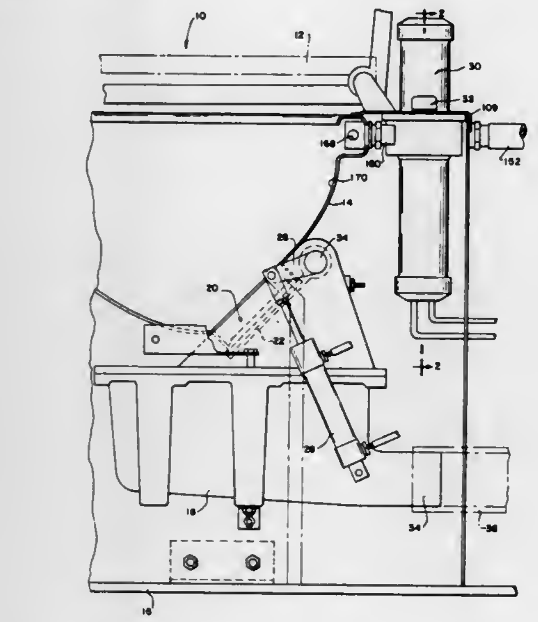
3,968,526
FLUSH TOILET AND METHOD

Robert E. Harrah, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.

Filed Aug. 21, 1974, Ser. No. 499,114

Int. Cl.^{2} E03D *5/012*

U.S. Cl. 4—79 **9 Claims**



1. In a combination toilet particularly adapted for mobile use, wherein a bowl portion is supported above a base chamber and cooperating means are provided to introduce water to flush said bowl portion and to introduce compressed air to discharge the contents of said base chamber, and wherein fluid communication between said bowl portion and base chamber is regulated by sealing means movable between a closed position sealing said bowl portion from said base chamber and an open position providing communication therewith: the improvement, comprising, unitary spool valve means to selectively and sequentially control the operations of said movable sealing means and said cooperating means to introduce water to said bowl portion and air to said base chamber of the toilet, said spool valve means including conduit means to effect air discharge of said base chamber only at such time as said movable sealing means is in said closed position to prevent passage of water or air between said bowl portion and said base chamber of the toilet, and means to actuate said spool valve means to sequentially control the movement of said sealing means to said open position, the introduction of flush water to said bowl portion, the closing of said sealing means, the introduction of air to said base chamber, the termination of water introduction to said bowl portion, and the termination of air introduction to said base chamber.

3,968,527
PERIMETER OVERFLOW SYSTEM FOR SWIMMING POOLS

William D. Hough, 2611 Poinsettia Drive, McKeesport, Pa. 15131

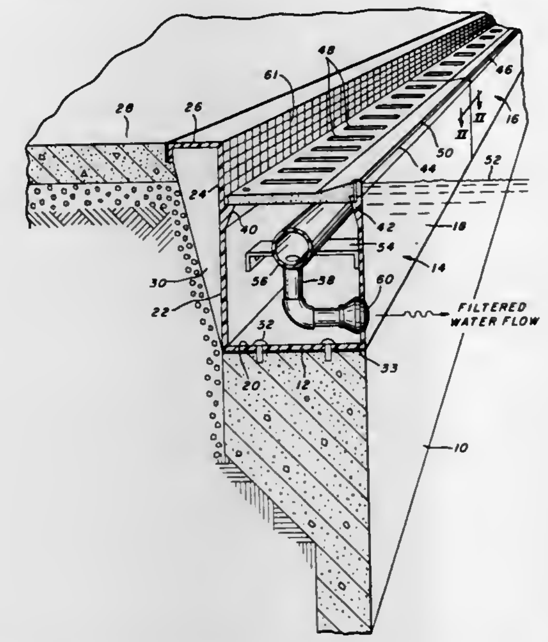
Filed May 21, 1975, Ser. No. 579,314

Int. Cl.^{2} E04H *3/16, 3/18;* **F16L** *21/02*

U.S. Cl. 4—172.17 **9 Claims**

1. In a swimming pool construction of the type having side walls, and a gutter extending along the top of the side walls around the periphery of the swimming pool; the improvement in said swimming pool construction wherein said gutter is formed in sections of non-metallic plastic material joined end-to-end by pliable gaskets and mounted on top of said side

wall, each of said gutter sections having a front wall facing said swimming pool, a bottom wall resting on the top of the side



walls of said swimming pool, and a back wall, the front, bottom and back walls being integrally formed.

3,968,528
BEDSTEAD HAVING A WOVEN SUPPORT

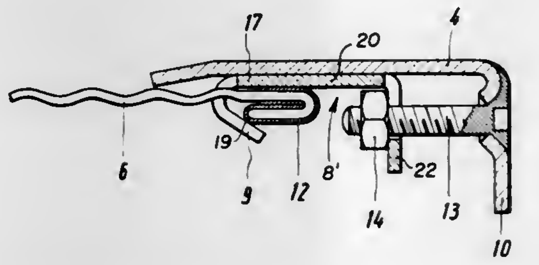
Jannes Jonge Poerink, 25 Prins Bernardlaan, Borne, Netherlands

Filed Apr. 23, 1974, Ser. No. 463,645

Claims priority, application Germany, Apr. 26, 1973, 2321037

Int. Cl.^{2} A47C *19/00*

U.S. Cl. 5—211 **5 Claims**



1. Bedstead comprising crossheads between which a woven mat support is stretched, said mat being made of spring steel wire, preferably plastic coated, and including longitudinal wire members having U-shaped ends, hook rails carried by said crossheads each having a row of spaced apart V-shaped hook members with recesses therebetween, the hook members of one hook rail pointing towards the hook members of the other hook rail, one of said hook rails being adjustable so as to tension said mat support, a double folded U-shaped clamping bar encasing the U-shaped ends of the longitudinal wire members, the wire receiving open edge of said U-shaped clamping bar being nested in and facing the closed ends of the V-shaped hook members of said adjustable hook rail such that a clamping force is exerted on said clamping bar and said U-shaped ends by said V-shaped hook members in proportion to tension force applied to said mat support by the adjustable hook rail.

3,968,529
PILLOW STRUCTURE

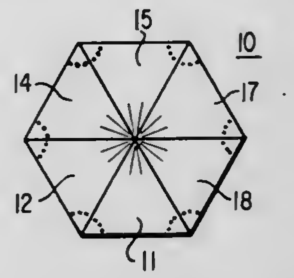
Martin Levin, and Selene Levin, both of 333 W. 56th St., New York, N.Y. 10019

Filed Dec. 17, 1974, Ser. No. 533,512

Int. Cl.^{2} A47G *9/00;* **A47C** *27/00*

U.S. Cl. 5—338 **1 Claim**

1. A manipulative arrangement comprising a plurality of stuffed triangular sections interconnected in a chain including a first and a last section wherein said chain is folded to form an overall hexagon shape, said chain being foldable into a plurality of groups such that said first and last sections are in close proximity to form an overall geometrical shape, said first and last section being attached to one another in a manner to permit the manipulation of some of said sections from one to



another of said groups and to preserve said shape wherein said sections are manipulated about an axis and said sections have sides of equal lengths transverse to said axis.

3,968,530
BODY SUPPORT MEANS

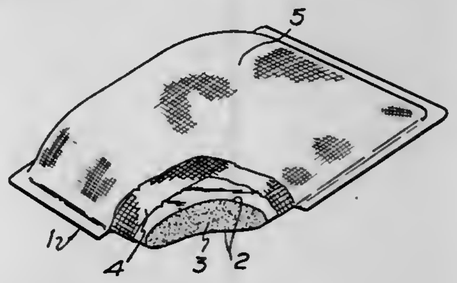
Reginald Dyson, Bath, England, assignor to G. D. Searle & Co., High Wycombe, England

Filed Feb. 19, 1974, Ser. No. 443,606

Claims priority, application United Kingdom, Feb. 24, 1973, 9193/73

Int. Cl.^{2} A47G *9/00;* **A47C** *27/08*

U.S. Cl. 5—338 **7 Claims**



1. Body support means comprising:
a flexible, fluid-impermeable container;
a viscous fluid within said container and
a plurality of particles dispersed throughout said fluid, wherein said particles have a size distribution in the range from 0.01 to 15 millimeters in diameter and the volume ratio of said particles to said fluid is between about 70:30 and 95:5, said particles consist of a mixture of polystyrene beads and hollow silica beads and the viscosity of said fluid is between about 10,000 to 20,000 centipoises.

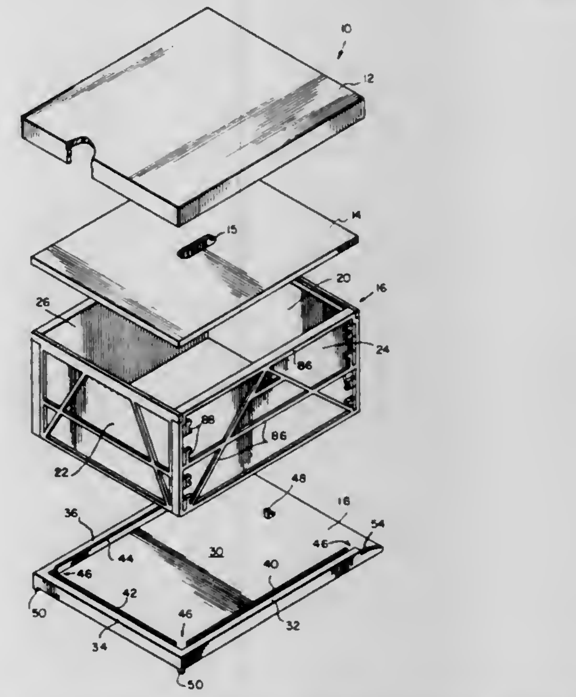
3,968,531
MOLDED PLASTIC BEEHIVE

Patrick E. Cartwright, R.R. No. 1, Seymour, Ind. 47274

Filed Dec. 18, 1974, Ser. No. 533,929

Int. Cl.^{2} A01K *47/00*

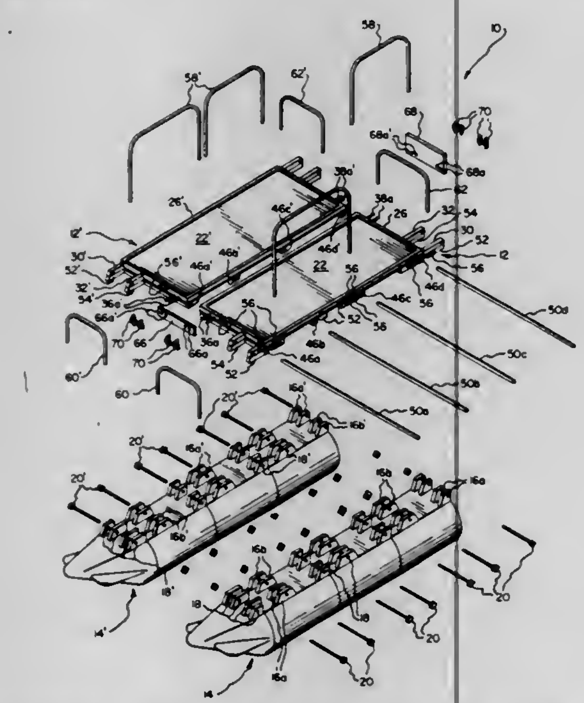
U.S. Cl. 6—1 **6 Claims**



1. A beehive comprising a molded plastic bottom board, a molded plastic super mounted upon said bottom board, a

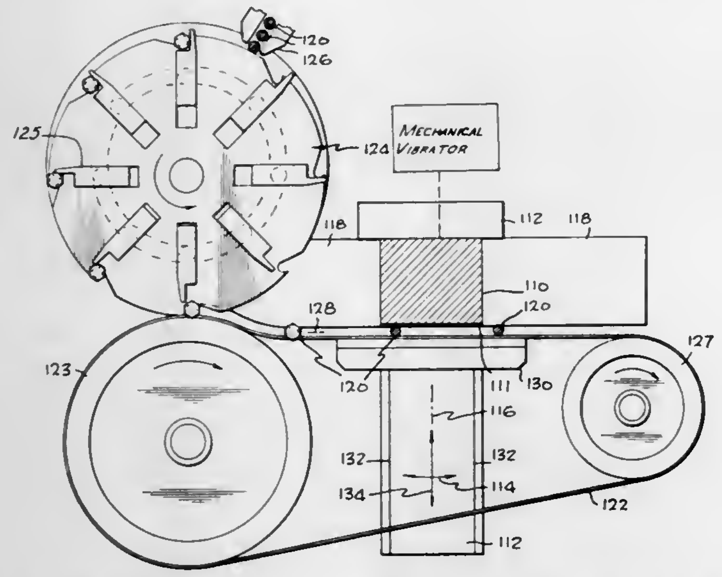
molded plastic inner cover for said super, and a molded plastic top cover for said hive, said top cover being substantially identical to said bottom board, said super including opposite side walls and opposite end walls snapped together to provide four corner connections, each corner connection including tenons on one wall resiliently snapped into engagement with openings in the adjacent wall, each said opening being a vertically elongated rectangular opening, each said tenon including a pair of vertically spaced apart lugs projecting outwardly from said one wall to penetrate through the adjacent opening, said lugs being resiliently movable toward each other, at least one of said lugs being formed with a vertically inclined camming surface which engages said opening as said lugs are penetrated into said opening to move said one lug vertically toward the other lug, said camming surface terminating with a hook which moves vertically as said camming surface passes through said opening to engage said adjacent wall.

3,968,532
KNOCK DOWN BOAT CONSTRUCTION
Alfred Bailey, Orchard Park, N.Y., assignor to Kar-Ta-Craft Corporation, East Aurora, N.Y.
Filed Mar. 7, 1975, Ser. No. 556,214
Int. Cl.^{2} B63B *7/00*
U.S. Cl. 9—2 C **8 Claims**



1. A knock down boat construction including a pair of generally rectangular deck halves each having fore and aft edges and outboard and inboard side edges, each of said deck halves having means defining a plurality of parallel guide openings of essentially square cross section, said parallel guide openings extending between said outboard and inboard side edges of said deck halves, said parallel guide openings of one of said deck halves being arranged for end alignment with said parallel guide openings of the other of said deck halves to form continuous guide openings extending between said outboard side edges when said inboard side edges are brought together in vertical and horizontal alignment; a pair of pontoon boat supporting devices fixed one to the bottom of each of said deck halves along said outboard side edges, whereby said pontoon devices are disposed in an essentially parallel relationship when said inboard side edges are disposed in alignment; means removably bridging between said deck halves adjacent both said fore and aft edges thereof for removably locking said inboard side edges in alignment; and a plurality of cylindrical stabilizing tubes transversely dimensioned to be loosely slidably and rotatably fitted one within each of said continuous guide openings, said stabilizing tubes having lengths corresponding essentially to the lengths of said continuous guide openings, and said stabilizing tubes being automatically clamped against wall surfaces of said continuous guide openings to prevent displacements thereof lengthwise of said continuous guide openings by the tendency of said inboard side edges to move from alignment in a direction downwardly and about said pontoon devices associated with their respective deck halves upon the application of loading to the upper surfaces of said deck halves.

3,968,533
FASTENER MANUFACTURING APPARATUS
Richard L. Reynolds, Palos Verdes, Calif., assignor to Litton Fastening Systems, Lakewood, Calif.
Continuation-in-part of Ser. No. 353,449, April 23, 1973, Pat. No. 3,894,570. This application June 17, 1974, Ser. No. 479,650
Int. Cl.^{2} B21H *3/00;* **B23G** *9/00;* **B23K** *9/04*
U.S. Cl. 10—2 **8 Claims**



1. In an apparatus for producing self-tapping threaded fasteners from metallic fasteners which have been formed with complete helical, crested threads upon a shank,

means for hardening at least portions of the threads of said fastener, said hardening means comprising:

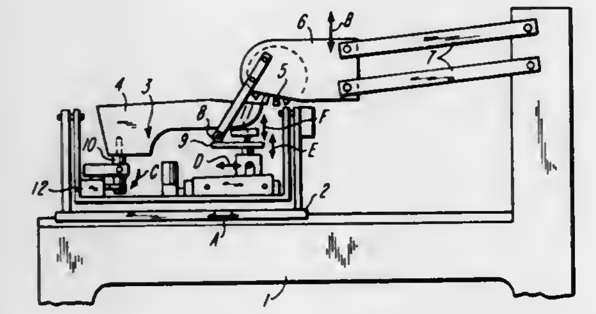
at least one electrode of carbon-containing material in a predetermined fixed position;

means for advancing said threaded fastener in rolling motion along a predetermined path past said electrode to successively position portions of the crest region of its completely formed thread adjacent said electrode;

means for maintaining said electrode in contact with said thread crest portions as said fastener is rolled along said predetermined path for hardening said thread portions around the periphery of said fastener; and

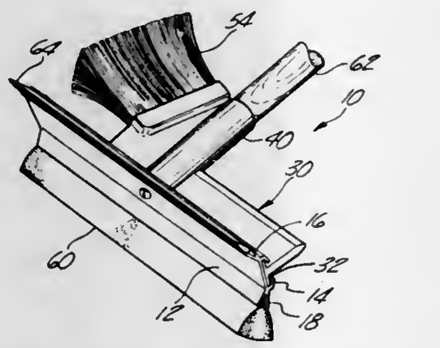
means for applying a potential difference between said threaded fastener and said electrode.

3,968,534
DEVICE FOR USE IN THE MANUFACTURE OF SHOES
Dieter Braun, Stuttgart, Germany, assignor to Fortuna-Werke Maschinenfabrik AG, Stuttgart, Germany
Filed Jan. 27, 1975, Ser. No. 544,673
Claims priority, application Germany, Jan. 25, 1974, 2403535
Int. Cl.^{2} A43D *3/00*
U.S. Cl. 12—127 **10 Claims**



1. In a device for use in manufacture of shoes; a frame, support element in the frame engageable with the heel end of a last in inserted position of the last, a support member in the frame for engagement with the tip end of the last, a tool in the frame operatively engageable with a shoe on the last, a guide member in the frame adjacent said support member operable for guiding said tool as the tool traverses the shoe in the longitudinal direction, means for adjusting said support element and support member together with said guide member relatively in said frame in the longitudinal direction of the last to adapt the device to lasts of different sizes, and control means responsive to movement of said support element and said support member together with said guide member relatively in the longitudinal direction for adjusting said support element and said support member and said guide member relatively in a direction perpendicular to said longitudinal direction, the adjustment of said guide member relative to said support element by said control means being greater than the adjustment of said support member relative to said support element by said control means.

3,968,535
CLEANING IMPLEMENT INCLUDING A SPONGE, SQUEEGEE, SCRAPER AND BRUSH
Harry S. Nichols, Jr., 5675 Sussex Road, Troy, Mich. 48084
Filed Mar. 20, 1975, Ser. No. 560,300
Int. Cl.^{2} A47L *1/08, 23/04;* **B60S** *1/04*
U.S. Cl. 15—105 **4 Claims**



1. A multiple purpose cleaning device to be employed in washing, squeegeeing, and brushing accumulations off windshields of vehicles carrying an integral scraping surface for cleaning debris from the soles and heels of shoes comprising:

a sponge;

a window squeegee;

a plate comprising an elongated edge on one side with means for mounting the sponge and an elongated edge on the opposite side with means for mounting the window squeegee;

a T-shaped attachment comprising a handle carrying cylindrical portion;

a brush holder portion carried adjacent to and integrally formed with the cylindrical portion;

a shoe scraper carried adjacent to and integrally formed with the cylindrical portion opposite the brush holder portion, the scraper extending upwardly from the plate substantially at right angles thereto;

means on the attachment for joining it to the plate;

a brush carried by the brush holder portion with its bristles extending laterally of the cylindrical portion;

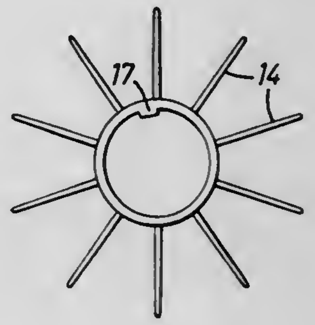
a handle carried by the handle-carrying cylindrical portion; and

a means on the plate for receiving the T-shaped attachment.

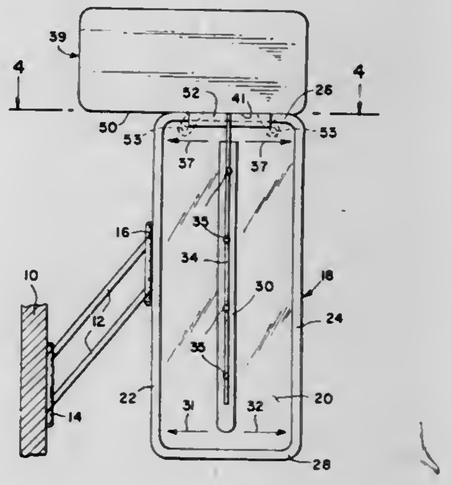
3,968,536
HAIRBRUSH
Harold Leighton, London, and William John Gullis, Sandwich, both of England, assignors to Harold Leighton, London, England
Filed Feb. 6, 1975, Ser. No. 547,461
Int. Cl.^{2} A46B *9/10*
U.S. Cl. 15—187 **4 Claims**

1. A hairbrush comprising:

a shank, a handle extending rearward from said shank, a plurality of annular members detachably disposed on said shank, each member having a plurality of unitary, semi-rigid bristles extending radially therefrom and equally spaced about the whole circumference of the member, and means for securing the annular members against rotation, said means permitting mounting of each member in either a forward or rearward manner, said means including an eccentric keying arrangement so that said bristles on an annular member mounted in a forward manner are relatively angularly displaced with respect to bristles or an annular member mounted in a rearward manner, wherein bristles of a number of adjacent elements mounted in like manner align to form a predetermined number of longitudinal rows of bristles, and bristles of a number of members mounted in alternately opposite manner align to form twice said predetermined number of rows.



3,968,537
WIPING BLADE DEVICE FOR TRUCK REAR VIEW MIRRORS
John Joseph Wagenhofer, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Sept. 25, 1974, Ser. No. 509,044
Int. Cl.^{2} B60S *1/24, 1/08*
U.S. Cl. 15—250.29 **2 Claims**



1. A detachably mounted wiping device for cleaning off rear view and side view mirrors of vehicles in which the mirrors are supported outwardly from the vehicles and are of substantial surface area expanse, said device comprising wiper support stem means, for carrying a wiper blade means, main wiper housing means, motor means in said main wiper housing means for driving said wiper support stem means, reciprocating coupling means for connecting said motor means to said wiper support stem means for reciprocally moving said wiper blade means back and forth in a horizontal direction over said mirrors, said main wiper housing means comprising a top wall, a bottom wall, two end walls, and two side walls defining an enclosed main housing chamber for blocking entrance of rain and snow into said chamber, motor mounting means in said chamber for supporting said motor means, said chamber having a narrow elongated opening formed in said bottom wall thereof for extension therethrough of said wiper support stem

means, said motor means comprising rotatable drive shaft means, cam drive wheel means carried by said drive shaft means for rotation therewith, said reciprocating coupling means comprising wrist pin means carried on said cam drive wheel means for rotation therewith, sliding bar means carried by said wiper blade stem means, connecting rod means coupling said wrist pin means with said sliding bar means for causing said wiper blade stem means to undergo reciprocal wiping motion upon rotation of said drive shaft of said motor means, guide plate means supported in said main chamber and mounted parallel to said bottom wall said sliding bar means being horizontally guided within the space between said guide plate, said bottom wall, and said slide walls to provide reciprocating movement of the stem and wiper blade in a direction parallel to the surface of said mirror and for maintaining said blade in engagement with said mirror surface, channel rail means carried by said bottom wall of said housing means for engaging an upper top edge margin portion of said mirror, and releasable clamp means on said channel rail means for holding said mirror in adjustable relationship to said housing means for providing lateral position adjustment of said housing with respect to said mirror.

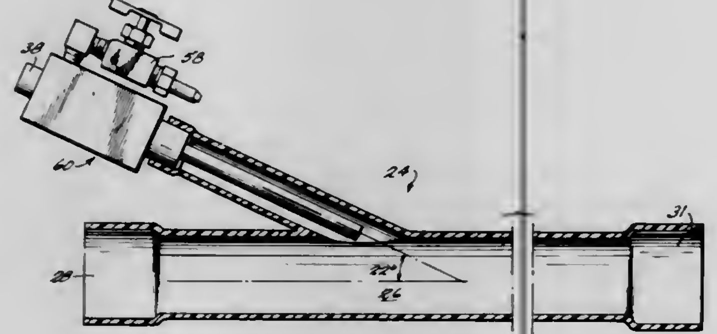
3,968,538
DOUBLE SUCTION UNIT

Owen F. Dunne, Tiverton, R.I., assignor to Clevepak Corporation, New York, N.Y.

Division of Ser. No. 449,082, March 7, 1974, Pat. No. 3,853,079. This application Sept. 30, 1974, Ser. No. 510,573

Int. Cl.² A47L *5/18*

U.S. Cl. 15—409 **7 Claims**



1. A dual suction apparatus having a first air passage extending from a first open inlet for receiving material to be transported to an outlet, a second air passage separate from said first passage and extending from a second open inlet for also receiving material to be transported to an outlet opening into said first passage between the inlet and outlet thereof, a third air passage extending from an inlet to an outlet opening into said second passage between the inlet and outlet thereof at such an angle so as to inject an air stream at a pressure above atmospheric pressure into said second passage to transfer momentum to the air therein, and to cause air to flow between the inlet and outlet of said second passage, said air flow in said second passage being injected into said first passage at such an angle so as to transfer momentum to the air therein to cause air to flow between the inlet and outlet of said first passage, and means coupled to said inlet of said third passage for supplying said air stream at a pressure above atmospheric pressure.

3,968,539
ADJUSTABLE HANDLE FOR AN INSTRUMENT CASING

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Oct. 10, 1975, Ser. No. 621,482

Int. Cl.² A47B *95/02;* **B65D** *25/28*

U.S. Cl. 16—115 **8 Claims**

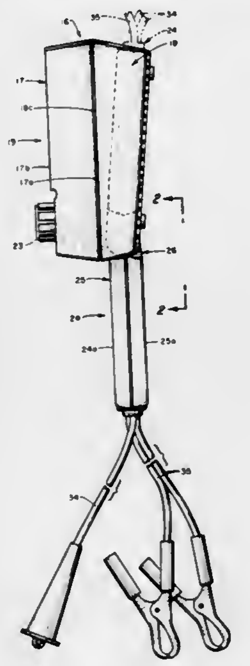
1. An adjustable handle for a casing comprising:

a gripping section movably secured to the casing for supporting the casing and an extension section extending from one end of said gripping section;

a pair of bearing projections extending from opposite sides of said handle extension section;

a pair of spaced walls supported by said casing and having curved surfaces for receiving one side portion of said projections;

a pair of cover caps for securing each of said projections to said casing at the opposite sides of said extension section, each of said caps having a curved surface portion for receiving the other side portion of said projections;



spaced, curved detent surfaces in an external surface of said handle extension section;

a roller located between said walls and movable into engagement with said curved surfaces; and

a spring wire extending through said roller and supported by supports attached to said casing;

said spring wire causing said roller to roll on the surface of said extension and to enter one of the curved detent surfaces in order to hold said handle relative to the casing when the handle is in a selected position.

3,968,540
FURNITURE HINGE FOR A GROOVED DOOR

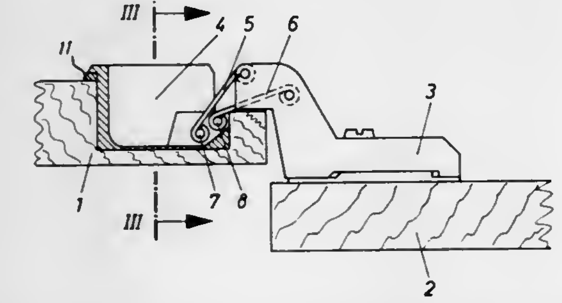
Karl Lautenschläger, Reinheim, Odw., and Gerhard Lautenschläger, Wersau, Odwo, both of Germany, assignors to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Odw., Germany

Filed June 20, 1975, Ser. No. 588,980

Claims priority, application Germany, Sept. 18, 1974, 2444569

Int. Cl.² E05D *3/06*

U.S. Cl. 16—163 **2 Claims**



1. A furniture hinge for a grooved door comprising:

a door engagement portion constituting a slip-on mount;

a quadrilateral link connected to said slip-on mount including two pivot pins disposed at a door side of said mount, and two control levers positioned within a lower half of said slip-on mount on said pivot pins;

a retaining flange formed at a lower end of said slip-on mount;

at least one washer is mounted beneath and contacting said flange; and

said slip-on mount being formed with a mouth and having a jacket beneath said control levers formed with a slot extending from said mouth of said slip-on mount, said slot having a width and depth such that said control levers pass therethroughout when opening the door.

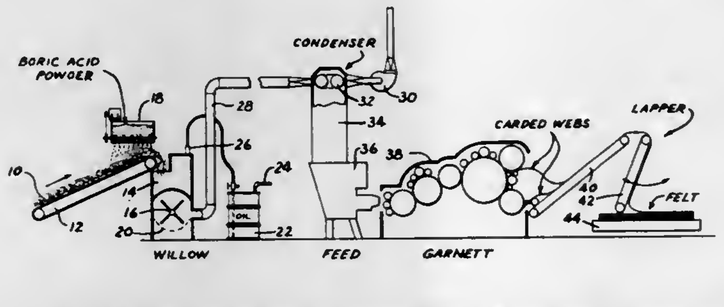
3,968,541
PROCESS FOR MANUFACTURING FIRE-RETARDANT COTTON FELT

Emil B. Rasmussen, 10408 Newville Ave., Downey, Calif. 90241

Filed Sept. 4, 1974, Ser. No. 503,106

Int. Cl.² D01G *15/06, 29/00, 37/00*

U.S. Cl. 19—66 R **2 Claims**



1. The method of manufacturing fire-retardant cotton felt by a continuous garnetting process which comprises adding powdered boric acid to raw cotton fiber in a metered flow at the rate of approximately 12% by weight of the raw cotton and making the introduction at a point in the material flow prior to garnetting to achieve substantial mechanical working of the boric acid into association with the natural coating of the raw cotton fibers on the carding cloth of the garnett rolls.

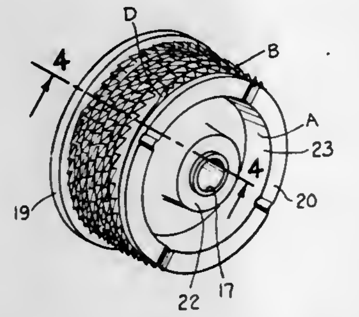
3,968,542
BEATER ROLL

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Filed Mar. 21, 1975, Ser. No. 561,001

Int. Cl.² D01G *15/14*

U.S. Cl. 19—97 **2 Claims**



1. A beater roll for opening fibers comprising:

a cylindrical drum constructed of molded synthetic polymeric material having a longitudinal central opening for mounting the drum for rotation;

a coil of preset metallic wire card clothing having a base portion carrying spaced carding teeth extending upwardly therefrom adjacent an edge thereof with a predetermined set in said coil of metallic card clothing such that in an unstressed state, the coil would assume an inside diameter less than an outside diameter of the drum;

said coil having successive contiguous convolutions and with such set remaining therein, upon the drum so as to aid in retaining the coil thereon by the compressive stresses produced by the set causing the clothing to bear and exert constrictive force upon the drum so as to grip the drum; and

adhesive means extending between said wire card clothing and said surface of the drum as well as between said contiguous convolutions.

3,968,543
ROTARY DRAFTING APPARATUS

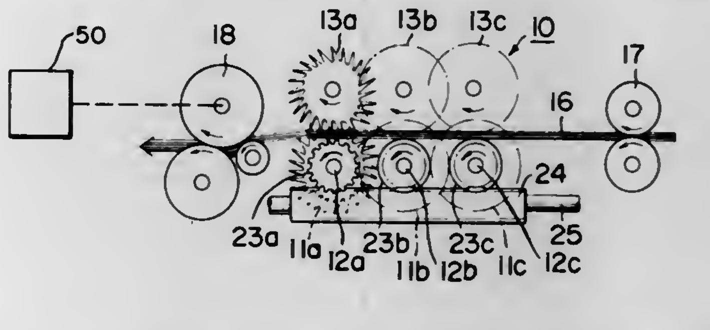
Masakazu Shino, Yamato-takada; Toshio Tange, Nagoya; Shigekazu Ueda, and Masashi Kobayashi, both of Kasugai, all of Japan, assignors to Chubu Seiko Kabushiki Kaisha, Kasugai and Masakazu Shino, Yamato-takada, both of, Japan

Filed July 3, 1974, Ser. No. 485,760

Claims priority, application Japan, July 6, 1973, 48-80989[U]; July 6, 1973, 48-80990[U]

Int. Cl.² D01H *5/24*

U.S. Cl. 19—293 **2 Claims**



1. A rotary drafting apparatus for a spinning machine, comprising a pair of back rollers coactively rotatable for guiding therethrough, a sliver to be drafted, a pair of front rollers coactively rotatable for drafting the guided sliver, drive means for the front rollers, a sliver control means interposed between said back rollers and said front rollers and including a plurality of pairs of rotatable control rollers with respective rotatable support shafts, said shafts being arranged in spaced relation between the front and back rollers, a plurality of needles on said support shafts for combing the sliver passing through the sliver control means, and second drive means for that pair of control rollers lying closest to said front rollers for imparting thereto a predetermined substantially constant angular velocity irrespective of any variation in the tension of the sliver between the front rollers and said control rollers, said second drive means including a worm wheel secured to one end of said shaft of said closest pair of said control rollers, a prime mover, and a worm driven by said prime mover substantially at a predetermined constant velocity and meshing with said worm wheel for rotating one corresponding roller of said closest pair of said predetermined constant angular velocity.

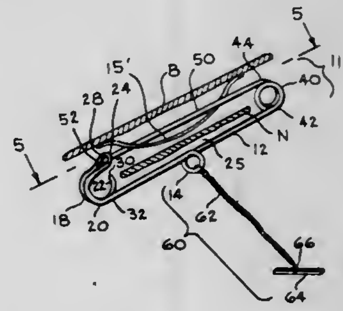
3,968,544
TIE CLASP

James A. Sinclair, 4609 Creekbend St., Houston, Tex. 77035

Filed Mar. 19, 1975, Ser. No. 559,685

Int. Cl.² A41D *25/00*

U.S. Cl. 24—49 CF **4 Claims**



1. A tie clasp comprising a loop-forming member having a closed position defining a generally rectangular space having

a relatively long dimension and a relatively short dimension, said loop including a pair of end members and a pair of parallel front and back members extending between and secured to said end members, and a shirt link connected to said back member between the ends thereof, said loop-forming member in closed position being free of sharp projecting points, said long and short dimensions being selectively chosen to accommodate therein the back pendant of a four-in-hand necktie in free hanging position, one of said end members being a spring while the other is a latch, said front member being pivotally secured to and actuated by said spring at one of its ends, the other or free end of said front member being pointed and releasably received in said latch in the closed position of said loop-forming member, said loop forming member also having an open position in which the front member is free from said latch and extends at an angle to the back member, and may be inserted either through the front or broad pendant of said necktie or through a label or securing strip secured at its ends to the back face of said broad pendant and thereafter returned to the closed position, said long dimension being shorter than the width of the broad pendant of the necktie to keep said tie clasp concealed, said latch being bent to define an eye receiving said pointed end of the front member to shield said point from contact with cloth and other extraneous material, said latch being formed of a pair of legs which converge together away from said eye, one of said legs being joined to the back member while the other terminates in a free-ended arcuate portion slightly spaced from said eye and serving to guide said pointed end of the front into said eye.

3,968,545
SLIDE FASTENER SLIDER

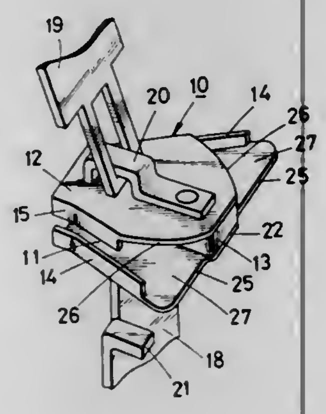
Teruaki Kawashima, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, 03, JA

Filed June 5, 1974, Ser. No. 476,427

Claims priority, application Japan, June 14, 1973, 48-70928[U]

Int. Cl.^{2} A44B *19/26*

U.S. Cl. 24—205.15 R **1 Claim**



1. A slider for a slide fastener having rows of interengageable fastener elements carried by respective stringer tapes comprising an upper wing and a lower wing disposed in generally parallel relation and each having an inwardly directed flange and connected together at one end by a neck portion and a pull tab pivotally carried at least on one of said upper and lower wings, the flange of one of said wings being shorter than that of the other wing, said wings having unobstructed end edges, one of said wings having a transversely diverging shoulder on opposite sides of said neck portion, with the corresponding shoulder of the other wing being offset relative to said diverging shoulder to provide an open area where the upper and lower wings are not superimposed, said open area having a configuration allowing the fastener elements upon entry into said open area to tilt longitudinally and transversely to relieve creases in the stringer tapes.

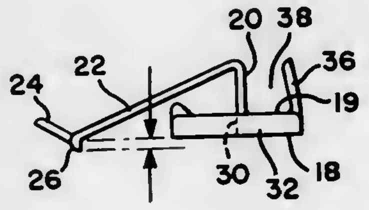
3,968,546
ONE-PIECE COMBINATION CLIP

Paul E. Seaborn, Los Gatos, Calif., and John R. Wyant, Marietta, Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 13, 1975, Ser. No. 540,657

Int. Cl.^{2} B42F *1/00*

U.S. Cl. 24—67.9 **4 Claims**



1. A clip comprising:
a. a base having upper and lower surfaces and forward and rear edges,
b. a first wall projecting upwardly a substantial distance above said upper surface of said base at said forward edge thereof,
c. a second wall projecting downwardly and forwardly from an upper edge of said first wall,
d. said second wall being greater than a plurality of times the length of said first wall,
e. said second wall terminating in a gripping portion disposed in a plane beneath the plane of said lower surface of said base,
f. feet projecting forwardly from said forward edge of said base beneath said second wall and diminishing the space between said forward edge of said base and said gripping portion of said second wall,
g. attaching means for securing the clip to a supporting surface,
h. said attaching means constituting the sole means of attachment for said clip to a supporting surface and being disposed approximately in line with the plane of said first wall and being partly in said base and said feet,
i. said clip being of one-piece construction with the components thereof formed integrally with each other,
j. said clip being molded from a synthetic resinous material, and
k. protrustions projecting upwardly from outer ends of said feet diminishing the space between said outer ends of said feet and a lower surface of said second wall.

3,968,547
YARN SINGEING MACHINE HAVING A CLEANING DEVICE

Hermann Mettler, and Paul Aschwanden, both of Arth, Switzerland, assignors to Aktiengesellschaft Fr. Mettler's Sohne Maschinenfabrik, Switzerland

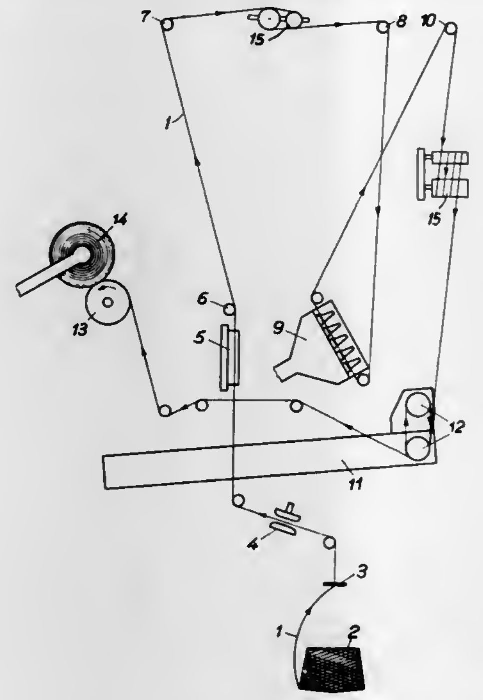
Filed Mar. 20, 1975, Ser. No. 560,495

Claims priority, application Switzerland, Mar. 27, 1974, 4251/74

Int. Cl.^{2} D02J *3/16;* **D06C** *9/00*

U.S. Cl. 28—63 **3 Claims**

1. A yarn singeing machine, comprising a singeing burner, a yarn cleaning device, yarn winding means for winding treated yarn onto a spool, a yarn supply, a yarn brake for braking the movement of said yarn, a yarn delivery mechanism having a plurality of advance rollers around which the yarn is directed, deflecting means deflecting the yarn into a lengthened run between said burner and said cleaning device and between said cleaning device and said yarn winding means, said brake and said delivery mechanism comprising yarn tension reducing means, and means for directing said yarn from said yarn supply through said yarn brake, said burner, said cleaner, said deflecting means, said delivery mechanism and to said yarn winding means.



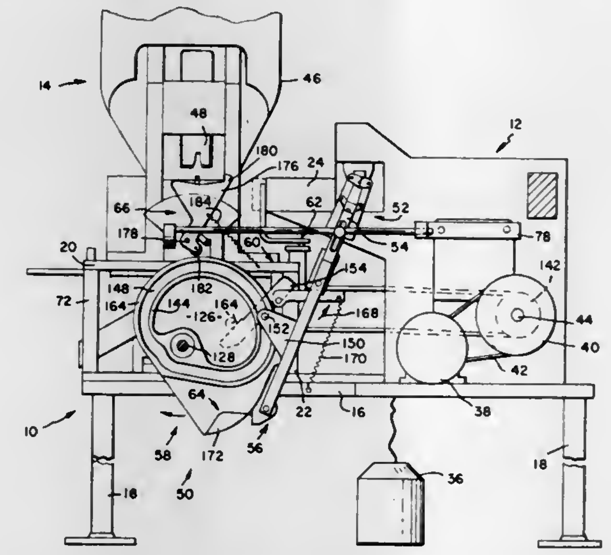
3,968,548
LEAD TRANSFER MECHANISM

Donald George Clark, Instow, and Ivan Godfrey Oliver Brown, Barnstaple, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 16, 1974, Ser. No. 533,390

Int. Cl.^{2} B21F *15/00*

U.S. Cl. 29—33 M **17 Claims**



1. In an automatic lead processing apparatus including a frame;
a mechanism mounted on said frame and operable to feed a predetermined length of lead from a lead supply, and to cut and strip the lead after feeding; and
an applicator mounted on said frame at a location spaced away from said mechanism and operable to apply a termination to the cut and stripped end of the lead;
the combination therewith of a lead transfer mechanism including:
lead engaging means shiftable between a closed engaging position and an open position where it is capable of either receiving or discharging a lead;
conveyor arm means pivotally mounted on said frame, one end of said conveyor arm means carrying said lead engaging means;
rotary cam means rotatably mounted on said frame and interconnected with said conveyor arm means and operable upon rotation of said cam means to swing said one end of the conveyor arm means between a first position adjacent said mechanism and a second position adjacent said applicator; and shifting means for normally shifting the lead engaging means between closed and open positions in timed sequence to the movement of the conveyor arm means, causing said lead engaging means to receive and engage a lead when said one end of said conveyor arm means is in the first position, to hold the lead as said one end of the conveyor arm means is moved from the first position to the second position, and to open the lead engaging means when said one end of the conveyor arm means is in the second position;
said shifting means including first shiftable means for normally shifting the lead engaging means from its open position to its closed position when said one end of the conveyor arm means is disposed in its first position.

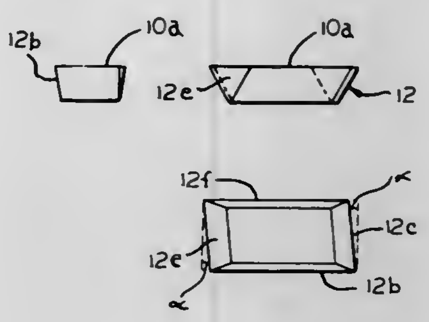
3,968,549
CUTTING TOOL

Edwin A. Carpenter, Milwaukee, Wis., assignor to Allied Tool Products, Inc., Milwaukee, Wis.

Division of Ser. No. 237,157, March 22, 1972. This application Sept. 23, 1974, Ser. No. 508,425

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—95 R **3 Claims**



1. A cutting insert adapted to be reversibly mounted in tool holder means, said cutting insert having a cutting tip formed at each end for making a cut in a work piece, a component of the force on said insert resulting from the engagement between said insert and a work piece being directed in a first direction,
said insert having a first face on the side thereof presented to the work piece when said insert is in an operative position and a second face on the opposite side,
said insert having a third face intersecting said first and second faces at substantially the same angle, said third face being generally parallel to said first direction and adapted to be engaged by a conforming surface formed in a tool holder, said cutting tips being formed by fourth and fifth faces formed respectively on the opposite ends of said insert, said fourth face intersecting said first and third faces and said fifth face intersecting said second and third faces, said faces intersecting at substantially the same angle for each of said cutting tips, whereby said fifth face is adapted to engage an angularly arranged surface on a holder when said insert is positioned with the cutting tip formed by said fourth surface is presented to a work piece and said fourth surface is adapted to engage the same angularly arranged surface when said insert is reoriented with the cutting tip formed by said fifth face is presented to a work piece.

3,968,550
HARD METAL CUTTING BIT

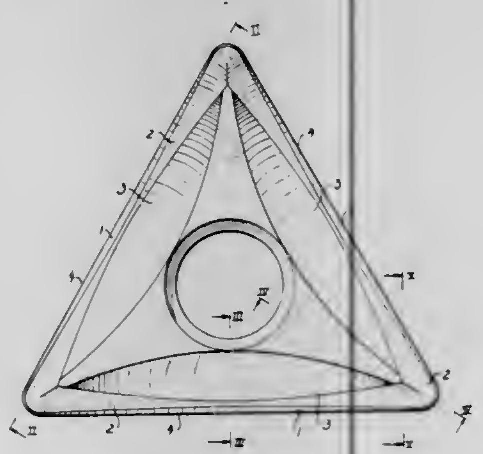
Hermann Gehri, Prangins, Switzerland, assignor to Stellram SA, Nyon, Switzerland

Filed Dec. 16, 1975, Ser. No. 641,354

Claims priority, application Switzerland, Jan. 14, 1975, 391/75

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—95 R **4 Claims**



1. A polygonal hard metal cutting bit comprising on at least one of its faces a fillet extending about the entire periphery of the bit, the fillet being concave between the corners of the bit, the bit also having two chip breakers on each side of the bit, a first of said chip breakers being next to said fillet and having a width and depth that are maximum adjacent the corners of the bit and a minimum mid-way between the corners of the bit, the second of said chip breakers being concave and discontinuous and being at least partly spaced from the fillet by said first chip breaker and having a depth and width that vary, the greatest depth and the greatest width of said second chip breaker being adjacent the middle of each side of the bit.

3,968,551
ADAMITE ROLL CONTAINING COBALT

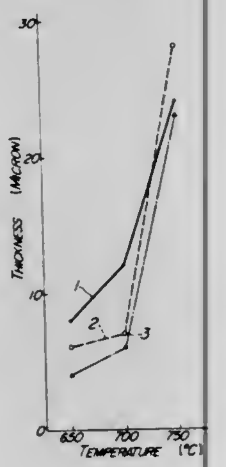
Kakunosuke Miyashita, Tokyo, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed June 9, 1975, Ser. No. 584,836

Claims priority, application Japan, June 12, 1974, 49-66103

Int. Cl.^{2} B21B *31/08*

U.S. Cl. 29—132 **4 Claims**



1. An Steel based Adamite roll containing, in weight percent, from 1.0 to 2.2 percent C, from 0.5 to 0.8 percent Si, from 0.5 to 0.8 percent Mn, from 0.5 to 1.0 percent Ni, from 1.0 to 2.0 percent Cr, from 0.1 to 1.0 percent Mo, from 0.5 to 2.0 percent Co, the balance being essentially Fe, and a reasonable amount of impurities.

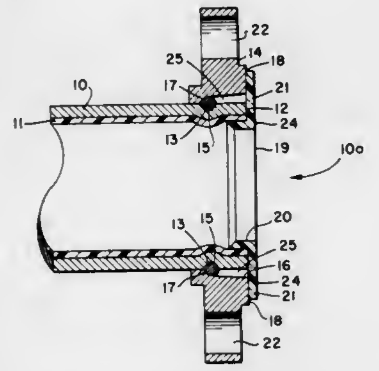
3,968,552
METHOD AND APPARATUS FOR FORMING PLASTIC LINED JUNCTION IN LINED PIPE

John J. Hunter, 1410 Willow Pond, Abilene, Tex. 79103

Filed Oct. 24, 1974, Ser. No. 517,686

Int. Cl.^{2} B23P *15/00;* **F16L** *23/02*

U.S. Cl. 29—157 R **5 Claims**



1. The method of lining the end face at the open end of a lined pipe joint having a plastic liner bonded to the entire interior of said pipe joint comprising the steps of

a. rolling an annular groove adapted to mate with a compression ring of circular cross-section in the outer surface of said pipe joint at a predetermined distance from the open end of said pipe joint,

b. placing a ring of circular cross-section within said annular groove,

c. placing a rigid flange on the outer surface of said pipe joint, said flange having a central opening substantially conforming to the outer dimensions of said pipe joint and having

  i. an annular shoulder in said central opening mating with said ring and

  ii. a radially extending face lying in the plane of the open end of said pipe joint when said shoulder mates with said ring,

and

d. inserting a plastic collar in the open end of said pipe joint, said plastic collar comprising a cylindrical body, the outer dimensions thereof substantially conforming to the inner dimensions of the liner in said pipe joint and a flange extending radially from one end of said cylindrical body, said radially extending flange mating with both the open end of said pipe joint and said radially extending face on said rigid flange.

3,968,553
METHOD OF MANUFACTURING A VALVE

Sakuji Tachikawa, No. 25, Futabacho, Itabashi, Tokyo, Japan

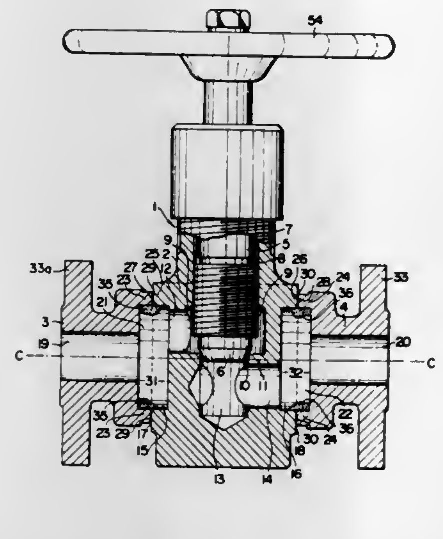
Filed Dec. 11, 1974, Ser. No. 531,834

Claims priority, application Japan, Dec. 17, 1973, 48-141606; Nov. 22, 1974, 49-134891

Int. Cl.^{2} B23P *15/00;* **B23K** *19/02*

U.S. Cl. 29—157.1 R **3 Claims**

1. A method of making a valve comprising the steps of forming a valve body with a body inlet passage opening up on one side of said valve body into a larger diameter body inlet stay passage with a body outlet passage opening up on the other side of said valve body into a larger diameter body outlet stay passage, forming a fluid inlet member with an inlet passage opening up one side thereof into a larger diameter inlet stay passage, forming a fluid outlet member with an outlet passage opening up on one side thereof into a larger diameter outlet stay passage, aligning said fluid inlet member with said body inlet passage such that said body inlet stay passage is generally axially with said inlet member stay passage, aligning said fluid outlet member with said body outlet passage such that said body outlet stay passage is generally axially aligned with said outlet member stay passage, rotating said fluid inlet and fluid outlet members at high speed relative to said valve body while applying axial pressure urging said fluid inlet and fluid outlet members towards said valve body, producing molten material at the interface between said valve body and said fluid inlet and fluid outlet members resulting from friction therebetween and said applied axial pressure, passing said molten material into said aligned stay passages, and pressure welding said fluid inlet and fluid outlet members to said valve body utilizing the high frictional heat and pressure to effect the weld.



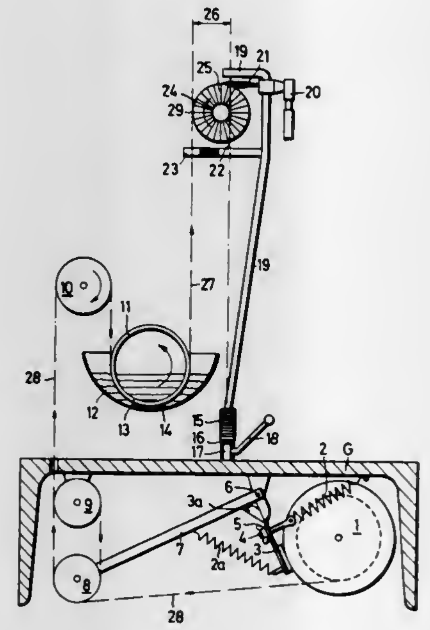
3,968,554
HEAT EXCHANGER

Franciscus Roffelsen, Helmond, Netherlands, assignor to Naamloze Venootschap Spiro Research N.V., Helmond, Netherlands

Division of Ser. No. 56,366, July 20, 1970, Pat. No. 3,703,253. This application Sept. 5, 1972, Ser. No. 286,455

Int. Cl.^{2} B23P *15/26*

U.S. Cl. 29—157.3 AH **1 Claim**



1. In a method of manufacturing a heat exchanger by helically wrapping, about the outer surface of a carrier tube and with a prescribed pitch, at least one wire helix having a plurality of successive turns of relatively large radial extent, and rigidly securing the inner surfaces of the successive turns of the helix to the outer surface of the tube, an improved technique for reinforcing the resulting heat exchanger, which comprises the steps of:

rotating the tube on its axis and simultaneously advancing the tube by an amount corresponding to the pitch of the helix;

winding a separate support wire around the radially outer edge extremity of each of the turns of the spirally advancing helix under a constant selectable tension; and

intimately securing the wound support wire to each of the associated adjacent outer edges of the turns of the helix.

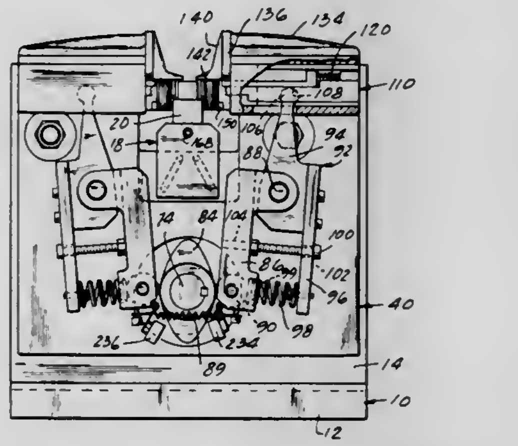
3,968,555
ELECTRICALLY OPERATED PROGRAMMABLE INSERTION TOOL WITH CONDUCTOR GUIDE AND MOVABLE STRAIN RELIEF INSERTION MECHANISMS

Harley Raymond Holt, Forest Park, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 500,633, Aug. 26, 1974, abandoned. This application Feb. 11, 1975, Ser. No. 548,903

Int. Cl.^{2} H01R *43/04*

U.S. Cl. 29—203 MW **60 Claims**



1. A conductor terminating mechanism for terminating a plurality of insulated conductors in respective terminating portions of respective spaced apart electrical contacts which are supported in alignment by an electrical device, comprising:

device support means for supporting the electrical device;

conductor support means for supporting a plurality of free-ended insulated conductors;

a carriage, said carriage and said device support means mounted for relative movement in the direction of alignment of the electrical contacts between points spaced a distance of at least the spacing between the terminating portions of the electrical contacts;

an insertion tool mounted on said carriage for movement toward the electrical device and including at least one insertion blade for engaging and pressing a conductor into the terminating portion of the electrical contact;

a conductor guide means mounted on said carriage for accurately positioning a conductor in an interference relationship with the insertion tool between the tool and a terminating portion of an electrical contact as the conductor is moved, under tension, toward that termination portion;

an insertion programmer operable to effect movement of said carriage to the spaced points; and

insertion control means including switch means operated upon accurate positioning of the conductor to effect movement of the insertion tool.

3,968,556
WEDGE FEEDING MECHANISM FOR SHORT STROKE DYNAMOELECTRIC MACHINE COIL AND WEDGE INSERTING APPARATUS

Charles W. Morr, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

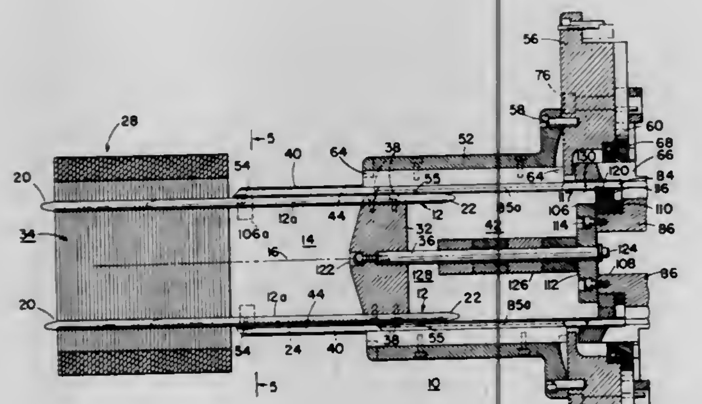
Filed Nov. 7, 1975, Ser. No. 629,722

Int. Cl.^{2} H02K *15/10*

U.S. Cl. 29—205 D **3 Claims**

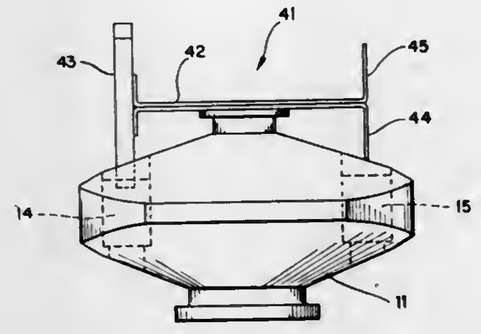
1. In apparatus for inserting prewound coils and slot wedges into the slots of an internally slotted dynamoelectric machine stator core member, said apparatus including a plurality of elongated, axially extending parallel blade elements defining

a bore having an axis and having outer surfaces, said blade elements being spaced about said bore and defining radially and axially extending spaces therebetween, said blade elements having distal ends and rear portions, the outer surfaces of said distal ends being adapted to engage the inner ends of the teeth of a stator core member which define said slots with the spaces between said blade elements being in axial alignment with and communicating with respective slots, a plurality of elongated, axially extending, parallel slot wedge guide elements respectively in axial and radial alignment with said blade elements and defining first wedge guide slots therebetween respectively in axial and radial alignment with said blade element spaces and in axial alignment with said stator core member slots, said guide elements respectively abutting the outer surfaces of the rear portions of said blade elements and having forward ends which are spaced rear-wardly from said distal ends of said blade elements and also having rear portions, a coil stripper member mounted for axial movement in said bore, first means for moving said stripper member axially through said bore within said blade elements, means extending rear-wardly from said rear portions of said wedge guide members for receiving slot wedges and having a plurality of elongated, axially extending, second wedge guide slots formed therein adapted respectively to receive slot wedges at a first location, said second wedge guide slots being respectively in axial alignment with said first wedge guide slots and communicating therewith, first means for pushing said slot wedges forwardly from said first location through said second wedge guide slots to a second location in said first wedge guide slots spaced rearwardly from said forward ends of said wedge guide elements, second means spaced axially forwardly from said first pushing means for pushing said slot wedges forwardly from said second location through said first wedge guide slots and to a third location, and reciprocating means for moving said first and second pushing means forward and for returning the same to push a first group of slot wedges from said second location to said third location as a second group of slot wedges are pushed from said first location to said second location on the forward stroke of said reciprocating means; the improvement wherein said second pushing means comprises a rigid pushing element axially movable between rear and forward positions and having a plurality of fingers extending radially therefrom, one each of said fingers extending into said wedge guide slots, means on each of said fingers for engaging said slot wedges when said pushing element is moved forwardly to move said slot wedges forward, and camming means on each of said fingers for preventing said fingers from engaging and moving the slot wedges at said second location rearwardly as said pushing element is returned to its rear position.



3,968,557
ALIGNMENT OF CENTRIFUGE CELLS AND COUNTERBALANCES

Charles H. Chervenka, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jan. 24, 1975, Ser. No. 543,668
Int. Cl.^{2} B25B *27/14*
U.S. Cl. 29—271 **2 Claims**



1. A tool for angular alignment of cells and counterweights in centrifuge rotors having diametrically oppositely located cylindrical chambers for reception of such cells and counterweights, the rotor and chambers having parallel axes, each cell having a window holder with a straight sided aperture, each counterweight having a center hole and an alignment hole spaced radially therefrom, said tool comprising:

a diametrically extending arm having first and second ends,
a tool arm secured to the first end of the diametrically extending arm, perpendicular thereto, extending in opposite directions from the diametrically extending arm,
a cell guide at the second end of the diametrically extending arm at right angles thereto,
a counterweight guide at the second end of the diametrically extending arm at right angles thereto,
the tool arm having an end formed with an oblong cross section for fitting into the cell window holder, said end of said tool arm extending in the same direction from the diametrically extending arm as the cell guide,
the tool arm having a second end formed as a circular bar for fitting into the center hole of the counterweight and having a pin parallel to the circular bar spaced radially therefrom for fitting into the alignment hole of the counterweight.

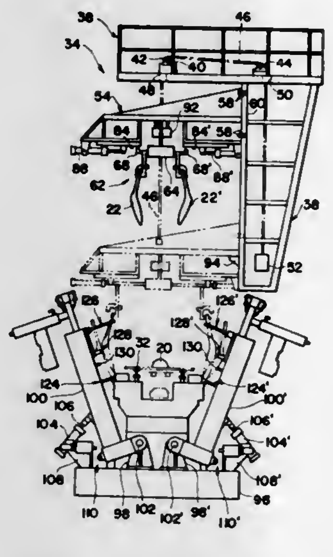
3,968,558
APPARATUS FOR AND METHOD OF AUTOMATICALLY ASSEMBLING AN AUTOMOBILE BODY STRUCTURE

Yoshitada Sekine, Ohme, and Tsuneo Fujikawa, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Dec. 11, 1974, Ser. No. 531,813
Claims priority, application Japan, Dec. 14, 1973, 48-138800
Int. Cl.^{2} B23P *21/00, 19/04*
U.S. Cl. 29—429 **13 Claims**

1. A method of assembling an automobile body structure, comprising the steps of:

providing an automobile body floor panel and a pair of automobile body side panels;
conveying the floor panel to a predetermined substantially horizontal working position;
vertically suspending the side panels in a closely horizontally spaced condition;
downwardly conveying the side panels and simultaneously gradually increasing the horizontal spacing between the side panels to position the side panels at first temporary positions above said working position and horizontally spaced parallel to each other and extending substantially parallel to the fore-and-aft direction of the floor panel;
positioning the respective lower ends of the side panels laterally of said floor panel at predetermined lateral positions respectively on opposite sides of the floor panel;

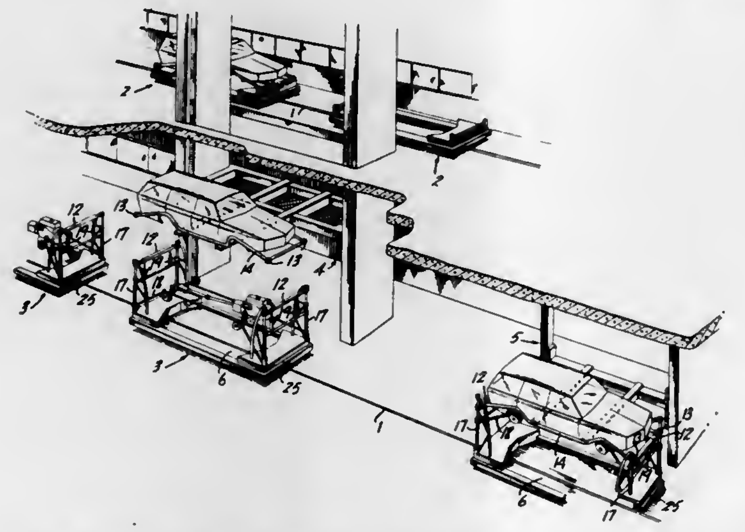
positioning the side panels longitudinally of the floor panel at predetermined fore-and-aft positions relative to the floor panel;
tilting the side panels away from each other about said respective lower ends of the side panels to second temporary positions;



moving the side panels laterally inwardly of the floor panel to position the side panels for welding the same to the floor panel; and
welding the side panels to the floor panel to form a unitary automobile body structure.

3,968,559
METHOD AND ARRANGEMENT FOR ASSEMBLY OF COMPONENT PARTS, PREFERABLY FOR MOTOR VEHICLES

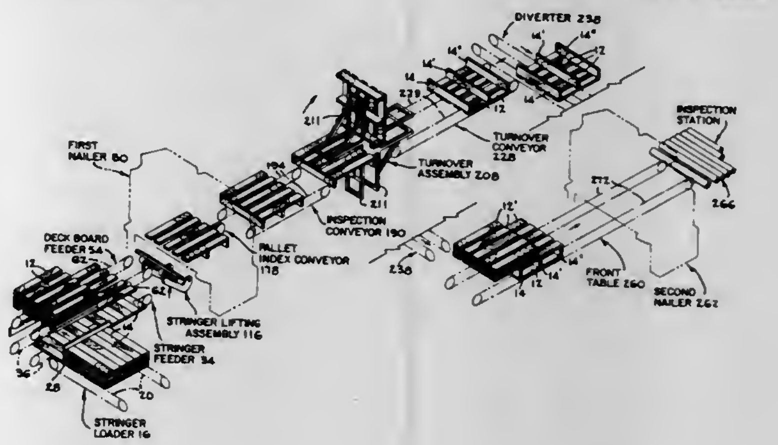
Sven Torgny Karlsson, Ockero, Sweden, assignor to AB Volvo, Goteborg, Sweden
Filed May 15, 1973, Ser. No. 360,586
Claims priority, application Sweden, May 19, 1972, 6607/72
Int. Cl.^{2} B23P *19/04, 21/00;* **B60L** *27/00, 27/04*
U.S. Cl. 29—430 **15 Claims**



1. A method of assembling units, such as bodies, chassis and motors of automobiles, in which each of a plurality of incomplete units is moved forward along a main assembly line to successive assembly stations for the addition of components to the unit until the unit is complete, the method comprising placing and transporting each incomplete unit on a different one of a plurality of individually motor-driven transport cars, the transporting being along a path through the successive assembly stations, adding components to each unit while it remains placed on its transport car at at least some of such stations, and individually controlling the movement of the transport cars between the stations by signals from at least one control wire connected with a control center and running in the direction of the main assembly line whereby the speed of assembling the components to each unit at the assembly stations is independent of the speed of assembling the components to other units.

3,968,560
PALLET ASSEMBLING SYSTEM

Garye R. Vial, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Dec. 16, 1974, Ser. No. 533,436
Int. Cl.^{2} B27M *1/08;* **B27B** *31/00;* **B27C** *9/00*
U.S. Cl. 29—430 **18 Claims**



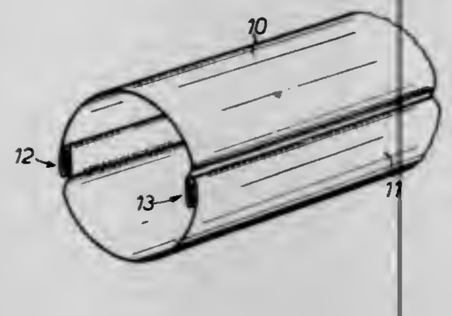
1. A pallet assembling system for assembling a pallet comprised of a plurality of deck boards placed crosswise to and on both sides of a plurality of spaced parallel stringers, said system comprising a first nailing machine, means for simultaneously feeding one set of deck boards to said first nailing machine, means for individually and sequentially feeding said stringers to said first nailing machine and for aligning said stringers within said first nailing machine in a position underlying said one set of deck boards for receipt of fasteners from said nailing machine, means for indexing said one set of deck boards after the delivery of each successive stringer to the nailing machine and the nailing of said deck boards to said stringer, a turnover device positioned downstream from said first nailing machine for reversing the orientation of the half-formed pallet after the first set of deck boards have been nailed by rotating it through 180° to place the unnailed side of the pallet face up, a second nailing machine, means for feeding said turned pallet to said second nailing machine, means for feeding a second set of deck boards to said second nailing machine in a position overlying said turned pallet, and diverting means located between said first nailing machine and said pallet feeding means of the second nailing machine for providing an offset in the path of the pallet through the system so that the deck boards for the second nailing machine can be directly loaded into said pallet feeding means at the upstream end thereof by being moved in a direction parallel to their longitudinal axes.

3,968,561
METHOD OF FABRICATING HOLLOW, FOAM-FILLED, METAL STRUCTURAL MEMBERS

Thomas Francis Oakes, Aldwick, Selkirk Gardens, Cheltenham, Gloucestershire, and Martin Bridgewater, 2 Highland Road, Charlton, Kings, Cheltenham, Gloucestershire, both of England
Division of Ser. No. 349,894, April 10, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,837
Claims priority, application United Kingdom, Apr. 12, 1972, 16781/72
Int. Cl.^{2} B23P *3/00*
U.S. Cl. 29—460 **4 Claims**

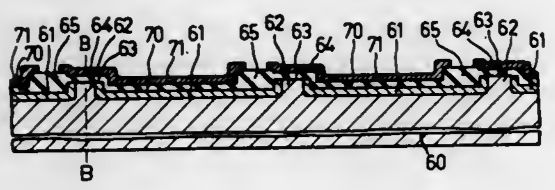
1. The method of constructing a structural member for use in an architectural or building panel, comprising the steps of fabricating a pair of hollow frame members, each of said frame members being fabricated by shaping a pair of elongted thin sheet metal strips to desired cross-sectional profiles, assembling said profiled strips into a comparatively weak, hollow frame member by positioning the shaped strips in

general alignment with one another with the profiled portions of said strips being in opposing spaced relation to one another and with each elongated edge of each strip being disposed adjacent to but spaced from an elongated edge of the other strip, said assembly step for each frame member further comprising bridging the space between the edges in each pair of adjacent edges of said two strips by means respectively of two elongated thermal insulating members which extend respectively along the two pairs of adjacent spaced edges to form two spaced longitudinal joints in said hollow frame member, each of said insulating members being in loose engagement with its associated pair of elongated strip edges at the time of said assembly step to define a gap which extends along each of said joints and through which air may escape from the interior to the exterior of said hollow frame member, positioning said pair of frame members in closely adjacent end-to-end relation to one another, interconnecting said pair of closely adjacent hollow frame members by inserting a hollow reinforcing member having two communicating hollow limbs into the adjacent hollow ends of said pair of hollow frame members respectively to conceal said reinforcing member completely within said frame members, said hollow reinforcing member being fit loosely into each of said frame members to provide a clearance between the exterior of said reinforcing member and the interior facing surfaces of said frame members, and thereafter strengthening said hollow frame members with a rigidifying plastic material by introducing plastic foam material in fluid form into the spaces between said pairs of profiled strips to completely fill each of said hollow frame members and to extend continuously between said two frame members via the communicating hollow limbs of said reinforcing member while displacing air from the interior of said reinforcing member and the interiors of said hollow frame members via said gaps in said joints, said plastic foam introducing step being continued to an extent sufficient to cause said plastic foam material to penetrate into each of said longitudinal joints and into said clearance to close each of said gaps and to form an adhesive bond connecting each of said thermal insulating elements to its associated pair of elongated strip edges thereby to fixedly connect the pair of metal strips in each frame member to one another along said joints and to fixedly connect said pair of frame members to one another at said reinforcing member, the portions of said introduced plastic foam material which penetrate into each of said joints and into said clearance changing in consistency at the time of penetration from a cellular foam to a solid homogeneous material to cause said plastic material to exhibit a higher density in said joints and clearance than in the main spaces within said hollow frame members.



3,968,562
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Joseph Gijsbertus Van Lierop, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 304,391, Nov. 7, 1972, abandoned. This application Feb. 11, 1975, Ser. No. 548,999
Claims priority, application Netherlands, Nov. 25, 1971, 7116182
Int. Cl.^{2} H01L *21/22, 21/316*
U.S. Cl. 29—571 7 Claims



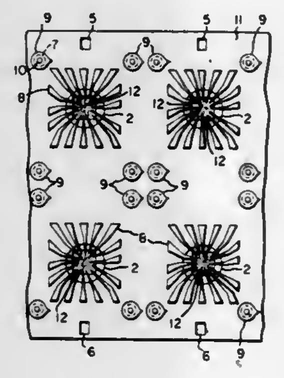
1. A method of manufacturing a semiconductor device containing a plurality of field effect transistors comprising a semiconductor body, each of said field effect transistors comprising two spaced surface zones of one conductivity type which extend in a region of the opposite conductivity type adjoining a surface of the semiconductor body, said surface zones constituting source and drain zones of the field effect transistor having at least one insulated gate electrode and defining in the opposite type region under the gate electrode a channel region wherein carriers can be caused to flow from source to drain, comprising providing an oxidation masking pattern which includes a material other than a semiconductor oxide over at least the channel region and introducing impurities into the semiconductor body to form the said surface source and drain zones, selectively oxidizing the semiconductor surface in apertures in the oxidation masking the pattern to form a thick patterned oxide layer inset in the semiconductor body at least over a part of its thickness and covering at least part of each of the said source and drain zones, thereafter forming a thinner section of the inset oxide layer present above at least part of said drain zone by removing part of the inset oxide layer thickness, forming a conductive layer on the surface of at least part of the thinner section of the inset oxide layer to serve as an electrode of a capacitance whose other electrode is formed by the drain zone whereby the capacitance is maximized, forming a conductive layer over the channel to constitute a gate electrode, said gate electrode being formed to extend over a portion of the thick oxide layer remaining on the said source zone whereby source-gate overlap capacitance is minimized, and making connections to the field effect transistors and capacitors.

3,968,563
PRECISION REGISTRATION SYSTEM FOR LEADS

Arthur Houser Hamlin, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 27, 1975, Ser. No. 562,939
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—591 2 Claims

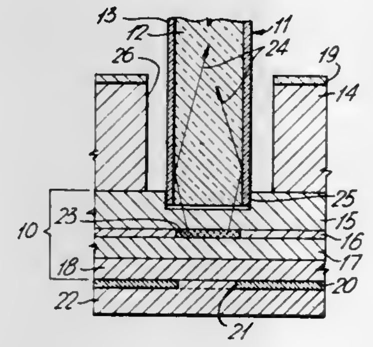
1. A process for preparing sets of finger-like leads and mounting them on semiconductive devices comprising forming first holes in a carrier strip which holes are adapted to surround a semiconductive device, forming second holes in said carrier strip adjacent said first holes and spaced in a predetermined registration with said first holes, applying a metallic layer to said carrier strip, which metallic layer covers said first and second holes, which metallic layer is of a metal suitable for forming sets of finger-like leads, and which metallic layer is intimately adhered to said carrier at least in the areas immediately surrounding said holes, applying a resist to said metallic layer which partially overlies said first holes in a pattern to form said sets of finger-like leads over said first holes and which overlies said second holes, except for an

aperture smaller than and surrounded by each of said second holes to form indexing holes over said second holes, etching away the metallic layer not covered by the resist to simultaneously form sets of finger-like metallic leads, and apertured metallic indexing members protruding over said second holes, and bonding semiconductive devices to the sets of finger-like leads using the etched indexing holes to achieve the registration between the lead frame and the semiconductive device.



3,968,564
ALIGNMENT OF OPTICAL FIBERS TO LIGHT EMITTING DIODES

Anthony John Springthorpe, Richmond, Canada, assignor to Northern Electric Company Limited, Montreal, Canada
Filed Apr. 30, 1975, Ser. No. 573,266
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—580 4 Claims

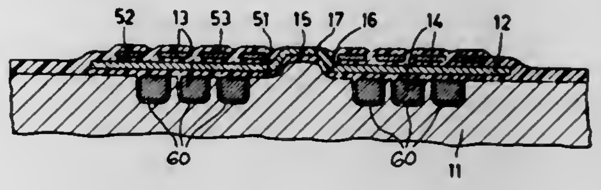


1. A method of aligning optical fibres to light emitting diodes, comprising;

forming a mesa on a surface of a semiconductor substrate;
said mesa of a diameter equal to the diameter of an optical fibre;
sequentially forming a plurality of layers on said one surface, said layers including first and second confining layers and an active layer between said confining layers;
forming a contact on an outer layer of said plurality of layers, said contact aligned with said mesa;
forming an electrical contact layer on the surface of the substrate remote from said one surface;
forming a clearance hole in said substrate, said clearance hole surrounding and being larger than said mesa, and removing said mesa to form a locating recess in the first of said plurality of layers for said fibre.

3,968,565
METHOD OF MANUFACTURING A DEVICE COMPRISING A SEMICONDUCTOR BODY

Theodorus Cornelius Johannes Maria Bertens; Hendrikus Josephus Antonius Van Dijk, and Jan T. Gerkema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 392,791, Aug. 29, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,784
Claims priority, application Netherlands, Sept. 1, 1972, 7211910
Int. Cl.^{2} G11B *5/42;* H01F *7/06*
U.S. Cl. 29—603 5 Claims



1. A method of manufacturing a film-deposited magnetic head comprising the steps of:

a. providing a semiconductor body having a flat major surface, said body having adjacent its flat major surface a semiconductor layer portion of high electrical resistivity,
b. introducing into the semiconductor body from its major surface to a depth less than that of the high resistance layer portion doping impurities to a concentration which when incorporated into the semiconductor body substantially reduces its resistivity, the distribution of said introduced impurities and its resultant profile substantially exactly corresponding to the negative of a non-planar profile which it is desired to shape into the body surface, said desired profile including body surface portions at plural levels,
c. thereafter subjecting the thus-doped body to a selective electrolytic etching process which operates to remove the doped surface portions of reduced resistivity but not the high resistivity portions until said doped surface portions are substantially entirely removed leaving intact deeper high resistivity portions forming the desired non-planar profile,
d. thereafter depositing on the non-planar profiled surface a continuous film of conductive material which extends over the different levels of the non-planar profile, and
e. thereafter completing by deposition electrical windings and a gapped magnetic circuit of the magnetic head utilizing the film of conductive material to form conductive elements recessed in some of the deeper areas of the non-planar profile.

3,968,566
METHOD OF FORMING A DEFLECTION YOKE SYSTEM

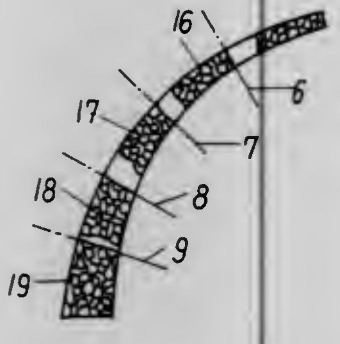
Rudolf Schubert, Dornstadt, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Division of Ser. No. 444,101, Feb. 20, 1974, abandoned, which is a continuation of Ser. No. 229,343, Feb. 25, 1972, abandoned. This application Dec. 19, 1974, Ser. No. 534,219
Claims priority, application Germany, Feb. 27, 1971, 2109439
Int. Cl.^{2} H01F *41/06*
U.S. Cl. 29—605 3 Claims

1. A method of winding a saddle shaped deflection coil comprising:

a. providing a mandrel having a recess, whose shape corresponds to the final shape of the coil, for receiving continuously applied coil turns of wire;

b. continuously applying coil turns of wire into said recess to wind the saddle shaped deflection coil;

c. during said step (b), inserting projections at predetermined positions into the recess after applying a predetermined number of coil turns to provide predetermined starting points for the subsequently applied coil turns; and



d. heating the completed coil prior to removing same from the mandrel for obtaining a self-sustaining unit.

3,968,567

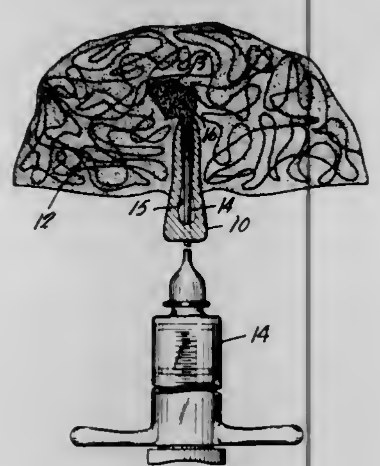
ENDODONTIC COMPOSITION AND METHOD

Alan J. Nevins, 200 Carmen Ave., Apt. 7C, East Meadow, N.Y. 11554

Filed Apr. 21, 1975, Ser. No. 569,675

Int. Cl.^{2} A61K *5/01*

U.S. Cl. 32—15 **20 Claims**



1. A method for causing formation of a physiologic seal across the opening of a rigid, cavity-containing tubular member adjacent capsular connective tissue within a mammalian body comprising

a. filling the tube with a gelable composition comprising collagen, a calcium salt, and a phosphate salt,

b. allowing the composition to gel, and

c. permitting the ingrowth of connective tissue into the cavity.

3,968,568

ENCODER ERROR CORRECTION MEANS FOR USE WITH A DISTANCE MEASURING WHEEL

Bobby R. Jackson, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 10, 1974, Ser. No. 487,184

Int. Cl.^{2} G01B *3/12, 7/04;* **G01C** *22/00*

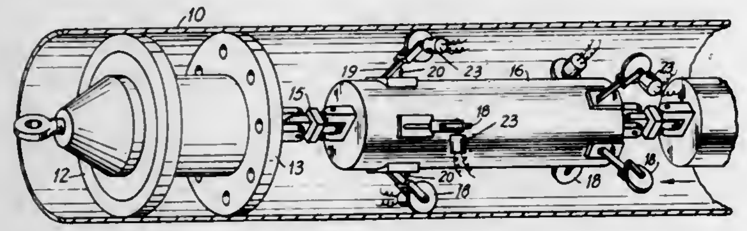
U.S. Cl. 33—141 G **10 Claims**

1. In apparatus for measuring the relative translation between a base member and a surface wherein indication of translation is produced by a rotatable wheel and a measuring device having a rotor portion and a stator portion which are relatively movable about an axis, and wherein said wheel is supported against said surface by a pivot arm which is pivotally coupled at a first position on the base member and wherein the arm is inclined with respect to the surface and subject to a change in its angle of inclination when the lateral spacing between said surface and base member changes, thereby producing a rotation of said wheel and an erroneous indication of relative translation, the improvement for minimizing such an erroneous indication comprising

means for mounting said measuring device on said apparatus and for coupling the rotor portion thereof to said wheel for rotating the rotor as a function of the rotation of the wheel,

the stator portion of the measuring device being rotatable about said axis,

a crank arm pivotally coupled to said stator at a location removed from said axis and pivotally coupled to a second position on said base member to provide a crank action to rotate said stator portion about said axis when the lateral spacing changes between said surface and base member,



said pivot arm and said crank arm forming opposite sides of a quadrangular shaped four bar linkage,

the portion of said stator between said axis and the pivotal coupling to said crank arm forming a third side of said linkage and the portion of said base member between said first and second positions comprising the forth side opposite to said third side,

the lengths of said pivot arm and said crank arm and the coupling locations of said crank arm to said stator portion and to said base member being proportioned and arranged to make the rotation of the stator portion substantially equal in magnitude to the rotation of said wheel throughout a given range of angles of inclination of said pivot arm caused by changes in the spacing between said base member and said surface.

3,968,569

CLEARANCE MONITORING PROBE FOR ROTARY REGENERATIVE HEAT EXCHANGER

Gordon J. Faris, 8004 Booth St., Niagara Falls, Ontario, Canada

Filed Aug. 27, 1973, Ser. No. 391,094

Claims priority, application Canada, Sept. 21, 1972, 152223

Int. Cl.^{2} G01B *3/22, 5/14*

U.S. Cl. 33—169 R **3 Claims**

1. A probe for monitoring the clearance between the stationary and rotating parts of a rotary regenerative heat exchanger while in motion, said probe including:

a housing suitable for mounting on a stationary part of the heat exchanger, the housing having a bore,

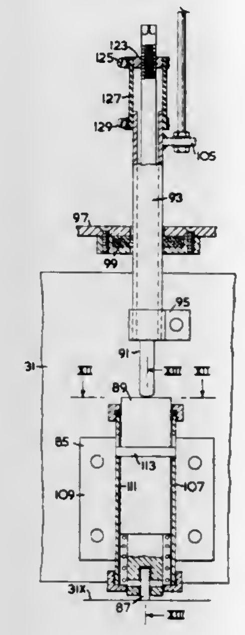
a plunger slidable in said bore without rotation,

a roller mounted on said plunger so that its curved surface projects beyond the end of said plunger,

spring means acting on said plunger in such direction as to retract the roller relative to the housing, and

adjustment means for resiliently moving the plunger a measurable distance against the force of said spring means to bring said roller into contact with a movable part of said heat exchanger while permitting slight movement of said roller when contacted by said movable part,

and, wherein said adjustment means includes a tube mountable on said stationary part co-axial with said plunger and at the end of said plunger remote from the roller, a rod slidable in said tube and having a threaded portion, and screw threaded means received on said threaded portion and held non-rotatably relative to said tube by resilient means permitting slight movement of said screw threaded means with said rod in a direction away from said plunger, whereby said plunger may be moved towards the rotating part of the heat exchanger by rotation of said rod in said screw threaded means, said resilient means allowing slight movement of said roller when contacted by said rotating part, said slight movement being suitable for detection by sensing means.



3,968,570

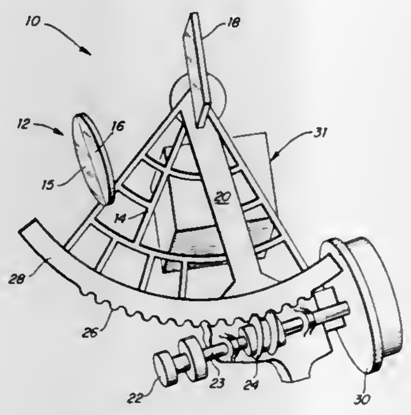
ELECTRONIC SEXTANT

Fred A. Leuchter, Jr., 174 Belmont St., Malden, Mass. 02148

Continuation-in-part of Ser. No. 377,753, July 9, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,392

Int. Cl.^{2} G01C *1/08*

U.S. Cl. 33—267 **6 Claims**



1. An improved double-reflecting sextant for accurately measuring an angle and for automatically providing angular measurement and time electrical output signals which are suitable for further electrical processing and automatic data reduction and comprising:

a. a sextant including means for measuring an angle and including a horizon mirror-glass and an index mirror, whereby the sextant may be collimated by aligning an image of the horizon on the index mirror with a horizon sighting through the horizon mirror-glass, and then the altitude of a celestial body above the horizon may be measured by adjusting the angular position of the index mirror until an image of the celestial body on the index mirror is aligned with a horizon sighting through the horizon mirror-glass, and a digital encoder means for providing a digital electrical signal indicative of the magnitude of said measured angle;

b. clock means for providing an accurate indication of the time at which the measurement is made and for producing an electrical output signal indicative of that time; and

c. electronic means, including means actuated by the operator for completing an electrical circuit for a given period of time, for automatically providing synchronized output electrical signals from said measuring means and said clock means which are suitable for further electrical processing and automatic data reduction, said electronic means including first electronic means coupled to said encoder means for automatically providing an average of said angle measurement over the given period of time, and second electronic means coupled to said clock means for automatically providing an averaged time during which the measurement is made over the given period of time, whereby a single operator may take measurements with the sextant thereby eliminating the requirement for a second operator, and further eliminating synchronization and transcription errors between several operators.

3,968,571

DRYING PROCESS

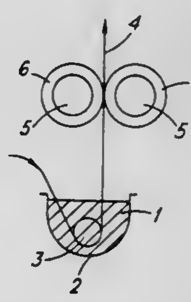
Christian Oschatz, Rummingen, Germany, and Franz Somm, Riehen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,576

Claims priority, application Switzerland, Jan. 25, 1974, 1043/74; Nov. 2, 1973, 15453/73

Int. Cl.^{2} F26B *5/14, 25/20*

U.S. Cl. 34—14 **15 Claims**



1. In a process for the removal of a liquid from an absorbent substrate comprising passing the substrate through the nip of a pair of rollers, of which at least one roller of said pair is provided with a sponge material, the improvement wherein: (1) the average diameter of the capillary pores of said sponge material is less than 1 mm and the diameter of at least 50% of the capillary pores being in the range of 0.1 to 0.001 mm; and (2) the pressure at the nip of said rollers is less than 1 kg. per cm. roller length.

3,968,572

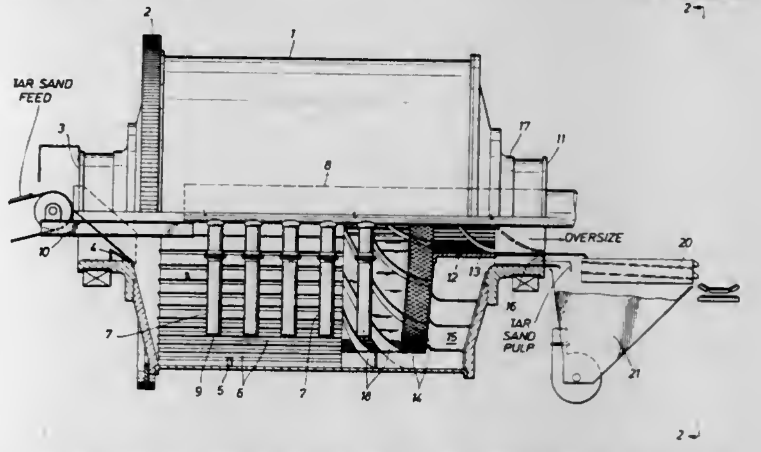
CONDITIONING DRUM FOR USE IN HOT WATER SEPARATION OF BITUMEN FROM MINED TAR SANDS

Frederick C. Stuchberry, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 3, 1975, Ser. No. 564,959

Int. Cl.^{2} F26B *11/02*

U.S. Cl. 34—134 **14 Claims**



1. A tar sands conditioning drum for mulling of mined tar sand lumps into pulp through the addition of hot water, steam

and caustic which comprises; a horizontally disposed cylindrical drum of a length to diameter ratio of between 0.5:1 and 1.25:1, rotatable around its longitudinal axis and having

- a. an axial opening at one end for introduction of mined tar sand, water and caustic;
- b. a second axial opening at the other end for rejection of oversize and discharge of mulled tar sands pulp, said second axial opening being divided by a coaxial grate member, extending along the longitudinal axis of the drum, into an outer annular opening for discharge of tar sands pulp and an inner axial opening for rejection of oversize, said grate size being sufficient to allow ready passage of tar sands pulp into a discharge passageway defined by said outer annular opening while retaining the oversize; and
- c. an externally supported stationary steam header extending into and substantially over the length of the drum interior along the longitudinal axis of the drum having affixed thereto, in fluid communication, a plurality of steam conduits which project downwardly from the steam header to a point above the lower interior surface of the drum, said steam conduits being positioned at spaced intervals along the length of the steam header and perforated for injection of steam into said cylindrical drum.

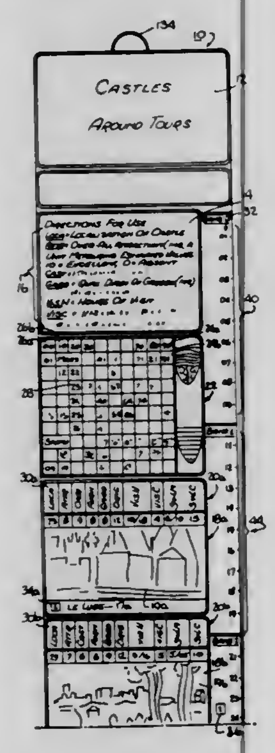
3,968,573
METHOD AND MEANS FOR INFORMATION PRESENTATION

Jean-Paul Poliniére, Biarritz, France, assignor to Allen Grossman, New York, N.Y., a part interest

Filed Oct. 24, 1974, Ser. No. 517,748

Int. Cl.^{2} G09B *29/00*

U.S. Cl. 35—7 R **3 Claims**



1. An information display system for presenting information about objects, such as tourist attractions, having a common characteristic throughout, namely a location within a particular geographical area, said system comprising:

a plurality of separate and distinct, portable panels, said panels being disposable substantially in parallel columns and/or rows and orientated in the same upright position for ready viewing, each said panel including a carrier having the following information disposed thereon;

- a. a geographical chart consisting of a map of said geographical area, and means for dividing said map into a plurality of subsections, each of said subsections identified by a unique character positioned thereon,
- b. a marginal scale, said scale consisting of a predetermined order of said unique characters disposed upon said carrier at intervals along the edge of said carrier, said marginal scale identically disposed on each said carrier,
- c. a plurality of separate and physically independent, self-sufficient and self-contained, main charts, each of said main charts expressing an essential element of said information, said main charts disposed, one after the other, along the length of said carrier, each of said main charts containing at least one of the same forms of information, said forms of information positioned within said main chart identically from chart to chart, said forms of information limited in number to facilitate comparison of the content of each of said forms of information within each panel and between said panels, said information within each main chart related to a particular object located within said geographical area,
- d. means for referencing each said particular object described in each said main chart to the location along said marginal scale representing the geographical location of said particular object, said referencing means identical in form for each said main chart,

said identical position and same forms of information in each main chart, said identical marginal scales along the edge of said panel and said identical means for referencing each said particular object to the marginal scale combining to facilitate the comparison of the different objects described in each of the main charts both within and between panels.

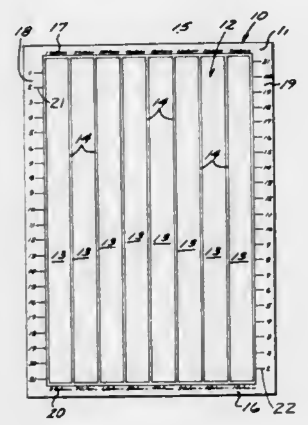
3,968,574
JOURNALIST TEACHING AID

Gary R. Ellis, 1855 Cedar, Apartment 16, Long Beach, Calif. 90806

Filed Feb. 10, 1975, Ser. No. 548,815

Int. Cl.^{2} G09B *29/00*

U.S. Cl. 35—7 R **8 Claims**



1. A method of preparation of a full size publication page makeup layout representing a prepared dummy page layout, said dummy page layout further representing a proposed publication page of a class of publications comprising newspapers, tabloids, magazines, pamphlets, manuals, yearbooks, annuals and books, said method comprising:

- a. providing a master layout board set, said set comprising a plurality of master layout boards, said plurality including therewithin master layout boards having rectangular dimensions including a range of dimensions representative of a class of proposed publications comprising newspapers, tabloids, magazines, pamphlets, manuals, yearbooks, annuals and books each of said master layout boards having a work surface thereon being divided into substantially equal columns by column dividing strips extending from a master layout board top portion to a master layout board bottom portion, said columns being representative of a column, said columns having a shade or hue differing from the column dividing strips thereby simulating printed matter between the column dividing strips, said master layout boards being constructed of any of the class of materials comprising plastics, epoxy coated paper, epoxy coated card stock, wood, metal, glossy paper, glossy card stock, painted wood and painted metals, said work surface having a surface preparation thereon to permit detachably adhesively mounting pressure sensitive, adhesively backed materials thereonto;
- b. providing an art work simulating set, comprising a plurality of art work simulating sheets, each of said sheets comprising a relatively thin pressure sensitive adhesively backed rectangularly shaped sheet being constructed of any of the class of materials comprising, glossy paper, plastics, plastic coated paper, epoxy coated paper, plastic coated card stock or epoxy coated card stock, said artwork simulating sheets having imprinted on a front face thereof printing indicative of art-work, said plurality of art work simulating sheets including therewithin art-work simulating sheets having rectangular dimensions representing a variety of sizes of art-work or pictures consistent with the publishing art having a range of dimensions within a range of widths of one-half master layout board column wide through four master layout board columns wide and within a range of depths of one-half inch deep through 6 inches deep;
- c. providing a headline simulating set comprising a plurality of headline simulating strips for simulating headlines within a range of from one through eight columns wide and one-half inch through 4 inches deep, said strips each comprising a relatively thin pressure sensitive adhesively backed elongate retangularly shaped strip constructed of any of the class of materials as set forth for the construction of the said art-work simulating sheets, said headline simulating strips having on a front face thereof headline simulating printing, including a range of print styles comprising Bodoni, Italic, Optima, Corona, Garamond, Spartan, Roman, Memphis, Gothic, expanded, condensed, Cheltenham, Cairo and Cameo, said plurality of strips further including therewithin printing point sized throughout the range generally used in the publishing art including point sizes of **14, 18, 24, 30, 36, 42, 48, 60** and **72**;
- d. providing a flag, nameplate, or logo simulating set comprising a plurality of flag, nameplate or logo simulating strips for simulating flags, nameplates, or logos within the range of from one through eight columns wide and one-half through 4 inches deep, each of said flag, nameplate or logo similating strips having imprinted on a flag, nameplate, or logo simulating strip front face printing distinctively setting said flag, nameplate, or logo simulating strips apart from the said headline simulating strips, said flag, nameplate, or logo simulating strips being otherwise similar in construction to that set forth above for the said construction of headline simulating strips; and
- e. detachably adhesively mounting said headline simulating strips, said flag, nameplate or logo simulating strips, and said art-work simulating sheets onto a work surface of a master layout board, said board having dimensions representative of a proposed publication page being represented by a prepared dummy page layout, said mounting of said strips and sheets conforming with information set forth on the prepared dummy page layout, said mounted strips and sheets overlaying columns on the master layout board in conformity with the dummy page layout leaving uncovered columns on the master layout board work surface representing printed story matter of the proposed publication page.

3,968,575
TEACHING DEVICE

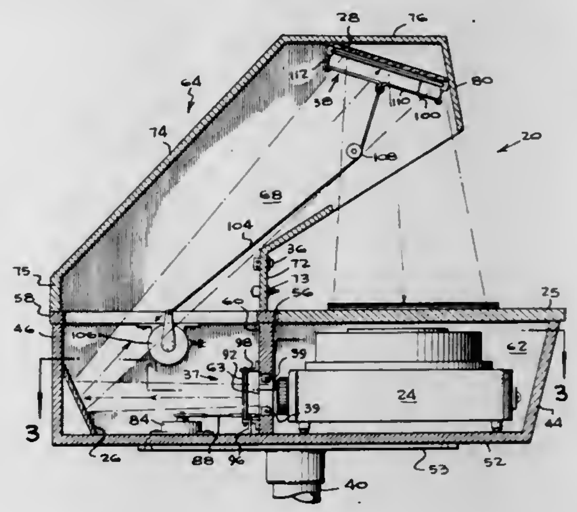
Marlin Van Wilson, Rte. 1, Barboursville, Va. 22923

Filed Apr. 2, 1975, Ser. No. 564,292

Int. Cl.^{2} G09B *5/06*

U.S. Cl. 35—9 A **20 Claims**

1. An audio-visual device which is capable of responding to a student's capability to learn or to absorb a variety of subjects and mode of skills, said audio-visual device comprising a surface mean for displaying a projected visual image on which the student can write, a visual image projecting means for projecting a series of visual images onto the surface means, an audio means for creating an audible signal synchronized with the visual images, a manual advance means for advancing the visual images a predetermined number of visual images, a manual look-up means for causing additional information to be projected in a particular visual image if the student manually operates the look-up means in completing a lesson taught in said particular visual image, and a control means for advancing the visual images less than said predetermined number of visual images and in relationship to the frequency of manual operation of the look-up button.



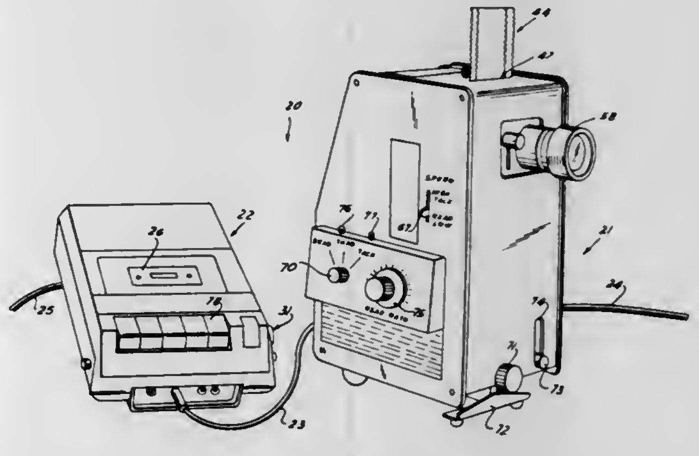
3,968,576
METHOD AND APPARATUS OF AURAL/VISUAL CORRESPONDENCE FOR THE IMPROVEMENT OF READING

Stanford E. Taylor, Hawk Drive, Lloyd Harbor, N.Y. 11743

Continuation-in-part of Ser. No. 599,117, July 25, 1975, abandoned, which is a continuation of Ser. No. 423,271, Dec. 10, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,619

Int. Cl.^{2} G09B *17/04*

U.S. Cl. 35—35 B **5 Claims**



1. A method of aural and visual correspondence for the improvement of reading by training the reader comprising:

viewing a visual program in line-by-line sequence with the print being stationary and a single line being observable during the predetermined viewing time;

transmitting an aural program in the form corresponding to the visual program and including signals to advance the visual program with a single pulse in a predetermined pattern in coordination with the audio program; and

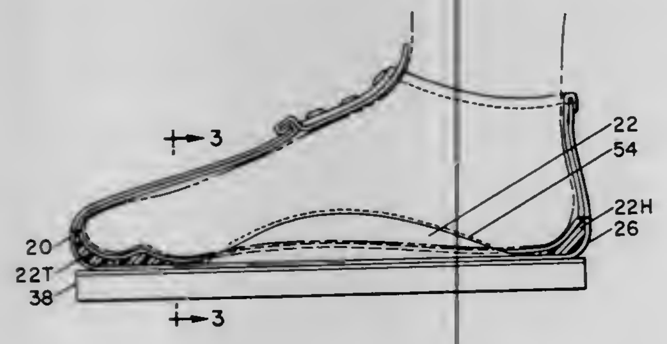
presenting the aural and visual programs slightly out of time sequence one to the other while still maintaining a line of visual material in coordination with the audio program so that the rate of both aural and visual presentation are constant one to the other.

3,968,577

METHOD AND CONSTRUCTION OF FOOTWEAR INCORPORATING A CUSTOMIZED, FORM FITTED CASTING UNIT

Lynn Wolstenholme Jackson, 911 30th St., Santa Cruz, Calif. 95062

Filed Nov. 18, 1974, Ser. No. 524,619
Int. Cl.^{2} A43B *13/38, 13/18, 3/12*
U.S. Cl. 36—43 **2 Claims**



1. An article of footwear having a customized, form-fitted, casting unit for engagement with and support of the undersurface of a person's foot, said casting unit comprising a layer of a formable material having an undersurface on the sole side of the footwear and having an upper surface custom shaped to the contour of the foot, said formable material having sufficient pliability, prior to any curing of the formable material, so as to be displaceable to the exact contour of the underside of the person's foot by the application of the person's weight alone to the top of the casting unit without the necessity of any additional forming means, said casting unit including container means enveloping the formable material for totally enclosing the casting unit to seal off the formable material from the rest of the footwear and for preventing contact of the formable material with the person's foot, said container means including an innersole between the formable material and the person's foot, means for incorporating the casting unit in the article of footwear as an integral part of the footwear, and wherein the formable material is a moldable material and includes a curing agent and the casting unit is cured in the shaped configuration to a permanent molded state, and including edge restraint means for causing the formable material to turn upward along the periphery of the foot to provide positive foot-to-ground response and to prevent rotation and slippage of the footwear from the foot and wherein said layer of the formable material has sufficient initial thickness prior to custom shaping, to provide, after custom shaping, both side-cupped retainment of the foot and also heel and toe containment while maintaining a ⅛ to ¼ inch minimum thickness of the formable material under the ball of the foot for the absorption of shock.

3,968,578

SKI BOAT WITH ADJUSTABLE RIGIDITY

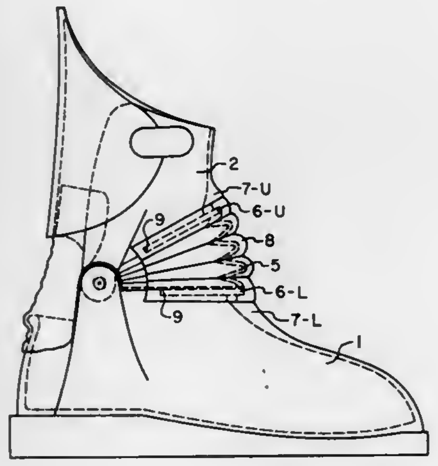
Richard K. Rathmell, 12 Pine Tree Road, Ramsey, N.J. 07446

Filed June 19, 1975, Ser. No. 588,203
Int. Cl.^{2} A43B *5/04*
U.S. Cl. 36—121 **6 Claims**

1. A ski boot which by itself is relatively flexible in a forward-backward direction, but can be stiffened conveniently by the addition of a removable interlocking stiffening member, wherein the boot has elements that include:

- a. a lower section that is relatively stiff and adapted to cover and hold the skier's foot within said section,
- b. an upper section that is relatively stiff and adapted to hold the skier's lower leg above the ankle within said section,
- c. hinges that connect the said upper section to the said lower section in a manner that allows the upper section to pivot in a forward-backward direction,
- d. a flexible section located in the space forward of the hinges and between the upper section and the lower section,

and the boot is uniquely characterized by means provided for a removable stiffening member to be interlocked over the said flexible section and to transmit either compressive or tensile forces from the upper section to the lower section when the upper section is strained in either a forward or backward direction, wherein the said means are shear-resistant projections that interlock into corresponding indentations, and the said projections may extend from the boot sections into the stiffening member or vise-versa from the stiffening member into the boot, and means are provided to hold the stiffening member in a functioning position when the skier prefers the boot to be relatively stiff, or to remove the stiffening member when a relatively flexible boot is preferred.

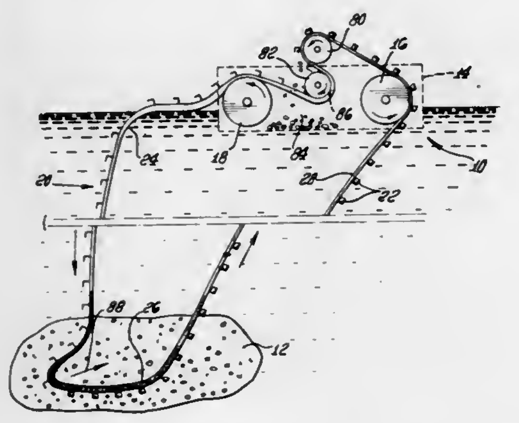


3,968,579

APPARATUS FOR SEDIMENT DREDGING AND OCEAN MINERAL GATHERING

André M. Rossfelder, 1805 Crespo Drive, La Jolla, Calif. 92037

Filed Feb. 24, 1975, Ser. No. 552,363
Int. Cl.^{2} E21C *3/00*
U.S. Cl. 37—69 **15 Claims**



1. An apparatus for gathering underwater mineral aggregates comprising:

- a. a supporting vessel having means for handling a loop element;
- b. a loop element movable between said vessel and an aggregate-gathering position for transporting said aggregates from the ocean floor to said vessel, said loop having an upper descending portion, a lower portion and an upper ascending portion wherein said upper descending portion is buoyant and said lower portion is weighted; and

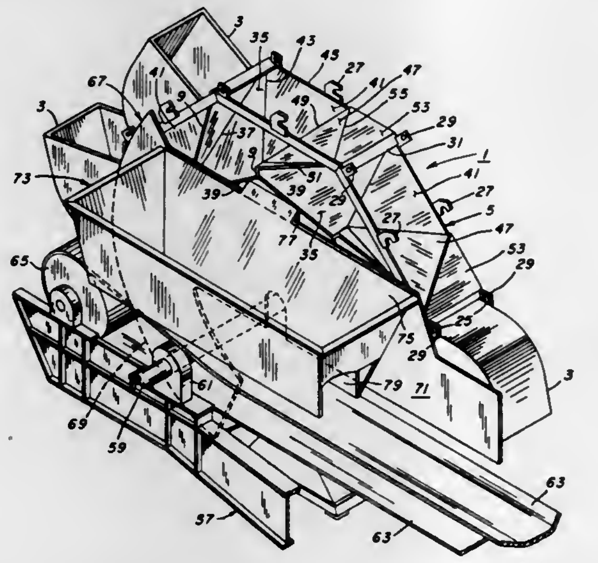
- c. means attached to said loop element for holding said aggregates during ascent from the ocean floor to said vessel.

3,968,580

BUCKET WHEEL ASSEMBLY

Raymond P. Lombardi, Pittsburgh; Thomas D. Wertz, Coraopolis, and Ira W. Lakin, Volant, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1975, Ser. No. 559,217
Int. Cl.^{2} E02F *3/24*
U.S. Cl. 37—189 **12 Claims**



1. A compartmented bucket wheel assembly comprising:

- a. a shell structure mounted for rotation about a substantially horizontal shaft and having two axially displaced lateral faces;
- b. a plurality of buckets angularly displaced about the periphery of the shell structure for scooping up material as the shell is rotated; and
- c. partitions within said shell structure disposed and arranged to define compartments for the buckets which are at least partially open toward the periphery of the shell to receive material from the buckets and which compartment extend diagonally inward and in the direction opposite the direction of shell rotation from the periphery of the shell to trail diagonally behind the buckets, said compartments being provided with deflecting surfaces which slope radially inward and angularly in the direction of shell rotation from one lateral face of the shell toward a discharge edge of extended length in the second lateral face of the shell.

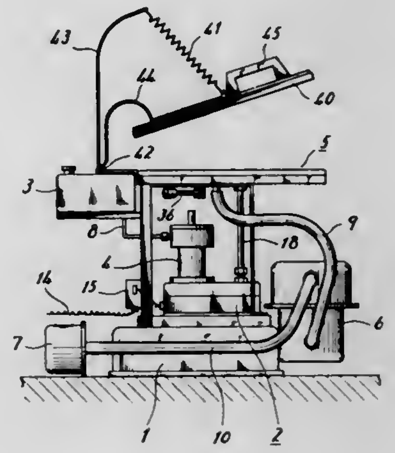
3,968,581

STEAM PRESSER

Fukuyuki Tsunoda, 644, Iizuka-Cho, Katsusika, Tokyo, Japan

Filed Aug. 4, 1975, Ser. No. 601,294
Claims priority, application Japan, Aug. 6, 1974, 49-90440
Int. Cl.^{2} D06F *71/34*
U.S. Cl. 38—15 **2 Claims**

1. A steam presser comprising, a steam-spouting press table composed of a mattress member including a steam chamber; a steam-generating chamber disposed under the steam-spouting press table, a base mounting said steam-generating chamber, said steam-generating chamber comprising a heat plate and a lid plate fitted over the heat plate to define a steam-generating space therebetween; compressive water-feed valve means mounted on said steam-generating chamber for feeding necessary amounts of water to the steam-generating chamber; a water tank situated at a higher position beside the compressive water-feed valve means and communicating with said compressive water-feed valve means; a water supply pipe providing communication between said water tank and said water-feed valve; suction means for waste steam disposed beside the steam-generating chamber and communicating with the bottom of said steam-spouting press table; a suction pipe providing communication between said suction means and said steam-spouting press table; a waste-steam tank disposed beside the base and connected to said suction means; and a discharge pipe for discharging the waste steam sucked by the suction means into said waste steam tank.

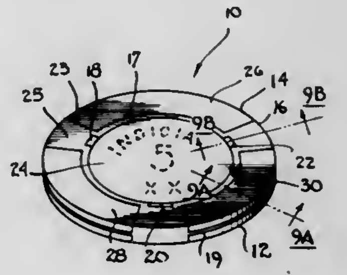


3,968,582

GAMING TOKEN AND PROCESS FOR FABRICATING SAME

Bernard B. Jones, 3672 S. Highland, Las Vegas, Nev. 89103

Filed Feb. 6, 1975, Ser. No. 547,560
Int. Cl.^{2} G09F *3/02*
U.S. Cl. 40—27.5 **15 Claims**



1. A gaming token comprising:

- a. first and second relatively flat annular rings, each having substantially parallel major surfaces and substantially concentric minor surfaces extending between said major surfaces;
- b. each of said rings having spaced apart offset surface regions facing like regions of an aligned ring to thereby define preconfigured volumeric indentations beneath the major surfaces of said rings;
- c. a molding compound formed within the confines of said indentations and contiguous with the major surfaces of said rings to thereby define a predetermined color pattern corresponding to a particular monetary denomination of the token; and
- d. metal coin means removably disposed within a central opening defined by said rings, whereby a common interface between the molding compound and the annular rings provides a highly sharp and durable surface pattern definition for said token.

3,968,583

NUMERIC DISPLAY FOR ARABIC SPEAKING PEOPLE

George A. Allam, 2734-A N. 50th St., Milwaukee, Wis. 53210

Filed Mar. 24, 1975, Ser. No. 561,368
Int. Cl.^{2} G09F *9/30*
U.S. Cl. 40—125 E **6 Claims**

1. A display device comprising a cluster of segments which segments may be utilized alone or in combination with others to graphically display numerals as written in the Arabic language, the segments being arranged as follows;

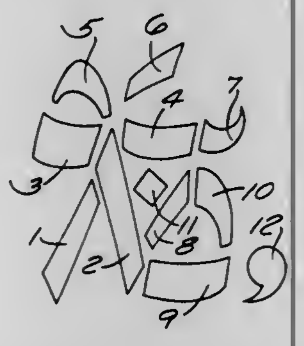
1st and 2nd rhomboidal segments arranged generally in the form of an inverted V with said 2nd segment being on the right of and longer than said 1st segment;

3rd and 4th generally rectangular segments disposed generally horizontally at the apex of said inverted V and, respectively, on the left and right of said apex;

a 5th segment generally in the form of a crescent originating at said apex and arcing upwardly and then downwardly above said 3rd segment;

a 6th segment generally rhomboidal in shape and originating generally at said apex and extending upwardly to the right of the apex;

a 7th segment generally in the form of a semi-crescent disposed generally horizontally with the flat end of the segment facing said 4th segment;



an 8th segment generally of rhomboidal shape disposed between the lower end of the 2nd segment and the right end of the 4th segment;

a 9th segment generally rectangular in shape disposed horizontally to the right of the lower end of said 2nd segment;

a 10th segment generally in the form of a semi-crescent positioned between the upper end of said 8th segment and the right end of said 9th segment with the pseudo centers of the 10th segment lying generally between the 8th, 9th, and 10th segments;

an 11th segment generally square in configuration;

whereby the Arabic numeric sequence is formed by use or display of the segments according to the following schedule:

Numeral	Segments Used
1	2
2	2 and 4
3	2, 4, 7
4	6, 4, 8, 9
5	8, 9, 10
6	2, 3
7	2, 8
8	1, 2
9	2, 3, 5
0	11

3,968,584
ILLUMINATED SIGN

Willard L. Kingston, 225 W. Forest St., Brigham City, Utah 84302

Filed July 18, 1974, Ser. No. 489,770

Int. Cl.² G09F *13/18*

U.S. Cl. 40—130 K **6 Claims**

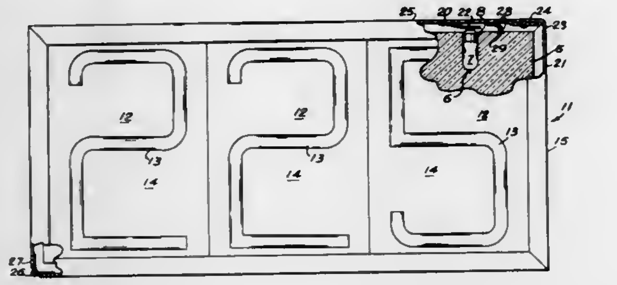
1. An illuminated sign comprising:

a transparent light-source plate having cavities in the edges thereof and having an opaque surface and a translucent surface, both surfaces being internally reflective;

a plurality of electric lamps, one seated for frictional retention in each of the cavities with its terminals extending outwardly:

at least one opaque plate fitted over the translucent surface of the light-source plate, each opaque plate having a character therein covered on at least one side with opaque material except for the character;

a frame surrounding the edges of the plates and comprising an externally insulated channel that confines the transparent and opaque plates between its flanges, and, further including electrically-conductive means fixed inside the channel that may contact lamp terminals, so that the



frame will function also as an electrical conductor thereto;

a second electrical conductor seated in a groove in the edge of the transparent plate and capable of contacting a terminal in each of the lamps; and

means for easy removal of the frame from the plates.

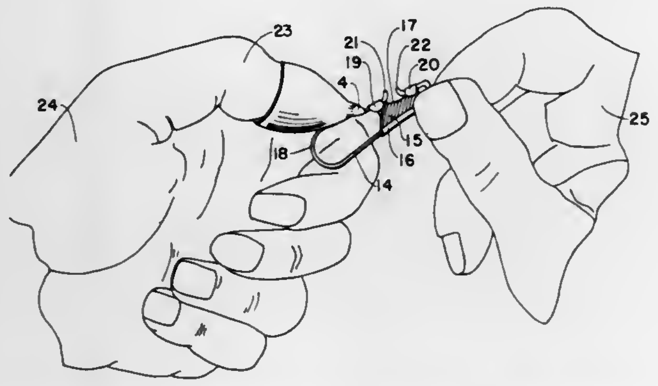
3,968,585
DEVICE FOR OPENING LEADER SNAPS

Jaromir B. Linha, Minot, N. Dak., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 12, 1975, Ser. No. 557,810

Int. Cl.² A01K *97/00*

U.S. Cl. 43—4 **3 Claims**



1. A device for opening leader snaps having a resilient wire element, said device comprising

a substantially thimble-like member worn on the thumb of a hand of a fisherman and having a wedge-like member approximating a fingernail extending therefrom, said wedge-like member having spaced notches formed therein and extending from the edge thereof, said notches being sized and shaped to receive and manipulate said resilient wire element.

3,968,586
METHOD FOR FINDING TEMPERATURE ENVIRONMENTS FOR FISH

Glen Peterson, Tulsa, Okla., assignor to Richard E. Fowlkes, Tulsa, Okla., a part interest

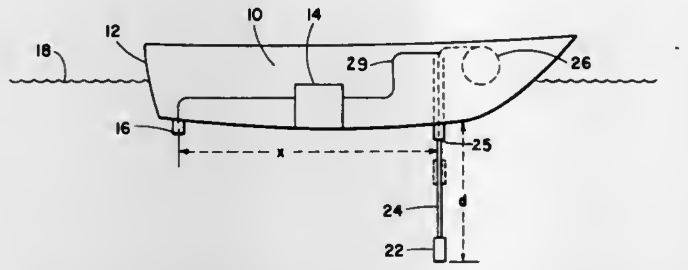
Division of Ser. No. 334,077, Feb. 20, 1973. This application Jan. 6, 1975, Ser. No. 538,714

Int. Cl.² A01K *73/02*

U.S. Cl. 43—4.5 **3 Claims**

1. A method for locating specific varieties of fish comprising the steps of making at least one pass over an area of water with a boat having thereon a pair of longitudinally spaced temperature measuring devices disposed in the water, taking differential temperature measurements immediately beneath the surface of the water during each such pass for determining a temperature variance of the water near the surface thereof as a projection of subsurface temperature variations, making at least one depth versus temperature measurement by lowering

one of said temperature measuring devices further beneath the surface of the water for determining the temperature variance of the water with respect to the depth of the water,



and comparing the temperature measurements with known fish environment reference data for locating likely positions for specific varieties of fish.

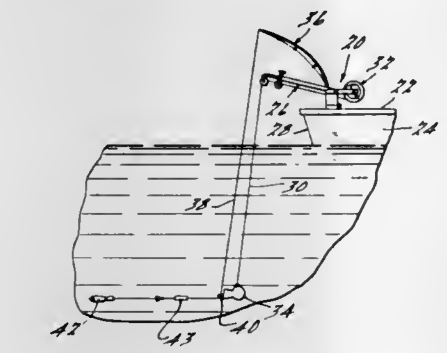
3,968,587
DOWNRIGGER

James Allen Kammeraad, Holland, Mich., assignor to DFK Inc., Holland, Mich.

Filed July 21, 1975, Ser. No. 597,412

Int. Cl.² A01K *89/00*

U.S. Cl. 43—27.4 **10 Claims**



1. A downrigger comprising, in combination, a base adapted to be secured to a watercraft, a base housing indexably mounted on said base, a boom pivotally mounted on said base housing, a cable reel secured to said base housing in alignment with said boom, means on said base housing for releasably securing a fishing rod thereto, means for releasably locking said base housing to said base in a selected indexed position, said boom including a plurality of sections disposed in telescoping extensible relationship, and means for locking said sections in a selected longitudinal position relative to each other.

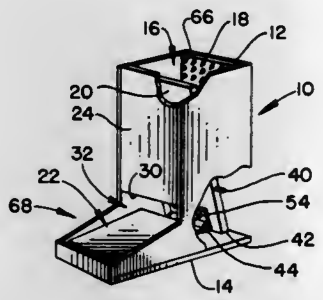
3,968,588
FISH CLAMPING APPARATUS

Roy L. Peterson, Sr., Rte. 1 Box 217, Wewahitchka, Fla. 32465

Filed July 29, 1975, Ser. No. 600,152

Int. Cl.² A01K *97/00*

U.S. Cl. 43—53.5 **9 Claims**



1. A clamping apparatus for grasping and holding a live, hooked fish between fixed and movable jaws comprising spaced walls defining an upwardly opening housing, a movable jaw member, a fixed jaw member, said fixed jaw member being formed on one of said walls; said movable jaw member having a medial and opposed distal portions, means by which said medial portion of said movable jaw member is pivotally secured to said housing;

means forming a jaw on one said distal portion of said movable jaw member;

a pedal including means by which it is movably affixed to said housing; said pedal having a movable free end portion; a toggle pivotally connected to said free end portion of said pedal and to the distal portion of said movable jaw member which is opposed to said jaw.

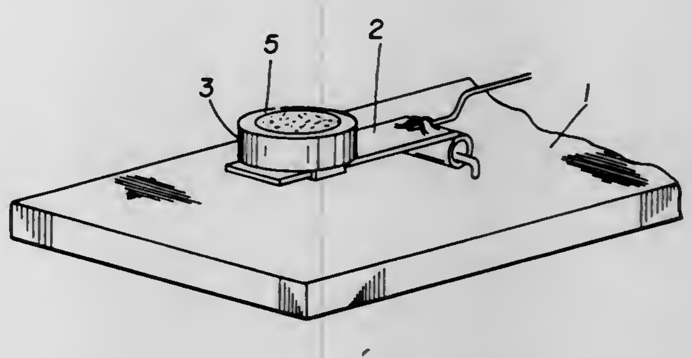
3,968,589
PRELOADED DISPOSABLE BUTTON BAIT DEVICE

Monte C. Basham, Apple Valley, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1975, Ser. No. 563,625

Int. Cl.² A01M *23/24*

U.S. Cl. 43—81 **2 Claims**



1. A preloaded disposable button bait device for a trap having a trigger device for springing the trap, said bait device comprising

an open substantially cylindrical container of bait having a substantially circular bottom and an open top, said container being preloaded with animal bait; and

a pair of arms affixed to and extending substantially parallel to the bottom of the container in diametrically opposed spaced relation therewith whereby the container is removably mounted on the trigger device of a trap and maintained thereon via said arms.

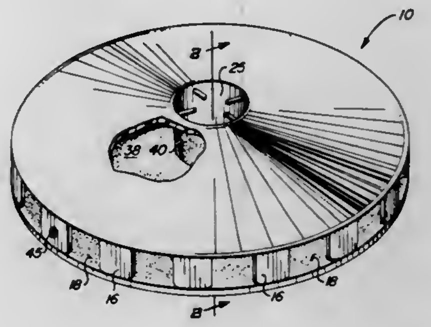
3,968,590
INSECT TRAP

Roger L. Kitterman, Tonopah, Ariz., assignor to Wilbur-Ellis Company, San Francisco, Calif.

Filed Apr. 7, 1975, Ser. No. 565,429

Int. Cl.² A01M *1/14*

U.S. Cl. 43—114 **5 Claims**



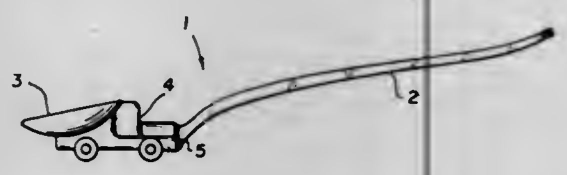
1. A trap for control and monitoring of the insect population; said trap comprising:

a. a detachable insect trap panel coated with a trap substance;

b. a substantially impervious cover; and
c. mounting means associated with said cover adapted to releasably engage said panel in a position spaced apart and subjacent said cover.

3,968,591
COMBINED SPOON AND TOY

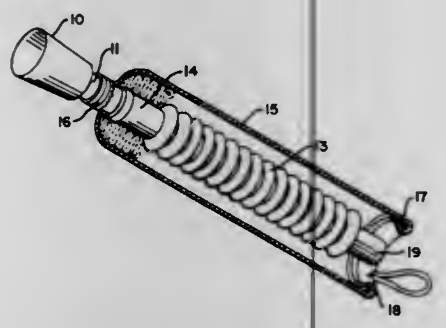
Karl Henry Pearson, Jr., R.D. No. 1, Prosperity, Pa. 15329
Filed Dec. 6, 1971, Ser. No. 205,218
Int. Cl.^{2} A63H *33/00*
U.S. Cl. 46—1 R **1 Claim**



1. A combined spoon and toy for feeding an infant or small child, comprising a ladle like portion integrally secured to and extending forwardly in front of a portion simulating a truck, and a handle portion having one end integrally attached to the rear end of said truck and extending longitudinally rearwardly thereof, whereby as the handle portion is grasped so as to push and slide the truck portion on a table surface, it will provide attraction to the infant or small child by simulating a motor-driven cargo for feeding.

3,968,592
GAME CALLER HAVING DIAPHRAGM MEANS, MEGAPHONE AND BELLOWS

Frank R. Piper, Delmont, Pa., assignor to Penn's Woods Products, Inc., Delmont, Pa.
Filed Aug. 23, 1974, Ser. No. 499,838
Int. Cl.^{2} G10K *9/02, 9/18*
U.S. Cl. 46—178 **7 Claims**



1. A game calling device to simulate the sounds made by wild game, said device comprising:

a first housing having a flange at one end thereof,

a truncated conical megaphone housing secured at the end thereof having the smallest diameter to the other end of said first housing with the interiors of said housings in communication,

a support plate having an opening therethrough,

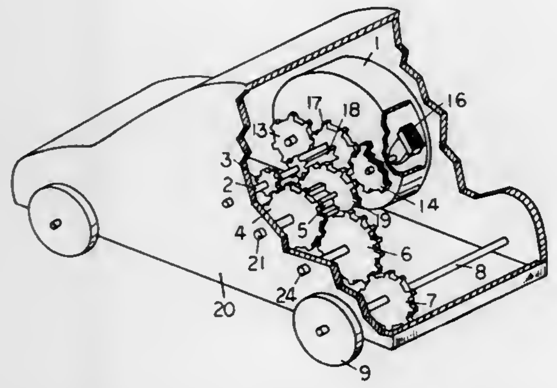
diaphragm means for producing vibrations in the column of air which lies within said first housing, said diaphragm means being carried by said support plate in an overlying relation with said opening, an edge of said diaphragm means forming a narrow slot with an edge in the opening,

an end cap including a rim with means projecting from the periphery thereof for releasably engaging the flange at one end of said first housing, said end cap receiving and holding said diaphragm means on the flanged end of said first housing, and

an elongated flexible and resilient bellows having a wall at one end thereof with an exhaust opening therein adapted to be closed by elastic deformation for producing bursts of air, said bellows being secured at its other end in open communication with said first housing for the passage of the bursts of air into said first housing to vibrate said diaphragm means.

3,968,593
VARIABLE-INERTIA FLYWHEEL

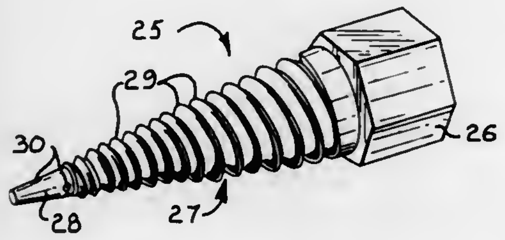
Shi-Tron Lin, 54, Yen-Ping N. Rd., Sec. 2, Taipei, Taiwan, China
Filed Aug. 22, 1974, Ser. No. 499,628
Int. Cl.^{2} A63H *29/20*
U.S. Cl. 46—209 **9 Claims**



1. A vehicle comprising a vehicle body including at least one ground engaging wheel rotatably connected to said vehicle body, a main shaft mounted for rotation within said vehicle body, a flywheel rigidly connected to said main shaft, said flywheel including weight means capable of being shifted radially with respect to said main shaft, drive train means between said at least one ground engaging wheel and said main shaft for transmitting inertia to said flywheel in response to the rotative motion of the said at least one ground engaging wheel and means for shifting said weight means radially with respect to said main shaft to cause a variable inertia response in said vehicle through the interaction of said weight means and said flywheel.

3,968,594
METHOD AND APPARATUS FOR THE CHEMICAL TREATMENT OF TREES

George S. Kawakami, 810 1/2 E. 31st St., Kansas City, Mo. 64109
Continuation of Ser. No. 461,012, Aug. 15, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,476
Int. Cl.^{2} A01G *29/00*
U.S. Cl. 47—57.5 **1 Claim**



1. A self-tapping applicator nozzle for treating trees comprising:

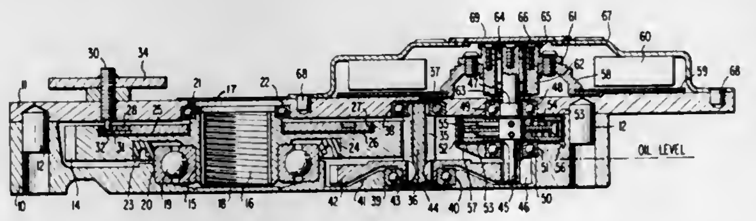
a socket having an inlet orifice defined therein, a substantially straight shank portion extending from said socket in a tapered manner and having an interior passageway extending longitudinally therein, said interior passageway communicating with said socket inlet orifice, said shank portion having external threads winding continuously thereon throughout the entire length of said shank portion and arranged to permit the threadable advancement of said shank portion into a tree, said shank portion being exteriorly imperforate the entire length thereof;

a non-threaded tip connected to the end of said shank portion remote from said socket, said interior passageway terminating within said tip; and

a plurality of output orifices extending transversely in said tip from said interior passageway to the exterior of said tip, all of said orifices being located in said tip and beyond the threads of said shank portion.

3,968,595
OPERATING AND SPEED CONTROL MECHANISM FOR REVOLVING DOORS

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.
Filed Nov. 13, 1974, Ser. No. 523,415
Int. Cl.^{2} E05D *15/02*
U.S. Cl. 49—43 **14 Claims**

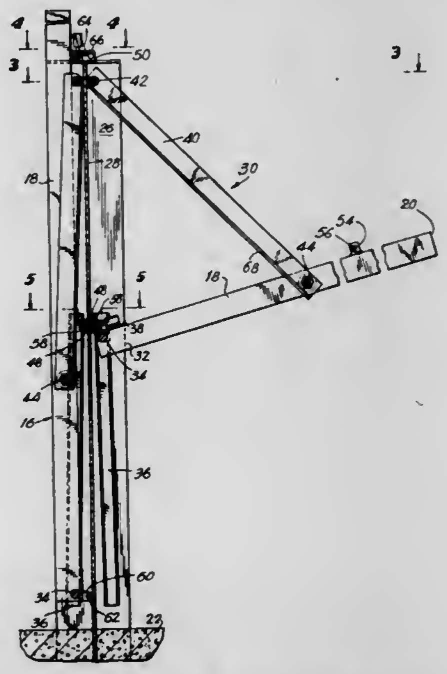


1. A low profile operating mechanism for revolving doors comprising a shallow top opening mechanism housing and a cover plate for said housing attached to the top thereof and spanning and covering the open top of the housing, a main revolving door drive gear and gear support bearing means within the housing and beneath the cover plate, an intermediate pinion within the housing in mesh with said main gear and having a top support bearing in said cover plate, an umbrella-like Evoloid gear within the housing beneath the main gear and being fixed to the intermediate pinion near the bottom of the housing and having a hub, a lower support bearing in the bottom of the housing receiving and supporting the Evoloid gear hub and also supporting the intermediate pinion which is affixed to the Evoloid gear, a high speed pinion within the housing in mesh with the Evoloid gear, a shaft carrying the high speed pinion and extending thereabove, an upper support bearing for the high speed pinion shaft on said cover plate, a lower bearing for the pinion shaft within said housing above the Evoloid gear, whereby the high speed pinion is cantilevered below said lower bearing for the high speed pinion shaft, and a centrifugal friction brake assembly secured to the high speed pinion shaft and turning therewith relative to the stationary brake drum within the tip portion of the housing and being formed integral therewith and integral with a seat for said lower high speed pinion shaft.

3,968,596
VEHICLE BARRIERS

Alex Danin, 1080 Mamaroneck Ave., White Plains, N.Y. 10605
Filed Sept. 19, 1974, Ser. No. 507,348
Int. Cl.^{2} E01F *13/00*
U.S. Cl. 49—49 **11 Claims**

1. In a system for at least temporarily preventing the travel of at least one vehicle along at least one path, upright support means situated beside said path, an elongated barrier arm having a blocking position projecting laterally from said upright support means across said path for preventing a vehicle from traveling past said barrier arm along said path when said barrier arm is in said blocking position thereof, and connecting means connecting said barrier arm to said upright support means for swinging movement with respect thereto about a substantially horizontal axis between said blocking position extending across said path and a non-blocking position where said barrier arm extends substantially vertically along said upright support means to be situated with the latter beside said path to permit a vehicle to travel therealong, said connecting means connecting said arm to said support means for swinging movement in an upward direction from said blocking to said non-blocking position and in a downward direction from said non-blocking to said blocking position, and said axis around which said arm swings being situated at the region of a lower end of said arm when the latter is in said non-blocking position thereof, said connecting means having a portion pivotally connected with said arm between opposed ends thereof for turnably supporting said arm between said opposed ends for swinging movement not only with respect to said substantially horizontal axis but also with respect to said portion of said connecting means, whereby one part of said arm on one side of said portion of said connecting means serves at least partially to counterbalance another part of said arm on the other side of said portion of said connecting means, a pair of said barrier arms being connected by a pair of said connecting means to a common upright support means for swinging movement with respect thereto about a pair of said substantially horizontal axes between a pair of blocking positions where said arms respectively project laterally in opposite directions from said common upright support means across a pair of paths which are situated beside each other with said upright support means located therebetween, and said arms when in their non-blocking positions extending substantially vertically and located closely adjacent to each other while extending along said upright support means, said paths respectively leading to a pair of parking spaces which are situated beside each other and access to which is prevented by said arms when the latter are in their blocking positions, the system including a row of said parking spaces separated from each other by boundary lines and said upright support means with said pair of barrier arms connected thereto by said pair of connecting means being situated only at every other boundary line while the remaining boundary lines are completely free and unobstructed, said barrier arms being sufficiently long to extend when in their blocking positions between a pair of successive upright support means through distances sufficiently great to separate the free ends of a pair of barrier arms which extend toward each other from a pair of successive upright support means by a distance which is too small to permit a vehicle to pass through the space between said free ends.

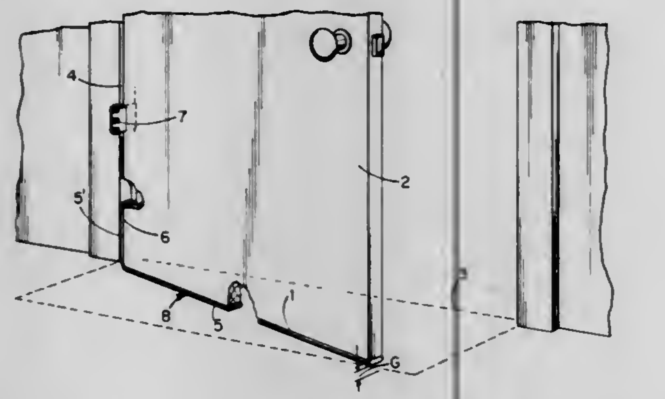


3,968,597
CLOSURE SEAL AND METHOD

Parker W. Hirtle, Lexington, Mass., assignor to Bolt Beranek and Newman, Inc., Cambridge, Mass.
Filed Jan. 13, 1972, Ser. No. 217,534
Int. Cl.^{2} E06B *7/16*
U.S. Cl. 49—477 **2 Claims**

1. Apparatus for acoustically sealing an edge such as the bottom edge of a closure such as a door that is mounted along

a different edge thereof within a corresponding frame, with a greater gap between the bottom edge and the adjacent bottom of the frame than that between the mounting edge and its adjacent frame edge, the apparatus having, in combination a single-piece airtight L-shaped resilient tubular member of substantially uniform long-oval cross-section throughout its length mounted with its horizontal leg extending externally along the door bottom edge and its vertical leg extending externally along at least the adjacent region of the said mounting edge, the member being oriented so that the smaller cross-dimension of each leg is perpendicular to the associated edge,



the tubular member horizontal leg having its normal smaller cross-dimension less than said greater gap and the vertical leg having its normal smaller cross-dimension sufficient to enable compression of the same against the said frame edge during closing of the door while the horizontal leg remains free of the said bottom of the frame, the relative length dimensions of the legs being adjusted such that the vertical leg contains sufficient air that, upon the said compression of the same, the horizontal leg may become pumped up into an expansion sufficient to seal the gap between it and the said bottom of the frame at total closing of the door.

3,968,598

WORKPIECE LAPPING DEVICE

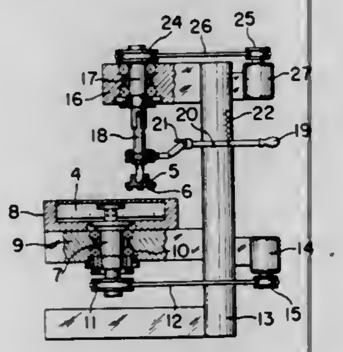
Haruo Ogawa, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of Japan

Continuation of Ser. No. 324,781, Jan. 18, 1974, abandoned. This application Sept. 30, 1974, Ser. No. 510,781

Claims priority, application Japan, Jan. 20, 1972, 47-7771

Int. Cl.^{2} B24B *7/04, 7/16*

U.S. Cl. 51—55 **5 Claims**



1. A grain processing machine comprising supporting means for supporting work to be processed, a first rotation driving motor including a rotating shaft for rotating said supporting means in one direction, a rotating member for grain processing disposed opposite to said work to be processed, a rotating shaft for said rotating member, the rotating shaft of said rotating member being offset from the rotating shaft of said supporting means, a second driving motor for rotating said rotating member in the same direction as said supporting means in a way in which a path that an arbitrary point on said work makes on said rotating member is helical and the difference in the number of rotations between said rotating member and said work to be processed is not more than 30% but more than 0%, and means for shifting said rotating shaft of said rotating member,

the rotating shaft of said first rotation driving motor being provided at a fixed position and the rotating shaft of said rotating member for grain processing being pivotable in an arcuate manner,

said rotating member for grain processing being secured at one end of a table journaled to a shaft and the other end of said table being eccentrically driven by a rotating means.

3,968,599

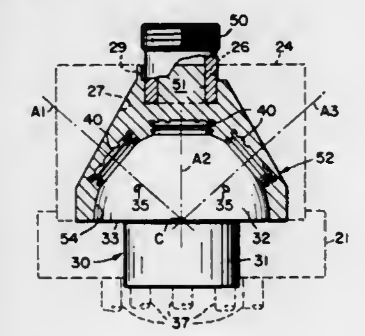
LENS BLOCKING TOOLS

Charles L. Gill, Dresden, N.Y., assignor to Harris, Beach & Wilcox and Angelo Pelino, part interest to each

Division of Ser. No. 311,399, Dec. 1, 1972, Pat. No. 3,866,660. This application Sept. 17, 1974, Ser. No. 506,868

Int. Cl.^{2} B24B *41/06*

U.S. Cl. 51—216 LP **7 Claims**



1. A tool for accurately holding a plurality of lens blanks for simultaneous generation thereof on a surfacing machine or the like, comprising

a molded body having on one end a segmental spherical surface,

a plurality of spaced inserts substantially completely embedded at their inner ends in said body so that only the outer ends of the inserts extend to the exterior of said body and register with said spherical surface, each of said inserts having in its outer end a circular recess opening on said spherical surface with the axis of the recess extending through the center of curvature of said surface, and with said recess in each insert being disposed to have a lens blank adhered therein for a surfacing operation, and

a shank projecting from the opposite end of said body coaxially of said surface for mounting the tool in a lens surfac ing machine,

said body of the tool being molded from a material having a melting point lower than the material from which said inserts are made, whereby after use the body of the tool may be melted and the inserts may be recovered and saved for future use.

3,968,600

ADJUSTABLE MANHOLE COVER SUPPORT STRUCTURE

Harold M. Bowman, Bay Village, Ohio, assignor to National Utility Products Company, Cleveland, Ohio

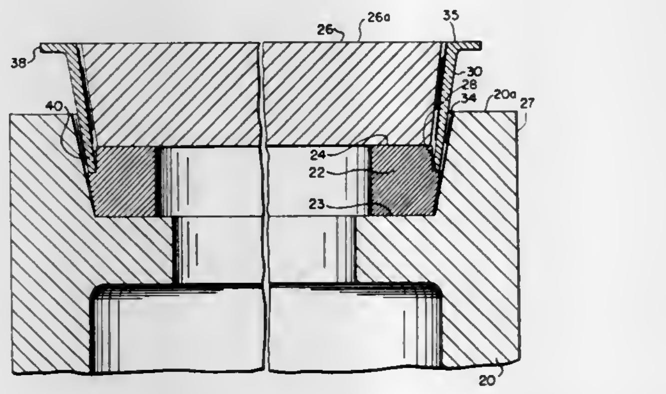
Continuation of Ser. No. 286,115, Sept. 5, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,817

Int. Cl.^{2} E02D *29/14*

U.S. Cl. 52—19 **8 Claims**

1. A manhole cover support structure to vertically adjust and support a manhole cover in a manhole frame, wherein the manhole frame is supported in a manhole housing and has an upwardly facing shoulder circumscribed by an upwardly projecting collar-like portion defining the manhole opening, a manhole cover normally engaged with and supported on said shoulder, with said cover substantially completely filling said opening, except for predetermined generally unobstructed lateral clearance between said cover and the confronting

interior surface of said collar-like portion, a cover adjusting insert resting on said shoulder and having an upper cover supporting surface on which said cover rests in adjusted, elevated position relative to the shoulder of said frame, the outer peripheral edge of said cover spaced laterally from said interior surface of said collar-like portion in said adjusted, elevated position of said cover, and a separate relatively thin lateral support ring resting on said cover support insert and disposed in the last mentioned lateral space between said interior surface of said collar-like portion and said outer edge of said cover, to restrain against lateral movement relative to the frame, the full weight of said cover being supported directly by said cover adjusting insert in said adjusted elevated position of said cover, and wherein said interior surface of said collar-like portion of said frame slopes downwardly and inwardly terminating at its lower edge at the outer periphery of said shoulder, said collar-like portion having a substantially horizontal top surface, said adjusting insert having an outer side surface which tapers inwardly in a downward direction and which last mentioned side surface is disposed in confronting generally closely spaced relation to said interior surface, and said support ring including a defining wall structure which on its outer side surface is tapered inwardly in a downward direction and generally complementary to the taper on said outer side surface of said adjusting insert, said support ring having an inner downwardly and inwardly sloped defining side surface, and said cover comprising an outer defining side surface which is sloped generally complementary to said sloped inner defining side surface of said support ring, said cover and ring confronting side surfaces being disposed in generally laterally spaced relation to one another, and with the top surfaces of said cover and said support ring being disposed at substantially the same elevation and with said top surface of said support ring being disposed in elevated condition relative to said top surface of said collar-like portion.



3,968,601

HANDHOLE TO RECEIVE AND LOCATE CONNECTIONS OF UNDERGROUND SECONDARY ELECTRICAL POWER CABLE TERMINATIONS

Clayton S. Brown, 8021 Juanita Drive, Kirkland, Wash. 98003, and Joseph Jacobs, 18221-3rd Place, SW., Seattle, Wash. 98166

Continuation of Ser. No. 373,015, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 116,346, Feb. 18, 1971, abandoned. This application Dec. 19, 1974, Ser. No. 534,473

Int. Cl.^{2} E02D *29/10*

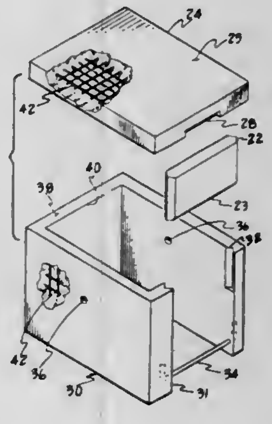
U.S. Cl. 52—21 **6 Claims**

1. Secondary handhole means, adapted to be installed in the ground with its top adjacent ground level, for receiving terminal portions of underground secondary wiring cables and their connectors, comprising:

a. a one-piece integral unitary upstanding substantially surrounding body structure comprising vertical wall means for defining said structure;

b. means defining a completely open horizontal top entry on said body structure and a single complementary vertical entry through said vertical wall means, joining said horizontal top entry, for forming a complete lay in lift out underground secondary cable entry, receiving the terminal portions of underground secondary wiring cables and their connectors which may come in at different elevations and all from the same general direction whereby such cables and connectors may be easily lifted by their ends from said secondary handhole means to a convenient standup working height for alterations, additions or repairs, and readily lowered and replaced in said secondary handhole means after such alterations, additions or repairs;

c. means defining a completely transverse horizontal clear lower entry at the bottom of said body structure joining said vertical entry, for receiving underground secondary cables which may come into said secondary handhole means from therebeneath, said lower entry, vertical entry and top entry forming an open slot completely vertically through said secondary handhole means whereby such underground secondary cables which may come into said secondary handhole means from therebeneath may be easily lifted by their ends from said secondary handhole means to a convenient standup working height for alterations, additions or repairs, and readily lowered and replaced in said secondary handhole means after such alterations, additions or repairs;



d. opposed lower portions of said vertical wall means further comprising means defining a plurality of pairs of opposed hole means therein and a removable, relocatable, reinforcing member selectively insertable into a complementary pair of said hole means whereby said reinforcing member is selectively optionally relocatable further from said vertical entry to clear and support entering cable terminations at varying angles of entry from respective underground depths;

e. A removable gate placed substantially across a top portion of said vertical entry, the top of the gate being located flush against such horizontal top entry, the bottom of the gate being located well above the plane of said lower entry, said gate thus providing a strong structural cross member for said body structure and a clear opening therebeneath for underground secondary cables positioned therethrough; and

f. a removable cover placed over said body structure, completely covering said horizontal top entry.

3,968,602

PROTECTIVE WORKMAN AND EQUIPMENT COVERS

Frank L. Mitchell, 4929 S. Troost, Tulsa, Okla. 74105

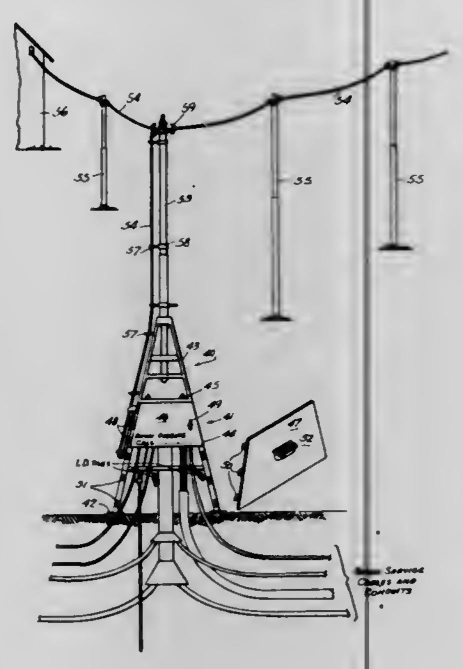
Filed Jan. 24, 1975, Ser. No. 543,874

Int. Cl.^{2} E04H *12/00;* **E04C** *3/30*

U.S. Cl. 52—40 **5 Claims**

1. Equipment and personnel protection means comprising a tower, said tower being placed near the emerging position of underground buried cables and conduits, ground contacting feet for supporting the tower, a lower completely enclosed, bottom half of the tower with side panels and a horizontal top

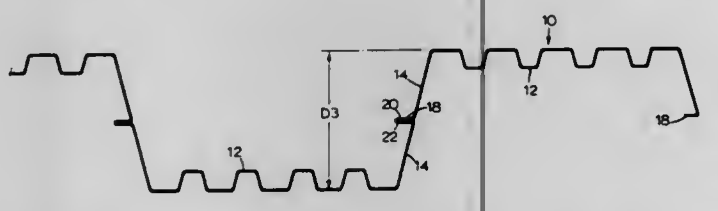
panel midway up the tower sealed to the side panels, an open work upper half of the tower connected to the lower section,



and cable supporting means mounted on the upper half of the tower.

3,968,603
PANEL FOR PREFABRICATED METAL BUILDINGS

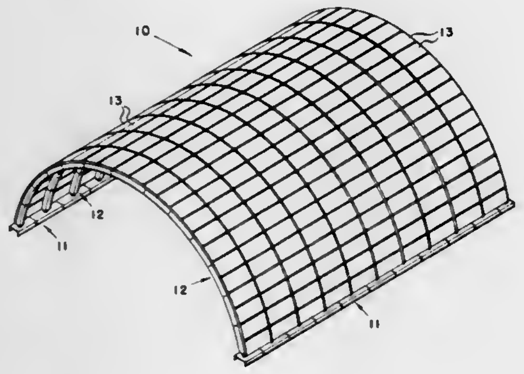
Karol J. Merson, 1307 Crossfield Bend, Mississagua, Canada
Filed Mar. 25, 1974, Ser. No. 454,149
Claims priority, application Canada, May 15, 1973, 171581
Int. Cl.² E04B ***1/32;*** **E04C** ***2/32***
U.S. Cl. 52—86 **3 Claims**



1. In a prefabricated sheet metal building, a composite wall panel comprising:
  multiple first and second complementary sheet metal members alternately interconnected in series, each member being longitudinally elongated and longitudinally curved to conform with a common arc of curvature of the wall panel;
  said first sheet metal members each having a base wall curving with said common arc but located radially inside the arc and having longitudinal reinforcing ribs comprising radially extending corrugations, and each first member having a pair of opposed side walls forming with said base wall a U-shaped cross-sectional configuration, said side walls projecting radially outwardly beyond said corrugations and terminating in longitudinal locking flanges respectively located along said common arc;
  said second sheet metal members each having a base wall curving with said common arc but located radially outside the arc and having longitudinal reinforcing ribs comprising radially extending corrugations, and each second member having a pair of opposed side walls forming with said base wall a U-shaped cross-sectional configuration, said side walls projecting radially inwardly beyond said corrugations and terminating in longitudinal locking flanges respectively located along said common arc; and
  the side walls of the first and second sheet metal members meeting with their respective locking flanges interconnected at said common arc and with their side walls aligned so that they occupy a common plane extending from the locking flanges to the respective base walls of the members, the locking flanges of said members including flange portions following the curvature of said common arc and disposed substantially at right angles to said common plane so that when the members are interconnected the flange portions will unite in radially abutting mutual relationship.

3,968,604
ERECTABLE SHELTER STRUCTURE AND METHOD OF ERECTION

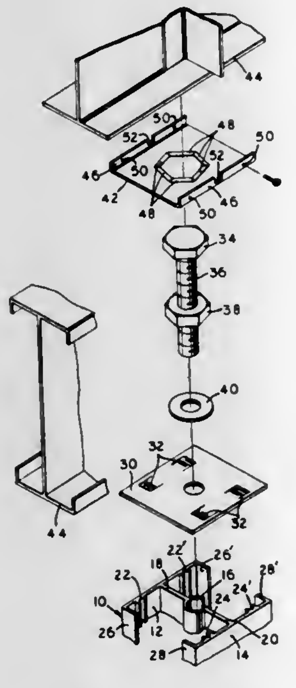
James F. Hills, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Aug. 2, 1974, Ser. No. 494,350
Int. Cl.² E04B ***1/35;*** **E04G** ***21/00***
U.S. Cl. 52—86 **28 Claims**



1. A shelter or building assembly that may be both erected and disassembled for relocation and erection elsewhere with all assembly, erection and disassembly accomplished without elevation of any personnel from the base level of a location site comprising in combination:
  a pair of elongated base rail means located longitudinally coextensive and equidistant laterally spaced from each other at the location site;
  a plurality of arch beam means each having a linear distance between the ends thereof substantially equal to the lateral spacing between the pair of base rail means;
  connection means consisting of first members mounted and spaced along said base rail means and second members on the ends of said arch beam means, said first and second members adapted for pivotal connection together by a pin means on axes substantially perpendicular to the longitudinal elongation of said base rail means and substantially parallel to the planes defined by said arch beam means whereby the ends of said arch beam means may be connected to said base rail means while an arch beam means is substantially parallel to the location site surface before pivotal raising of the arch beam means to an erected position;
  each pair of adjacent arch beam means when located in their erected positions forming an arch frame between the pair of base rail means, and
  a plurality of individual panel means each adapted to slidably and retainably engage each of a pair of adjacent arch beam means and to sealingly engage with adjacent panel means in the same arch frame, the plurality of panel means when installed in each said arch frame constituting inclement weather-sealed arch frame shelter covers and the only means for retaining said arch beam means pivotally connected to said base rail means in their upright erected positions.

3,968,605
ADJUSTABLE COLUMN FOR BUILDINGS

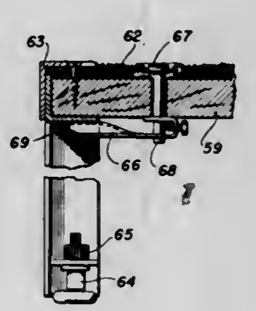
Richard A. Lovgren, Allison Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Dec. 27, 1974, Ser. No. 536,876
Int. Cl.² E02D ***35/00***
U.S. Cl. 52—126 **4 Claims**



1. An adjustable load-bearing column assembly for supporting beams and the like comprising
  an elongated generally H-shaped metal column having a pair of spaced parallel side wall segments integrally joined together over the full length thereof by a transverse web compositely constituted of an intermediate generally C-shaped tubular core and a pair of web segments extending therefrom and joined to the midpoint of said side wall segments,
  a bearing plate adapted to be secured to overlying abutting relationship with the upper end of said column, said plate having a generally circular opening concentric with and overlying the centrally disposed C-shaped tubular core of said column,
  a bolt member having a threaded shaft with a selectively contoured head at one end thereof and a nut member in rotatable threaded engagement therewith, the undersurface of said nut being disposed in supportive facing relation with the upper surface of said bearing plate and with the portion of said threaded shaft of said bolt disposed beneath said nut extending through the aperture in said bearing plate and into said C-shaped tubular core of said column,
  a bracket member disposable in abutting embracive engagement with the undersurface of a beam to be supported having a complementally shaped opening therein sized to non-rotatably receive and contain said head of said bolt to prevent the bolt from being rotatably displaced when said nut is turned to effect vertical displacement thereof.

3,968,606
PORTABLE ROSTRUM

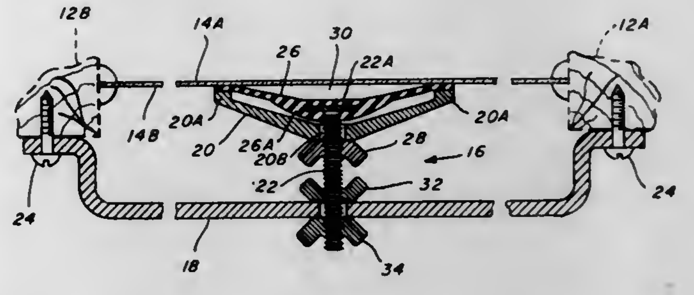
Odie D. Facemire, Clark Road, Shirley, Mass. 01464
Continuation of Ser. No. 311,629, Dec. 4, 1972, abandoned, which is a division of Ser. No. 141,942, May 10, 1971, abandoned, which is a continuation of Ser. No. 39,647, May 22, 1970, abandoned, which is a division of Ser. No. 849,561, July 23, 1969, Pat. No. 3,531,898, which is a continuation of Ser. No. 640,590, May 23, 1967, abandoned. This application Aug. 30, 1974, Ser. No. 501,996
Int. Cl.² E04H ***3/10***
U.S. Cl. 52—127 **3 Claims**



1. A portable rostrum, comprising
  a. a unit adapted to be connected to similar units, the unit consisting of a rectangular main frame from each corner of which extends a short leg, the frame being formed of angle iron with an upwardly-extending flange extending around its periphery to form a recess, and an inwardly- and horizontally-extending flange defining an opening,
  b. a continuous rigid rectangular floor removably carried in the recess and covering the opening, the floor having its upper surface covered with a rug material,
  c. a fastening means extending downwardly from the floor and movable from a first position in which the floor is removable from the frame to a second position in which the fastening means engages the underside of the frame and locks the floor in the frame against removal,
  d. a controller positioned at the upper surface of the floor and adapted to effect the movement of the fastening means when the controller is rotated, and
  e. a clamp adapted to hold the unit in contact with the similar units.

3,968,607
APPARATUS FOR REDUCING WINDOW BREAKAGE BY WIND PRESSURE

Robert J. Baran, 1021 Harrington, College Station, Tex. 77840
Filed Jan. 21, 1975, Ser. No. 542,769
Int. Cl.² E04H ***14/00;*** **E06B** ***5/12***
U.S. Cl. 52—173 R **1 Claim**



1. Apparatus for use on a window pane having a frame with opposite sides, the apparatus being used for increasing the positive and negative failure pressure of the window pane when subjected to wind forces, comprising:
  a rigid bracket having means at each end for affixing to a window frame and positionable to extend from one side to the opposite side of the window frame, the bracket being spaced from the window pane and generally paral-

lel to it and having an opening therein intermediate the ends;

a rigid pressure plate body having a forward side and a rearward side, the forward side having an integral peripheral forward extending lip portion, the body having a central opening therethrough, the lip portion providing a flat forward planar contacting surface;

a diaphragm of thin flat resilient impervious material of shape and dimension at least equal said pressure plate body peripheral lip portion contacting surface, the diaphragm being positioned between said pressure plate body peripheral lip portion planar conducting surface and the window pane;

a bolt received in said pressure plate body opening, the bolt having an inner end and an outer end, the inner end of the bolt being secured to the central portion of said diaphragm and the outer end being received in said opening in said bracket;

a nut threaded onto said bolt engaging said rearward side of said pressure plate whereby said diaphragm may be applied against a window pane by engagement with said pressure plate circumferential lip portion and said diaphragm central portion partially withdrawn by said bolt to thereby create a vacuum to secure said diaphragm and said pressure plate to the window pane; and

nuts received on said bolt to either side of said bracket, the force exerted by said body peripheral lip portion through said diaphragm serving to resist positive wind pressure on the window pane and the vacuum force applied by said diaphragm serving to resist negative wind pressure on the window pane.

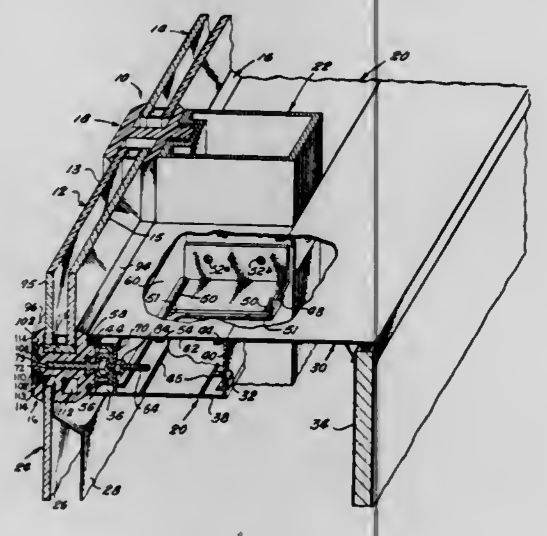
3,968,608
CURTAIN WALL PANEL SUPPORT

Billy J. Swango, 4141 N. St. Augustine, Dallas, Tex. 75227

Filed Aug. 12, 1974, Ser. No. 496,646

Int. Cl.² E04B *1/66;* **E06B** *3/62*

U.S. Cl. 52—235 **5 Claims**



1. Apparatus to secure a curtain wall to a structural frame including: a horizontal mullion, said horizontal mullion having a channel formed therein; upper and lower shoulders formed horizontally along opposite sides of said channel; an elongated gasket support bar; a support tenon extending longitudinally of said support bar; anchor lugs extending longitudinally of the tenon on opposite sides thereof; an elongated resilient gasket, said gasket having a groove formed longitudinally in the inner face of said gasket of such shape and dimension as to receive said tenon and anchor lugs, said tenon and anchor lugs being disposed in and extending longitudinally of said groove, said anchor lugs being positioned adjacent said upper and lower shoulders, said gasket having upper and lower panel-receiving slots formed along opposite faces thereon, the upper slot being positioned above said tenon such that the tenon supports a panel disposed in the slot above the gasket, said gasket having abutment faces formed longitudinally of the gasket extending outwardly of the inner face of the gasket; and means to draw said support bar and abutment surfaces into said channel between said upper and lower shoulders to restrain said gasket about said tenon and anchor lugs and secure said support bar and gasket to said horizontal mullion.

3,968,609
ASSEMBLY FOR FORMING A STRUCTURE HAVING GENERALLY CURVED SURFACES

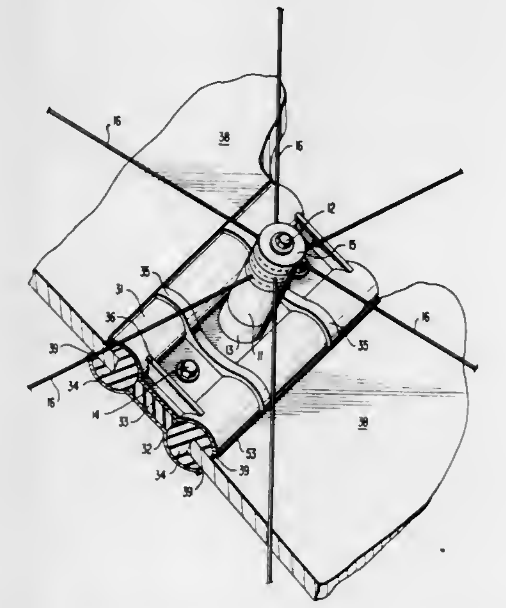
Ernst Deutsch, and Bernhard Reifenscheid, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Filed Apr. 1, 1974, Ser. No. 457,214

Claims priority, application Germany, Mar. 31, 1973, 2316175

Int. Cl.² E04B *7/14*

U.S. Cl. 52—245 **17 Claims**



1. Assembly for sheathing a network thereby forming a structure having generally curved surfaces comprising:

a. a connector panel or strip adapted to be joined to the network via a firm or elastic intermediate element, said connector panel or strip comprising at least two associated clamping plates and a filling panel therebetween to regulate the distance between the individual clamping plates or strips, said connector panel or strip holding two bearing profile members of a weather-resistant and aging-resistant vulcanized elastomer, and

b. a covering panel attached to at least one of the bearing profile members held by the connector panel or strip, said covering panel being shaped to fit said network.

3,968,610
FACING STRUCTURES FOR BUILDING

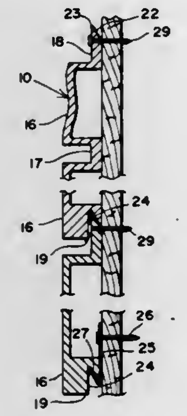
Robert S. Medow, 16000 Kelmarnock Drive, Miami Lakes, Fla. 33014

Filed Dec. 9, 1974, Ser. No. 530,827

Int. Cl.² E04D *3/361*

U.S. Cl. 52—314 **1 Claim**

1. A facing panel structure for walls of a building comprising a plurality of sheets of substantially rectangular material whose outer surface is contoured for simulating at least one of various construction facing materials, positioned thereon in spaced relation with each other and with mortar line portions simulated between said construction material, each of said sheets having flange portions extending along its edge portions, said flange portions of a top edge portion and one side edge portion of each of said sheets of material having an inclined inner wall portion forming a wedge shape, said inclined inner wall portion having an opening in substantially close proximity to said wedge shaped portions for receiving a fastening member therethrough, said flange portions of a bottom edge portion and the other side of said sheet of material having an inclined outer wall portion forming a mating slot substantially identical in shape and size with said wedge shaped flange portions, said simulated construction material of said sheets extending beyond said inclined outer wall portion, said simulated mortar line portion extending beyond said inclined inner wall portion and lying in a plane stepped inwardly of said simulated construction facing material, whereby upon mounting said sheets of material on said wall, said wedge shaped flanges of one sheet are received by said mating slots of adjoining sheets of material, and fastening members extending through said openings for securing said sheets of material to said wall, and said extended simulated construction material extending over said fastening members whereby said inclined outer wall portion of one sheet engages said outer wall portion of an adjacent sheet in proximity of said fastening members.



3,968,611
DILATION JOINT STRIP

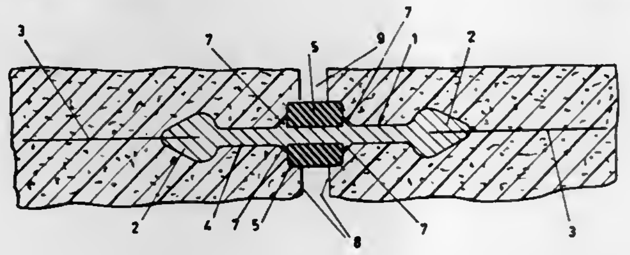
Eduard Herman Louis de Munck, The Hague, Netherlands, assignor to International B. F. Goodrich-Europe B.V., The Hague, Netherlands

Filed Sept. 9, 1974, Ser. No. 504,176

Claims priority, application Netherlands, Sept. 20, 1973, 7312973

Int. Cl.² E04B *1/62;* **E04F** *15/14*

U.S. Cl. 52—396 **3 Claims**



1. A dilation joint strip for sections of masonry defining a gap between the sections of masonry joined therewith and in which said sections of masonry have opposed recesses facing each other, said joint strip having a substantially flat intermediate portion and anchoring side wings integral therewith consisting of a solid material such as rubber, artificial rubber and other elastic deformable synthetic material, said anchoring wings being combined with further anchorage means for reliably anchoring said anchoring wings in the sections of masonry, said joint strip being provided at either side with a central strip of elastic cellular material extending in the longitudinal direction of said intermediate portion with opposite ends thereof in said opposed recesses and having a width greater than the width of the gap between said sections of masonry, said central strip covering said flat intermediate portion and also the end portions of the anchoring wings so that when said joint strip is in use, both end portions of said central strip are embedded in said recesses in said sections of masonry, said joint strip also including means for maintaining said central strips in place thereon.

3,968,612
MOTOR VEHICLE WINDOW

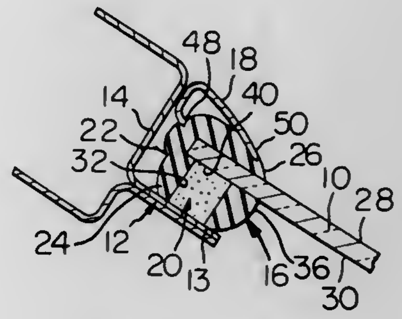
Shiro Endo, Hino; Minoru Yoshida, Hachiohji, and Kouichi Yaotani, Akikawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,012

Claims priority, application Japan, Feb. 9, 1974, 49-16448

Int. Cl.² E04B *1/62;* **E04C** *1/36*

U.S. Cl. 52—400 **4 Claims**



1. A motor vehicle window assembly comprising:

a windshield;

a window frame defining a windshield-receiving aperture;

said window frame having a flange in parallel spaced relationship to a marginal area on the rear surface of said windshield;

a looped trim strip of flexible plastic material including a channel portion having a front channel wall and a rear channel wall with an edge, a base portion spacing apart said front and rear channel walls such that said channel portion can embrace the edge of the windshield with said front channel wall lying against the front surface of said windshield and the rear channel wall lying against the rear surface of the windshield;

a dam portion spaced apart from the edge of said rear channel wall and a plurality of bridge portions integrally connecting it therewith such that said dam portion can lie against the rear surface of said windshield, said rear channel wall, the rear surface of said windshields and said dam portion cooperating to define an adhesive receiving channel;

an adhesive filling said adhesive receiving channel said adhesive bonding the rear surface of said windshield to said flange; and

said rear channel wall and said dam portion lying against said flange to prevent said adhesive from being exposed to the ambient atmosphere.

3,968,613
TRIM MOLDING ASSEMBLY

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed June 3, 1974, Ser. No. 475,839

Int. Cl.² E04F *19/02;* **E04B** *1/62*

U.S. Cl. 52—400 **4 Claims**

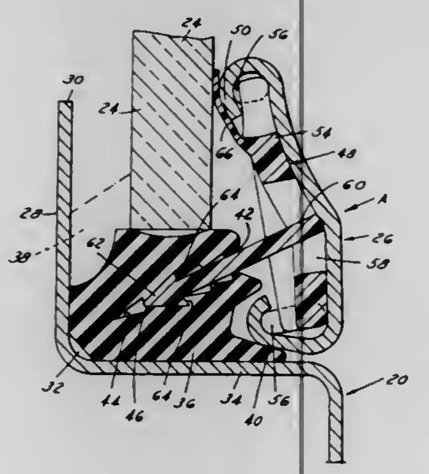
1. A trim molding assembly comprising a support having a window frame opening therein, a pane of glass or the like positioned to substantially cover said opening, an elongated trim molding extending generally along the lower marginal edge of said pane, a resilient pad interposed between the lower side of said window frame and said lower marginal edge of the pane, and a fastener interconnecting the molding and the pad;

said fastener including a body portion joined to the trim molding, and having a tongue-shaped extension projecting generally perpendicularly away from the molding;

said resilient pad having a slit opening through the face thereof adjacent to said trim molding, but terminating short of the opposite face of the pad, said slit having the opposite walls thereof spaced apart normally less than the thickness of said fastener extension but being expanded apart by the forced insertion of the extension therein;

said fastener extension being engaged within said slit, with the fastener extension and the slit having complementary, transversely extending surface portions interengaged with one another following insertion of the extension into the slit to prevent withdrawal of the fastener from the pad;

said pane resting upon said pad, and said slit extending into said pad in a direction generally transverse to the plane of said pane, whereby at least a part of the weight of the pane acts on the pad in the direction to close said slit and cause the opposing walls of the slit to apply contractual gripping pressures on the fastener extension to retain the same within the slit;



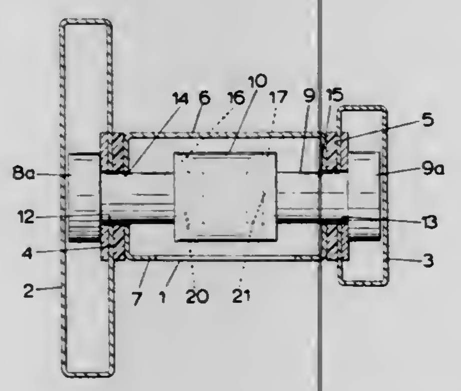
the upper marginal edge of said trim molding overlying said pane, and said fastener including a fin projecting from the body portion of the fastener and interposed between said pane and the upper marginal edge of said molding;

said resilient pad having an outwardly projecting foot-like portion underlying the lower marginal edge of said molding and interposed between the molding and the lower side of the window frame;

said trim molding being generally channel-shaped in cross-section and extending for approximately the lateral extent of the pane, and said resilient pad being fixed to said support in underlying supporting relation to the lower marginal edge of the glass pane and extending for approximately the lateral extent of the pane.

3,968,614
FRAMING

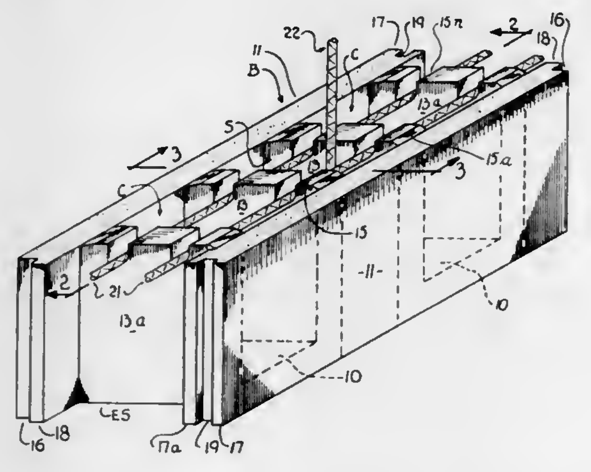
James Wallace, Sonning, England, assignor to Ideal Casements (Reading) Limited, England
Filed July 15, 1974, Ser. No. 488,848
Int. Cl.² E04C *3/30*
U.S. Cl. 52—403 **8 Claims**



1. A framing member comprising three elongated tubular elements lying in parallel relationship, each such element having at least one plane surface adjacent a similar plane surface of another of the elements, resilient sealing strips located between each pair of adjacent plane surfaces, and transverse fasteners each securing all three said elements together, and located in at least two places along their lengths, the fasteners being adapted to exert pressure on the sealing strips.

3,968,615
METHOD, BUILDING STRUCTURE AND BLOCK THEREFOR

George R. Ivany, 3871 W. Valley Drive, Faiview Park, Ohio 44126
Filed Aug. 15, 1975, Ser. No. 605,021
Int. Cl.² E04B *2/18*
U.S. Cl. 52—439 **9 Claims**



1. A method for constructing a building wall comprising the steps of:

providing like three-cavity molded hollow rectangular block modules of cement-like material each comprised of a pair of like parallel vertical longitudinal side walls joined by pairs of like, flat-topped transverse webs.

the side walls having coplanar horizontal top edges, coplanar horizontal bottom edges, and at the respective ends of the block, coplanar principal end faces or edges, the tops of the webs extending above the side wall edges in projections beveled at opposite ends toward the side wall top edges, and the bottoms of the webs coplanar with the side wall bottom edges thereby to define a bed joint space between successive courses of block modules laid with webs aligned,

the opposite end edges of each side wall having respectively a tongue and a groove complementary thereto, said webs mutually spaced to define a narrow central slot cavity, with a larger cell cavity one each side thereof, and end recesses comprising respective half-slots forming a full slot size when the block modules are abutted endwise in a course;

laying block modules, abutting endwise without application of head joint mortar to individual blocks in courses, upon bed joint mortar applied to the top edges of block modules in underlying courses, the block modules in each course staggered to bring the abutments over the central slots of block modules in the underlying course, thereby to form vertically elongated wall slots;

periodically among said courses including a distribution block course whereof:

the said block module have bottom walls in the cell cavities to form mortar receiving pockets, and the web tops have paired downward, horizontal reinforcing bar receiving notches, reaching to a depth sufficiently below the side wall top edges for said bars to be embedded by mortar filling said pockets;

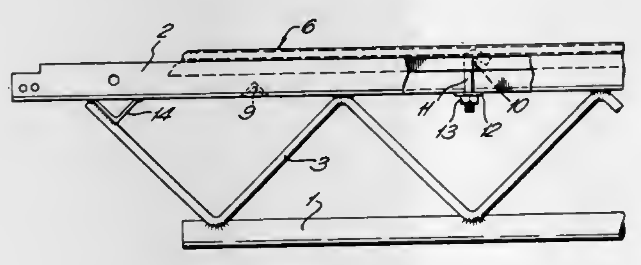
after laying up to courses to a distribution course at story-height,

emplacing horizontal bars in the notches of the distribution course blocks and vertical reinforcing bars in some selected wall slots, and

filling the mortar pockets of the distribution course blocks and the vertical wall slot.

3,968,616
DECKING BEAM ASSEMBLY

Peter Eric Gostling, Sutton Coldfield, England, assignor to C. Evans & Sons Limited, Illford, United Kingdom
Filed Oct. 4, 1974, Ser. No. 511,950
Claims priority, application United Kingdom, Oct. 12, 1973, 47798/73
Int. Cl.² E04C *3/02*
U.S. Cl. 52—645 **6 Claims**

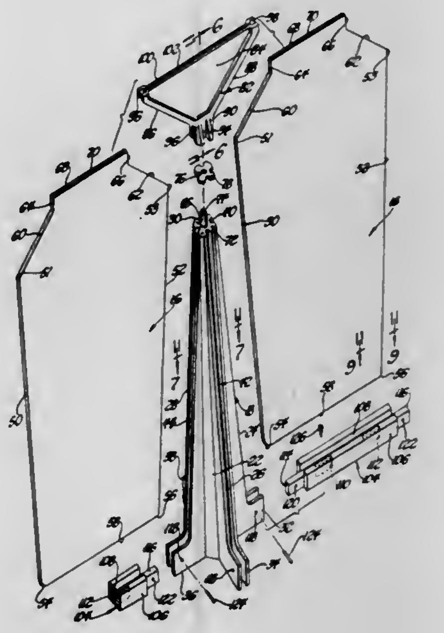


1. A decking beam assembly for use in combination with support panels to provide shuttering for concrete structures, said beam assembly being adaptable for use with standard support panels of different sizes and comprising a lower stringer member, a pair of spaced-apart panel supporting upper members in the form of angle irons, connecting means in the form of zig-zag bars extending between, and fixedly secured to, said lower stringer member and respective ones of said panel supporting members, a plurality of spaced adjustable tie members extending between and connected to said two panel supporting members, a replaceable spacer element of generally T-shaped cross-section supported by said panel supporting members, said spacer element having a crossbar portion opposite ends of which are engaged by one edge of each of two adjacent ones of said support panels and a tail portion which is received between said two panel supporting members, and means for retaining said tail portion of said spacer element in position relative to said panel supporting members, the arrangement being such that said adjustable tie members permit a selected one of said replaceable spacer elements to be used depending on the size of said support panels.

3,968,617
BUILDING STRUCTURE

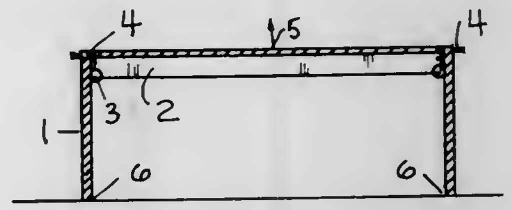
John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220
Division of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application Nov. 20, 1974, Ser. No. 525,369
Int. Cl.² E04C *3/30;* **E04B** *1/10*
U.S. Cl. 52—720 **7 Claims**

1. A base member for laterally interconnecting succeeding structural column members, said base member comprising body means, said body means comprising a lower disposed mounting surface, an upper situated surface, first and second oppositely disposed side surfaces, first and second oppositely disposed end portions, slot means formed in said body means and through said upper situated surface, aperture means located generally between said first and second end portions and formed through said body means as to be directed generally transversely to said upper surface, said aperture means being effective to receive therethrough related anchoring means whereby said body means is secured to associated support structure supporting said body means along said lower disposed mounting surface, and first and second connecting portions generally respectively extending beyond said first and second end portions, said first and second connecting portions each having an uppermost surface at an elevation substantially below the elevation of said upper situated surface and being effective for operative connection to respective first and second of said succeeding structural column members as to thereby be situated generally between said succeeding column members.



3,968,618
METHOD OF CONSTRUCTING A FOLDABLE BUILDING WITH BEAM ROOF AND RIGID FRAME

Delp W. Johnson, 240 Oakview Drive, San Carlos, Calif. 94070
Filed May 31, 1974, Ser. No. 474,937
Int. Cl.² E04B *1/00;* **E04G** *21/14*
U.S. Cl. 52—745 **4 Claims**



1. The method of constructing a clearspan building having an elongated Tee beam roof of given depth comprising the steps of:

a. positioning said Tee beam and a further elongated structural member with major surfaces thereof in parallel planes and the axes of elongation thereof in alignment;

b. establishing a connection between said Tee beam and said further elongated structural member, which connection is pivoted about an axis normal to said axes of elongation thereof;

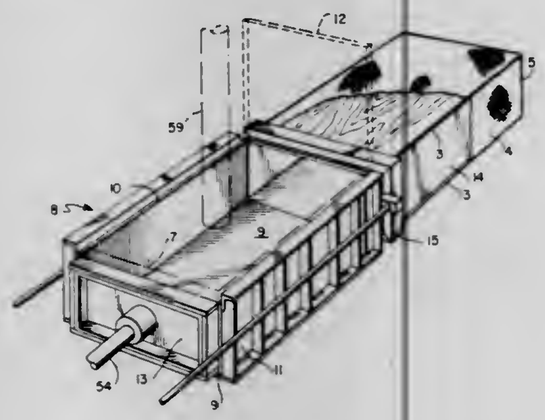
c. lifting said Tee beam by exerting a lifting force at a limited central portion only of said Tee beam to allow said further elongated structural member to rotate about said pivotal connection;

d. lowering the free end of said further elongated structural member into contact with a foundation; and

e. anchoring said Tee beam and said further elongated structural member to each other by means capable of withstanding both tensile and compressive stress at a point spaced from said pivotal connection by a distance at least about equal to one-half said given depth of said Tee beam and anchoring the free ends of said Tee beam and said further elongated structural member to said foundation whereby the release of said lifting force introduces bending moments into said Tee beam and said wall through said pivotal connection and anchoring means therebetween.

3,968,619
METHOD AND APPARATUS FOR PRODUCING ENCLOSED BALES OF COMPRESSIBLE MATERIAL

Francis B. Fishburne, P.O. Box 338, Arden, N.C. 28704
Filed Sept. 2, 1975, Ser. No. 609,673
Int. Cl.² B65B *13/20, 63/02*
U.S. Cl. 53—24 **22 Claims**

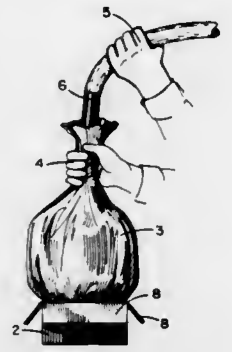


1. In the production of enclosed bales of compressible material such as tobacco, the method comprising
  - confining a predetermined quantity of the compressible material within an upright zone which terminates at the bottom in a compression zone in the form of a hexahedron which is similar to but slightly smaller than the bale to be formed and which can be placed in communication with a laterally extending sleeve having a transverse cross-sectional shape corresponding to that of the compression zone;
  - compressing the predetermined quantity of compressible material into the compression zone by forcing a press ram having a flat lower face downwardly through said upright zone until the flat face of the ram forms the top wall of the compression zone;
  - disposing about the laterally extending sleeve a container having an open end adjacent the compression zone and a closed end extending across the end of the laterally extending sleeve which is more distant from the compression zone;
  - placing the compression zone in communication with the laterally extending sleeve;
  - forcing the compressed cake of material from the compression chamber into and through the laterally extending sleeve;
  - maintaining the container on the sleeve until the compressed cake of material has reached the discharge end of the sleeve;
  - then positively moving the container over and away from the sleeve in the same direction and at essentially the same speed as the compressed cake is moved by said forcing step;
    - said steps of forcing the compressed cake and positively moving the container being continued until the cake has passed completely through the sleeve and the container has been removed from the sleeve; and
  - closing the open end of the container;
  - the compressed cake reexpanding, in the direction in which it was compressed, after the cake has emerged from the sleeve, such reexpansion causing the cake to place the container in tension.

3,968,620
METHOD OF COMPRESSING A FOAM ARTICLE

Heidi Keltner, 3389 Knollwood Court, Las Vegas, Nev. 89121
Filed Dec. 23, 1974, Ser. No. 535,798
Int. Cl.² B65B *63/02*
U.S. Cl. 53—24 **1 Claim**

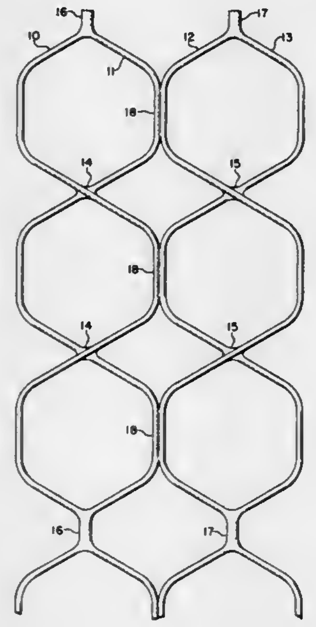
1. A method of packaging an article fabricated from flexible foam encased in airpermeable fabric comprising encasing the article in a substantially air-tight bag, removing air from the bag by means of a vacuum pump to create a pressure differential between the inside and outside of the bag of at least 1.0 psi while simultaneously urging the bag into a rigid container,



compressing the article to less than about 25% of its freely expanded volume, and securing the opening in the bag to prevent expansion of the article.

3,968,621
METHOD OF PACKAGING USING EXTRUDED NET

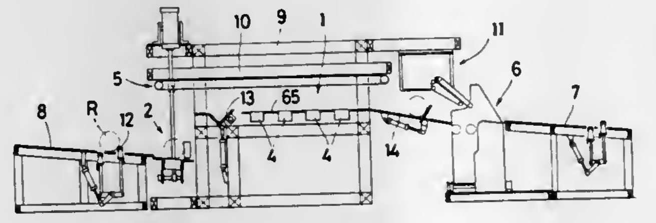
Ougljesa Jules Poupitch, La Jolla, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.
Division of Ser. No. 250,535, March 5, 1972, and a continuation of Ser. No. 398,105, Sept. 17, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 545,964
Int. Cl.² B65B *5/08, 11/00;* **B29F** *3/00*
U.S. Cl. 53—52 **8 Claims**



1. A method of packaging including forming a multiple container carrier stock capable of being severed transversely at certain longitudinally spaced positions thereof to form successive individual multiple container carriers and applying said carriers to containers, said method comprising the steps of extruding a pair of strands of a resilient and deformable plastic material in a state subject to being fused together upon contact, moving said extruding strands together in a contiguous side-by-side relationship for a predetermined period of time to fuse said strands together in contiguous side-by-side portions thereof of such a length as is capable of being transversely severed to form common ends for successive carriers, thereafter moving said extruding strands apart and together and crossing in a repeating pattern and fusing said strands at intersections thereof to define a plurality of integral bands each having an inner circumferential dimension less than outer circumferential dimensions of containers intended to be associated therewith and sufficiently large to enable said bands to be stretched and circumferentially applied about said containers, thereafter repeating the step of moving said extruding strands together in a contiguous side-by-side relationship for a predetermined period of time to fuse said strands together in a contiguous relationship of a predetermined length capable of being transversely severed to form the common ends of a pair of longitudinally adjacent individual multiple container carriers in said stock, and thereafter sequentially repeating the steps of forming said bands and said side-by-side portions to form said carrier stock as a longitudinal series of individual multiple container carriers interconnected by said side-by-side portions, and thereafter stretching and applying each of said bands circumferentially about a set of containers and contemporaneously transversely severing said strands intermediate said side-by-side portions thereby forming said containers into packages.

3,968,622
ROLL PACKAGING APPARATUS

Hiroshi Kataoka, Ohmachi 1491, Toyooka-cho, Iyomishima, Ehime, Japan
Filed Aug. 19, 1974, Ser. No. 498,369
Int. Cl.² B65B *57/14, 11/32*
U.S. Cl. 53—59 R **13 Claims**



1. A roll packaging apparatus comprising in combination, a substantially rectangular packaging table having means for effecting a packaging operation; a roll supplying device provided on one side of said packaging table; a packaging paper cutting and supplying device provided adjacent said packaging table; a transportation mechanism for positioning a cut packaging paper sheet from the supplying device in a desired position on said packaging table; a roll driving device for rollingly advancing a roll to be packaged on the paper sheet disposed on said packaging table from location of said table to another while rolling the paper sheet around the periphery of the roll to be packaged; said roll driving device comprises a vertically movable horizontal frame provided above said packaging table; endless belts provided below said horizontal frame to run along the advancing direction of the roll to be packaged and a driving means disposed to operate the endless belts; and receiving means provided adjacent an exit surface of said packaging table for receiving a roll having a paper sheet wrapped thereabout.

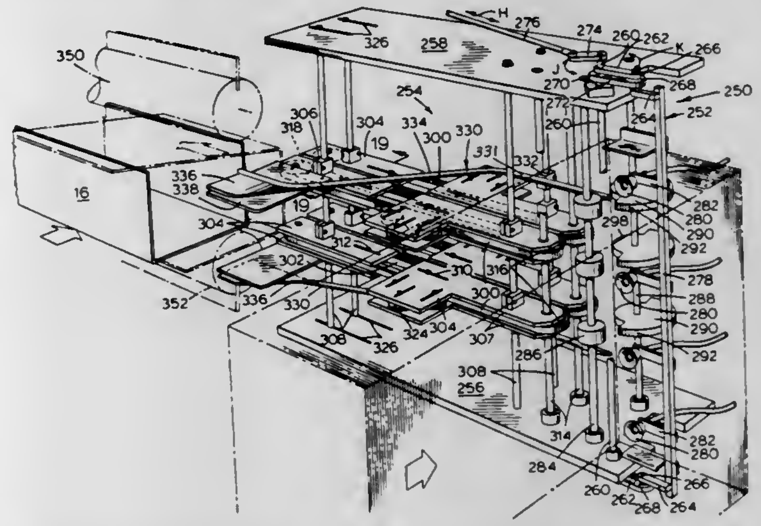
3,968,623
WRAP-AROUND CARTON FORMING MACHINE

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada
Filed Feb. 26, 1975, Ser. No. 553,269
Int. Cl.² B65B *11/22, 41/08*
U.S. Cl. 53—195 **4 Claims**

1. In a wrap-around carton forming machine of the type having a carton wrapping station in which carton blanks are wrapped around forming mandrels which are driven continuously through a wrapping station in a wrapping path, the carton blanks each having a back wall panel and top and bottom wall panels each hingedly connected to the back wall panel, and a front wall panel, and a side closure flap hingedly connected to the top or bottom wall panels, and end flaps attached to said panels for closing the ends of the carton, the improvement of;

a. a storage magazine adapted to support a plurality of carton blanks in a vertically oriented face-to-face relationship, said magazine having a discharge end through which cartons may be removed one at a time from the magazine, said discharge end of said magazine being transversely spaced from said wrapping path, and

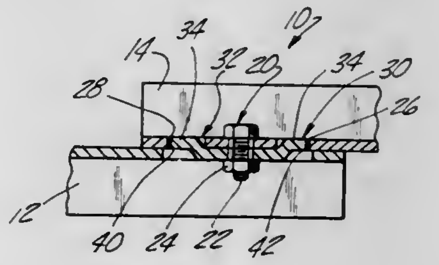
b. transfer means comprising
  - i. a frame,
  - ii. carton blank conveyor means mounted on said frame and extending between said magazine and said wrapping station in a carton blank shooting plane which is perpendicular to said wrapping path, said conveyor means being arranged to engage said back wall of a blank and support said back wall in said shooting plane during its movement therealong, said conveyor means having an input end disposed adjacent said discharge end of said magazine and an output end disposed adjacent said wrapping path,
  - iii. drive means for driving said conveyor to move a carton from the input end thereof into the wrapping path,



  - iv. dispenser means mounted on said frame and operable to remove carton blanks one at a time from said dispenser through said discharge end and to locate said carton blanks in said input end of said conveyor means,
  - v. plow blade means mounted on said frame above and below said conveyor means, said plow blade means extending obliquely with respect to said shooting plane of said conveyor means from adjacent said input end of said conveyor means to the discharge end of said conveyor means in a folding plane which is inclined in a direction opposite to the direction of travel of the mandrels through the wrapping station, said plow blade means engaging said top and bottom wall panels of said carton so as to fold them along their hinged connection with said back wall, as said carton blank travels from said input end of said conveyor to the discharge end thereof, to a generally U-shaped configuration opening in a direction to receive a mandrel travelling along said wrapping path.

3,968,624
CONNECTOR FIXTURE

Jackson G. Allmendinger, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.
Filed July 1, 1975, Ser. No. 592,113
Int. Cl.² F16B *7/00*
U.S. Cl. 52—758 F **6 Claims**

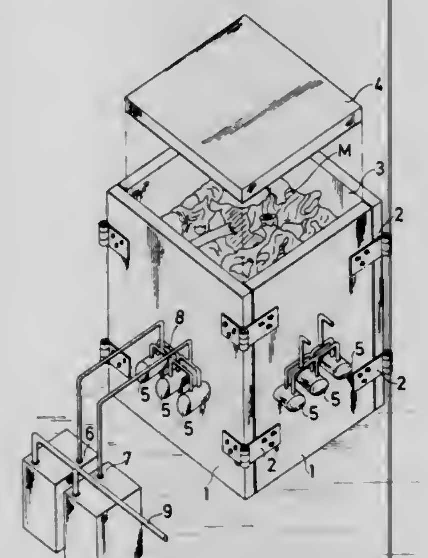


1. A connector fixture comprising:

a first structural member having a central bore formed therethrough and a pair of lugs formed thereon, said lugs being formed on opposite sides of said central bore;
a second structural member having a central bore in register with said central bore of said first structural member and having a pair of lug receiving apertures formed therethrough which register with and receive said lugs of said first structural member therein; and
a connector inserted through said registering central bores of said first and second structural members clamping said first structural member to said second structural member, wherein each of said lugs comprises a segment having a generally-flat, thin, first portion generally parallel to the surface of the first structural member and having an exposed edge surface generally normal to the surface of the first structural member, and a second portion between the first structural member and the first portion and supporting the first portion in a centilever-like fashion above and spaced from the surface of the first structural member, said segment being fitted within a corresponding one of said lug receiving apertures in said second structural member.

3,968,625
APPARATUS FOR THE TREATMENT OF REFUSE OR THE LIKE WITH A FOAM MATERIAL

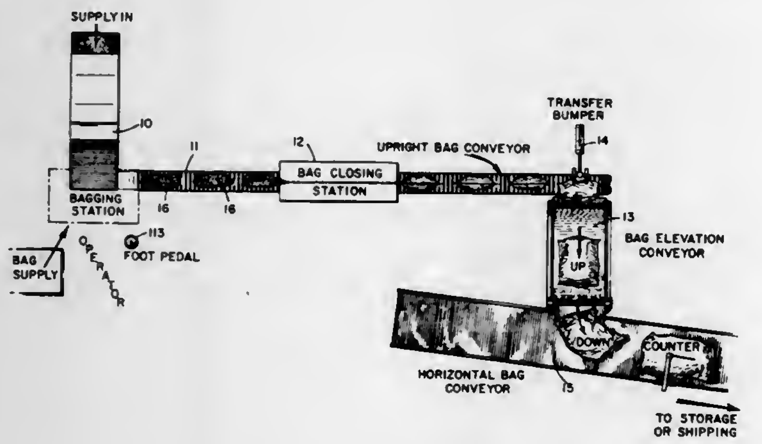
Walter E. G. Lindenmaier, Beethovenweg 47, 7958 Laupheim, and Hans Sukopp, 7959 Orsenhausen, Germany
Division of Ser. No. 470,278, May 15, 1974. This application Mar. 10, 1975, Ser. No. 557,072
Claims priority, application Germany, Aug. 6, 1973, 2339777; Oct. 15, 1973, 2351679; Nov. 20, 1973, B41464[U]
Int. Cl.² B65B *1/24*
U.S. Cl. 53—124 D **1 Claim**



1. An apparatus for the foam-treating of refuse or the like with a foam material of closed-cellular structure, comprising enclosure means for receiving a quantity of said refuse; means for compacting said refuse; said refuse compacting means comprising two conically converging movable conveyor bands receiving said refuse between the adjacent runs of said bands, said conveyor bands forming a continuous strand of said compacted refuse, said enclosure means including an elongate channel having an inlet end for receiving said compacted refuse strand; means adjacent said inlet end for separating said strand into compacted refuse segments of predetermined lengths; means for imparting a layer of said foam material to said compacted refuse, said last-mentioned means including foam material inlet nozzle means communicating with the interior of said channel intermediate the ends thereof for imparting an encompassing layer of foam material to each of said compacted refuse segments; and cutting means adjacent the outlet end of said channel for separating the foam material-enclosed segments between adjacent segments so as to form successive foam material-encased bodies.

3,968,626
APPARATUS FOR BAGGING MATERIAL

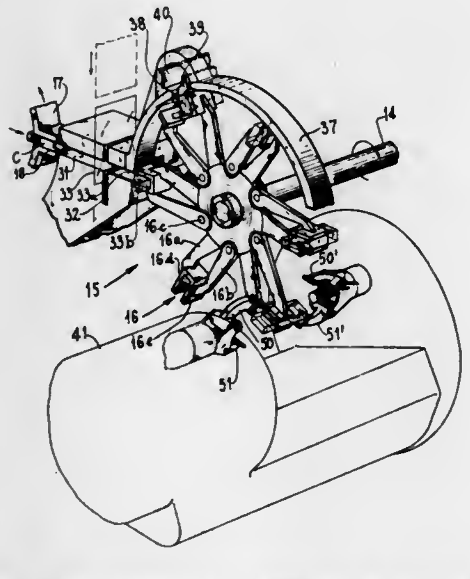
Oliver K. Hobbs, Box 1306, Suffolk, Va. 23434
Filed Nov. 11, 1974, Ser. No. 522,761
Int. Cl.² B65B *1/00*
U.S. Cl. 53—267 **24 Claims**



1. An apparatus for dispensing measured volumes of flowable solid material comprising a housing having a bottom and end walls and enclosing a space for storing said material, means for discharge of material through the bottom comprising an endless belt disposed in said space over the said bottom and having a width substantially equal to the width of the space and extending longitudinally across the space from one end wall to a point spaced from an opposite end wall to provide space for flow of material over the end of the endless belt, an opening in said bottom for discharge of material flowing over the end of the endless belt, means for agitating material in the space and for limiting the thickness of material carried by said endless belt where the material flows therefrom, means for driving said belt with its upper reach travelling towards said discharge opening, means for initiating said driving means, and means for stopping the movement of the endless belt after it has travelled a predetermined distance.

3,968,627
TWIST FINGER DEVICE FOR A CANDY WRAPPING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy
Filed Dec. 2, 1974, Ser. No. 528,663
Claims priority, application Italy, Dec. 20, 1973, 3545/73
Int. Cl.² B65B *7/12*
U.S. Cl. 53—370 **11 Claims**



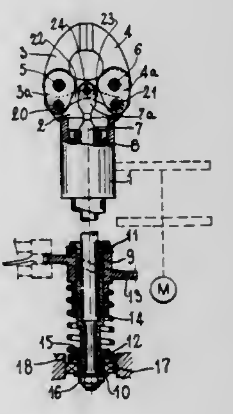
1. Apparatus for twisting wrappers on products such as candies, comprising:

a twisting finger device having a carrier for transferring successive products each in a tubular wrapping having an end portion extending beyond the product from one to another part of a wrapping machine and for briefly stationarily presenting the end portion of each wrapper in a predetermined position during the transferring of the products, a housing in the machine opposite said position, a sleeve mounted in the housing for reversible axial sliding toward said position and having gear means on its circumference for driving it in continuous unidirectional rapid rotary motion, a pair of fingers each pivoted to and rotatable with an end portion of the sleeve outside the housing and adjacent said position for reversible pivotal movement of the fingers radially of the sleeve to releasably grip successive ones of the wrapper end portions and for twisting each gripped end portion as the fingers rotate with the sleeve, a rod mounted in the sleeve for rotation therewith and for axial reciprocable sliding both with and relative to the sleeve and having a rod portion projecting from the sleeve in the housing remotely from said position, the rod having another portion outside the housing and adjacent said position for effecting the pivotal movement of the fingers; and
drive means for the twisting finger device, comprising;
  a. first and second disks in the housing, having hubs mounted respectively on and rotatable relative to the sleeve and the projecting rod portion, each disk having a web rigid with its hub and inclined to the sleeve and rod, defining a cam surface, and having gear teeth on the disk's circumference surrounding the cam surface;
  b. first, second and third gear means unidirectionally rapidly rotatable in the housing in synchronism with one another, the first and second gear means engaging the gear teeth of the first and second disks, respectively and the third gear means engaging the gear means on the sleeve, for rapid rotation of the disks and sleeve respectively;
  c. first and second roller means stationarily mounted in the housing in contact respectively with the cam surfaces of the first and second disks for axial shifting of the respective disks in response to the rotation thereof;
  d. first shoulder means on the sleeve, engageable by the hub of the first disk for direct reversible shifting of the sleeve, fingers and rod, jointly, toward said position, by the first disk; and
  e. second shoulder means on the projecting rod portion, engageable by the hub of the second disk for direct reversible shifting of the rod relative to the sleeve by the second disk to enable the pivotal movement of the fingers for gripping the wrapper end portions in synchronism with the rapid rotation of the sleeve and fingers for twisting the wrapper end portions.

3,968,628
TWIST FINGER APPARATUS FOR WRAPPING CANDIES AND THE LIKE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy
Filed Dec. 2, 1974, Ser. No. 528,662
Claims priority, application Italy, Dec. 20, 1973, 3546/73
Int. Cl.² B65B *7/12*
U.S. Cl. 53—370 **7 Claims**

1. A twist finger device, comprising;
a pair of fingers, each having a gripping member rigid therewith and disposed to be alternately (a) in a gripping position closely adjacent the gripping member of the other finger for gripping tubular wrap portions of candies and similar products between the gripping members to twist the gripped wrap portions and (b) in a releasing position spaced from the gripping member of the other finger, each finger also having an actuator member extending therefrom and rigid therewith;
a pair of pivot pins, one for each finger, pivotally supporting the finger and located, parallel to one another between the gripping and actuator members of the finger;
a sleeve having an end portion supporting the pivot pins to support the fingers;
a rod slidably mounted in the sleeve for controlling the fingers and having an end portion which extends to a location adjacent the pivot pins;
means for rotation of the sleeve and rod;
a pair of links, each articulated at one point thereof to the end portion of the rod and at another point thereof to the actuator member of one of the fingers; and



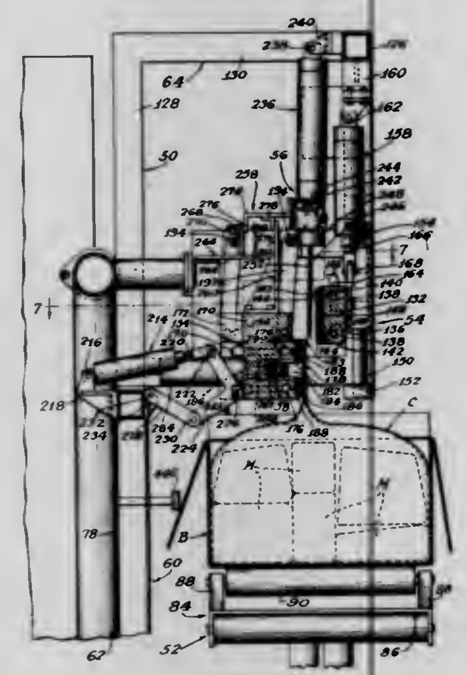
means for reciprocatingly sliding the rod relative to the sleeve during their rotation for pivoting the fingers about the pivot pins by the links articulated to the rod and the actuator members, to alternately place the gripping members of the fingers in the gripping and releasing positions, an acute angle being defined, in a plane at right angles to the pivot pins, by (1) a line from the pivot pin of each finger to the point where the respective link is articulated to the finger's actuator member, and (2) a line from the latter point to the point where the respective link is articulated to the end portion of the rod, when the gripping members of the fingers are in the gripping position.

3,968,629
PACKAGING APPARATUS

Kenneth L. Gidewall, Clarendon Hills, and Larry W. Heavner, Glen Ellyn, both of Ill., assignors to CVP Systems, Inc., Lombard, Ill.
Division of Ser. No. 364,305, May 29, 1973. This application Mar. 4, 1975, Ser. No. 555,123
Int. Cl.² B65B *51/14*
U.S. Cl. 53—373 **5 Claims**

1. A mechanism for gripping opposite sides of a flexible container, said mechanism comprising in combination, first and second elongated members, each of said members having cooperating facing surfaces, vacuum means communicating with said surfaces, means for moving said first elongated member between a first position at which said elongated members and said surfaces are laterally misaligned, and a second position at which said elongated members and surfaces are laterally aligned, said second elongated member gripping one side of said flexible container while said first elongated member is at said second position, means mounted on each of said elongated members for effecting a self-sustaining seal on said container sides, and means for moving said elongated mem-

bers between spaced and proximate relationships when said first elongated member is in said second position and while



said container panels are held against said elongated members by said vacuum means.

3,968,630

MOWER MACHINES

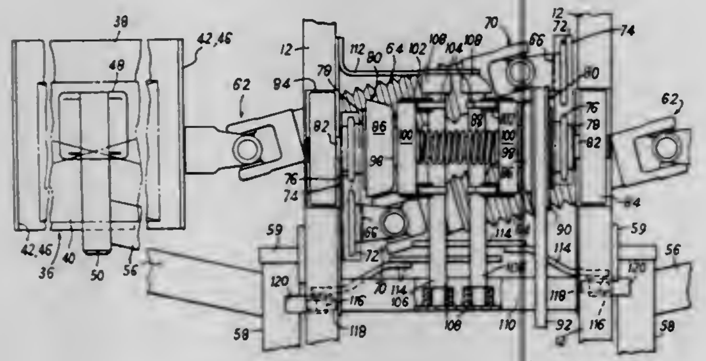
Brian Eric Mitchell, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed July 18, 1975, Ser. No. 597,373

Claims priority, application United Kingdom, July 29, 1974, 33419/74

Int. Cl.^{2} A01D *75/30*

U.S. Cl. 56—7 **8 Claims**



1. A self-propelled grass mower machine comprising a chassis, ground-engaging wheels on which the chassis is supported, a cutter reel of the helically bladed type mounted on and, when in operative cutting position, extending laterally of and projecting from the chassis, a driving motor carried on the chassis for effecting propulsion of the machine and driving of the cutter reel, and transmission means for driving the cutter reel from the motor, wherein said transmission means include a driven member, a transversely disposed driven shaft and universal couplings connecting respective opposite ends of the driven shaft to the reel and, adjacent the side of the chassis remote from the reel, to said driven member of the transmission means, the axes of the shaft and the reel being mutually inclined at a large obtuse angle therebetween.

3,968,631

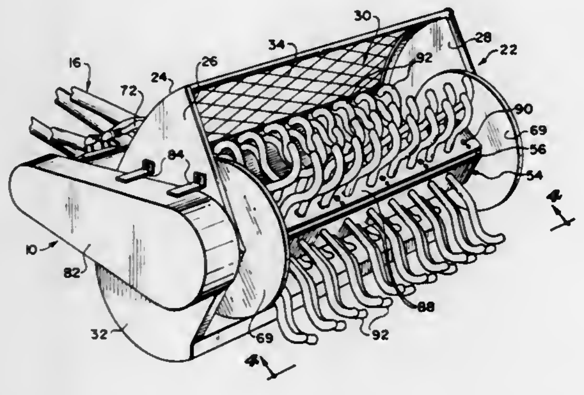
FRUIT PICKING DEVICE

Delmar C. Haines, Box 112, 401 N. State St., Saybrook, Ill. 61770

Filed Oct. 8, 1975, Ser. No. 620,699

Int. Cl.^{2} A01D *46/00*

U.S. Cl. 56—328 R **13 Claims**



1. Apparatus for picking fruit from a tree comprising, a housing, an elongate drum mounted for rotative movement in the housing, the drum having a plurality of outer-facing generally planar surfaces, a first group of fruit engaging fingers disposed on each respective surface along a first line extending parallel to the elongate dimension of the drum, each pair of adjacent fingers of said first group defining a space therebetween, a second group of fruit engaging fingers disposed on each respective surface spaced from each other along a second line extending parallel to the elongate dimension of the drum spaced from said first line, adjacent ones of said first and second groups of fingers being staggered with respect to each other to provide a plurality of adjacent groups of three fingers along the length of the drum, each finger including a first generally straight portion extending normal from the drum and a second generally curved portion formed as an extension of the first portion, means for moving the housing adjacent the fruit on the tree and means for imparting rotative movement to the drum, whereby the fruit is engaged by a finger of said first group to move pivotally about the stem of the fruit to be wedged into said space and thereby is separated from the tree and deposited in the housing.

3,968,632

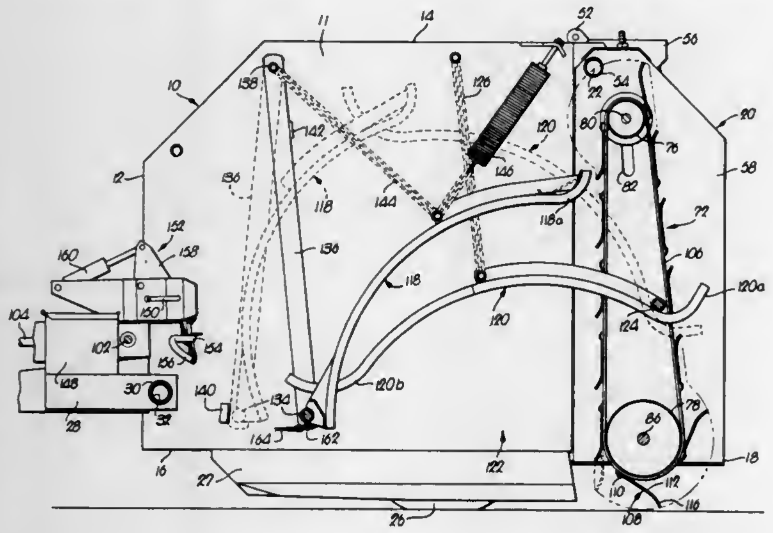
MACHINE FOR FORMING ROUND BALES

Melvin Victor Gaeddert, Newton, and Bobby Dwayne McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 2, 1974, Ser. No. 511,215

Int. Cl.^{2} A01D *39/00*

U.S. Cl. 56—341 **29 Claims**



21. In a mobile round bale forming machine having a baling chamber:

- a rotary member carried in a position normally adjacent the ground and having an arcuate periphery;
- an elongated, flexible element looped around said member and movable lengthwise during rotation of the member,
- said element having a bale-engaging stretch extending across said chamber in disposition for engaging a bale forming in the chamber; and
- a series of elongated crop lifting devices mounted on said element with their longitudinal axes extending at least substantially parallel to that of the element,
- said devices being mounted to remain in said parallel relationship along said bale-engaging stretch but swing outwardly from said relationship as they move around said periphery of the member with the element.

3,968,633

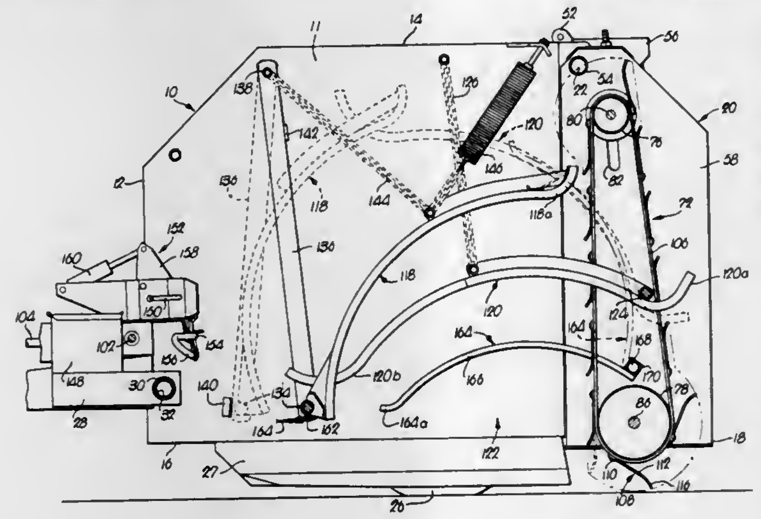
ROUND BALE FORMING MACHINE FOR LIGHT CROP MATERIALS

Melvin Victor Gaeddert, Newton, and Bobby Dwayne McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Continuation-in-part of Ser. No. 511,215, Oct. 2, 1974. This application Dec. 5, 1974, Ser. No. 529,739

Int. Cl.^{2} A01D *75/00*

U.S. Cl. 56—341 **4 Claims**



1. In a machine for forming round bales by rolling a mass of hay along a ground surface covered with loose hay:

- a mobile, open bottom housing;
- mechanism at the rear of said housing for picking up loose hay through said open bottom as the housing passes over the hay;
- a pair of oppositely extending, upwardly concave, front and rear forming elements disposed in overlapping relationship to one another ahead of said mechanism and defining an arcuately topped, expandable forming chamber for the hay mass as the latter is rolled into a bale,
- said rear element being upwardly and rearwardly swingable under resistance about an axis transverse to the normal path of travel of the housing to maintain yieldable pressure against the upper rear portion of the bale as it progressively grows in size,
- said front element being mounted for upward and forward swinging under resistance about a transverse axis that is shiftable forwardly during growth of the bale to maintain yieldable pressure against the upper forward portion of the bale as it progressively grows in size; and
- a second rear forming element in said chamber underlying the first mentioned rear element in vertically spaced relationship thereto for initiating rolling of the hay mass as the latter accumulates from said mechanism,
- said second rear element being upwardly concave and being upwardly and rearwardly swingable under resistance independently of said first-mentioned rear element about a transverse axis below that of said first-mentioned rear element to confine and apply yieldable pressure against the mass alone until the latter swings the second rear element upwardly to said first-mentioned rear element.

3,968,634

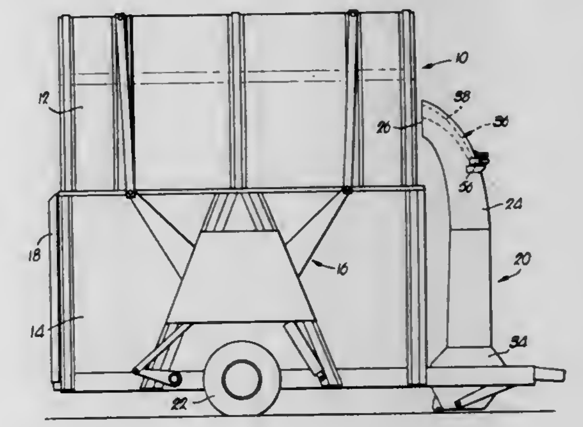
STACK-FORMING MACHINE HAVING UNIFORM LOADING CONTROL

John Dale Anderson, Canton; Bruce Leo Lutz, Hesston, and Harold Keith Garrison, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Feb. 18, 1975, Ser. No. 550,177

Int. Cl.^{2} A01D *87/10*

U.S. Cl. 56—344 **18 Claims**



1. In a stack-forming machine having a hollow body provided with a reciprocable press and apparatus for picking up a crop from the ground and projecting it into the body for compaction, said apparatus including an elongate spout conducting a stream of the projected crop and having a discharge outlet oriented to direct the stream into the body, the improvement comprising:

- elongate baffle structure;
- means shiftably mounting said structure within said spout near said outlet for movement transversely of the spout along a predetermined path of travel,
- said mounting means disposing each end of said structure within said stream; and
- mechanism operably coupled with said structure for continuously oscillating the latter along said path and through said stream to reduce conglomerates of projected crop and to evenly distribute the stream from side-to-side within said body.

3,968,635

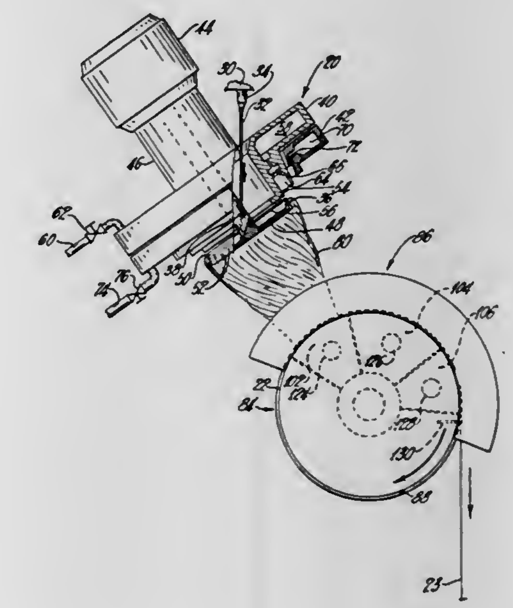
TEXTILE COATING APPARATUS AND METHOD

Charles R. Morrison, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 26, 1974, Ser. No. 527,312

Int. Cl.^{2} D02G *3/18, 3/36, 3/40*

U.S. Cl. 57—35 **11 Claims**



1. Apparatus for forming a yarn from discontinuous glass fibers that are effectively interengaged into a relatively loosely associated longitudinal sliver-like grouping comprising:

a container for holding the longitudinal sliver-like grouping of discontinuous fibers;

a series of rolls for linearly advancing the grouping of discontinuous fibers from the container and for drafting the grouping where the drafting places the interengaged discontinuous fibers in the sliver-like grouping into an orientation that is generally parallel to the direction of travel of the sliver-like grouping;

a ring rail twister for applying twist to the drafted grouping of discontinuous fibers and for collecting the twisted and drafted grouping into a wound package; and

means for coating the drafted grouping of discontinuous fibers during their advancement to the twister where the means for coating is located between the series of rolls for advancing and drafting and the ring rail twister, such means defining a coating passageway for containing a liquid coating material and for passage of the sliver-like grouping of discontinuous fibers during its advancement to the twister, the coating passageway being so located that the grouping of discontinuous fibers in the coating passageway is unaffected by the twist imparted by the twister during its advancement through the passageway so as to promote penetration of sizing material into the sliver-like grouping of discontinuous fibers.

3,968,636
OPEN-END FIBER SPINNING MACHINE

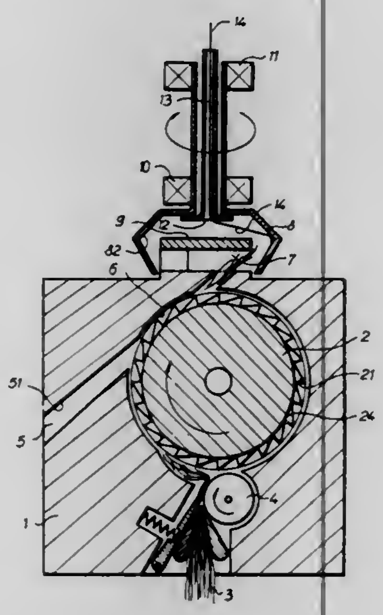
Jan Junek, Usti nad Orlici; Vaclav Vobornik, Lethohrad; Frantisek Jaros, Usti nad Orlici; Josef Ripka, Usti nad Orlici; Ludmila Lihtarova, Usti nad Orlici; Vladimir Ohlidal, Usti nad Orlici, and Frantisek Hortlik, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 22, 1974, Ser. No. 516,908

Claims priority, application Czechoslovakia, Oct. 24, 1973, 7309-73

Int. Cl.² D01H ***1/12***

U.S. Cl. 57—58.95 **3 Claims**



1. In an open-end fiber spinning machine including an under pressure spinning chamber and an opening roller having a sawtooth covering mounted in a fiber opening body, said opening roller engaging a feeding channel for feeding the separated fibers, said channel connecting directly the inner space of the spinning chamber with an environment of higher pressure, the improvement wherein the feeding channel is provided in the wall thereof located opposite the fiber opening roller with a recess which is engaged by the sawtooth covering of the fiber opening roller, said covering being adapted to sweep adjacent the wall of said recess.

3,968,637
YARN BREAK DETECTION BY MEANS OF TRIBOELECTRICAL NOISE SIGNAL

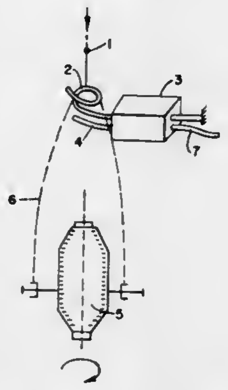
Eleonoor van Andel, Twekkelo; Garrit J. Hilferink, Arnhem, and Theodorus P. J. Lendering, Apeldoorn, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Aug. 5, 1974, Ser. No. 494,903

Claims priority, application Netherlands, Aug. 6, 1973, 7310809

Int. Cl.² D01H ***13/16***

U.S. Cl. 57—81 **14 Claims**



1. An apparatus for detecting a yarn break on a textile machine having at least one yarn processing position where the transport of a yarn is to be monitored, which comprises a triboelectric noise signal generator located at said yarn processing position for providing a signal indicating the transport of the yarn and a signal detection circuit means for amplifying and rectifying the signal provided by said generator to provide an output indicative of a yarn break, said circuit means including an amplifier circuit providing a low frequency band filter, and said signal generator comprising an insulated electric conductor contacted by said yarn during transport thereof, to produce an electrostatic charge.

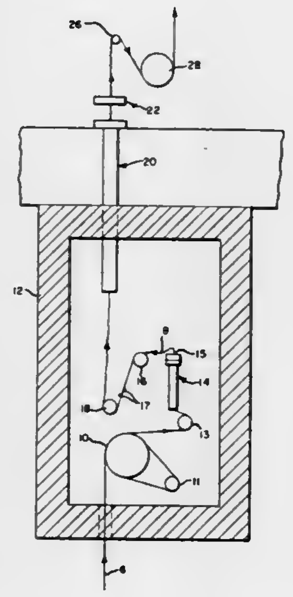
3,968,638
PRODUCT AND PROCESS

Lilburn Lafayette Norton, and William Thomas Windley, both of Seaford, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 9, 1975, Ser. No. 585,353

Int. Cl.² D02G ***1/16, 1/20;*** **D02J** ***1/08***

U.S. Cl. 57—140 R **11 Claims**



1. A coherent yarn of continuous thermoplastic multifilaments which have an average of at least 4 crimps per inch of filament when relaxed in heat and moisture and are highly entangled throughout the length of the yarn, the yarn having a lateral coherency of 0.2 to 2.8 inches with a standard deviation of less than 0.5 times the average value, and a latent twist of 0.75 to 10 turns per inch which is recoverable by relaxation of the yarn in heat and moisture, there being an increase in yarn bundle diameter of greater than 10 percent when recovering latent twist after tufting.

8. The process of preparing a coherent yarn from a feed yarn of continuous thermoplastic multifilaments which have an average of at least 4 crimps per inch of filament when relaxed in heat and moisture, which comprises feeding the feed yarn at an overfeed of 2 to 15 percent through a forwarding jet device wherein at least 3 jets of compressible fluid heated to a temperature which will plasticize the filaments are impinged laterally against the feed yarn from different directions to entangle the filaments throughout the length of the yarn, and forwarding the yarn from the entangling jets through a false-twist, heat-setting operation wherein the yarn is twisted to about 1 to 30 turns per inch by a false-twister, is heated and cooled while twisted to set latent twist in surface filaments of the yarn without removing entanglement from filaments inside the yarn bundle, and is then untwisted.

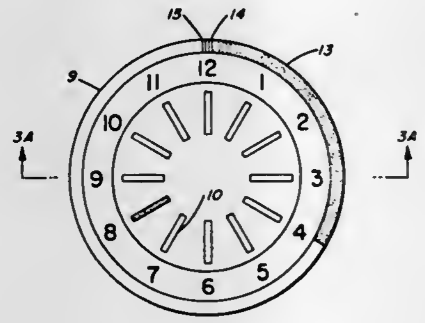
3,968,639
ELECTROCHROMIC INFORMATION DISPLAYS

Donald Joseph Berets; George Augustus Castellion, and Gottfried Haacke, all of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 149,423, June 3, 1971, Pat. No. 3,839,857. This application July 16, 1974, Ser. No. 489,796

Int. Cl.² G04C ***3/00;*** **G04B** ***19/06;*** **G01R** ***27/22;*** **G02F** ***1/28***

U.S. Cl. 58—23 R **7 Claims**



1. An electronic device for visually indicating accumulated electric current flow comprising means to establish a regulated electric current flow, and a graduated persistent electrochromic display means electrically connected to said electric current flow means, whereby said electrochromic display changes color in a continuously advancing manner as a function of said current flow, so as to indicate accumulated electric current flow.

3,968,640
DIGITAL WATCH WITH ELASTOMER HOUSING BLOCK AND FLEXIBLE PRINTED CIRCUITRY

Paul J. Clemmer, Huntington Beach, and Roger A. Burke, Laguna Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 16, 1974, Ser. No. 506,621

Int. Cl.² C04B ***19/34***

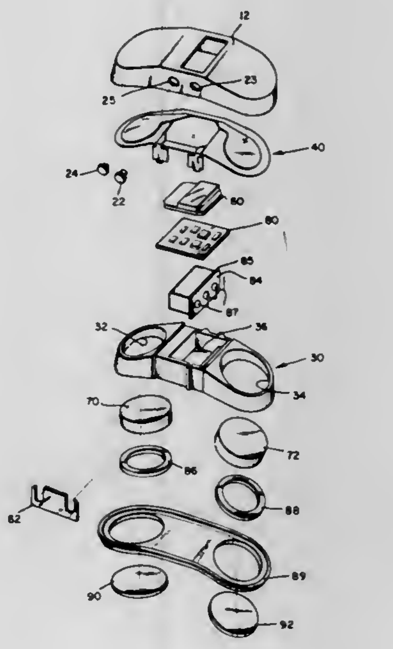
U.S. Cl. 58—50 R **5 Claims**

1. A digital watch having a case and a substrate on which electronic circuitry and electro-optical display devices are situated, a spacer block for supporting said substrate and for positioning and isolating at-least one battery, the improvement comprising:

at least one push button for activating said display devices;

a flexible circuit with at least one contact for providing electrical continuity between said push buttons and said electronic circuitry and between said batteries and said electronic circuitry; and

an elastomeric spacer for supporting the substrate, isolating the batteries, and acting as a spring to return the contacts



of said flexible circuit to their uncontacted position after the push buttons have been depressed.

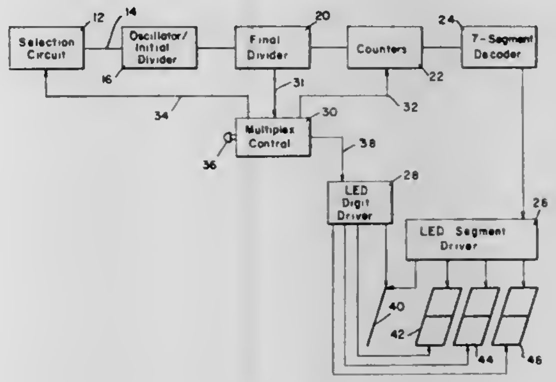
3,968,641
DIGITAL WATCH WITH OSCILLATOR/DIVIDER POWER SELECTION CIRCUITRY

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1975, Ser. No. 576,760

Int. Cl.² G04C ***3/00;*** **G04B** ***19/30***

U.S. Cl. 58—50 R **7 Claims**



1. A method of increasing the battery life in an LED digital watch comprising a plurality of LED display elements, an oscillator divider and two series connected batteries, which comprises:

a. connecting only one of said battery to power the oscillator/divider when the LED display elements are not illuminated;

b. connecting said two series connected batteries to power the oscillator/divider when the LED display elements are illuminated.

3,968,642
WATCH-MOVEMENT FRAME WITH EXTRA HOLES FOR USING DIFFERENT ESCAPEMENT MECHANISMS

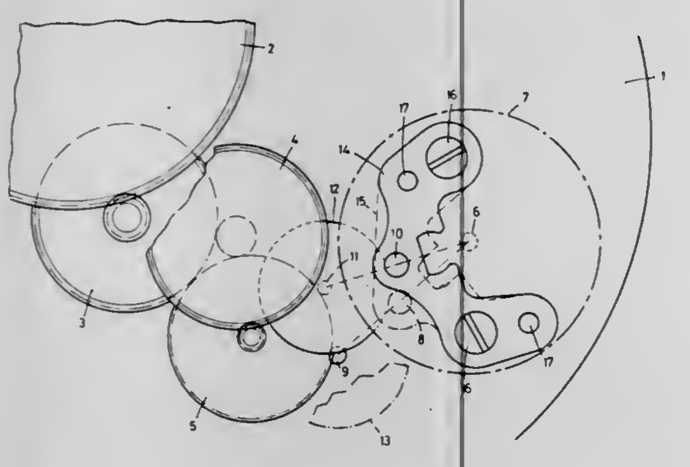
Hagues Bürki, L'Orient, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Jan. 21, 1975, Ser. No. 542,785

Claims priority, application Switzerland, Jan. 25, 1974, 1053/74

Int. Cl.² G04B *33/00, 29/02, 15/08*

U.S. Cl. 58—59 **9 Claims**



1. A watch-movement frame comprising a plate having holes for receiving bearings situated at the locations of gears of a wheel-train, of a pallet-lever, and of a balance, wherein two said holes are aligned in a first direction with respect to the location of said balance and are situated at respective distances from the axis of said balance corresponding to the dimensions of a first standard escapement centering, and another two said holes are aligned in a second direction with respect to the location of said balance and are situated at respective distances from the axis of said balance corresponding to the dimensions of a second standard escapement centering.

3,968,643
WRISTWATCH CASE AND WRISTLET ASSEMBLY

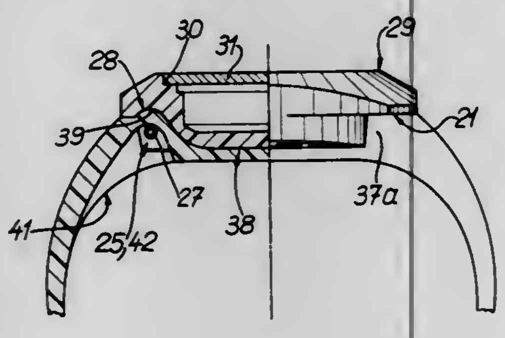
Marcel Curtil, 10, rue Marie-Louise, 25000 Besancon, France

Filed Mar. 25, 1975, Ser. No. 561,907

Claims priority, application Switzerland, Mar. 28, 1974, 4348/74

Int. Cl.² G04B *37/00;* **A45C** *11/10*

U.S. Cl. 58—88 R **6 Claims**



1. A wristwatch comprising a case having a front face and a rear face;

said rear face of the case including a rearwardly-facing generally flat peripheral first shoulder and a back protruding rearwardly from said peripheral first shoulder, said back having two pairs of wristlet-securing horns extending from opposite sides of said back and disposed within the bounds of said peripheral first shoulder, each pair of horns having outer faces and facing inner faces;

a wristlet including a central case-receiving part having a front face and a rear face;

said front face of the central part of the wristlet having a complementary shape to said rear face of the case and including two spaced-apart second shoulders each adapted to bear against a part of said first shoulder of the case and each including a pair of lateral extremities shaped to fit about the outer faces of said pair of horns of the case, a middle portion inset from said second shoulders complementary to at least a part of the rear surface of said back of the case, and two bulges joining said second shoulders to said inset middle portion, each bulge extending from between the extremities of the respective second shoulder and being shaped to fit between a pair of horns of the case;

said rear face of the central part of the wristlet having recesses defined by said bulges and lateral openings through said bulges facing said extremities of said second shoulders for receiving wristlet-securing bars;

and wristlet-securing bars disposed in said recesses and having end parts removably securing the horns of the case between said extremities.

3,968,644
FUEL ADMITTING AND CONDITIONING MEANS ON COMBUSTION CHAMBERS FOR GAS TURBINE ENGINES

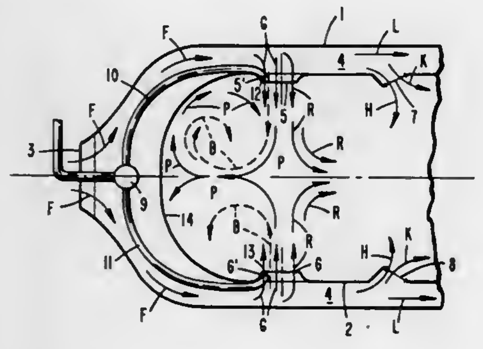
Adolf Fehler, Pfaffing, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 19, 1974, Ser. No. 498,662

Claims priority, application Germany, Aug. 18, 1973, 2341904

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.65 **25 Claims**



1. Combustion chamber apparatus for a gas turbine engine comprising:

an external engine casing,

a flame tube inserted in said engine casing such that an annular chamber is formed between the flame tube and the engine casing,

means for supplying primary combustion air and secondary mixing air to said annular chamber,

primary supply ports disposed at respective facing opposite sides of said flame tube for directing primary air from said annular chamber into said flame tube,

and fuel tubes projecting respectively into each of said primary supply ports for admitting fuel at low pressure and velocity for entrainment by portions of said primary air passing through said primary supply ports,

wherein said flame tube has an upstream end wall spaced upstream a small distance from said primary supply ports with respect to the flow of gases through said flame tube, wherein each of said primary supply ports are formed by wall means surrounding a primary port centerline of the respective primary supply port, each of said primary port centerlines extending in the direction of flow of primary air through the associated primary supply port toward the center of the flame tube, and wherein each of said fuel tubes terminate and open into said primary supply ports only at the side of said primary port centerlines closest to the upstream end wall of said flame tube in such a manner that collision of primary air flow portions at the upstream sides of said supply ports from respective facing primary supply ports causes primary zone eddies to be formed recirculating approximately from the center of the flame tube toward said upstream end wall with said fuel from said fuel tubes being embedded in and mixed with the primary air portions in said primary zone eddies, and that the remaining portions of the primary air flow through said primary supply ports is deflected as mixing air in the region of the center of the flame tube which flows in the downstream direction of said flame tube.

3,968,645
EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

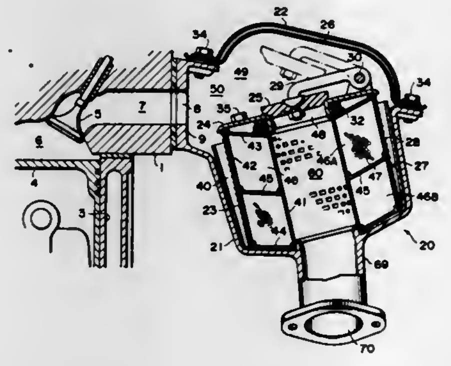
Masaaki Noguchi; Masaharu Sumiyoshi, and Shinichiro Mizusawa, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sept. 16, 1974, Ser. No. 506,450

Claims priority, application Japan, Oct. 12, 1973, 48-114499

Int. Cl.² F01N *3/14*

U.S. Cl. 60—288 **12 Claims**



1. An exhaust gas purifier for use in an internal combustion engine having a plurality of exhaust ports arranged horizontally relative to each other, said purifier comprising:

an exhaust manifold connected to said posts for collecting therein exhaust gases generated in said engine;

a catalyst container vertically installed in said exhaust manifold;

said container having inner and outer cylindrical walls and upper and bottom annular end walls, said inner and outer cylindrical walls having perforations thereon, an outer passage defined between said outer cylindrical wall and an inner wall of said exhaust manifold, an inner passage being defined by said inner cylindrical wall therein;

said exhaust manifold and said container being adapted to form a large space so that a thermal reaction of the exhaust gas takes place therein, said inner passage having a normally closed upper end;

catalyst charged to form a catalyst bed within a space defined by said inner and outer cylindrical walls and said upper and bottom end walls therebetween; and

an exhaust pipe connected to said container at a bottom opening of said inner passage for discharging exhaust gases to the atmosphere;

the arrangement being such that exhaust gases are introduced from said engine into said large space in which part of the unburned gases of the exhaust gases are burned in the presence of oxygen contained in the exhaust gases by the thermal reaction, and these gases flow through said outer passage and perforations disposed in said outer cylindrical wall into said catalyst bed where catalysis occurs, and thereafter through perforations disposed in said inner cylindrical wall and into said inner passage and then through said inner passage to be discharged through said exhaust pipe to the atmosphere.

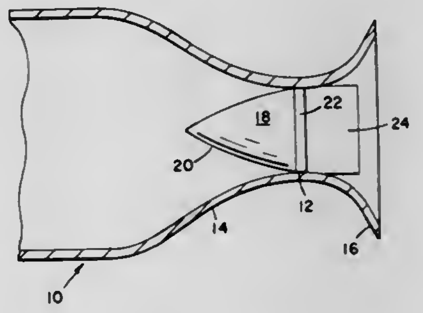
3,968,646
NOISE CONTROLLABLE NOZZLE CLOSURE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and Albert R. Maykut, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,035

Int. Cl.² F02K *1/00, 1/26*

U.S. Cl. 60—271 **1 Claim**



1. In a rocket motor having a nozzle including an entrance section, a throat section and an exit section, closure means for controlling the opening of said nozzle responsive to ignition of said rocket motor comprising:

a. a forward section disposed in said entrance section of said nozzle, said forward section having an ogival configuration having helical grooves on the outer surface thereof;

b. an intermediate section disposed in said throat section; and,

c. an aft section disposed in said exit section of said nozzle, said aft section having a solid frusto-conical configuration.

3,968,647
MULTIFLOW GAS TURBINE POWER PLANT

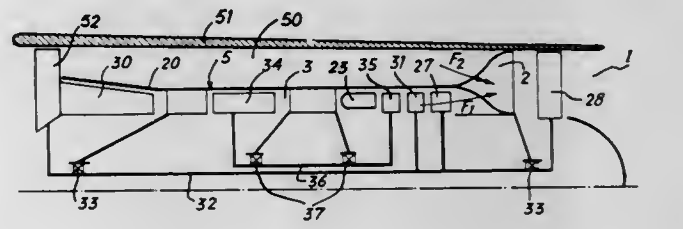
Serge Boudigues, Bagneux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 7, 1974, Ser. No. 467,793

Claims priority, application France, May 8, 1973, 73.16471

Int. Cl.² F02C *3/06;* **F02K** *3/04*

U.S. Cl. 60—262 **5 Claims**



1. A dual-flow gas-turbine jet propulsion engine of the kind subdivided into a primary duct and a secondary duct traversed in operation respectively by a primary gas flow and by a secondary air flow, comprising in combination (i) a fore unit which comprises:

a. a gas generator of the internal-combustion gas-turbine type including compressor means, combustion means and turbine means mounted in series flow arrangement in said primary duct, said gas generator being designed to deliver a gas flow at a first pressure, and

b. mechanical compression means extending in said secondary duct for compressing said secondary air flow to a second pressure lower than said first pressure; and (ii) an aft unit which comprises:

c. a super-expansion turbine separate and distinct from said turbine means and located in said primary duct downstream of said turbine means to receive the gas flow from said gas generator, said super-expansion turbine being designed to super-expand said gas flow from said first pressure down to a third pressure substantially equal to said second pressure of said secondary air flow,

- d. flow-mixer means communicating both with said primary duct downstream of said super-expansion turbine and with said secondary duct downstream of said mechanical compression means, for intermingling gas at said third pressure issuing from said super-expansion turbine with air at said second pressure issuing from said mechanical compression means, to deliver a gaseous mixture of said gas and said air,
- e. a recompressor arranged downstream of said flow-mixer means to be supplied in operation with said gaseous mixture and raise the same to a fourth pressure,
- f. drive means interconnecting said recompressor and said super-expansion turbine for driving said recompressor from said super-expansion turbine, and
- g. a jet propulsion nozzle extending downstream of said recompressor to be supplied with said gaseous mixture issuing therefrom at said fourth pressure, and issue a thrust-producing jet.

3,968,648
MANIFOLD REACTOR FOR AN AUTOMOBILE

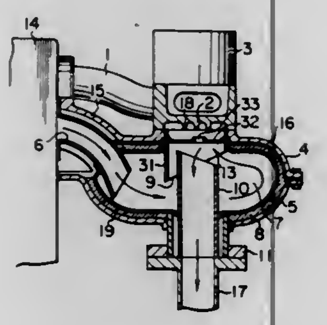
Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 13, 1974, Ser. No. 532,468

Claims priority, application Japan, June 6, 1974, 49-63344

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 60—282 5 Claims



1. A manifold reactor for an automobile comprising a reactor vessel which defines a reaction chamber having at least first and second oppositely located end portions, said vessel having a riser port communicating to a bottom wall of a riser portion of an intake manifold, said riser port being located between said first and second end portions and bordered with a liner having an obliquely cut end which presents an effective end face area toward said second end portion of said chamber, thereby fluid-dynamically confronting said second end portion, exhaust gas inlet ports connected to exhaust ports of an engine and opening to said chamber at said first end portion, and an exhaust gas outlet port connected to an exhaust gas pipe and opening to said chamber within a region of said riser port.

3,968,649
EXHAUST EMISSION CONTROL SYSTEM

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Continuation-in-part of Ser. No. 417,888, Nov. 21, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,700

Int. Cl.^{2} B01D *50/00*

U.S. Cl. 60—297 4 Claims

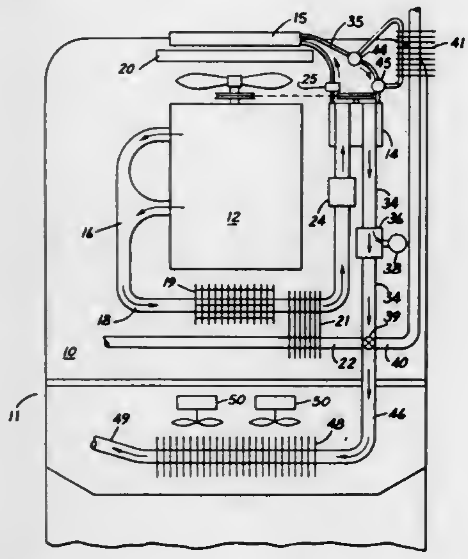
1. In an emission control system for treating the exhaust gas from an internal combustion engine of a moving vehicle, comprising, in combination:

means for initially cooling the exhaust gas from said engine,

means for adiabatically compressing said initially cooled exhaust gas,

means for cooling the adiabatically compressed exhaust gas, and means for work-expanding said cooled adiabatically compressed exhaust gas to further cool said exhaust gas,

the improvement wherein said adiabatically compressing means and said work-expanding means is a unitary rotary compressor-expander including a cylindrical rotor provided with a plurality of radially-extended vanes, said rotor rotating within a substantially elliptical stator having a compressor inlet port receiving said initially cooled exhaust gas, a compressor outlet port exhausting to said cooling means, an expander inlet port receiving said cooled exhaust gas, and an expander outlet port discharging said cooled exhaust gas, so that said exhaust gas is cooled to a temperature substantially below ambient to condense a substantial portion of the pollutants as a liquid or a solid phase separable from the expanded exhaust gas, and means for separating said separable phase containing said pollutants from the expanded exhuast gas.



3,968,650
FLUID FEED DEVICE COMPRISING A CONSTANT CYLINDER CAPACITY PUMP AND AT LEAST ONE VARIABLE CYLINDER CAPACITY PUMP

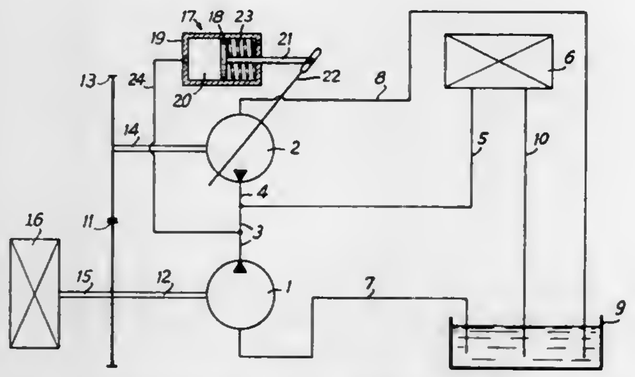
Serge B. Bacquie, La-Croix-Saint-Quen, and Jean G. Dagnaux, Villers-Saint-Paul, both of France, assignors to Societe Anonyme: Poclain, Le-Plessis-Belleville, France

Filed May 2, 1975, Ser. No. 574,106

Claims priority, application France, May 15, 1974, 74.16902

Int. Cl.^{2} F15B *11/16, 13/09*

U.S. Cl. 60—428 6 Claims



1. A device for feeding a load circuit with fluid under pressure through a pipe, comprising two pumps driven by one engine the maximum power of which is less than the sum of the maximum powers of the two pumps, one of the pumps being a constant cylinder-capacity pump and the other pump being a variable-cylinder-capacity pump provided with a regulator for regulating the value of its cylinder capacity, the said regulator comprising a jack having a movable member coupled to a member for regulation of the cylinder capacity of the pump, a chamber connected to the pipe, and a resilient return member acting on the movable member in opposition to fluid pressure in the chamber and tending to displace the movable member in the direction of regulation of the cylinder capacity to its maximum value, the characteristics of initial tension and stiffness of the resilient return member being such that during regulation of the variable-cylinder-capacity pump by the regulator the power absorbed by the variable-cylinder-capacity pump is a decreasing linear function of the pressure, the power absorbed decreasing for a given increase in pressure by an amount to equal in absolute value the corresponding increase in the power absorbed by the constant-cylinder-capacity pump, so that the maximum power absorbed by the two pumps is constant and equal to the maximum power of the engine.

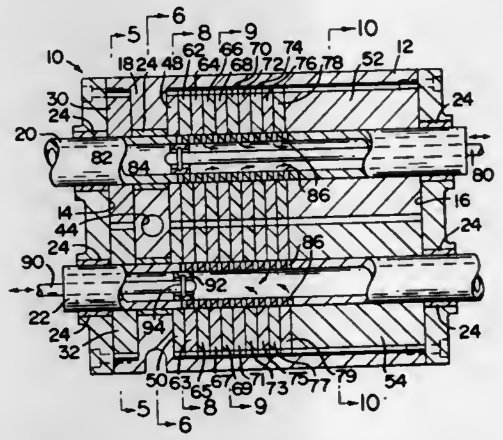
3,968,651
TRANS-CLUTCH TORQUE CONVERTER

Ralph Franklin Walworth, 226 13th Ave., NE., St. Petersburg, Fla. 33701

Filed July 2, 1975, Ser. No. 592,417

Int. Cl.^{2} F16D *31/04*

U.S. Cl. 60—487 10 Claims



1. A trans-clutch torque converter comprising

a housing having two aligned chambers therein,

parallel input and output shafts journalled in the housing and extending through said chambers,

a driven gear pump in one chamber of the housing with the gears thereof individually mounted on said shafts,

a first pair of interengaging input gears positioned on said shafts in said second chamber with the gear on said input shaft being secured thereto,

a pair of interengaging output gears mounted on said shafts in said second chamber with the gear on said output shaft being secured thereto,

at least one pair of idler gears on said shafts between the other sets of gears thereon,

hydraulic fluid galleries being formed in both of said chambers, and

connecting means for transferring the liquid output of said gear pump to the input gallery of the second chamber for transfer to the output gallery of said second chamber by rotation of said first pair of gears in one direction and return to said input gallery by drive of said pair of output gears in the opposite direction.

3,968,652
APPARATUS RESPONSIVE TO SOLAR ENERGY FOR PRODUCING POWER

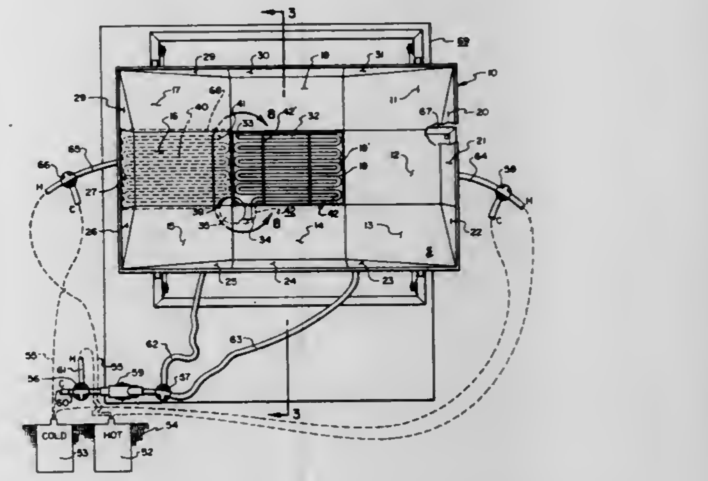
Donald M. Chevalier, 248 15th Ave. S., Great Falls, Mont. 59405

Filed June 9, 1975, Ser. No. 585,126

Int. Cl.^{2} F03G *7/02*

U.S. Cl. 60—641 9 Claims

1. A solar-powered, gas-turbine apparatus including, in combination, a screen having a central window; first and second heat-conductive hollow means for storing and releasing gas under pressure; a gas turbine interposed between and operatively communicating with said first and second means; track means mounting said first and second means for enabling the alternating disposition of one of said first and second means in registry position with said window; and an output drive coupled to said gas turbine.



3,968,653
APPARATUS FOR THE REMOVAL OF AFTER HEAT IN A SODIUM-COOLED FAST REACTOR

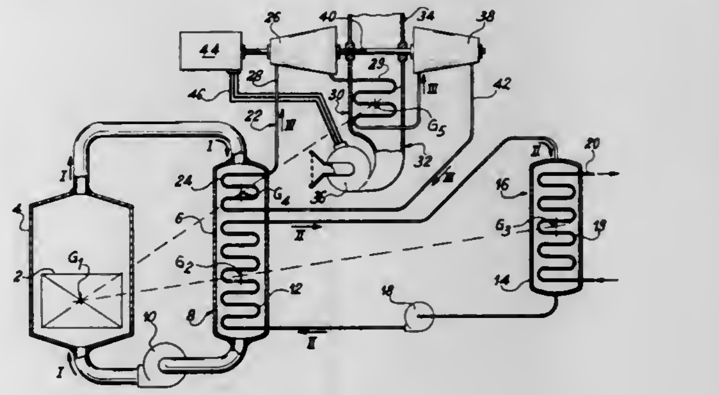
Pierre Charles Cachera, Saint-Germain-en-Laye, France, assignor to Electricite de France (Service National), Paris, France

Filed Sept. 24, 1974, Ser. No. 508,855

Claims priority, application France, Oct. 2, 1973, 73.35223

Int. Cl.^{2} E21D *3/04;* G21D *5/08*

U.S. Cl. 60—644 9 Claims



1. Apparatus for the removal of afterheat in a sodium-cooled fast reactor of the type in which each cooling loop comprises the primary sodium circuit which exchanges its heat with the sodium of a secondary circuit by means of an intermediate heat exchanger, wherein each cooling loop comprises in parallel with the secondary sodium circuit an auxiliary secondary circuit in which a chemically inert gas extracts heat from the primary sodium, said auxiliary secondary circuit being equipped with at least one gas turbine supplied with said inert gas and operating in a closed energy-producing gas cycle.

3,968,654
UNDERGROUND DRAIN PIPE COUPLING

Robert Sinbad Auriemma, R.D. No. 1, P.O. Box 104, Bethel, Pa. 19507

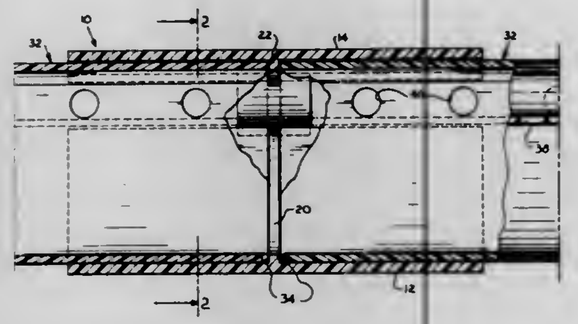
Filed Apr. 16, 1975, Ser. No. 568,398

Int. Cl.^{2} E02B *11/00*

U.S. Cl. 61—11 9 Claims

1. An underground drainage pipe coupling formed of stiffly flexible material and including an elongate trough cover adapted to closely overlie the troughs of underground drain pipes joined by the coupling and having spaced lips, an elongate roof cover overlying the trough cover and adapted to

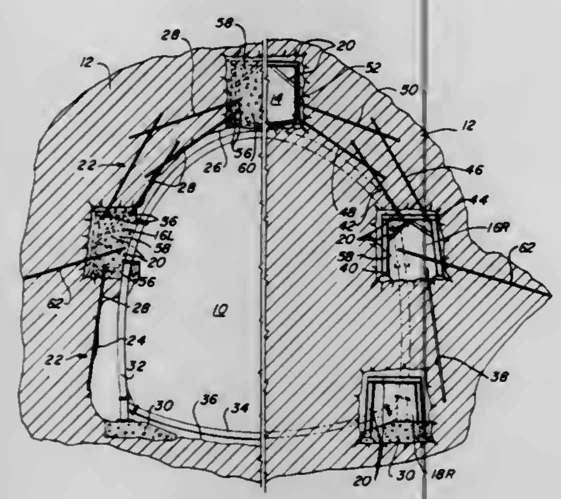
closely overlie the roofs of underground drain pipes joined by the coupling, means centrally located on the sides of the coupling joining the lip of the trough cover and the adjacent edge of the roof cover, and drainage separations between said



trough and roof covers to either side of said means, such separations permitting an unimpeded flow of water through water collection holes in the ends of the underground drain pipes joined by the coupling.

3,968,655
METHOD OF REINFORCING TUNNELS BEFORE EXCAVATION

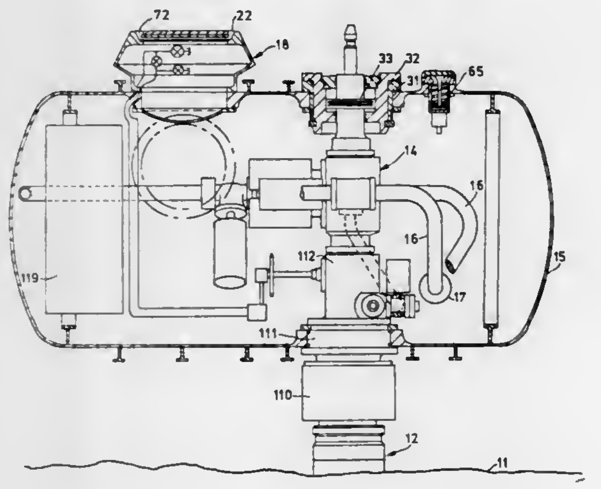
William K. McGlothlin, 1040 48th Ave., Greeley, Colo. 80631
Continuation of Ser. No. 379,124, July 13, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,242
Int. Cl.² E01G ***3/00***
U.S. Cl. 61—42 **5 Claims**



1. The method of reinforcing the perimeter rock bordering a tunnel formed through rock preparatory to excavating same which comprises the steps of: excavating a crown drift along the top of the proposed tunnel, excavating a pair of wall plate drifts along opposite sides of the proposed tunnel in spaced substantially parallel relation beneath and to the sides of the crown drift, drilling a longitudinally spaced series of small diameter bores downwardly and outwardly in both directions from within the crown drift along the ceiling of the proposed tunnel, drilling other series of similar bores upwardly from within the wall plate drifts along the walls of the proposed tunnel, inserting reinforcing rods into the bores of each series thereof a distance at least half way but less than all the way to the adjacent drift, said rods cooperating to define a metal curtain between drifts bordering the perimeter of the proposed tunnel, grouting the rods permanently in place within their respective bores, and filling the drifts with concrete.

3,968,656
METHOD OF WORKING UNDERWATER

Kenneth Ball, Hightown, England, assignor to Intertek Technical Services Limited, Liverpool, England
Filed Apr. 1, 1974, Ser. No. 456,769
Int. Cl.² B63C ***11/36***
U.S. Cl. 61–69 R **5 Claims**



1. A method of working underwater comprising descending in an air-filled transit capsule at atmospheric pressure to a permanently installed part of an underwater installation on which a function is to be performed and which is at a depth where the external pressure is greater than safe for working without the need for lengthy decompression, said part and said capsule having complementary means to form another capsule when said part and said transit capsule are joined, joining the transit capsule in fluid-tight sealing relationship to said installation part so as to have two capsules, the transit capsule filled with air at atmospheric pressure and said another capsule filled with water initially at said external pressure, reducing the pressure of the water in said another capsule to atmospheric by connecting said another capsule to the atmospheric pressure in the transit capsule, gaining access to, and performing the desired function on, the installation part whilst it is surrounded with water at atmospheric pressure, returning to the transit capsule, repressurizing said another capsule by disconnecting it from the atmospheric pressure in said transit capsule while connecting said another capsule with sea water at said external pressure, and returning to the surface in said transit capsule.

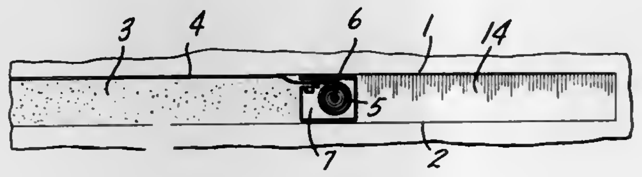
3,968,657
METHOD FOR SETTING OR RESETTING POLES IN THE GROUND WITH FOAMED POLYURETHANE RESIN

Richard C. Hannay, 8111 Renmark, Houston, Tex. 77070
Filed July 19, 1974, Ser. No. 490,086
Int. Cl.² E02D ***5/26***
U.S. Cl. 61—53.5 **10 Claims**

1. In the method of setting or resetting a pole or the like in earth with a foamed polyurethane composition which is formed in-situ by reacting organic polyisocyanate with an organic active hydrogen containing component reactive therewith; the improvement comprising utilizing polyurethane resin forming components including organic polyisocyanate and an organic active hydrogen containing material reactive therewith, said composition containing as an additional ingredient, a liquid water-immiscible component in an amount effective to allow formation of a foam of sufficient strength for holding the pole in the presence of water by inhibiting the reaction of the polyisocyanate with water.

3,968,658
METHOD AND APPARATUS FOR INTRODUCING WATER-PROOF SHEETING INTO THE GROUND IN A VERTICAL POSITION

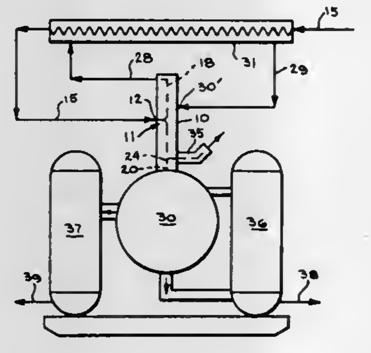
Heiner I. Hammer, Klecken, Germany, assignor to Schlegel Engineering GmbH, Hamburg, Germany
Filed Sept. 4, 1974, Ser. No. 502,953
Claims priority, application Germany, Sept. 12, 1973, 2345983
Int. Cl.² E02F ***5/22***
U.S. Cl. 61—72.1 **6 Claims**



1. A method of introducing a horizontally elongated flexible sheet material, more particularly a waterproofing sheeting, in a vertical position into a trench by sequentially excavating a plurality of trench sections of short length in comparison to the length of the sheet material to be used, comprising the steps of excavating a first trench section introducing a protective liquid into the first of said trenches, introducing said sheet material along with a pay out device for said sheet material into said first trench section such that the pay out device is adjacent the next subsequent trench section to be excavated and a portion of said sheet material is vertically adjacent one wall of said trench, excavating the next trench section and placing the material excavated from the next trench into said first trench section as the excavated material is removed from the next trench section, allowing the protective liquid to be displaced from the first trench section into the next trench section as the said first trench section is filled with excavated material from the next trench section, and paying out sheet material into the next trench section.

3,968,659
PROCESS FOR SEPARATING WATER AND LIQUID HYDROCARBONS FROM A FLUID FLOW MEDIUM

David W. Pilcher, 2544 Aspen, Pampa, Tex. 79605
Filed Sept. 9, 1974, Ser. No. 504,271
Int. Cl.² F25B ***9/02***
U.S. Cl. 62—5 **10 Claims**

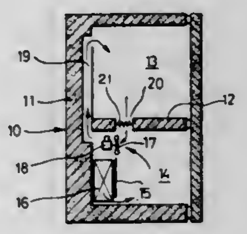


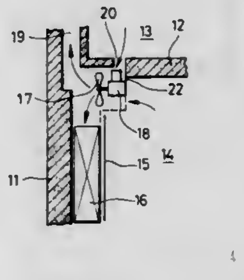
1. A method of treating a fluid flow having entrained liquids comprising the steps of:

a. conducting the fluid flow through a heat exchanger in a single pass;
b. conducting the fluid flow from the heat exchanger to a vortex generation chamber in a housing in a single pass to split the fluid flow into a hot stream and a cold stream;
c. conducting one of the streams to the heat exchanger in a single pass for heat transfer relationship between the stream and the fluid flow;
d. conducting the cold stream to a vessel to condense and separate the entrained liquids therefrom in a single pass; and
e. discharging the resulting cold stream from the vessel.

3,968,660
COOLING ARRANGEMENT FOR A NO-FROST REFRIGERATOR

Klaus Amann, and Wolfgang Dienemann, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich, Germany
Filed June 28, 1974, Ser. No. 484,334
Claims priority, application Germany, June 29, 1973, 2333158
Int. Cl.² F25D ***21/04, 17/06***
U.S. Cl. 62—275 **7 Claims**

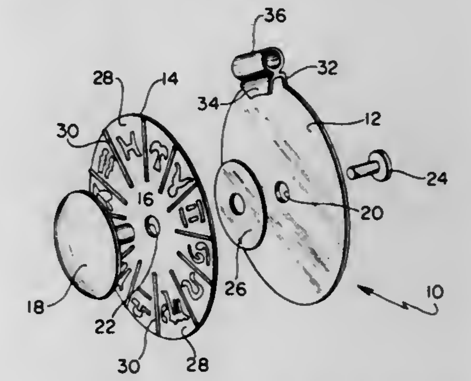




1. A cooling arrangement, particularly for a no-frost refrigerator, comprising a heat-insulating housing containing air in a first zone in which the air is relatively warmer and more humid, and in a second zone in which the air is relatively cooler and less humid; passage means including a mixing region for conducting at least a portion of the more humid air from said first zone towards said second zone and to said mixing region; mixing means for causing said portion of humid air from said first zone to be mixed with the air in said second zone; and means for heating and lowering the relative moisture content of said portion of humid air from said first zone prior to the mixing by said mixing means, so that the formation of fog and ice in said mixing region is prevented, said heating means comprising a motor associated with said mixing means.

3,968,661
JEWELRY HAVING ROTATABLE INDICIA-BEARING DISC AND INDICATING MEANS

Francis E. Williams, North Scituate, R.I., assignor to Carl-Art, Inc., Providence, R.I.
Filed Sept. 23, 1974, Ser. No. 508,268
Int. Cl.² A44C ***25/00***
U.S. Cl. 63—31 **1 Claim**



1. An ornamental article adapted to be worn on the person, comprising a flat, rigid, generally circular back plate, a generally circular front disc rotatably mounted on said back plate, means on the front surface of said disc defining a plurality of

substantially equal sections located adjacent the outer periphery of said disc, each section having a different form of ornamentation provided therein, and indicating means fixedly carried by said back plate and having a portion located adjacent the periphery of said disc, said portion corresponding generally to the outer peripheral width of said sections, whereby said disc may be manually rotated until a desired section is in alignment with said indicating means, said indicating means comprising a reversely bent, integral extension of said back plate, and means fixedly secured to the top of said indicating means for receiving a neck chain or the like, whereby when said article is suspended during normal use, said indicating means will automatically be located at the top of said article, said receiving means comprising an elongated tube extending laterally across the top of said indicating means and substantially co-extensive therewith, the means for rotatably mounting said disc on said back plate comprising a pin extending centrally through said disc and plate, an enlarged head at the front of said pin overlying said disc and means at the back end of said pin securing said disc and plate together, and a plastic washer on said pin between said plate and disc, said washer causing a frictional drag to exist when said disc is rotated relative to said plate, said defining means comprising a plurality of integral, raised, radial ribs, and said enlarged head comprising a domed portion overlying the central portion of said disc, the peripheral edge of said domed portion engaging said ribs.

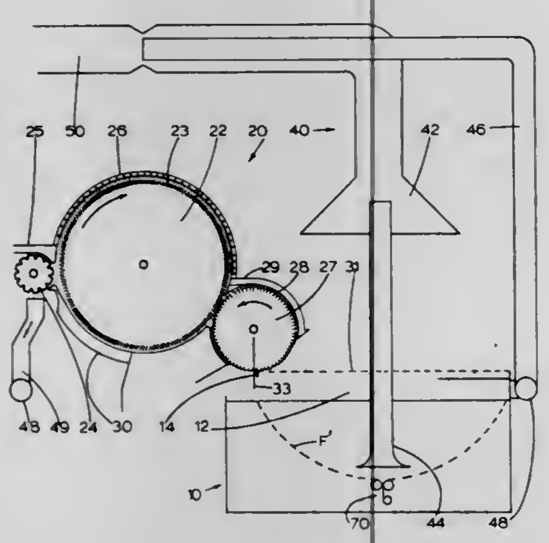
3,968,662
METHOD OF FEEDING FIBERS TO A PILE FABRIC CIRCULAR KNITTING MACHINE

Anthony F. Kunak; Wayne C. Jarvis, both of Spartanburg, S.C.; Rollie B. Kidd, and Bobby L. Williams, both of Morganton, N.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,410

Int. Cl.² D04B *9/14*; D01G *15/24*

U.S. Cl. 66—9 B **4 Claims**



1. A method of handling pile fibers preparatory to feeding the fibers to the needles of a pile fabric circular knitting machine comprising the steps of:

a. feeding discrete fibers between a fluted roll and a polished guide directly to a rotating clothed cylinder;
b. separating fibers by cooperation between clothing on said cylinder and said polished guide while avoiding any substantial embedding of fibers in said cylinder clothing;
c. separating and aligning said fibers on said rotating clothed cylinder during transport of same while precluding any substantial embedding thereof, said cylinder cooperating with a guide positioned adjacent thereto;
d. contacting only said fibers being carried on said clothed cylinder with fiber engaging elements rotating in a direction opposite the direction of rotation of said clothed cylinder and removing said fibers from said cylinder for transfer to the needles of the knitting machine, said fibers having passed through a closed system in transit from the fluted roll and polished guide through the means for removing the fibers from the rotating clothed cylinder; and
e. generating an air current through said closed system at least in part externally of the closed system, whereby said fibers float atop said cylinder clothing without any substantial embedding thereof.

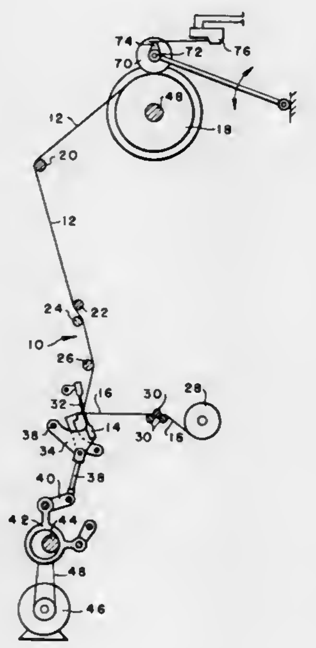
3,968,663
KNITTING MACHINE TENSION CONTROL

Charles Ray Masters, Walhalla, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 30, 1974, Ser. No. 510,436

Int. Cl.² D04B *23/00, 27/00*

U.S. Cl. 66—212 **4 Claims**



3. An improved warp knitting machine comprising: a warp beam having warp yarn thereon, a plurality of knitting needle means supplying yarn from said warp beam to said plurality of needles, means rotating said warp beam at pre-determined speed to deliver warp yarns to said knitting needles, means actuating said knitting needles to knit said warp yarn into knit fabric, means to take-up the knit fabric, means operably associated with said warp beam rotating means to adjust the speed of rotation of said warp beam, a pre-settable course counter means operably associated with said knitting machine to compare a pre-determined course count against an actual course, means to count the number of courses being knit and to supply such number to said course counter and means operably associated with said warp beam to actuate said course counter when said warp beam has rotated a pre-determined distance to cause said course counter to automatically cause said warp beam speed adjustment means to adjust the speed of said warp beam in accordance with the difference between the predetermined pre-set course count and the actual course count.

3,968,664
APPARATUS FOR FINAL IMMERSION WASHING OF FABRICS

Amedea Arioli, and Lorenza Arioli, both of Via Cristoforo Colombo 20, 21040 Gerenzano, Italy

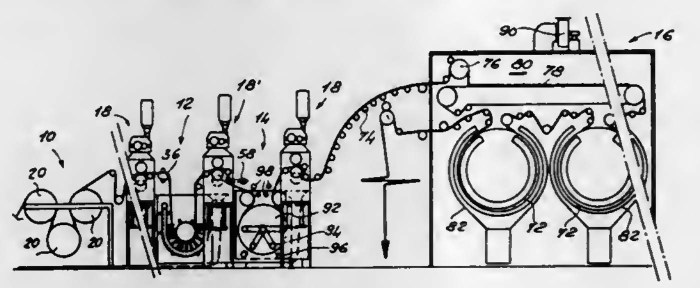
Filed July 25, 1974, Ser. No. 491,868

Claims priority, application Italy, July 27, 1973, 27195/73

Int. Cl.² D06F *29/00, 35/00, 3/00*

U.S. Cl. 68—22 R **11 Claims**

1. In an apparatus for the continuous immersion washing of an uninterrupted length of fabric tending to curl when subject to longitudinal pull, a combination comprising a plurality of washing stations including at least one washing container adapted to contain washing liquid at a predetermined level; a rotary member adapted to be partially immersed in the washing liquid and mounted for rotation about a horizontal axis; drive means for intermittently rotating said rotary member about said axis, said drive means including a pair of gears connected to opposite axial ends of said rotary member and a pair of endless elongated sprocket chains trained about said gears; a plurality of radially extending first vanes distributed about said rotary member; a plurality of second vanes extending transversely of and distributed along the elongation of said chains in a predetermined spacing and phase relationship, successive ones of said second vanes being respectively aligned in coplanar positions with successive ones of said first vanes in end-to-end relationship so as to form during rotation of said rotary member, at least in a region immediately above and below said predetermined level, substantially horizontal platforms upon which the fabric is deposited, adjacent pairs of said first and said second vanes forming essentially closed spaces when said rotary member moves through the washing liquid, and the fabric being maintained and carried essentially entirely between said adjacent pairs of vanes in said closed spaces in an essentially tensionless condition; and reciprocating means for feeding successive portions of the fabric intermediate said rotary member and said chains so as to deposit and fold the successive portions of the fabric overlapping relationship onto respective ones of said platforms formed above said predetermined level of the liquid.



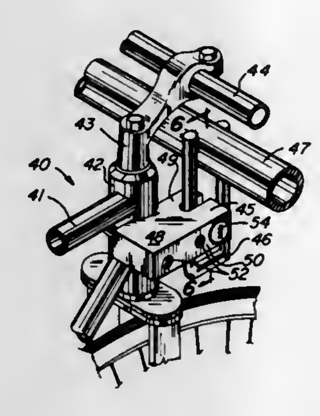
3,968,665
SLOTTED LOCKING DEVICE

Edward A. Kaufmann, 2785 N. Speer Blvd., Denver, Colo. 80211

Continuation-in-part of Ser. No. 393,828, Sept. 4, 1973, Pat. No. 3,832,871, which is a continuation-in-part of Ser. No. 349,489, April 19, 1973, Pat. No. 3,841,119. This application Aug. 23, 1974, Ser. No. 500,107

Int. Cl.² B62H *3/02, 5/00*; E05B *71/00*

U.S. Cl. 70—234 **3 Claims**



1. A bicycle locking device for securing a bicycle to an anchored elongated object, comprising:

a. a body including a U-shaped clamp means positioned around the frame of a bicycle with the ends of said clamp firmly secured in said body, and having a pair of outwardly extending, rigid arms spaced from each other to form an open slot therebetween, said spaced arms include aligned transverse apertures arranged near the outer end of said arms, said body being fixedly attached to the frame of said bicycle;
b. at least partially removable axial locking means arranged to be inserted into said apertures for releasably enclosing said anchored object between said spaced rigid arms, whereby said bicycle can be secured to prevent unauthorized removal; and
c. said axial locking means includes a lockable cylinder and an extension member mounted at one end of said cylinder and an extension whereby when the locking means is inserted into said apertures, the extension member is disposed across the opening between said arms to prevent removal of the bicycle from said anchored object.

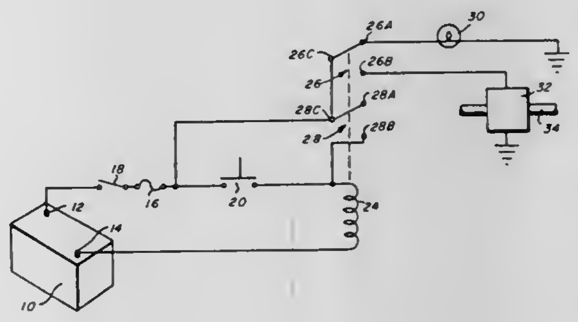
3,968,666
AUTO ANTI-THEFT DEVICE

Richard B. MacKinnon, Oakland Heights Bldg., Apt. 12, Exeter, N.H. 03833

Continuation-in-part of Ser. No. 370,358, June 15, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,095

Int. Cl. B60r *25/04*

U.S. Cl. 70—243 **13 Claims**

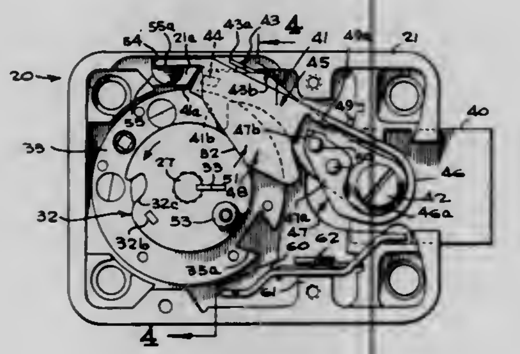


1. An anti-theft circuit for a vehicle having an ignition switch receiving energy from a battery and a fuel line for delivering the fuel to the engine of the vehicle, said circuit operable by an authorized operator to permit operation of the vehicle and comprising;

electromechanical relay means,
a switch means disposed in the vehicle in a position known by an authorized operator but not known by an unauthorized operator,
conductor means coupling said switch means in a series circuit with said ignition switch and electromechanical relay means,
an electrically-operated valve means disposed in the vehicle fuel line and having an open position and a closed position,
and an indicator means,
said electromechanical relay means including two sets of contacts at least one of which is responsive to an authorized operator causing both said ignition switch and said switch means to be in a closed position to couple energy to said relay means, for operating said valve means to its open position thereby permitting fuel flow through said valve means, and responsive to an unauthorized operator not closing said switch means to maintain said valve means in its closed position thereby preventing fuel flow through said valve means,
each said set of contacts including a common terminal and a pair of selective terminals with the indicator means coupling to one selective terminal of the one set and the valve means coupling to the other selective terminal of the one set whereby the indicating means is adapted to be in its indicating condition when said valve means is closed.

3,968,667
COMBINATION LOCK CONSTRUCTION

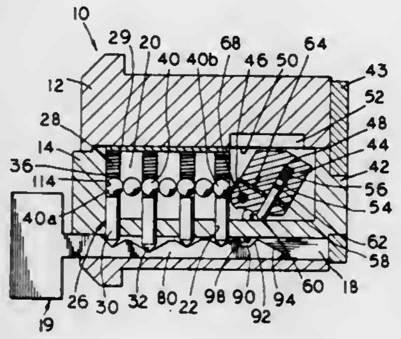
Klaus W. Gartner, Downey; Tim M. Uyeda, San Gabriel, both of Calif., and Steven Helesfai, Rochester, N.Y., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.
Filed July 2, 1975, Ser. No. 592,671
Int. Cl.^{2} E05B *37/08*
U.S. Cl. 70—303 A **17 Claims**



1. In a combination lock having a plurality of peripherally gated tumbler wheels loosely journalled for rotation about a common axis, a peripherally gated driving cam fixed on a spindle rotatable about said axis, a bolt movable between projected and retracted positions, a fence lever having a fence and a nose formation thereon, means pivotally connecting the fence lever to the bolt for arcuate movement between a raised inactive position spacing the fence and nose out of contact with the tumbler wheel and driving cam peripheries and a lowered active position locating the fence and nose in said gates, the driving cam being operatively coupled to said nose at said active position for retracting the bolt upon rotation of the driving cam, means providing a lost motion driving coupling between the driving cam and tumbler wheels for adjusting the angular positions of the tumbler wheels, and a rotatable dial on the spindle for rotating the driving cam to angularly adjust the tumbler wheels, and improvement comprising over-center spring means coupled to said fence lever normally positioned for holding the latter at said raised inactive position, a fence lever accelerator including an anvil surface portion and a hammer portion mounted on the fence lever with the hammer portion supported by a spring formation for relative movement between a stressed spring energy storage position spaced from said anvil surface portion and an impact position engaging the latter, the accelerator having an abutment formation extending into the path of movement of a portion of the driving cam providing means for shifting said hammer portion to the stressed position upon selective rotation of the driving cam, restraint means for releasably supporting said hammer portion at said stressed position, and means for releasing said hammer portion from such stressed position for rapid spring driven movement to impact against said anvil surface portion and impel the fence lever toward the driving cam to a position momentarily engaging the fence with the tumbler wheel peripheries, the over-center spring means being operative to continue urging the fence lever to said raised inactive position when the tumbler wheel gates are not aligned with the fence to immediately return the fence lever to said raised inactive position following the momentary engagement with a misaligned tumbler wheel periphery and the over-center spring means shifting to a position urging the fence lever to said lowered active position responsive to such impelling of the fence lever toward the driving cam when the tumblers are properly aligned therewith.

3,968,668
PICKPROOF CYLINDER LOCK

Norman Epstein, Carmel, N.Y., assignor to Norman Lock Co., Mahopac, N.Y.
Continuation-in-part of Ser. No. 388,428, Aug. 15, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,034
Int. Cl.^{2} E05B *17/04*
U.S. Cl. 70—364 A **9 Claims**

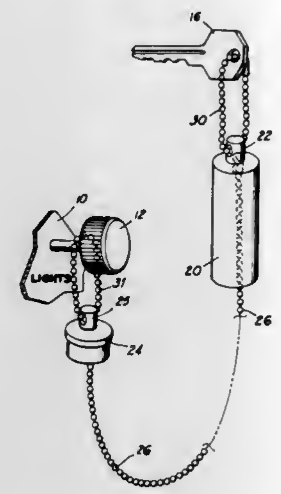


1. A locking mechanism characterized by:
a body having a longitudinally-extending key slot therein;
a lock-operating lever pivotally mounted within the lock body for movement between a normal locking position and a second position which it must occupy before the lock can be released;
biasing means urging said lock-operating lever to its normal locking position;
a key sized for insertion into said key slot and movable to a fully-inserted position therein;
a plurality of key-actuatable members movably mounted within said body;
means urging said key-actuatable members toward positions in which portions thereof are engageable by said key when inserted in said key slot, and from which positions said key-actuatable members are movable to predetermined unlocking positions by said key in its fully inserted position;
a lock-release element carried by each of said key-actuatable members, said key-actuatable members having a normal lock-closed position in which said lock-release elements are maintained out of operative association with each other, said key-actuatable members in their unlocking positions retaining said lock-release elements in operative engagement with each other, with each element exerting a force upon the adjacent elements and said force being transmitted to said lock operating lever in a direction to move the latter to said second position;
releasable retaining means for rigidly locking said lock-operating lever in its normal locking position against movement to its second position, said retaining means being engageable by said lock-release elements when the latter are in operative engagement with each other, whereby the force of said lock-release elements is transmitted to said retaining means for moving the latter to a position in which it releases said lock-operating lever for movement of the latter to its second position.

3,968,669
BATTERY SAVING KEY CHAIN

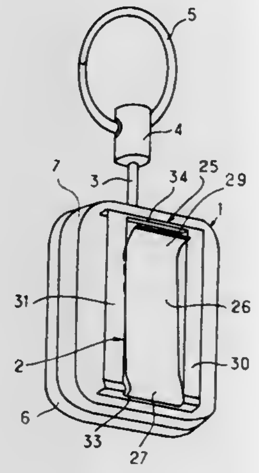
Berta W. Coleman, 1447 Northeast Expressway, NE., Atlanta, Ga. 30329
Filed Oct. 14, 1975, Ser. No. 621,658
Int. Cl.^{2} A47G *29/10*
U.S. Cl. 70—456 R **6 Claims**

1. A battery saving key chain for inhibiting unintentional usage of an automobile battery comprising a capsule having a tubular member with an open end and a cap member dimensioned to removably close said tubular member open end and thereby define a storage space within said tubular member, a flexible elongated connecting member sized for storage within said storage space loosely connecting said cap member with said tubular member; means for linking an automobile ignition key with one of said capsule members and means for suspending the other of said capsule members from an automobile headlight control while said ignition key is operatively engaged for ignition purposes.



3,968,670
SECURITY KEY-RING

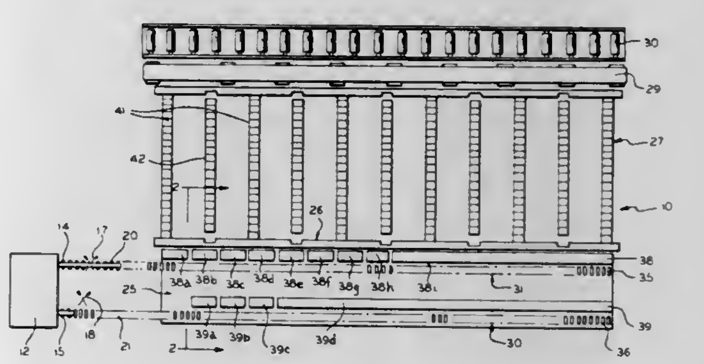
Michel Quenot, Besancon, France, assignor to Stanley-Mabo, Besancon, France
Filed Jan. 20, 1975, Ser. No. 542,441
Claims priority, application France, Feb. 2, 1974, 74.04209
Int. Cl.^{2} A47G *29/10*
U.S. Cl. 70—456 R **7 Claims**



1. Safety key-rings for use by prison guards, formed of two half-shells, male and female, fitting one into the other, containing in their free inside an automatic roll-up mechanism with a strong pull-back spring to the rolled-up position, the mentioned mechanism pulling with it a solid string over the upper edge of the housing, which is inseparably connected with a key-ring, characterized by the fact that the rear face of the housing has a metal attaching assembly in the shape of a clasp to hold it onto an outside plane, which clasp is safely anchored to its frame on the half-shells forming the housing, and further characterized by the fact that the metal attaching device is essentially composed by the clasp, with double purpose, containing a central blade in the shape of an elongated S, presenting a lower loop with its concave side turned toward the housing, a central part, which is practically flat, of considerable length, and a free upper part, curved in, its concave side turned toward the outside, to take up the blade, and by the fact that this blade holds onto a frame constituted by two narrow iron plates, placed longitudinally, between which is placed the blade, the flat irons being connected to each other by the cross pieces, one top the other bottom, perpendicularly to the plane of the mentioned flat irons.

3,968,671
COOLING BED METHOD

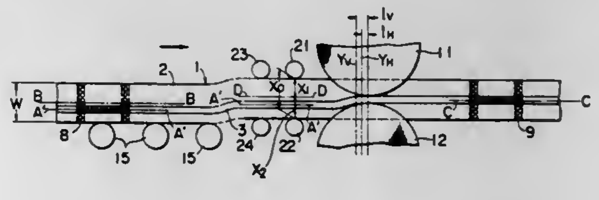
John F. Turner, West Lawn, Pa., assignor to Birdsboro Corporation, Birdsboro, Pa.
Division of Ser. No. 468,373, May 9, 1974, Pat. No. 3,916,660. This application Aug. 27, 1975, Ser. No. 608,038
Int. Cl.^{2} B21B *37/00, 43/00, 45/02*
U.S. Cl. 72—14 **6 Claims**



1. A method of simultaneously transferring pairs of elongate metal strands from pairs of inlets of a cooling bed, which metal strands precede further successive pairs of elongate metal strands, received from a rolling mill, the steps of sensing when said first metal strand has reached a predetermined position in one inlet, sensing when the next succeeding metal strand is received at a predetermined position of a second inlet, removing said first metal strand from said one inlet when the time lapse between said first and second metal strands is larger than a predermined time interval, and delaying the removal of said first metal strand from said one inlet if said time lapse is below a predetermined time and simultaneously removing said two metal strands from both of said inlets.

3,968,672
METHOD OF ROLLING SHAPED STEEL MEMBERS HAVING FLANGES AND APPARATUS THEREFOR

Yoshiro Kamogawa, and Akihiro Saoka, both of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Dec. 3, 1974, Ser. No. 529,107
Claims priority, application Japan, Dec. 5, 1973, 48-135965
Int. Cl.^{2} B21B *1/08*
U.S. Cl. 72—225 **11 Claims**



1. In a method of rolling shaped steel members having flanges and a web by a universal rolling mill having horizontal and vertical working rolls, the improvement which comprises engaging the shaped steel member at least along the tops and bottoms of the flanges at a point immediately ahead of the universal rolling mill with a force sufficient only for guiding the material to be rolled so that the center of the width of the flanges is substantially level with the pass line of said universal rolling mill before the material of the steel member being rolled is bitten into by the working rolls of said universal rolling mill, and causing the vertical rolls of the universal rolling mill to contact the flanges of said material to be rolled no later than the horizontal rolls contact the web of said material to be rolled.

3,968,673

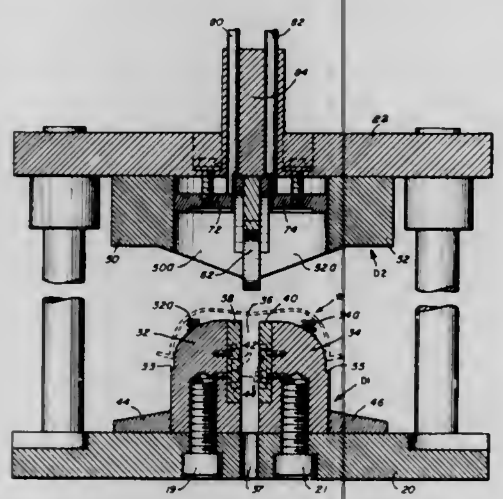
METHOD AND APPARATUS FOR PRODUCING STEEL BOX TOES TO BE USED IN SAFETY SHOES

William H. Ryan, Boca Raton, Fla., and Norman H. Evers, West Natick, Mass., assignors to William H. Ryan, Boca Raton, Fla.

Filed Apr. 25, 1975, Ser. No. 571,624

Int. Cl.² B21D *28/06, 31/00*

U.S. Cl. 72—331 **20 Claims**



1. In a method of making box toes for safety shoes in which a metal sheet material is subjected to pressure to produce a bowl-shaped workpiece having a pair of mirror-imaged toe cap parts surrounded by irregular outer edge portions, the steps which include cutting the workpiece to provide separated toe cap parts, and then trimming said out edge portions from the toe cap portions as they become separated from one another by progressively exerting shearing forces therearound.

3,968,674

APPARATUS FOR SIMULTANEOUSLY PRODUCING INNER AND OUTER RINGS IN HOT FORMER

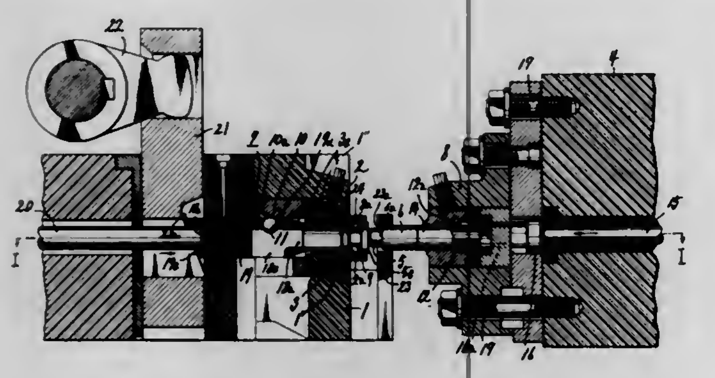
Tomio Ishida, Toyonaka, Japan, assignor to Sakamura Machine Co., Ltd., Osaka-Shi, Japan

Filed Aug. 5, 1975, Ser. No. 602,007

Claims priority, application Japan, Aug. 6, 1974, 49-90539

Int. Cl.² B21D *28/06, 45/04*

U.S. Cl. 72—334 **5 Claims**



1. An apparatus for use in a hot former to simultaneously produce an inner ring and an outer ring by cutting an elongated continuous steel round bar to a specified dimension, pressing the resulting piece by a forging machine into a workpiece including an annular portion and a smaller annular portion concentrically integrally projecting therefrom and separating the workpiece into a large annular member and a small annular member, the apparatus comprising an annular outer ring die fixedly mounted on a stationary base and having a recess for receiving the outer ring therein, an inner ring die in the form of a hollow cylinder into which the inner ring is fittable and inserted in the base in axially slidable manner, a movable ram disposed in opposing relation to the dies and having a mounting portion, an inner ring punch supported by the mounting portion and fittable into the inner ring die to punch out the inner ring, and an outer ring punch supported by the mounting portion and fittable into the outer ring die in end-to-end opposing relation to the inner ring die to separate an intermediate ring from the outer ring, the outer ring punch being fitted around the outer periphery of the inner ring punch and axially slidable, the outer ring punch having a front end movable forward and backward from the front end of the inner ring punch.

3,968,675

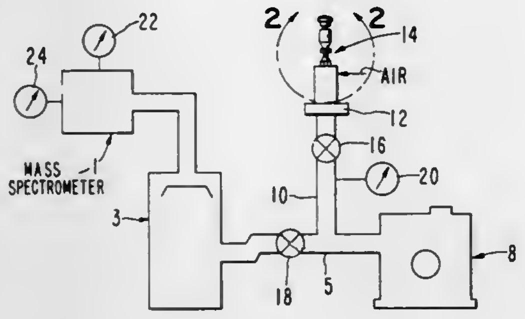
METHOD AND APPARATUS FOR PREPARING A MASS SPECTROMETER LEAK DETECTOR SYSTEM FOR OPERATION

Walton E. Briggs, Lynnfield, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed June 7, 1974, Ser. No. 477,248

Int. Cl.² G01M *3/04*

U.S. Cl. 73—1 G **6 Claims**



1. A method of preparing a mass spectrometer leak detector system for operation in testing for leaks, said method comprising the steps of establishing in said mass spectrometer a reduced pressure and then introducing substantially pure atmospheric air into said air system to provide in said mass spectrometer a partial pressure of the helium in said air sufficient to be detectable by said mass spectrometer while preventing the introduction of said air into the system in an amount which will damage said mass spectrometer.

3,968,676

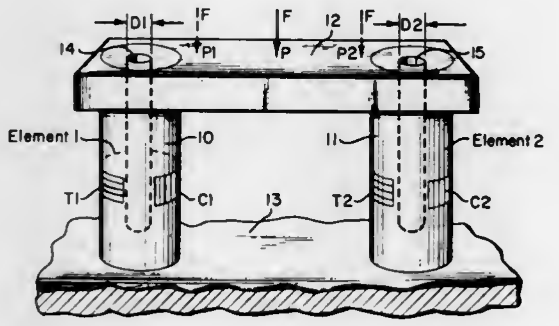
MECHANICAL EQUALIZATION OF STRAIN GAUGE SENSITIVITY

Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Filed Mar. 24, 1975, Ser. No. 561,108

Int. Cl.² G01L *1/22, 25/00*

U.S. Cl. 73—1 B **5 Claims**



1. A method of mechanically equalizing the strain gauge sensitivity of at least two spaced load elements supporting a platform on a fixed reference frame so that the output signal from strain gauges secured to the elements and connected in a strain gauge bridge circuit is the same for different positions of an applied load on the platform, comprising the steps of:

a. comparing the output signals from the bridge when a given load is first positioned off-center adjacent to one element and then shifted to an alternate position aajacent to another element; and,

b. progressively, physically removing material from at least one of the elements to change the sensitivity until the measured output signal is the same for all positions of the applied load.

3,968,677

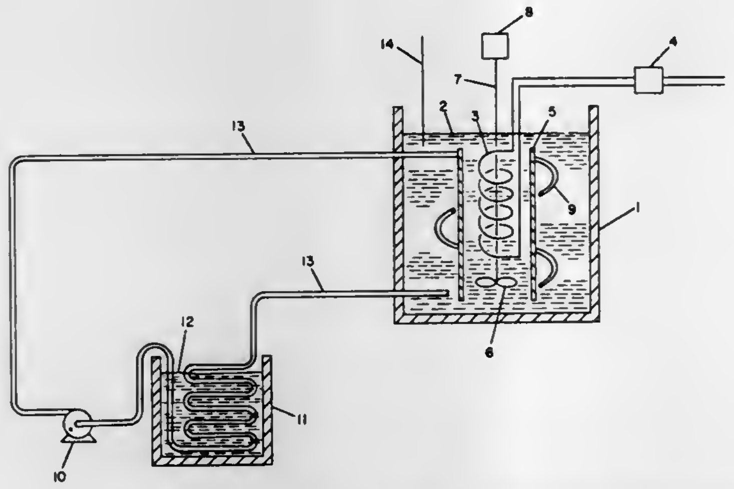
CONTINUOUS EVALUATION OF THERMAL STABILITY OF QUENCHING OILS

George F. Felton, Jr., Chadds Ford, and Robert E. Royer, Chester, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 12, 1975, Ser. No. 557,718

Int. Cl.² G01N *25/00*

U.S. Cl. 73—15 R **3 Claims**



1. A testing apparatus for use in evaluating the thermal stability of a liquid hydrocarbon oil which comprises:

a. means for providing a bath of the liquid hydrocarbon oil to be evaluated;

b. metallic member located entirely internally of said bath for heating said oil and means for heating said member;

c. mixing means located internally of said bath whereby rapid movement of said oil occurs within baffling means of (d), and means for energizing the mixing means;

d. baffling means partially enclosing the metallic member and the mixing means and the volume within the baffling means is relatively small to the total volume of the bath;

e. cooling means located outside said baffling means and located entirely internally of a said bath for maintaining the temperature of said oil external of said baffling means at a temperature substantially lower than the temperature of said member and means for maintaining cooling effect; and

f. said means for providing the bath, the metallic member, the mixing means, baffling means and cooling means are constructed of materials which do not chemically react with said oil; and

whereby the thermal stability of said oil can be determined.

3,968,678

METHOD OF DETERMINING THE RELATIVE AIR CONTENT IN AN AIR-CONTAINING LIQUID OR CREAM AND AN APPARATUS FOR CARRYING OUT THE METHOD

Ole Garne Krener, and Erik Nielsen, both of Hojbjerg, Denmark, assignors to O. G. Hoyer A/S, Aarhus-Hojbjerg, Denmark

Filed Mar. 27, 1975, Ser. No. 562,951

Claims priority, application Denmark, Apr. 5, 1974, 1911/74

Int. Cl.² G01N *7/00*

U.S. Cl. 73—19 **10 Claims**

1. Apparatus for determining the relative air content in a product flowing through a conduit in the form of air containing liquid or cream, said apparatus comprising:

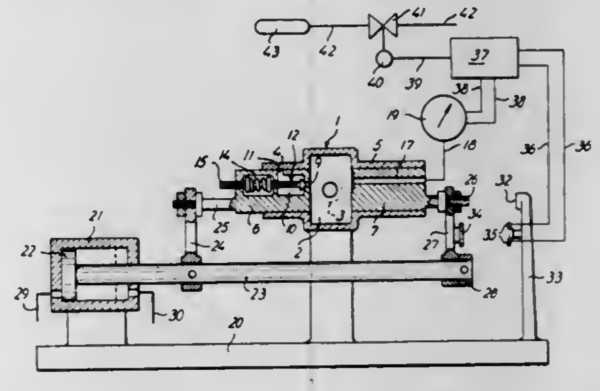
a. a housing having means for connecting the housing in a conduit for receiving a flow of the product,

b. a first cylinder and a second cylinder connected coaxially opposite one another to said housing and communicating with the interior of said housing,

c. a first piston axially displaceable with a tight fit in said first cylinder,

d. a second piston axially displaceable with a tight fit in said second cylinder,

e. a drive mechanism means connected to said pistons and arranged to displace said second piston between a first end position in which it is retracted into said second cylinder, and a second end position in which it is projected across the interior of said housing into said first cylinder to define, in cooperation with said first cylinder and said first piston, a sampling chamber, said drive mechanism means being further arragned to move said pistons axially towards one another when said second piston has entered said first cylinder,



f. overflow duct means extending from said sampling chamber and containing an overflow valve,

g. means for keeping said overflow valve closed when pressure in said sampling chamber is below a predetermined magnitude, and

h. means for recording the pressure in said sampling chamber.

3,968,679

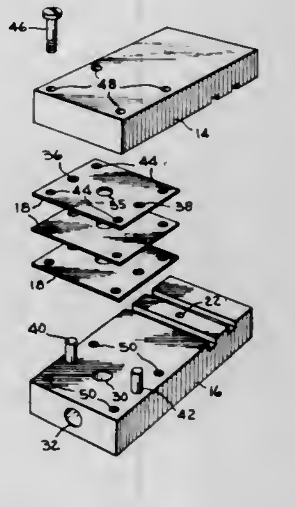
PNEUMATIC THICKNESS SENSOR HEAD

Frank Stephen Ralbovsky, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,876

Int. Cl.² G01B *13/06;* **B65H** *25/08*

U.S. Cl. 73—37.7 **3 Claims**



1. A pneumatic sensor head for monitoring the thickness of a continuously moving sheet of material passing therethrough, comprising:

a. first and second blocks having respective first and second aligned nozzles separated by a distance sufficient to receive the sheet of material passing therethrough;

b. means for admitting pressurized fluid to said first and second nozzles to sense an average variation in the back pressure therefrom proportional to a change in the thickness of the sheet of material being monitored;

c. a plurality of removable stacked laminated sheets positioned between said first and second blocks for adjusting the distance between said first and second nozzles, whereby to enable optimum operation of said sensor head over wide variations in nominal thicknesses of monitored sheets of material, each of said laminated sheets having a hole therethrough in alignment with the hole in an adjacent one of said laminated sheets to form a passageway therein; and

d. said admitting means comprising passageway means within said first block, passageway means and a port within said second block and said passageway formed within said stacked laminated sheets, said passageway within said first block being fluidically connected between said first nozzle and said passageway formed within said stacked laminated sheets, and said passageway means within said second block being fluidically connected to said second nozzle, said port and said passageway formed within said stacked laminated sheets.

3,968,680

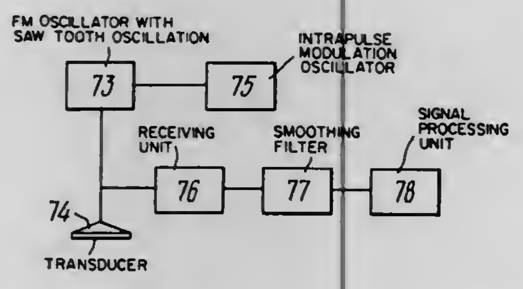
WIDE-BAND ULTRASONIC TRANSDUCER AND ITS USES

Alexeil Kharitonovich Vopilkin, ulitsa Vorovskogo, 20, kv. 9; Igor Nikolaevich Ermolov, Ryazansky prospekt, 19, kv. 50; Vladimir Ivanovich Ryzhov-Nikonov, Simonovsky val, 13, kv. 26, all of Moscow; Valery Ivanovich Ivanov, Bolnichny pereulok, 3, kv. 1, Podolsk Moskovskoi oblasti; Vladimir Izidorovich Ryk, pereulok Aksakova, 18, kv. 14, Moscow; Viktor Vasilievich Rakhmanov, Spartakovskaya ulitsa, 8, kv. 1, Kaliningrad Moskovskoi oblasti; Vladimir Dmitrievich Korolev, Volkov pereulok, 9, kv. 41, and Petr Yakovlevich Krasinsky, Malaya Filevskaya ulitsa, 40, kv. 31, both of Moscow, all of U.S.S.R.

Filed Feb. 25, 1975, Ser. No. 552,782

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.8 R **16 Claims**



1. A wide-band ultrasonic transducer comprising: a body of revolution; at least two electrodes connected to said body of revolution; said body of revolution being made of a material possessing piezoelectric properties and having one flat end face surface, its other end face surface, opposite said flat end face surface, being profiled; the profile of said profiled end face surface of said body of revolution being made in accordance with the following relationships:

$$h' = -\rho \cdot h \cdot k\,(f)$$

where

ρ is the radial coordinate;

h is the thickness of said transducer, corresponding to the radial coordinate;

$k(f)$ is the frequency characteristic of said transducer;

h' is the derivative of the thickness h of the transducer with respect to the radial coordinate;

said electrodes being applied onto said flat end face surface and said profiled end face surface of said body of revolution.

3,968,681

TESTING ARTICLES

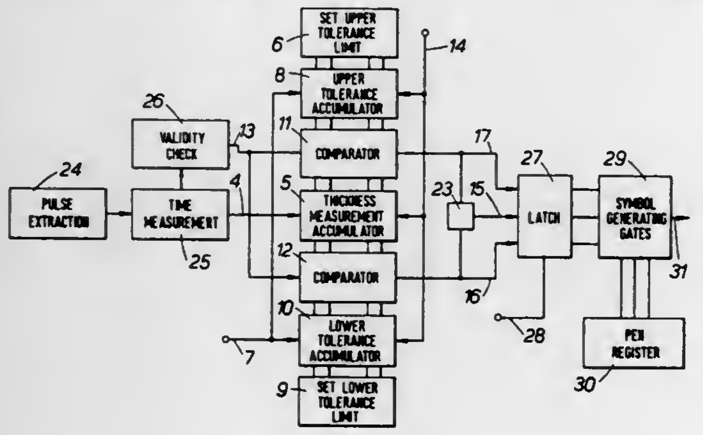
Alexander Rankin Cornforth, Stanion, and Peter John Trigg, Corby, both of England, assignors to The British Steel Corporation, London, England

Filed June 12, 1974, Ser. No. 478,488

Claims priority, application United Kingdom, June 19, 1973, 29000/73

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.5 R **16 Claims**



1. Apparatus for testing an article for deviation thereof from an optimum thickness range including a thickness measuring device mounted for scanning movement across the article; means for making a plurality of thickness measurements of the article during each scanning movement of the thickness measuring device; electrical means for accumulating the thickness measurements of successive groups of a predetermined theoretical number of measurements during each scan and comparing the sum of accumulated measurements so obtained with the sum of an equivalent accumulation of predetermined upper tolerance thickness values and with the sum of an equivalent accumulation of lower tolerance thickness values, and visual recording means for recording each group comparison with alternative symbols indicative of whether the accumulated thickness measurements for each group is within, greater than or less than the optimum thickness range.

3,968,682

PENETROMETERS

Charles Marc Marie Saint-Remy Pellissier, Avignon, France, assignor to Societe Anonyme Fondasol-Technique, Avignon, France

Filed Jan. 24, 1975, Ser. No. 543,951

Claims priority, application France, Jan. 24, 1974, 74.03868

Int. Cl.² G01N *33/24, 3/00*

U.S. Cl. 73—84 **4 Claims**

1. A penetrometer probe comprising:

a central point;

a rod connected to said point and extending the length of the probe;

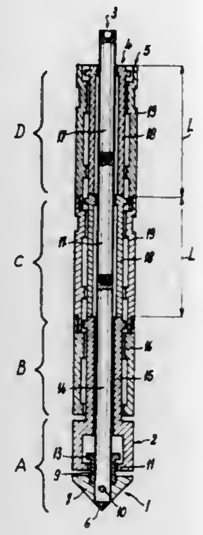
a frustoconical annular member surrounding said point;

a shear pin traversing said member and said point for joint movement of said member and said point upon displacement of the latter by said rod;

a sleeve circumferentially spaced from said rod in the region of said point and extending axially along said rod directly adjacent thereto over the length of the probe;

an outer tube surrounding said sleeve and terminating above said point while extending the length of said probe, said rod, said sleeve and said outer tube being connectable to a penetration measuring device; and

coupling means in the space between said sleeve and said rod in the region of said point for conecting said sleeve and said member in force-transmitting relation enabling shearing of said pin, said coupling means comprising an annular part affixed to said member and surrounding said rod, said annular part being of a diameter less than that of the sleeve at the lower end thereof and having an annular outwardly extending shoulder said annular part terminating below the bottom of said outer tube, said lower end of said sleeve being formed with an inwardly extending part engageable with said shoulder upon relative axial displacement of said sleeve and said rod to cause said shearing of said pin.



3,968,683

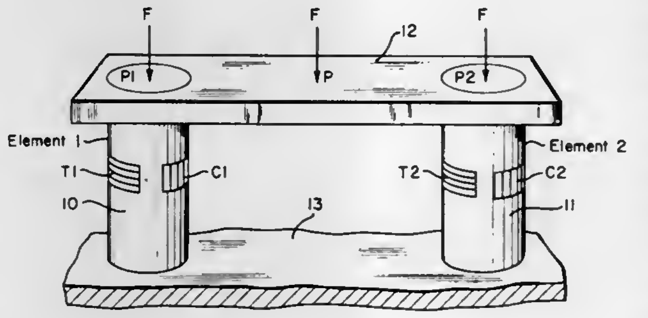
ELECTRICAL EQUALIZATION OF LOAD ELEMENT SENSITIVITY

Alfred Neuman Ormond, 11969 F. Rivera Road, Sante Fe Springs, Calif. 90670

Filed June 2, 1975, Ser. No. 582,729

Int. Cl.² G01L *1/22*

U.S. Cl. 73—141 A **7 Claims**



1. A method of electrically equalizing the strain gauge sensitivity of at least two spaced load elements supporting a platform so that the output signal derived from at least four strain gauges, wherein each load element has secured to it one compression strain gauge and one tension strain gauge, is the same for different positions of a given load on the platform, comprising the steps of:

a. providing a strain gauge bridge circuit having four legs including said four strain gauges, the two compression gauges being in opposite legs and the two tension gauges being in the remaining opposite legs;

b. applying an input voltage to two opposite corners of the bridge;

c. deriving an output signal from the remaining opposite corners of the bridge;

d. comparing the output signals from the bridge when a given load is first positioned on said platform off-center closer to one element than the other and then shifted to an alternate position closer to another element than the one element;

e. shunting a compression gauge and a tension strain gauge in the leg of said bridge associated with the element exhibiting the most sensitivity with first and second substantially equal resistances of value such that the measured output signals are the same for all positions of said given load on said platforms; and

f. varying the value of one of said resistances relative to the other only to the extent necessary to avoid any shifting of the zero point of said output signal as a consequence of differences in the electrical properties of said strain gauges.

3,968,684

APPARATUS AND METHOD FOR DETERMINING OPTIMUM DIRECTION OF PROCESS OF SAILING VESSELS

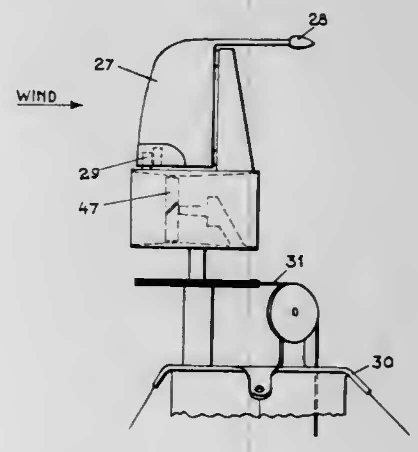
Raoul Maria Johann Ottokar Karl Hafner, Clappers, Backwell Hill Road, Backwell, Bristol, England

Filed Jan. 6, 1975, Ser. No. 538.727

Claims priority, application United Kingdom, Jan. 7, 1974, 676/74

Int. Cl.² G01C *21/20*

U.S. Cl. 73—178 R **13 Claims**



1. A method for use in determining a figure of merit regarding the course of a vessel in sailing from one point to a second point, comprising setting a wind vane, having a mean position between two limiting positions, relatively to the vessel with said mean position at a required angle of apparent wind with respect to the vessel, integrating of deviations of the wind vane from said mean position while steering the vessel to maintain said integration substantially at a zero value, measuring the angle of leeway between the direction of heading of the vessel and the course of the vessel, obtaining the sum of said required angle of apparent wind and said angle of leeway, using means providing a digital display to measure the distance covered by the vessel relative to the water in a given space of time, simultaneously measuring the distance covered by the vessel relative to air in said space of time, obtaining the quotient of said firstmentioned distance divided by said second-mentioned distance, selecting an appropriate one of three charts allocated respectively to beating, reaching and running modes of sailing, each said chart presenting a series of curves allocated to different figures of merit and having co-ordinates representing (*a*) the sum of the required angle of apparent wind and the angle of leeway and (*b*) the quotient of the first-mentioned distance divided by the second-mentioned distance and deriving a figure of merit from said chart based on the obtained sum and the obtained quotient.

3,968,685

TRANSISTOR ANEMOMETER

Lloyd E. MacHattie, Willowdale, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence

Filed Feb. 6, 1974, Ser. No. 439,997

Claims priority, application Canada, Feb. 16, 1973, 163897

Int. Cl.² G01F *1/68*

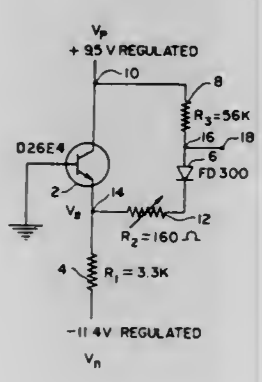
U.S. Cl. 73—204 **3 Claims**

1. An anemometer comprising:

a. a transistor connected in a transistor circuit;

b. semiconductor diode compensating means connected in parallel with said transistor;

c. means for obtaining an output voltage representative of the difference between the forward voltage drop across the base-emitter junction of the transistor and the voltage drop across said semiconductor diode, whereby said output voltage is substantially independent of the ambient temperature and is proportional to the temperature rise of said transistor above the ambient temperature; and



wherein the base electrode of the transistor is connected to ground potential, wherein the collector electrode of the transistor is connected to a voltage V_p, wherein the emitter electrode of the transistor is connected through a resistor of resistance R_1 to a voltage V_n, wherein the semiconductor diode is connected on one side through a resistor having a resistance R_2 to the emitter electrode of said transistor and on the other side through a resistor having a resistance R_3 to the collector electrode of said transistor, whereby the transistor dissipation is given by the formula;

$$(V_p - V_e)\left[\frac{V_e - V_n}{R_1} - \frac{V_p}{R_3}\right]$$

whereby V_e is the forward voltage drop across the base-emitter junction of the transistor, and wherein an output terminal is connected to the junction of said diode and the resistor having a resistance R_3 whereby said output voltage is obtained at said output terminal and is the difference between V_e and the voltage drop across said semiconductor diode.

3,968,686
FLOW INDICATOR

Allen O'Neal, Park Forest, Ill., assignor to Libby, McNeil & Libby, Chicago, Ill.

Filed Sept. 24, 1974, Ser. No. 508,875
Int. Cl.² G01F ***1/20***

U.S. Cl. 73—207 **9 Claims**

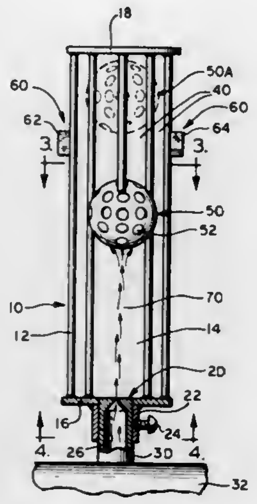
1. A flow indicator for measuring the fluid flow through a pressure cooking vessel bleeder, said indicator comprising:

an elongated housing having a fluid passage formed therethrough;

a fluid inlet opening disposed at one end of said passage and having a means for vertically securing said housing to said bleeder so that a fluid flow connection exists between said bleeder and fluid inlet opening;

a lightweight perforated indicator ball disposed within said passage; and

vertical slots having a width smaller than the diameter of said ball formed along the length of said housing and opening into said passage thereby providing for the external observation of the position of said ball with said passage and allowing fluid to escape from said passage whereby said ball is suspended in said fluid flow.

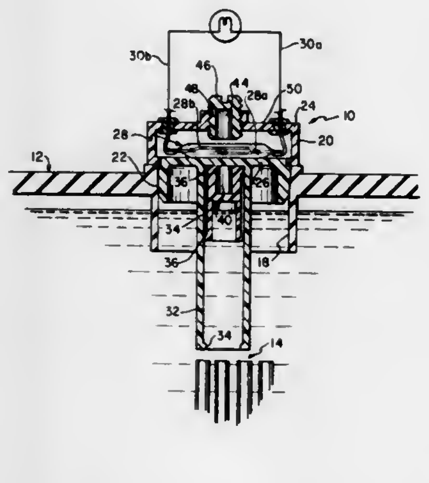


3,968,687
BATTERY ELECTROLYTE INDICATOR DEVICE

Ronald C. Fester, Rutherford, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed May 23, 1975, Ser. No. 580,480
Int. Cl.² G01F ***23/12***

U.S. Cl. 73—291 **9 Claims**



1. A device for determining the level and/or specific gravity of an electrolyte in a wet storage battery having an opening into a cell area, said device comprising:

a housing for fitting within said opening,

a magnetically actuated switching means carried by the housing,

float means positioned to communicate with and be moved by the electrolyte in accordance with its level and/or specific gravity,

a first permanent magnet means carried by said float means, said first permanent magnet means located with respect to said switching means to exert a magnetic force thereon, said first permanent magnet means causing said switching means to switch from a first to a second condition when said float means reaches a predetermined location in said battery electrolyte, and

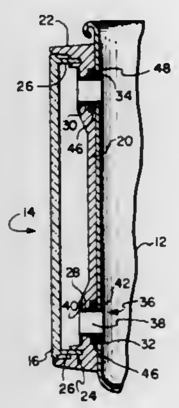
second permanent magnet means carried by said housing and located with respect to said switching means and said first permanent magnet means to exert a magnetic force on said switching means to counteract that of the first permanent magnet means to thereby adjust the position of the predetermined location of said float means where the switching action takes place.

3,968,688
LIQUID LEVEL GAUGE

John L. Eaton, Delanco, N.J., and John C. Fagan, Philadelphia, Pa., assignors to SCM Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,505
Int. Cl.² G01F ***23/02***

U.S. Cl. 73—328 **3 Claims**



1. A liquid level gauge for a generally cylindrical, thin-walled vessel comprising:

a generally rectangular, hollow housing having at least one transparent wall and a separate base wall engaging and conforming to said vessel along the length thereof;

said transparent wall having an integrally-formed flange extending therefrom;

said base wall having a flange formed with an integral slot therein for receiving said flange of said transparent wall when said walls are assembled;

a sealant securing said flange of said transparent wall to said base wall in a liquid tight manner;

a port in said base wall adjacent a corresponding port near the bottom of said vessel; and

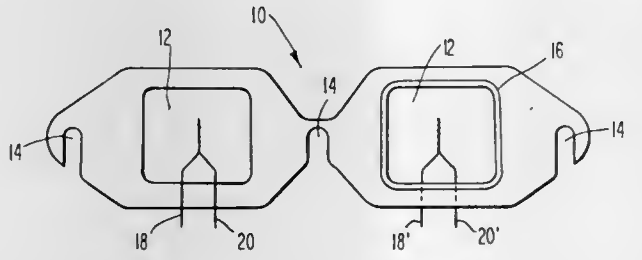
an eyelet with a flange on each end engaging the interior surface of said vessel and the exterior surface of said base wall, respectively, for providing liquid communication between said vessel and said gauge and for securing said gauge to said vessel without substantially reducing the liquid opening defined by said ports.

3,968,689
MOUNTING THERMOCOUPLES IN INTERNAL COMBUSTION ENGINES

Ervin Leshner, Cherry Hill, N.J., assignor to Fuel Injection Development Corporation, N.J.

Filed June 30, 1975, Ser. No. 591,608
Int. Cl.² G01K ***1/14, 7/04, 13/02***

U.S. Cl. 73—341 **13 Claims**



1. Apparatus for sensing the temperature of a stream of gas in an internal combustion engine having intake and exhaust ports, intake and exhaust manifolds and fastening means for coupling the manifolds to the ports, comprising:

a gasket defining a plurality of port-registering apertures which correspond to at least some of the ports for sealingly engaging and being compressed between a manifold and a surface surrounding an engine port; and

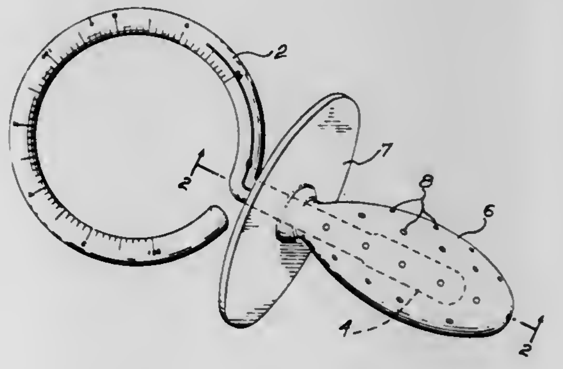
a plurality of thermocouples each comprising two wires of dissimilar metals joined at one end thereof to form a junction, said wires traversing portions of and affixed to said gasket so that each of said junctions extends within ones of said aperture.

3,968,690
COMBINED INFANT PACIFIER AND THERMOMETER

Michel Blouin, 2815 des Pruches St., Orsainville, Quebec, and Léo Mercier, 1778 Bergemont St., Quebec, Quebec, both of Canada

Filed Feb. 12, 1975, Ser. No. 549,224
Int. Cl.² G01K ***1/14, 5/02***

U.S. Cl. 73—343 R **4 Claims**



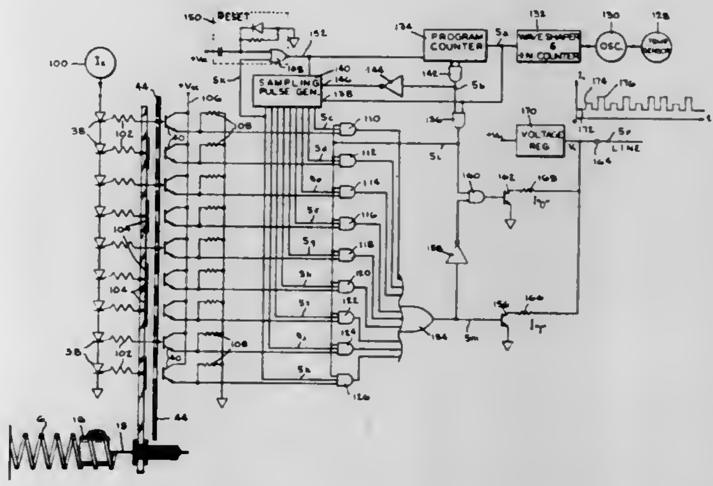
1. A combined pacifier and mouth thermometer device comprising a liquid thermometer tube including a liquid bulb portion having an inner open end and an outer closed end, a temperature display portion joined to the inner open end of the liquid bulb portion along said thermometer tube, a flexible nipple mouth-piece freely surrounding the outer end of said liquid bulb portion and having apertures therethrough placing the bulb portion in open commumication with the exterior of the mouth-piece, and a stop ring secured over said tube at the junction between said bulb and said temperature display portions.

3,968,691
ENVIRONMENTAL CONDITION SENSING APPARATUS

Hayati Balkanli, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Mar. 13, 1974, Ser. No. 450,819
Int. Cl.² E21B ***47/06***

U.S. Cl. 73—345 **11 Claims**



1. Environmental condition responsive apparatus comprising:

means for sensing a first environmental condition, including means for providing a binary coded word having at least two distinct code states the permutation sequence of said code states indicative of the first environmental condition sensed,

means for sensing a second environmental condition, including means for providing a timing signal having a frequency indicative of the second environmental sensed, and

means connected to receive said timing signal and said binary coded word for providing a composite signal indicative of the said first and second environmental condition, said composite signal having a code permutation sequence indicative of the first environmental condition sensed and a binary code sequence frequency indicative of the second environmental condition sensed.

3,968,692
THERMOSTATIC EXPANSIBLE MATERIAL-WORKING ELEMENT

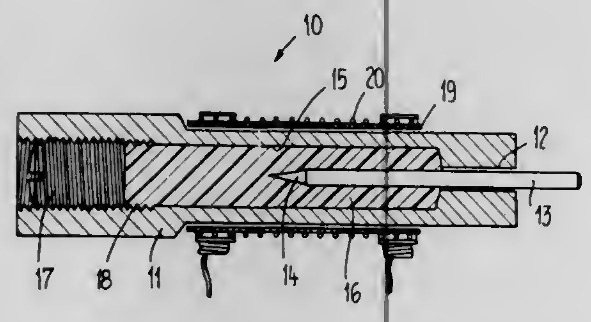
Ernst Blättler, Stafa, and Werner Roner, Feldbach, both of Switzerland, assignors to Elektrowatt AG, Zurich, Switzerland

Filed Dec. 30, 1974, Ser. No. 537,395

Claims priority, application Switzerland, Jan. 11, 1974, 327/74

Int. Cl.^{2} G01K *5/48*

U.S. Cl. 73—363 **9 Claims**



1. A thermostatic expansible material-working element, comprising a housing having an opening and provided with an internal compartment, a molded body constituted by a thermally expansible non-elastomeric fluorinated hydrocarbon material located within said internal compartment of the housing, a substantially pin-shaped work piston which is pointed at one end, said work piston extending through said opening of the housing by means of its pointed end into the expansible material such that a portion of the circumference of the work piston and its pointed end are surrounded by the expansible material, said work piston, upon thermal expansion of the thermally expansible material, being squeezed by the expansible material and displaced by virtue of the squeezing action in a direction through said opening of the housing, said molded body predominantly being formed of a member selected from the group consisting essentially of polytetrafluoroethylene, polytrifluoroethylene and polytetrafluoroethyleneperfluoropropylene.

3,968,693
OPEN-LOOP DIFFERENTIAL-PRESSURE TRANSMITTER

Masahiro Kazahaya, Southampton, Pa., assignor to Fischer & Porter Co., Warminster, Pa.N

Filed May 21, 1975, Ser. No. 579,712

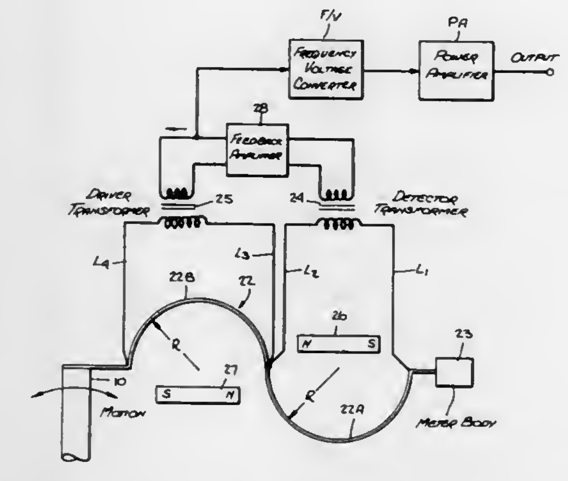
Int. Cl.^{2} G01L *9/16*

U.S. Cl. 73—398 R **16 Claims**

1. An open-loop force-beam differential pressure transmitter for producing an electrical signal representing differential pressure, said transmitter comprising:

A a measuring element including a meter body having a chamber, a force-beam mounted on a fulcrum, the lower portion of the beam below the fulcrum extending into said chamber and the upper portion thereof above the fulcrum extending outside the meter body, diaphragm means in said meter body responsive to the difference in pressure between high and low pressure inputs to produce an input force, and means to apply said force to the lower end of the beam to cause deflection of said beam about said fulcrum to a degree depending on the pressure difference,

B at least one range spring, one end of said spring being attached to a point on the upper portion of said beam and the other end to a fixed point, said spring restraining the movement of said beam to an extent whereby the movement of the beam in the measuring range of the instrument, though it exceeds about 0.001 inches, is slight and is substantially linear with respect to the applied input force, and



C a beam motion detection element coupled to the upper end of said beam and including means responsive to said slight beam motion to convert said motion into a corresponding electrical signal.

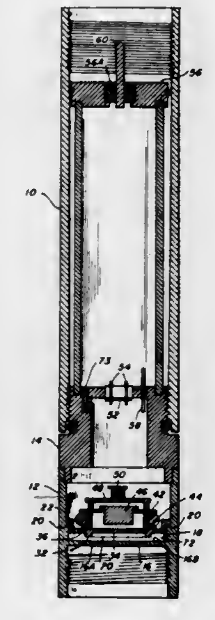
3,968,694
GAUGE FOR REMOTELY INDICATING THE PRESSURE OF A SUBTERRANEAN FORMATION

Kenneth K. Clark, Tulsa, Okla., assignor to Geophysical Research Corporation, Tulsa, Okla.

Filed Apr. 21, 1975, Ser. No. 569,945

Int. Cl.^{2} G01L *9/12, 7/08;* H01G *7/00*

U.S. Cl. 73—398 C **8 Claims**



1. A gauge for remotely indicating pressure, comprising:

a tubular housing having a closed end forming an integral diaphragm, the exterior surface of which is subjected to the pressure to be measured in the housing having a reduced internal diameter portion adjacent said diaphragm forming an integral circumferential ledge;

a cup shaped stator element of insulating material, the stator element having a closed bottom and opened top, the external diameter of the stator element being slightly less than the internal diameter of said housing reduced diameter portion, and having an enlarged external diameter lip portion at the top, the external diameter of the lip portion being larger than the internal diameter of said housing reduced diameter portion and slightly less than the internal diameter of said housing whereby the lip portion rests on said housing ledge to accurately position the stator element closed bottom adjacent to and spaced from the internal surface of said diaphragm forming the closed end of said housing, at least a portion of the external surface of the closed bottom portion of the stator element having a conductive surface thereon forming a capacitive relationship with said housing diaphragm portion;

a conductive cable connected to the housing by which electrical signals may be carried to a remote location; and

circuit means connected with the capacitor formed by said diaphragm and stator elements providing an A.C. signal responsive to the spacing between the diaphragm and stator element, the output of the circuit means being connected to said conductive cable.

3,968,695
DEVICE FOR TAKING SAMPLES OF MOLTEN METALS FLOWING IN PIPES

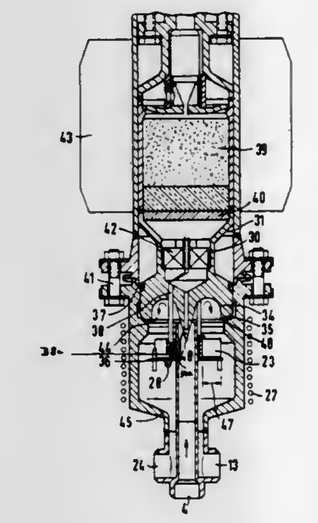
Hansjakob Weiss, Bensberg; Dieter Cremer, Bensberg-Immekeppel, and Eginhard Kranz, Cologne, all of Germany, assignors to Interatom Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed Aug. 28, 1975, Ser. No. 608,702

Claims priority, application Germany, Sept. 11, 1974, 2443559

Int. Cl.^{2} G01N *1/10*

U.S. Cl. 73—422 R **14 Claims**



1. A device for obtaining samples of liquid metal and comprising a housing having an inlet and an outlet for the liquid metal, and containing crucibles having open tops and which can be filled while in the housing with the liquid metal and subsequently removed from the housing; wherein the improvement comprises positioning means in said housing for positioning said crucibles so they form a horizontal ring of crucibles, said inlet comprising a vertical feed pipe extending upwardly in said housing within said ring of crucibles and having an open top for the upward ejection of the liquid metal at a level above the open tops of the ring of crucibles, and baffle means for forming a baffle surface spaced above the feed pipe's open top and the open tops of said ring of crucibles, said baffle surface being contoured to deflect liquid metal ejected upwardly from the feed pipe's open top, downwardly into the open tops of said ring of crucibles.

3,968,696
DEVICE FOR TAKING SAMPLES OF SLURRIES OR OF ANY SUSPENSION OF PARTICULATE MATERIAL IN LIQUID AND FOR MEASURING DESIRED CHEMICAL OR PHYSICAL PROPERTIES OF SUCH SAMPLES

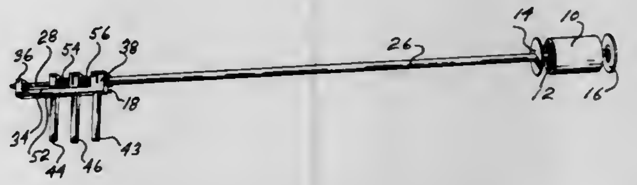
Frank Rosenblum, Ville St. Laurent, Canada, assignor to Noranda Mines Limited, Ontario, Canada

Filed Mar. 6, 1975, Ser. No. 555,719

Claims priority, application Canada, Apr. 3, 1974, 196721

Int. Cl.^{2} G01N *1/12*

U.S. Cl. 73—425.4 R **20 Claims**



1. A device for taking samples of slurries or any suspension of particulate material in a liquid comprising:

a. a container consisting of side walls and movable end closures;

b. a holder of suitable length secured at one end to said container for immersing the container into a body of slurry or liquid; and

c. means associated with said holder for tightly closing the end closures against the walls of the container and for opening at least one of said movable end closures, said means for closing and opening said end closures comprising separate connections associated with said holder and attached to each of said end closures, a handle assembly mounted at the other end of said holder and including separate handles for operating said connections, and spring means also mounted on said holder for biasing said connections with respect to each other in a direction such as to close the end closures.

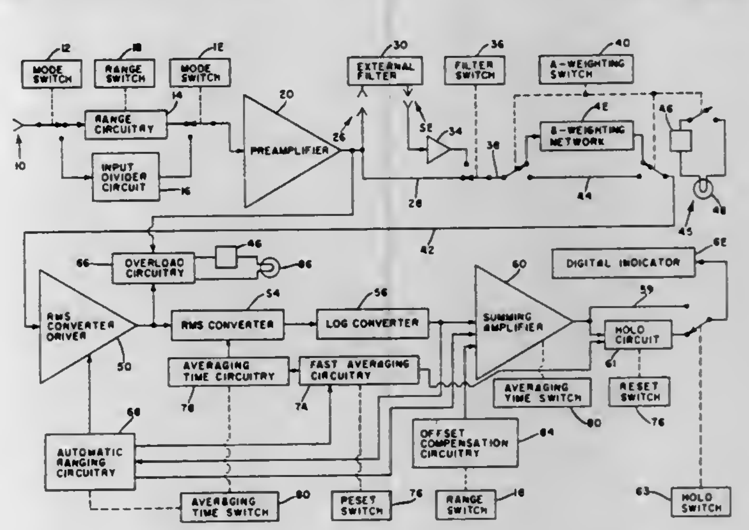
3,968,697
SOUND LEVEL METER

John Stefan Mutziger, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 30, 1975, Ser. No. 582,508

Int. Cl.^{2} G01H *3/14*

U.S. Cl. 73—557 **10 Claims**



1. A sound level meter comprising: preamplifier means responsive to the output of a sound transducer to provide an amplified signal proportional to the input to the sound transducer; RMS converter driver means for receiving and processing the amplified signal and switchable between a lower or higher level to produce a plurality of selectable output signals; RMS converter means connected to the RMS converter driver means for receiving and processing the driver means output signals to produce RMS value signals; log converter means for receiving and processing the RMS value signals to produce

logarithmic value signals; automatic ranging circuitry means connected between the log converter means and the RMS converter driver means for receiving and processing the logarithmic value signals above or below a predetermined value to switch the RMS converter driver means respectively between the lower or higher level; said automatic ranging circuitry means including means for producing a first and second signals indicative of the switch of the RMS converter driver means; averaging time circuitry means connected to the RMS converter means for introducing a plurality of times over which the driver means output signals can be averaged in the RMS converter and means to produce the RMS value signals; fast averaging circuitry means connected to the automatic ranging circuitry means and to the averaging time circuitry means responsive to the first signal to cause the averaging time circuitry means to introduce a minimum averaging time to the RMS converter means; summing amplifier means responsive to the logarithmic value signals and to the second signal to provide scaled output signals for a digital indicator; and hold circuit means selectively connectible between the log converter means and the digital indicator for maintaining the highest value signal of the scaled output signals.

8. A sound level meter comprising: preamplifier means responsive to the output of a sound transducer to provide an amplified signal proportional to the input to the sound transducer; RMS converter driver means for receiving and processing the amplified signal to produce a driver means output signal; RMS converter means connected to the RMS converter driver means for receiving and processing the driver means output signal to produce RMS value signals; log converter means for receiving and processing the RMS value signals to produce logarithmic value signals; amplifier means responsive to the logarithmic value signals to provide scaled output signals for a digital indicator; averaging time circuitry means connected to the RMS converter means for introducing a plurality of different time intervals over which the driver means output signals can be averaged in the RMS converter means to produce the RMS value signals; fast averaging circuitry means connected to the averaging time circuitry means for introducing a minimum averaging time thereto; and hold circuit means selectively connectible between the log converter means and the digital indicator for maintaining the highest value signal of the scaled output signals responsive to the introduction of the minimum averaging time to release the highest value signal and maintain a subsequent highest value signal.

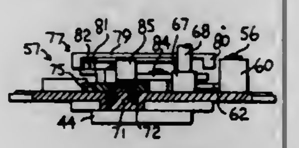
3,968,698
AUTOMATIC RESET TIMER

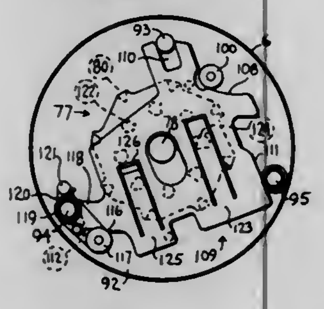
John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Filed Feb. 20, 1973, Ser. No. 333,767

Int. Cl.² F16H *5/74*

U.S. Cl. 74—3.5 **23 Claims**





1. In a control device, drive member means having operating abutment means, means for actuating the drive member means and arranged for selectively moving the abutment means through either a first operating range or a second operating range, a driven member arranged to be actuated by engagement and disengagement with the abutment means, and adjustable selective means associated with the driven member for selecting when the driven member responds to movement of the drive member means, said selective means being constructed and arranged to shift at least a portion of the driven member relative to said first and second operating ranges, said selective means including means for maintaining same in a plurality of adjusted positions.

3,968,699
DRIVE SYSTEM

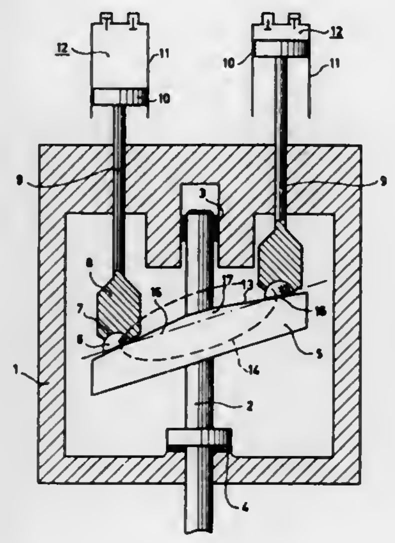
Henricus Cornelis Johannes van Beukering, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 476,891

Claims priority, application Netherlands, June 22, 1973, 7308702

Int. Cl.² F16H *23/00*

U.S. Cl. 74—60 **14 Claims**



1. A drive system comprising a shaft which is journalled to be rotatable in a frame and on which a plate is provided which cooperates with at least one sliding body, one flat side of which cooperates with a running surface on the side of the plate which faces said body, the said running surface being formed by a face which encloses an angle with the center line of the rotatable shaft, the sliding body being provided with a spherical face which cooperates with a corresponding face in a head of a drive rod, the arrangement being such that when the shaft rotates, the sliding body and the drive rod cooperating therewith perform a reciprocating movement, characterized in that the running surface is formed by a face which is constructed to be convex at least in the relative movement direction of sliding body and running surface.

3,968,700
DEVICE FOR CONVERTING ROTARY MOTION INTO A UNIDIRECTIONAL LINEAR MOTION

Calvin I. Cuff, 135 Ocean Ave., Brooklyn, N.Y. 11225

Filed Aug. 1, 1974, Ser. No. 493,748

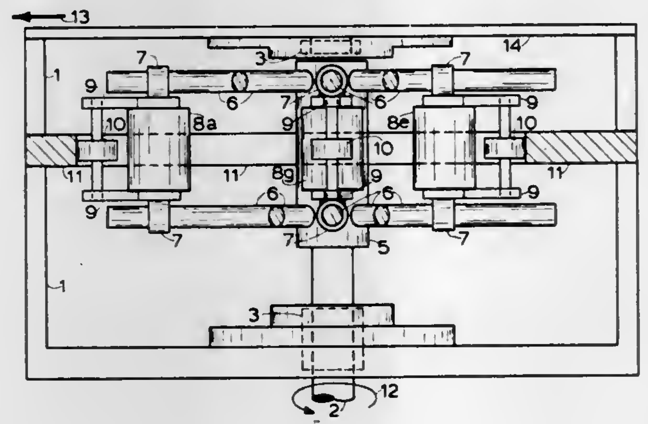
Int. Cl.² F16H *27/04*

U.S. Cl. 74—84 S **2 Claims**

1. In a device that converts rotary motion into unidirectional motion by varying the radius of gyration of a plurality of gyrating masses which device includes means for both supporting and permitting sliding radial movement of said plurality of gyrating masses; the improvement comprising:

a shaft;
a hub mounted on said shaft;
two, identical, axially spaced-apart sets of cylindrical arms fixed to and extending radially from said hub;
a plurality of bearings each mounted on one of said radially extending cylindrical arms for sliding linear movement with respect thereto;

said cylindrical arms in each of said sets being secured at one end to and spaced at equal angular intervals about the circumference of said hub such that each arm of one of said sets is in substantial alignment with an arm of the other of said sets to provide aligned pairs of arms having aligned pairs of bearings thereon;
each of said radially moveable gyrating masses being mounted between the said sets of arms by securement to both members of a pair of bearings on each of a pair of aligned arms;
a wheel or roller type cam-follower for each of said gyrating masses;



means for supporting each of said wheel or roller type cam-followers in fixed relationship to their respective gyrating masses;
a circular cam track in radially spaced and encircling relationship with respect to said gyrating masses and eccentrically disposed with respect to the axis of said shaft;
said wheel or roller type cam-followers being maintained in rolling contact with said cam track by the centrifugal force produced by said gyrating masses during rotation of said shaft; and
means for rotating said shaft.

3,968,701
POSITIVE MOTION BELT WITH ELASTIC TEETH

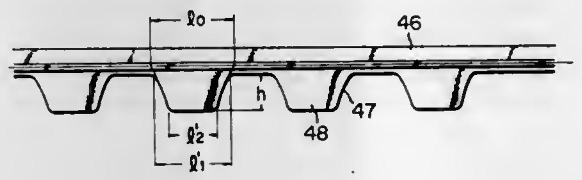
Masao Maruyama, Hanno, Japan, assignor to Tsubakimoto Chain Co., Ltd., Osaka, Japan

Filed Jan. 10, 1975, Ser. No. 540,255

Claims priority, application Japan, May 24, 1974, 49-057783

Int. Cl.² F16G *1/28, 1/00;* B29H *7/22*

U.S. Cl. 74—229 **6 Claims**



1. In a positive motion endless belt having elastic teeth, said teeth having side faces adapted for engagement with a toothed wheel, comprising the improvement wherein the side faces are formed by a concave involute curve.

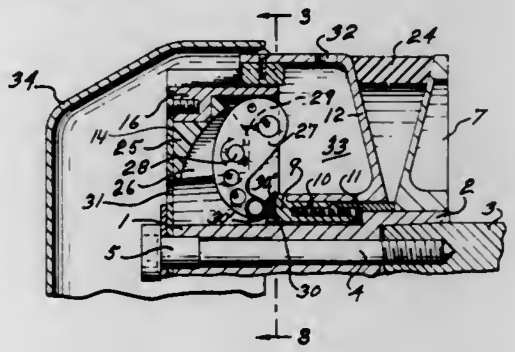
3,968,702
CENTRIFUGALLY CONTROLLED EXPANSIBLE PULLEY WITH MANUALLY ENGAGED NEGATIVE TORQUE RESPONSIVE MEANS

Guy Beaudoin, Drummondville South, and Marcel Vincent, Wickham, both of Canada, assignors to Skiroule Ltee, Wickham, Canada

Filed Jan. 14, 1975, Ser. No. 541,072

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 E **6 Claims**



1. A variable diameter pulley comprising shaft means, a first and a second pulley flanges coaxially mounted on said shaft means, said first pulley flange being axially displaceable along said shaft means, a centrifugal weight carrier having a part fixedly secured to said shaft means, bodily rotatable therewith, and including an external circumferential surface having axially extending guideways thereon, centrifugal weights pivotally mounted on another part of said carrier and operatively engaging said first pulley flange for axial displacement of the latter, and follower members secured to the periphery of said first pulley flange for axial displacement therewith in slidable and non-rotatable engagement with said guideways respectively, and axially displaceable bodily with said first pulley flange along said guideways in response to centrifugal action on said centrifugal weights.

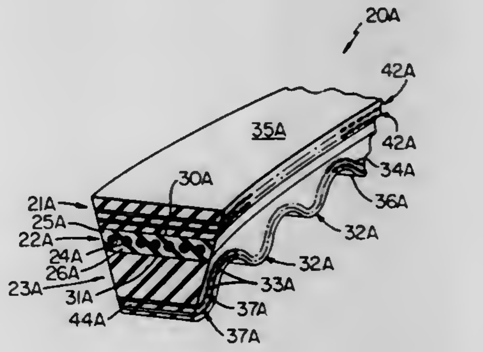
3,968,703
ENDLESS POWER TRANSMISSION BELT

Bernard R. Bellmann, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 24, 1975, Ser. No. 543,837

Int. Cl.² F16G *1/28, 5/20, 5/08*

U.S. Cl. 74—231 C **16 Claims**



1. An endless power transmission belt having outside and inside surfaces made primarily of elastomeric materials and being adapted to be operated in an endless path, said belt comprising, a tension section, load-carrying means, and a compression section, at least one of said sections having a plurality of stiffening members extending the full width thereof, each of said members having a substantially flat non-circular cross-sectional configuration which provides transverse rigidity for said belt yet enables said belt to be made of minimum height perpendicular its outside and inside surfaces when viewing said belt in cross section, said minimum height enabling said belt to operate at a lower temperature which extends the service life thereof, said members being arranged in at least one layer along said endless path and in parallel

relationship, said members being held in interconnected by comparatively weak tie bands extending substantially parallel to said endless path.

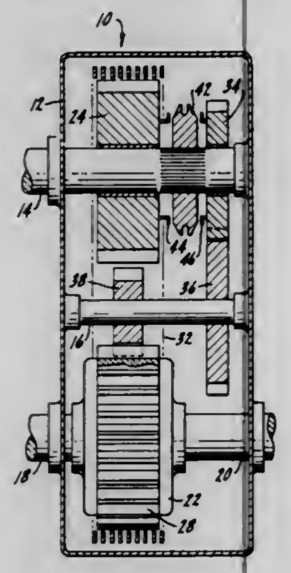
3,968,704
POWER TRANSFER MECHANISM

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1974, Ser. No. 526,982

Int. Cl.² F16H *3/10*

U.S. Cl. 74—376 **21 Claims**



1. In a power transfer mechanism for coupling power input means with power output means, the combination comprising a chain drive train engageable with said power means for effecting power transfer therebetween, said chain drive train including a pair of sprockets defining sprocket teeth and a chain engaging said teeth, a gear drive train engageable with said power means for effecting power transfer therebetween, said gear drive train including a gear meshing with said teeth of one of said sprockets, and means for selectively engaging said drive trains with said power means.

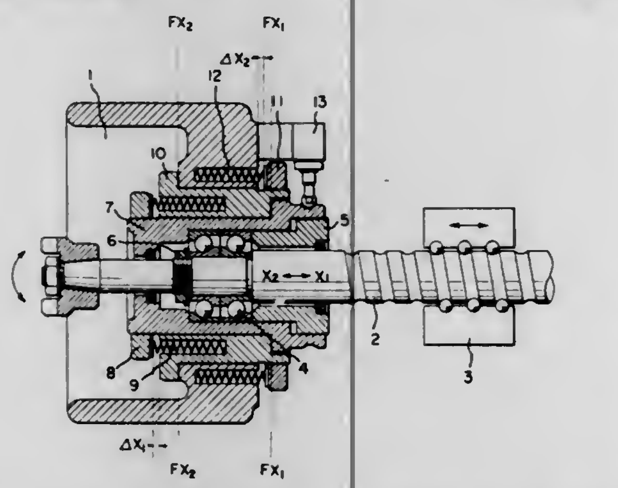
3,968,705
OVERLOAD SAFETY DEVICE

Hitoshi Amano, Tokyo, and Yoshifumi Tsuchiya, Ohme, both of Japan, assignors to Takayuki Nomura, Tokyo, Japan

Filed Jan. 10, 1975, Ser. No. 540,243

Int. Cl.² F16H *1/18;* **B23B** *21/00*

U.S. Cl. 74—424.8 R **4 Claims**



1. An overload safety device for a machine having a feed screw and a body comprising:
- a first sleeve mounted to said feed screw to move axially therewith relative to said body;
- a second sleeve slidably mounted to the outer periphery of said first sleeve and the inner periphery of said body;
- a first spring between said first and second sleeves biasing said first sleeve in a first axial direction relative to said second sleeve;
- a second spring between said second sleeve and said body biasing said second sleeve in an axial direction opposite said first axial direction; and
- a switch mounted to said body to detect movement of said feed screw and first sleeve in both axial directions.

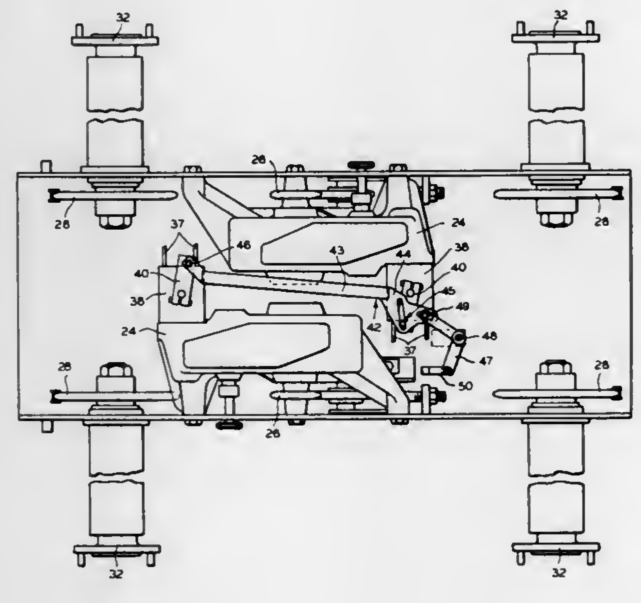
3,968,706
TWO-SPEED MOTOR CONTROL FOR DUAL HYDROSTATIC TRANSMISSIONS

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 400,462, Sept. 24, 1973, Pat. No. 3,938,401. This application Feb. 6, 1975, Ser. No. 547,537

Int. Cl.² G05G *9/00*

U.S. Cl. 74—471 R **1 Claim**



1. A two-speed control for dual hydrostatic motors spaced with the output shafts extending in opposite directions on different axes, each motor having a rotating piston group and a swash plate inclinable to a high or low speed position of piston displacement, said control comprising a shift lever interconnecting the swash plate of the motors operable in one direction to cause both swash plates to be shifted to one position and vice versa, a manual control lever movable between high and low speed positions, and a linkage connecting the manual control lever and shift lever operable upon movement of the manual control member to move the shift lever in one or the other of said positions corresponding to either the high or low speed positions of the swash plate, and wedging means acting to yieldably hold the shift lever in the position selected against the returning force acting on the swash plates by said piston groups, said linkage comprising a drag link, a bell crank pivoted horizontally, one end of the drag link being pivotally connected to said manual control member and the other to said bell crank, said shift lever extending horizontally and having a projection connected to the other end of the bell crank, such that longitudinal movement of the drag link causes rotation of the bell crank, which in conjunction with the slide and guide wedging motion, produces a longitudinal lateral shifting movement of said shift lever, and an over-center spring mechanism acting on said manual control member offset relative to its pivot axis so as to hold said member on either side of a midposition yet permitting the operator to move the control member between the low or high speed positions by overcoming the biasing force of the over-center spring mechanism.

3,968,707
HYDRAULIC SPEED-CHANGING SYSTEM

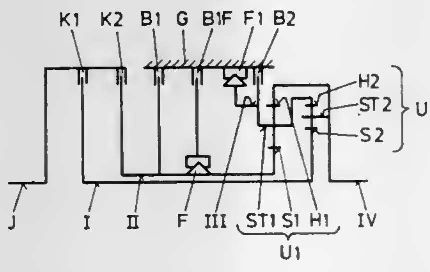
Hansjörg Dach, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Dec. 2, 1974, Ser. No. 528,940

Claims priority, application Germany, Dec. 5, 1973, 2360513

Int. Cl.² B60K *41/18;* **G05G** *21/00*

U.S. Cl. 74—869 **7 Claims**



1. In a transmission system connected between a fuel-powered engine and an output shaft driven thereby, in combination:
- gear-shifting means for switching between a plurality of forward speed ratios and a reverse speed ratio of said output shaft with reference to said engine, said gear-shifting means including a fluid-operated clutch actuatable to establish one forward speed ratio and said reverse speed ratio;
- a speed selector having a forward position and a reverse position;
- an operator-controlled accelerator for varying the fuel supply to said engine;
- switchover means controlled by said speed selector and responsive to the position of said accelerator and to the speed of said output shaft for actuating said clutch in said reverse position and under certain load conditions in said forward position of said speed selector; and
- damping means responsive to said speed selector for retarding full operation of said clutch by a first delay period in said forward position and by a second delay period shorter than said first delay period in said reverse position thereof;
- said switchover means comprising a control valve inserted between said clutch and a source of pressure fluid therefor;
- said control valve including a cylinder with a piston, biasing means tending to hold said piston in a normal position enabling rapid flow of fluid from said source to said clutch, and a feedback connection from said clutch to said cylinder for shifting said piston into a throttling position against the force of said biasing means upon partial pressurization of said clutch;
- said damping means comprising a plunger mechanically linked with said piston and fluidically connected to said clutch for displacement in a direction restoring said piston to said normal position upon further pressurization of said clutch;
- said control valve being provided with an ancillary inlet connected to said source in said reverse position of said speed selector for subjecting said piston to a supplemental force aiding the force of said biasing means in said reverse position of said speed selector.

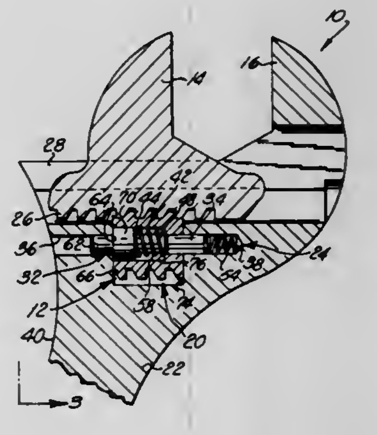
3,968,708
ADJUSTABLE WRENCH

Charles B. Ingersoll, Orchard Park, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 25, 1974, Ser. No. 526,904

Int. Cl.² B25B *13/16*

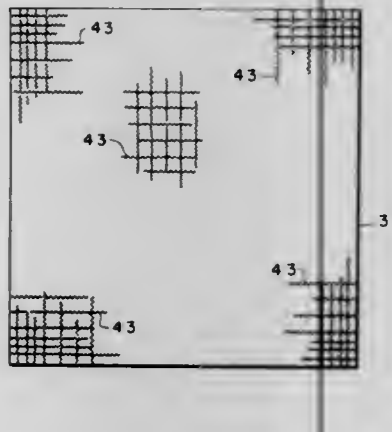
U.S. Cl. 81—157 **16 Claims**



1. A wrench comprising a frame having major and minor side surfaces, a fixed jaw connected with said frame, a movable jaw slidably mounted on said frame for movement toward and away from said fixed jaw, a rack gear connected with said movable jaw, said frame including first surface means for at least partially defining a gear cavity in said frame adjacent to said rack gear, said gear cavity having at least one opening in the major side surface of said frame, said frame further including second surface means for at least partially defining a second cavity in said frame and opening into said gear cavity and third surface means for defining a third cavity in said frame and opening into said gear cavity, a worm gear disposed in said gear cavity in meshing engagement with said rack gear, said worm gear including surface means for at least partially defining a cavity in said worm gear, said cavity in said worm gear having a central axis coincident with a central axis of said worm gear, retaining means for releasably retaining said worm gear in said gear cavity in said frame, for enabling said worm gear to be rotated about its central axis to effect movement of said movable jaw relative to said fixed jaw and for enabling said worm gear to be removed from said gear cavity through the opening in the major side surface of said frame to facilitate disassembly of said wrench, said retaining means including a first member movable from an engaged position extending outwardly from said cavity in said worm gear into said second cavity in said frame to a second position in which said first member is disposed substantially entirely within said cavity in said worm gear to at least partially release said worm gear for movement through said opening in said major side surface of said frame in a direction transverse to the central axis of said worm gear and a second member extending outwardly from said cavity in said worm gear into said third cavity in said frame, said first and second members being cooperable with said frame and said worm gear to support said worm gear for rotation about its central axis, and spring means disposed in said third cavity in said frame for resiliently urging said second member toward said worm gear, said first member being movable in said cavity in said worm gear to move said second member against the influence of said spring means.

3,968,709
CARPET TILE MACHINE

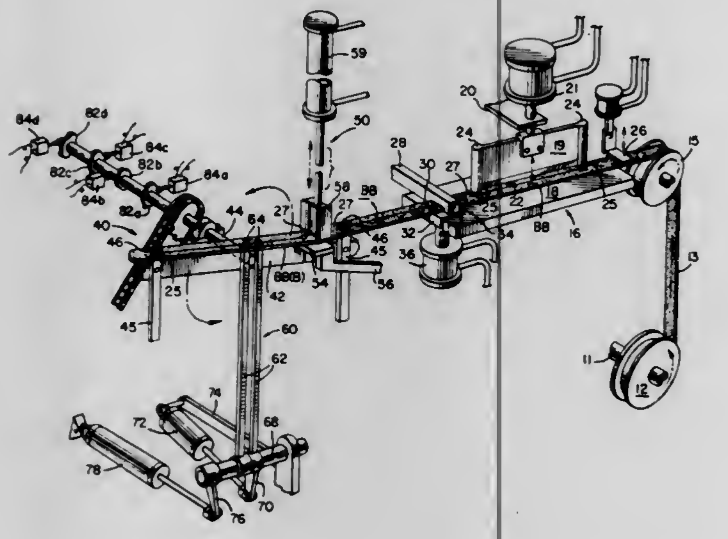
James E. Fowler, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Division of Ser. No. 542,110, Jan. 20, 1975. This application Aug. 7, 1975, Ser. No. 602,694
Int. Cl.² B26D *3/08*
U.S. Cl. 83—1 **1 Claim**



1. tile comprising the steps of: providing a carpet tile having a hardback, contacting the hardback of the carpet tile with a cutting die and applying pressure thereto to cut a plurality of substantially continuous lines of varying depth in the hardback of the carpet tile.

3,968,710
APPARATUS AND METHOD FOR MANUFACTURING RESILIENT BANDS

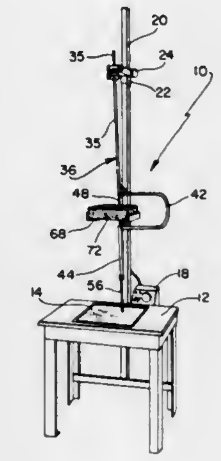
Chajim Gros, 172, Gladstone Park Gardens, London, NW. 2 GRL, England
Filed Dec. 26, 1974, Ser. No. 536,464
Claims priority, application United Kingdom, Dec. 29, 1973, 60165/73
Int. Cl.² B26D *7/06, 7/14*
U.S. Cl. 83—18 **10 Claims**



1. Apparatus for use in the manufacture of resilient bands from an elongated strip or web of resilient material comprising slitting means for preliminary cutting longitudinally extending and longitudinally spaced slits in said strip, means for repetitively severing separate lengths from said strip, said severing taking place transversely in the region between said longitudinal slits, whereby each severed length forms an endless band, and band-engaging and supporting means for receiving and holding each band before it has been completely severed from the remainder of said strip.

3,968,711
PATTERN CUTTING APPARATUS

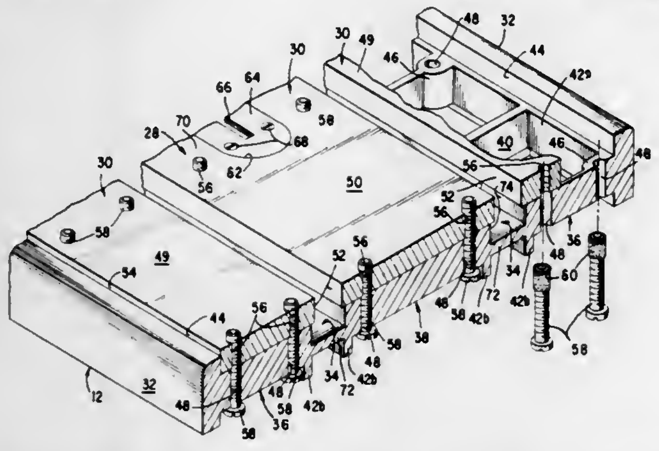
William Donald Wilson, Barrington, R.I., assignor to Huestic Machine Corporation, Bristol, R.I.
Filed Nov. 24, 1975, Ser. No. 634,476
Int. Cl.² B26D *7/10*
U.S. Cl. 83—171 **10 Claims**



1. A device for cutting patterns in mold blocks and the like comprising, a frame, a rigid rod attached at one end thereof to said frame for pivotal movement therewith, said rod having tracing means at the other end thereof for tracing a pattern and an offset portion intermediate said ends, said offset portion defining a discontinuity in said rod, means for supporting a block within said offset portion, and cutting means tightly spanning said discontinuity for cutting said block in a pattern corresponding to a pattern traced by said tracing means, said cutting means comprising a spring-loaded, electrically heated wire.

3,968,712
FABRICATED TABLE FOR STATIONARY POWER TOOLS

John L. Duncan, Pickens, S.C., assignor to The Singer Company, New York, N.Y.
Filed May 1, 1975, Ser. No. 573,657
Int. Cl.² B23D *19/00*; **B26D** *1/18*; **B27B** *5/28, 27/04*
U.S. Cl. 83—477.2 **5 Claims**



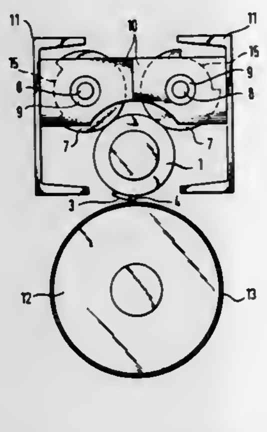
1. A fabricated table for a stationary power tool comprising:
- a. a frame made of a lightweight material,
- b. at least one channel formed in the top surface of the frame to divide the frame into sections,
- c. a plurality of bosses formed in the frame with aperatures therethrough,
- d. a plurality of steel plates, one atop each frame section, and disposed on either side of the channel,
- e. a plurality of tapped holes formed in the steel plates in alignment with the apertures in the bosses, and
- f. threaded means extending through the apertures in the bosses to be threadedly received in the tapped holes of each of the steel plates to secure the steel plates to the frame, whereby the top surface of the steel plate to be machined to provide a coplanar surface thereon.

4. The combination claimed in claim 1 wherein:
- a. the frame sections between the channel are substantially open areas,
- b. rib members are formed integrally with the frame to extend in the open areas, and
- c. the bosses are formed at some of the rib members.

5. The combination claimed in claim 4 wherein:
- a. a motor is mounted to the frame,
- b. a blade slot for a saw blade is formed in one of the plates,
- c. a saw blade is rotatively carried on the frame to extend through and vertically above the blade slot, and
- d. means connecting the saw blade to the motor, whereby the saw blade is driven by the motor and is adapted to cut any work translated upon the table into engagement with the saw blade.

3,968,713
MACHINE FOR CROSS-CUTTING A WEB OF MATERIAL

Hans Mosburger, Weiherhammer, Oberpfalz, Germany, assignor to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft, Munich, Germany
Filed Sept. 2, 1975, Ser. No. 609,364
Claims priority, application Germany, Sept. 19, 1974, 2444704
Int. Cl.² B26D *1/36*
U.S. Cl. 83—347 **9 Claims**

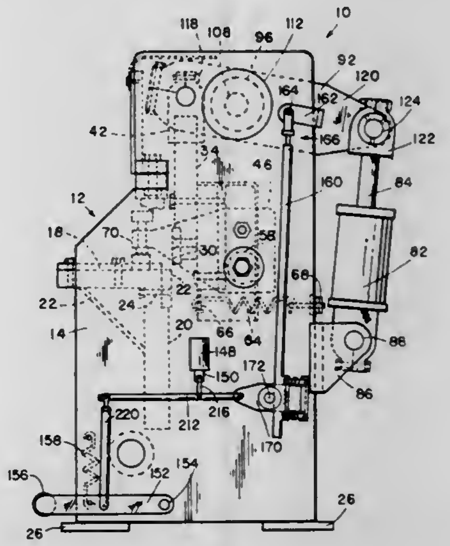


1. Machine for cross-cutting a web of material comprising, a knife blade carried in a rotatable knife carrier arranged transverse to the web of material, a plurality of supporting plates arranged in supporting engagement with said blade along the entire length thereof, said knife carrier and said plates being drivable rotatively in synchronization, said knife carrier having a low mass moment of inertia, said support plates being of generally circular configuration, and each plate having a recess formed on the circumference thereof to permit passage of the knife blade therethrough.

3,968,714
HEAVY DUTY SHEAR

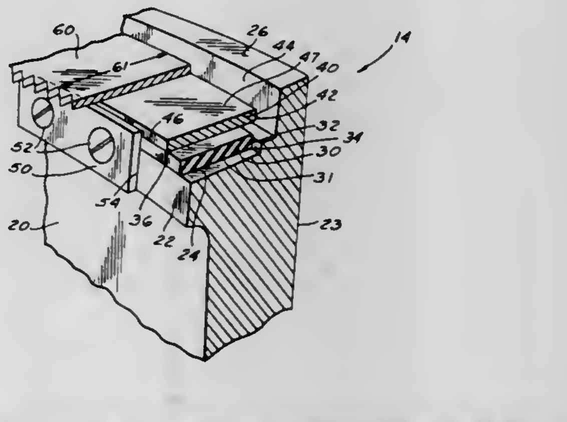
Charles Kuchyt, R.R. No. 3, Box 118, Shelbyville, Ind. 46176
Filed Jan. 11, 1974, Ser. No. 432,528
Int. Cl.² B26D *5/12*
U.S. Cl. 83—582 **12 Claims**

1. A shear including a frame, fixed blade means mounted on said frame movable blade means cooperating with said fixed blade means to cut sheet material disposed therebetween, power means for moving said movable blade means upwardly and downwardly past said fixed blade means, and means for connecting said power means to said movable blade means, wherein the improvement comprises means for guiding said movable blade means for such movement past said fixed blade means, said guiding means including bracket means mounted on said frame for selectively adjustable movement relative to said fixed blade means, roller means journal mounted upon said bracket means for rotation about an axis generally perpendicular to the direction of movement of said movable blade means, and means for yieldably urging said movable blade means against said roller means, said power means including a power cylinder having a ram as a driver, and said connecting means including lever means mounted on said frame for pivotal movement about an axis generally parallel to the journal axis of said roller means and providing oppositely extending lever portions, means for pivotally connecting said movable blade means to one of said lever portions and means for pivotally connecting said ram to the other of said lever portions, said means for pivotally connecting said movable blade means to said one lever portion including a bearing block supporting said movable blade means, said bearing block providing a cylindrical bore parallel to the pivot axis of said lever, a cylindrical trunnion mounted upon said one lever portion parallel to said pivot axis and extending through said bore, and an eccentric sleeve having internal and external cylindrical surfaces formed respectively about parallel spaced apart axes, the internal surface of said sleeve receiving said trunnion and the external surface of said sleeve being received in said cylindrical bore, whereby the position of said bearing block relative to the pivot axis of said lever is determined by the rotational position of said eccentric sleeve on said trunnion.



3,968,715
VIBRATION RESISTANT BAND SAW WHEEL

Charles E. Cleland, Edina, Minn., assignor to Continental Machines, Inc., Savage, Minn.
Filed June 27, 1975, Ser. No. 590,816
Int. Cl.² B26D *1/54*
U.S. Cl. 83—820 **15 Claims**

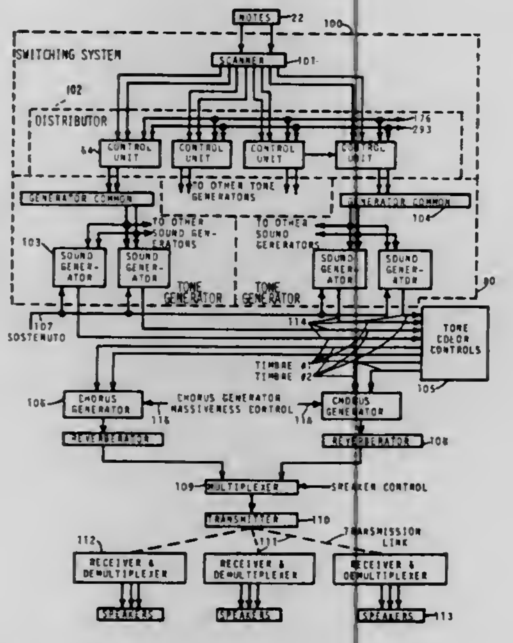


1. A vibration resistant band wheel arrangement for a band saw of the type having an endless cutting band trained in tension around the peripheral surfaces of spaced band wheels, comprising:
- a band wheel having a disc body portion surmounted by a peripheral surface;
- a flange extending radially outward at the edge of said peripheral surface of said band wheel disc body portion;
- a resilient tire fitted over said peripheral surface of said disc body portion;

a contact tire fitted above said peripheral surface of said disc body portion over said resilient tire;
retainer means for retaining said resilient tire and said contact tire in position on said band wheel over said peripheral surface.

3,968,716
MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Chochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.
Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 490,386
Int. Cl.² G10H *3/00*
U.S. Cl. 84—1.13 **24 Claims**

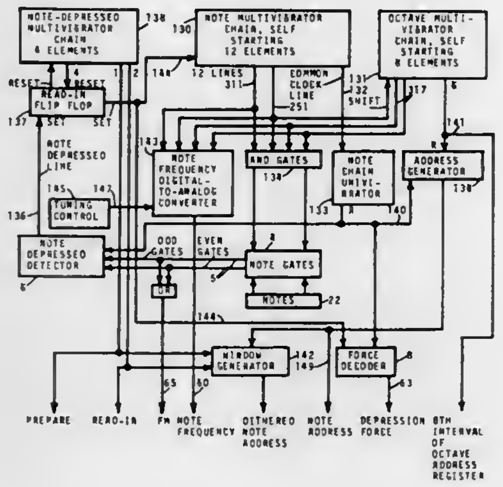


1. Sound generating apparatus comprising,
output means,
a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,
a plurality of note selecting means for selecting note signals characteristic of selected notes for production to said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of note pitch and at least one of speed of note selection and force applied to note selecting means,
control means coupled to said tone generators for providing continuous data signals to said tone generators representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signals,
and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means.

3,968,717
MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Cochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.
Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 491,159
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.19 **3 Claims**

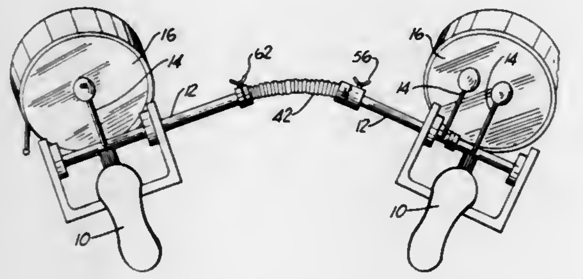
1. Sound generating apparatus comprising,
output means,
a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,
a plurality of note selecting means for selecting note signals characteristic of selected notes for production by said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of at least one of note pitch, speed of note selection and force applied to note selecting means,



control means coupled to said tone generators for providing continuous data signals representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signals,
and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means,
and further comprising means for connecting two tone generators together when said note selecting means selects two notes to produce a composite tone frequency controlling signal dependent upon the degree of selection of the two notes.

3,968,718
DRUM TYPE MUSICAL INSTRUMENT

Earl Randy Carver, Forest City, N.C., assignor to The Raymond Lee Organization, Inc., a part interest
Filed Aug. 11, 1975, Ser. No. 603,769
Int. Cl.² G10D *13/02*
U.S. Cl. 84—422 R **4 Claims**

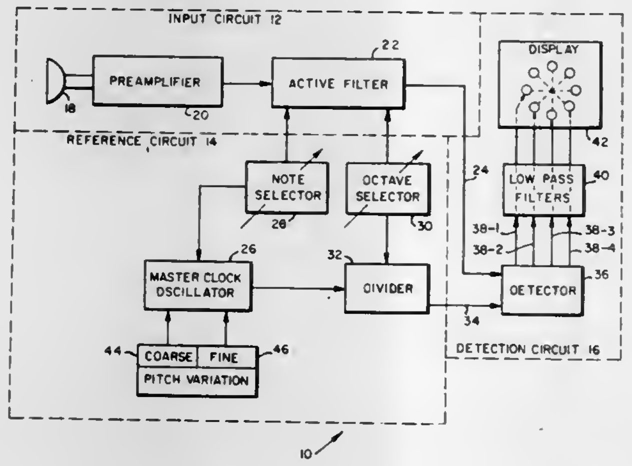


1. A drum type musical instrument comprising:
first and second drums;
first and second pedal actuated beater means, each means having a mechanism with a horizontal shaft for controlling the position of a drum beater that will beat a corresponding one of the drums, the shafts being disposed end to end with one end of one shaft adjacent one end of the other shaft;

an elongated flexible resilient coil spring;
a first cylinder at one end of the spring;
a second cylinder at the other end of the spring;
first attachment means detachably securing the first cylinder to said one end of said one shaft; and
second attachment means located at said one end of said other shaft for receiving the second cylinder and detachably securing the cylinder to said other shaft, the second attachment means having a recess within which the second cylinder can be rotated to a desired angular position relative to the first cylinder prior to being detachably secured to said other shaft, whereby the spring can be pre-tensioned to the degree desired.

3,968,719
METHOD FOR TUNING MUSICAL INSTRUMENTS

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.
Continuation-in-part of Ser. No. 399,990, Sept. 24, 1973, abandoned, which is a division of Ser. No. 249,942, May 3, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,921
Int. Cl.² G10G *7/02*
U.S. Cl. 84—454 **10 Claims**

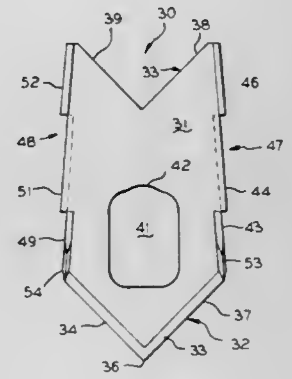


1. A method for tuning a musical instrument comprising a plurality of adjustable frequency tone generators and frequency adjustment means for each tone generator, each tone generator producing a plurality of partials, the partials being of different order with the first order partial for each tone generator corresponding to the lowest frequency produced thereby and with the higher order partials for each tone generator differing in frequency from corresponding order mathematical harmonics of the lowest frequency, said method comprising the steps of:

A. measuring the inharmonicity of the musical instrument by:
  i. energizing one of the tone generators to transmit a tone therefrom,
  ii. measuring, with a tuning device including means for indicating the frequency of the tone from a tone generator, the frequency of a partial of a selected order of the tone, and
  iii. measuring with the tuning device the frequency of another partial of the tone to obtain a characteristic inharmonicity for the musical instrument,
B. tuning a reference one of the tone generators to a predetermined standard frequency by:
  i. energizing the reference tone generator to transmit a tone therefrom, and
  ii. adjusting the corresponding frequency adjustment means until the tuning device indicates that the tone is at the predetermined standard frequency, and
C. tuning successive ones of the tone generators having different first partials from the reference tone generator, each successive such tuning step including:
  i. energizing the corresponding one of the tone generators to transmit a tone therefrom, and
  ii. adjusting the corresponding frequency adjustment means until the tuning device indicates that the tone is at a corresponding tuning frequency which is the sum of a mathematical frequency for that corresponding tone generator and a deviation frequency that is dependent upon the characteristic inharmonicity of the musical instrument.

3,968,720
FASTENERS

Hugh Black, P.O. Box 953, Waynesville, N.C. 28786
Filed Feb. 3, 1975, Ser. No. 546,288
Int. Cl.² F16B *15/00*
U.S. Cl. 85—11 **4 Claims**



1. A fastener for securely joining material sections together, said fastener comprising a main body section,
said main body section having a leading end and a trailing end and sides connecting said leading end and said trailing end,
said leading end being tapered and being wider than said trailing end,
said main body section having an aperture therein substantially centrally located,
peripheral walls depending from each of said sides of said main body section,
each of said peripheral walls having a first extending spline portion,
said first extending spline portion of each of said peripheral walls being opposite to each other and both extending in a first direction substantially normal to said main body section and being spaced apart by said main body section,
said first extending spline portion of each of said peripheral walls being located the same distance from said leading end,
said peripheral walls each having a second extending spline portion,
said second extending spline portion of each of said peripheral walls being axially offset from said first extending spline portion without any overlapping and being further from said leading end than said first extending spline portion of each of said peripheral walls,
said second extending spline portion of each of said peripheral walls being opposite to each other and being in an axial extending section of the peripheral walls where there is no first extending spline portion,
said second extending spline portion of each of said peripheral walls both extending in a second direction substantially normal to said main body section and being spaced apart by said main body section, and
said first and second directions being opposite each other.

3,968,721
EXPANSION ANCHOR WITH SAFETY FEATURE

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

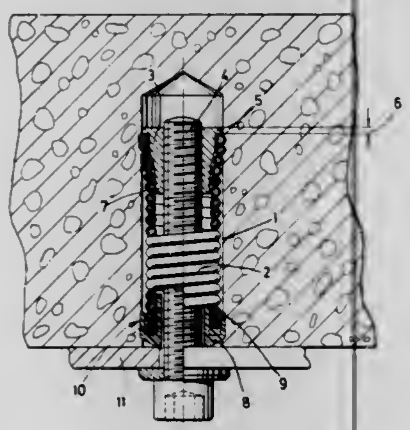
Continuation of Ser. No. 446,922, Feb. 28, 1974, which is a continuation-in-part of Ser. No. 280,885, Aug. 15, 1972, Pat. No. 3,837,257. This application June 27, 1975, Ser. No. 591,063

Claims priority, application Germany, Aug. 17, 1971, 2141079; Sept. 14, 1971, 2145918; Dec. 15, 1971, 2162255; Dec. 24, 1971, 2164587

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² E04B *1/41*

U.S. Cl. 85—64 **5 Claims**



1. An anchoring arrangement, comprising a supporting structure formed of a low-strength material having a known breaking strength when a predetermined pressure is exerted thereto, said supporting structure having wall portions bounding an anchor hole; an expansion anchor sleeve in form of a wire spring received in said anchor hole of said supporting structure and having a leading end and a trailing end; an expander member at said leading end and adapted to enter into said expansion anchor sleeve in direction towards said trailing end; actuating means extending through said expansion anchor sleeve from said trailing end to said expander member and being connected with the same, said actuating means being operative for drawing said expander member into said expansion anchor sleeve and for thereby pressing said expansion anchor sleeve outwardly against said wall portions; and break-away means on said expander member in abutment with said leading end of said expansion anchor sleeve for limiting axial movement of the latter so long as the pressure exerted by said expansion anchor sleeve against said wall portions bounding said anchor hole is below said predetermined pressure required for breaking said low-strength material of said supporting structure, and for breaking off from said expander member when said predetermined pressure is exceeded, said break-away means comprising a break-away flange having an axial thickness so selected that said flange will shear off from said expander member before the force exerted by said expansion anchor sleeve against said wall portions bounding said anchor hole can reach said predetermined pressure.

3,968,722
MUSICAL KEYS AND INTERVALS TEACHING DEVICE

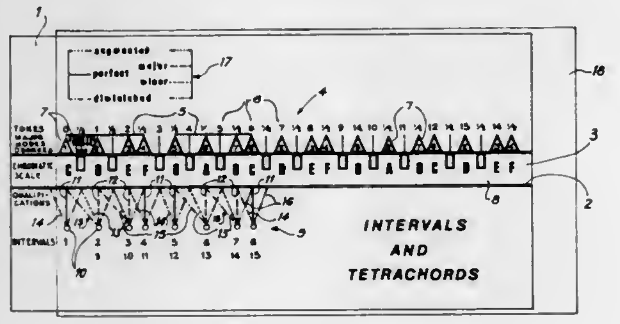
Georges A. Cournoyer, 480 Chapman St., St. Bruno, Quebec, Canada

Filed Dec. 9, 1974, Ser. No. 531,196

Int. Cl.² G09B *15/02*

U.S. Cl. 84—473 **6 Claims**

1. A musical scales and intervals teaching device comprising a first member and a second member movably connected one to the other, a chromatic scale having the musical notes equidistantly marked in equidistant tonal relationship on one face of said first member and arranged for endwise displacement relative to said second member, and an intervals indicator marked on one face of said second member laterally adjacent to said chromatic scale and including coded pointers and predetermined points spaced from said chromatic scale with said coded pointers extending from said predetermined points and leading toward the chromatic scale in predetermined spaced-apart relationship to distinctively indicate the qualifications of any simple and composed interval.



3,968,723
METHOD FOR RECLAIMING AND RECYCLING PLASTIC BONDED ENERGETIC MATERIAL

Charles W. Falterman, China Lake; Fred Menz, Ridgecrest; Wallace E. Silver, Ridgecrest, and Pearsie S. Wiggins, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,358

Int. Cl.² F42B *33/06;* **C06B** *25/34*

U.S. Cl. 86—1 A **9 Claims**

1. A method for removing solid plastic-bonded high explosive material form a warhead casing without detonating said high explosive material comprising the steps of:

A. inserting, into a cavity in said solid plastic bonded high explosive material, a suitable length of detonating cord to partially fill the cavity;

B. substantially filling the remainder of the cavity with a suitable fluid; and

C. detonating the detonating cord.

3,968,724
METHOD FOR ACCURATELY VARYING THE DENSITY OF A POWDER OR POWDER CHARGE, AND SHRINK TUBES FOR USE THEREWITH

James F. Kowalick, Southampton; George F. Hare, Feasterville, both of Pa., and Harry J. Addison, Jr., Willingboro, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,830

Int. Cl.² F42B *3/00;* **C06B** *21/00*

U.S. Cl. 86—20 R **2 Claims**

1. Method for controlling the density of an explosive powder and bringing said powder to a desired constant linear density powder charge comprising:

a. inserting said explosive powder into heat shrink tubing, said heat shrink tubing comprising a plurality of concentric pieces of heat shrink tubing,

b. sealing ends of said powder contained heat shrink tubing, and

c. heating said sealed heat shrink tubing to effect shrinkage of said tubing and radial compression of said explosive powder contained therewithin to a constant linear density powder charge.

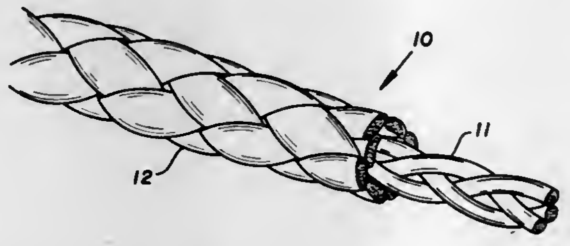
3,968,725
HIGH STRENGTH, LOW STRETCH BRAIDED ROPE

Henry J. Holzhauer, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Dec. 13, 1974, Ser. No. 532,457

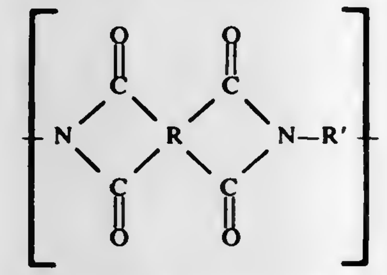
Int. Cl.² D04C *1/12*

U.S. Cl. 87—6 **4 Claims**



1. Multi-filament line means comprising a blend of filaments braided together to form a composite line structure and including a core with a multi-filament sheath braided thereover;

a. said core comprising the combination of a first and a second plurality of filaments combined together with said first plurality of filaments consisting essentially of a polyolefin selected from the group consisting of polypropylene and polyethylene, and with said second plurality of filaments consisting essentially of polyimide of an aromatic tetracarboxylic acid dianhydride having the recurring unit with the structural formula:



wherein R is a tetravalent aromatic radical, and wherein R is a divalent benzenoid radical;

b. said sheath comprising a plurality of filaments braided together and consisting essentially of polypropylene.

3,968,726
CARTRIDGE RECEIVING DRUM CONSTRUCTION FOR GAS-TIGHT CLOSURE BETWEEN THE DRUM AND THE ADJACENT GUN BARREL

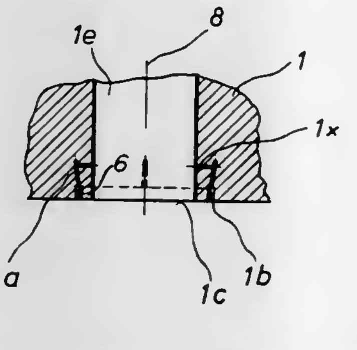
Oskar Grimm, Epfendorf; Ludwig Vorgrimler, Oberndorf, Neckar, and Peter Bernhard, Dietingen, all of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

Filed Sept. 12, 1974, Ser. No. 505,250

Claims priority, application Germany, Sept. 22, 1973, 2347855

Int. Cl.² F41D *7/04*

U.S. Cl. 89—26 **5 Claims**



1. A cartridge receiving drum construction providing a gas-tight closure of a separation interstice between a gun barrel and a cartridge receiving drum mounted coaxially of the gun barrel for rotation in a gun housing, particularly for revolver guns with high ballistic performances and correspondingly designed ammunition, comprising a drum having at least one projectile guideway for receiving a cartridge which is alignable with the gun barrel and having a front surface facing the end of the gun barrel with a circular groove arranged concentrically of the projectile guideway of said drum, an elastic seal ring in said groove capable of withstanding very high temperature, and at least one small bore defined in said drum between the inner end of said groove and said projectile guideway opening in said guideway at a spaced location from the gun barrel facing end, said small diameter bore providing a passage for a partial stream of high pressure powder gases upon ignition of the cartridge which stream acts to deform the seal in said groove to cause it to seal one side of the groove and back the other side and wherein said groove has an outside diameter approximately 8% larger than the largest case diameter of a cartridge to be fired.

3,968,727
FIREARM WITH GAS-OPERABLE STRUCTURE AND RELIEF VALVE

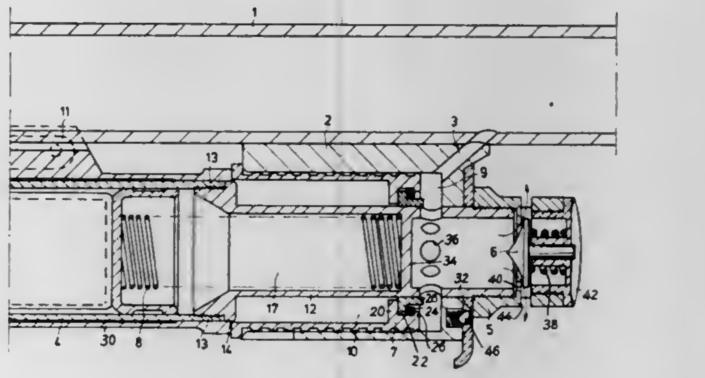
Timo Hyytinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

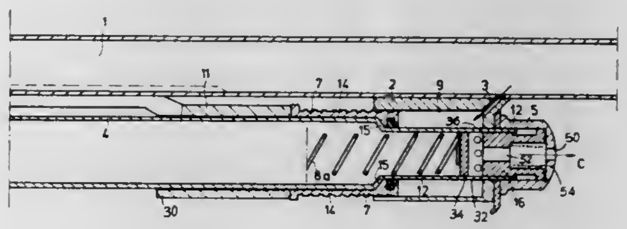
Filed Apr. 26, 1974, Ser. No. 464,639

Claims priority, application Finland, Apr. 27, 1973, 1356/73

Int. Cl.² F41D *5/08, 5/10*

U.S. Cl. 89—191 A **9 Claims**





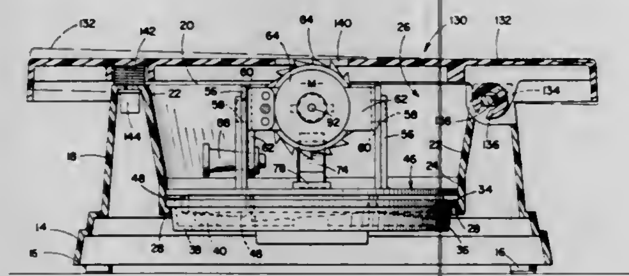
1. In a firearm, a barrel, gas cylinder means having an axis parallel to said barrel, said gas cylinder means being fixed to a lower portion of said barrel and communicating with the interior thereof for receiving gas under pressure upon firing of a round, elongated magazine means coaxial with said gas cylinder means and extending rearwardly therefrom beneath said barrel, guide means fixed to and forming a forward extension of said magazine means, said guide means extending coaxially into said gas cylinder means, gas piston means situated in said gas cylinder means for movement rearwardly therein when gas under pressure is received in said gas cylinder means, said gas piston means surrounding and being guided by said guide means and also being surrounded and guided by said gas cylinder means, automatically operable means operatively connected with said gas piston means to be operated automatically thereby when said gas piston means moves rearwardly in said cylinder means, gas-passage means communcating with spaces in said cylinder means situated before and behind said gas piston means for admitting some gas from the space before said gas piston means to the space behind the latter for braking the rearward movement of said

gas piston means, and relief valve means fixed to and forming a forward extension of said guide means, said relief valve means communicating on the one hand with the interior of said gas cylinder means forwardly of said gas piston means and on the other hand with the outer atmosphere for relieving excess pressure encountered in said gas cylinder means when gas under pressure is received therein.

3,968,728
CARVING TOOL

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Aug. 8, 1975, Ser. No. 602,997
Int. Cl.^{2} B23C *3/00, 1/06*
U.S. Cl. 90—11 C **20 Claims**



1. A method of carving a design in a transparent substrate capable of having material removed by rotary routing action, said method comprising:

a. creating a design pattern on a surface of said transparent substrate,
b. locating said substrate with an inward face disposed on a support which is relatively movable toward and away from a rotatable cutting element, the support having an opening therethrough for the cutting element to pass through and engage the substrate inward face,
c. effecting relative movement of the support toward the cutting element so that said inward face of said substrate is engaged by said cutting element,
d. effecting rotation of said cutting element when said relative movement of the support toward the cutting element occurs but prior to the cutting element engaging the substrate inward face, and
e. moving the substrate over the support with respect to the cutting element and in relation to said design pattern to thereby form a carved design on said substrate inward surface in accordance with said design pattern.

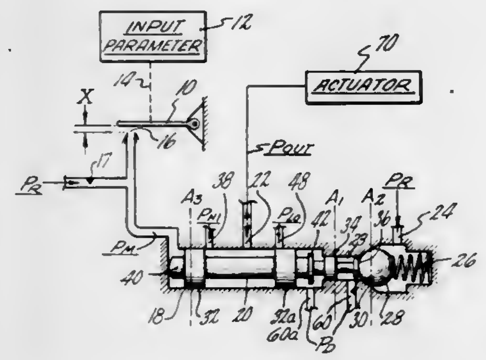
3,968,729
FLUID-OPERATED APPARATUS EXHIBITING HYSTERESIS EFFECT

Kenneth P. Hansen, Enfield, and Dean H. Crombie, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,491
Int. Cl.^{2} F15B *13/042*
U.S. Cl. 91—32 **5 Claims**

1. A fluid operated control apparatus for selecting output signals from a plurality of sources and exhibiting a predefined hysteresis effect in response to an input pressure signal comprising:

An input pressure signal, a housing having an internal bore with a passageway to receive the input pressure signal and direct the pressure signal into one end of the bore, and a pressure chamber at the opposite end of the bore;
first pressure source signal means communicating a first signal at a first pressure level to said bore;
second pressure source signal means communicating a second signal at a second pressure level to said bore;
actuator means responsive to said first and second pressure source signals;
output means communicating said bore with said actuator means for conveying said first and second pressure source signals to said actuator means; and
a shuttle member mounted within the housing bore for sliding movement between a first and second position and having one end exposed to the input pressure signal received at said one end of the bore and an opposite end of a first predefined cross sectional area exposed to a pressure in the pressure chamber at said opposite end of the bore, said shuttle member having first and second land means thereon between said one end and said opposite end, one of said first and second land means communicating said first signal with said output means when said shuttle member is in said first position and the other of said first and second land means communicating said second signal with said output means when said shuttle member is in said second position;
means for continuously restrictively draining pressurized fluid from the pressure chamber; a regulated pressurized fluid;
valve means communicating with the pressure chamber for admitting the regulated pressurized fluid to the pressure chamber and exposing said opposite end of the shuttle member to the pressurized fluid, the valve means including a valve seat having a second predefined cross sectional area, a biased closed valve element engaging the valve seat, and a movable valve member cooperating with the valve element to open the valve element and admit pressurized fluid into the pressure chamber, the valve member being connected with said opposite end of the shuttle member for movement between opened and closed positions of the valve element in response to pressure forces developed by the input pressure signal on said one end of the shuttle member, the second predefined cross sectional area of the valve seat and the first predefined cross sectional area of said opposite end of the shuttle member being selected relative to one another to move the shuttle member in one direction to one of said first and second positions and open the valve means at a first input pressure signal level and to move the shuttle member in the opposite direction to the other of said first and second positions and close the valve means in response to the pressurized fluid in the chamber at a second input pressure signal level different from the first level.



3,968,730
METHOD OF AND APPARATUS FOR SYNCHRONIZING A PLURALITY OF FLUID-OPERATED RAMS

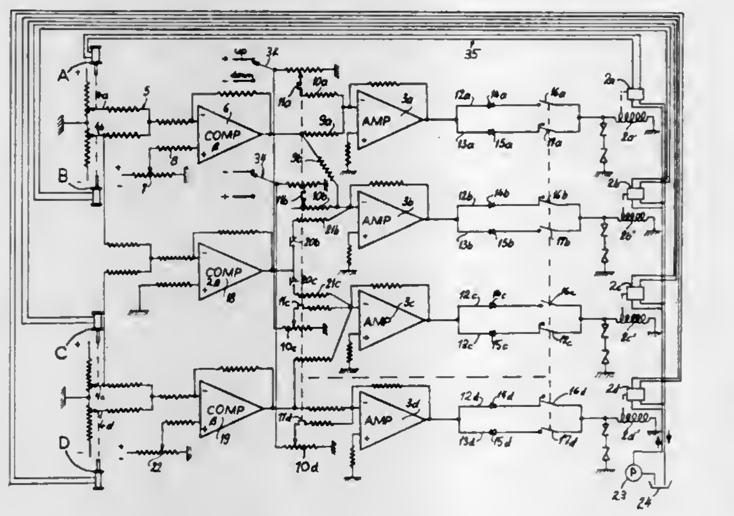
Bernard Lucien Gabriel Lionet, 72, rue Francis de Pressense, Villeurbanne, France

Filed May 13, 1974, Ser. No. 469,304
Int. Cl.^{2} F01B *25/04;* F15B *11/22*
U.S. Cl. 91—171 **6 Claims**

1. A method of synchronizing at least three rams each controlled by a respective servovalve, said method comprising the steps of:

generating a respective analog position signal for each of said rams corresponding to the position thereof;

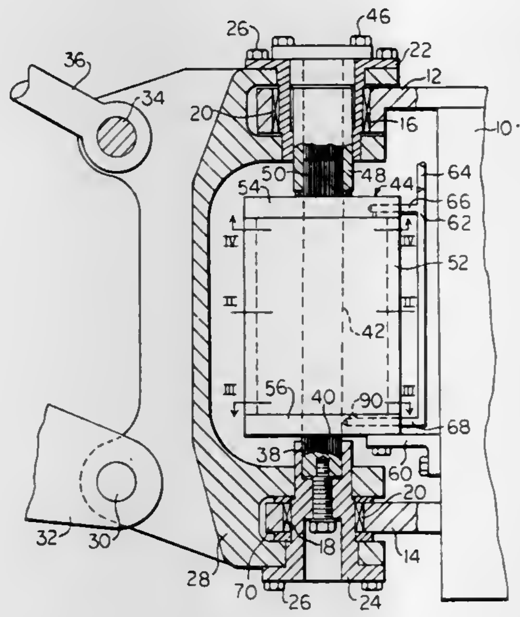
algebraically combining the position signal for a first of said rams with the position signal for a second of said rams and comparing the resulting combination with a reference signal to produce a first primary analog deviation signal and operating the first ram therewith;
algebraically combining the position signal for the second ram with the position signal for a third of said rams and comparing the resulting combination with a reference signal to produce a second primary analog deviation signal and operating the third ram therewith; and
algebraically combining the primary deviation signals and comparing the resulting combination with a reference signal to produce an analog secondary deviation signal and operating said second ram therewith.



3,968,731
FLUID MOTOR FOR SWINGING BOOMS

Jimmy Dale Myers, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 6, 1975, Ser. No. 555,925
Int. Cl.^{2} F15B *21/04, 15/22;* F01C *9/00*
U.S. Cl. 91—407 **4 Claims**



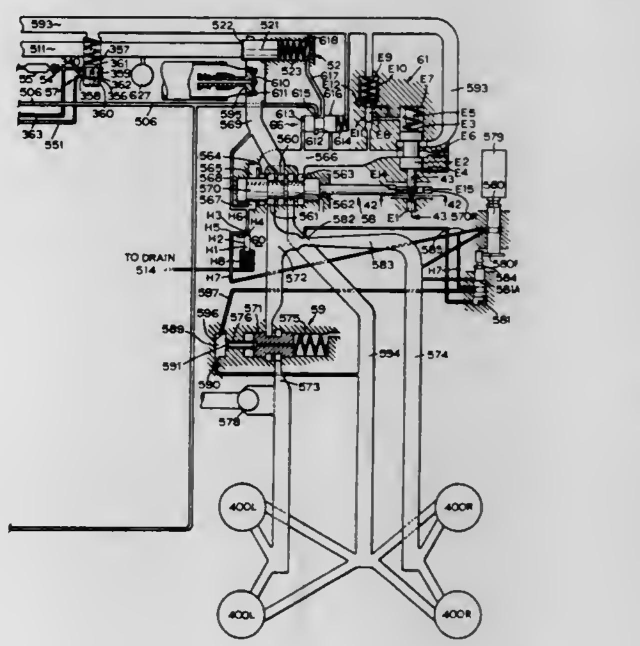
1. A fluid motor for a boom or the like, comprising:

a generally vertical shaft;
a hollow cylinder disposed concentrically about said shaft;
upper and lower end plates secured to and sealingly engaging opposite ends of said cylinder to define a motor chamber;
said motor chamber and said shaft being relatively rotatable;
a first vane within said motor chamber and secured to said shaft and sealingly engaging said cylinder and said end plates;
a second vane within said motor chamber and secured to at least one of said cylinder and said end plates and sealingly engaging said shaft;
a first set of ports opening into said chamber adjacent one side of said second vane, said first set including at least one port in each of said end plates;
first means establishing a continually open fluid flow path between the ports of said first set and adapted to be alternately connected to a fluid pressure source and a fluid drain;
a second set of ports opening into said chamber adjacent the other side of said second vane, said second set including at least one port in each of said end plates; and
second means establishing a continually open fluid flow path between the ports of said second set and adapted to be alternately connected to the fluid pressure source and the fluid drain.

3,968,732
HYDRAULIC POWER TRANSMISSION SYSTEM

William Maurice Bard Fitzgerald, R.R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,725
Int. Cl.^{2} F15B *11/16*
U.S. Cl. 91—414 **8 Claims**



1. A hydraulic power transmission system comprising:

first and second drive units each including one or more hydraulic motors;
conduit means connected to the motors for supplying working fluid thereto,
said conduit means further including a common return pipe connected to the motors for returning fluid therefrom;
a two-position valve in circuit with the motors of one said drive unit,
the motors of the other drive unit being supplied independently of said two-position valve,
said valve having a first operative position for blocking flow of working fluid to said one drive unit and a second operative position for permitting flow of working fluid to said one drive unit,
said valve being operable between its first and second positions for selective operation of one or both drive units;
a spring-loaded valve in circuit with the return pipe, the spring-loaded valve being displaceable from an open to a closed position to restrict fluid flow along the return pipe and so effect braking of the motors;
and a pressure-responsive valve means responsive to pressure in the return pipe for effecting displacement of the

two-position valve to the second operative position when said pressure exceeds a predetermined value.

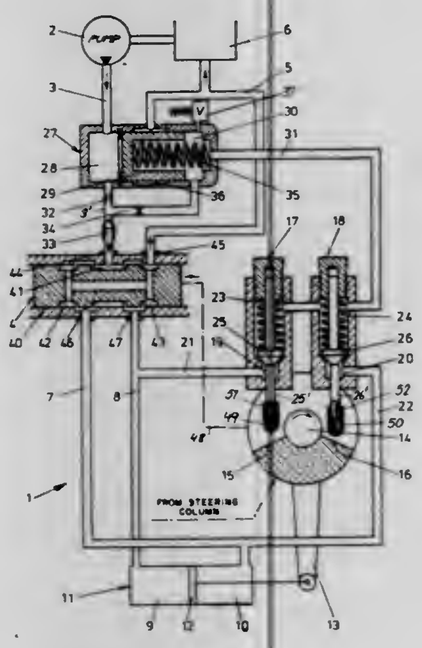
3,968,733
HYDRAULIC POWER-STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

Armin Lang, Schwabisch-Gmund-Bettringen; Falk Kurz, Schorndorf, and Wolfgang Walter, Schwabisch-Gmund, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed May 15, 1974, Ser. No. 470,046

Int. Cl.² F15B *11/08*, *13/042*

U.S. Cl. 91—451 **9 Claims**



1. A vehicular steering system comprising:

a source of hydraulic fluid having a high-pressure side and a low-pressure side;

a hydraulic servomotor with a movable element and with two feeder lines for alternately driving said movable element in opposite directions;

main valve means inserted between said source and said feeder lines for reversibly connecting same to said high-pressure side and said low-pressure side, respectively, said main valve means normally maintaining said feeder lines at a balanced pressure;

a steering shaft linked with said movable element for bidirectional rotation thereby, said shaft being manually rotatable and being operatively coupled with said main valve means for shifting same, upon incipient manual rotation in a given direction, into a working position pressurizing one of said feeder lines and depressurizing the other of said feeder lines to displace said movable element in a sense aiding the rotation of said shaft in said given direction;

differential valve means including a cylinder and a spring-loaded piston dividing the interior of said cylinder into a first and a second compartment, said first compartment being connected to said high-pressure side, said cylinder having an outlet leading to said low-pressure side, said piston being urged by its spring force into a normal position blocking said outlet;

conduit means extending from said feeder lines to said second compartment, said conduit means including a pair of branch lines respectively connected to said feeder lines;

a pair of normally closed ancillary valves in said branch lines; and

actuating means mechanically coupled with said shaft for opening, upon said shaft approaching a terminal position while performing a hydraulically assisted rotation in said given direction, a respective ancillary valve in the branch line of the depressurized feeder line with resulting development of a pressure difference across said piston for moving the latter against its spring force into an off-normal position venting said high-pressure side to said outlet, thereby depressurizing the previously pressurized feeder line.

3,968,734
HYDROSTATIC PISTON MACHINE

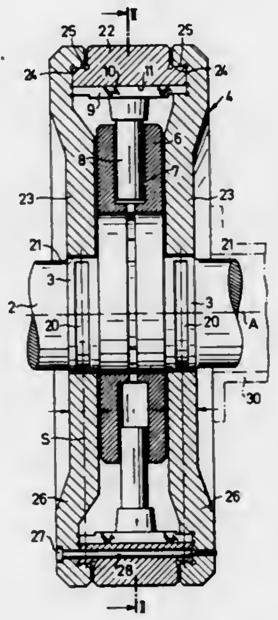
Peter Rutz, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,749

Claims priority, application Switzerland, Oct. 15, 1973, 14585/73

Int. Cl.² F01B *13/06*

U.S. Cl. 91—491 **4 Claims**



1. A hydrostatic piston machine comprising

a pin;

a cylinder block rotatably mounted on said pin about an axis;

a plurality of pistons movably mounted in said cylinder block radially of said pin, each said piston having a foot at an outer end, said foot having a plane bearing surface thereon disposed tangentially of a circular cylinder having an axis eccentrically disposed relative to said axis of said cylinder block; and

a guide member rotatably mounted on said pin to rotate about said axis of said cylinder, said guide member including a guide ring having guide surfaces guiding each said bearing surface of a respective foot and a cylindrical bearing surface at each lateral end, and a pair of disc-shaped side parts supporting said guide ring in a radial direction, each said part having a cylindrical bearing surface bearing against a bearing surface of said guide ring and a bearing surface facing said pin, said cylindrical bearing surfaces of said guide ring and one of said parts having a plane of symmetry perpendicular to said cylinder axis and coincident with a plane of symmetry of said bearing surface of said side part facing said pin.

3,968,735
CONTROL DEVICE FOR A FLUIDIC-CONTROL JACK

Gilbert Boisde, Bures-sur-Yvette; Paul Cogez, Montrouge; Jean-Michel Lachenal, Ris Orangis, and Michel Lamare, Palaiseau, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

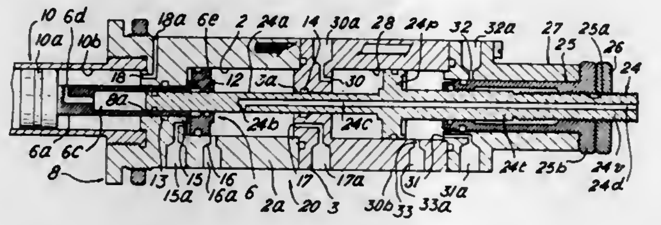
Filed Mar. 8, 1974, Ser. No. 449,528

Claims priority, application France, Mar. 9, 1973, 73.08507

Int. Cl.² F01B *7/10*; **F15B** *15/24*

U.S. Cl. 92—13.8 **4 Claims**

1. A control device for a pneumatic double acting jack (20) for the operation of a proportioning pump comprising a main piston (6), a hollow operating stem (6*a*) for said main piston extending from the jack (20) and moveable between extreme inner and outer positions, an auxiliary piston (24*p*) having inner and outer positions equal to those of said main piston (6), a piston extension (24*a*) connected to said auxiliary piston (24*p*) and sliding in said hollow operating stem (6*a*), a shaft (24*t*) connected to said auxiliary piston, a slide valve (25) surrounding said shaft (24*t*), means (25*a*) for adjusting the relative positions of said shaft (24*t*) and slide valve (25), a master cylinder (2) receiving said main piston (6), an auxiliary cylinder (28) receiving said auxiliary piston (24*p*), a distributor cylinder (27) opening into said auxiliary cylinder (28), said slide valve (25) sliding in said distributor cylinder (27) together with said shaft (24*t*) for limited movement when said slide valve (25) engages said distributor cylinder (27), fixed and independent control ports (15, 17, 30, 31) for the passage of a motor fluid respectively disposed at the two extremities of said main cylinder (2) and of said auxiliary cylinder (28), a fluidic control port (6*e*) in said main piston (6) opening on said piston extension (24*a*), a port (24*b*) in said piston extension (24*a*) cooperating with said fluidic control port (6*e*), a fluidic control port (16) opening into said main cylinder (2) at a distance equal to the thickness of said main piston (6) from its outer position, a fluidic control port (33) opening into said auxiliary cylinder (28) at a distance equal to the thickness of said auxiliary piston (24*p*) from its inner position for moving said main piston (6) into its extreme inner position and a fluidic control port (32) in said distributor cylinder (27) opening into said auxiliary cylinder (28) and opened and closed by said slide valve (25) subject to said adjusting means (25*a*).



3,968,736
RADIAL FLUID-PRESSURE APPARATUS

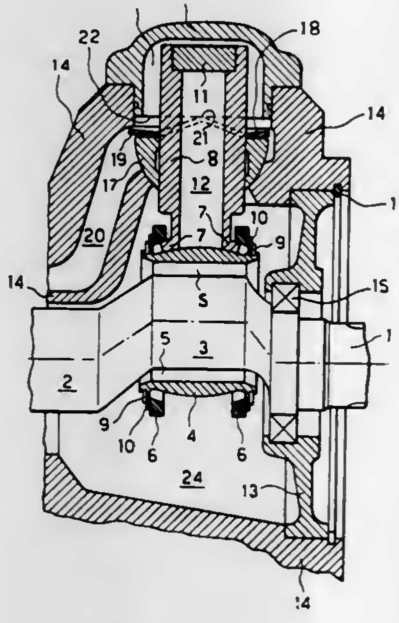
Felice Pecorari, Via Zanoni, 62, Modena, Italy

Filed May 20, 1974, Ser. No. 471,781

Claims priority, application Italy, May 24, 1973, 40048/73

Int. Cl.² F16J *15/18*

U.S. Cl. 92—165 R **9 Claims**



1. In a radial type of fluid-pressure apparatus, rotary crankshaft means and support means supporting said rotary crankshaft means for rotation about its axis, said rotary crankshaft means having a crankpin spaced radially from its axis of rotation, a piston extending outwardly away from said crankpin and having an inner end region adjacent said crankpin, connecting means connecting said inner end region of said piston to said crankpin for transmitting motion between said piston and crankpin, outer housing means surrounding said axis and having an outer wall portion and an inner surface region defining a chamber into which an outer end region of said piston extends, fluid passage means communicating with said chamber, inner housing means surrounded by said outer housing means and situated between the latter and said axis with said inner housing means also surrounding said axis, said inner housing means being formed with a seat surrounding said piston and forming part of a sphere, a sleeve having an inner cylindrical surface surrounding and slidably engaging an exterior cylindrical surface of said piston with the latter extending through said sleeve, said sleeve having an outer surface forming part of a sphere of the same diameter as the sphere of which said seat forms a part and said sleeve being seated on said seat, and spring means urging said sleeve into engagement with said seat for maintaining a fluid-tight slidable engagement of said sleeve with said seat so that while said piston moves outwardly away from or inwardly toward said axis said sleeve can rock at said seat while remaining in fluid-tight engagement therewith, said piston approaching closely to said outer wall portion of said outer housing means during said movement of said piston outwardly away from said axis and said inner surface region of said outer housing means which defines said chamber surrounding and extending longitudinally along a substantial portion of said piston which extends from said outer end region therof and being located adjacent the latter substantial portion of said piston while at the same time being spaced therefrom by a distance sufficient to provide for free, unobstructed rocking of said piston in said chamber, said sphere of which said outer surface of said sleeve and said seat form a part having a center situated outwardly beyond said inner housing means and said sleeve having an outer end surface surrounding said piston and situated between said inner and outer housing means while being directed toward said outer housing means, said spring means engaging and being compressed between said outer end surface of said sleeve and said outer housing means for pressing said sleeve against said seat, said spring means including a ring of elastic sheet material surrounding said piston and having an inner surface part of which engages said outer end surface of said sleeve and an outer surface part of which engages said outer housing means, the latter having adjacent but spaced from said outer end surface of said sleeve an annular surface directed inwardly toward said outer end surface of said sleeve and being of the same diameter as said ring of elastic sheet material and engaged by said outer surface part thereof so that said ring of elastic sheet material is situated in its entirety adjacent said sleeve distant from said outer wall portion of said outer housing means.

3,968,737
DISJOINABLE ASSEMBLY DESIGNED FOR CONNECTING OF PISTON WITH PISTON ROD IN ENGINES AND MACHINES, PARTICULARLY SUITABLE FOR USE IN COMPRESSORS

Stanislaw Kulig, Krakow, Poland, assignor to Osrodek Badawczo-Rozwojewy Przemyslu Budowy Urzadzen Chemicznych "Cebea", Krakow, Poland

Filed Mar. 13, 1975, Ser. No. 558,114

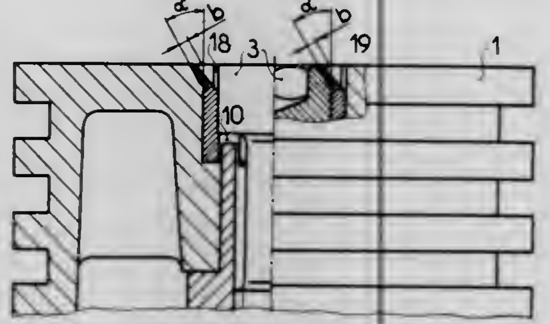
Claims priority, application Poland, Apr. 5, 1974, 170132

Int. Cl.² F16J *1/12*

U.S. Cl. 92—258 **6 Claims**

1. The combination of a piston and piston rod with a demountable assembly connecting the piston and piston rod, said piston having an end face with a recess therein and at least one socket extending from said recess, a tubular insert in said recess and abutting an axially facing wall thereof, a connector in said insert and in engagement with a portion thereof,

said piston rod abutting an axially facing portion of said piston and means engaging said connector with said piston rod, said insert and piston rod including means defining a splined connection therebetween, said insert having an upper portion which is thinner than its lower portion, said upper portion forming a single, axially extending thin rim which includes portions bent laterally, said rim having an outer diameter less than the outer diameter of the lower portion of the insert



connected thereto and an inner diameter greater than the inner diameter of the lower portion of the insert connected thereto; said connector having at least one socket therein, one portion of said rim being being bent outwardly into the socket in said piston and a second portion being bent inwardly into the socket in said connector to secure the connector against rotation, said rim initially forming free spaces with said connector and piston to permit bending the rim into said sockets after installation of the insert into said recess.

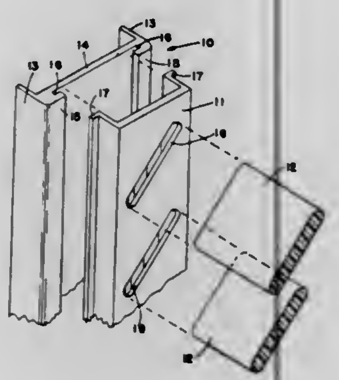
3,968,738
PLASTIC LOUVER FRAME ASSEMBLY

William A. Matzke, Mahopac, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 464,915, April 29, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,060

Int. Cl.² F24F *13/06*

U.S. Cl. 98—108 **3 Claims**



1. A plastic louver frame assembly comprising: an external frame assembly comprising top, bottom, and side external frame sections for fitting into an opening in a wall, including two inwardly extending turned-over rails forming vertical grooves in the side external frame sections; two vertical retaining frames, each formed with outwardly extending members which are slidably received into the grooves in the side external frame sections and are formed with a U-shaped channel defining an enclosed air space, each retaining frame formed with angular slots closed at each end; and a series of plastic louver strips positioned in the angular slots in the retaining frames, and held against movement by the slot ends.

3,968,739
APPARATUS FOR THE PROCESSING OF VINASSE

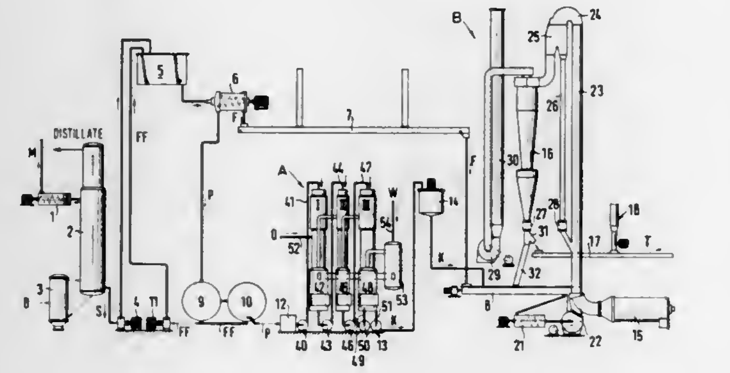
Hans-Martin Stoltenburg, Selk, Germany, assignor to Kartoffelverwertungsgesellschaft Cordes & Stoltenburg, Schleswig, Germany

Division of Ser. No. 459,276, April 9, 1974. This application Dec. 23, 1974, Ser. No. 535,579

Claims priority, application Germany, Apr. 13, 1973, 2318751

Int. Cl.² C12F *3/10*

U.S. Cl. 99—276 **6 Claims**



1. Apparatus for processing vinasse comprising:

a. means for crushing large solids of a fermented mash whereby the dangers of heat crusting and clogging are reduced to a minimum;
b. means for distilling the crushed solids to obtain a bottoms residue of vinasse;
c. means for indirect heating of the distilling means;
d. decanting means for fractionating the vinasse to simultaneously convert the vinasse into clear liquid with a very minimal content of undissolved fine grained solids, and solids with a high degree of dehydration, and removing the solids therefrom;
e. means for exiting the clear fractionated liquid from the decanter;
f. buffer tank means for receiving free-fall the clear fractionated liquid from the decanter, and separating sediment therefrom;
g. means for recycling the aforesaid sediment to the decanter;
h. multiple effect vacuum downfall vaporizing means to thicken the clear fractionated liquid, and form a concentrate thereof;
i. means for conveying the fractionated solids from the decanting means to a mixing means;
j. means for intermixing said concentrate with said solids;
k. means for drying the mixed concentrate and solids by a two-stage hot-air drying means;
l. means for separating said solids from the mixer, and returning a portion thereof for further mixing.

3,968,740
COFFEEMAKER

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed July 28, 1975, Ser. No. 599,411

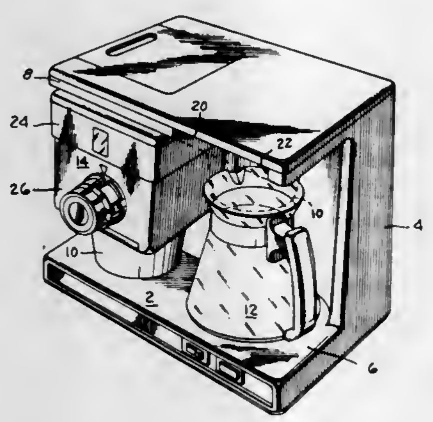
Int. Cl.² A47J *31/40*

U.S. Cl. 99—289 R **7 Claims**

1. An electric coffeemaker comprising:

a. a housing having a hollow generally vertical rear wall, a generally horizontal stand portion extending outwardly from a lower portion of said rear wall, and an overhanging wall extending outwardly from an upper portion of the vertical rear wall;
b. a ground coffee dispenser positioned on said generally vertical wall a substantial distance above the lower stand portion of said housing;

c. a carafe for brewed coffee positioned on the lower stand portion of said housing at one side of said ground coffee dispenser and under said overhanging wall;
d. means for discharging heated water through an outlet which is provided in the overhanging wall of said housing above said carafe;
e. a ground coffee basket having an outwardly extending lip at its upper portion;
f. a supporting guide rail means formed at a lower portion of said ground coffee dispenser for receiving the lip portion of said coffee basket to removably support said coffee basket below said ground coffee dispenser; and



g. a supporting guide rail means provided in the overhanging top wall of said housing above said carafe and at one side of said ground coffee dispenser for receiving the lip portion of said coffee basket to removably support said coffee basket on the top wall of said housing above said carafe so that said ground coffee basket may be first positioned on the guide rail means below said coffee dispenser to receive ground coffee, and then positioned on the guide rail means provided in the top wall of the housing to receive heated water from said heated water outlet.

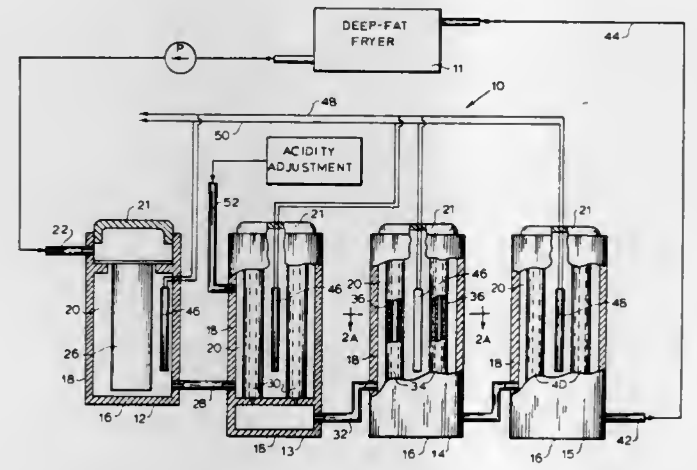
3,968,741
COOKING OIL RECOVERY SYSTEM

Arthur John Hunt, 332 N. Halifax Drive, Ormond Beach, Fla. 32074

Continuation-in-part of Ser. No. 266,222, June 26, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,256

Int. Cl.² A47J *37/12*

U.S. Cl. 99—330 **5 Claims**



1. A cooking apparatus comprising in combination:

a cooking container having container walls and a bottom for holding and heating cooking oil, said cooking container having a drain in the bottom thereof;
a plurality of filtering elements connected in series for filtering cooking oil passing therethrough;
a drain line connecting the first filter element in said series to said cooking container drain;
a return line operatively connecting the last of said series of filter elements to said cooking container;
pump means operatively connected to said cooking apparatus to pump cooking oil from said cooking container through said drain line, filtering elements and through said return line back into said cooking container, the return line being connected to said cooking container through one wall adjacent a second wall thereby causing a circular movement of oil around said cooking container;
drain line heating means attached to said drain line to heat said oil passing thereby;
filter heating means attached around at least one filtering element for heating oil passing therethrough;
acid reducing metering means operatively connected between said drain line and said return line for metering acid to said cooking oil; and
ph measuring means for measuring the ph of cooking oil and being operatively connected to said acid reducing metering means for activating said acid reducing metering means when said ph reaches to a predetermined level.

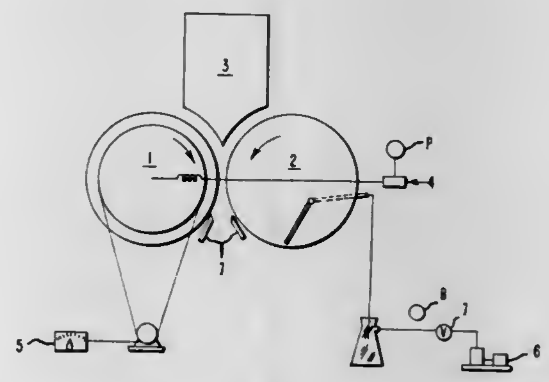
3,968,742
PROCESS FOR THE CONCENTRATION OF PIGMENT PRESS CAKE

John Hammond Kerr, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1974, Ser. No. 493,070

Int. Cl.² B30B *9/20*

U.S. Cl. 100—37 **6 Claims**

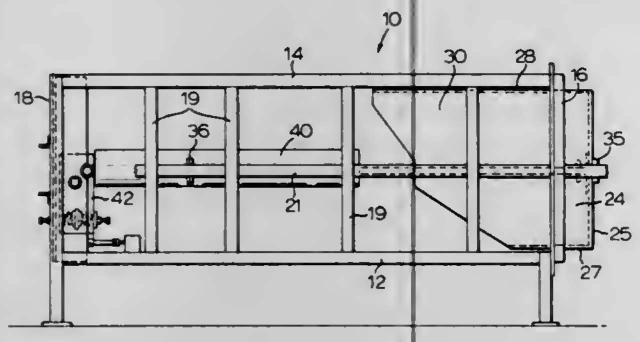


1. In a process for using an apparatus which apparatus comprises a pair of rotatable, perforated rolls; means connected to said rolls for rotating said rolls in opposite directions such that the top of each roll rotates toward a plane located between the rolls and said plane being perpendicular to a plane through the center axes of said rolls; means connected to said rolls for adjusting the distance between the rolls; means for feeding pigment press cake between the rolls such that when the rolls are rotated, the press cake is drawn between the rolls; means connected to said rolls for applying vacuum to the interior of the rolls; means connected to said rolls for removing the pigment press cake from the rolls; the improvement comprising using said apparatus, wherein the rolls are circumferentially grooved, mounted horizontally with respect to one another and covered with a porous covering so that only water and dissolved solids can pass through the covering, for performing the process comprising:

a. feeding the pigment press cake between the rolls of said apparatus,
b. adjusting the distance between the rolls to provide compression and shear on the pigment press cake,
c. applying a vacuum to the interior of the rolls sufficient to cause excess water which is squeezed from the pigment press cake to be drawn into the rolls and eliminated, and
d. removing the pigment press cake from the rolls.

3,968,743
REFUSE PACKER

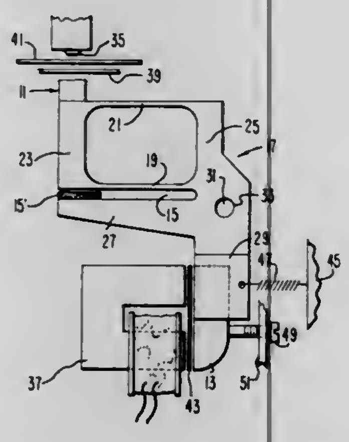
John J. Scherrer, Elmira, Canada, assignor to B & L Metal Products (Elmira) Limited, Elmira, Canada
Filed May 19, 1975, Ser. No. 578,731
Claims priority, application United Kingdom, May 22, 1974, 22917/74
Int. Cl.² B30B *15/16*
U.S. Cl. 100—52 **6 Claims**



1. In combination:
a frame which includes substantially rectilinear track means,
a force-exerting member adapted to reciprocate along said track means,
a lever member pivoted to said frame about a pivot point,
a hydraulic component adapted positively to urge said force-exerting member along said track means, part of said hydraulic component being operatively connected to said force-exerting means, another part thereof being operatively connected to said lever member at a location such that activation of said hydraulic component applies torque to said lever member tending to rotate it about said pivot point with respect to said frame,
resilient means biasing said lever member toward an at-rest position,
and displacement-sensitive control means connected between said lever member and said frame, said control means being adapted, upon sensing a predetermined amount of displacement in said lever member, to reverse the direction of said hydraulic component.

3,968,744
SELF-DAMPING UNITARY PRINT HAMMER FOR HIGH SPEED PRINTERS

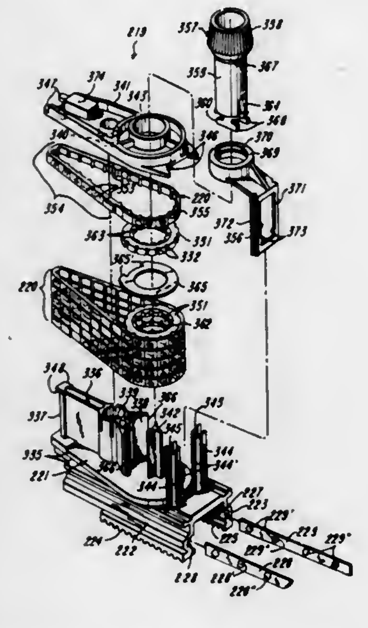
Abdul L. Kasu, Westland, and William J. Basse, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Mar. 3, 1975, Ser. No. 554,579
Int. Cl.² B41J *9/42*
U.S. Cl. 101—93.02 **9 Claims**



1. A self-contained print hammer for rotatable impacting use in association with a solenoid and a print station in a line printer, said print hammer being rotatably effective for producing a printed output in said print station and for preventing an overprint of said printed output, said self-contained print hammer comprising:
a. an actuator formed of a metallic material and operatively associated with said solenoid,
b. an impactor formed of a metallic material and effective for producing said printed output in said print station,
c. thermoplastic body means comprising:
first and second spaced apart flexure members interconnected at corresponding ends thereof by an interconnecting member, said interconnecting member having a recess constrictively securing and supporting said impactor,
a first rigid member disposed in parallel and predetermined spaced relationship with said first flexure member on the side thereof opposite said second flexure member and said impactor, said first rigid member operating in support of said impactor in producing said printed output and in opposition to said impactor in preventing said overprint of said printed output, and
a second rigid member disposed on the side of said thermoplastic body means remote from said interconnected first and second flexure members, said second rigid member being provided with a recess constrictively securing and supporting said actuator in cooperable relationship with said solenoid, and
d. a dampener associated with said impactor and comprising:
said predetermined spaced relationship between said first rigid member and said first flexure member, and
a damping material fixed to said first rigid member on the surface thereof adjacent said first flexure member, whereby upon the production of said printed output in said print station the kinetic energy generated in said impactor and in said interconnected first and second flexure members is absorbed by the contraction of the spaced distance comprising said predetermined spaced relationship between said first rigid member and said first flexure member and by the damping compression of said damping material.

3,968,745
LABEL PRINTING AND APPLYING APPARATUS

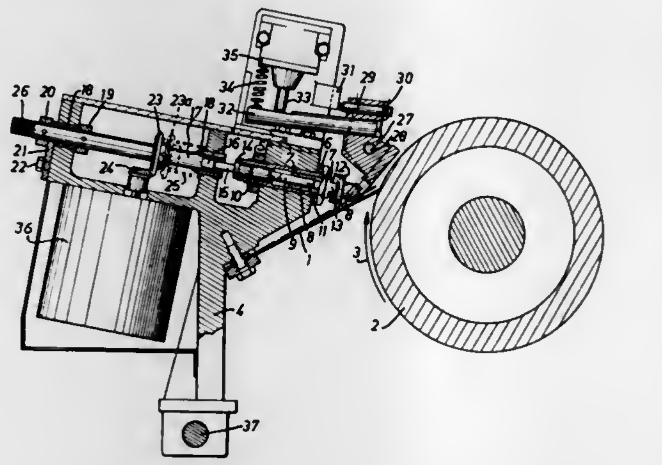
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,454
Int. Cl.² B41J *1/20, 1/24*
U.S. Cl. 101—111 **28 Claims**



1. Printing apparatus, comprising: a series of flexible printing bands, a drive wheel in driving engagement with each respective printing band, each drive wheel having a hole, the holes being generally aligned to provide an opening, a selectively shiftable and rotatable selector movable into the opening, means formed partly by the selector and partly by the wheels for selectively drivingly coupling the selector and a selected one of the wheels at a selected position to effect rotative setting of the selected wheel upon rotation of the selector, and means formed partly by the selector and partly by at least one wheel and disposed in the opening for releasably holding the selector in the selected shifted position irrespective of the position to which the selector is shifted.

3,968,746
AUTOMATIC DEVICE FOR THE REMOTE ADJUSTMENT OF THE INKING BLADE OF A PRINTING MACHINE

Jean R. Gaillochet, Paris, France, assignor to Marinoni, Paris, France
Filed Sept. 18, 1970, Ser. No. 73,319
Claims priority, application France, Nov. 12, 1969, 69.38854
Int. Cl.² B41F *31/04*
U.S. Cl. 101—365 **4 Claims**

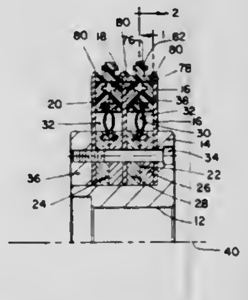


1. An inking device for printing machines comprising an ink fountain, means for creating a flow of ink from said ink fountain, means for adjusting said flow of ink including a rotationally adjustable ink control element and a first electrically reversible synchronous motor, means for drivably connecting said synchronous motor with said ink control element to effect adjustment thereof at a predetermined angular speed, a control device comprising a presetting element manually rotatable through various angular displacements in either of two directions from a neutral position, a second electrically reversible synchronous motor drivably connected to said presetting element to drive said presetting element rotationally from said various displacements to said neutral position at the same angular speed as said predetermined angular speed, and switch means actuatable by said presetting element upon angular displacement thereof for simultaneously energizing said first and second synchronous motors in a common direction with an AC voltage to drive said presetting element in a direction toward said neutral position and to rotationally adjust a corresponding one of said ink control elements, said switch means further comprising means for de-energizing said first and second synchronous motors upon arrival of said presetting element at said neutral position.

3,968,747
PRINTING APPARATUS

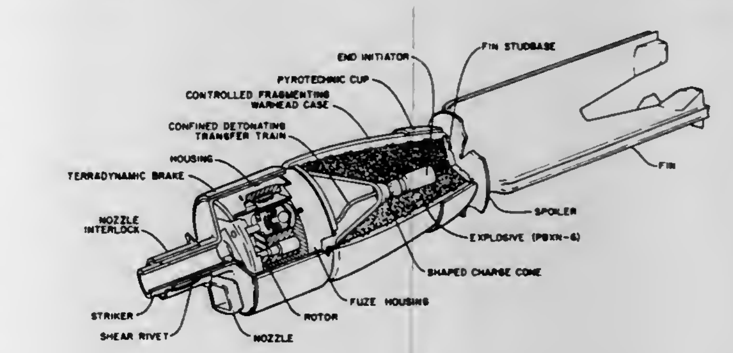
Leonard L. Johnson, Fort Wayne, Ind., assignor to Lincoln Logotype Co., Inc., Fort Wayne, Ind.
Filed Jan. 27, 1975, Ser. No. 543,991
Int. Cl.² B41F *13/10*
U.S. Cl. 101—376 **23 Claims**

1. Printing apparatus comprising a wheel having two spaced sides, a support member mounted between said sides for radial movement, means for limiting the outward radial travel of said member, said wheel being open radially outwardly from said support member, a spring of resilient, rubber-like material, in buckled columnar form extending radially of said wheel between said support member in its outermost radial position and the central portion of said wheel,
said buckled columnar spring being secured at its radially outer end to said support member and at its inner end to said central portion of said wheel whereby radially inward movement of said support member causes lateral bowing of said spring with the force exerted by the spring in opposition to the radially inward movement remaining nearly constant over the range of support member radial movement, and type-supporting means including said support member and wheel sides for supporting a type segment in said open portion of said wheel.



3,968,748
TARGET DISCRIMINATING BOMBLET

Milton K. Burford, China Lake; Joseph F. Mattis, Ridgecrest, both of Calif.; Peter D. Gratton, Simpsonville; William J. Donahue, Takoma Park, both of Md.; Michael A. Halling, San Diego; Ken Pinkerton, Westminster, both of Calif.; Thomas A. Cammack, Beltsville, Md.; Rodney A. Bernardin, Wayzota, Minn.; Lee Johnson, Edina, Minn.; Art Lohmann, Hopkins, Minn., and Ed Abt, Chalfont, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 15, 1973, Ser. No. 329,263
Int. Cl.² F42B *25/16*
U.S. Cl. 102—7.2 **2 Claims**

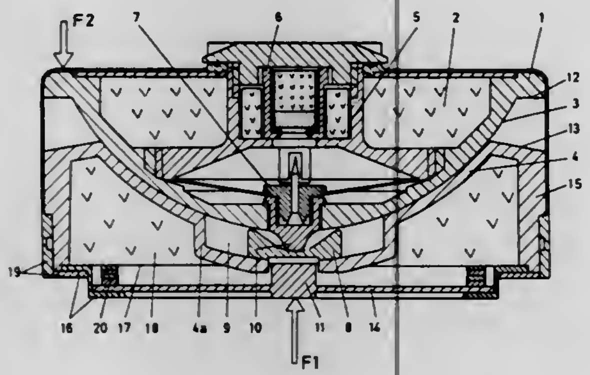


1. A target discriminating bomblet for distinguishing between hard and soft targets, comprising:
a warhead, having
an ogive-shaped fragmentation case; a conical shaped charge liner mounted within said case; an explosive load located in said case between said case and said liner; and
a zirconium cup circumferentially attached to said case; and a fuse, having
a stab detonator;
an explosive transfer line, one end of which is adjacent to said detonator and the other end of which is attached to a booster charge located within said warhead;
a first firing pin located adjacent to said detonator when the bomblet is armed;
a first cylindrical body held closely within a second cylindrical body forming a part of a housing for said fuze and relative axial movement between said two cylindrical bodies being prevented by at least one shear rivet passing through walls of said bodies;

a stab primer;
a second firing pin having a pointed and a non-pointed end, said pin located adjacent to said primer when the bomblet is armed;
expulsion means for propelling the bomblet warhead into the air after the bomblet has impacted a soft target;
a first pyrotechnic delay connecting said primer with said expulsion means for igniting said expulsion means;
a second pyrotechnic delay connecting said primer with said detonator;
said second delay being sufficiently longer than said first delay so that the bomblet warhead is propelled into the air prior to detonation of said warhead;
said housing defining a ball mass chamber having a centering receptacle which forms a first end of said chamber opposite said stab primer, and said primer forming a second end of said chamber;
a metal ball-shaped inertial mass poised to inertially plunge said second firing pin into said primer upon a sudden deceleration of the bomblet, said ball mass being contained within said chamber;
a hemispherical cup attached to said non-pointed end of said second firing pin and holding said ball-shaped mass within said cup; and
resilient means for urging said cup and said second firing pin away from said primer and toward said centering receptacle;
so arranged and constructed that the bomblet striking a soft target will fail to activate said first firing pin and will activate said second firing pin to initiate said expulsion means for propelling the bomblet warhead into the air where said warhead is detonated, and so that the bomblet exhibits pyrophoric properties upon detonation.

3,968,749
LAND MINE

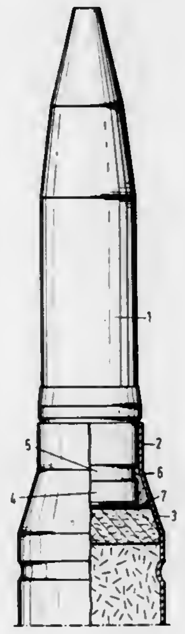
Karl Olof Bertil Malm, Stockholm, Sweden, assignor to AB Bofors, Bofors, Sweden
Filed May 16, 1974, Ser. No. 470,508
Claims priority, application Sweden, May 22, 1973, 7307161
Int. Cl.^{2} F42B *23/26*
U.S. Cl. 102—8 **6 Claims**



1. A land mine comprising two relatively movable parts, one of said parts having a spherical contact surface which is supported in and slidably engages a complementary bowl-shaped contact surface in the second part, said parts being adapted to be tangentially displaced relative to one another at their respective contact surfaces upon application of an external force to one of said parts, a percussion mechanism, an actuating device selectively responsive to said tangential displacement of said parts at their respective contact surfaces for activating said percussion mechanism, said actuating device comprising a member located in a space between said contact surfaces, and locking means adjacent said member responsive to the presence of a further external force for selectively locking said member in fixed position relative to said second part so that, upon occurrence of said tangential displacement of said parts at their respective contact surfaces, relative movement occurs between said member and said first part to cause said member to activate said percussion mechanism, said locking means being responsive to the absence of said further external force for unlocking said member from said second part to permit said member to follow the movement of said first part within said space upon occurrence of said tangential displacement thereby to prevent the activation of said percussion mechanism.

3,968,750
PROJECTILE-CASE CONNECTION

Antonius Maria Deelen, Schijndel, Netherlands, assignor to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V., 's-Hertogenbosch, Netherlands
Continuation-in-part of Ser. No. 342,988, March 20, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,286
Int. Cl.^{2} F42B *9/20*
U.S. Cl. 102—41 **1 Claim**



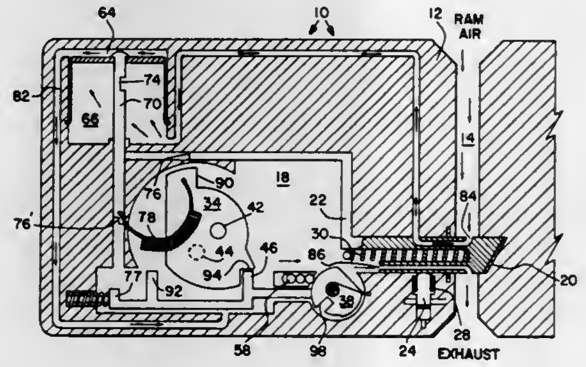
1. In ammunition, in particular disintegrating practice ammunition for artillery pieces having a high rate of fire, comprising in combination a projectile having a relatively soft deformable plastic material shell having an end portion formed with at least one annular recess therein, a cartridge case open at one end and receiving said end portion, said case having a conical part extending rearwardly and surrounding said annular recess, and means for securing the shell to said cartridge case comprising hardened, molded material filling the space between said recess and said conical part.

3,968,751
ARMING DEVICE

Robert G. Palifka, Orford, N.H., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 5, 1975, Ser. No. 610,601
Int. Cl.^{2} F42C *5/00*
U.S. Cl. 102—76 R **3 Claims**

1. In a control mechanism including:
environmental sensing means having an energy output;
actuation initiation means;
time delay means;
first, second and third cam means movable from an initial position to a final actuation position;
plunger means coacting with said cam means and movable from an initial position blocking movement of said third cam means;
said first cam means being driven under control of said time delay means from an initial position blocking movement of said plunger means to an actuation position allowing finite travel of said plunger means;

said second cam means being driven by energy developed by said environmental sensing means from an initial position blocking movement of said plunger means to an actuation position allowing full travel of said plunger means;
said third cam means carrying said actuation initiation means and being connected to said second cam means through an energy storage means;
said plunger means blocking movement of said third cam means until energy has been stored in said energy storage means;
whereby, when said first and second cam means move into the actuated position, said plunger means will move into a position unlocking said third cam means and allowing said third cam means to move into the actuation initiation position; the improvement comprising:

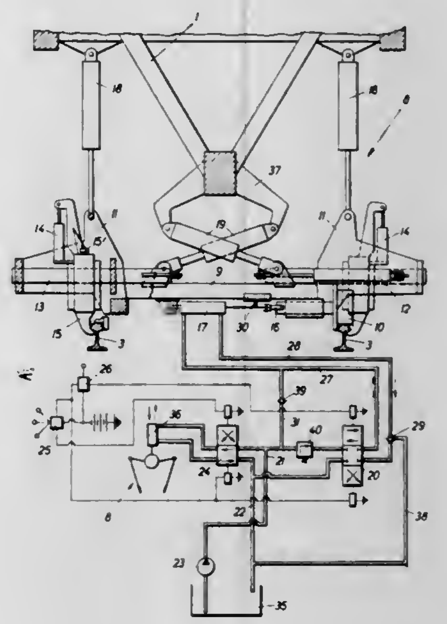


said energy storage means connecting said second and third cam means consisting of a compression spring having a predetermined threshold level response and supplying a constant force over the displacement range of said second cam means;
whereby energy is stored in said spring upon movement of said second cam means in response to said environmental sensing means; and
said force being sufficient to move said third cam means when unlocked to actuation initiation position; or
to move said second cam means back into a position locking said plunger means when said energy developed by said environmental sensing means falls below a predetermined value.

3,968,752
MOBILE TRACK WORKING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H., Vienna, Austria
Filed Feb. 18, 1975, Ser. No. 550,751
Claims priority, application Austria, Sept. 27, 1974, 7794/74
Int. Cl.^{2} E01B *27/17, 29/04*
U.S. Cl. 104—7 B **12 Claims**

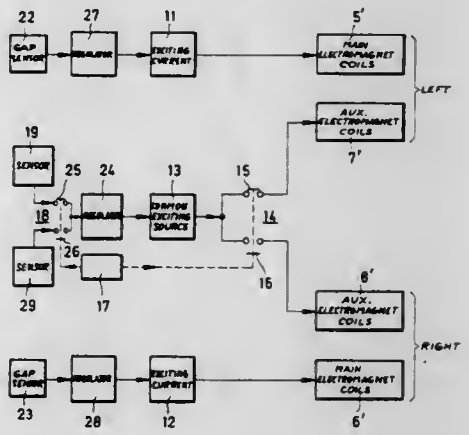
1. In a mobile apparatus for working on a track including two rails fastened to ties, which comprises a track lining and leveling unit having a frame mounted for mobility on the track rails, hydraulic drive means for moving the frame in mutually perpendicular directions extending transversely and vertically to the track for lining and leveling the track, flanged lining rollers mounted on the frame for engagement with an associated one of the rails, and poweractuated rail lifting hooks mounted on the frame and arranged to subtend the rails, the improvement of
1. adjustment drive means for continuously and simultaneously moving the lining rollers into substantially playfree engagement with the associated rails, and



2. a control for the adjustment drive means for temporarily holding the lining rollers in a fixed relation to the frame.

3,968,753
CIRCUIT ARRANGEMENT FOR MAGNETIC SUSPENSION VEHICLE SYSTEMS

Ulrich Breitling, Berlin, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany
Filed Feb. 19, 1975, Ser. No. 551,054
Claims priority, application Germany, Feb. 20, 1974, 2408071
Int. Cl.^{2} B61B *13/08*
U.S. Cl. 104—148 MS **8 Claims**



1. An electromagnetic suspension vehicle system comprising:
a track having a pair of main armature rails on opposite sides thereof, a switch portion in which at least one of said main armature rails is interrupted, and a pair of auxiliary armature rails at least at selected locations of said switch portion;
a vehicle displaceable along said track and having at opposite sides thereof respective main electromagnets respectively cooperating with said main armature rail, and auxiliary electromagnets cooperating with said auxiliary armature rails at least at selected regions of said switch portion for suspending said vehicle on said track in the absence of suspension force from an associated main electromagnet;
separate exciting current sources for each of said main electromagnets;

a common exciting current source for both said auxiliary electromagnets on opposite sides of said vehicle;

switching means for selectively connecting said common exciting current source with a selected auxiliary electromagnet on only one side of said vehicle;

a regulator for said common exciting current source for controlling same to maintain a substantially constant suspension gap;

respective sensors respectively associated with the auxiliary electromagnets on either side of said vehicle; and

second switching means between said sensors and said regulators for selectively connecting a corresponding one of said sensors to said regulator in accordance with the side of the vehicle at which an auxiliary electromagnet is energized by said common exciting current source.

3,968,754
CHAIN DRIVE ARRANGEMENT FOR A MINING MACHINE

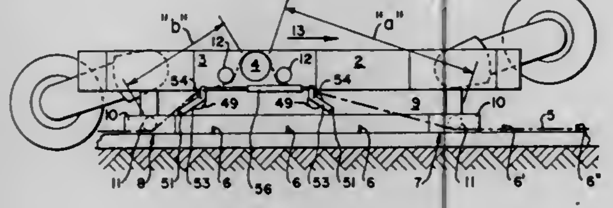
Willy Lanfermann; Paul Kaisler, and Dieter Lauterbach, all of Bochum, Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Jan. 13, 1975, Ser. No. 540,556

Claims priority, application Germany, Jan. 11, 1974, 2401981

Int. Cl.^{2} B61B *13/00*

U.S. Cl. 104—172 R **29 Claims**



1. In an apparatus for securing and guiding a chain-like means which is normally positioned to extend in a longitudinal direction along the path of travel by a mining machine for underground mining operations, a portion of the chain-like means being continuously displaced from its normal position into an engaging relation with a drive output member of a driven winch on the mining machine to thereby propel the mining machine along the chain-like means, guide members spaced apart in relation to the length of the mining machine to retain and then return the chain-like means to the normal position as the mining machine is propelled along such that the guide members generally bound between them the displaced portion of the chain-like means for engagement with the drive output member, the improvement comprising:

holding means engaging said chain-like means at spaced-apart intervals to restrain the chain-like means along the length thereof, each holding means resisting the tension load imposed upon the length of chain-like means lying ahead of the mining machine in relation to the propelled movement thereof by the driven winch on the mining machine; and

guide means distinct from said guide members and spaced apart in relation to the length of said mining machine at opposite sides of said drive output member to releasably retain said chain-like means by successive ones of said holding means until displacement of the chain-like means toward the drive output member and to engage again the released chain-like means passed from the drive output member with the holding means as the mining machine is propelled along said chain-like means.

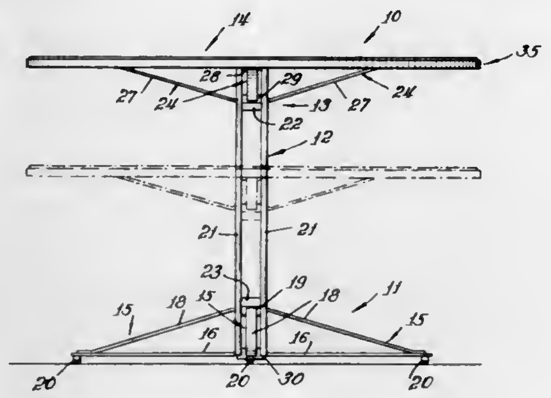
3,968,755
TABLE AND BENCH CONSTRUCTION AND METHOD FOR FORMING SAME

Fritz O. Lester, Kalamazoo, Mich., assignor to Leane E. Lester, Kalamazoo, Mich.

Filed Nov. 28, 1973, Ser. No. 419,675

Int. Cl.^{2} A47B *13/02*

U.S. Cl. 108—150 **20 Claims**



1. A flat surface and support therefor comprising in combination:

1. at least one pillar comprising a plurality of elongate pillar members and a joint member support near the top of said pillar affixed to and maintaining said pillar members in spaced-apart configuration with free ends thereof projecting above said joint member support in parallel relation one to the other,
2. means for supporting the pillar in a vertical position to a horizontal surface,
3. a flat surface support comprising a joint member adapted to rest on said joint member support and to be engaged by the free ends of said pillar members and a plurality of supporting arms affixed to and projecting from said joint member having horizontal portions, and
4. a flat surface supported by the horizontal portions of said arms.

3,968,756
METHOD FOR INCINERATION OF A SLUDGE CONTAINING CHROMIUM SUBSTANCE AND APPARATUS THEREFOR

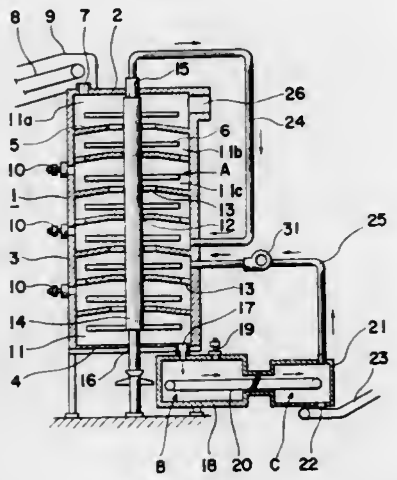
Shintaro Yamada, Toyanaka, Japan, assignor to Chugairo Kogyo Kaisha Ltd., Osaka, Japan

Filed Aug. 19, 1975, Ser. No. 605,927

Claims priority, application Japan, Aug. 20, 1974, 49-95629

Int. Cl.^{2} F23G *7/00*

U.S. Cl. 110—12 **10 Claims**



1. A method for incineration of a sludge containing chromium substance comprising a sequential combination of a step of incinerating the sludge containing chromium substance into ashes, a step of reducing hexad chromium existing within the resultant of the first step into triad chromium by means of reducing gas, and a step of cooling the resultant of the second step before discharging the same to the outside.

5. An apparatus for incineration of a sludge containing chromium substance comprising in combination of a zone for incineration of the sludge containing chromium substance into ashes, the sludge being supplied from the outside into the incineration zone, a zone for reduction of the resultant of the incineration zone by means of reducing gas, the reduction zone being connected with the incineration zone to receive the resultant from the incineration zone, and a zone for cooling the resultant of the reduction zone, the cooling zone being connected with the reduction zone to receive the resultant from the reduction zone and with the outside to discharge the resultant of the cooling zone.

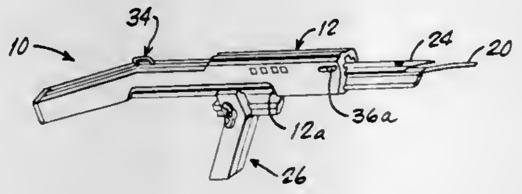
3,968,757
RUG-TUFTING DEVICE SUITABLE FOR HOME USE BY HOBYISTS

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Oct. 31, 1975, Ser. No. 627,668

Int. Cl.^{2} D03C *15/06*

U.S. Cl. 112—80 **5 Claims**



1. A hand-operated rug-tufting device comprising:

an axially extending elongated, and substantially hollow housing having a needle drive handle at the axially back end and a forward portion having a forwardly opening and axially extending looper holder slot and a forwardly opening and axially extending needle holder slot;

an elongated, axially extending looper holder received within the looper holder slot of the housing for reciprocating axial movement therein with respect to the housing;

an elongated, axially extending looper secured to the looper holder at a selected axial position with respect thereto and extending forwardly of the axially forward end of the looper holder;

a looper drive handle secured to the axially back end of the looper holder at a selected axial position with respect thereto and extending transversely away from the housing;

an elongated, axially extending needle holder received within the needle holder slot of the housing for axial movement therein with respect to the housing;

means for securing the needle holder to the housing at a selected axial position with respect thereto;

an elongated, axially extending needle secured to the needle holder and extending axially forwardly therefrom; and

said housing having a back stop and a forward stop disposed in the reciprocating axial path of the combination of the looper holder and the looper drive handle to limit the respective forward and back movement of said combination.

3,968,758
ARRANGEMENT FOR THE TUFTING OF CARPETS

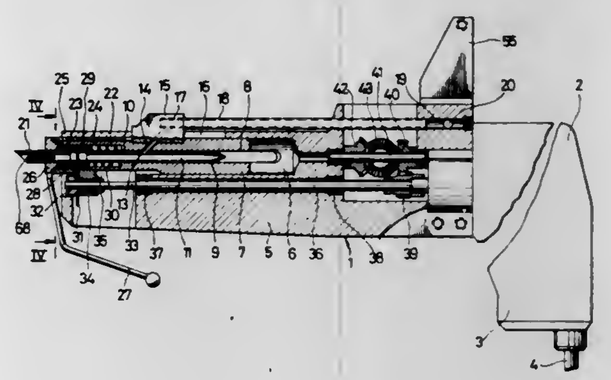
Hartmut Scholz, No. 10 Wolfsteiner Strasse, D-8501 Allersberg, Germany

Filed Nov. 1, 1974, Ser. No. 520,119

Claims priority, application Germany, Nov. 13, 1973, 2356585

Int. Cl.^{2} D05C *15/06*

U.S. Cl. 112—80 **11 Claims**



1. In an arrangement for the tufting of carpets during needleworking, including a hollow needle having an axial passageway and adapted to penetrate through the backing fabric of said carpet; a piston, means mounting said hollow needle for axial reciprocation within said piston; means for transporting the tufting thread through said needle in an airstream, said needle including an air inlet aperture for the sideways infeed of said air stream; a thread infeed aperture for the sideways infeed of said thread into said needle, said air inlet aperture being behind said thread infeed aperture in the direction of conveyance of said thread through said needle; a cutter for severing the thread in said needle passageway in timed sequence; and a common synchronously operating drive for effecting cutter movement and needle lifting motion, the improvement comprising; said air inlet aperture and said thread infeed aperture communicating with the interior of said hollow needle at separate locations, said hollow needle having the forward portion thereof located within said piston, and means mounting said needle so as to be rotatable about its longitudinal axis, said cutter being a rotatable cutter.

3,968,759
AUTOMATIC YARN CHANGER

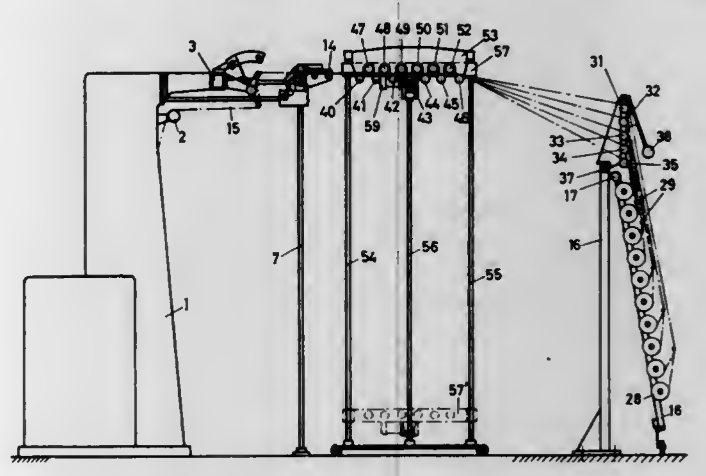
Rudolf Reich, 6, An der Ringstrasse, Neuwied, Germany

Filed Oct. 15, 1974, Ser. No. 514,531

Claims priority, application Germany, Oct. 18, 1973, 2352207

Int. Cl.^{2} D05C *3/04*

U.S. Cl. 112—83 **11 Claims**

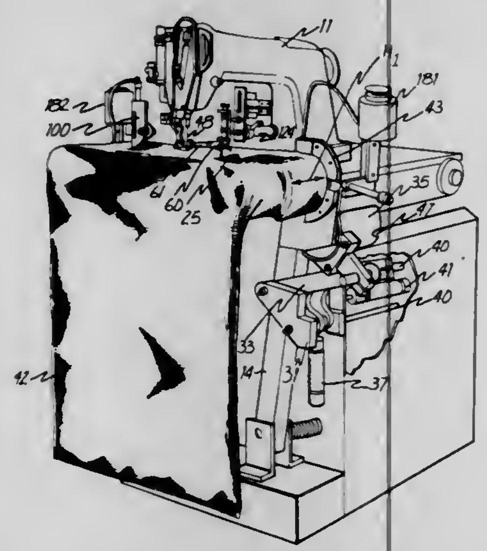


1. An arrangement for an embroidery machine having a needle side and in which the yarn ends to be fed at said needle side are to be changed, comprising:

a replaceable yarn support stand;
a plurality of feed yarn rolls for the needle yarns required by the operations of said machine, said yarns being arranged in a close yarn group;
a movable yarn storage and tensioning arrangement separate from the embroidery machine adapted to withdraw an amount of yarn from said feed yarn rolls required for changing the yarn, and to accommodate the needle yarns from the feed yarn rolls with the same yarn lengths and for tension free and continuous supply of the yarn necessary for the operation while the embroidery mechanism is running; and
a yarn clamping device provided between said yarn support stand and said storage and tensioning arrangement, said clamping device clamping the resting feed yarn rolls in the yarn support stand for changing the yarn rolls.

3,968,760
METHOD AND APPARATUS FOR THE PRODUCTION AND HANDLING OF ARTICLES, PARTICULARLY OF TUBULAR FORM

Herman Rovin, Norwalk; Rudolf Kreidel, Shelton, both of Conn., and Lawrence J. Levine, Valley Stream, N.Y., assignors to Automatech Industries Inc., Bridgeport, Conn.
Division of Ser. No. 365,098, May 30, 1973, Pat. No. 3,865,058. This application Nov. 27, 1974, Ser. No. 527,695
Int. Cl.^{2} D05B *69/36*
U.S. Cl. 112—219 R **4 Claims**

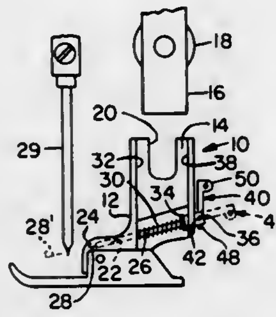


1. The method of detecting a no-sew condition in a hemmed article during a sewing operation, which comprises
 a. placing an unsupported region of the hemmed margin of the article under tension in the direction of the sewing, whereby a tension plane of the article is formed,
 b. deflecting the article in the area of said unsupported region immediately adjacent but beyond the free edge of the hem in a direction away from said free edge and out of said tension plane thereby tending to effect a separation of the deflected portion of the article from said free edge, and
 c. sensing the position of said free edge relative to said deflected portion, whereby a separation of said edge from said deflected portion in a direction toward said tension plane reflects a non-sewn condition of the hem.

2. Means for detecting a sewn or unsewn condition between two layers of material, which comprises
 a. means for supporting said layers of material under tension in the sewing direction, whereby a tension plane of said layers is formed, and with one layer projecting out from under the other in a direction at right angles to the sewing direction,
 b. a deflector member positioned to contact the projecting portion of said one layer and being adjacent to but out of contact with said other layer,
 c. said deflector member being operative to divert said projecting layer out of said tension plane, thereby effecting a separation of said projecting layer from said other layer when a non-sewn condition exists and deflecting said other layer out of said tension plane along with said projecting layer when a sewn condition exists, and
 d. means to sense the path of the other layer of material in the region of said deflector member.

3,968,761
HAND AND SEWING MACHINE NEEDLE THREADER

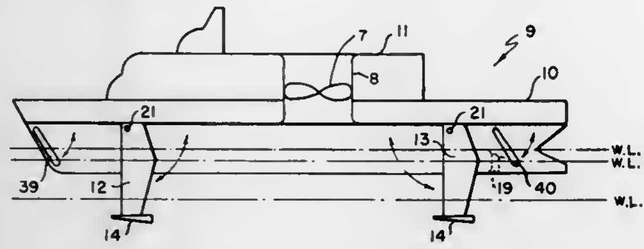
Paul Tarrants, 207 Orchard Lane, Henderson, Ky. 42420
Filed May 9, 1975, Ser. No. 576,186
Int. Cl.^{2} D05B *53/00, 87/00*
U.S. Cl. 112—225 **7 Claims**



1. A sewing machine needle threader comprising
a presser foot defining a housing,
a movable rod slidably mounted in said housing,
a threading means connected to one end of said rod and adapted to insert through the eye of a needle,
biasing means confined in said housing about said rod tending to maintain said threading means in a retracted position in said housing, and
means for advancing said rod forward from said retracted position for movement of said threading means out of said housing to a position of engagement with an eye of a needle.

3,968,762
TRIPLE HYBRID WATERCRAFT

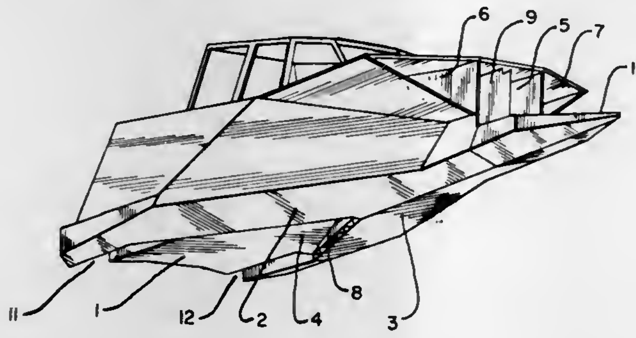
John R. Meyer, Jr., Kensington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 21, 1975, Ser. No. 606,675
Int. Cl.^{2} B63B *1/18*
U.S. Cl. 114—66.5 H **5 Claims**



1. A multi-modal watercraft having a wide speed range with favorable lift-to-drag ratio resulting in good performance under various sea conditions comprising:
a hull structure;
a superstructure mounted on said hull;
said hull structure includes a pair of buoyant sidewall structures attached to said hull structure;
a hydrofoil and strut system attached to said hull structure;
a forward seal and an after seal attached to said hull and sidewall structure for forming an air cushion with said sidewall structure;
a propulsion engine for providing a rotational shaft output mounted in said hull and sidewall structure;
a dividing gearbox attached to said shaft output of said propulsion engine;
a set of clutches coupled to said dividing gearbox;
a subcavitating propeller selectively engagable to said gearbox with one of said clutches clutches;
a waterjet propulsion pump selectively engagable to said gearbox with the other of said clutches; and
at least one set of outlet jets and inlets for said propulsion pump.

3,968,763
RAMMED AIR CUSHION HYDROPLANE

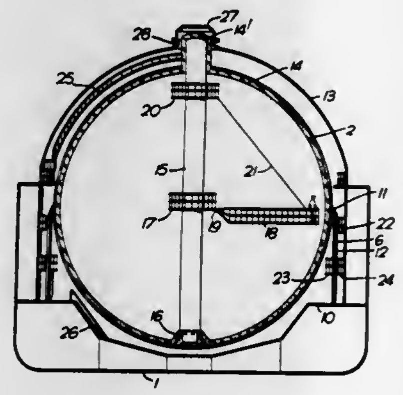
John S. Mason, 105 Deepdene Road, Baltimore, Md. 21210
Filed Feb. 28, 1974, Ser. No. 446,670
Int. Cl.^{2} B63B *1/34*
U.S. Cl. 114—67 A **4 Claims**



1. In a hydroplane boat, the combination of a buoyant hull provided with means of propelling and guiding the same, diagonal and transverse planing surfaces so disposed beneath said hull that they lift the hull above the surface of the water and at their lower extremities surround, confine, and fix the location of an air cavity beneath the center of gravity of the boat, and an air scoop in the bow of said hull which gathers air from the forward motion of the boat, forces it through a duct into said air cavity and pressurizes said air cavity, and which hull is equipped with a retractable bowsprit, said bowsprit being an extension of said diagonal planing surfaces which improves their ability to penetrate wave crests when extended, and which bowsprit seals and closes said air scoop when retracted to render said air scoop buoyant when the boat is not moving at high speed.

3,968,764
SHIPS FOR TRANSPORT OF LIQUEFIED GASES

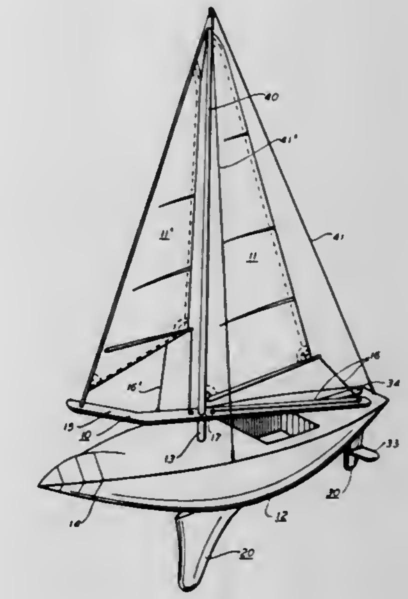
Rolf Kvamsdal, Jeloy, and Roar Tobiassen, Stavanger, both of Norway, assignors to Moss Rosenberg Verft A/S, Jeloy, Norway
Filed Jan. 10, 1975, Ser. No. 540,095
Claims priority, application Norway, Oct. 31, 1974, 743932/74
Int. Cl.^{2} B63B *25/08*
U.S. Cl. 114—74 A **3 Claims**



1. In a marine vessel for the transport of liquefied gas,
a hull,
a plurality of spherical tanks of non-cryogenic material for storage of said liquefied gas,
a cylindrical skirt extending from the hull of the vessel up to the equator of each tank and secured to the tank at the equator to support the tank,
a layer of thermally insulating material secured over the inner surface of the wall of each tank, the outer surface of the wall of each tank being accessible for inspection for faults;
scaffolding means provided at the interior and the exterior of each of said tanks to facilitate inspection of the interior insulating material and of the exterior of said tank wall, respectively;
each of said tanks further comprising:
a central column for enclosing piping extending into said tank through an opening in the top thereof and supporting said scaffolding means in the tank,
a truncated substantially conical member secured at its base to the bottom of the tank and extending upwardly therefrom to support said central column at its lower end in spaced relation to said bottom of the tank,
thermally insulating material disposed on the inner and outer surfaces of said substantially conical member and in said member between the lower end of the column and the tank,
and thermally insulating material on the upper portion of the column extending through the opening in the tank.

3,968,765
ROTATABLE-MOUNTING APPARATUS FOR SAILS

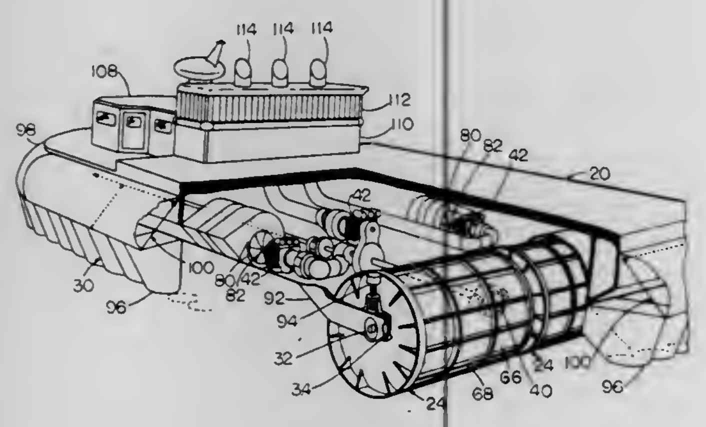
Robert L. Menegus, 62 Major St., Clifton, N.J. 07013
Continuation of Ser. No. 302,212, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 113,208, Feb. 8, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,882
Int. Cl.^{2} B63H *9/04*
U.S. Cl. 114—102 **3 Claims**



1. An apparatus for mounting sails on a racing yacht, which comprises:
 a. a step, adapted to be mounted on the hull of the racing yacht;
 b. an elongated unitary boom;
 c. rigging, connecting the sails to the boom; and
 d. means for connecting the boom, intermediate its ends, parallel to and spaced from the hull, with no means other than the step connecting the boom to the hull, whereby the boom, sails and rigging are substantially freely rotatable as a unit about the step and relative to and unconnected to the hull, and so that the boom, sails and rigging

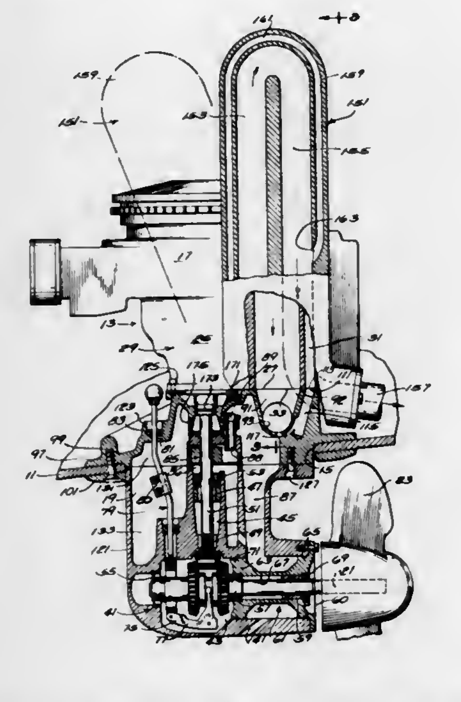
will automatically respond to maintain a substantially constant angle with respect to the direction of the shifting apparent wind, to provide maximum thrust, with minimum drag, for substantially increased yacht speed capabilities;
- e. a rudder movably connected to the hull;
- f. and a helm connected to the rudder for movement thereof angularly relative to the longitudinal axis of the boom.

3,968,766
AMPHIBIOUS AIR CUSHION VEHICLE
William C. House, 4515 N. Lexington, Tacoma, Wash. 98407
Filed June 16, 1975, Ser. No. 587,099
Int. Cl.² B06V *1/00*
U.S. Cl. 115—1 R **8 Claims**



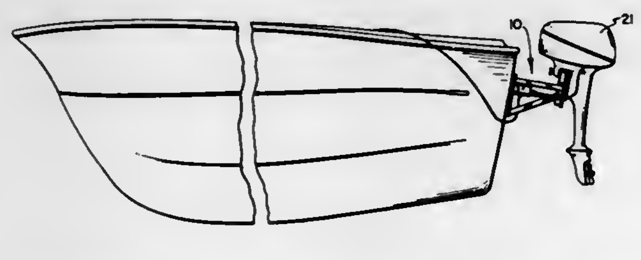
1. An amphibious air lift cushion vehicle equipped with low pressure variable inflatable cylindrical drum rollers made of air tight flexible materials, comprising
- a. a body;
- b. transverse fore and aft pairs of hollow shafts mounted on bearings secured in turn to the body including end bearings near the sides of the body and central bearings supported at the middle of the body;
- c. differentials and drive shaft assemblies secured adjacent the central bearings, to the respective hollow shafts of each pair of hollow shafts;
- d. low pressure selectively variably pressurized cylindrical drum rollers made of air tight flexible materials mounted on each of the hollow shafts; having radial and longitudinal flexible structural air tight diaphragms in their interiors;
- e. a compressed air distribution system to distribute selectively variably pressurized air throughout the hollow shafts and the interiors of the low pressure drum rollers from a compressed air generating source mounted on the body;
- f. an air cushion lift system mounted on the body having lift fan assemblies, a plenum, and finger skirt assemblies around the base of the plenum; and
- g. a power plant system mounted on the body for converting the energy of a fuel into mechanical driving power for turning the drive shafts and differentials thereby transmitting power to the hollow shafts and the low pressure cylindrical drum rollers, into mechanical driving power to drive the lift fan assemblies, and into mechanical driving power to operate the compressed air generating source serving the cylindrical drum rollers.

3,968,767
MARINE PROPULSION DEVICE ADAPTED FOR A SAILBOAT
Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed June 24, 1974, Ser. No. 482,468
Int. Cl.² F01N *3/04*
U.S. Cl. 115—.5 E **14 Claims**



2. A marine propulsion device comprising a power head including a bottom face having therein an exhaust gas passage port, a lower unit connected to said bottom face and including a side surface, a propeller shaft, a propeller carried on said propeller shaft, and an exhaust gas passage communicating with said power head port and terminating in a port in said side surface, and an exhaust gas passage conduit connected to said lower unit for pivotal movement relative thereto and in communication with said port in said side surface and extending upwardly therefrom to above said power head and downwardly therefrom and being adapted to be connected to a duct discharging the exhaust gas into the atmosphere.

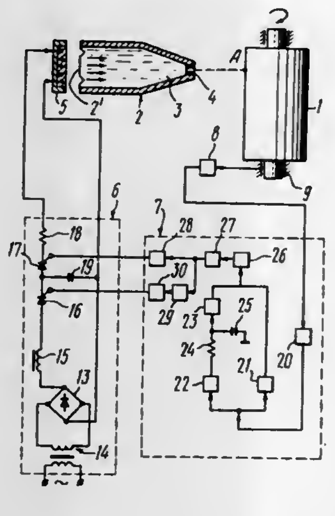
3,968,768
REMOTELY CONTROLLED STEERING TRANSOM FOR OUTBOARD MOTORS
Dean L. Solt, 3271 S. 1800 West, Granger, Utah 84119
Filed Sept. 29, 1975, Ser. No. 617,278
Int. Cl.² B63H *21/26*
U.S. Cl. 115—18 R **8 Claims**



1. A remotely controlled steering transom for outboard motors comprising
- a. a frame adapted to be attached to the transom of a boat by mounting means, said frame having a front plate, top and bottom plates affixed to said front plate each of which extend rearwardly being affixed at the rear most portions thereof to a tubular bearing support,
- b. a spindle journaled through said bearing support having projecting ends,
- c. caps inserted over the projecting ends of said spindle, said caps being affixed to the vertical center portion of a rear metal plate,

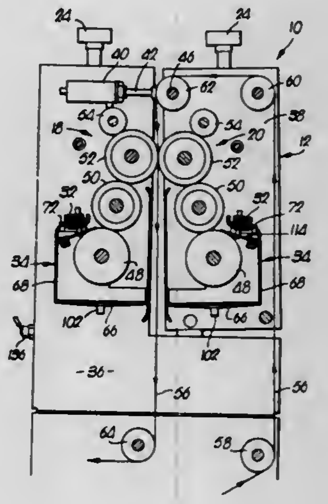
- d. means affixed to said rear metal plate on which to mount an outboard motor,
- e. bracket means affixed to the front plate of said frame between the top and bottom plates,
- f. a reversible electric motor connectible to a battery attached to said bracket means and interconnected with a motor driven pulley,
- g. a double acting switch attached to said reversible electric motor by means of an electric cable of sufficient length to be positioned at any desired location in the boat to be steered,
- h. tension springs affixed to the front plate on either side of the reversible electric motor,
- i. pulley means mounted on either side of the rear metal plate facing said tension springs, and
- j. a flexible cable affixed at each end to the tension springs, said cable passing around said oppositely facing pulleys from an outside to the inside relationship, the portion of said cable between said pulleys being looped around said motor driven pulley such that when said electric motor is operated in response to the double acting switch, the flexible cable will be frictionally moved around the motor driven pulley thereby causing the rear plate containing the outboard motor to rotate about the spindle in a direction opposite to the direction of rotation of the motor driven pulley thereby steering the boat.

3,968,769
APPARATUS FOR BALANCING ROTORS
Anatoly Alexandrovich Gusarov, Unversitetsky prospekt, 5, kv. 470, and Lev Nikolaevich Shatalov, ulitsa Utrennyaya, 3, kv. 107, both of Moscow, U.S.S.R.
Filed Jan. 13, 1975, Ser. No. 540,665
Int. Cl.² B05B *15/00*
U.S. Cl. 118—8 **7 Claims**



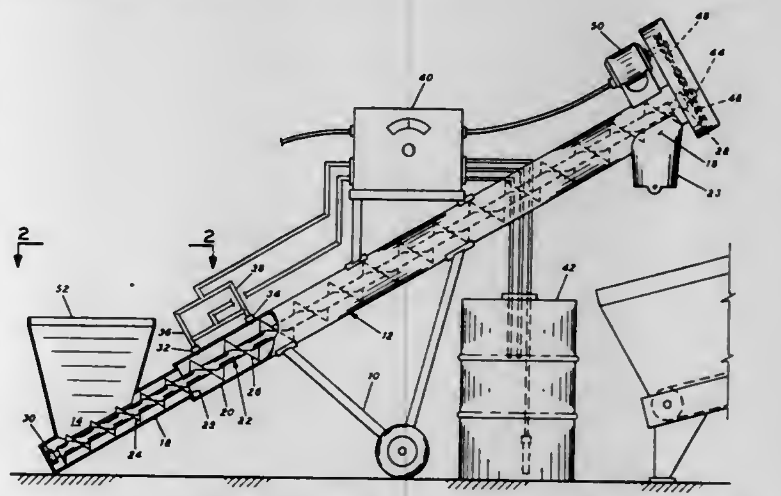
1. An apparatus for balancing rotors, comprising: a chamber for a balancing material, said chamber having a nozzle; an electromagnetic inductor, said chamber being arranged in the magnetic field thereof; a pulse generator having a charge circuit and a discharge circuit, said electromagnetic inductor being connected to the latter and receiving electric pulses therefrom; a control unit, said charge circuit and said discharge circuit of said electromagnetic inductor being connected to the output of said control unit; a transducer of vibration parameters of a rotor being balanced in the course of its rotation, said transducer being connected to the input of said control unit; said chamber being constructed so that upon the arrival at said electromagnetic inductor of electric pulses from said pulse generator and according to an instruction from said control unit, there are produced in said chamber magnetic pulse forces which eject doses of the balancing material from the nozzle of said chamber onto the light point area of the surface of the rotor being balanced in the course of its rotation.

3,968,770
TINTING FLUID DISTRIBUTING APPARATUS FOR WEB FED PRINTING PRESS
Robert G. Marrs, Emporia, Kans., assignor to Didde-Glaser, Inc., Emporia, Kans.
Filed July 3, 1974, Ser. No. 485,443
Int. Cl.² B05C *1/08*
U.S. Cl. 118—227 **8 Claims**



1. A web tinting unit, comprising:
- at least one roll train having a number of elongated, rotatable rolls in tangential engagement along the lengths thereof and including an applicator roll at one end thereof and a tinting-fluid receiving roll at the opposite end thereof;
- a plurality of spaced dispensing means disposed along the length of said tinting fluid receiving roll and proximal thereto for directing tinting fluid onto the periphery of the latter;
- each of said dispensing means including a head having a tubular dispensing pipe in offset relationship to the geometric center thereof;
- means mounting said heads for rotation thereof about respective axes for varying the amount of tinting fluid directed onto the periphery of the latter; and
- structure supporting said roll train and dispensing means in web-receiving and tinting disposition.

3,968,771
PROCESS AND APPARATUS FOR APPLYING PESTICIDES TO GRANULAR MATERIALS
David D. Walgenbach, Brookings, S. Dak., and Kenneth E. Stocker, Indianola, Iowa, assignors to Chevron Research Company, San Francisco, Calif.
Filed May 23, 1974, Ser. No. 472,784
Int. Cl.² B05C *5/02*
U.S. Cl. 118—303 **7 Claims**



1. An apparatus for applying a liquid composition to a granular material which comprises:

a hollow cylindrical tube, said tube having a portion of reduced internal diameter at the low length thereof and being formed with an enlarged internal diameter adjoining said portion of reduced internal diameter at the lower length thereof and being formed with an enlarged internal diameter adjoining said portion of reduced internal diameter for the remaining length thereof;

a first opening in the bottom portion of said reduced-diameter portion of said tube for loading a granular material into said tube;

a second opening in the top portion of said enlarged-diameter of said tube for discharging said granular material;

a rotatable auger housed in said tube and operably mounted for conveying said granular material through said tube;

means for supporting said tube at an angle to the horizontal to essentially completely fill said granular material in said reduced-diameter portion of said tube;

at least one inwardly directed liquid spray nozzle assembly mounted on said enlarged-diameter portion and positioned adjacent said reduced-diameter portion;

a liquid supply system connected to said spray nozzle assembly; and

means for rotating said auger, said rotating auger and said tube being constructed and arranged to automatically meter the quantity of said granular material being conveyed from the reduced-diameter portion to the enlarged-diameter portion and to limit said quantity to an amount which will be packed loosely in said enlarged-diameter portion to permit said granular material to tumble and expose all surfaces to said composition.

3,968,772
CURTAIN COATING APPARATUS

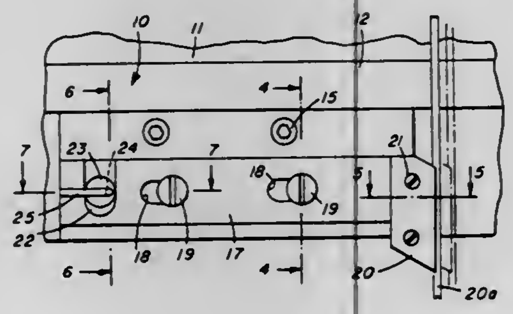
Jack F. Greiller, Ruislip, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 148,886, June 1, 1971, abandoned, which is a division of Ser. No. 883,185, Dec. 8, 1969, Pat. No. 3,632,403. This application Sept. 28, 1973, Ser. No. 401,786

Claims priority, application United Kingdom, Mar. 26, 1969, 15870

Int. Cl.² B05C *5/00*

U.S. Cl. 118—325 **5 Claims**



1. In a curtain-coating apparatus having means for forming a free-falling curtain of liquid coating composition which is directed to impinge on the face of a moving support, a pair of edge guide members each having means defining a vertically oriented edge guide surface, and means for mounting each edge guide member with respect to the curtain forming means such that the edge guide surfaces are adjacent to and vertically aligned with the opposite edges of a formed curtain to engage the edges of said curtain, the improvement wherein said mounting means comprises:

a. support means located in a predetermined position with respect to the curtain forming means;

b. means movably mounting each of said edge guide members on said support means in such manner that each edge guide member is longitudinally stationary but laterally movable so that the vertically oriented edge guide surfaces can be moved laterally in the plane of the curtain; and

c. control means for driving each said edge guide member a perdetermined distance laterally between first and second predetermined positions while maintaining the vertical orientation of the respective edge guide surfaces to adjust the width of a stable, free-falling curtain between said edge guide surfaces whereby the thickness of any edge bead formed in the curtain adjacent each edge guide surface is substantially reduced so that the coating assumes a substantially uniform thickness.

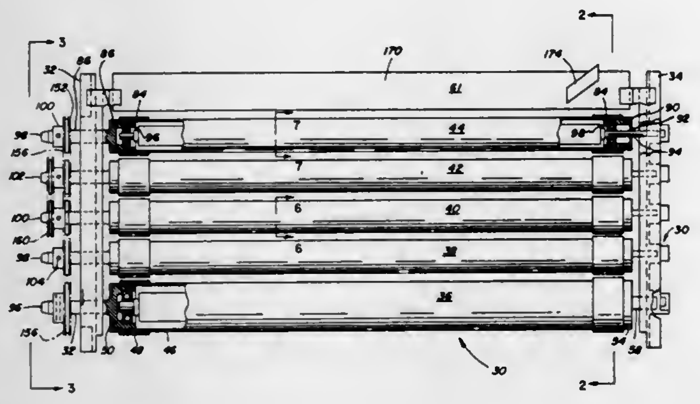
3,968,773
MAGNETIC BRUSH DEVELOPING APPARATUS

Terrence D. Charland, Pittsford, and Stanley D. Klett, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 442,036, Feb. 13, 1974, Pat. No. 3,906,898, which is a continuation-in-part of Ser. No. 255,721, May 22, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,954

Int. Cl.² G03G *15/09*

U.S. Cl. 118—637 **3 Claims**



1. In a magnetic brush developing apparatus for applying developing materials to a photoconductive surface to develop electrostatic latent images thereon in an electrostatic printing machine, an improved roller assembly which comprises: an external sleeve, said sleeve being comprised of an electrically conductive material, and insulating members disposed on the end portions of said sleeve to electrically insulate said sleeve from external discharge.

3,968,774
MASTITIS DETECTOR

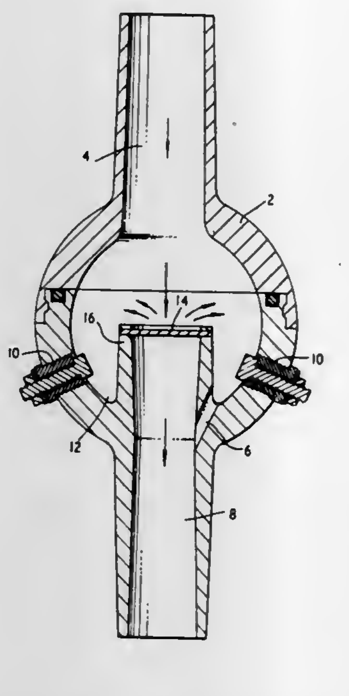
Kenneth Herbert Massie, Bromborough, England, assignor to Chalton Electronic Services Limited, Wales

Division of Ser. No. 399,613, Sept. 21, 1973, Pat. No. 3,884,187. This application Mar. 5, 1975, Ser. No. 555,706

Int. Cl.² A01J *7/00*

U.S. Cl. 119—14.14 **4 Claims**

1. A cell comprising a casing defined by a generally spherical wall having diametrically opposed inlet and outlet ports, a tubular member within said spherical wall and forming an extension to one of said ports, the outer wall of the tubular member and a portion of the inner wall of the spherical wall defining an annular well, to receive a sample of milk flowing into the cell through said inlet port, and two electrodes extending through said spherical wall and having ends spaced apart within said well, said tubular member having a drainage duct therethrough connecting said well to said one of said ports, said duct having dimensions such as to retain said milk sample in said well with said electrodes submerged therein.



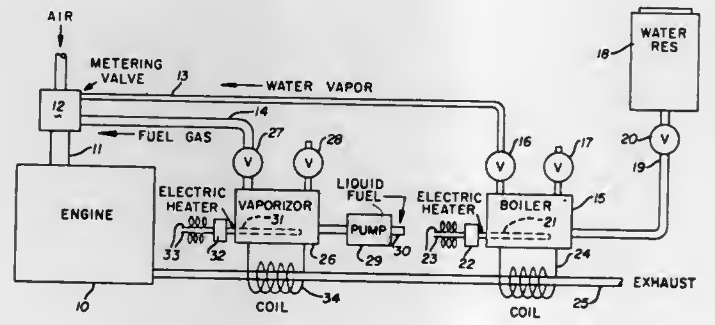
3,968,775
FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Webster B. Harpman, Poland, Ohio, assignor to Energy Research Inc., Greensburg, Pa.

Filed Sept. 24, 1973, Ser. No. 400,413

Int. Cl.² F02D *19/00*

U.S. Cl. 123—25 B **3 Claims**



1. An improved fuel system for an internal combustion engine having an inlet manifold and comprising a metering valve in communication with said inlet manifold for controlling air and gaseous fuel entering the same and introducing said air and gaseous fuel into said inlet manifold, a water vaporizer and a supply of water therefor and a liquid fuel vaporizer and a supply of liquid fuel therefor, an unbroken flat heating surface in said liquid fuel vaporizer for flash generation of said gaseous fuel, an electric resistance heating unit in said flat heating surface operating at a temperature of at least 700°F. and means for introducing said liquid fuel into said fuel vaporizer and directing the same against said flat heating surface for said flash vaporization thereon, means establishing communication between said liquid fuel vaporizer and said metering valve and between said water vaporizer and said metering valve, valve means in said means establishing communication between said liquid fuel vaporizer and said metering valve arranged to permit said gaseous fuel to flow only from said liquid fuel vaporizer to said metering valve and means for controlling the amount of liquid fuel introduced into said fuel vaporizer responsive in operation to the pressure of gaseous fuel generated in said liquid fuel vaporizer.

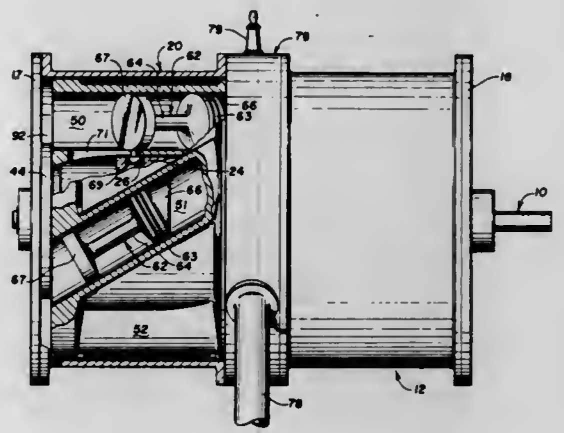
3,968,776
ROTARY CRANKLESS MACHINE

Larry D. Rund, Marshall, Minn., assignor to Rund Rotary Engines, Inc., Marshall, Minn.

Filed Aug. 23, 1974, Ser. No. 500,013

Int. Cl.² F02B *53/08*

U.S. Cl. 123—43 C **9 Claims**



1. A rotary crankless machine having a rotary shaft, a rotary cylinder block, and a stationary housing, all concentrically disposed with respect to a common axis,

said stationary housing having a central annular manifold block with inlet and outlet passages disposed approximately midway between the ends of said housing and extending inwardly from the outer annular wall of said housing, said annular manifold block having opposite surfaces facing the outer ends of said housing and having two opposed pairs of spaced openings, each of said pairs of openings extending through a different one of said opposite surfaces at a radial distance closer to the outer annular surface of said manifold block than to said common axis, said pairs of openings being connected together in sets, one set of openings communicating with said inlet passage and the other set of openings communicating with said outlet passage, said housing further having means for rotatably coupling together said rotary cylinder block and said shaft so that rotation of either one causes rotation of the other, and

said rotary cylinder block comprising two sets of oppositely directed cylinders each of which extends from adjacent an outer wall of said cylinder block inwardly towards said manifold block and through an inner surface of said cylinder block at the same radial distance from said common axis as the openings through the opposite surfaces of said manifold block, said inner surfaces conforming with said opposite surfaces and in sliding, sealing engagement therewith so that the inner ends of said cylinders are selectively brought into communication with said inlet and outlet passages of said manifold block as said cylinder block rotates, each of said cylinders having a longitudinal axis which is substantially inclined inwardly with respect to the common axis of said machine,

said cylinder block having a piston disposed in each of said cylinders each of which pistons has a piston head facing said manifold block and movable towards and away from said manifold block as the piston reciprocates within its cylinder,

and cam means disposed between said stationary housing and each of said pistons to cause reciprocation of said pistons to result in or accompany rotation of said rotary cylinder block and hence rotation of said rotary shaft.

3,968,777
INTERNAL COMBUSTION ENGINE

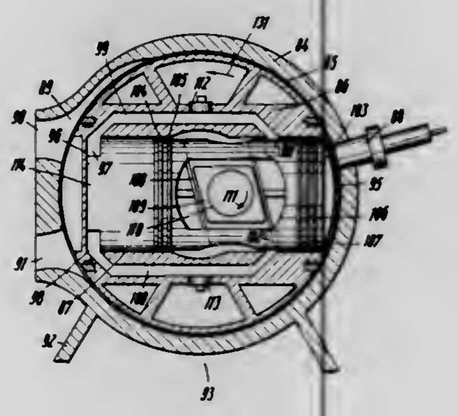
Walter Franke, Maschen, u. Winsen-Luhe, Germany, assignor to Motoren Forschungs GmbH & Co. KG Franken Motoren, Hamburg, Germany

Division of Ser. No. 306,039, Nov. 13, 1972, Pat. No. 3,906,908. This application Apr. 17, 1975, Ser. No. 568,829

Claims priority, application Germany, Nov. 15, 1971, 2156586

Int. Cl.^{2} F02B *57/00*

U.S. Cl. 123—44 R **9 Claims**



1. An internal combustion engine which comprises
- a stator defining a circular cylindrical opening and having substantially diametrically oppositely disposed, first and second portions adjoining said opening, said stator being provided in said first portion with combustion-initiating means communicating with said opening and in said second portion with an intake port and an exhaust port communicating with said opening,
- at least one cylinder diametrically extending in and rotatably mounted in said opening and adapted to control said combustion-initiating means and said intake and exhaust ports and having an open end and a bottom closing said cylinder at its opposite end,
- a piston which is reciprocable in said cylinder and defines a power chamber with said open end and an air compression chamber with said bottom, said piston being adapted to move between a first dead center near said bottom and a second dead center opposite to said bottom,
- said combustion-initiating means being adapted to initiate the combustion of a fuel-air mixture in said power chamber,
- a transfer duct formed in said cylinder and adapted to connect said compression chamber to said power chamber when said piston is at said first dead center,
- an inlet valve connected to said transfer duct,
- a crankshaft operatively connected to said piston,
- a rotatable drive shaft connected to said cylinder and adapted to rotate the same, and
- torque-transmitting means arranged to rotate said drive shaft from a given position to a subsequent position which is angularly spaced 90° therefrom in response to a rotation of said crankshaft from a given position to a position which is spaced 90° therefrom in a sense which is opposite to the sense in which said subsequent position of said drive shaft is spaced 90° apart from said given position thereof.

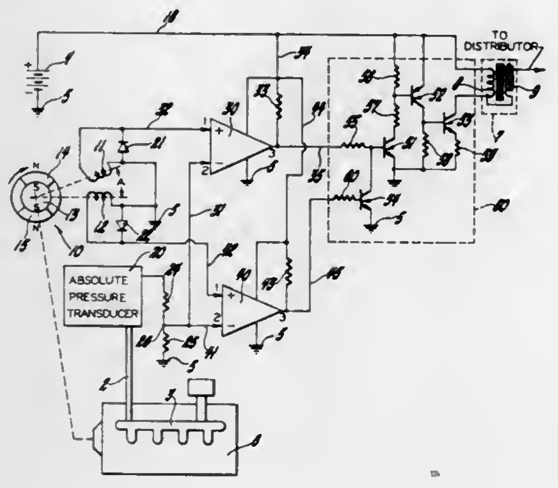
3,968,778
ELECTRONIC INTERNAL COMBUSTION ENGINE IGNITION SPARK VACUUM AND SPEED ADVANCE SYSTEM WITH IGNITION DWELL TIME DIRECTLY PROPORTIONAL TO ENGINE SPEED

Charles C. Gambill, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1974, Ser. No. 497,868

Int. Cl.^{2} F02P *5/04*

U.S. Cl. 123—117 R **3 Claims**



1. An electronic internal combustion engine ignition spark vacuum and speed advance system comprising in combination with an internal combustion engine and an ignition coil having a primary winding:
- means for producing in timed relationship with said engine a first and a second series of phase displaced leading and trailing electrical signal wave forms of a potential level proportional to engine speed, the potential level of said second series of trailing electrical wave forms being greater than the potential level of said first series of leading electrical signal wave forms over the engine speed range;
- means for producing an engine manifold absolute pressure electrical signal of a potential level proportional to engine manifold absolute pressure;
- means responsive to said leading electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition dwell signal while the potential level of each of said leading electrical signal wave forms is greater than that of said engine manifold absolute pressure signal;
- means responsive to said trailing electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition signal when the potential level of each of said trailing electrical signal wave forms has increased to that of said engine manifold absolute pressure signal; and
- circuit means responsive to said dwell time and ignition signals for completing and interrupting, respectively, an energizing circuit for said primary winding of said ignition coil.

3,968,779
FUEL INJECTION PUMP AND INJECTION CONTROL SYSTEM THEREFOR

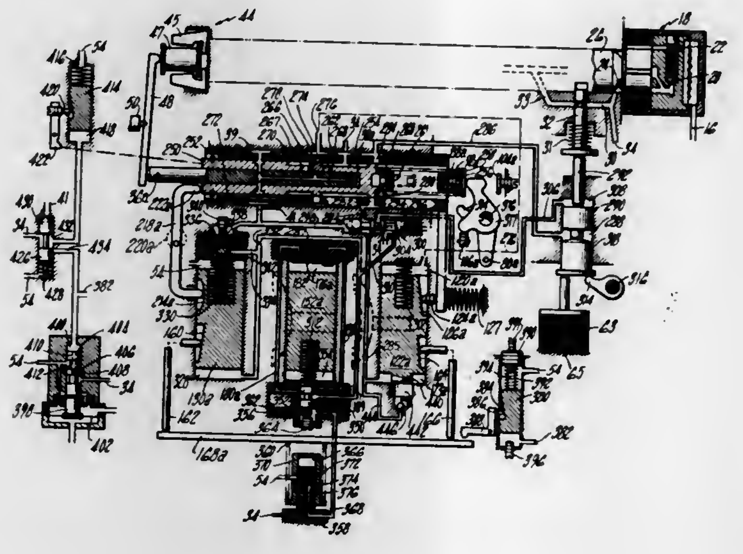
Charles W. Davis, Simsbury, Conn., assignor to Stanadyne, Inc., Hartford, Conn.

Filed Feb. 11, 1975, Ser. No. 548,906

Int. Cl.^{2} F02D *1/00, 1/04*

U.S. Cl. 123—140 FG **37 Claims**

1. A fuel injection pump for delivering measured charges of fuel under high pressure to an associated engine comprising, a source of fuel under pressure, a charge pump connected to receive fuel from said source and pressurize the fuel to high pressure, and a control system for regulating the charges of fuel and their delivery to the engine; said control system including injection timing means for controlling the timing of delivery of fuel by the charge pump, first and second pistons, actuating means for actuating the first piston to a position indicative of engine speed and for actuating second piston independently of the first piston to a position indicative of the quantity of fuel in each charge of fuel delivered by the charge pump, and means interconnecting said pistons with each other and with said injection timing means for controlling the timing of injection according to the positions of the first and second pistons.



3,968,780
FUEL SYSTEM FOR MULTICYLINDER ENGINES

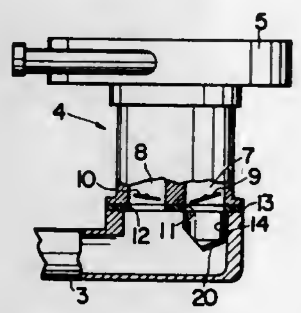
Toshiaki Konomi, and Jyoji Nurita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed July 18, 1974, Ser. No. 489,549

Claims priority, application Japan, Jan. 17, 1974, 49-7529

Int. Cl.^{2} F02M *29/00*

U.S. Cl. 123—141 **5 Claims**



1. In a multicylinder engine comprising an intake manifold having branches in communication with the cylinders and an intake port, and a carburetor having an axially extending primary barrel and an axially extending secondary barrel each in communication with said intake port, the improvement comprising that said secondary barrel is adjacent to and located downstream from said primary barrel toward said intake port, a hollow cylinder coaxial with said primary barrel and attached thereto at the downstream end of said primary barrel, a deflector attached to said hollow cylinder near its downstream opening and extending across a portion of the downstream opening, said deflector positioned for reorienting axial flow through said at least one barrel toward said intake port, said deflector defining with said hollow cylinder two openings from the downstream end of said first hollow cylinder, whereby the fuel-air mixture may be equally distributed among the cylinders.

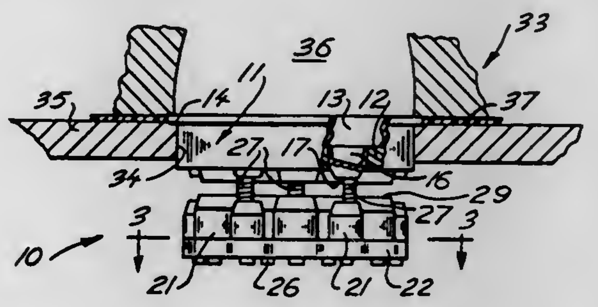
3,968,781
FUEL ATOMIZING DEVICE FOR CARBURETORS OF INTERNAL COMBUSTION ENGINES

Carl George Stephenson, 2052 Paulus Crescent, Burnaby, British Columbia, Canada

Filed Sept. 30, 1974, Ser. No. 510,426

Int. Cl.^{2} F02M *29/00*

U.S. Cl. 123—141 **5 Claims**



1. A fuel atomizing device for carburetors of internal combustion engines comprising:
- a. a plurality of tapered nozzles,
- b. means for securing said nozzles in axial parallelism with each other in the air passage of the carburetor so that the air/fuel mixture passing through said passage passes through said nozzles and issues a plurality of jets from said nozzles,
- c. a plurality of cylindrical cups having knife-edged open ends and being equal in number to said nozzles, each cup being located so that each said cup is spaced downstream of the discharge end of an associate nozzle and has its open end opening toward said associated nozzle,
- d. each of said cups being axially aligned with its associated nozzle and being spaced downstream from its associated nozzle for receiving the jet of air/fuel mixture issuing from its associated nozzle.

3,968,782
TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE WITH A RESTRICTED ORIFICE

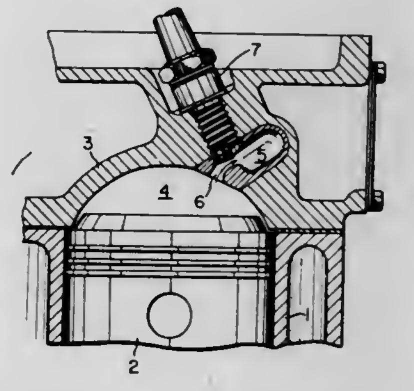
Masaaki Noguchi, Nagoya, and Takashi Kato, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1974, Ser. No. 534,584

Claims priority, application Japan, July 31, 1974, 49-87799

Int. Cl.^{2} F02B *19/12, 19/18*

U.S. Cl. 123—191 S **4 Claims**



1. A torch ignition internal combustion engine of the type which has no intake valve in the auxiliary combustion chamber, said engine comprising:
- a cylinder;
- a reciprocating piston snugly received in said cylinder;
- a main combustion chamber defined between the head of said cylinder and said piston and having an intake valve and an exhaust valve to control intake and exhaust ports in the cylinder head;

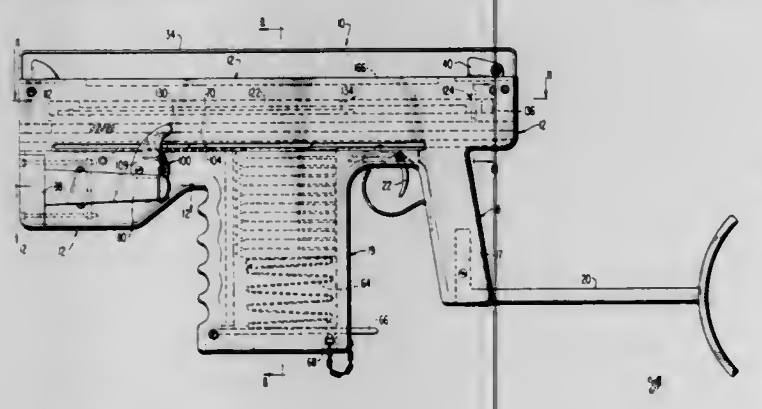
an auxiliary combustion chamber, having a volume smaller than that of the main combustion chamber, provided on the cylinder head;
an arcuately curved passage interconnecting said main and auxiliary combustion chambers, and the cross-sectional area of the passage is made sufficiently small to ensure sufficient velocity of flow therethrough; and
an ignition plug mounted on the cylinder head with its sparking electrodes located in a circumferential portion of said arcuately curved passage.

3,968,783
CROSSBOW TYPE GUN

James M. Pfotenhauer, 1302 N. 19th St., Escanaba, Mich. 49829

Filed July 11, 1974, Ser. No. 487,636
Int. Cl.² F41B *7/00*

U.S. Cl. 124—25 **15 Claims**



1. A bow gun comprising:
a body having a channel disposed therein, said channel including a projectile discharge bore and a cocking bore, said discharge bore having a projectile discharge opening at a forward end thereof;
a magazine chamber communicating with said channel for storing a plurality of projectiles for sequential discharge;
a bow mounted on said body at a forward end thereof, said bow carrying a bow string; impulse slide means disposed for reciprocal movement within said discharge bore and including a cocking head disposed in said cocking bore;
said bow string being connected to said impulse slide means;
cocking slide means disposed for reciprocal movement in said cocking bore relative to and ahead of said cocking head for shifting said impulse slide means rearwardly in said cocking bore;
a manually actuable cocking lever means pivotally mounted to said gun body and connected to said cocking slide to effect rearward movement thereof toward said cocking head to shift said impulse slide means rearwardly toward a cocked position; and
triggering means for retaining said impulse slide means in a cocked position and for releasing said impulse slide means for forward movement toward a projectile in said discharge bore under the bias of said bow string.

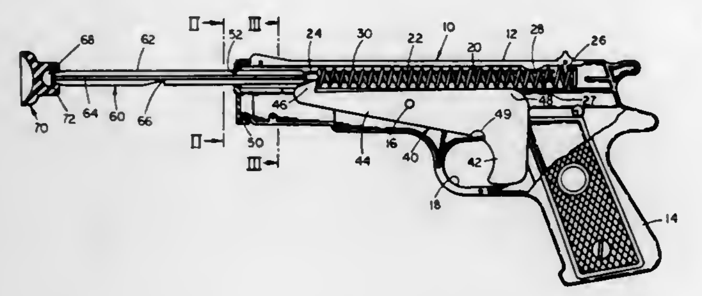
3,968,784
SPRING TYPE PROJECTILE PROJECTING DEVICE

Larry E. Miller, Bryan, Ohio, assignor to The Ohio Art Company, Bryan, Ohio

Filed Feb. 10, 1975, Ser. No. 548,263
Int. Cl.² F41B *7/00*

U.S. Cl. 124—27 **8 Claims**

1. In a dart gun comprising a barrel having an outer open end and a closed inner end, a helical compression spring in said barrel engaging said closed inner end, and a projectile having a shank with a notch therealong and being insertable in said open outer end of said barrel for compressing said spring, the improvement comprising:
A. a trigger means for holding and releasing said projectile having a longitudinal portion extending along said barrel intermediate the ends thereof, and being pivoted intermediate said longitudinal portion adjacent said barrel, said longitudinal portion having a hook at one end engageable with said notch in said projectile and an abutment at its other and engageable with the side of said spring, and



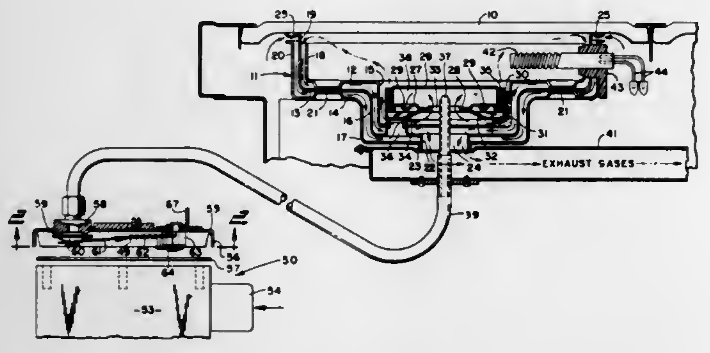
B. a deflector means in said barrel opposite said abutment on said trigger means for urging the lateral side of said spring towards said abutment on said trigger means to urge said hook into engagement with said notch.

3,968,785
BLUE FLAME GAS SMOOTH TOP RANGE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Division of Ser. No. 432,547, Jan. 11, 1974, Pat. No. 3,870,457, which is a continuation of Ser. No. 223,451, Feb. 4, 1972, abandoned. This application Dec. 26, 1974, Ser. No. 536,352
Int. Cl.² F24C *3/04*

U.S. Cl. 126—39 J **8 Claims**



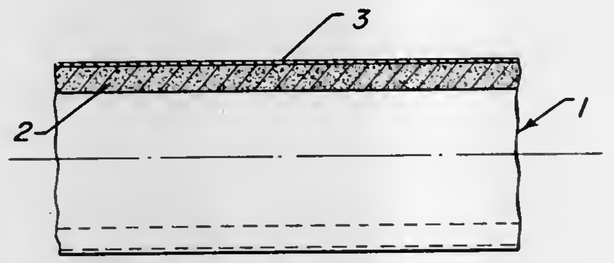
1. A gas burner assembly, comprising housing means having a mixing chamber, means for delivering a gaseous fuel and air to said mixing chamber for forming a combustible mixture therein, said mixing chamber having outlet port means for issue and blue flame combustion of such mixture, automatic valve means for controlling the delivery of the gaseous fuel to said mixing chamber, said valve means including a valve closure member, and electrical actuating means for operating said valve closure member to open and to close the same, and a glow type electric resistance igniter positioned to ignite the mixture issuing from said outlet port means, said igniter being operative to develop appreciable thermal energy and connected in circuit with said electrical actuating means for concurrent energization with the latter, said electrical actuating means including a thermally responsive member operatively connected to said valve closure member for opening and closing the same, and electric heater means for applying thermal heat to actuate said thermally responsive member, and means for pre-adjusting said actuating means to determine the response thereof with said valve closure member in condition capable of operation including means for applying a pre-load on said valve closure member and means for adjusting such pre-load to vary the responsiveness of said thermally responsive member for opening and closing said valve closure member, so that the response times of said automatic valve means and igniter are related in normal operation of said gas burner assembly such that said valve closure member remains closed until said igniter attains a temperature approximately at which ignition of the combustible mixture at the outlet port means occurs.

3,968,786
SOLAR HEAT ABSORBING TUBING

David H. Spielberg, Schaumburg, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 15, 1974, Ser. No. 470,254
Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **7 Claims**



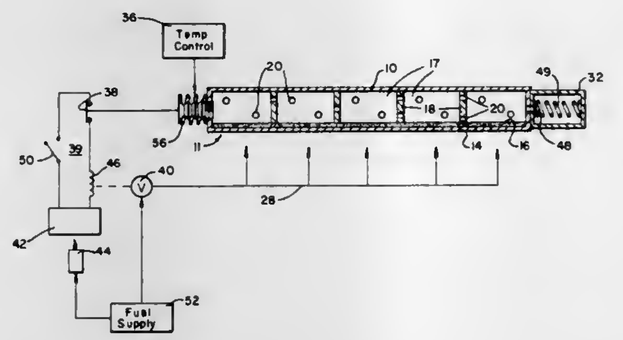
1. A heat absorbing tube providing enhanced solar radiation collection efficiency, which comprises in combination, a tubular member formed of plastic material containing a sufficient quantity of small electrical conductive black body absorber particles distributed throughout the thickness thereof to render said tubular member electrically conductive, and said black body particles being composed of conductive carbonaceous pyropolymer formed on a refractory oxide base material from a pyrolyzable organic material contacting said base material at a high temperature in the range of 400° to 750° C.

3,968,787
CONTROLLED VAPOR CHAMBER COOKING DEVICE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 16, 1973, Ser. No. 342,022
Int. Cl.² A47J *37/00*

U.S. Cl. 126—390 **4 Claims**



1. A controlled vapor chamber cooking device having:
a housing defining a sealed vapor chamber and having an extended top wall for providing a cooking surface;
a capillary wick disposed along the bottom surface of said chamber;
a plurality of internal structural support members disposed between said wick and the upper surface of said chamber and secured to said upper surface, said support members defining a plurality of vapor pressure equalization holes;
a quantity of volatile working fluid disposed in said chamber sufficient to saturate said wick when in a liquid state;
means for heating said chamber to vaporize working fluid contained therin;
means responsive to the vapor pressure within said chamber for controlling said heating means to maintain said vapor pressure within a predetermined range; and
means defining an auxiliary chamber having a volume equal to at least about twice the liquid volume of said working fluid in fluid communication with said vapor chamber, a valve disposed to selectively allow and preclude said fluid communication and pressure actuated means for controlling said valve to preclude said fluid communication under normal operating conditions and to allow said fluid communication upon the occurrence of said overpressure condition.

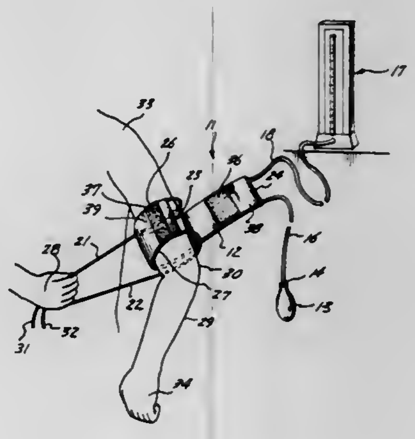
3. A controlled vapor chamber cooking device having:
a housing defining a sealed vapor chamber and having an extended top wall for providing a cooking surface;
a capillary wick disposed along the bottom surface of said chamber;
a plurality of internal structural support members disposed between said wick and the upper surface of said chamber, and secured to said upper surface, said support members defining a plurality of vapor pressure equalization holes;
a quantity of volatile working fluid disposed in said chamber sufficient to saturate said wick when in a liquid state;
means for heating said chamber to vaporize working fluid contained therein;
means responsive to the vapor pressure within said chamber for controlling said heating means to maintain said vapor pressure within a predetermined range; and
means defining an auxiliary chamber adjacent to said vapor chamber and for providing a fluid passageway between said auxiliary chamber and said vapor chamber, and pressure sensitive rupturable means disposed in said passageway for normally precluding fluid communication between said vapor chamber and said auxiliary chamber and designed to rupture when the pressure differential between said chambers reaches said overpressure condition.

3,968,788
SPHYGOMANOMETER BAND AND METHOD OF SELF-APPLICATION THEREOF

John Paxton Hopkins, 4146 Blvd. Place, Mercer Island, Wash. 98040

Filed May 29, 1975, Ser. No. 581,715
Int. Cl.² A61B *1/00*

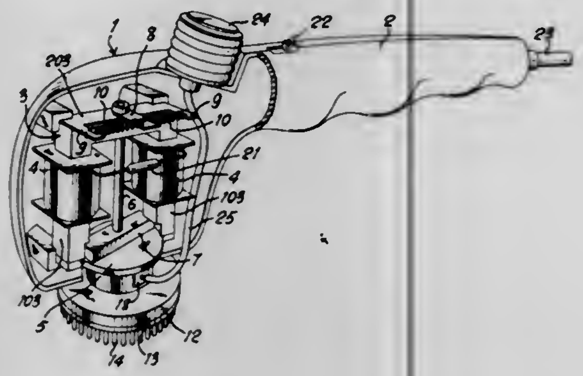
U.S. Cl. 128—2.05 C **6 Claims**



1. An improved sphygomanometer having an elongate, pliable, inflatable band capable of being self-applied by the patient to an upper portion of one of his arms wherein the improvement comprises:
a pair of elongate tensioning cords each having one end connected to a first end of said inflatable band adjacent opposite longitudinal edge portions thereof, whereby the patient may dispose the first end of said band on his arm and hold it in place by applying tension to said cords while a second end of said band is pulled taut and wrapped circumferentially about the arm overlapping said first band end.

3,968,789
APPARATUS FOR MASSAGING THE SKIN

Giancarlo Simoncini, 47, Via Jussi, San Lazzaro di Savena, Italy (40068)
Filed Oct. 29, 1974, Ser. No. 518,589
Claims priority, application Italy, Oct. 31, 1973, 12908/73
Int. Cl.² A61H *7/00, 15/00*
U.S. Cl. 128—49 6 Claims

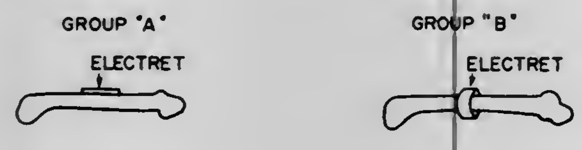


1. Apparatus for massaging the skin, comprising:
- a. a casing provided with a handle;
- b. an electric motor having a shaft, housed in said casing and being capable of imparting to said shaft a rotary oscillatory movement;
- c. support means for carrying a skin massaging element, comprising a non circular support plate, integral with said shaft for rotation therewith, said plate being provided with a circular plug, coaxial with said motor shaft;
- d. a skin massaging element, comprising a brush having a dispensing bore for fluid formed therein, provided with a non circular recess and with a cylindrical socket, said recess and said socket being adapted to complementarily removably receive respectively said support plate and said plug;
- e. a container for a liquid or pasty substance, arranged on the casing in proximity to said handle and being provided with at least a flexible portion adapted to be manually pressed; and
- f. conduit means for connecting said container to said dispensing bore in said brush,

whereby said liquid may be dispensed during rotation of said brush.

3,968,790
ELECTRET METHOD OF PROMOTING CALLUS FORMATION IN REGENERATION OF BONES

Eiichi Fukada, Wako; Toshiaki Takamatsu, Tokyo, and Iwao Yasuda, Uji, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan
Filed Feb. 26, 1975, Ser. No. 553,097
Int. Cl.² A61N *1/00;* A61B *17/18*
U.S. Cl. 128—82.1 5 Claims



1. A method of promoting callus formation on bones comprising applying to a bone an electret composed of a material selected from the group consisting of polytetrafluoroethylene, polyhexafluoropryopylene, polyesters, polypropylene, carnauba wax, bees wax, and rosin, said electret being charged, prior to application to the bone, at a density of at least 30 e.s.u./cm².

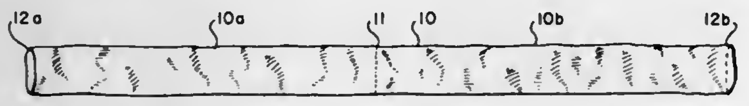
3,968,791
ORTHOPEDIC BANDAGE COMPRISING DIACETONE ACRYLAMIDE, AND CAST PREPARED THEREFROM

John Wesley Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio
Filed Jan. 29, 1975, Ser. No. 545,078
Int. Cl.² A61F *5/04*
U.S. Cl. 128—90 9 Claims

1. An orthopedic bandage comprising a flexible carrier having adhered thereto a cast-forming composition comprising diacetone acrylamide and a water-insoluble condensation product of formaldehyde and diacetone acrylamide.

3,968,792
STERILE TUBULAR DRAPE

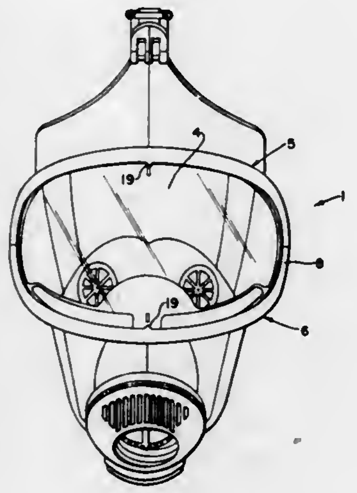
Martin H. Small, Dallas, Tex., assignor to Hydro-Med Products, Inc., Dallas, Tex.
Filed Apr. 4, 1975, Ser. No. 564,872
Int. Cl.² A61F *13/00*
U.S. Cl. 128—132 D 9 Claims



1. A sterile drape comprising a tubular stockinette open at both ends and closed at about the middle to form two tubular stockinettes each having an open end and a mutual closed end, one of said tubular stockinettes reversed and drawn over the other tubular stockinette to form a double-walled tubular stockinette having one open end and one closed end; the double-walled tubular stockinette having the open end thereof folded outwardly from the center thereof and rolled toward the closed end.

3,968,793
CLAMPING RING FOR THE WINDOW FRAME OF A BREATHING MASK

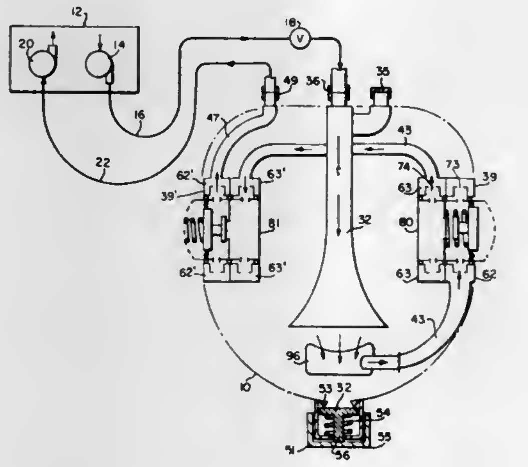
Rolf Geissler, Berlin, Germany, assignor to Auergesellschaft GmbH, Berlin, Germany
Filed Mar. 27, 1975, Ser. No. 562,409
Claims priority, application Germany, Mar. 28, 1974, 2415492
Int. Cl.² A62B *9/04*
U.S. Cl. 128—141 R 9 Claims



1. A clamping ring for a breathing mask viewing window held in a groove in a flexible frame at the front of the mask, the ring comprising two channel-shape half rings engaging each other at their ends and having on the outside of each of their end portions a pair of laterally projecting vertical flanges so that said end portions are H-shape in cross section, each pair of said engaging ends being provided with a guide member extending between the flanges of one of the half rings and projecting vertically from the end portion of said one of the half rings into the space between the flanges of the other half ring, a cross member extending between said flanges of said other half ring and spaced from the end portion of said other half ring, said cross member and said guide member each having a bore therethrough in axial alignment, a bolt rotatably mounted in each bore through said cross member and the adjacent guide member, and a nut on the end of each bolt, whereby the ends of each half ring can be drawn into contact with the ends of the other half ring to hold the half rings together.

3,968,794
UNDERWATER BREATHING APPARATUS

Wilbur J. O'Neill, W. Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 11, 1974, Ser. No. 531,845
Int. Cl.² A62B *7/00*
U.S. Cl. 128—142.3 9 Claims

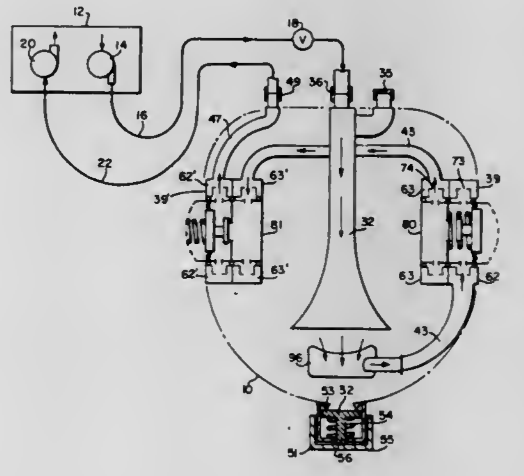


1. Underwater breathing apparatus comprising:
- A. diver headgear including an input connection means for receiving breathing gas, from a remote source and an output connection means for returning exhaust gas back to said source:
- B. an exhaust control valve having input port means and output port means and connected to said output connection means of said headgear, and means for controlling the flow of gas from said input port means to said output port means whereby the headgear pressure is maintained within certain limits relative to the ambient water pressure at said valve;
- C. a normally open fail-safe valve having an input port means and output port means and being in gas communication with the interior of said headgear with said output port means being directly connected to the input port means of said exhaust control valve, said fail-safe valve further including means for controlling the flow of gas from said input port means to said output port means whereby the fail-safe valve will close upon failure of said exhaust control valve in an open position.

3,968,795
UNDERWATER BREATHING APPARATUS

Wilbur J. O'Neill, W. Severna Park, and John R. Colston, Annapolis, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 11, 1974, Ser. No. 531,849
Int. Cl.² A62B *7/00*
U.S. Cl. 128—142.3 13 Claims

1. Underwater breathing apparatus comprising:
- A. diver headgear including an input connection means for receiving breathing gas from a remote source and an output connection means for returning exhaust gas back to said source;
- B. an exhaust flow path connected to said output connection means and including a normally open fail-safe valve and an exhaust control valve in series arrangement, with each said valve including three compartments;
- C. said exhaust flow path including a first duct communicating the interior space for said headgear with a first compartment of said fail-safe valve;
- D. a second compartment of said fail safe valve being directly communicative with a first compartment of said exhaust control valve;
- E. a second compartment of said exhaust control valve being directly communicative with said output connection means;
- F. said first compartment of said respective valves being communicative with said second compartment of said respective valves;
- G. the third compartment of each said valve being out of said flow path and being in direct pressure communication with said interior space for sensing the pressure therein;

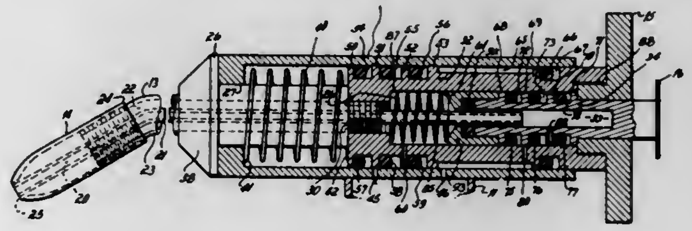


- H. said third compartment of said fail-safe valve including means responsive to the pressure in said interior space relative to the ambient water pressure at said fail safe-valve and operable to prevent flow from said first compartment to said second compartment of said fail-safe valve when the pressure in said interior space falls below predetermined limits relative to the ambient water pressure at said fail-safe valve;

said third compartment of said exhaust control valve including means responsive to the pressure in said interior space relative to the ambient water pressure at said exhaust control valve and thereby, operable to control flow from said first compartment to said second compartment of said exhaust control valve and maintain the pressure in said interior space within said predetermined limits relative to the ambient water pressure at said exhaust control valve.

3,968,796
DENTAL SYRINGE

Ronald L. Baker, Florence, Ky., assignor to Thomas G. Lutes, Fort Mitchell, Ky., a part interest
Filed Sept. 23, 1974, Ser. No. 508,154
Int. Cl.² A61M *11/00*
U.S. Cl. 128—173.1 10 Claims



1. A dental syringe comprising,

a handle,

a housing mounted on said handle,

a nozzle rotatably mounted in and projecting from one end of said housing and having an angulated tip,

an operator rotatably mounted at the other end of said housing,

means connecting said operator to said nozzle to rotate said nozzle about its axis upon rotation of said operator to change the direction of said tip with respect to said handle,

valve means in said housing,

means for supplying air and water to said housing, the flow of said air and water to said nozzle being controlled by said valve means,

said operator being axially slidable and connected to said valve means to control one of said fluids,

a push button coaxial with said operator, said push button being axially slidable to and connected to said valve means to control the flow of said other fluid.

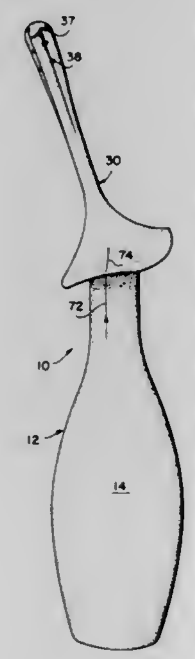
3,968,797
DISPOSABLE DOUCHE PRODUCT

Gilbert Packer; Roger W. Boucher, both of Bristol; James M. Moore, East Greenwich, all of R.I.; John D. Wark, Freeport, and Henry A. Holzwarth, Bayside, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 497,122

Int. Cl.^{2} A61M *1/00*

U.S. Cl. 128—232 **46 Claims**



1. A douche nozzle adapted to be attached to a liquid container comprising:

a flexible, elongated tube having a passageway therethrough, at least one aperture through a first end of said tube communicating with said passageway and formed to direct liquid flowing outwardly of the container through said passageway substantially transversely of the long axis of said tube, and

a liquid effluent flow-directing combined base and shield formed at a second end of said tube remote from said first end, the axial extent of said tube extending from said combined base and shield being at least twice the axial extent of said combined base and shield, the intersection of the exterior surface of said combined base and shield and a plurality of planes through the longitudinal axis of said nozzle and spaced about the periphery of said nozzle each defines a continuous concave curve having a predetermined radius of curvature,

the base portion having a substantially concial configuration, a bottom wall and means adapted to sealingly affix said base portion on a liquid container,

a flexible shield portion having at least a section thereof extending away from said first end and beyond said bottom wall and adapted to overlap the container when mounted thereon, said combined base and shield directing the flow of effluent which has left the nozzle downwardly substantially perpendicularly to the longitudinal axis of said nozzle.

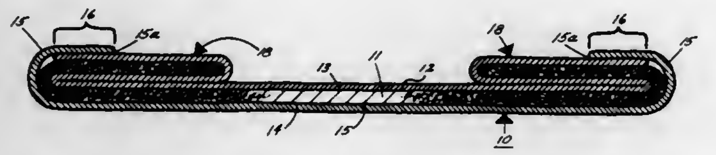
3,968,798
INCONTINENT PAD

Kenneth C. Hokanson, Greenwood, S.C., assignor to Parke, Davis & Company, Detroit, Mich.

Filed July 3, 1975, Ser. No. 592,962

Int. Cl.^{2} A61F *13/16, 13/18*

U.S. Cl. 128—284 **7 Claims**



1. A disposable nursing or incontinent pad or the like adapted to absorb body fluids, comprising in layered relation:

a rectilinear absorbent matrix having a facing side and a backing side,

a facing sheet, and

a water-impervious backing sheet,

the matrix being sealingly enveloped within the facing and backing sheets and having its lateral edges infolded onto the facing side in a C-fold configuration to provide two spaced apart infolded flaps and a middle portion between the fold lines,

the facing sheet being wider than the matrix and extending over the facing side of the middle portion and the outer and inner faces of each of the infolded flaps,

the backing sheet being narrower than the matrix and overlapping the facing sheet on said outer face such that the pad in fluid absorbing relation with the body is resistant to lateral run-off of fluid.

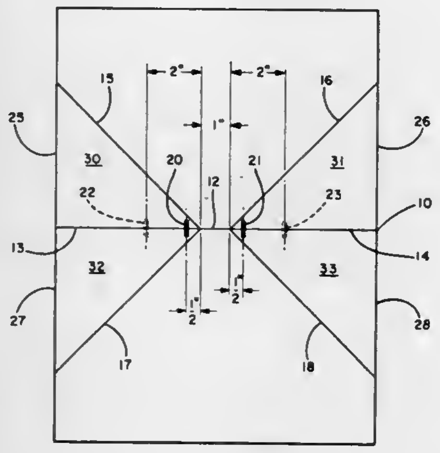
3,968,799
PREFOLDED DISPOSABLE DIAPER

Mark S. Schrading, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 4, 1975, Ser. No. 565,046

Int. Cl.^{2} A61F *13/16*

U.S. Cl. 128—287 **3 Claims**



1. In a prefolded disposable diaper of substantially rectangular configuration having an exterior surface and an interior body contacting surface which is folded in half transversely with the body contacting surface internally disposed and in which outer segments of the transverse fold are inverted and tucked back into the interior of the diaper to form a pair of facing triangular panels on each side of the folded diaper to define a central disposed flat-bottomed pocket, the improvement wherein the internally disposed surfaces of the facing panels on each side of the pocket are adhesively attached to the interior body contacting surface by means of a short narrow stripe of adhesive spaced outwardly from the pocket and disposed perpendicular to and straddling the inverted transverse fold, the flat bottom of said diaper having a dimension of about 1 inch to 4 inches and each of said adhesive stripes being spaced from the respective end portion of said pocket a distance of from about ½ inch to 2 inches.

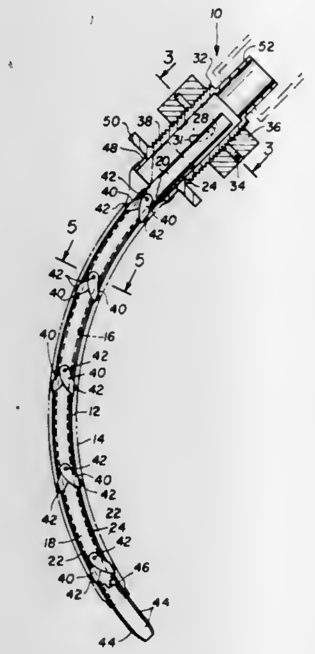
3,968,800
DEVICE FOR INSERTION INTO A BODY OPENING

Joseph A. Vilasi, 37 Wagon Wheel Lane, Dix Hills, N.Y. 11746

Filed Sept. 17, 1974, Ser. No. 506,683

Int. Cl.^{2} A61M *29/00, 16/00*

U.S. Cl. 128—343 **20 Claims**



1. A device for insertion into a body opening comprising a tube-like member longer in length than in cross section having an uninterrupted relatively smooth outer surface yieldable to vary in cross section along substantially its full length,

a hollow passage extending through the full length of said member,

means movable in response to a selective operation to vary the cross section of the outer surface of said member along substantially the full length thereof,

and operable means connected with said movable means to selectively move the same to vary the cross section of said outer surface of said member.

3,968,801
CALF PULLER

Jerry Lee Simon, Zeona, S. Dak. 57795, and Larry Ray Schuelke, Mud Butte, S. Dak. 57758

Filed Nov. 14, 1974, Ser. No. 523,672

Int. Cl.^{2} A61B *17/42*

U.S. Cl. 128—352 **73 Claims**

1. Force exerting mechanism comprising:

supporting means,

movable means supported by said supporting means,

said movable means including lever means for moving said movable means relative to said supporting means,

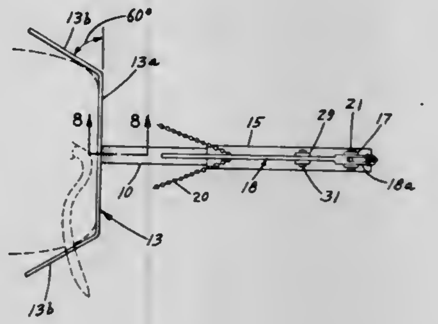
said lever means including a handle swingable between a first position in which the lever means are deactivated and a second position in which the lever means cause said movable means to move relative to said supporting means,

attachment means carried by said movable means, said attachment means being adapted for connection to an object on which said force is to be exerted,

movement of said movable means relative to said supporting means in one direction transmitting a force in the same direction through said attachment means to said object,

locking means for releasably holding said supporting means and movable means against movement relative to one another in at least one direction,

said locking means including a locking member swingable into and out of engagement with said supporting means, said locking member when engaged with the supporting means holding said supporting means and movable means against movement relative to each other in one direction while permitting relative movement between the supporting means and movable means in the opposite direction,



a pair of opposed spaced apart supporting elements mounted on said movable means for said locking member,

means pivotally supporting said locking member between said supporting elements for swinging movement therebetween,

spring means biasing said locking member towards locking engagement with said supporting means, said spring means having two end portions, one end portion being attached to said locking member, the other end portion being attached to said supporting element,

release means carried by said handle for releasing said locking means in response to the actuation of said lever means, said release means being adapted to engage said locking member when said locking member is in engagement with said supporting means and swing it out of engagement with said supporting means, and

said engagement of said release means and locking member taking place as said handle moves toward said first position.

3,968,802
CAUTERY PROTECTION CIRCUIT FOR A HEART PACEMAKER

Joseph A. Ballis, Roseville, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 24, 1975, Ser. No. 543,978

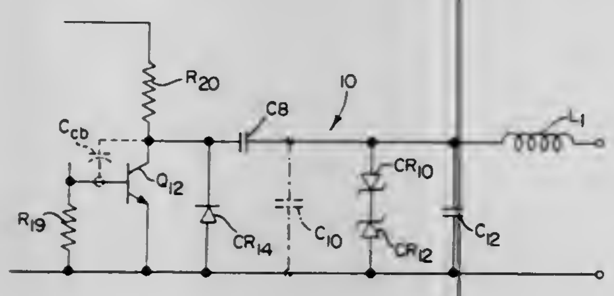
Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 PG **10 Claims**

1. A heart pacemaker circuit comprising:

a. output switch means controllably turned on and off at a rate corresponding to that with which it is desired to stimulate a patient's heart and having outputs from which a heart stimulating signal is derived, said switch means being characterized by a first conduction therethrough greater than a second conduction in an opposite direction therethrough; and

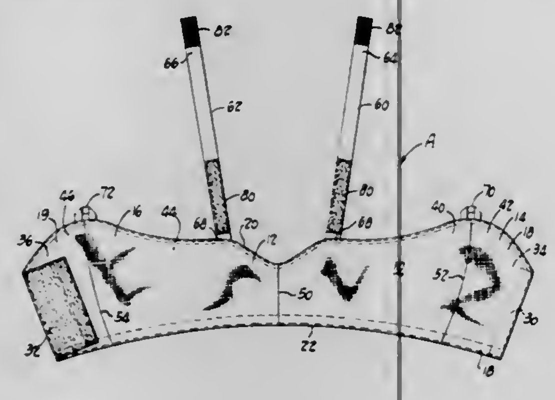
b. means disposed across the output of said switch means for preventing the difference between the first and second conductions of said switch from rendering induced signals in the circuit output unsymmetrical.



3,968,803
SURGICAL CHEST DRESSING

Davie S. Hyman, Gates Mills, Ohio, assignor to Golda, Inc., Cleveland Heights, Ohio

Filed June 4, 1975, Ser. No. 583,785
Int. Cl.² A41C *3/02;* A61F *13/00*
U.S. Cl. 128—482 10 Claims



1. A surgical chest dressing comprising: a chest encircling flexible band formed primarily from a stretchable material, said band having a longitudinally continuous back portion adapted to lie against the back of a person using said dressing; said continuous back portion having two longitudinally spaced ends, with each of said ends connected to one of a pair of front flaps; said front flaps including free ends spaced from said back portion and overlapping each other at engaging surfaces when said dressing is wrapped around a person using the same; a two element, contact sensitive, reusable fastening means for releasably securing said free ends together in selected, adjustable longitudinal positions with one element of said fastening means being secured to each of said engaging surfaces of said free ends; first and second straps, each of said straps being fixedly secured onto said back portion; and, means on each of said front flaps for securing one of said straps thereto.

3,968,804
EXTRUDED TOBACCO SHEET

T. Kenneth Kelly, Fairfield, and Donald Alfred Savitz, Stamford, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,614
Int. Cl.² A24B *3/14*
U.S. Cl. 131—140 C 6 Claims

1. A process for the preparation of reconstituted tobacco materials which comprises

forming a composition consisting essentially of tobacco particles, a thermoplastic binder, and less than 15% moisture;

maintaining said composition in an enclosed atmosphere under a pressure of between about 1000 and about 3000 psig and an elevated temperature, sufficient to render the composition plastic, of between about 100°C. and about 150°C.;

injecting an inert gas into said composition, wherein the inert gas in injected at a temperature within 20°C. and 60°C. of the temperature of said composition;

working said composition to effect a uniform distribution of fine bubbles therein;

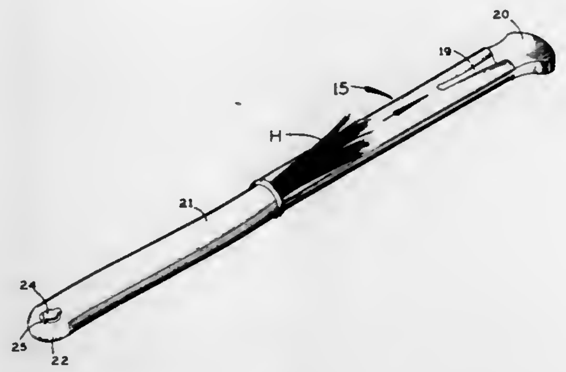
expressing said composition through an orifice to form said composition into the shape of such orifice; and

cooling.

3,968,805
HAIR TREATMENT APPARATUS

Thomas J. Sobeck, Jr., 813-815 NE. 125 St., North Miami, Fla. 33161

Filed Sept. 8, 1975, Ser. No. 611,402
Int. Cl.² A45D *19/16*
U.S. Cl. 132—9 14 Claims



1. Apparatus for treating hair comprising:

a core having means at one end for holding the free end of strands of hair to be wrapped around the core;

and a flexible sheath of fluid-tight material which is closed at one end and open at its opposite end, said sheath being slidably insertable over said core with said open end first from said one end of the core toward the opposite end of the core while the wrapped-around strands of hair remain in place on the core;

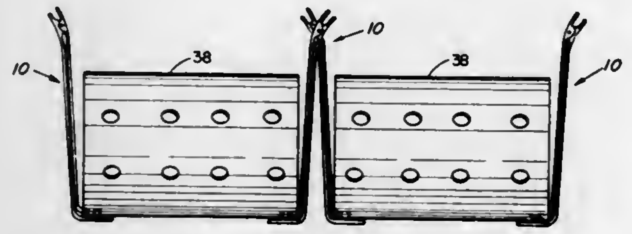
said core being slidably removable from said open end of the sheath while leaving the strands of hair inside the sheath;

and said sheath having an opening for introducing hair-treating fluid, and a removable closure for said opening.

3,968,806
HAIR CLIP

Kenneth Altemare, 5247 Brownsville Road, Pittsburgh, Pa. 15236

Filed Feb. 12, 1975, Ser. No. 549,316
Int. Cl.² A45D *8/24*
U.S. Cl. 132—48 R 8 Claims



1. A hair clip for holding a hollow, thinwalled, tubular hair curler in position when setting hair comprising:

a. an elongated base member with a pivot support mechanism formed adjacent one end, an operating tab positioned on said base member between said pivot support member and said one end, and a clamping jaw portion positioned remotely of said operating tab at the other end and extending at an obtuse angle to said base member;

b. an elongated movable member with a pivot support mechanism formed adjacent one end, an operating tab positioned on said movable member between said pivot support member and said one end, and a clamping jaw portion positioned remotely of said operating tab at the other end and extending at an obtuse angle to said movable member such that said tubular hair curler is received between said base member clamping jaw portion and said movable member clamping jaw portion;

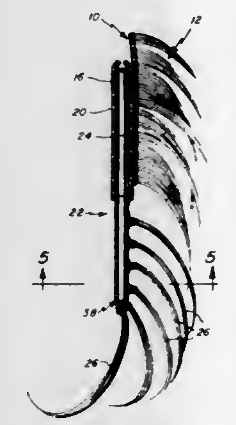
c. pivot means retained by said pivot support mechanisms for pivotally connecting said base member to said movable member in substantially spaced parallel, overlying relation with said operating tabs extending diametrically beyond the surface of said tubular hair curler to facilitate clamping of said clip thereto; and

d. spring means positioned between said base member and said movable member around said pivot means for urging said members toward each to move said clamping jaw portions into abutting relation when said clip is closed and securely retain therebetween said tubular hair curler.

3,968,807
WIG

John Kraicer, Brookline, Mass., assignor to Europa Group, Inc., South Boston, Mass.

Continuation-in-part of Ser. No. 512,006, Oct. 4, 1974, abandoned. This application Feb. 11, 1975, Ser. No. 548,897
Int. Cl.² A41G *3/00*
U.S. Cl. 132—53 18 Claims



1. A wig comprising:

a base structure having an edge portion;

a multiplicity of hairs secured to said base portion;

a plurality of fingers secured to the lower edge of said base portion in spaced relation therealong, said fingers extending generally downwardly therefrom; and

a plurality of hairs attached to each of said fingers.

3,968,808
COLLAPSIBLE SELF-SUPPORTING STRUCTURE

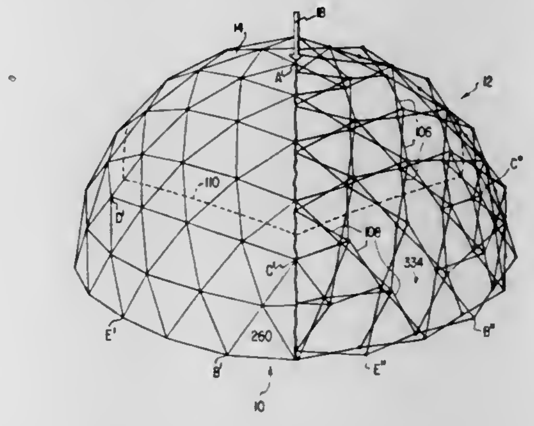
Theodore R. Zeigler, 2007 R St., NW., Washington, D.C. 20009

Filed Nov. 6, 1974, Ser. No. 521,472
Int. Cl.² A45F *1/16;* E04H *12/18*
U.S. Cl. 135—4 R 28 Claims

1. A self-supporting structure, comprising in combination:

a network of column-like elements freely pivotally joined together to form the self-supporting structure, there being groups of said elements which intersect and are freely pivotally joined at their ends to define inner and outer apical points, said outer apical points lying on a surface of revolution and said inner apical points being paired each with a corresponding outer apical point and being spaced inwardly from their corresponding outer apical points along radial lines normal to said surface of revolution;

there being at least three elements forming each of said groups which elements radiate from their corresponding apical points to join with other elements at other surrounding apical points, with those elements radiating from each inner apical point lying essentially in a common plane and radiating from such inner apical point to a plurality of surrounding outer apical points, whereby the network is characterized by a series of planes essentially within which lie elements radiating from and between a number of outer apical points;



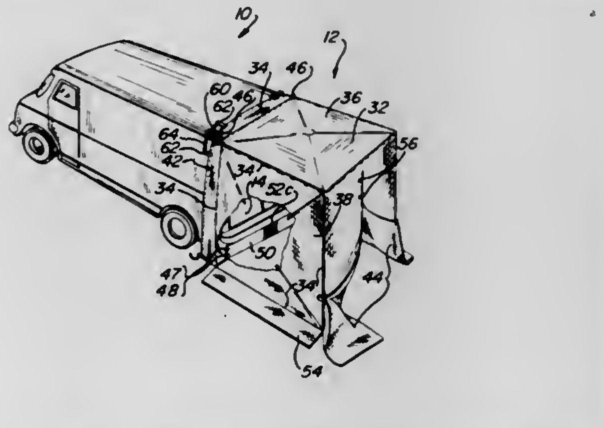
each pair of corresponding inner and outer apical points, having a plurality of pairs of elements which radiate therefrom and cross in scissors-like fashion; and

means joining said pairs of elements at their crossing points so as to cause the network to be self-supporting.

3,968,809
VAN TENT FOR OPEN-ENDED VANS

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed May 27, 1975, Ser. No. 580,932
Int. Cl.² A45F *1/06, 1/16*
U.S. Cl. 135—4 A 12 Claims

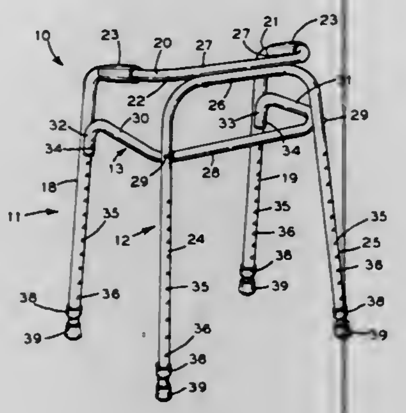


1. A tent for use in combination with a rear-opening van-type vehicle to form a temporary room-like extension at the rear end thereof which comprises: a first foldable rigid subframe including intersecting diagonally-disposed pairs of jointed struts, a hub located at the intersection of the strut pairs, and stretchable means successively interconnecting the ends of the struts remote from the hub cooperating therewith and with said hub to releasably maintain said frame in an unfolded generally rectangular configuration; means for detachably connecting the first subframe to the upper outside corners at the rear of the van body depending from the front corners of said first subframe; second and third foldable rigid subframes attached to opposite side margins of the first subframe in supporting relation therebeneath; a first fabric panel covering the first subframe and cooperating therewith to define a roof; second and third fabric panels covering the second and third subframes cooperating therewith to produce sidewalls; fabric flaps extending forwardly from the front margins of the roof and sidwall panels into position atop and alongside the van body; and, means carried by the forward edges of the flaps connecting them together and cooperating

therewith to define a retractable cuff sealable against the side and top of the van.

3,968,810
CONVERTIBLE WALKER

Morton I. Thomas, 125 South St., Passaic, N.J. 07055
Filed Nov. 18, 1974, Ser. No. 524,476
Int. Cl.² F16M *13/08*
U.S. Cl. 135—45 A **4 Claims**



1. A walker comprising a substantially rigid, stable frame, said frame comprising:

a first U shaped member, said U shaped member comprising a pair of laterally spaced, rearwardly disposed, substantially vertical leg receiving portions, substantially horizontal side arm portions extending forwardly from the upper ends of said vertical leg receiving portions, and a forwardly disposed, horizontal elongated portion connecting the forward ends of said side arm portions;

a second U shaped member, said second U shaped member comprising a pair of laterally spaced, forwardly disposed, substantially vertical leg receiving portions, and a substantially horizontal elongated portion connecting the upper ends of said last mentioned leg receiving portions, the elongated horizontal portions of said first and second U shaped members being in abutting relation to each other and means interconnecting said abutting elongated horizontal portions;

a third U shaped member, said third U shaped member comprising a forwardly and horizontally disposed elongated portion located substantially closer to the abutted horizontal portions of said first and second U shaped members than the lower ends of the vertical leg receiving portions of the second U shaped member with the space between the vertical leg receiving portions of the second U shaped member being unobstructed below the horizontally disposed elongated portion of the third U shaped member, a pair of horizontal side portions respectively extending rearwardly from the opposite ends of said last mentioned elongated portion, and vertical portions of limited length depending from the rear ends of said last mentioned horizontal side portions;

means connecting the depending vertical portions of said third U shaped member to the leg receiving portions of said first U shaped member at points located substantially closer to the side arm portions of the first U shaped member than the lower ends of the vertical leg receiving portions of said first U shaped member;

means connecting the elongated portion of said third U shaped member to the leg receiving portions of said second U shaped member at points substantially closer to the abutted horizontal portions of said first and second U shaped member than the lower ends of the vertical leg receiving portions of the second U shaped member;

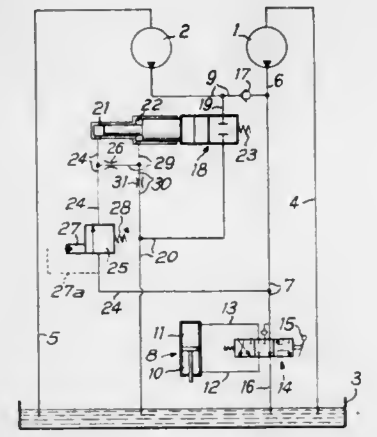
a set of leg members being received within the leg receiving portions of said first and second U shaped members in relative slidable relation to each other;

and coacting means on said leg receiving portions and said leg members for locking said leg members in adjusted positions relative to said leg receiving portions between the fully extended and the fully retracted positions of said leg members relative to said leg receiving portions; said coacting means extending between the lower ends of said leg receiving portions and the respective means for connecting said third U shaped member;

said leg members and leg receiving portions having correlated linear dimensions which provide (1) use of the walker by an individual having a height as little as 4′4″ when said leg members are fully retracted; and (2) use of the walker by an individual having a height of as much as 6′4″ when said leg members are fully extended.

3,968,811
PRESSURIZED FLUID CONTROL CIRCUIT

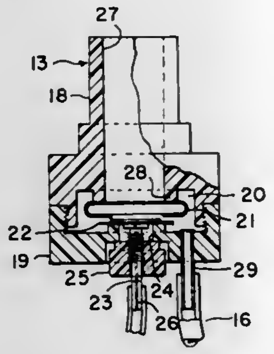
Pierre C. Fillion, Nanteuil-le-Haudouin, France, assignor to Societe Anonyme: Poclain, Le-Plessis-Belleville, France
Filed May 9, 1975, Ser. No. 576,049
Claims priority, application France, May 16, 1974, 74.17084
Int. Cl.² G05D *16/04*
U.S. Cl. 137—114 **4 Claims**



1. A pressurised fluid control circuit comprising at least one receiving means, a pipe for supplying the receiving means called the main supply pipe, a first pressurised fluid source which is provided with a delivery pipe called the first pipe and connected to the main supply pipe, a second pressurised fluid source provided with a delivery pipe called the second pipe connected to a receiving means, a branch pipe connected on the one hand to the second pipe and on the other to a two-position valve, a first discharge pipe connected to the valve, a first-position regulating member which is coupled to the valve and has a working chamber called the first working chamber which can be connected with a pressurised fluid whose action is opposite to that of a restoring member which is also coupled to the valve, whereby the action of the said restoring member when it predominates is to bring the valve into its first position where the branch pipe is shut off whilst the second position of the valve corresponds to the connection of the branch pipe to the first discharge pipe, a supply pipe for the first working chamber called the first supply pipe connecting the main supply pipe to the first working chamber, whilst on the said first supply pipe is positioned a calibrated relief valve equipped with a member for controlling its opening connected to the first supply pipe between the main supply pipe and the calibrated relief valve, a second discharge pipe connected to the first working chamber and a first constrictor placed between the said second discharge pipe and the first working chamber, wherein this circuit comprises a second position regulating member which is coupled to the valve and comprises a working chamber called the second working chamber which can be made to connect with a pressurised fluid whose effect is also opposite to that of the restoring member, whereby the said second discharge pipe is also connected to the second second working chamber, a supply pipe for the said working chamber called the second supply pipe which links the first working chamber to the second working chamber and wherein is provided the first constrictor and a second constrictor placed in the second discharge pipe.

3,968,812
APPARATUS FOR REMOVAL OF CONDENSED MOISTURE FROM RESPIRATORY TUBES

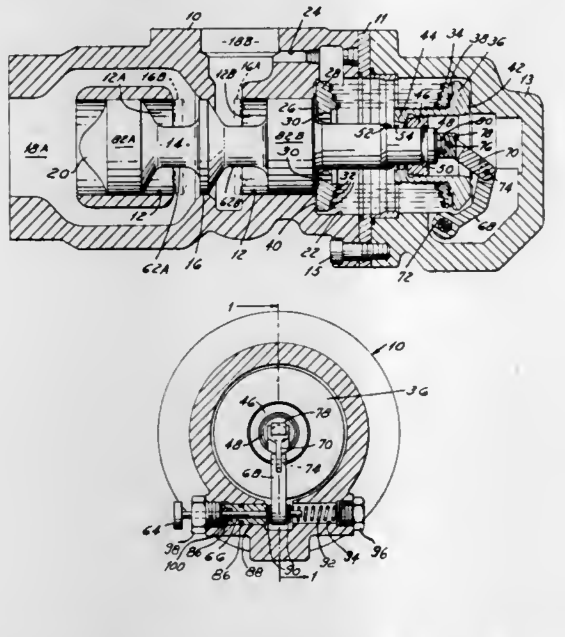
Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.
Filed Oct. 12, 1971, Ser. No. 188,093
Int. Cl.² F16T *1/14*
U.S. Cl. 137—188 **11 Claims**



1. Drain valve means for automatically draining condensed moisture from tubing, said valve means comprising a casing having a passage adapted to be connected to the tubing and forming an inlet chamber into which condensed moisture from the tubing may flow by gravity, an outlet chamber with which said inlet chamber communicates at its bottom and an outlet port in said outlet chamber from which moisture may flow by gravity to atmosphere, an annular valve seat at the bottom of said inlet chamber between said inlet and outlet chambers and a resilient hollow disc-like bulb controlling communication between said inlet chamber and said outlet chamber through said valve seat, said disc-like bulb being biased to an expanded position engaging the valve seat and opened by collapsing responsively to a predetermined weight of condensed moisture accumulated thereon.

3,968,813
FLOW SHUT OFF VALVE

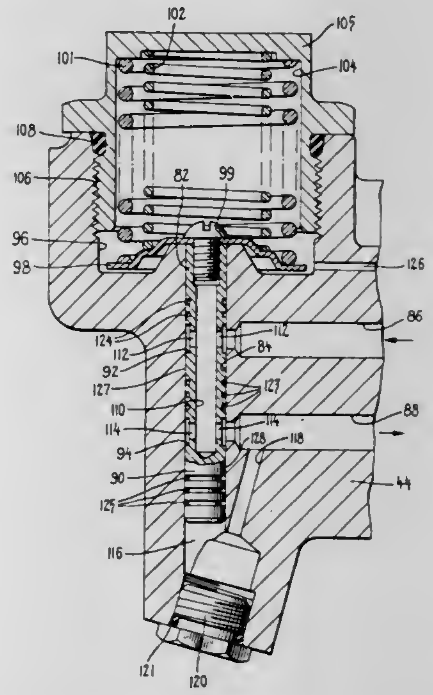
Peter B. Olmsted, Traverse City, Mich., assignor to Olmsted Products Company, Traverse City, Mich.
Filed Oct. 9, 1974, Ser. No. 513,216
Int. Cl.² F16K *17/22, 37/00*
U.S. Cl. 137—493 **23 Claims**



1. Fluid control means comprising a body, a chamber in the body, at least two external ports communicating with the chamber, a spool in the chamber adapted to reciprocate about a neutral position located between the two external ports in response to reversing fluid pressure differentials occurring between the two ports and acting upon the spool thereby displacing the spool to permit fluid communication between the two external ports and exercising the spool to assure operability of the spool in the event of emergency, shut off means on the spool actuateable by the spool to substantially prevent fluid communication between the two ports in response to a fluid pressure differential in excess of the reversing fluid pressure differentials, and, means adapted to provide a cushioned halt to the movement of the spool upon complete shut off.

3,968,814
HYDRAULIC BOOSTER BRAKE PRESSURE REGULATOR

Kenneth B. Swanson, Bannister, and Kenneth D. Jensen, Owosso, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio
Continuation of Ser. No. 346,854, April 2, 1973, abandoned. This application Jan. 14, 1975, Ser. No. 540,997
Int. Cl.² F16K *17/34, 31/363*
U.S. Cl. 137—505.18 **3 Claims**



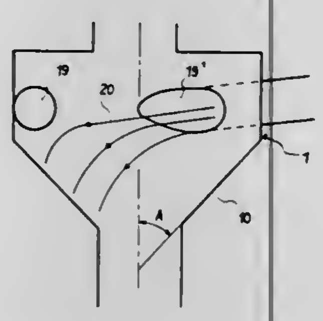
1. A pressure regulator comprising a housing, an elongated bore in said housing, spaced fluid inlet and outlet ports communicating with said bore, an elongated plunger slidable in said bore between first and second positions, a plurality of annular grooves formed in and spaced longitudinally of said plunger, said plunger forming a longitudinally extending chamber therein, said chamber being closed at its opposite ends and having first and second passages communicating said chamber with a first one and a second one of said plurality of annular grooves, respectively, closure securement means closing an end of said chamber and connecting a support means to said plunger, a third one of said grooves being disposed between said first and second grooves and forming an open groove seal preventing communication therebetween, a fourth one of said grooves being disposed between one end of said plunger and said first groove, a fifth one of said grooves being disposed between the other end of said plunger and said second groove, said fourth and fifth grooves each forming open groove seals preventing communication between the ends of said plunger and said first and second grooves, said first one and second one of said grooves being in communication with said inlet and outlet ports when said plunger is in its first position, a control chamber formed in one end of said bore and being continuously open to said outlet port, resilient means acting on said support means and urging said plunger to said first position with a predetermined force and maintaining said plunger in said first position when the pressure at said outlet is below a predetermined pressure, said plunger being movable to a second position in which said inlet and outlet ports are simultaneously closed by said plunger from communication with said first and second ones of said passages in

response to a pressure greater than said predetermined pressure at said outlet and in said control chamber acting on said plunger to exert a force greater than the predetermined force of said resilient means.

3,968,815
BRANCH FITTINGS FOR HYDRAULIC STACK APPARATUSES WITH GYROLAMINARY FLOW FOR USE IN BUILDINGS

Monique Legg née Jouve, 3, Avenue Anatole, and Georges Richard, 51, Avenue St-Jerome, both of 13 Aix-en-Provence, France

Filed Dec. 23, 1974, Ser. No. 535,783
Int. Cl.² E03C *1/222*
U.S. Cl. 137—602 6 Claims

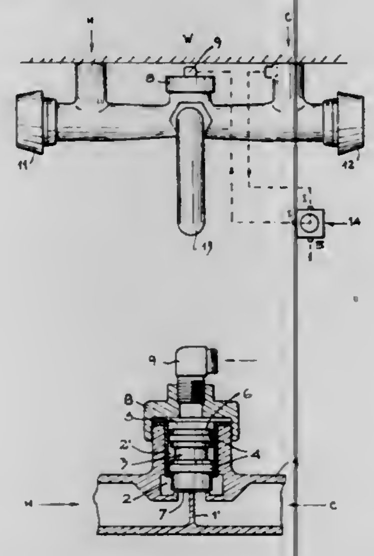


1. A branch fitting for hydraulic stack apparatuses with gyro-laminary ventilated flow for use in buildings, the fitting comprising, a fitting body provided with an inlet and an outlet for connecting vertical stack portions respectively thereto and at least one inlet tangential to said body for connecting a branch-pipe which admits liquid into said stack, said body having a downwardly converging, inlcined braking surface in the shape of a funnel with a top edge and a bottom edge, said tangential inlet being disposed adjacent said top edge of said braking surface, said braking surface being longer between its top edge and bottom edge than the greatest vertical dimension of said inlet, whereby a constant link is maintained between air above the liquid in said branch-pipe and air in said stack.

3,968,816
COCK

Elazar Tagansky, 16 Berdichevsky St., Tel Aviv, Israel

Filed Dec. 31, 1974, Ser. No. 537,826
Int. Cl.² F16K *19/00*
U.S. Cl. 137—606 3 Claims



1. A fluid dispensing apparatus comprising, in combination:

a mixing chamber having a first inlet port and second inlet port, each port introducing a respective fluid stream into said mixing chamber through an opening having a perimeter which defines a valve seat, thereby allowing said fluid stream to mix;

first and second valve means in communication with respective ones of said inlet ports for opening and closing said first and second inlet ports respectively;

output means in fluid communication with said mixing chamber for dispensing said mixed fluid stream;

a communication chamber located adjacent said mixing chamber;

a conduit opening into said communication chamber directly opposite said mixing chamber and connected to one of said inlet ports;

third valve means connected between said conduit and that one of said ports connected to said conduit for controlling fluid flow through said conduit and into said communication chamber; and

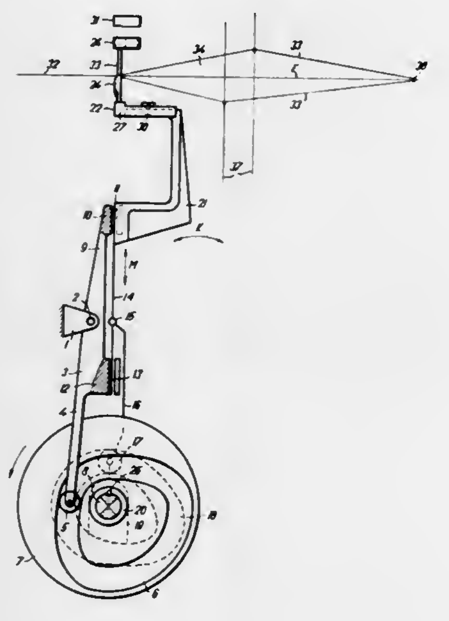
a shuttle valve, movable within said mixing chamber and said communication chamber, said shuttle valve having a first face providing, when seated on said seat, a given surface area exposed to the oncoming fluid flow from said inlet ports toward said mixing chamber and a second face having a surface area larger than said given surface area of said first face, exposed to the oncoming fluid flow from said conduit;

whereby when both faces of said shuttle valve are exposed to a fluid flow, said shuttle valve is forced toward said mixing chamber due to said larger surface area of said second face and closes said output means preventing fluid contained in said mixing chamber from flowing through said output means, and when only said first face is exposed to a fluid stream, said shuttle valve moves away from said mixing chamber, and said output means is opened allowing fluid contained in said mixing chamber to flow through said output means.

3,968,817
METHOD OF AND APPARATUS FOR CONTINUOUS PROGRESSIVE BEATING UP OF WEFT IN TRAVELLING-WAVE SHEDDING LOOMS

Ladislav Bezstarosti; Jaroslav Cizek; Frantisek Jekl, and Lumir Martinek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Apr. 26, 1971, Ser. No. 137,248
Claims priority, application Czechoslovakia, Apr. 28, 1970, 2939-70
Int. Cl.² D03D *47/26, 49/60, 49/62*
U.S. Cl. 139—436 3 Claims



1. In a travelling-wave shedding loom provided with means for the simultaneous picking of weft into the warp and affecting the weft in the shed by a beating-up force progressing in the weaving direction, and apparatus for the beating-up of the weft comprising

a reed divided into sections, the sections consisting of spaced splits, the gaps between the splits serving for the passage of the warp threads,

beating-up projections formed on the splits, the beating-up projections of each section being mutually shifted in such a way that the connecting lines of their homothetic points form straight lines, said straight lines being inclined with respect to the weaving plane and forming with it an acute angle the arms of which open in the weaving direction,

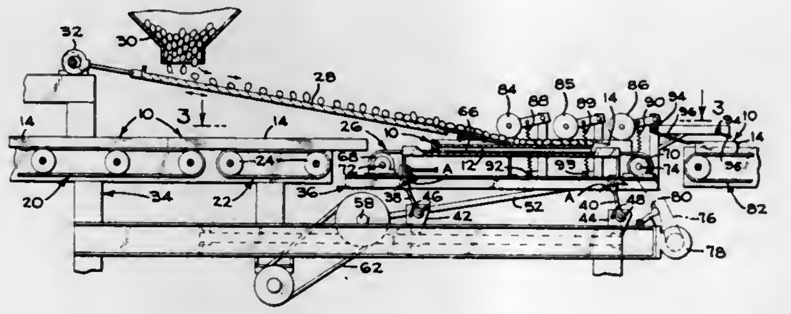
and a mechanism forth driving the sections back and forth and with an upward and downward wave-like motion.

3. A method of continuous progressive beating-up of weft in a travelling-wave shedding loom with simultaneous picking of weft into the warp in which the weft in the shed is affected by a beating-up force progressing in the weaving direction, comprising first affecting the weft by a beating-up force which is the resultant of a force acting in the direction of the weaving plane and another force acting in the direction towards the weaving plane, and then affecting the warp by a beating-up force acting in the direction of the weaving plane, and moving the beating-up force continuously in accordance with the travelling shed waves along the whole warp width.

3,968,818
TRAY LOADING APPARATUS

Alfred W. Gerrans, San Jose, Calif., assignor to Sunsweet Growers, Inc., San Jose, Calif.

Filed Oct. 1, 1971, Ser. No. 185,547
Int. Cl.² B67C *3/02;* **B65B** *1/20*
U.S. Cl. 141—78 8 Claims



1. Apparatus for loading trays with a single layer of articles which comprises

means including a powered belt conveyor for conveying a tray along a substantially horizontal path,

means for delivering articles to the upper surface of the tray during conveyance thereof, and

means for vibrating said tray-conveying means during the delivery of articles to the tray whereby the tray thereon is vibrated during its conveyed movement and the articles are closely compacted thereon, said vibrating means imparting a reciprocal motion to said tray-conveying means including a vertical component of motion and a horizontal component of motion in the direction of conveyance.

3,968,819
DRUM FILLING DEVICE

Henry L. Bachofer, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 423,343, Dec. 10, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,447
Int. Cl.² B65B *43/42, 57/00*
U.S. Cl. 141—155 2 Claims

1. An apparatus for filling a drum with liquid and for preventing the removal of the drum until the filling apparatus has been completely removed from the drum, comprising:

a. a source of liquid,

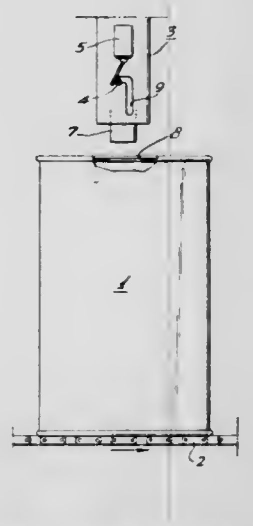
b. a filling assembly connected to the source of liquid comprising:

  i. an outer pipe housing having an inverted notch with a detent section,

  ii. an inner fill pipe retractably mounted inside the outer pipe housing, and

  iii. a retractor handle passing through the notch in the pipe housing and secured to the fill pipe so that when the retractor handle is raised as far as the notch will allow, the fill pipe is completely withdrawn from the drum,

c. means for removing the drum from its fill position beneath the filling assembly, and

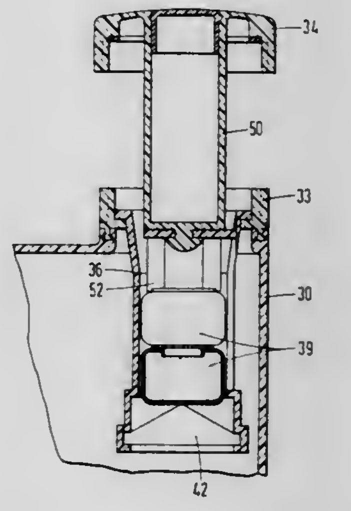


d. switching means having an actuator arm which has a normal position and an actuated position, said switching means mounted on the outside of the pipe housing so that when the retractor handle has been raised to its uppermost limits and rotated into the detent section of the notch, the actuator arm is deflected from its normal position to its actuated position, said switching means being connected to the drum removing means so that the removing means will not operate until the actuator arm is in its actuated position.

3,968,820
MIXING CONTAINER

Walter Kolb, and Dieter Achenbach, both of Betzdorf, Germany, assignors to Wolf-Gerate GmbH, Germany

Filed Apr. 17, 1974, Ser. No. 461,711
Claims priority, application Germany, Apr. 17, 1973, 2319453
Int. Cl.² B65B *1/04;* **B65D** *25/00*
U.S. Cl. 141—330 9 Claims



1. A mixing container for dispensing at least one material contained in at least one capsule into a vessel containing a second material, comprising:

a vessel for containing the second material; said vessel having an open, but closable, filling neck; a sleeve shaped extension projecting into said vessel from said filling neck to an inner end; said extension having an internal cross section defined by internal walls thereof;

a cutting knife near said extension inner end and located in said extension, and having a cutting edge facing toward said neck; said knife cutting edge extending completely across said extension between its said internal walls, whereby said knife cutting edge is so shaped and of such length and size as to cut completely through a capsule pressed against said knife edge;

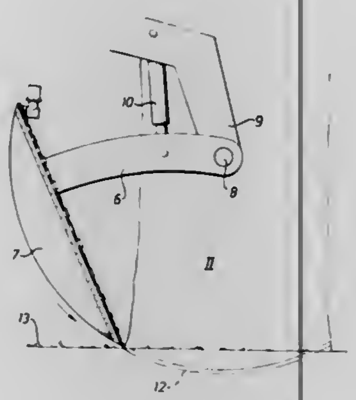
at least one capsule positionable in said extension by insertion through said neck and having a width substantially of said extension cross section; said capsule being formed of a material capable of being cut through by a knife edge and said capsule being so shaped that upon said capsule being pressed against said knife edge, said knife slices completely through said capsule in a manner that said capsule can pass said knife and move into said vessel;

a capsule pressing punch insertable into said neck and adapted to pass through said extension; said capsule being located between said punch and said knife; said punch having a portion having a cross section that is substantially said cross section of said extension and that is shaped to meet with said knife cutting edge along substantially the entire length of said knife cutting edge; said punch being adapted to press against said capsule and press said capsule past said knife.

3,968,821

TREE FELLING DEVICE

Karl-Erik Arnold Jonsson, Floraplan 14, Gavle, Sweden
Filed May 21, 1975, Ser. No. 579,727
Claims priority, application Sweden, July 24, 1974, 7409613
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 R **4 Claims**



1. A tree felling device adapted to be suspended in a crane beam carried by a vehicle, said device comprising:

a spherical bowl mounted to be moved a limited angle around the center of an imagined sphere in which the bowl is included, said bowl having an outer rim with an annular groove therein;

means for pivoting the bowl around said center;

an endless saw chain extending around said rim of said bowl, said chain being formed by links connected by pivot pins, said chain having a bent configuration in the form of a truncated cone with said pivot pins each extending in directions toward said center of said sphere;

said saw chain including links with depending tongues adapted to be engaged by driving means, said depending tongues of said saw chain being received and guided in said annular groove;

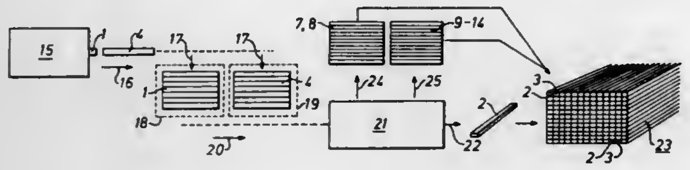
said groove having an inner wall extended to support chain link portions located below and inward of the teeth of said chain; and

at least one sprocket driven by a motor and inserted in a recess at said rim of said bowl and engaging said tongues of said saw chain.

3,968,822

METHOD AND INSTALLATION FOR SAWING TIMBER

Per Axel Rune Ottosson, and Claes Emil Lennart Otterbeck, both of Nybro, Sweden, assignors to Kahrs Maskiner Aktiebolag, Sweden
Filed Apr. 25, 1974, Ser. No. 464,228
Claims priority, application Sweden, Apr. 27, 1973, 7306009
Int. Cl.² B27B *1/00*
U.S. Cl. 144—312 **2 Claims**

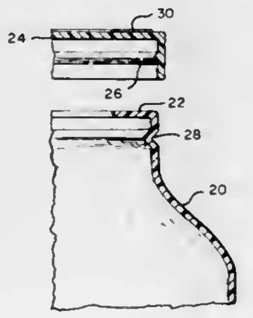


1. A method of sawing logs for obtaining therefrom wooden board stack units of a desired number of boards of a given same cross section within each stack unit comprising the steps of, presorting by diameter a plurality of logs into groups within which each log selected has a sawing yield of a number of boards of a same cross section as a center yield thereof, feeding logs from at least one of said groups to a saw mill for sawing them longitudinally and equal in number to yield a number of boards of a same cross section from a center yield thereof equal to a stack unit of a desired number of boards of a same cross section, and stacking the boards obtained by sawing from said at least one group of logs into a stack unit of said desired number of boards of a same cross section without further sorting.

3,968,823

LID FOR A CONTAINER AND A METHOD FOR SEALING THE LID ON A CONTAINER

B. Kenneth Simon, Chatham Park Apartments, Greentree, Pa. 15220
Filed Nov. 19, 1975, Ser. No. 633,241
Int. Cl.² B65D *1/02, 39/00, 41/00*
U.S. Cl. 150—.5 **6 Claims**



1. A lid for a container having an opening comprising a lid having the same contour as the opening, the lid has a continuous ring of electrically conductive material on a top of the lid, the ring follows the contour of the mouth of the container.

3,968,824

PROTECTIVE COVER FOR EXTENDING SHAFTS

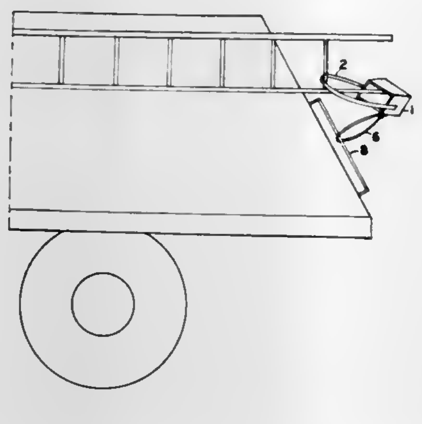
John McLoughlin, 92 Mobrey Lane, Smithtown, N.Y. 11787
Filed June 23, 1975, Ser. No. 589,245
Int. Cl.² B65D *59/08*
U.S. Cl. 150—52 R **2 Claims**

1. A protective cover for extending shafts comprising;

an enclosure open at one end, said enclosure being padded and being adapted to fit over the end of an extending shaft,

an adjustable mounting strap fixedly connected to one side of said enclosure at one strap end, means to removably connect the other strap end to the opposite side of said enclosure,

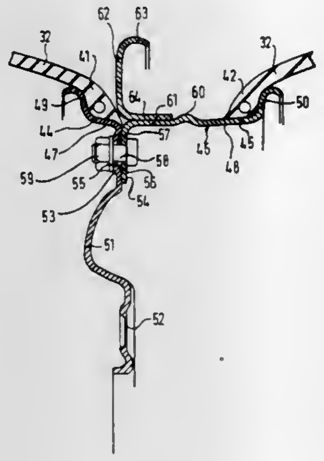
and a retaining strap connected to said enclosure, said retaining strap being adapted to be connected to a fixed object to prevent said enclosure from being lost when said enclosure is removed from said shaft.



3,968,825

VEHICLE WHEELS

William Eric Mitchell, Coventry, and Reginald Harold Edwards, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England
Filed Aug. 29, 1973, Ser. No. 392,558
Claims priority, application United Kingdom, Sept. 8, 1972, 41693/72; Mar. 3, 1973, 10444/73
Int. Cl.² B60C *5/00*
U.S. Cl. 152—158 **1 Claim**

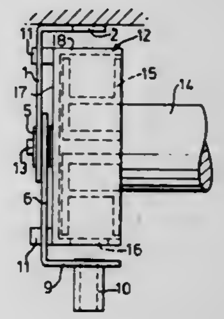


1. The assembly of a pneumatic tire and a vehicle wheel, the tire comprising tread and sidewall portions and bead portions at the radially inner peripheries of the sidewall portions; the wheel comprising a disc and a rim, the rim comprising a pair of bead seat portions on which the beads of the tire are respectively seated, a pair of bead support flanges on the axially outer sides of and integral with the bead seat portions and extending radially beyond the bead seat portions adjacent the axially outer sides of the tire beads; a well-less base portion between said bead seat portions, the rim comprising two parts separable in a diametral plane between the bead seat portions to permit tire mounting and dismounting with the base portion being of diameter such as to prevent mounting and dismounting of the tire from the rim without separation of the parts thereof, an annular tire support member separably surrounding the base portion of the rim, said support member comprising a foot portion extending axially of the rim in contact with the base portion, a web portion extending radially outwardly of the base portion of the rim from one end of the foot portion and an annular tire support flange connected at one of its axial ends to the radially outer end of said web portion to extend from said web portion in cantilever fashion generally parallel with the rim axis at a position radially beyond the radially outer ends of the bed support flanges and spaced from the interior of the tire when the latter is in a normal state of inflation, said support flange being positioned to engage and support the inner surface of the tread portion of the tire when the latter is wholly or partially deflated, the two parts of the rim being separable adjacent one of the bead seat portions thereof, the base portion of the rim being formed in the part which comprises the other of said bead seat portions and having intermediate its ends a deformation against which the foot of the support member is locatable to prevent displacement of the support member axially of the base portion between said deformation and the tire bead on said one bead seat portion.

3,968,826

MOUNTING BRACKET FOR A BLIND

Edwin Zilver, Beethovenlaan, Netherlands, assignor to Silverflex International N.W., London, England
Filed Apr. 15, 1974, Ser. No. 460,978
Claims priority, application Netherlands, Apr. 19, 1973, 7305524
Int. Cl.² E06B *9/08*
U.S. Cl. 160—323 R **7 Claims**



1. In a blind assembly, a blind member, mounting bracket means having separate members, means pivotally interconnecting said bracket members at adjacent ends, one of said bracket members having means at the other end for attachment to a wall, ceiling or like anchorage, means rotatably mounting said blind member on said bracket means substantially coaxially of the pivot axis between said bracket members, a cord reel secured on said blind member adjacent said bracket means, a tubular cage member loosely mounted on said blind member between said reel and said bracket means and having an annular flange extending over the periphery of said reel, and cooperating interengaging means on said cage member and both of said bracket members whereby said cage member may retain said bracket members in any one of a plurality of selected relative angular positions while said bracket means positively limits displacement of said cage member relative to said reel.

3,968,827

METHOD OF PREPARING CERAMIC CASTING MOULDS FOR POURING METAL THEREIN

Jury Leibovich Perevozkin, prospekt Selmash, 36, kv. 81; Anatoly Aramovich Mkrtychian, ulitsa Progressivnaya, 1, kv. 24; Leonid Mikhailovich Baryshevsky, ulitsa Ilicha, 40/26, kv. 22; Vadim Manuilovich Livshits, ulitsa Brestskaya, 9a, kv. 10; Daniel Semenovich Meilikhov, ulitsa Volkova, 10/2, kv. 6; Jury Ivanovich Govorov, ulitsa Vorovskogo, 50, kv. 44; Andrei Stepanovich Beschastny, prospekt Selmash, 36, kv. 89, and Fedor Spiridonovich Maximov, prospekt Lenina, 225/1, kv. 37, all of Rostov-na-Donu, U.S.S.R.
Filed Mar. 7, 1975, Ser. No. 556,534
Int. Cl.² B22C *9/00*
U.S. Cl. 164—23 **1 Claim**

1. A method of preparing ceramic casting moulds for pouring metal therein envisaging the following operations: calcining ceramic casting moulds; cooling said moulds to a temperature between 30° and 60°C; applying a particulate material preheated to between 600° and 850°C to the outside of cooled said moulds; compacting said particulate material; keeping the

moulds in said particulate material for a period lasting between 10 and 40 minutes.

3,968,828
METHOD OF CASTING NON-FERROUS ALLOYS

Richard H. Toeniskoetter, Worthington, and John J. Spiwak, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 415,852, Nov. 14, 1973, Pat. No. 3,930,872, which is a continuation of Ser. No. 351,903, April 17, 1973, Pat. No. 3,923,525. This application May 29, 1975, Ser. No. 581,912

Int. Cl.^{2} B22D *21/04;* **B22C** *1/18*

U.S. Cl. 164—41 **18 Claims**

1. Process for casting relatively low melting point non-ferrous type metals which comprises:

a. fabricating a shape from a composition which comprises a major amount of aggregate and an effective bonding amount up to about 40 percent by weight of the aggregate of a binder composition which comprises:
  i. boronated aluminum phosphate containing boron in an amount from about 3 mole percent to about 40 mole percent based upon the moles of aluminum and containing a mole ratio of phosphorus to total moles of aluminum and boron of about 2:1 to about 4:1;
  ii. alkaline earth metal material containing alkaline earth metal and an oxide; and
  iii. water; wherein the amount of boronated aluminum phosphate is from about 50 to about 95 percent by weight based upon the total weight of aluminum phosphate and alkaline earth material; the amount of alkaline earth material is from about 50 to about 5 percent by weight based upon the total weight of aluminum phosphate and alkaline earth material; the amount of water is from about 15 to about 50 percent by weight based upon the total weight of boronated aluminum phosphate and water; and the aggregate has a particle size large enough to provide sufficient porosity in the foundry shape to permit escape of volatiles from the shape during the casting operation:

b. pouring said relatively low melting point non-ferrous type metal while in the liquid state into said shape;

c. allowing said non-ferrous type metal to cool and solidify;

d. contacting said shape with water in an amount and for a time sufficient to cause degradation of the binder system; and

e. then separating the molded article.

3,968,829
MOLDING APPARATUS WITH SHIELDING MOLD MEMBER

Kunii Nakata, Nagano, and Yoshimasa Kubo, Susaka, both of Japan, assignors to Kabushiki Kaisha Akita, Susaka, Japan

Division of Ser. No. 182,476, Sept. 21, 1971, Pat. No. 3,789,907. This application Mar. 13, 1973, Ser. No. 340,902

Claims priority, application Japan, June 25, 1971, 46-46463

Int. Cl.^{2} B22C *9/02*

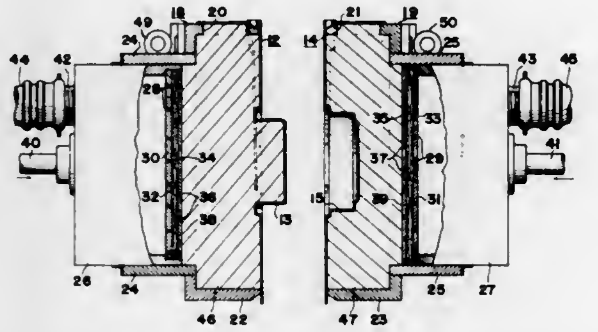
U.S. Cl. 164—160 **1 Claim**

1. A molding apparatus, comprising:

a preformed shielding mold member having at least an outer portion thereof in the shape of a desired mold surface,

a flask having means defining a first opening therein for intimately contacting an inner portion of said shielding mold member; and another opening in said flask for filling heat resistant particulate materials therethrough into the flask between the flask and said shielding mold member; and a vent port for conducting evacuated gases from the interior of the flask so that the particulate materials, which do not include a binding agent, are compressed between said shielding mold member and the flask and are maintained in position in the flask;

means for positively evacuating gases from the interior of said flask so that the interior of the flask is maintained at subatmosheric pressure, said means being connected to said flask through said vent port; and



a filter inserted between said vent port and the interior of said mold, for preventing particulate material from passing through said vent port to said evacuating means.

3,968,830
MOLDING APPARATUS FOR COMPRESSING AND VIBRATING FOUNDRY MOLDS

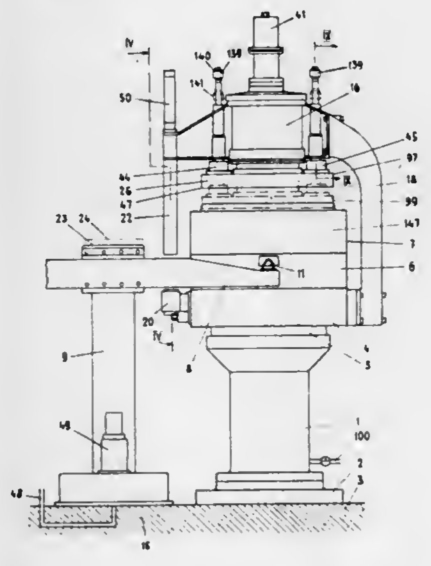
Erwin Bührer, Vogelingasschen 40, Schaffhausen, Switzerland

Filed Nov. 26, 1974, Ser. No. 527,188

Claims priority, application Switzerland, Dec. 6, 1973, 17150/73

Int. Cl.^{2} B22C *15/30*

U.S. Cl. 164—196 **12 Claims**



1. Molding apparatus for squeezing and jolting foundry molds comprising, in combination, a jolting table adapted to have molds placed thereupon, means operatively connected with said jolting table for jolting said table, presser means including a presser plate and pressure applying means located at a spaced distance above said jolting table, said presser means being movable between an uppermost position to permit placement of said molds between said jolting table and said presser plate and a lowermost position for applying a squeezing force to molds placed between said jolting table and said presser plate, arm means located adjacent said table and adapted to have said molds supported thereon, mounting means effecting rotation of said arm means for moving said molds into and out of position between said jolting table and presser plate, and column means extending between said presser means and said jolting table to enable formation of a rigid frame assembly including said jolting table and said presser means, said column means including a first column rigidly interconnecting said presser means with said jolting table and a second column including locking means movable between a locked and an unlocked position, said locking means when in said unlocked position forming a gap between said second column and said jolting table to enable said arm means to be rotated through said gap for placement of said molds between said jolting table and said presser plate, said rigid frame assembly being adapted to be jolted as a unit by said means for jolting said jolting table while said mold is being squeezed between said jolting table and said presser plate with said locking means in the locked position.

3,968,831
SYSTEM OF USING VACUUM FOR CONTROLLING HEAT TRANSFER IN BUILDING STRUCTURES, MOTOR VEHICLES AND THE LIKE

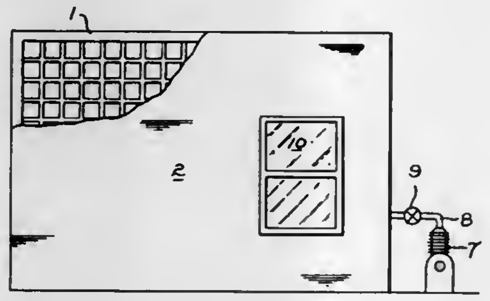
Theodore Xenophou, 16 Karri Drive, Dernancourt, South Australia, Australia (5075)

Filed May 26, 1971, Ser. No. 146,955

Claims priority, application Australia, May 29, 1970, 1347/70

Int. Cl.^{2} F25B *13/00*

U.S. Cl. 165—1 **2 Claims**



1. The method of controlling thermal transfer in structures occupied by humans, defined by walls which comprises: drawing a partial vacuum between spaced panels forming said walls in conjunction with spaced cellular stiffening members in which the cells are in communication with each other to allow air equalization throughout the space enclosed by said panels and members, and controlling thermal transfer by regulating the vacuum so that thermal transfer is permitted by reducing the vacuum when ambient conditions are required within the structure to allow heat flow through the panels, and then increasing the vacuum to maintain the structure at the selected temperature by decreasing heat flow through the walls of the structure due to the increased vacuum.

3,968,832
APPARATUS FOR CONTROLLING THE TEMPERATURE OF A HEAT EXCHANGE LIQUID

Willy Regenass, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

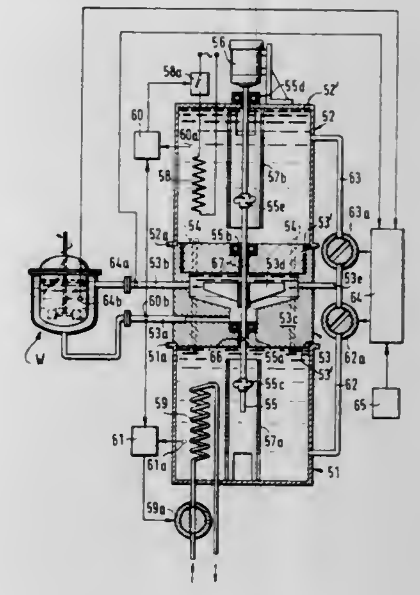
Filed Oct. 25, 1974, Ser. No. 517,986

Claims priority, application Germany, Nov. 2, 1973, 2354997

Int. Cl.^{2} F25B *7/00*

U.S. Cl. 165—58 **11 Claims**

1. An apparatus for controlling the temperature of a heat-exchange liquid in accordance with the mixing principle, the apparatus including a centrifugal pump connected to a drive motor for conveying or circulating the liquid in a working circuit, two containers for the liquid, each in a shunt circuit connected via respective shut-off devices to the working circuit, means for maintaining the temperature of the liquid in one container at a given value below the temperature in the working circuit, and the temperature of the liquid in the other container at a given value above the latter temperature and a mechanical propeller-like circulating means in each container, the centrifugal pump being disposed between the two containers and having a pump shaft which extends into both of said containers and is connected to the drive motor, and the propeller-like means being mounted on the two portions of the pump shaft disposed inside the containers.



3,968,833
METHOD FOR HEAT RECOVERY IN VENTILATION INSTALLATIONS

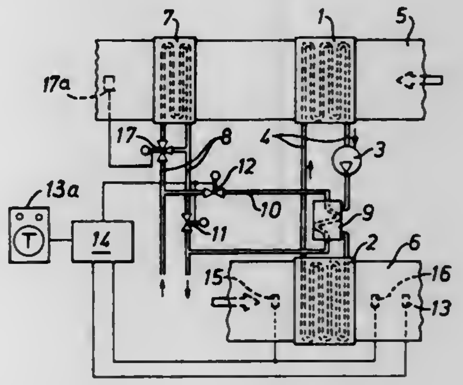
Ove Strindehag, and Roy Holmberg, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 18, 1975, Ser. No. 559,500

Claims priority, application Sweden, Mar. 26, 1964, 7404016

Int. Cl.^{2} A23C *3/02*

U.S. Cl. 165—66 **11 Claims**



1. A method of increasing the efficiency of heat recovery in heat recovery systems in ventilation installations, comprising at least two heat exchangers, one disposed in the supply air duct and the other disposed in the spent air duct of the installation, a pipe circuit for heat exchange medium interconnecting the heat exchangers and pump means circulating a heat exchange medium through the pipe circuit and the heat exchangers to transfer heat from the spent air to the supply air, characterized in that at low outside temperatures the system is caused to alternate between two modes of operation in such a manner, that during the first mode the temperature of the heat exchange medium passing through the spent air heat exchanger is permitted to decrease to a temperature below the freezing point at which ice is formed from the moisture in the spent air, and a second mode in which the temperature of said heat exchange medium passing through the spent air heat exchanger is controlled to maintain a temperature above the freezing point at which the ice is caused to melt, maintaining said first mode for one period to permit ice to develop, and maintaining said second mode for a second period to effect melting of the developed ice.

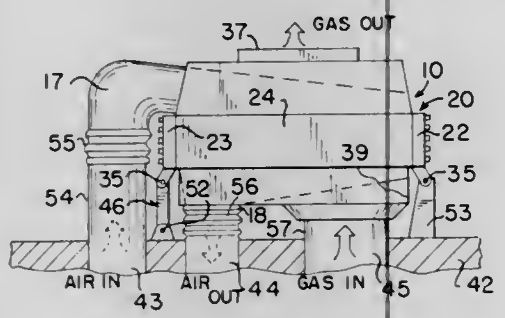
3,968,834
HEAT EXCHANGER MOUNTING FOR A TURBINE ENGINE

Ervin E. Mangus, Brimfield; Richard W. Kizer, Morton, and D. Craig Young, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 7, 1975, Ser. No. 548,112

Int. Cl.^{2} F28F *7/00*

U.S. Cl. 165—82 **9 Claims**



1. In a heat exchanger mounting system for a turbine engine:

- a. a heat exchanger unit comprising an elongated core having opposed upper and lower surfaces, opposed end members and opposed side surfaces, an air-in manifold integrally connected to the upper surface of said core and an air-out manifold integrally connected to the lower surface of said core,
- b. said heat exchanger unit further comprising a support frame surrounding the end members and side surfaces of said core, said support frame having rigid end beams and side members extending between the end beams and secured thereto;
- c. said heat exchanger unit further comprising means for supporting said core in said frame against upward or downward movement relative thereto;
- d. said heat exchanger unit further comprising a gas-in manifold connected thereto,
- e. an engine body having air-in, air-out and gas-in passages therein,
- f. rigid link means pivoted to said engine body and to one end beam of said support frame for supporting said end beam spaced a substantially fixed distance from said engine body and for restraining said end beam against sidewise movement while allowing endwise movement of said end beam relative to said engine body,
- g. means for supporting the other end beam of said support frame spaced a substantially fixed distance from said engine body and for restraining said other end beam against endwise and sidewise movement relative to said engine body,
- h. conduit means, including an expansion bellows therein, connecting and communicating said air-in manifold to and with said air-in passage,
- i. conduit means connecting and communicating said gas-in manifold to and with said gas-in passage.

3,968,835
HEAT EXCHANGER FOR OIL DEODORIZING PLANT

Albert Hartmann, Heusenstamm; Herbert Schilken, Friedberg, and Bernhard Romeiser, Hanau, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 15, 1974, Ser. No. 488,801

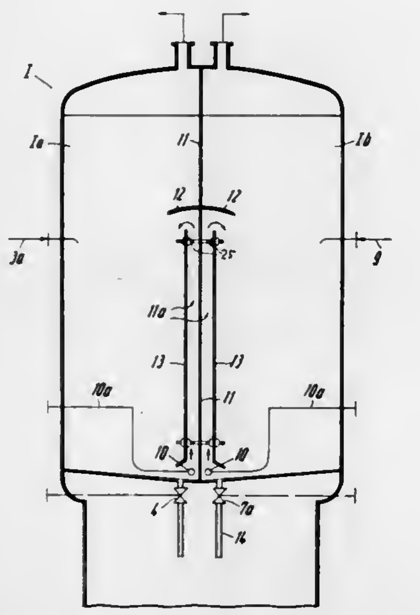
Claims priority, application Germany, July 18, 1973, 2336632

Int. Cl.^{2} F28F *13/06*

U.S. Cl. 165—108 **6 Claims**

1. A heat exchanger for a pair of liquids, said exchanger comprising:

- a. a generally closed compartment;
- b. a heat-conducting partition wall subdividing said compartment into at least a pair of contiguous chambers each holding a respective liquid;



- c. means for forming a partial vacuum in said chambers;
- d. means in each of said chambers for inducing recirculating liquid flow along the respective side of said partition wall; and
- e. at least one guide wall in each of said chambers spaced from and generally parallel to the respective side of said partition wall.

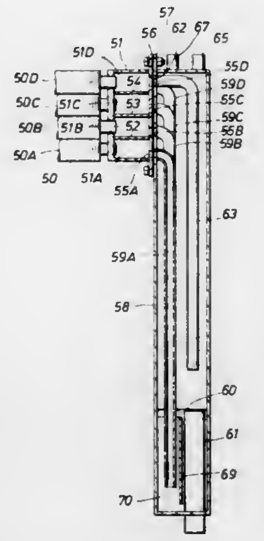
3,968,836
HEAT EXCHANGER

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Aug. 5, 1974, Ser. No. 494,471

Int. Cl.^{2} F28B *9/08*

U.S. Cl. 165—111 **11 Claims**



1. A heat exchanger, comprising a tube bundle having a plurality of rows of tubes adapted to be arranged successively in the direction of air flow therepast, an inlet header for introducing vapor into one end of the tubes of the rows, a plurality of outlet headers each for receiving condensate and uncondensed vapor from the opposite ends of the tubes of one of said rows, each outlet header having an outlet from the lower end thereof, a generally upright drain pot having an upper portion which surrounds said outlets, a plurality of leg seal tubes each connecting with the outlet from one of the outlet headers and extending into a lower portion of the drain pot, means for maintaining the level of condensate within the drain pot above the lower ends of the leg seal tubes so as to isolate pressures within said outlet headers from one another, and an additional tube connecting one outlet header above its lower end with the drain pot above the condensate level therein so as to introduce uncondensed vapor from said one outlet header into said drain pot.

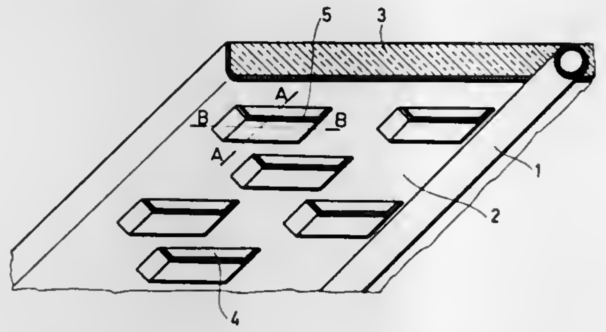
3,968,837
SOUND ABSORBING RADIATING SCREEN

Gyorgy Makara, Budapest, Hungary, assignor to "Futober" Epuletgepeszeti Termekeket Gyarto Vallalat, Budapest, Hungary

Filed Aug. 30, 1974, Ser. No. 502,144

Int. Cl.^{2} F24H *9/08;* **F28F** *13/00*

U.S. Cl. 165—135 **1 Claim**



1. A radiant heat-transfer body comprising a plate of heat conductive material lying substantially in a plane and formed with a multiplicity of spaced apart generally rectangular openings; at least one pipe for a heat-transfer fluid bonded to said plate and in heat conducting relationship therewith; a body of thermally insulated and heat absorptive in contact with one side of said plate and substantially coextensive therewith, said body being exposed at said openings; and respective walls spaced from the opposite side of said plate and overlying each of said openings parallel to the plane of the plate, and respective webs on opposite ends of each of said walls connecting same with said plate along opposite edges of each respective opening whereby the webs and wall at each opening frame a pair of slots opening laterally between each wall and the body of insulating material, said slots opening in directions perpendicular to the longitudinal dimension of said pipe.

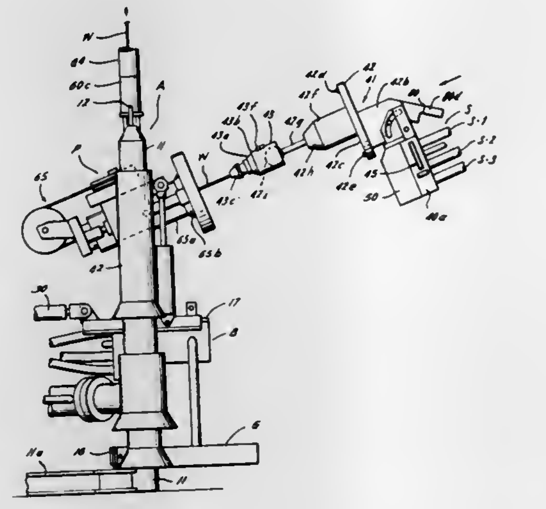
3,968,838
UNDERWATER CONNECTION APPARATUS

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Division of Ser. No. 386,431, Aug. 7, 1973, Pat. No. 3,866,677. This application Nov. 25, 1974, Ser. No. 526,465

Int. Cl.^{2} E21B *33/035*

U.S. Cl. 166—.6 **15 Claims**



1. Apparatus for running an underwater flowline to a desired landing point, comprising:

an underwater flowline extending from a remote point to a position near a desired landing point;

a flowline positioning assembly for lowering from the surface of a body of water downwardly to a position in proximity to said desired landing point;

said flowline positioning assembly including a funnel assembly having a flexible line extending therethrough into attachment with said underwater flowline such that the flexible line is extendable from attachment with said underwater flowline through said funnel assembly and upwardly to the surface of said body of water with said flowline positioning assembly being lowered to said position adjacent said desired landing point;

said funnel assembly including control means for directing the travel of said underwater flowline into initial attachment with said funnel assembly in response to the manipulation of said flexible line such that said underwater flowline is partially positioned with respect to said desired landing point; and

remotely operable power means in said funnel assembly for engaging said underwater flowline in a position of partial alignment and for moving said underwater flowline from said position of partial alignment to a position wherein said underwater flowline is fully aligned with respect to said desired landing point.

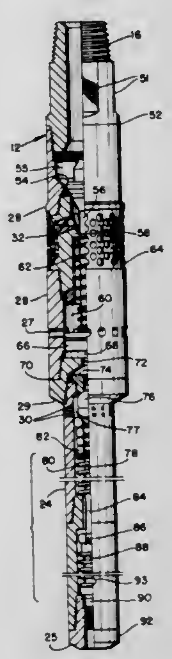
3,968,839
SUBSURFACE FLOW CONTROL APPARATUS

Patrick S. Swihart, Sr., 3507 Baumann, Midland, Tex. 79701

Filed Mar. 21, 1975, Ser. No. 560,350

Int. Cl.^{2} E21B *43/00, 47/06*

U.S. Cl. 166—250 **15 Claims**



1. In a borehole having a fluid producing formation located downhole therein, and a production tubing extending downhole into proximity of the formation, with the tubing forming a produced fluid flow path and a borehole annulus, the improvement comprising:

- a subsurface flow controller for controlling flow of fluid from the formation into the tubing string, said controller being in the form of a fluid-conducting hollow body and having an upper and lower end portion, said hollow body having means forming a piston chamber, a production inlet chamber, and a production outlet chamber therewithin;
- said piston chamber having a piston reciprocatingly received therewithin and dividing the last said chamber into an upper and a lower piston chamber;

a pilot valve means actuated in response to downhole pressure for controlling produced fluid flow into and out of said lower piston chamber;

a production valve seat separating said production outlet chamber from said production inlet chamber, a production valve element having means by which it is actuated by said piston from an opened to a closed position for controlling fluid flow through said production valve seat; a choke forming a produced fluid inlet into said production inlet chamber; means forming a bleed port which is arranged respective to the piston so that downhole pressure is effected within said upper piston chamber when said production valve is closed and which is effected within said lower chamber when said production valve is moved to the open position; and means biasing said production valve element towards the closed position;

so that increased bottomhole pressure opens said pilot valve to cause said piston to open said production valve element, so that fluid flow can occur through said production valve seat until a reduced flow rate through the last said seat causes the production valve element to assume a closed position.

9. Method of controlling mixed liquid and gaseous fluid flow from a producing formation located downhole in the borehole, wherein the produced fluid flows uphole through a production tubing string, comprising the steps of:

1. locating a flow controller downhole in a borehole in proximity of the production formation;
2. connecting the flow controller to the tubing string so that fluid flow through the tubing string is controlled by the action of the controller;
3. sensing the formation pressure and moving the flow controller to a fluid flow position in response to the bottomhole pressure increasing to a value which will expel most of the accumulated liquid from the borehole;
4. sensing the flow rate through the tubing string and moving the controller to a position to prevent fluid flow through the tubing string in response to the flow rate decreasing to a value which is in excess of a rate of flow where insufficient velocity through the tubing string is available to carry liquid to the surface by entrainment.

3,968,840
CONTROLLED RATE ACIDIZATION PROCESS

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

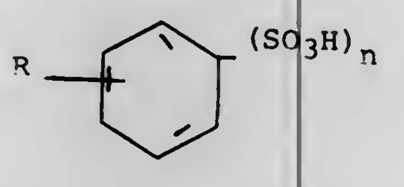
Filed May 25, 1973, Ser. No. 363,934

Int. Cl.^{2} E21B *43/26*

U.S. Cl. 166—280 **6 Claims**

1. A process for increasing the productivity of a subterranean formation penetrated by a wellbore comprising

forcing a fracturing fluid into the formation under sufficient pressure to fracture the formation wherein the fracturing fluid has suspended therein a solid acidic material of the formula:



wherein *n* is 1 or 2 and R is NH_2, —Cl, —OH, —NO_2, alkyl, carboxyl or ether which will slowly dissolve upon contact with sufficient aqueous medium and attack the formation and,

displacing the fracturing fluid and suspended solid acidic material into the fractured formation.

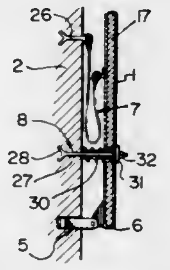
3,968,841
FLAME DEFLECTING DEVICE FOR MOUNTING ON A BUILDING EXTERIOR

Tibor Z. Harmathy, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed June 4, 1975, Ser. No. 583,518

Int. Cl.^{2} A62C *7/00*

U.S. Cl. 169—48 **5 Claims**



1. A flame deflecting device mounted on a building exterior, comprising:

a. a fireproof and weatherproof panel in an upwardly extending position on a side portion of the building exterior extending between adjacent windows at different levels and with the panel extending in a horizontal direction beyond the extremities of the said adjacent windows and in an upward direction extending at least three feet,

b. mounting means pivotally mounting the panel on the building exterior in the upwardly extending position, so that the panel may turn from the upwardly extending position to a substantially horizontally extending position,

c. holding means by which the panel is held against turning any further than the substantially horizontally extending position, and

d. securing means releasably securing the panel in the upwardly extending position, and whereby,

e. when the panel is thus mounted, held and secured in the upwardly extending position to the portion of a building exterior, the securing means may be actuated for the panel to turn to the substantially horizontally extending position to deflect flames, issuing from the window immediately beneath the panel, from the adjacent window immediately above the panel.

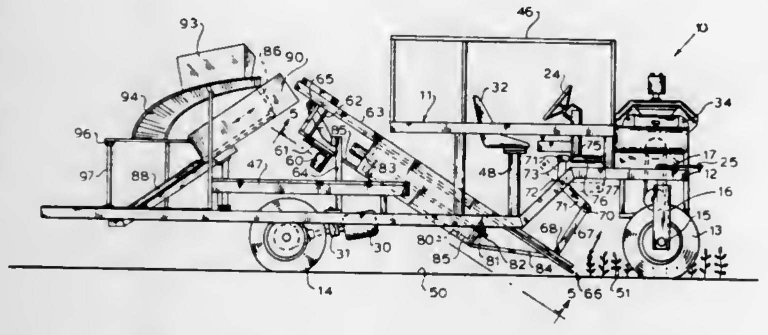
3,968,842
TOMATO PLANT HARVESTING APPARATUS

Erwin F. Puch, Sr., and Erwin F. Puch, Jr., both of P.O. Box 3043, Orlando, Fla. 32802

Filed Apr. 7, 1975, Ser. No. 566,028

Int. Cl.^{2} A01D *19/12*

U.S. Cl. 171—11 **21 Claims**



13. In a plant pulling and packing machine having a wheeled frame and a plant pulling and conveying means attached to said wheeled frame for picking plants from the earth and transporting the plants for packaging, wherein the improvement comprises in combination therewith:

a plant packing magazine located adjacent one end of said plant conveying means for receiving plants being picked and conveyed, said packing magazine having a receiving container and a backing plate located therein whereby received plants in said magazine are compressed against said backing plate;

backing plate actuating means attached to said backing plate for shifting said backing plate in said magazine responsive to predetermined pressure thereagainst by plants being received therein; and

means for removing said plants from said magazine into packaging containers.

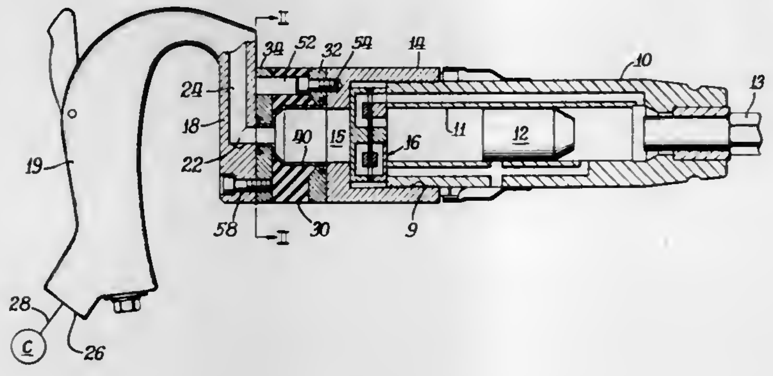
3,968,843
PNEUMATIC PERCUSSION TOOL HAVING A VIBRATION DAMPENED HANDLE

Daniel B. Shotwell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 21, 1975, Ser. No. 551,796

Int. Cl.^{2} B25D *9/04*

U.S. Cl. 173—139 **17 Claims**



1. A portable pneumatic percussion tool having a barrel; pneumatically actuated apparatus in the barrel; a vibration-dampened handle secured at one end of the barrel and including a hand-grasping section having an air pressure supply passage therein; a cushion member of resilient rubber disposed between the handle and barrel; a pair of metal plate coupling members each on opposite sides of the cushion member and each bonded thereto; the coupling members and cushion member having aligned air pressure supply passages extending therethrough; a unitary, oil-resistant, one-piece, resilient linear which completely lines the air supply passages of said members; the resilient liner having first and second integral flanges extending laterally along the outer face of each coupling member and circumjacent the air pressure supply passage; each flange having an outer face extending beyond the adjacent outer face of the coupling member to provide an annular sealing gasket between each respective coupling member and its adjacent handle and barrel; and means for securing each respective coupling member to its adjacent handle and barrel with the annular sealing gasket compressed sufficiently to provide an airtight seal.

3,968,844
DETERMINING THE EXTENT OF ENTRY OF FLUIDS INTO A BOREHOLE DURING DRILLING

Herbert C. Walther, Jr., Ponca City, Okla., and George M. Myers, Houston, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sept. 19, 1974, Ser. No. 507,320

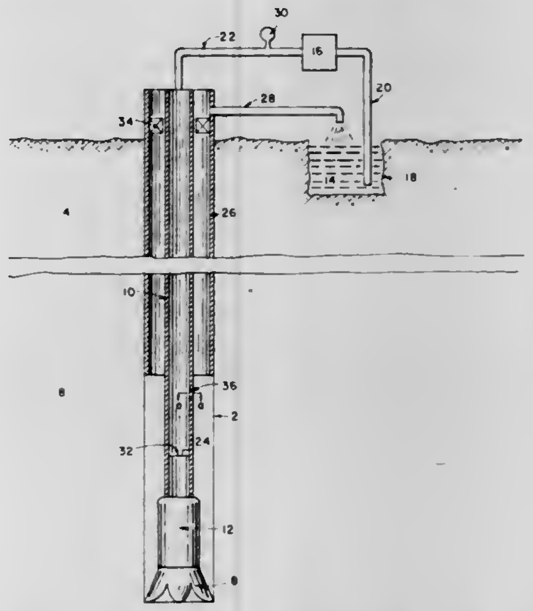
Int. Cl.^{2} E21B *47/00*

U.S. Cl. 175—48 **4 Claims**

1. A method for determining the entry of formation fluids into the borehole of a well during drilling of the well using a circulating drilling fluid and a drill string with a back pressure valve positioned near the bottom of the drill string above the drill bit comprising:

a. providing a bypass in the sidewall of the drill string above the back pressure valve, said bypass providing fluid pressure communication between the interior of the drill string and the annulus between the drill pipe and the borehole;

b. circulating drilling fluid down the drill pipe and back up said annulus during drilling thereby producing formation cuttings which are carried to the surface by said circulating fluid, said formation cuttings providing, in the absence of entry of formation fluids into the borehole, a returning circulating fluid of greater density than the density of the circulating fluid in said drill pipe;



c. stopping the circulation of drilling fluid in the borehole;

d. determining the pressure in the drill string downstream from the pump used to circulate the drilling fluid, said pressure reflecting the difference in density of circulating fluid in the borehole annulus and in the drill string; and

e. comparing the so-determined pressure with previous pressure determinations made using similar steps.

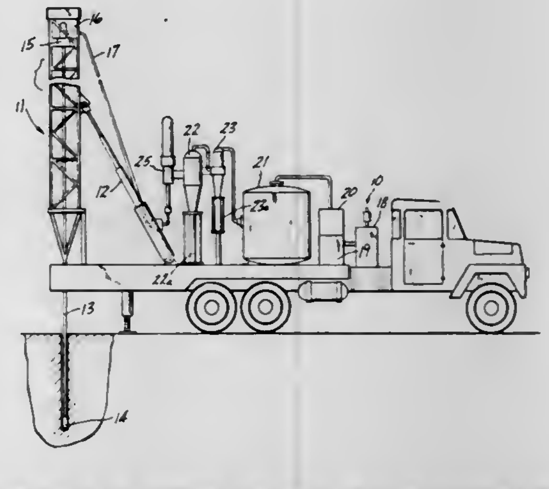
3,968,845
APPARATUS AND METHOD FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Division of Ser. No. 323,852, Jan. 15, 1973, Pat. No. 3,887,020, which is a continuation-in-part of Ser. No. 132,001, April 7, 1971, abandoned. This application Mar. 6, 1975, Ser. No. 555,784

Int. Cl.^{2} E21B *49/00*

U.S. Cl. 175—60 **4 Claims**



1. A method of drilling in wet, dry, or caving formations with near 100% geologic sample recovery in dry formation and taking core samples in wet formation comprising the steps of:

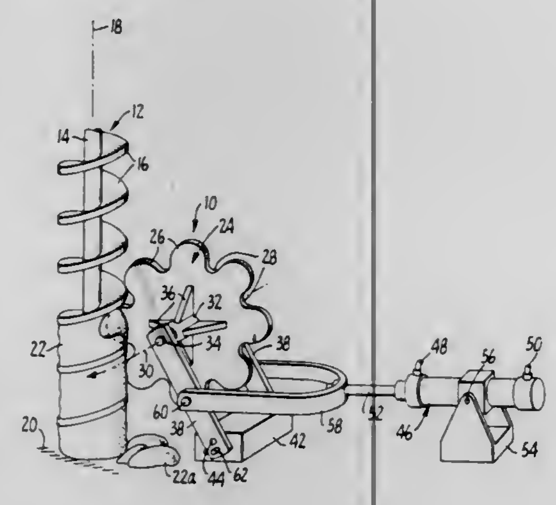
A. forming a continuous bore hole in the earth by drilling with a hollow stem rotary drill;

B. removing the drilled material from the bore hole in dry formation by entraining the drilling material in a current of air rising in the drill stem created by a vacuum applied to the top of the drill stem;

C. guiding the drilled material from the drill stem to a separator and collecting means;
D. separating the drilled material from the air;
E. collecting the drilled material;
F. and, when wet formation or the depth limit of the vacuum is reached, the steps of disconnecting the vacuum from the drill stem;
G. connecting a drilling fluid pump to the hollow drill stem;
H. pumping drilling fluid down the hollow drill stem and removing the drilled material from the bore hole by entraining said material in the drilling fluid as it rises in the annulus formed between the hollow drill stem and the earth formation;
I. and at selected depths in the bore hole the step of taking core samples and raising same to the surface.

3,968,846
AUGER WIPER

Gordon M. Brenner, Walnut Creek, Calif., assignor to M.G.B., Inc., Berkeley, Calif.
Filed May 9, 1975, Ser. No. 575,938
Int. Cl.² E21B *41/00*
U.S. Cl. 175—84 **5 Claims**



1. In combination with a continuous flight auger having a longitudinal axis with convolutions extending therearound for the transport of drilled debris longitudinally of the auger, an improved wiper for removing debris from the convolutions of the auger, said wiper comprising a wheel having radially extending fingers disposed therearound at uniformly spaced intervals, said fingers being proportioned so as to be engageable between the convolutions of the auger and being spaced relative to one another sufficiently that adjacent fingers may span the convolutions; and, means mounting the wheel for rotation about an axis disposed in a plane generally normal to the longitudinal axis of the auger whereby the fingers interdigitate between the convolutions of the auger and rotation of the auger about the longitudinal axis thereof functions to rotate the wheel around the axis about which it is mounted for rotation.

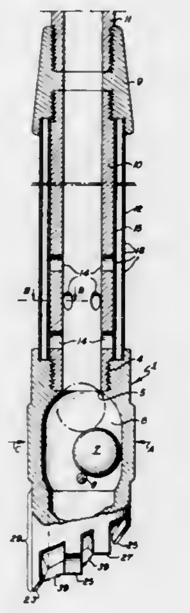
3,968,847
WELLPOINT JETTING HEAD

David A. Werblin, Riverdale, N.Y., assignor to Griffin Wellpoint Corporation, New York, N.Y.
Filed June 26, 1975, Ser. No. 590,508
Int. Cl.² E21B *17/14*
U.S. Cl. 175—402 **5 Claims**

1. A jetting nozzle head for use in a wellpoint device having a fluid delivery means to jet soil immediately in advance of said nozzle head, comprising:

means defining a nozzle adapted to be secured to the lower end of a wellpoint for receiving a passage of fluid under pressure therefrom;

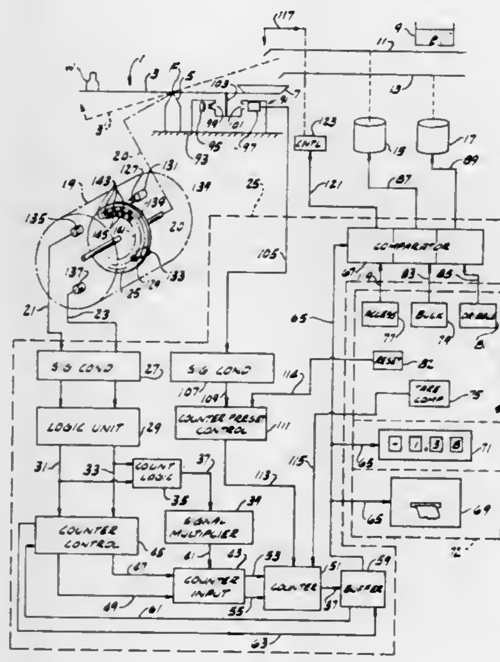
a plurality of spade-like teeth annularly positioned at the forward end of said nozzle means and projecting longitudinally therefrom, said teeth terminating in a cutting surface defining a cutting plane canted with respect to the longitudinal axis of said nozzle means; and



pressure face means formed on said teeth for dislodging soil particulate during a rotational manipulation of the wellpoint, said pressure face means disposed to confront a tilting, side-to-side, and up-or-down rotational path of said teeth during said manipulation.

3,968,848
DIGITAL WEIGHING APPARATUS

Dale M. Cherney, Howards Grove; Charles G. Hart, and Richard W. Safranski, both of Sheboygan, all of Wis., assignors to Hayssen Manufacturing Co., Sheboygan, Wis.
Filed July 28, 1975, Ser. No. 599,837
Int. Cl.² G01G *13/02, 23/18*
U.S. Cl. 177—123 **18 Claims**



1. Apparatus for feeding a product to a weighing scale and stopping the feed when the amount of product fed reaches a final weight comprising:

a scale having balance means, adapted to receive product to be weighed and movable from an initial position toward a balance position as product is delivered thereto, said balance means starting to move upon delivery thereto of a predetermined initial weight of product;

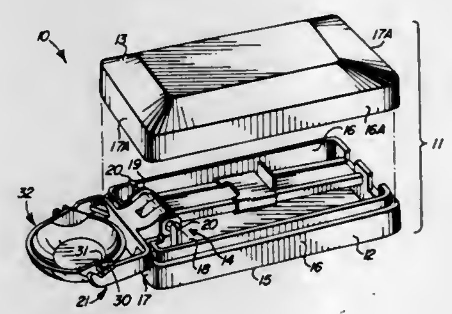
first and second product feed means activated at the start of a weighing operation for delivering a quantity of product from a source thereof to the balance means, the first means delivering product at a first rate of speed and the second means delivering product at a second and slower rate of speed;

means for sensing movement of the balance means in either of two directions and for providing first and second electrical outputs representative of the magnitude and direction of movement thereof, each output always having one of two discrete states; and

control means responsive to the sensing means outputs for terminating operation of the first product feed means when the amount of product delivered to the balance means reaches a first predetermined level and for terminating operation of the second product feed means when the amount of product delivered to the balance means reaches a second predetermined level substantially equal to the final weight of product to be delivered, whereby the amount of product delivered to the balance means after termination of operation of the second product feed means will bring the balance means into its balance position indicating that the final weight of product to be delivered has been attained.

3,968,849
LIGHTWEIGHT PORTABLE SCALE

John D. Dale, 1211 W. Rovey Ave., Phoenix, Ariz. 85013, and David G. Knotter, 4634 N. 44th St., Phoenix, Ariz. 85018
Filed Aug. 27, 1975, Ser. No. 608,231
Int. Cl.² G01G *21/28*
U.S. Cl. 177—127 **7 Claims**



1. A lightweight miniaturized portable scale comprising:

a carrying case comprising a base portion and a cover portion,

a pair of shaft support members spacedly mounted within said base portion and arranged to extend laterally of the longitudinal axis of said base portion each adjacent a different side thereof,

a collapsible weighing mechanism comprising a yoke portion having a pair of spaced arms, a scale portion and a shaft,

said shaft being non-rotatively attached to said yoke portion with each end fulcrumed on a different one of said support members,

said scale portion being pivotally mounted on said shaft and comprising interference means for engaging said yoke portion and for transmitting given rotative movement of said yoke portion to said scale portion,

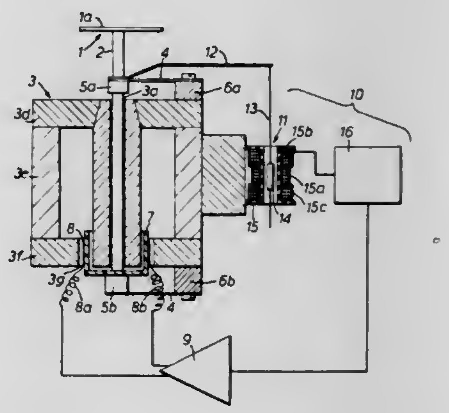
a scale having indicia thereon mounted on said scale portion along its length,

a slide member slidably mounted on said scale portion, and

a cup fulcrumed between said arms of said yoke portion for holding the substance to be weighed.

3,968,850
ELECTROMAGNET WEIGHING BALANCE

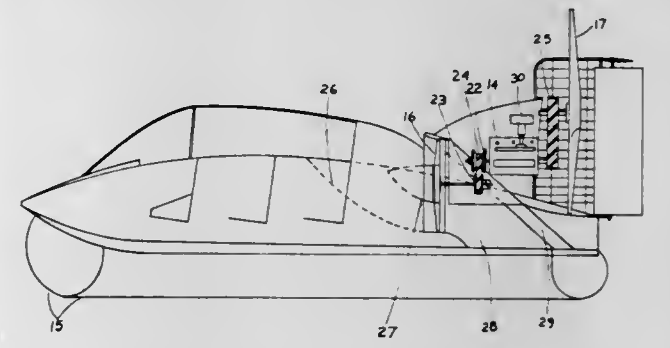
Charles David Sinclair Gaskill, Haslingden, England, assignor to International Electronics Limited, Haslingden, England
Filed Oct. 31, 1974, Ser. No. 519,773
Int. Cl.² G01G *3/14, 7/00, 23/10*
U.S. Cl. 177—210 **11 Claims**



1. In an electromagnetic weighing balance including a movable support system for a mass to be weighed, said support system including an electromagnetic balance coil disposed in the field of a permanent magnet, sensor means responsive to displacement of said support system from a datum position to develop a control signal representative of said displacement, a signal-controlled current source feeding to said balance coil a balancing current producing on said support system a force balancing said mass, balance circuit means fed with said control signal and applying a balancing signal derived therefrom to control said current source, and indicator means responsive to said balancing current to provide a measure of said mass, the improvement which comprises constructing said current source as a high impedance source comprising a transistor (45) having emitter, base and collector electrodes, with said balance coil connected between the collector electrode of said transistor and one terminal of a direct voltage source and the emitter electrode of the transistor returned to the other terminal of said voltage source, and means applying said balancing signal to said transistor base electrode, thereby to control the balancing current supplied to said balance coil.

3,968,851
AUTOMATIC LIFT SYSTEM FOR AIR CUSHION VEHICLES

Robert James Windt, 1204 Third St., Box 281, Cordova, Ill. 61242
Filed Mar. 14, 1975, Ser. No. 558,347
Int. Cl.² B60V *1/14*
U.S. Cl. 180—117 **12 Claims**



1. An air cushion vehicle comprising a body including at least one engine means for driving a lift fan and a propulsion unit, an air intake and lift air duct means for directing lift air to the underside of said vehicle wherein said lift fan is automatically kept running at the proper speed to maintain the correct amount of lift for said vehicle by means of two pulley wheels with movable face plates so as to adjust the effective

diameter of these pulleys and a belt, one of the said pulley wheels being controlled by torque from the lift fan is attached to the lift fan shaft while the other pulley wheel having a spring means to close its face plate is attached to the engine output shaft or power shaft.

3,968,852
STABILIZING MEANS FOR AIR CUSHION VEHICLES

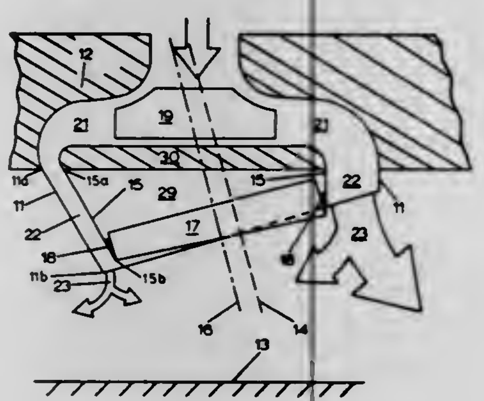
Peter Rowland Crewe, Newport, England, assignor to British Hovercraft Corporation Limited, England

Filed Aug. 5, 1974, Ser. No. 495,054

Claims priority, application United Kingdom, Aug. 15, 1973, 39592/73

Int. Cl.² B60V *1/11*

U.S. Cl. 180—118 **7 Claims**



1. An air-cushion vehicle including means for providing a supporting air cushion, cushion barrier means for sealing said air cushion and at least one stablizing device comprising first and second members formed from endless bands of flexible impermeable material having first edges attached to structure at the underside of the vehicle and extending downwardly therefrom to terminate at second edges, said first member extending around and being spaced from said second member, means on the vehicle for producing a flow of pressurized air which in operation of the vehicle passes downwardly between said first and second members to flow from between the second edges thereof in the form of an air curtain which serves to build up and maintain a localized cushion of pressurized air at a pressure which is higher than that of the air in the vehicle supporting cushion within a space defined by said cushion barrier means, the underside of said vehicle, and a surface over which said vehicle is supported, so that in operation when the height of said vehicle above the surface over which it is operating decreases there is an increase in the pressure of said localized cushion of air which acts between the underside of said vehicle and said surface to produce a stablizing force on the vehicle, the vertical distance measured from said structure at the underside of said vehicle to the second edges of said first and second members being between 25% to 75% of the vertical distance measured from the underside of said vehicle to the lowermost point of said cushion barrier means during the normal operation of the vehicle.

3,968,853
NOTCH ATTENUATION DEVICE

René Gérard Hoch, La Rochette, and Michel Henri Julliand, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

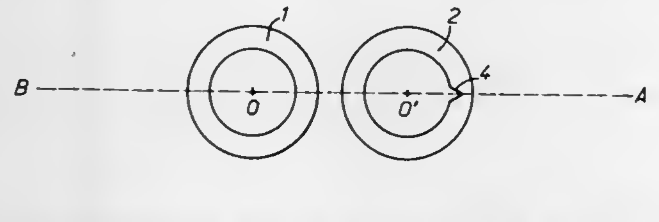
Filed Aug. 30, 1974, Ser. No. 502,198

Claims priority, application France, Aug. 31, 1973, 73.31582

Int. Cl.² B64D *33/06*

U.S. Cl. 181—33 C **5 Claims**

1. In a jet propulsion system comprising a main unsilenced exhaust nozzle having an endless outlet edge, a method for masking, in a given transversal direction with respect to said main nozzle, the noise emitted by said main nozzle, said masking method comprising the step of arranging in spaced offset relation to said main nozzle in said given transversal direction, an auxiliary exhaust nozzle less noisy than said main unsilenced exhaust nozzle in said given transversal direction and having an outlet edge located out of contact with the endless outlet edge of said main nozzle and interrupted by a single notch facing said given transversal direction.



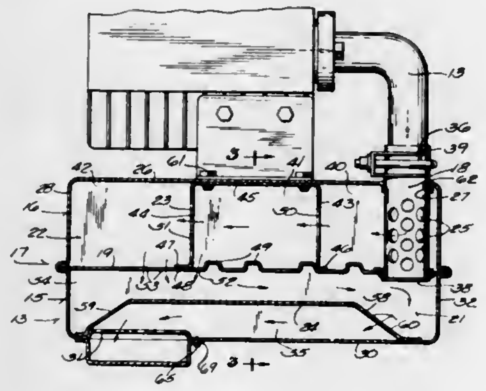
3,968,854
LOW NOISE LEVEL MUFFLER FOR SMALL ENGINES

Douglas Gordon, Hartford, and Richard W. Seilenbinder, Milwaukee, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 18, 1975, Ser. No. 559,567

Int. Cl.² F01N *7/10*

U.S. Cl. 181—40 **8 Claims**



1. In combination with an air cooled single-cylinder internal combustion engine having a blower shroud which embraces a substantial portion of the engine cylinder and which guides cooling air across the cylinder from a fly-wheel blower at one side of the cylinder to an outlet in the blower shroud at the opposite side of the cylinder:

A. an air outlet duct communicated with the outlet in the blower shroud and extending away from the same;

B. a muffler having
  1 an elongated shell with substantially parallel front and rear shell walls that extend lengthwise of the shell,
  2 an exhaust gas inlet port in the rear of the shell, near one end thereof, communicated by means of an exhaust gas duct with an exhaust outlet of the engine, and
  3 an exhaust outlet port in the front of the shell, near the opposite end thereof;

C. means mounting said muffler in the air outlet duct so that the muffler can be swept by the stream of cooling air that has been blown across the engine cylinder;

D. means defining front and rear partition walls in the interior of the muffler shell that are parallel to said front and rear shell walls and are spaced from them and from one another, to divide the interior of the muffler into three gas passages, each of which extends along a substantial portion of the length of the muffler, each said partition wall being apertured near the end of the shell remote from its adjacent port in the shell so that gas is constrained to flow lengthwise in succession through said passages in passing from said inlet port to said outlet port;

E. a substantially U-shaped partition member confined between the rear shell wall and the rear partition wall,
  1 the legs of said U-shaped member comprising apertured dividers which extend across the rear gas passage and divide it into three cmpartments that are communicated with one another through the apertures in said dividers, and
  2 the bight portions of said U-shaped member flatwise overlying the inner surface of the rear shell wall, said partition member thus serving both to disrupt gas flow through the rear gas passage and to transfer heat to said rear shell wall from the rear partition wall; and

F. the front partition wall comprising a pan-like member which has a substantially wide rim portion that flatwise overlies the inner surface of the front shell wall to reinforce the same and transfer heat thereto.

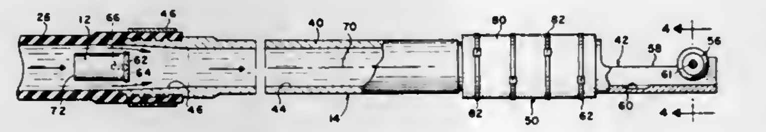
3,968,855
SEISMIC MARINE GUN ASSEMBLY

John C. Mollere, Nassay Bay, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 115,361, Feb. 16, 1971, abandoned, and a continuation of Ser. No. 354,270, April 25, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,363

Int. Cl.² G01V *1/38;* **F42D** *3/06*

U.S. Cl. 181—118 **6 Claims**



1. An underwater gun assembly for marine seismic exploration, into which, during operation, explosive-charged cylindrical cartridges are propelled by water under pressure flowing through a flexible conduit coupled to the gun assembly, comprising in combination:

A. a cylindrical firing gun having near its end a percussion element;

B. a barrel consisting of a cylindrical section and of a conical section,
  said conical section being forwardly of and tapering inwardly toward said cylindrical section, and
  said cylindrical section having a bore whose diameter is only slightly larger than the outer diameter of a cartridge and whose length is a multiple of the length of said cartridge, whereby said bore provides a sufficiently-long, alignment-and-acceleration passage for said cartridge to align the cartridge's longitudinal axis with the longitudinal axis of said cylindrical section, and to propel the cartridge into the firing gun with a predetermined acceleration for the proper initiation of said cartridge by said firing gun; and

C. coupling means detachably coupling the cylindrical section of said barrel forwardly of and in abutting coaxial engagement with said cylindrical firing gun.

3,968,856
SPIRAL SLIDE FIRE ESCAPE

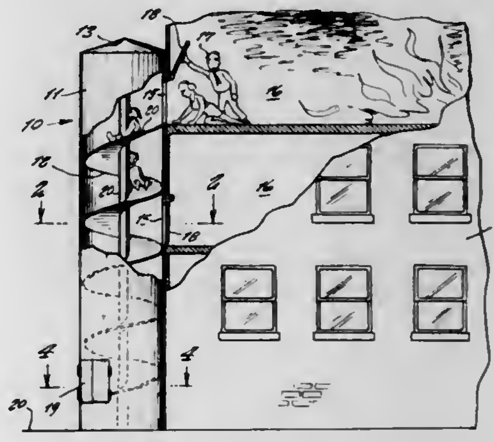
Warren L. Keen, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 7, 1974, Ser. No. 495,444

Int. Cl.² A62B *1/20*

U.S. Cl. 182—48 **1 Claim**

1. A spiral fire escape, comprising a vertical tube containing a spiral slide, said tube being mounted adjacent a vertical wall forming the sides of vertically aligned rooms, including an access door from each room and a corresponding adjacent aligned doorway formed through said tube, wherein corresponding aligned doors and doorways are of equal vertical dimension and are disposed between spaced adjacent portions of said slide providing unobstructed access into said slide, in further combination with a hinged exit door at the slide bottom, said door including a latch mounted slidably on the inside of said door, said latch being slidable from a normally locked position to an open position by means resiliently retaining the latch in the locked position in combination with a lever pivotally mounted on said door engaging said means, said lever being normally in a position corresponding to the locked position of said latch and movable to position causing said means to move the latch to said open position upon impact of a person descending from said slide wherein the exit door comprises adjacent similar portions pivotable about vertical axis having opposing brackets with vertically aligned holes, said latch having a rod normally extending through said holes and an upper end in engagement with said means, wherein said lever is pivotally mounted about a horizontal pin on said door and includes a lower impact bumper facing the escaping person, said means comprising a leaf spring engaging the bumper at one end and the upper end of said rod at the opposite end of the spring.



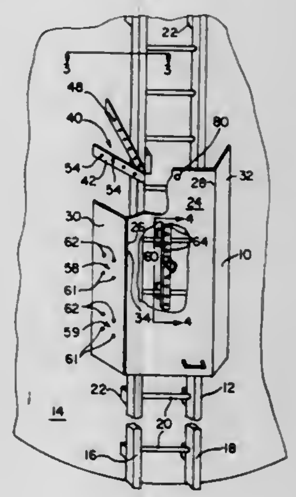
3,968,857
DEVICE FOR PREVENTING UNAUTHORIZED ACCESS TO PERMANENT LADDERS

Robin R. Bryan, 5007 Orchard Ridge Lane, Greensboro, N.C. 27405

Filed Feb. 20, 1975, Ser. No. 551,076

Int. Cl.² E06C *5/32*

U.S. Cl. 182—106 **5 Claims**



1. An improved safety shield for permanent ladders of the type having a pair of side rails and a plurality of rungs permanently secured to a support structure such as storage tanks, smoke stacks, television towers, tall buildings, bins and silos, said shield comprising:

a. a front plate having two longitudinal side edges;

b. a pair of side flanges, each of which extends rearwardly and outwardly from one of said side edges in angular relationship thereto to a point substantially adjacent said support structure;

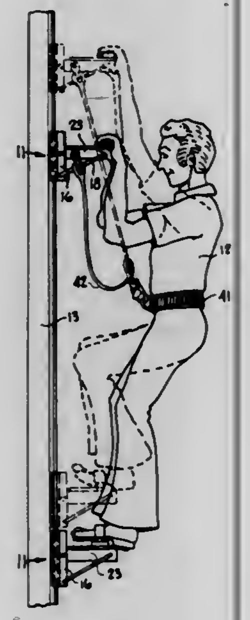
c. a hinge means connecting a first of said side flanges and said front plate along juxtaposed side edges;

d. at least one support bracket for connecting said first side flange to said ladder, said first side flange substantially abutting said support structure;
e. said front plate being movable between a first open position and a second closed position wherein said front plate, side flanges, and supporting structure substantially enclose said ladder and the second side flange substantially abut said support structure to prevent unauthorized access thereto; and
f. locking means for securing said front plate in said closed position.

3,968,858
CLIMBING DEVICE

Douglas D. Vollan, 115 Ardmore Road, Berkeley, Calif. 94707, and George W. Walsh, 330 Civic Drive, Walnut Creek, Calif. 94596

Filed May 14, 1975, Ser. No. 577,399
Int. Cl.² A63B ***27/02***
U.S. Cl. 182—135 **7 Claims**

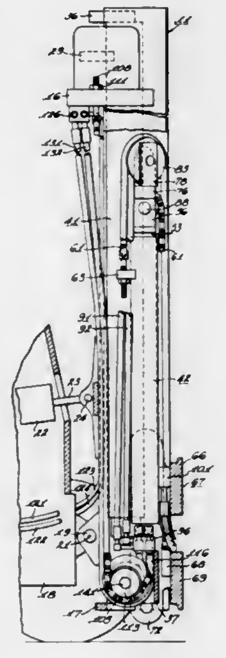


1. Apparatus responsive to the weight of a human operator tending to move in a downward direction along a generally vertical path by blocking said movement comprising:
A. a track extending generally rigidly along said path;
B. a carriage mounted on said track for slidable movement therealong;
C. cooperable interengaging structures on said track and said carriage essentially preventing outward transverse movement of said carriage away from said track and circumferential movement of said carriage around said track;
D. a blocking lever bar pivotally mounted on said carriage at a location and in an orientation at which upon tending to move in said downward direction said weight of said human operator will apply pivotal pressure to said bar on a first side of its pivotal mounting to said carriage causing frictional engagement with said track of its end on the opposite side of said pivotal mounting, whereby movement of said human operator downward is resisted by said blocking lever bar;
   1. said lever bar having a length on the opposite side of said pivotal mounting which is greater than the distance between said pivotal mounting and said track, the distance from said pivotal mounting on the location at which the weight of said human operator applies pressure to said bar on said first side being greater than the distance between said pivotal mounting and said end of said bar on said opposite side, whereby said frictional engagement in response to said application of the weight of a human operator will be provided with leverage pressure; and
   2. said blocking lever bar being pivotally mounted for movement in the direction opposite to that at which said weight of said human operator will apply pressure thereagainst in order to release said frictional engagement with said track of the end of said bar on the opposite side of said pivotal mounting, whereby said carriage is free for slidable movement along said track; and
E. means adapting said lever bar for supporting the weight of a human operator, said means including a foot platform secured to said bar on said first side of its pivotal mounting and a retaining member for maintaining said platform in engagement with any foot thereon upon said foot moving in said opposite direction to release said frictional engagement of said end of said lever bar with said track, said foot platform and retaining member being sized to accommodate both feet of an operator.

3,968,859
MULTIPLE HOSE GUIDE ARRANGEMENT FOR A LIFT TRUCK

Benonie C. Ehrhardt, Park Forest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,029
Int. Cl.² B66B ***9/20;*** **B65H** ***75/34***
U.S. Cl. 187—9 E **18 Claims**

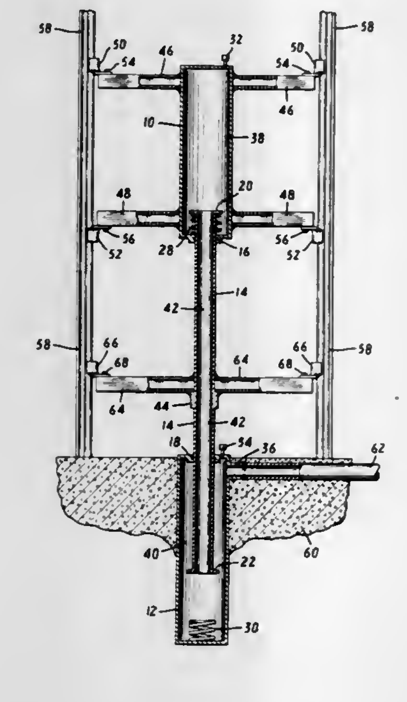


1. In a lift truck of the type having a mast, a carriage mounted on the mast for vertical movement at the front of the latter and a vertically disposed hydraulic lift jack for raising and lowering said carriage on said mast, the combination comprising:
a first pulley mounted on the upper end of said jack for rotation about a horizontal transverse axis,
an elongated flexible load support member trained over said first pulley and having its opposite ends connected to said carriage and mast,
a second pulley rotatably mounted on the upper end of said jack in a position above said first pulley and on a horizontal axis lying in a vertical plane disposed at an acute angle to said axis of said first pulley, and
a pair of flexible conduits for independently conveying hydraulic fluid between said carriage and said truck trained over said second pulley in one on top of the other relationship and extending downwardly at the front of said jack on one lateral side of said flexible load support member.

3,968,860
HYDRAULIC ELEVATOR INSTALLATION

Richard E. Atkey, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Oct. 25, 1974, Ser. No. 514,893
Int. Cl.² B66B ***9/04***
U.S. Cl. 187—17 **1 Claim**

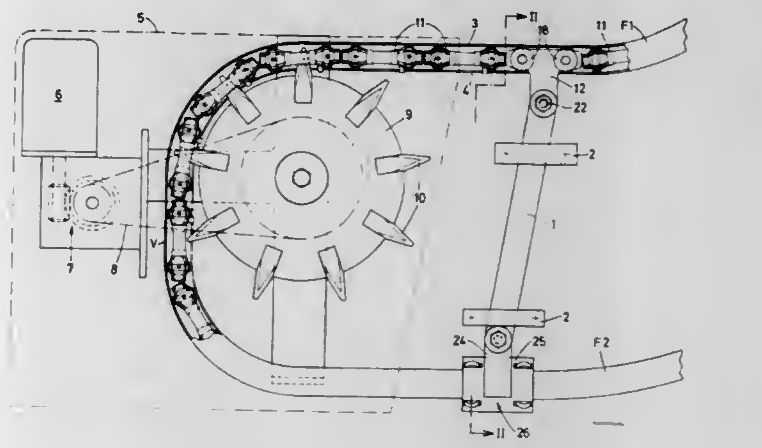


1. An hydraulic elevator installation for vertically transporting an elevator cab up and down in a hoistway, comprising a source of hydraulic fluid; a fluid pressure responsive hydraulic jack including a first cylinder fixedly mounted in a vertical position, said first cylinder having an inlet connected to said source of hydraulic fluid for receiving hydraulic fluid therefrom, a plunger, said plunger having a first end slidably mounted within said first cylinder for vertical reciprocating movement therein, a second end and an axial bore forming a passageway for hydraulic fluid, and a second cylinder slidably mounted about said second end of said plunger for vertical reciprocating movement thereon, wherein said bore has an inlet located at said first end of said plunger and communicating with said first cylinder for receiving hydraulic fluid supplied to said first cylinder and an outlet located at said second end of said plunger and communicating with said second cylinder for supplying hydraulic fluid to said second cylinder, whereby said second cylinder reciprocates vertically on said plunger under the influence of fluid pressure conditions within said second cylinder and said plunger reciprocates vertically within said first cylinder, at the same velocity at which said second cylinder reciprocates on said plunger, under the influence of fluid pressure conditions within said first cylinder; a lifting frame for carrying the elevator cab, said lifting frame including said second cylinder, a lower horizontal support member rigidly attached to said second cylinder and an upper horizontal support member rigidly attached to said second cylinder and located a predetermined distance above said lower horizontal support member; a pair of parallel guide rails extending upwardly in the hoistway; two pairs of vertically aligned lower and upper guide means carried by said lower and upper horizontal support members, respectively, and engageable with said guide rails for centering said lifting frame between said guide rails during the vertical movement of said lifting frame in the hoistway; a follower guide rigidly attached to said plunger between said first and second cylinders; and a pair of guide means carried by said follower guide and engageable with said guide rails for supporting the portion of said plunger between said first and second cylinders during the vertical movement of said lifting frame in the hoistway.

3,968,861
ELEVATOR

Hans Kernen, Engehaldenstr. 69, 3012 Bern, Switzerland

Filed July 1, 1975, Ser. No. 592,228
Claims priority, application Switzerland, July 9, 1974, 9439/74
Int. Cl.² B66B ***11/04***
U.S. Cl. 187—17 **4 Claims**

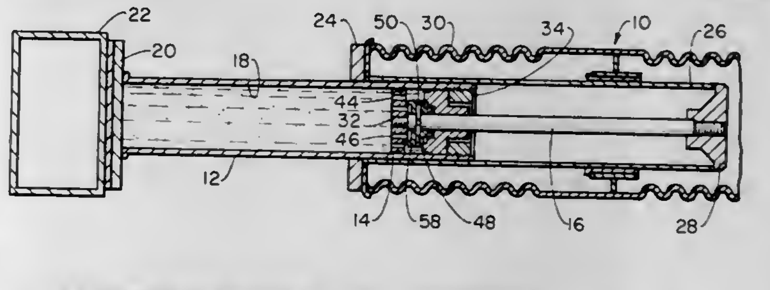


1. An elevator comprising a guide means, a car guided for reciprocating travel along said guide means, transmission means disposed in said guide means and comprising a substantially uninterrupted sequence of transmission members, and a motor drive means provided with teeth for engagement in said transmission means, wherein said guide means comprises two parallel guide tracks of a guide tube endlessly closed upon itself by means of two connecting sections, said guide tube having along its entire length a slot extending along a generatrix thereof, said slot being situated in facing sides of said guide tracks and being narrower in width than the inside diameter of said guide tube, said transmission members are disposed in said guide tube, not connected to one another, are guided by an inside wall of said guide tube, and include a carrier member having a middle portion from which a tongue projects through said slot, the remaining said transmission members being rams each having a middle portion in which there is a slot-like aperture aligned with said slot, and said teeth project through said slot into said guide tube and engage with said rams in the region of one of said connecting sections.

3,968,862
KINETIC ENERGY ABSORBING VALUE ASSEMBLY

Franz A. Gorges, Sun Valley, and James E. Robertson, Woodland Hills, both of Calif., assignors to Menasco Manufacturing Company, Burbank, Calif.

Filed Mar. 20, 1974, Ser. No. 452,920
Int. Cl.² B60R ***19/06;*** **B61F** ***19/04;*** **F16D** ***63/00;*** **F16F** ***9/30***
U.S. Cl. 188—1 C **1 Claim**



1. An energy absorption unit comprising:
a tubular housing having an internal chamber formed therein, said housing having a closed end and an open end;
a substance contained within said chamber being capable of absorbing energy;
a piston movably supported within said chamber;
an orifice means associated with said piston for permitting said substance to move from one side of said piston to the opposite side of said piston to produce a damping resistance force on said piston head;

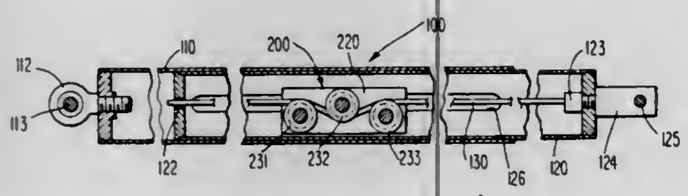
a piston rod secured to said piston and extends exteriorly of said housing through said open end;

sealing means mounted within said chamber adjacent said open end of said cylinder, said piston rod passing through said sealing means and being movably mounted in respect thereto;

said orifice means comprising first and second passage means, said substance being adapted to move through said first passage means from one side of said piston to the other side of said piston and absorb energy;

valve means movable relative to said piston head, said valve means being connected by frangible pin means to said piston rod to be normally positioned directly adjacent said piston head, with said valve means positioned directly adjacent said piston head said second passage means being closed, upon a certain predetermined pressure level being attained within said chamber said frangible pin means breaking apart permitting said valve means to slidably move on said piston rod to a displaced position opening said second passage means for passage therethrough of said substance.

3,968,863
ENERGY ATTENUATOR
Mason J. Reilly, Media, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Sept. 22, 1975, Ser. No. 615,279
Int. Cl.² F16F *7/12*
U.S. Cl. 188—1 C **5 Claims**



1. An energy attenuator comprising:

an outer housing defining a cavity, said outer housing having a first end adapted for mounting to a structure and a second end open for insertion of an inner housing;

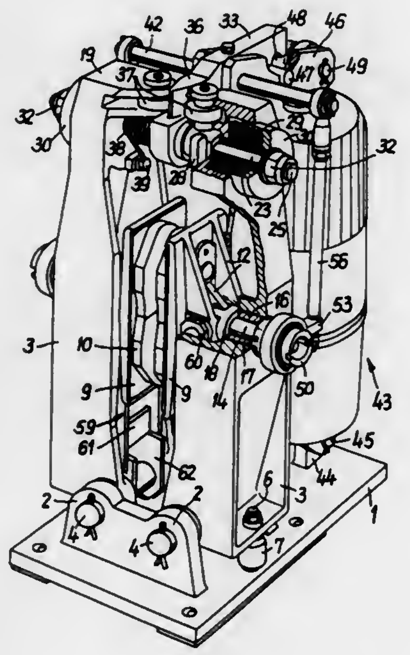
an inner housing defining a cavity, said inner housing having a first end adapted for mounting to a structure and a second end slidably inserted into the cavity of the outer housing, said inner housing having a longitudinal slot to allow communication from the cavity of the inner housing to the wall of the outer housing;

a wire extending longitudinally through the cavity of the inner housing; fixedly attached to the first and second ends of said inner housing;

wire bending means within the cavity of the inner housing operatively engaging the wire;

connecting means fixedly attaching the wire bending means to the outer housing, said connecting means passing through the longitudinal slot in the inner housing whereby, as the inner and outer housings move in relation to each other in response to tensile or compressive forces applied to the mounting ends of the housings, energy is expended in bending the wire.

3,968,864
DISC BRAKE, ESPECIALLY FOR CRANE DRIVES
Klaus Deichsel; Hinrich Flessner, and Henricus Theodorus Tromp, all of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Apr. 2, 1975, Ser. No. 564,462
Claims priority, application Germany, Apr. 13, 1974, 2418225
Int. Cl.² F16D *55/10, 65/56*
U.S. Cl. 188—71.9 **14 Claims**

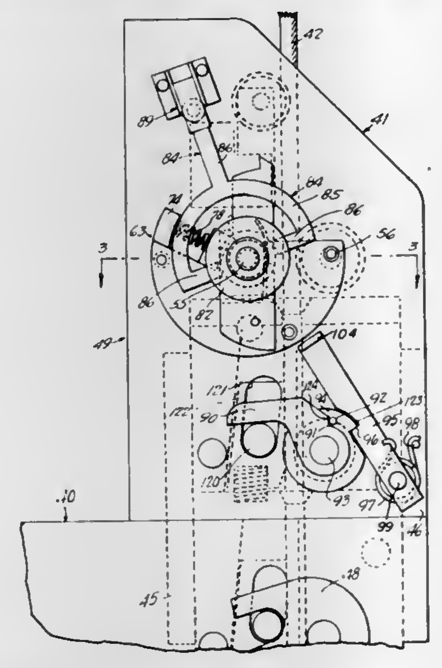


1. A disc brake having a pair of arms pivotally supported at one end and adapted to receive the periphery of a brake disc therebetween, means biasing the free ends of said arms toward each other, brake elements on the sides of the arms which face each other, adjustable means connecting said brake elements to said arms for adjustment of brake elements toward each other, a disengaging device including a lever pivotally connected to the free ends of the arms having a nose thereon operable when the lever is pivoted in one direction to press said arms apart, said nose camming out from between said arms when the lever is released, an actuator pivoted on said lever and when moved in one direction abutting said lever and moving said lever in said one direction, a free wheeling one way clutch device connected to each adjustable means, and a link forming a lost motion connection between each free wheeling device and the axis of pivotal connection of said actuator to said lever.

3,968,865
CABLE CLIMBER SAFETY LOCK
Robert C. McElroy, Lisbon, Ohio, assignor to Cable Climber Safety Devices, Incorporated, Lisbon, Ohio
Filed May 20, 1974, Ser. No. 471,646
Int. Cl.² B60T *8/12*
U.S. Cl. 188—188 **3 Claims**

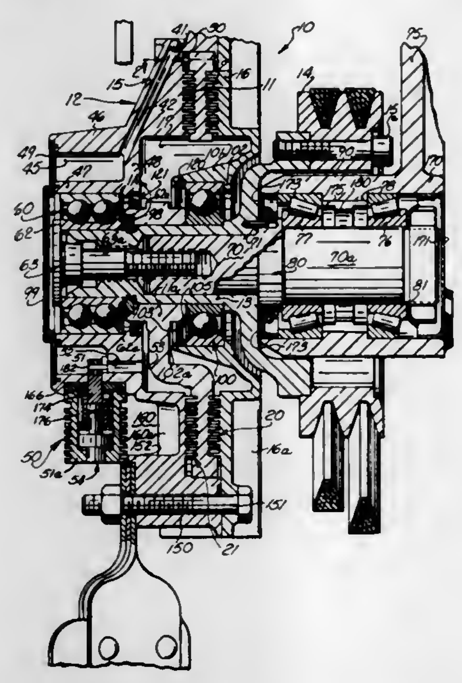
1. In combination with a cable climber, a safety lock including first and second spaced parallel vertically disposed plates, a vertically disposed support cable having a portion thereof positioned between said plates, a displacement solenoid contiguous to said first plate and secured thereto for selectively actuating said cable climber, mounting bars connecting said plates to said cable climber, a sensor for sensing relative movement between said climber and cable, first and second shafts arranged in spaced parallel relation with respect to each other and mounted in said plates, intermeshing gears on said shafts, a sensor drive pulley on said second shaft and said sensor drive pulley being interposed between said plates and having a plurality of serrated notches thereon, said sensor

mounted on said first shaft, a shiftable pulley on the end of said first shaft, resilient means for engaging said shiftable pulley, said solenoid selectively shifting said shiftable pulley,



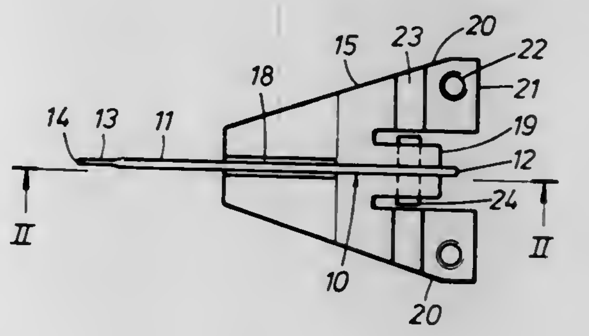
means on said shiftable pulley selectively engaging means on said sensor to drive said sensor from said first shaft on operation of said solenoid, and a positive lock arm contiguous to said overspeed sensor.

3,968,866
FLUID COUPLING
Wayne K. Leichliter; Rodney H. Detty, and John B. Hill, all of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio
Filed Nov. 29, 1974, Ser. No. 528,542
Int. Cl.² F16D *35/00, 43/25, 13/72*
U.S. Cl. 192—58 B **15 Claims**



1. A fluid coupling for driving a cooling fan device associated with a vehicle and which is positionable so that ram air impinges directly thereon, said fluid coupling comprising relatively rotatable input and output coupling members, said output coupling member defining a chamber within which said input coupling member rotates, said input and output coupling members having a shear space therebetween and are cooperable with viscous shear fluid in the shear space to transmit torque therebetween, said output member having means defining a reservoir chamber located forwardly of said shear space, means for directing viscous fluid from said shear space into said reservoir chamber including surface portions on one of said members against which said viscous fluid impinges due to rotation of said input member relative to said output member, temperature-responsive valve means for controlling flow of viscous fluid from said reservoir chamber into said shear space and including a temperature-sensing device located forwardly of said output member in the ram air stream, said output member having fan blade mounting pads against which the fan blades are secured, said fan blade mounting pads being located axially between said shear space and said reservoir chamber and being at least in part located radially outwardly of said shear space, a chamber defined by said output member and said fan blade mounting pads and opening into said ram air stream, said chamber being located axially adjacent said shear space and radially inwardly of said mounting pads.

3,968,867
INFORMATION TRANSMISSION DEVICE FOR POINT CONTACT ON AN INFORMATION CARRIER
Sven Gunnar Valter Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden
Filed July 15, 1974, Ser. No. 488,806
Int. Cl.² B41J *3/50*
U.S. Cl. 197—1 R **4 Claims**

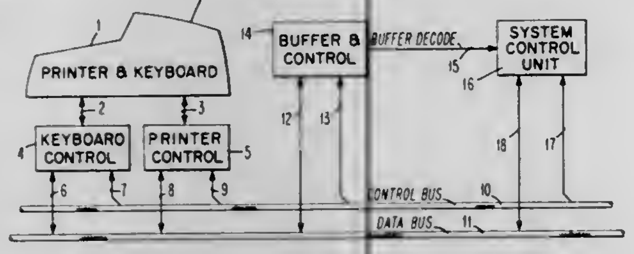


1. Device for point contact on an information carrier comprising:
- a. a frame,
- b. an electromagnet,
- c. an armature,
- d. a leaf spring having said armature mounted thereon,
- e. an elongated L-shaped arm formed by two generally perpendicular legs, the outer end of one of said legs being provided with means for engaging said information carrier,
- f. the electromagnet co-acting with said armature for moving said other of said legs toward said electromagnet and moving said means on the outer end of said one leg toward said information carrier to provide a dot thereon, and
- g. said leaf spring of a generally triangular shape being secured to an inner portion of said one leg, the apex of said triangular-shaped spring being directed toward the means for engaging said information carrier, the base opposite said apex being secured to said frame which is fixed relative to said electromagnet, said leaf spring having a portion of reduced thickness located between said apex and said base for providing the resilient function of said spring.

3,968,868
FORMAT CONTROL SYSTEM FOR POSITIONING FINAL COPY PRINTED TEXT
John Charlie Greek, Jr.; Eric Sigfried Petterson; Howard Carl Tanner, all of Austin, and David Wesley Terry, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 21, 1973, Ser. No. 427,184
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **10 Claims**

1. A system for printing final copy printed text at a specified location on a printing line upon a first printing comprising:

a. a printer;
b. a keyboard;
c. mode selection means in said keyboard for selecting the final copy printed text mode of operation;
d. print inhibit means responsive to said mode selection means for inhibiting outputting of data during input keying of data;
e. a buffer communicating with said keyboard for storing format control data and text data keyed on said keyboard; and

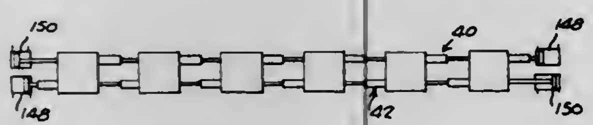


f. logic means operative in response to an end of line signal from said keyboard, said logic means including,
1. means for scanning the data stored in said buffer,
2. format control means operative in response to said scanning means for identifying the left side of said specified location, and
3. print control means connected to said buffer and said printer and operative in response to said format control means for controlling said printer to print said text data according to said format control data.

3,968,869

PALLET LOCATING AND CLAMPING ARRANGEMENT

Neil J. Stalker, Clarkston, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.
Filed July 14, 1975, Ser. No. 595,508
Int. Cl.² B23Q *5/22*
U.S. Cl. 198—19 **25 Claims**

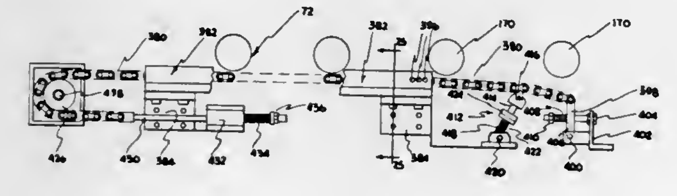


1. In a work piece transfer machine of the type wherein pallet supported work pieces are conveyed to a plurality of successively spaced apart stations at which operations are performed on the work piece, each said station including a locating pin movable from a retracted position to an operative position engaging the pallet to precisely locate it at the station and also including a clamp movable in one direction to an operative position wherein it engages the pallet at the station and firmly clamps it in said precise location and movable in the opposite direction to retract the clamp and disengage the pallet, the combination comprising at least one actuating bar entending lengthwise along said stations and mounted for axial reciprocation, means for shifting said bar axially in opposite directions, a drive member at each said station, said drive member being movable with said bar and also lengthwise of the bar, said drive member being operatively connected with said locating pin and clamp such that the pin and clamp are moved to their operative positions when the drive member is moved in one direction and are moved to their retracted positions when the drive member is moved in the opposite direction, compression spring means acting between said bar and said drive member and biasing said drive member in a direction tending to retract said pin and clamp, means limiting movement of the drive member relative to the bar in said retracting direction whereby when the bar is initially moved in said one direction the locating pin is projected into engagement with the pallet to locate the same and the clamp is brought into clamping engagement with the pallet, and upon further movement of the bar in said one direction said spring means are compressed and cause the drive member to urge said clamp against the pallet with a force proportional to the energy stored in the compressed spring means.

3,968,870

SPIN CYCLE MECHANISM FOR GLASS ARTICLE FORMING MACHINE

John D. Banyas, Toledo, and Edward A. Ross, Waterville, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Division of Ser. No. 419,535, Nov. 28, 1973, Pat. No. 3,902,727, which is a division of Ser. No. 244,700, Aug. 30, 1972, Pat. No. 3,868,010, which is a division of Ser. No. 77,425, Oct. 2, 1970, Pat. No. 3,726,659. This application Sept. 27, 1974, Ser. No. 510,119
Int. Cl.² B65G *47/24*
U.S. Cl. 198—240 **6 Claims**



1. In an article handling apparatus having a plurality of article supporting chucks, a frame, and drive means for driving said chucks in succession upon said frame along a fixed path, each of said chucks having a chuck sprocket thereon mounted for rotation about an axis normal to said path for rotating an article supported in the chuck; a spin cycle mechanism for driving said chuck sprockets in rotation as the chucks are driven along a selected portion of said fixed path comprising a sprocket chain, first support means supporting a first portion of said chain alongside and parallel to said selected portion of said path to meshingly engage and rotate chuck sprockets as the chucks are driven along said selected portion of said path, second support means mounted adjacent said path at a location spaced upstream of the direction of movement of said chucks along said path from said first portion of said chain, a second portion of said chain supported by and extending from said second support means and connected to said first portion of said chain at the upstream end of said first support means, said second portion of said chain being located clear of the path of movement of said chuck sprockets at said second support means and converging with the path of said sprockets in its extent toward said first support means to define a convergent initial sprocket engaging section of said chain, first tension applying means for applying a first tension to said first portion of said chain, and independent second tension applying means for applying a second tension to said second portion of said chain.

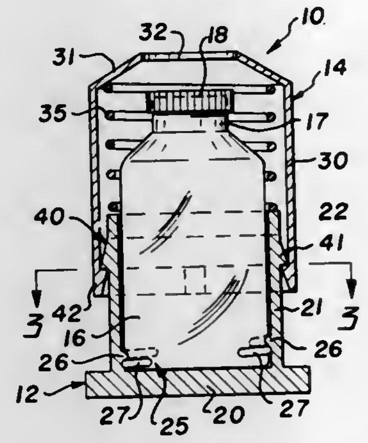
3,968,871

SAFETY CONTAINER FOR MEDICINE BOTTLES AND THE LIKE

Woodrow H. Briscoe, General Delivery, Cowichan Bay, British Columbia, Canada (VoR 1N0)
Filed May 16, 1975, Ser. No. 578,145
Int. Cl.² A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **6 Claims**

1. A container comprising a member insertable over an upper portion of a medicine bottle fitted with a cap, said member having an upper wall provided with an opening through which the cap can pass, spring means biasing the member away from the upper portion of the bottle, and stop

means limiting movement of the member relative to the bottle in response to pressure applied by the spring means normally

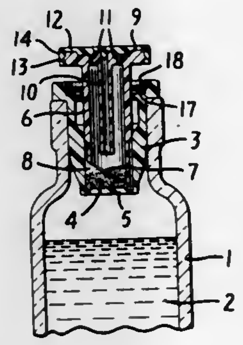


to maintain the cap a predetermined distance from the opening in the upper wall.

3,968,872

DEVICE, PROVIDED WITH A PUNCHER AND A DRIPPER, FOR THE HERMETIC SEALING OF CONTAINERS

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau, Italy
Filed Aug. 2, 1974, Ser. No. 494,375
Claims priority, application Italy, Aug. 3, 1973, 51818/73
Int. Cl.² B65D *25/08;* **B67B** *7/26*
U.S. Cl. 206—222 **2 Claims**

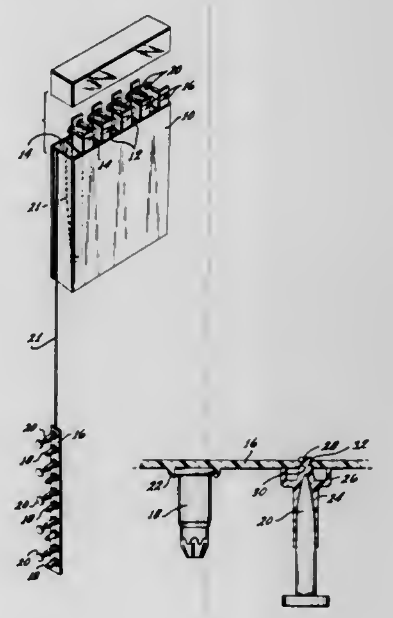


1. A dispensing closure for necked containers comprising a cup-shaped plug insertable and sealable into the neck of a necked container for closing it for containing therein a material to be introduced into the container for mixing with the contents of the container, said cup-shaped plug having a punchable and pierceable bottom, a dispensing element comprising a tubular punching piston inserted in use fluid-tightly axially into said cup-shaped plug and having an inner leading edge at an open inner end adjacent the bottom of the plug bottom for punching and piercing the bottom, said piston being depressable to effect punching and piercing of said bottom for introducing the material contained in the cup-shaped plug into the container, a dispensing tube of lesser diameter than said tubular punching piston fixed in the tubular punching piston extending axially therein and having open ends for dispensing mixture contents of said container after depressing of said tubular punching piston and upon inverting of said container, a removable cover mounted in use on said tubular punching piston closing the outer open end of said dispensing tube, and said cover and said plug having surfaces disposed relative to each other for engaging and removing said cover when said tubular punching piston is depressed.

3,968,873

PACKAGING FOR POWER LOADS AND FASTENERS

Raymond V. Pomeroy, Portland, and Lewis A. Scott, Lake Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.
Filed Aug. 13, 1975, Ser. No. 604,135
Int. Cl.² B65D *79/00, 73/02;* **F42B** *39/08*
U.S. Cl. 206—223 **5 Claims**

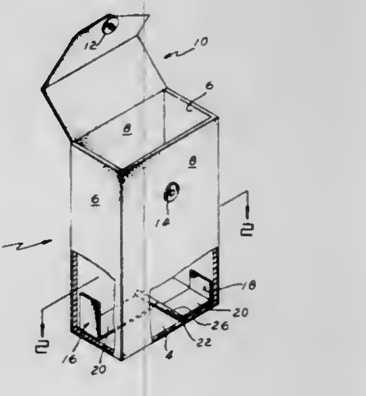


1. A packaging for power loads and fasteners for use in a power actuated tool comprising; a semi-rigid strip, first releasible attaching means for attaching power loads along the strip and second releasible attaching means for attaching fasteners along the strip, said first attaching means attaching to the head of the power load to enable the power load to be inserted into the receiving chamber of the power actuated tool and thereafter the strip peeled away from the power load, and said second attaching means attaching to the point of the fastener to enable the fastener to be inserted into the muzzle of the tool and thereafter the strip peeled away from the fastener.

3,968,874

CONVERTIBLE CIGARETTE CASE

Donald W. Corey, Wilbraham, Mass., assignor to Buxton, Incorporated, Agawam, Mass.
Filed Feb. 20, 1975, Ser. No. 551,375
Int. Cl.² B65D *85/10, 5/50;* **A24F** *15/00*
U.S. Cl. 206—248 **7 Claims**



1. In a convertible cigarette case having a bottom and upright front, back and side walls extending from said bottom to a height adapted to accommodate three different lengths of cigarette packages, support means for the shortest and intermediate cigarette packages comprising two pivotable support members each having a lever arm portion disposed at a first position against the bottom of said case and provided with a stand off link extending at a dihedral angle from the lever arm thereof and disposed generally parallel to and closely adjacent

an upright side wall of the case when the lever arm is against the bottom thereof in said first position for receiving the longest of said three different lengths of cigarette packages, said support members being selectively pivotable on an axis parallel to said side walls in opposite directions through obtuse angles from the bottom of said case to cigarette package supporting positions for said shortest and intermediate packages.

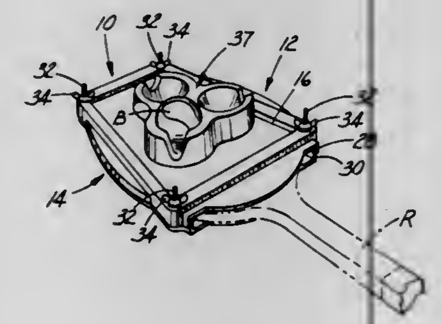
3,968,875
RACKET PRESS, COVER AND BALL HOLDER

Ronald L. Koehnle, 1122 Archer Road, Bedford, Ohio 44146

Filed Feb. 26, 1975, Ser. No. 553,238

Int. Cl.^{2} A65D *55/00;* **B65D** *85/00;* **A63B** *49/16, 49/18*

U.S. Cl. 206—315 B **6 Claims**



1. A combination racket press, cover, and ball holder comprising,

a pair of mating members formed of a relatively rigid non-deformable material, said members each having a racket covering portion and a trapezoidal portion formed integrally therewith, said trapezoidal portion being formed of ribs raised from the cover, said racket covering portions being configured to substantially conform in shape with and to overlie and enclose the head of a racket and the trapezoidal portions being disposed to engage the frame of the racket head when the members are disposed together on the head of the racket, clamping means disposed to draw said members toward each other and cause said trapezoidal portions to exert force against the racket frame, ball holding means formed on the outside surface of one of said members, said ball holding means including an upstanding flange portion, a top surface defining an upper rim, said upper rim having inner edge means defining a tennis ball receiving opening, and an interior portion extending downwardly from said inner edge defining a ball receiving pocket.

3,968,876
SEALED CONTAINER WITH A STERILIZED HYPODERMIC NEEDLE WITHIN IT AND METHOD FOR EFFECTING THE SEALING THEREOF

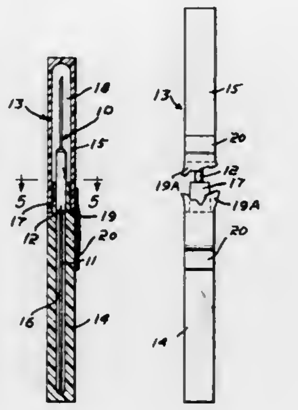
Richard A. Brookfield, 25 Drumlin Road, Newton, Mass.

Filed Mar. 19, 1975, Ser. No. 559,830

Int. Cl.^{2} B65D *17/04, 85/00*

U.S. Cl. 206—365 **5 Claims**

1. A sealed container with a sterilized hypodermic needle within it, said container comprising a receiver section provided with a cylindrical neck at one end and having a chamber opening through the neck and a cap section having a chamber receiving the neck within it, the mouth of the cap portion and the neck being of a fit permitting the sections to be turned relative to each other but dimensioned to establish a friction fit such as to provide a hermetic seal, said container portions including external, flat-surfaced portions that are substantially co-planar, and a seal in the form of a strip overlying said flat-surfaced portions and extending across the junction between the container sections, the container and the sealing strip being of heat sealable material, and heat seals, one between each flat-surfaced portions and said strip, said sealing strip also being of a material that will stretch somewhat and be deformed before rupturing, the seal stretching and rupturing as one container section is turned relative to the other as the sections are pulled apart with the proximate ends of the ruptured seal permanently deformed.



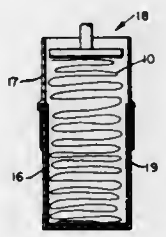
3,968,877
HIGH DENSITY TOW CARTONS

Weat Carl Mattis, Camden, S.C., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 64,438, Aug. 17, 1970, abandoned. This application June 8, 1971, Ser. No. 151,080

Int. Cl.^{2} B65D *85/671;* **B65H** *54/84*

U.S. Cl. 206—388 **2 Claims**



1. A package for the shipment and storage of acrylic tow comprising a closed, free-standing, nonbulging, flat-sided, paperboard container substantially filled with a self-supporting block consisting essentially of a tow of acrylic fibers having a shrinkage of not more than 3% and a moisture content of not more than 2% by weight, said block having a density between about 25 and 33 lbs/ft^3, and said tow being readily withdrawable from said block for textile processing.

3,968,878
CIRCULAR MAGAZINE FOR PHOTOGRAPHIC TRANSPARENCIES

Alfred Winkler, Munich; Albert Eggering, Leverkusen; Volkmar Stenzenberger, and Herbert Wilsch, both of Unterhaching, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

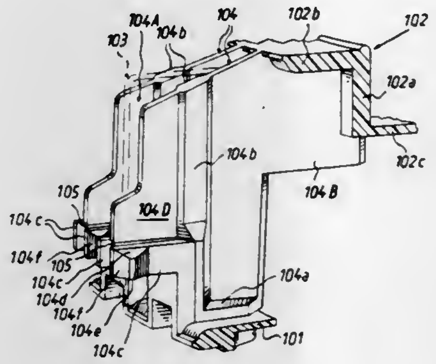
Filed Jan. 17, 1974, Ser. No. 434,293

Claims priority, application Germany, Jan. 20, 1973, 2302881; Sept. 15, 1973, 2346596

Int. Cl.^{2} G03B *23/06*

U.S. Cl. 206—455 **40 Claims**

1. A round tray for photographic transparencies, comprising an annulus of equidistant radially extending partitions defining radially extending compartments for transparencies, each of said partitions having at least one elastically deformable part integral therewith arranged to engage and yieldably hold said transparencies in at least one of the neighboring compartments; and wall means connected with said partitions.



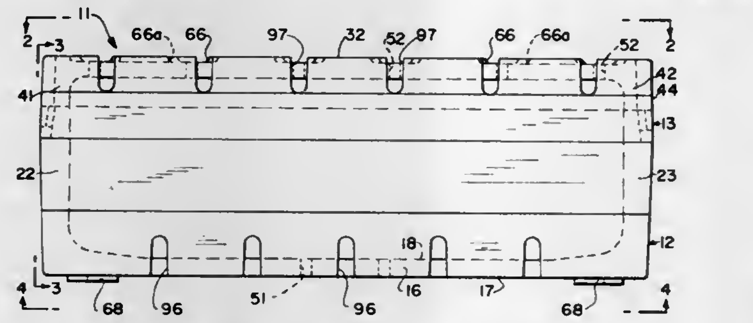
3,968,879
SHIPPING CONTAINER AND ASSEMBLY THEREOF

George Anthony Lucas, Sr.; George Anthony Lucas, Jr., both of Delano; Louis Anthony Lucas, Santa Maria, and Joseph Slapnik, Arcadia, all of Calif., assignors to George A. Lucas & Sons, Earlimart, Calif.

Filed Nov. 12, 1973, Ser. No. 414,765

Int. Cl.^{2} B65D *21/02, 11/10, 11/20*

U.S. Cl. 206—509 **8 Claims**



1. A shipping container of the type which can be stacked comprising a bottom part and a top part formed of a plastic foam material, said bottom part having a bottom wall, spaced generally parallel side walls and spaced generally parallel end walls, said side walls of said bottom part having vertical outer surfaces with tapered surfaces extending inwardly adjacent the lower portions thereof, said side walls of said bottom part having openings extending through the side walls of the bottom part and the tapered surfaces of the side walls of the bottom part, said tapered surfaces on the side walls of the bottom part having a height so that the openings in the bottom part extend solely through the tapered surfaces of the side walls of the bottom part, said top part having a top having a top wall, spaced generally parallel side walls and spaced generally parallel end walls, said side walls of said top part having vertical outer surfaces with tapered surfaces extending inwardly adjacent the upper portions thereof, said side walls of said top part having openings extending through the side walls of the top part and the tapered surfaces of the side walls of the top part, said tapered surfaces on the side walls of the top part having a height so that the openings in the top part extend solely through the tapered surfaces of the side walls of the top part, cooperative mating means carried by the bottom and top parts whereby the top part is releasably secured to the bottom part to form an enclosed volume within the bottom and top parts which is ventilated by the openings in bottom and top parts, cooperative stacking means carried by the bottom and top parts adapted to mate with containers of the same type so that the containers may be stacked with the top part of one container engaging the bottom part of another container and inhibiting substantial lateral and longtitudinal movement of the containers with respect to each other so that the containers are interlocked when stacked one on top of the other or when they are cross stacked, said cooperative stacking means including a plurality of spaced parallel rows of recesses in the outer surface of one of the parts, and protrusions formed on the outer surface of the other of the parts and having a shape so that they are adapted to fit within said recesses.

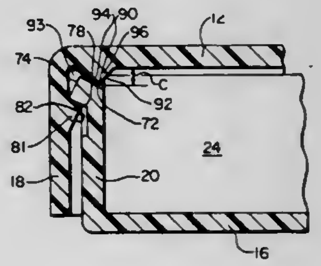
3,968,880
PLASTIC CONTAINER

Efrem M. Ostrowsky, Highland Park, Ill., assignor to VCA Corporation, Baton Rouge, La.

Filed Aug. 28, 1975, Ser. No. 608,545

Int. Cl.^{2} B65D *43/04, 43/14, 85/56*

U.S. Cl. 206—540 **15 Claims**



1. In an integrally formed, one-piece plastic container having a bottom section and an overlying top section hinged to said bottom section wherein:

said bottom section is characterized in that it has a planar bottom wall, two opposed, upturned sidewalls, an upturned back wall, and an upturned front wall, all of which are integrally formed and connected to each other; and

said top section is characterized in that it has a planar top wall, two opposed, downturned sidewalls, a downturned front wall, all of which are integrally formed and connected to each other and a downturned back wall integrally formed and connected to said top wall;

the improvement which comprises: said upturned front wall having an outwardly and upwardly projecting latching lug, said latching lug having an upper and lower surface which diverge one from the other; and said downturned front wall having on its inside surface an inwardly projecting lower latching protuberance and said top wall having on its inside surface a downwardly projecting upper latching protuberance, at least a part of said lower latching protuberance and said upper latching protuberance being in close proximity to said lower surface and said upper surface respectively, so that the distance between said parts is less than the distance between said surfaces at their distal ends.

3,968,881
MULTIPLE STACKING LETTER TRAY

Valentin E. Beil, Eden, and Francis J. Ihlenfeld, West Seneca, both of N.Y., assignors to McDonald Products Corporation, Buffalo, N.Y.

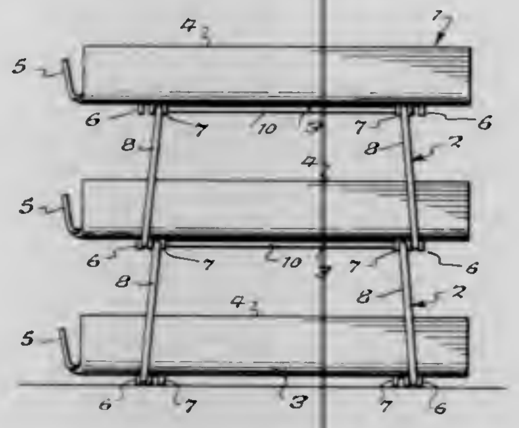
Filed Sept. 30, 1974, Ser. No. 510,795

Int. Cl.^{2} A47F *3/14;* **B42F** *17/00*

U.S. Cl. 211—128 **8 Claims**

1. A multiple stacking letter tray comprising a first tray member, a second tray member, and means including a tray support member supporting said second tray member in vertically spaced relation above said first tray member, said tray support member having leg portions extending between said tray members in downwardly diverging relation and terminating at their lower ends in horizontal foot portions extending therefrom into connected engagement with the underside of said first tray member, and a generally U-shaped horizontal upper end portion extending between the upper ends of said leg portions and connected to the underside of said second tray member in supporting relation thereto and each of said tray members having a pair of laterally spaced footpads on the underside thereof for respectively engaging said foot portions

of said lower ends and said U-shaped upper end portion of said tray support member, all of said footpads having spring fingers for engaging around and receiving said support member horizontal portions with a snap fit.



3,968,882
COMPLETE SET OF ELEMENTS FITTING IN UNIT-COMPOSED SUPPORTING SYSTEMS

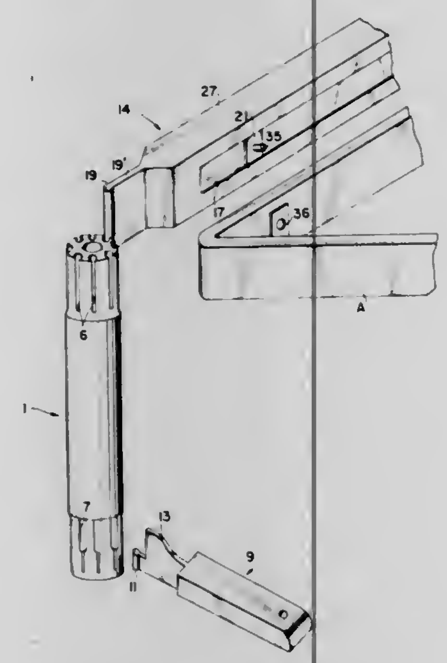
Fabio Mello, Milan, Italy, assignor to Commerciale Sacea, S.a.s., Milan, Italy

Filed Nov. 12, 1973, Ser. No. 414,665

Claims priority, application Italy, Nov. 14, 1972, 31624/72; Oct. 31, 1973, 30764/73

Int. Cl.² A47F *5/00*

U.S. Cl. 211—189 **10 Claims**



7. A combination for office furniture comprising
- a vertically disposed rod having an axial passage passing therethrough for receiving at least one wire, a plurality of radially directed slots at an upper end, at least some of said slots being shaped in a shape of a cylinder and a rectangular parallelepipedon, and a plurality of radially directed slots at a lower end, each of said latter slots having a widening at an upper end thereof;
- a horizontally disposed bar having at least one inner passage for receiving at least one wire;
- a terminal element secured to an end of said bar and having a parallelepipedon element and a cylindrical element fitted in a respective one of said shaped slots at said upper end of said rod for securing said bar to said rod; and
- a base having a terminal element engaged within one of said slots at said lower end and sized for withdrawal through the widening of said one slot.

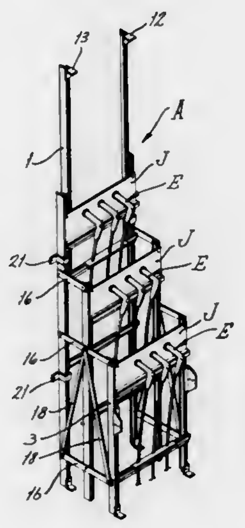
3,968,883
COLLAPSIBLE JUNCTION SUPPORT BRACKET

Marion R. Farmer, Memphis, Tenn., assignor to Aluma-Form Inc., Memphis, Tenn.

Filed Mar. 28, 1974, Ser. No. 455,540

Int. Cl.² H02B *1/02*

U.S. Cl. 211—201 **6 Claims**



1. In a junction support bracket of the type designed for supporting electrical elbows, connectors, terminators, and related electrical equipment comprising a series of vertically arranged frameworks disposing at least frontal and rear electrical equipment mounting surfaces, a pair of spaced apart vertically arranged structural members provided in each framework and providing a space therebetween for mounting of the defined type of electrical equipment, at least one transverse support member forming a mounting surface spanning the distance between each pair of structural members, each transverse support member including structural means for accommodating fastening means for securement of the said type of electrical equipment thereto, there being another space formed between each adjacent frameworks when the bracket is erected, said space being of a dimension to accommodate the convenient arrangement of electric lines therethrough for connection with the aforesaid type of electrical equipment, each forwardmost mounting surface being arranged lower than the mounting surface of the framework therebehind, a series of stringers interconnecting the frameworks together, and said series of frameworks being collapsible towards each other to compact the bracket and facilitate its shipment.

3,968,884
STORAGE MEANS FOR JIB FOR TELESCOPIC BOOM OF MOBILE CRANE

James N. Johnson; James C. Mayo, Sr., both of Cedar Rapids, Iowa., assignor to Harnischfeger Corporation, Milwaukee, Wis.

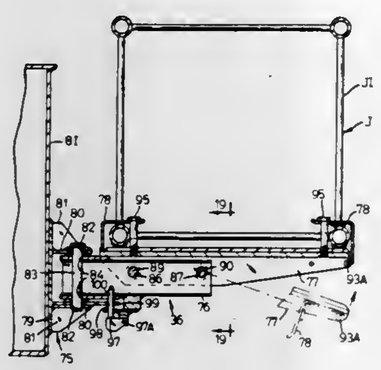
Filed Dec. 20, 1974, Ser. No. 534,746

Int. Cl.² B66C *23/06*

U.S. Cl. 212—55 **8 Claims**

1. In a mobile crane: a boom swingable upwardly and downwardly in a vertical plane; a jib having a base and selectively and pivotably connectable to the point end of said boom, said jib being swingable in a horizontal plane to and from a jib storage position alonside said boom; jib storage means on said crane to facilitate storage of said jib in a generally horizontal plane alongside said boom, said jib storage means comprising at least one jib storage assembly disposed adjacent said boom, said jib storage assembly comprising: a first support member, means pivotally mounting said first support member for pivotal movement in a direction outwardly of said boom; and a second jib support member pivotally connected to said first support member and pivotable about a horizontal axis which is generally parallel to said vertical plane by said jib between

a horizontal jib storage position wherein the jib can rest thereon and a downwardly tilted jib loading and unloading position such that as said jib is slid horizontally off of or onto said second jib support member the latter is pivoted in response to the sliding movement of the jib.



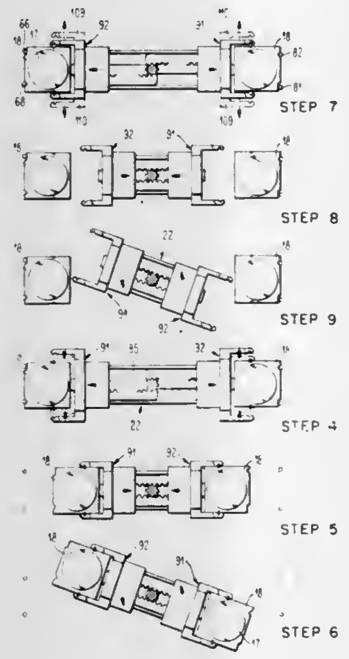
3,968,885
METHOD AND APPARATUS FOR HANDLING WORKPIECES

Javathu K. Hassan, Hopewell Junction; Alfred Mack, and Michael R. Wojtaszek, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 375,279, June 29, 1973, Pat. No. 3,874,525. This application Aug. 27, 1974, Ser. No. 501,005

Int. Cl.² B25J *3/00*

U.S. Cl. 214—1 BC **14 Claims**



1. An apparatus for transferring workpieces between first and second stations including:
- a rotary arm;
- said arm having workpiece gripping means disposed 180° from each other;
- index means to rotate said arm 180° in a plane during each activation to always position each of said gripping means at one of the stations; and
- each of said gripping means having means responsive to the station at which it is located to cause one of said gripping means to grasp one of the workpieces at only the first station and to release the grasped workpiece at only the second station and to cause the other of said gripping means to grasp one of the workpieces at only the second station and to release the grasped workpiece at only the first station.

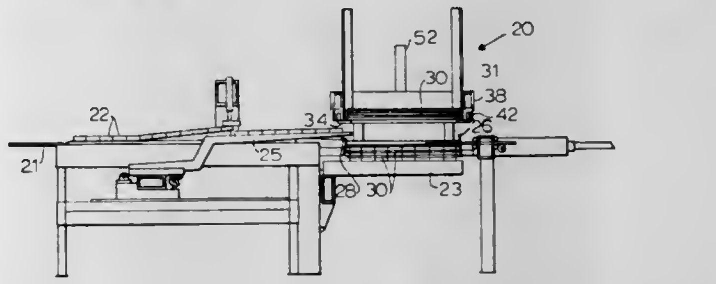
3,968,886
STICKER EMPLACER FOR A LUMBER STACKER

Edward M. Leon, Fort Bragg, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 29, 1975, Ser. No. 544,955

Int. Cl.² B65G *57/26*

U.S. Cl. 214—6 M **14 Claims**



1. A sticker emplacer for a lumber stacker of the type in which individual boards on a single layer are grouped into a series of layers of several boards each and said layers are stacked, successive layers being spaced apart by a series of spaced-apart stickers running laterally across each layer of boards, said stacker being provided with a series of stacked stickers providing a bottom end, said emplacer including in combination:
- sticker transfer means for moving the bottom sticker of each stack of stickers laterally transverse to its longitudinal axis,
- sticker holder means for receiving each said bottom sticker from said sticker transfer means and holding it positively,
- holder lowering means for positively lowering each said sticker holder means with its sticker until the sticker contacts the top of a layer of boards, and
- release means for releasing said sticker holder means from said sticker following contact of the sticker with the layer of boards and for releasing said holder lowering means, so that said sticker holder means is retracted upwardly after releasing said sticker.

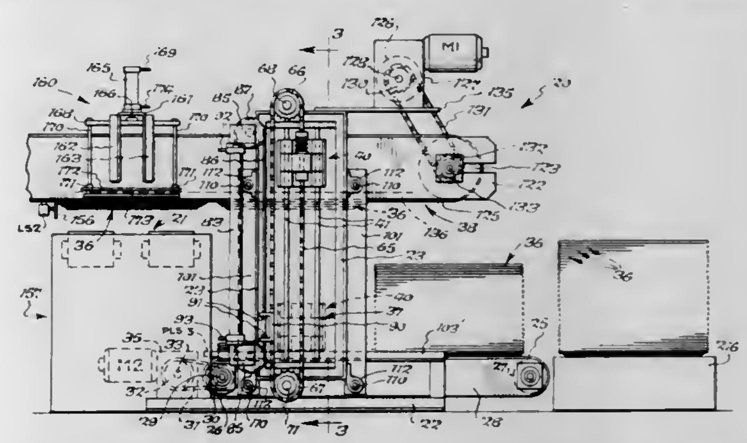
3,968,887
ARTICLE PICK-UP AND TRANSFER APPARATUS

Anthony F. Madonia, 19 Middlebury Lane, Buffalo, N.Y. 14216

Filed Sept. 18, 1972, Ser. No. 290,269

Int. Cl.² B65G *59/04*

U.S. Cl. 214—8.5 D **8 Claims**



1. An article transfer apparatus comprising: an upright frame, means for supporting a stack of articles adjacent the lower end of said frame, a plurality of upright support rods rigidly secured to said frame, carriage means vertically slidable on said rods and disposed in vertical registry with said article supporting means, means for moving said carriage means toward and away from said article supporting means, said carriage means including support plates, a plurality of elongated rigid members suspended from said support plates, at least one permanent magnet mounted on the lower end of each of said rigid members, each magnet being pivotally mounted at spaced locations thereon to two of said rigid

members, means mounting said rigid members on said plates for pivotal movement and bodily vertical displacement relative to said support plates whereby said magnets are self-orienting upon engagement thereof with an irregularly shaped article on said stack, said rigid member mounting means comprising pins projecting outwardly from said support plates, each of said rigid members having an elongated slot for receiving a corresponding one of said pins and being suspended thereby, each of said pins being movable along the slot in the corresponding one of said rigid members to allow said vertical displacement, said vertical displacement in conjunction with said spaced pivotal mounting of said magnets allowing tilting movement of said magnets substantially in a vertical plane, means for sensing the proximity of said magnets relative to said article upon downward movement of said carriage means, and control means reponsive to said sensing means for interrupting downward movement of said carriage means upon engagement of said magnetic means with said article and initiating upward movement of said carriage means to lift said magnets and remove a single article from said stack.

3,968,888

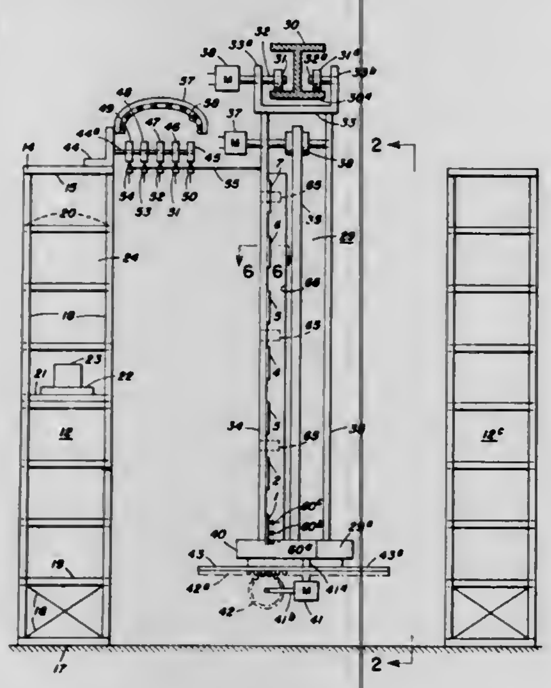
WAREHOUSE SYSEM WITH PARALLEL CONDUCTOR POSITIONAL CONTROL MEANS FOR A STACKER CRANE

William George Van Vliet, Greenwich, Conn., assignor to The Lummus Company, Bloomfield, N.J.

Filed Oct. 21, 1968, Ser. No. 769,012

Int. Cl.² B65G *1/06*

U.S. Cl. 214—16.4 A **6 Claims**



1. Automatic warehouse apparatus, comprising:

a support containing a plurality of intersecting adjacent columns and horizontal rows of storing spaces, each common to one intersecting column and row;

a plurality of first electric conductor means, each positioned in proximity of one of said storing space columns;

a load stacker movable in a horizontal direction in front of each of said first conductors and corresponding storing space columns;

first signal pickup means mounted on said stacker to slidably engage, portions of each said first electrode conductor means in turn;

a plurality of second electric conductor means mounted on said stacker, each positioned in relation to one of said storing space horizontal rows;

ı carriage mounted on said stacker and movable in a vertical direction thereon in front of each of said second conductors and corresponding storing space horizontal row;

second signal pickup means mounted on said carriage to slidably engage each of said second conductors in turn;

computer means mounted on said stacker;

a load handling fork movable on said carriage to extend into the interior of each of said storing spaces one at a time and to retract therefrom in a direction transverse to said carriage vertical movement;

means for continuously generating a plurality of different carrier currents;

first circuit means for continuously transmitting certain of said different currents from said generating means to said plurality of first electrical conductor means including one current indicating horizontal movement and other currents arranged in 1 digit positions of different 4-element Gray code signals, each transmitted to one of said first electrical conductor means for identifying the corresponding storing space column;

second circuit means for continuously transmitting additional of said different currents from said generating means to said second electrical conductor means including one current indicating vertical movement and other currents arranged in 1 digit positions of different 3-element Gray code signals, each transmitted to one of said second electrical conductor means for identifying the corresponding storing space horizontal row;

means for preselecting a predetermined load action of said fork at a preselected storing space formed by preselecting one intersecting storing space column and horizontal row; said preselecting means actuating said generating means to transmit therefrom on said second circuit means to said computer means a carrier current command signal including in sequence a carrier current indicating an outgoing signal, a carrier current indicating horizontal movement, a carrier current indicating vertical movement, a carrier current indicating transverse movement, a preselected one of said 4-element Gray codes identifying a preselected storing space column, a preselected one of said 3-element Gray codes for identifying a preselected storing space horizontal row, and further carrier currents arranged in 1 digit positions of two different 2-element Gray code signals, one indicating fork movement from said carriage to the interior of said preselected storing space and the other indicating fork movement from the interior of said last-mentioned storing space back to said carriage in sequence.

said computer means responsive to said outgoing and horizontal direction signal currents derived from said second circuit means and said horizontal direction signal current picked up by said first signal pickup means engaging one of said first electrical conductor means for comparing said 4-element code signals picked up one at a time by said first signal pickup means from said first electrical conductor means with said preselected 4-element code signal derived from said second circuit means to move said stacker in said horizontal direction in front of said storing space columns so long as said 4-element code signals picked up one at a time by said first pickup means from said first electrical conductor means are different from said last-mentioned preselected 4-element code signal, said computer means stopping said stacker in front of one of said portions of first electrical conductor means and corresponding storing space column identified by said last-mentioned preselected 4-element code signal when said 4-element code signal picked up from said last-mentioned one first electrical conductor means by said first pickup means is identical with said last-mentioned preselected 4-element code signal.

said computer means further responsive to said outgoing and vertical direction signal currents derived from said second circuit means and said vertical direction signal current picked up by said second signal pickup means engaging one of said second electrical conductor means for comparing said 3-element code signals picked up one at a time from said second electrical conductor means with said preselected 3-element code signal derived from said second circuit means to move said carriage in said vertical direction in front of said storing space horizontal rows so long as said 3-element code signals picked up one at a time by said second pickup means from said second electrical conductor means are different from said last-mentioned 3-element code signal, said computer means stopping said carriage in front of one of said second electrical conductor means and corresponding storing space horizontal row identified by said last-mentioned preselected 3-element code signal when said 3-element code signal picked up from said last-mentioned one second electrical conductor means by said second pickup means is identical with said last-mentioned 3-element code signal; said storing space column and horizontal row at which said stacker and carriage, respectively, are stopped forming said preselected storing space;

said computer means additionally responsive to said outgoing and transverse movement signal currents and one 2-element code signals to extend said fork from said carriage into the interior of said preslected storing space and therafter responsive to said other 2-element code signal to retract said fork from the interior of said last-mentioned storing space back to said carriage in response to said last-mentioned other 2-element code signal, said computer means programmed to actuate said fork in said predetermined load action in a time between said last-mentioned one and other 2-element code signals while said fork is in the interior of said pre-selected storing space;

said first signal pickup means comprising a plurality of pickup shoes horizontally aligned to overlap each of said first electrical conductor means in slidable engagement therewith, said pickup shoes slidably engaging adjacent first portions of said electrical conductor means to pick up said 4-element code signals therefrom, said computer means responsive to said last-mentioned signals for moving said stacker in said horizontal direction in front of said storing space columns, said computer means responsive to said 4-element code signal picked up by said shoes and preselected code signal when said shoes are stopped on said portion of said first electrical conductor means from which said picked up 4-element code signal is identical with said preselected 4-element code signal to stop said stacker in front of said storing space column corresponding with said last-mentioned portion of said one first electrical conductor means; and

said plurality of pickup shoes including at least three horizontally spaced pickup shoes of which a middle shoe engages a middle portion of each portion of said first electrical conductor means and outer shoes overlap opposite ends thereof, said middle shoe and one outer shoe engaging each portion of said first electrical conductor means and the other outer shoe engaging an adjacent portion of said first electrical conductor means to pick up said 4-element code signals from both latter electrical conductor means, said computer means responsive to said 4-element code signals picked up one at a time by said middle shoe from said first electrical conductor means to move said stacker at one rate of speed in the horizontal direction in front of said storing space columns to dispose a preselected point on said stacker approximately opposite to a preselected point on said portion of said first electrical conductor means from which said picked up 4-element code signal is identical with said preselected code signal, said computer means responsive to said preselected 4-element code signal and a 4-element code signal picked up by one of said outer shoes from a first electrical conductor means adjacent to said last-mentioned first electrical conductor means to move said stacker at a rate of speed different from said last-mentioned one speed rate for stopping said stacker preselected point precisely opposite to said last-mentioned first electrical conductor means from which said picked up 4-element code signal is identical with said preselected 4-element code signal.

3,968,889

CONVEYOR FOR TRANSPORTING WORKPIECES

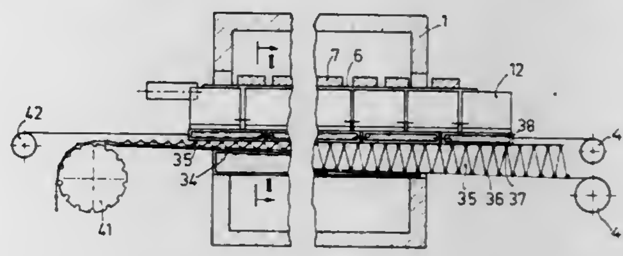
Günter Hepp, Oberhausen, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf-Heerdt, Germany

Filed Nov. 20, 1974, Ser. No. 525,371

Claims priority, application Germany, Nov. 28, 1973, 2359160

Int. Cl.² F27B *9/00*

U.S. Cl. 214—18 R **10 Claims**



1. A conveyor for transporting workpieces through heat-exchange zones, comprising at least one supporting structure which includes a pair of transversely spaced and linked conveyor sections together forming a channel having an open side, said conveyor sections each having a workpiece-supporting surface elongated in the direction of transport and together bounding said open side; and means for lifting and lowering the workpieces relative to said workpiece-supporting surfaces of said conveyor sections and for moving the workpieces in said transport direction, including a support beam elongated in said direction of transport and being movably mounted in said channel, workpiece-lifting members mounted for above said beam shifting and lifting movement relative to said channel, a lifting element extending along and beneath said support beam and converging upwardly towards the same in direction of the elongation thereof, and a wedge-shaped raising element having a planar upper face which extends parallel to an underside of said support beam and which raising element is actuated by said lifting element so as to move said workpiece-lifting members through said open side and thereby lift the workpieces off said workpiece-supporting surfaces and transport the workpieces in said direction of transport.

3,968,890

VEHICLE LOAD LIFTING AND LOWERING UNITS

Robert Robson, Welwyn Garden City, England, assignor to John Ratcliff (Tail Lifts) Limited, England

Filed Apr. 8, 1975, Ser. No. 566,113

Claims priority, application United Kingdom, Apr. 11, 1974, 16393/74

Int. Cl.² B60P *1/44*

U.S. Cl. 214—75 T **8 Claims**

1. For attachment to a vehicle, a load lifting and lowering unit comprising:

a pair of parallel spaced-apart guides, mountable in a vehicle so as to stand substantially upright across an access opening of the vehicle,

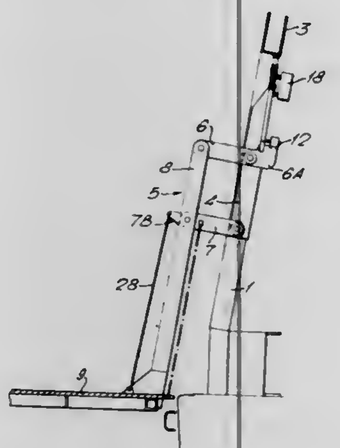
b. a pair of articulated parallelogram linkages, slidably supported one on each of said guides,

c. a load lifting and lowering platform pivotally carried between said linkages,

d. a prime mover connected to said articulated linkages to move the linkages up and down the guides,

e. means to actuate the articulated linkages, during movement thereof in one direction along a predetermined length of said guides, to alter the configuration of the linkages and thereby move the platform towards the interior of the vehicle for storage purposes, and to actuate the articulated linkages in the opposite sense, during

reverse movement of the linkages along said predetermined length, thereby to move the platform away from said interior towards an operative position, and
f. an inextensible tie member, pivotally connected between said platform and a swinging link of said parallelogram linkage at points which lie on the same side of the platform pivot, so that, when the linkage is actuated to move the platform towards the interior of the vehicle, the platform is swung about its pivot to fold with the linkage towards the vehicle interior, and when the linkage is actuated in the opposite sense the platform is swung in the opposite direction about its pivot to unfold with the linkage into its operative position.



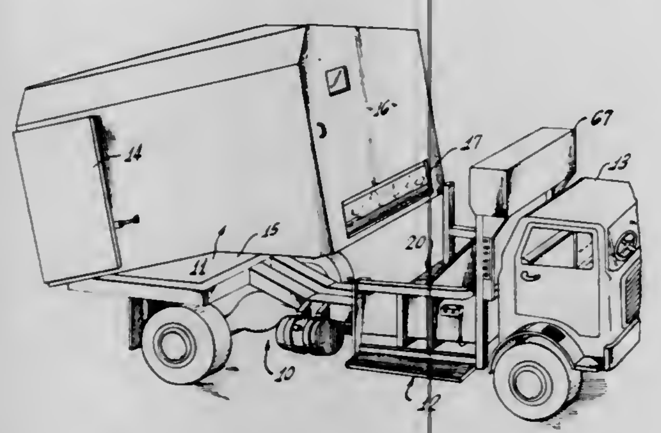
3,968,891
UNITIZED TWO STAGE COMPACTOR APPARATUS FOR REFUSE COLLECTING TRUCKS OR THE LIKE

William V. Perkins, Monrovia, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Filed Jan. 16, 1975, Ser. No. 541,614

Int. Cl.^{2} B65F *3/00*

U.S. Cl. 214—83.3 **9 Claims**



1. A refuse collecting and compacting truck, comprising;
a chassis having a refuse receiving tank thereon, a forward bulkhead of said tank being formed with a refuse receiving opening adjacent the lower end of said bulkhead;
an upwardly open refuse hopper mounted on said chassis forwardly adjacent to said bulkhead, said hopper having a rearwardly facing open end in registration with said opening in said bulkhead;
a primary compactor ram mounted within said hopper for reciprocation between a retracted position in which refuse is receivable within said hopper rearwardly of said ram, and an extended position;
a precompactor panel transversely mounted on said hopper in forwardly spaced relationship relative to said bulkhead for movement between retracted and extended positions,
said panel, when retracted, overlying said retracted ram and extending vertically forwardly and upwardly to define a barrier adapted to gravitationally deflect refuse into said upwardly open hopper and away from said retracted ram,
said panel having an actuating means for moving said panel between retracted and extended positions, said actuating means being so oriented as to be overlain by said panel when said panel is in said retracted position,
said panel being movable rearwardly and downwardly by said actuating means to said extended position to compact refuse, if any, protruding above said hopper downwardly into said hopper and rearwardly towards said opening of said bulkhead,
said panel, when fully extended, covering said hopper to define an essentially closed conduit with said hopper for reciprocation of said compacting ram and, also, then serving as a barrier against escape of refuse from said tank and said hopper.

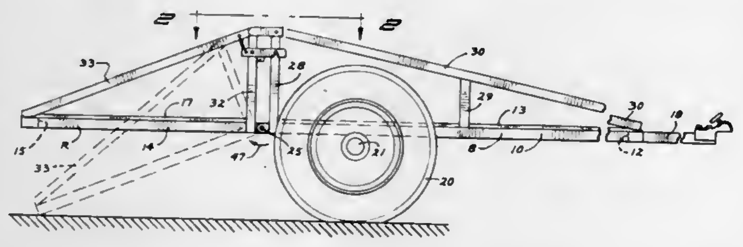
3,968,892
TRAILER

Francis L. Spors, 1426 Nobel St., Fairbanks, Alaska 99701

Filed Aug. 21, 1975, Ser. No. 606,524

Int. Cl.^{2} B60P *1/04*

U.S. Cl. 214—505 **12 Claims**



1. Trailer apparatus comprising a longitudinally elongated main frame having a front end portion and a rear end portion, wheel means for supporting the main frame, a loading ramp having a front end portion and a rear end portion, means hingedly connecting the ramp to the main frame rear end portion for movement between a downwardly and rearwardly inclined loading position, and a transport position to extend rearwardly of the main frame in the same general direction as the main frame, first side frame means mounted on the main frame to extend a substantial distance thereabove adjacent the main frame rear portion, second side frame means mounted on the ramp to extend a substantial distance thereabove adjacent the ramp front end portion, and latch mechanism for latchingly connecting the first and second side frame means together at a substantially higher elevation than the main frame rear portion.

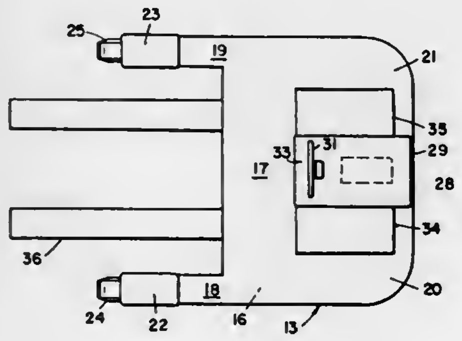
3,968,893
MATERIAL HANDLING VEHICLE WITH H-SHAPED WALK AREA

Sidney D. Lapham, Walnut Creek, Calif., assignor to Lapham Engineering Co., Inc., Martinez, Calif.

Division of Ser. No. 266,219, June 26, 1972, Pat. No. 3,825,130. This application June 24, 1974, Ser. No. 482,315

Int. Cl.^{2} B65G *47/00*

U.S. Cl. 214—700 **12 Claims**



1. A motor-driven vehicle for handling materials comprising:

a. a plurality of wheels mounted on said vehicle;
b. steering means operatively engaging at least one of said wheels for turning said wheels for steering said vehicle along a supporting surface;
c. a battery-driven motor disposed at the forward end of said vehicle and operatively engaging at least one of said wheels for rotating said latter wheel and thus moving said vehicle along said supporting surface;
d. at least a pair of batteries disposed on opposite sides of said motor at the forward end of said vehicle and operatively engaging said motor for supplying electrical power thereto;
e. a generally H-shaped horizontal walkway on said vehicle extending both across the short axis of said vehicle generally at the midpoint thereof and from the rear end of said vehicle, about both sides of said batteries opposite the sides of said batteries adjacent said motor and terminating at the forward end of said vehicle with at least a portion thereof in front of said motor whereby an operator may walk almost completely about the periphery of the upper surface of said vehicle and across said vehicle, said motor and said batteries occupying the area between the forward end of said generally H-shaped walkway and a cutout area being disposed between the rear end of said generally H-shaped walkway; and
f. fork lift means carried by said vehicle disposed below said walkway and operatively connected to said motor for engaging a pallet and lifting said pallet with respect to said vehicle, said fork lift means including a fork having a pair of spaced fork tines extending outwardly past the rear of said vehicle and within the cutout area of said walkway.

3,968,894
SAFETY CLOSURE CAP

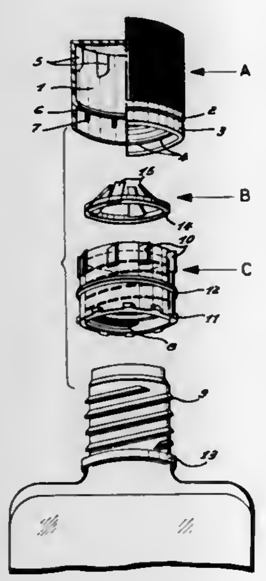
Ernst Herrmann, Kunststoff-Spritwerk Nord 27, 9428 Walzenhausen, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,727

Claims priority, application Switzerland, Oct. 2, 1974, 13264/74

Int. Cl.^{2} B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—220 **7 Claims**



1. A safety closure cap characterised by the fact that it comprises a cup and an internal part, which is retained within said cup but submitted to a resilient action tending to displace it toward the outside of said cup; corresponding ratching formations on the internal wall of the cup and on the outside wall of the internal part, cooperating to drive the internal part in rotation with the cup in only one direction of rotation, whatever the axial position of the internal part is with respect to the cup; and by the fact that corresponding driving formations provided on the internal surface of the cup and on the outside surface of the internal part, cooperate in order to drive the internal part through the cup in the other direction of rotation only when the internal part is axially displaced with respect to the cup against the resilient action.

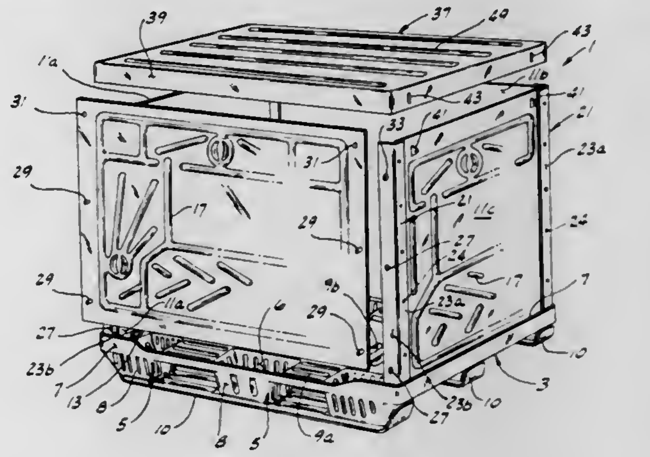
3,968,895
AIR CARGO SHIPPING CONTAINER

Richard R. Barnes, Jr., Bridgeton; Douglas E. MacArthur, Chesterfield; William Roy Wodell, St. Louis, and Irving Herbert Bernard, Bridgeton, all of Mo., assignors to Richard R. Barnes, Jr., Bridgeton and Douglas E. MacArthur, Chesterfield, both of, Mo.

Filed Feb. 19, 1975, Ser. No. 551,022

Int. Cl.^{2} B65D *7/24, 19/02*

U.S. Cl. 220—1.5 **3 Claims**



1. An air cargo shipping container comprising a rectangular base of molded synthetic resin material which is generally chemically inert to most substances, said base having a plurality of legs formed in its bottom for supporting the base above the ground, said legs being spaced for entry of the lifting tines of a forklift or the like, each said leg being hollow and open at its upper end thus defining a plurality of reservoirs on the inside of the base for containing spilled cargo, and an integral lip around the periphery of said base and extending above the level thereof, said container further having three panels constituting foldable panels hingedly secured to said lip for swinging between a generally vertical, erect position and a generally horizontal, folded position in which said panels overlie the base, and a fourth panel, constituting a front panel, being readily removable from said base and from said adjacent panel so as to enable loading and unloading of the container, and a lid engageable with the upper edges of said panels to close the container, two of said foldable panels being hingedly secured to said base on opposite ends of said front panel and thus constituting side panels, and the other said foldable panel being hingedly secured to said base opposite said front panel and constituting a back panel, said side panels each having a pair of angle members secured to their vertical edge portions, said angle members each having a pair of intersecting leg portions, one leg portion of each angle member being disposed on the outside of the vertical edge portion of the corresponding front or back panel to which the vertical edge portions of each side panel is interconnected, said container further having means for releasably securing said front panel to said side panels comprising at least one aperture in each said vertical edge portion of said front panel and at least one aperture in each said angle member leg portion disposed on the outside of said front panel, said leg portion apertures being below said panel apertures, a fastening member secured to said front panel vertical edge portion and projecting outwardly therefrom and received in a respective leg portion aperture, another fastening member secured to and projecting inwardly from the inner face of each said leg portion and received in a respective panel aperture, and removable securement members engaging said fastening members for holding said panels and said leg portions in assembled relation, said front panel when removed from said base being stowable on the base and said lid being cooperable with said base to enclose said foldable and said front panels therebetween so as to

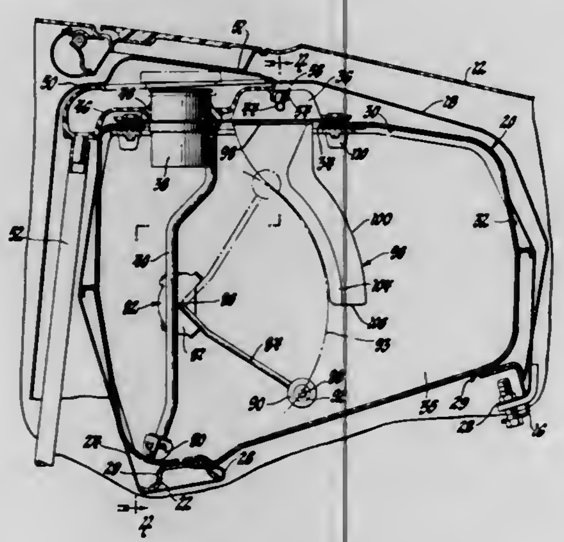
permit shipment of empty containers in a knock-down configuration.

3,968,896

FUEL TANK

John B. Giacoletti, Utica; Thomas C. Ryding, Madison Heights, and Walter C. Zetye, Orchard Lake, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 20, 1975, Ser. No. 588,887
Int. Cl.² B65D *25/14, 25/02*
U.S. Cl. 220—63 R **4 Claims**



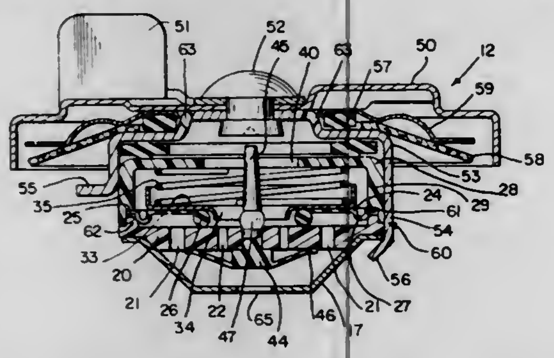
1. A fuel tank comprising an enclosure having a flexible wall and a rigid wall and adapted to contain liquid fuel, a fuel level sensor disposed within said enclosure and including a pivotally mounted arm having an end free for movement along an arcuate path in a selected plane and further including a float secured to said free end and responsive to the level of fuel within said enclosure for positioning said end of said arm along said path, means responsive to the position of said end of said arm for indicating the fuel level in said enclosure, and a fender having a flange secured to said rigid wall and a contoured portion disposed in said plane adjacent said arcuate path to prevent interference between said flexible wall and said arm should said flexible wall collapse.

3,968,897

PRESSURE-VACUUM RELIEF VALVE ASSEMBLY

Robert E. Rodgers, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 485,350, July 3, 1974, Pat. No. 3,929,158. This application Oct. 30, 1974, Ser. No. 519,350
Int. Cl.² F16K *17/18*
U.S. Cl. 220—204 **6 Claims**



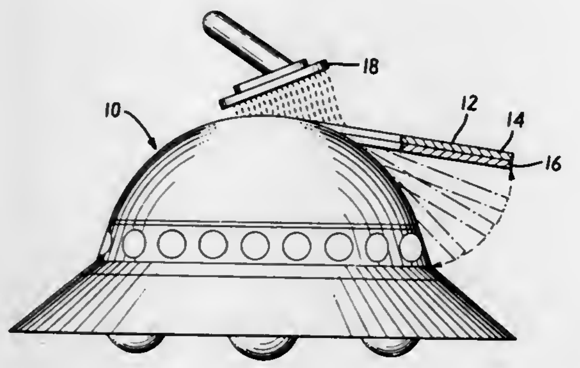
1. A safety pressure-vacuum relief cap for closing the filler neck of vehicle fuel tanks and the like comprising a fitting having a upper end and a lower end and having an upwardly facing substantially flat flange circumscribing its upper end and disposed in a plane substantially perpendicular to the axis of said fitting, a generally circular plate resting on and peripherally substantially congruent with said flange, said plate having a plurality of openings axially therethrough, each of said openings being disposed at at least a first radial distance from the center of said plate, said plate also having at least one aperture extending axially therethrough at a radial distance from said plate center less than said first distance, an inverted cap having a peripheral skirt, defining an annular shoulder, defining an annular, flexible gasket having an outer peripheral bead gripped between said plate and said shoulder and an inner peripheral bead engaging the upper flat surface of said plate in an annular area disposed between said first distance and said lesser distance, an outer shell for said cup providing means for engaging the filler neck and providing means for holding said fitting and said cup against axial separation, a seal plate having a central aperture and bearing on a radially inward region of the upper surface of said gasket, spring means confined between the floor of said cup base and said seal plate to urge said gasket inner peripheral bead into yieldable sealing contact with the upper surface of said plate to provide a pressure valve for the tank, a rubberoid umbrella valve having a stem centrally penetrating and axially fixed relative to said plate and having its flexible outer peripheral region normally in sealing engagement with the lower surface of said plate in an annular region disposed between said first distance and said lesser distance to provide a vacuum valve for the tank, and said lower end of said fitting being ported to provide communication with the interior of a fuel tank for such a vehicle, and said cup and said outer shell being ported to provide communication with the atmosphere.

3,968,898

MAGNETOSTRICTIVE CLOSURE MEMBER

Andrew E. Beer, 25 Sutton Place, New York, N.Y. 10022

Filed Aug. 26, 1974, Ser. No. 500,334
Int. Cl.² B65D *41/02, 43/14*
U.S. Cl. 220—260 **6 Claims**



1. A magnetostrictive closure member comprising:
- a. a housing having an opening adapted to receive closure means;
- b. closure means adapted to open or close the opening in said housing; and
- c. a bimetallic magnetostrictive strip adapted to operate said closure means, one metallic component of said bimetallic strip being attached to said closure means and having a magnetostrictive property different from the other metallic component of said bimetallic strip, said other metallic component being attached to said housing, such that the bimetallic strip, when subjected to a change of magnetic field, operates the closure means to open or close the opening.

3,968,899

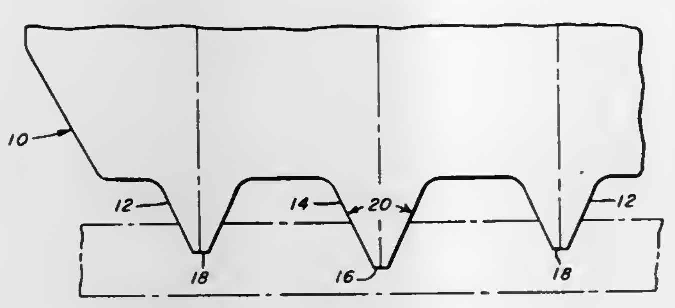
EASY-OPEN CONTAINER WALL AND APPARATUS

Charles L. Jordan, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 451,191, March 14, 1974. This application June 20, 1975, Ser. No. 588,633
Int. Cl.² B21D *51/38*
U.S. Cl. 220—266 **9 Claims**

5. A metallic container wall comprising

a removable sector having an integral opening device;
a primary score line defining said removable sector; and
a secondary score line substantially coextensive with said primary score line having a depth of no more than about 75% of that of said primary score line and located between said primary score line and the periphery of said removable panel with its centerline no more than about 0.040 inch from the centerline of said primary score line whereby said primary score line may be deep and narrow and yet have dependable integrity.

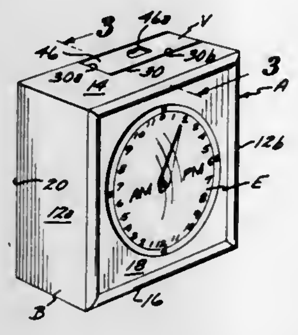


3,968,900

TIMED MEDICANT DISPENSING DEVICE

Berigoj K. Stambuk, 655 Camino De Los Mares, Suite 119, San Clemente, Calif. 92672

Filed July 25, 1975, Ser. No. 599,169
Int. Cl.² G04C *23/18*
U.S. Cl. 221—3 **7 Claims**



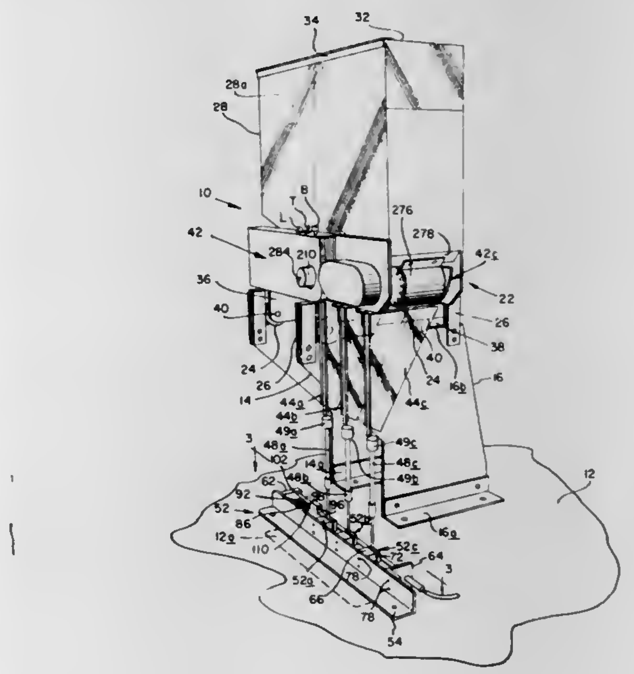
1. A device for storing a plurality of hollow balls defined by interlocking half portions that may be manually separated, which balls are consecutively dispensed at desired time intervals, with each of said balls serving as a carrier for a prescribed quantity of a medicant contained therein, which device includes:
- a. a cannister in which said balls are stored, in which cannister an opening is formed through which said balls can roll by force of gravity;
- b. a housing having a first opening formed therein through which said cannister may be inserted into the interior thereof, and with a second opening being formed in said housing through which said balls may roll due to force of gravity;
- c. a spring-loaded ball dispenser tray pivotally supported from said housing that in a first position obstructs said second opening and when in a second position serves as a support for a ball discharged thereonto from said second opening;
- d. movable ball stop means in said housing capable of occupying first and second positions, with said ball stop means as it moves from said first to said second position allowing one of said balls to roll from said cannister and pivot said dispenser tray from said first to said second position;
- e. first electrically operated spring-loaded means for moving said ball stop means from said first to said second position;
- f. an electrically operated timer supported at a fixed on said housing, said timer including a drive shaft;
- g. an opaque, non-light reflecting disk having a plurality of circumferentially spaced apertures formed therein, with said disk being non-rotatably mounted on said drive shaft;
- h. electrically operated light generating means which emit a beam of light that is sequentially aligned with said apertures as said disk rotates;
- i. light sensitive means that becomes electrically conductive only when said beam of light travels through one of said apertures and impinges thereon;
- j. a source of electric power;
- k. electrically operated sound generating means;
- l. a first normally open electrical switch that is closed when said dispenser tray pivots to said second position;
- m. a second normally closed electric switch that is opened when said dispenser tray occupies said second position and has one of said balls resting thereon; and
- n. an electrical circuit connected to said source of power, with said circuit including said first electrically operated means, timer, light-emitting means, light-sensitive means, and said first and second switches, with said first electrically operated means being energized by said electrical circuit each time one of said apertures is aligned with said beam of light to allow the latter to impinge on said light-sensitive means to move said ball stop from said first to said second position and allow one of said balls to pivot said dispenser tray from said first to second position to thereafter rest on said dispenser tray, said first switch when said dispenser tray is in said second position assuming an open position to break said circuit to said timer, which second switch when said dispenser tray is in said second position assumes a closed position to energize said sound-generating means to alert a patient to remove a ball from said dispenser tray, which tray when a ball is removed therefrom pivots to said first position to allow said first and second switches to move to closed and open positions respectively, to energize said timer and terminate operation of said sound-generating means.

3,968,901

STRAW DISPENSER

Stanley W. Peva, Jr., Salem, N.H., assignor to Austin-Gordon Design, Inc., Nashua, N.H.

Filed Feb. 14, 1975, Ser. No. 549,880
Int. Cl.² B65H *3/44*
U.S. Cl. 221—93 **12 Claims**



1. A straw dispenser comprising
A. a hopper containing a supply of straws, and

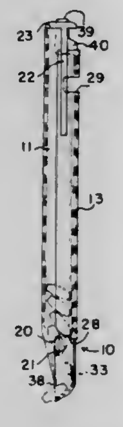
B. a plurality of indexing stations positioned below and in communication with the hopper, each station including
  1. a rotary index wheel having a plurality of notches distributed about its periphery, each said notch being shaped and arranged to contain a straw, and
  2. a guide plate positioned adjacent the index wheel and extending from a line near the top of the wheel to a line near the bottom thereof so as to trap straws positioned in the wheel notches opposite the guide plate,

C. means for rotating the index wheels in all of the indexing stations intermittently in unison one notch position to advance the uppermost notches in each wheel toward the upper edge of the corresponding guide plate so that the uppermost notches in each wheel can receive straws from the hopper and are rotated under the associated guide plate while the lowermost notches in each wheel are advanced beyond the lower edge of the corresponding guide plate so that any straws therein are free to fall by gravity,

D. straw retaining means positioned directly below each indexing station for orienting each straw vertically and engaging the bottom of each straw dropped from the associated indexing station each time the corresponding index wheel is rotated one notch position, and

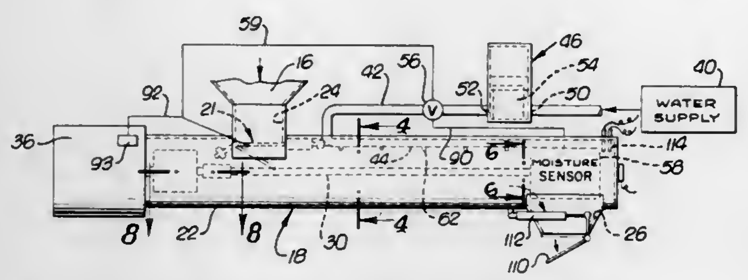
E. means for controlling all of the retaining means in unison each time the index wheels are rotated one notch position so as to simultaneously release the set of straws retained therein to a work station as a new set of straws is falling from the index station to the retaining means.

3,968,902
TABLET DISPENSER
Mario E. Bachmann, 2 E. Oak St., Chicago, Ill. 60611
Filed Mar. 17, 1975, Ser. No. 558,900
Int. Cl.^{2} B65D *83/04*
U.S. Cl. 221—263 5 Claims



1. A tablet dispenser of elongate tubular form comprising a semicylindrical stationary section, a relatively slidable section of semicylindrical section in edge to edge opposed relation complemental to the stationary section, and a shield of semicylindrical section overlying said slidable section and releasably secured to said stationary section by a snap fit engagement therewith, said stationary section and said slidable section form a storage chamber for containing a supply of tablets and a discharge chamber for holding and dispensing said tablets, said slidable section being movable relative to said stationary section to open said discharge chamber to dispense a tablet, a push button for moving the slidable section, spring means to restore said slidable section and close said discharge chamber after the tablet is dispensed, a top end wall on said slidable section projecting into said stationary section separating said storage chamber from said spring means, said stationary section having an integral projection on the inside surface thereof to tilt said tablets and said slidable section has a sloping guide surface on the inner side thereof to guide the tilted tablets toward said discharge chamber terminating in a stop holding the supply of tablets captive in said storage chamber, an integral interior inclined surface on said stationary section cooperating with said stop to retain a lowermost tablet ready to move into said discharge chamber when said slidable section is restored, and opposing stop means on the stationary and slidable sections to limit the movement of said slidable section to its restored position.

3,968,903
DUST WETTING APPARATUS
William O. Rosentreter, Norwalk; Richard M. Justice, La Mirada, and Timothy E. Wade, Whittier, all of Calif., assignors to Otto H. Rosentreter Co., Bell Gardens, Calif.
Filed Apr. 14, 1975, Ser. No. 567,758
Int. Cl.^{2} B67D *5/14*
U.S. Cl. 222—1 8 Claims

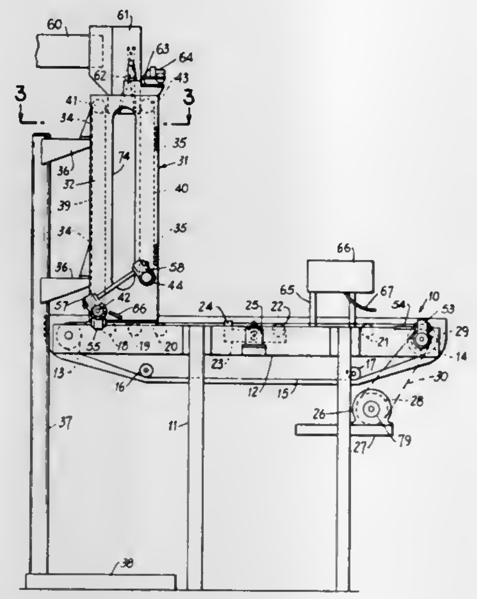


1. A wetting apparatus comprising in combination:
an elongated housing forming a passageway for a finely granulated product to be wetted, said housing having an inlet opening for receiving said product and an outlet opening through which said product may be discharged;
means mounted within said housing for moving said product from said inlet opening to said outlet opening and for mixing;
means connected to said housing and said moving means for operating said moving means;
means connected to said housing and communicating with a supply of water for allowing said product to be sprayed with water;
a gate connected to said housing for variably blocking the outlet opening thereby allowing the volume of said product to be controlled; and
a moisture sensor operatively connected to said gate to control the blocking by said gate of said outlet opening.

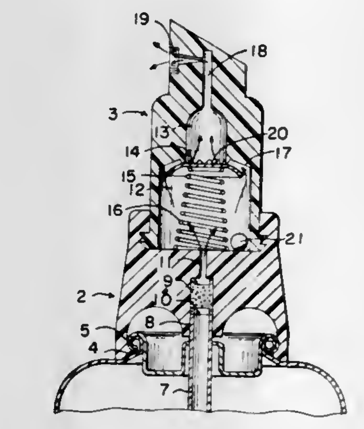
8. A method for wetting dust comprising providing a housing having an inlet opening and an outlet opening;
providing a mixing screw and a motor for driving said screw, said screw being placed in said housing;
selectively blocking said inlet opening for metering the input of dust, said metering being a function of dust weight;
selectively introducing water into said housing; and variably blocking said outlet opening in accordance with the wetness of said dust.

3,968,904
CONTINUOUS MEASUREMENT OF THE BULK DENSITY OF PARTICULATE MATERIAL
Richard Ernest Gartside Neville, Sailsbury, England, assignor to AMF Incorporated, White Plains, N.Y.
Filed Mar. 10, 1975, Ser. No. 557,208
Claims priority, application United Kingdom, Mar. 12, 1974, 10862/74
Int. Cl.^{2} B67D *5/06*
U.S. Cl. 222—25 13 Claims

1. An apparatus for the continuous measurement of the bulk density of particulate material, comprising a conveyor, means for weighing particulate material on said conveyor, drive means for said conveyor, a measuring column disposed above said conveyor for delivering particulate material to said conveyor, input feeder means for particulate material to said measuring column, a level detection disposed adjacent said measuring column, density indicating means, and a controller for receiving signals from said level detector proportional to the level of the particulate material and for varying the speed of said drive means in dependance upon said signals to maintain a substantially constant level of material within the measuring column independent of variations of supply to said column; wherein the indicating means is controlled by signals from said weighing means.

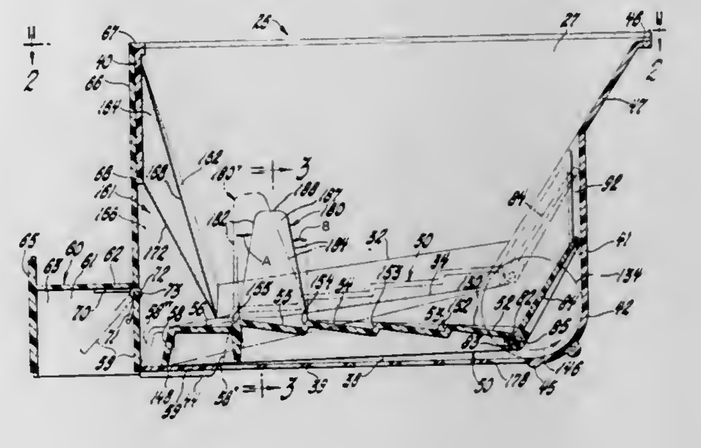


3,968,905
TIME RELEASE AEROSOL DISPENSER
Peter G. Pelton, Carol Stream, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Aug. 7, 1975, Ser. No. 602,718
Int. Cl.^{2} B67D *5/08*
U.S. Cl. 222—70 4 Claims



1. An improved timed release dispenser for use with an aerosol container, said dispenser comprising upper and lower body portions, means on said lower body portion for attachment of said dispenser to said container, a measuring chamber formed in said upper body portion, means for regulating the flow of contents from said containers to said measuring chamber, pressure actuated valve means controlling the outflow from said measuring chamber, said valve means comprising a spring disk and supporting spring mounted within said measuring chamber, an exit chamber formed in said upper body portion, an interchamber orifice connecting said measuring chamber and said exit chamber, a spray nozzle operatively connected with exit chamber, said spring disk being concave upward when in the closed condition and concave downward when in the open condition, said measuring chamber being formed with a shoulder encircling said interchamber orifice and said spring disk when in said closed condition seating thereagainst in sealing relation, and a plurality of spaced projections formed on said shoulder, and said spring disk, when in the open condition, is supported on said projections, the spaces therebetween providing passage between said measuring chamber and said exit chamber.

3,968,906
RAM FOR ICE DISPENSING DEVICE
Donald P. Kochendorfer, and Robert S. Hanson, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed May 8, 1975, Ser. No. 575,588
Int. Cl.^{2} G01F *11/00*
U.S. Cl. 222—243 1 Claim



1. An ice piece dispenser comprising a container for receiving and collecting ice pieces, said container including a front wall with a vertically extending chute formed therein communicating with a dispensing opening in said front wall, a longitudinally extending trough formed in the bottom wall of said container with said trough having a planar horizontally disposed base, the forward portion of said trough being subjacent to said chute so as to receive ice pieces therefrom, an elongated ram positioned in said trough, said ram having a forward end face with its lower edge supported on said trough base for reciprocal movement thereon, said ram having its rearward end secured by a pivotal connection to eccentric drive means for movement of said pivotal connection in a circular path, a plurality of steps formed on the upper surface of said ram, whereby eccentric movement of said pivotal connection, through rotation of said drive means, will cause said ram forward end face to move forwardly and rearwardly in a substantially horizontal path in said trough, such that an imaginary line connecting the leading edges of said steps is inclined rearwardly and downwardly when said ram is in an intermediate position, wherein the improvement comprising a vertically extending ice piece agitating fin member formed on the penultimate one of said ram steps, said fin member having a leading edge sloped rearwardly and upwardly from its base, said fin member having a trailing edge sloped forwardly and upwardly from its base, such that upon said ram being reciprocated to its forwardmost position said leading edge approaches a vertical orientation, said trailing edge slope being greater than said leading edge slope when said ram is in its intermediate position, said fin member extending the full longitudinal distance of said penultimate step, said fin member having its side walls converging upwardly from said ram in wedge shape fashion, whereby said fin member leading edge is operative in conjunction with said container front wall chute to break-up ice piece clusters upon the forward thrust of the ram, and whereby the ice pieces collected in said container being operative to exert a vertically downward component of force on said fin sloped edges and side walls to maintain said ram face lower edge in contact with the said trough base during the forward thrust of said ram.

3,968,907

DISPENSER FOR DISPENSING METERED QUANTITIES OF LIQUID FROM A CONTAINER

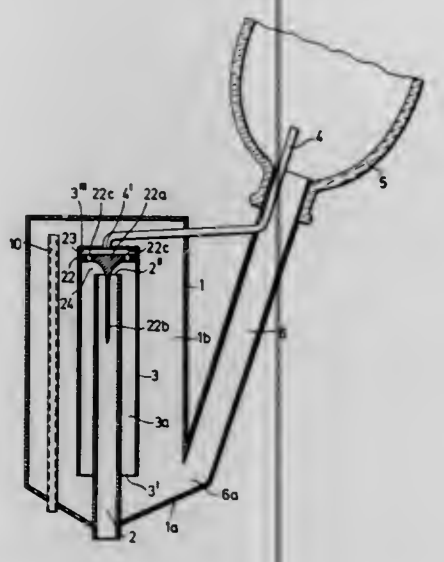
Maria Nix, nee Saxler, Cologne, Germany, assignor to Norbert Nix, Cologne, Germany

Filed Apr. 9, 1974, Ser. No. 459,356

Claims priority, application Germany, Apr. 11, 1973, 2318120

Int. Cl.^{2} G01F *11/26*

U.S. Cl. 222—416 **4 Claims**



1. A dispenser for dispensing metered quantities of liquid from a container, comprising a housing forming a chamber and having a bottom wall; a discharge tube communicating with said chamber in the region of said bottom wall and having a free end which is spaced from said housing and insertable into a discharge opening of the container; a dispensing tube extending through said bottom wall and including a portion located centrally within said chamber and having an open upper end; an outer tube surrounding said portion of said dispensing tube with clearance and having an open lower end portion communicating with said chamber at said bottom wall, and a closed upper end portion located upwardly of said open end of said dispensing tube and bounding an interior space in communication with said clearance and with said dispensing tube, the distance between said lower open end portion of said outer tube and said open upper end of said dispensing tube being determinative of the metered quantity of liquid dispensed from the container; insert means including an insert member accommodated in said closed upper end portion and subdividing said interior space thereof into an upper air compartment and a lower liquid compartment; passage means for passage of air through said insert means and including at least one opening in said insert member communicating said lower liquid compartment with said upper air compartment; means for replacing the liquid dispensed from the container by air and including an air tube communicating said air compartment with the container; and air vent means communicating said chamber with the exterior of said housing for admitting replacement air into said chamber.

3,968,908

DEVICE FOR PREVENTING LADLE NOZZLE LEAKS

Francis D. Nelson, Munster, and Willard M. Presson, Merrillville, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Oct. 3, 1975, Ser. No. 619,422

Int. Cl.^{2} B22D *41/10*

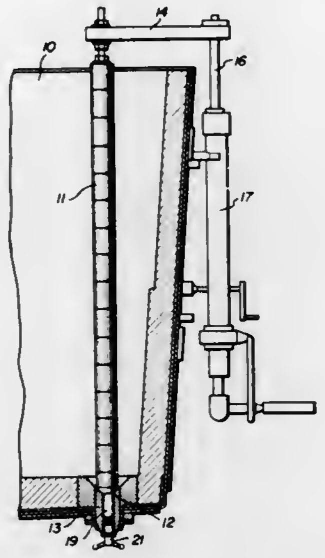
U.S. Cl. 222—563 **4 Claims**

1. A closure device for preventing leakage of molten metal from a ladle provided with a stopper rod assembly including a stopper rod and a nozzle having a bore which is blocked by said stopper rod to prevent flow of said metal, said device comprising:

a base member;

a pair of spaced elongated generally parallel gripping jaws, the outer surfaces of said jaws being adapted to grip the bore of said nozzle, one end of each jaw being pivotally connected to said base member, the dimensions of said base member and said jaws and the spacing between said jaws being such as to permit the insertion of said base member and jaws into the bore of said nozzle;

a threaded rod passing through a hole in said base member and extending into the space between said jaws, said rod having an enlarged head positioned between said jaws, the width of said head being larger than the spacing between said jaws at the points of connection to said base member, whereby said jaws are forced apart by contact with said head to an extent which increases as said head approaches the points of connection of said jaws to said base member;



a washer plate having a central hole through which said rod passes, said washer having a diameter larger than the bore of said nozzle and being positioned adjacent the outlet end of said nozzle; and

a nut engaging the threads of said rod adjacent said washer.

3,968,909

SLIDE CLOSURE FOR METALLURGICAL VESSELS

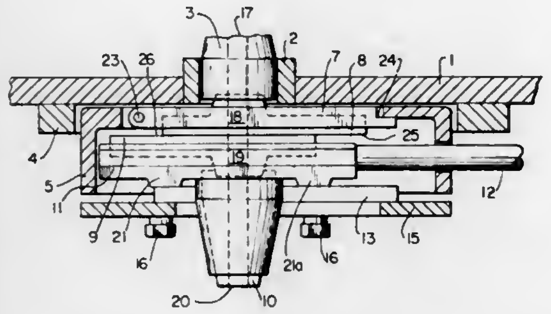
Ernst Meier, Kilchberg, Switzerland, assignor to Stopinc Aktiengesellschaft, Zug, Switzerland

Filed May 13, 1975, Ser. No. 577,071

Claims priority, application Germany, May 20, 1974, 2424512

Int. Cl.^{2} B22D *41/08;* **B67D** *3/00*

U.S. Cl. 222—600 **3 Claims**



1. In a slide closure device of the type including a housing attached to the bottom of a vessel having an outlet opening, a fixed refractory plate fixedly positioned in said housing by means of a metal holding frame and having an aperture aligned with said outlet opening, a refractory slide plate supported on a metal slide within said housing and having an aperture selectively alignable with said aperture of said fixed plate, a housing cover closing the bottom of said housing and having rails for supporting said slide, and means for moving said slide and said slide plate along said rails to selectively align said slide plate aperture with said fixed plate aperture, the improvement wherein:

each lateral side of said slide has two projections extending downwardly therefrom into contact with one of said rails, said two projections on each said lateral side of said slide being spaced from each other by a distance substantially equal to the distance between said rails.

3,968,910

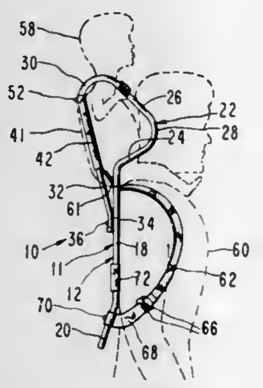
SHOULDER PACK CHILD CARRIER

John Dye, and Paal Myklebust, both of Reedsburg, Wis., assignors to Gerber Products Company, Fremont, Mich.

Filed July 11, 1974, Ser. No. 487,694

Int. Cl.^{2} A45F *3/26*

U.S. Cl. 224—6 **9 Claims**



1. A child carrier adapted to be worn on the back of an individual comprising:

a frame having a pair of spaced, generally rigid, generally parallel side members, each side member having an upper part, a central part, a junction between said central and upper part, and a lower part, a first crosspiece interconnecting the lower parts of said side members, and a second crosspiece spanning the distance between and carried by the side members near the junctions of the central and upper parts thereof, the second crosspiece being operable to limit the movement of the upper parts of the side members toward each other, each upper part having a first segment extending upwardly and rearwardly of the wearer and a second segment extending downwardly from said first segment to such central part; a flexible backrest having a pair of spaced, tubular side margins and a tubular lower end margin formed integrally therewith, each said first segment extending through the respective side margins and the second crosspiece extending through the lower end margin, and strap means coupled with said side members for removably mounting the frame on the back of an individual, such that when the child carrier is mounted to the back of the individual with the side members substantially vertical and each upper part extending relatively above the shoulders of said individual the backrest forms a child-receiving space with the shoulders and head of the individual that causes the weight of the child to bear downwardly upon the shoulders of said individual.

3,968,911

INFANT CARRIER

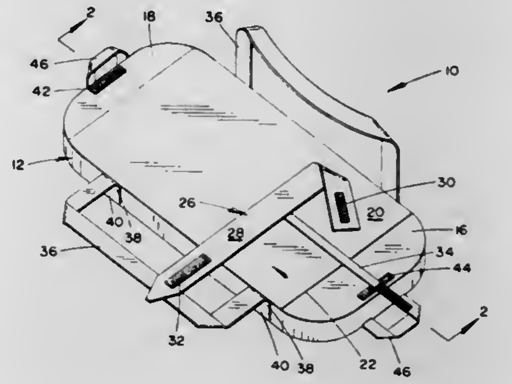
Marta Haas, 2275 Nelson Place, Lakewood, Colo. 80215

Filed Jan. 2, 1975, Ser. No. 537,773

Int. Cl.^{2} A47D *13/02*

U.S. Cl. 224—6 **4 Claims**

1. An infant carrier and mattress comprising a substantially planar pad of resilient material having a length and width substantially larger than an infant and having a thickness such that said pad defines a mattress which assumes a flat configuration for supporting an infant at rest thereon and deforms about the longitudinal axis thereof to partially surround the infant when carried thereon, a water proof covering enclosing said resilient material, a pair of carrying straps connected to each of the respective longitudinal sides of said mattress cover for carrying the infant when supported on the covered mattress, strap means for securing the infant to said cover of said mattress, and a layer of material stitched to said covering along the longitudinal sides thereof only and having a length less than the length of said mattress and said cover and being accessible from opposite ends of said covered mattress to thereby define an open ended pocket between said layer of material and said covering for carrying accessories and supplies required by the infant, whereby the supplies and accessories may be disposed within said pocket on opposite sides of the infant being carried to thereby maintain the infant centrally of the mattress and cover while the infant rests on the outer side of said layer of material.



3,968,912

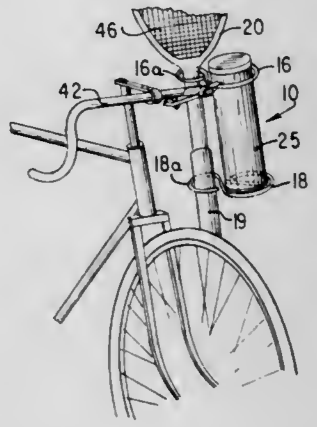
BALL AND RACKET CARRIER

Norton Horwitz, 2647 Prindle, Arlington Heights, Ill. 60504

Filed Nov. 11, 1974, Ser. No. 522,493

Int. Cl.^{2} B62J *7/06*

U.S. Cl. 224—36 **3 Claims**



1. A device for carrying a tennis or racquet ball racket and a container of balls on a bicycle, said device comprising:

an upper continuous rod formed into a figure eight configuration having a pair of circular sections one larger than the other;

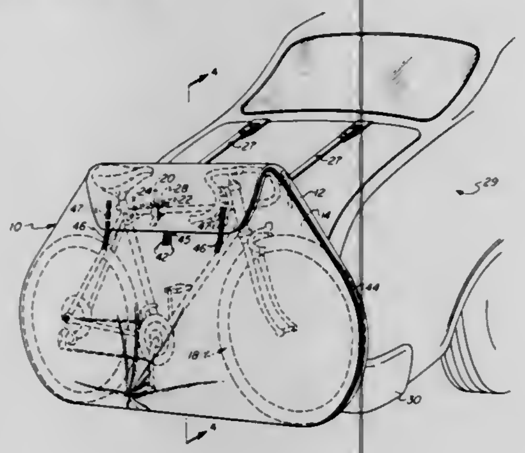
a lower continuous rod formed into a figure eight configuration having a pair of circular sections one larger than the other, said upper and lower circular sections being equal in size and positioned such that the respective sections are coaxial with each other whereby, the larger coaxially aligned circular sections are adapted to receive the can of balls while the other circular sections are adapted to receive the handle of the racket;

a connecting rod having one end attached to the upper rod and the other end attached to the lower rod, said connecting rod having an element thereof positioned across the larger circular section of the lower rod, wherein said connecting rod element inhibits the can of balls from passing through the larger circular sections of the upper

and lower rods and the smaller circular sections inhibit the racket from passing therethrough; and
means for coupling the device to the bicycle.

3,968,913
PROTECTIVE COVER FOR AUTOMOBILE MOUNTED BICYCLE CARRIER

Terrance O. Weed, 53 Addison Ave., and Daniel Mougel, 67 Vreeland Ave., both of Rutherford, N.J. 07070
Filed May 5, 1975, Ser. No. 574,304
Int. Cl.^{2} B60R *9/10*
U.S. Cl. 224—42.03 B **7 Claims**



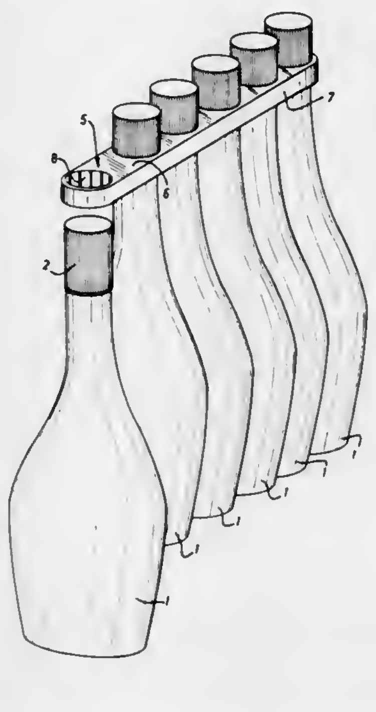
1. In a system for protecting a two wheeled vehicle such as a bicycle, having a seat and handle bars, while transporting the same on the back of an automobile having a frame affixed to the bumper and to an upper portion of the automobile, the frame being provided with a pair of spaced hangers to receive the bicycle and straps for holding the bicycle to the frame, the improvement comprising:

a back of flexible material having a first pair of openings to permit the spaced hangers to pass therethrough, a second pair and a third pair of openings each of which are positioned to permit one of the straps to pass therethrough to affix the bicycle to the frame;
a front of flexible material affixed at the bottom edge thereof to the corresponding edge of the back;
closure means affixed to the free edges of the front and back to permit them to be joined together to enclose and protect the bicycle from the ambient environment;
the upper portions of the front and back projecting above the top of the two wheeled vehicle to allow for variations in the heights of the seat and handle bars; and
fastening means for securing the joined upper portions of the front and back to the front when said joined upper portions are folded over toward the front.

3,968,914
CONTAINER ASSEMBLY

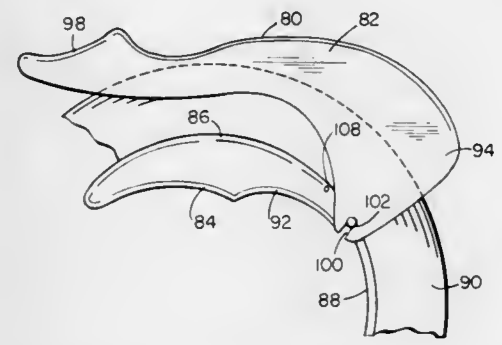
Antonin Goncalves, Groslay, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France
Filed Dec. 16, 1974, Ser. No. 533,213
Claims priority, application France, Feb. 26, 1974, 74.06432
Int. Cl.^{2} B65D *71/00*
U.S. Cl. 224—45 AA **12 Claims**

1. In a container assembly comprising in combination a plurality of containers provided with substantially identical caps and a carrier bar defining a corresponding number of openings completely encircled by sleeves, the improvement according to which
said caps have a circular transverse cross section and an external cylindrical surface, each said cylindrical surface carrying a plurality of ridges extending outward of said surface and in the direction of said cylinder, and
said sleeves have closed internal surfaces of revolution mating approximately with said cylindrical external surface, but provided with a different number of ridges having different dimensions which interengage with the ridges on said caps,
said caps and sleeves being made of a resilient material so that said ridges are compressible and the maximum undistended inner diameter of said sleeves being slightly less than the maximum uncompressed outer diameter of said caps, so that when said caps are forced into said sleeve said ridges are compressed and the caps are frictionally retained in said sleeves said caps having an axial length greater than said sleeves.



3,968,915
TAPE DISPENSER

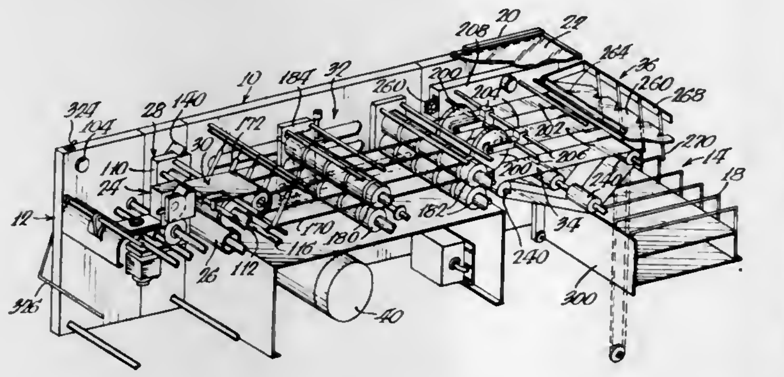
Ernst E. Schleicher, 7954-56 MacArthur Blvd., Oakland, Calif. 94605
Continuation-in-part of Ser. No. 490,900, July 22, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,345
Int. Cl.^{2} B65H *35/06*
U.S. Cl. 225—65 **11 Claims**



1. A tape dispenser for dispensing tape from a conventional tape roll having an annular core, said tape dispenser comprising: a finger grip piece having a crescent configuration insertable within the core of the tape roll, said finger grip piece having a first peripheral portion conforming with a portion of the annular core, and a second peripheral portion adapted for finger contact; a cover piece having a top section with an underside contoured in part to the outer periphery of a tape roll and having opposite side sections covering in part the sides of a tape roll, said top section and side sections forming a tapered extension at one end of said cover piece wherein said underside of said top section in said extension projects a distance substantially tangential from the outer periphery of the tape roll and includes a guide surface for separating tape from the tape roll and a termination with a cutting means; means for hingedly connecting said finger grip piece at one end of said finger grip piece and said cover piece at said side sections; and tape guide means in said extension wherein said guide means comprises oppositely facing elongated protrusions on the side sections substantially parallel to and proximately spaced from the underside of the top section at the tapered extension, each of said protrusions forming a slot on each of the opposed side sections of the extension and cooperatively providing a channel through which tape is dispensed, said protrusions being spaced apart a distance relative to the width of a tape which causes the tape to deform by bowing which permits the opposite edges of a tape to pass by when the tape is pulled up flatly against the underside of the top section, said protrusions being adapted to engage a narrow portion of the opposite edges of a tape and retain the tape substantially against the underside of the top section at said extension.

3,968,916
BURSTER

Charles C. Davis, Elgin, Ill., assignor to Uarco Incorporated, Barrington, Ill.
Filed Sept. 16, 1974, Ser. No. 506,190
Int. Cl.^{2} B26F *3/00;* **B65H** *43/06*
U.S. Cl. 225—100 **11 Claims**

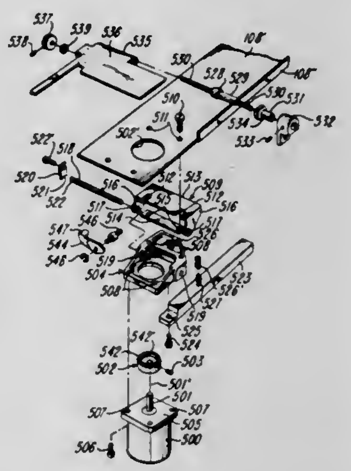


1. A burster for separating continuous forms stationary assemblies into individual form lengths, comprising: means defining a path of stationary travel through said burster; two pairs of burster rolls located along said path at spaced locations; a motor for rotating at least one roll in each of said pairs, said motor driving the driven roll in the forwardmost pair along said path of stationary travel at a lesser rate of peripheral speed than the driven roll in the other of said pairs; a conveyor located along said path of stationary travel to receive individual form lengths of the assembly from said other pair of burster rolls; a second motor for driving said conveyor; speed control means for both of said motors for selectively increasing or decreasing the peripheral speeds of said burster rolls and said conveyor; separate means for selectively operating said second motor independently of said first motor to drive said conveyor without driving said burster rolls; a stationary deflecting surface adjacent said conveyor; means for simultaneously adjusting the position of one of said pairs of burster rolls along said path relative to the other and the position of said stationary deflecting surface relative to said conveyor to accommodate business forms having differing individual form lengths; and an electrical control element responsive to said adjusting means and in speed control relationship with said second motor for automatically providing speed compensation for said conveyor for a variety of business forms having differing individual form lengths.

3,968,917
RECORD FEEDING APPARATUS AND METHOD

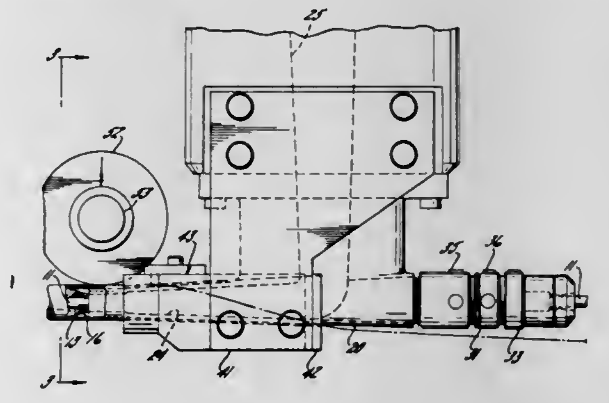
John H. Lanahan, Whitesboro, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Dec. 30, 1974, Ser. No. 537,629
Int. Cl.^{2} B65H *17/22*
U.S. Cl. 226—2 **18 Claims**

18. Method of feeding a record having opposite faces terminating at side edges, comprising the steps of: supporting the record for movement along a path, providing an edge guide adjacent the path, providing a rotatable feed wheel having a rotational axis and having a frictional surface in a plane perpendicular to the rotational axis, bringing the record between a pinch point provided by the frictional surface and an opposed back-up member, the pinch point being disposed either upstream longitudinally of the rotational axis and laterally between the rotational axis and the edge or downstream longitudinally of the rotational axis and laterally beyond the rotational axis so that the frictional surface of the feed wheel and the back-up member are in contact with opposite faces of the record to exert a resultant drive force on the record comprised of a force vector of large magnitude extending in the longitudinal direction for feeding the record longitudinally and a force vector of small magnitude extending in the lateral direction for driving the record laterally to cause its side edge to be in guided contact with the edge guide with concomitant slippage between the frictional surface and the face of the web to prevent the record from buckling laterally, and driving the feed wheel to feed the record longitudinally in guided relationship with the edge guide.



3,968,918
METHOD AND APPARATUS FOR PRODUCING CONTINUOUS LENGTHS OF COAXIAL PRODUCTS

Michel Merle, Elmira, N.Y., assignor to Andrew Corporation, Orland Park, Ill.
Continuation-in-part of Ser. No. 414,696, Nov. 11, 1974, abandoned. This application Nov. 11, 1974, Ser. No. 522,321
Int. Cl.^{2} B23K *31/02, 1/06*
U.S. Cl. 228—148 **13 Claims**



1. A method of producing continuous lengths of coaxial products having concentric inner and outer members and an intermediate layer of insulating material between the inner and outer members, said method comprising the steps of
a. continuously advancing a continuous length of said inner member,
b. continuously forming a concentric layer of the insulating material on the outer surface of said inner member by passing said inner member through an extrusion nozzle while extruding said insulating material through said

nozzle with the radial thickness of the insulating material increasing in the machine direction in a predetermined zone traversed by the advancing inner member,

c. and continuously advancing a continuous flat metal strip alongside said inner member, rolling said strip around said extrusion nozzle to form said strip into an outer member surrounding said inner member, and joining the longitudinal edge portions of the formed strip while the strip is still around said extrusion nozzle and before the insulating material reaches its maximum radial thickness so that the outer member is completed to enclose the inner member and insulating material when the outer member is advanced beyond said extrusion nozzle and the insulating material reaches its maximum radial thickness.

9. Apparatus for producing continuous lengths of coaxial products having concentric inner and outer members and an intermediate layer of insulating material between the inner and outer members, said apparatus comprising the combination of:

a. means for continuously advancing a continuous length of said inner member.
b. an extrusion nozzle adapted to pass said inner member therethrough for continuously extruding a concentric layer of insulating material onto the outer surface of said inner member,
c. means for continuously advancing a continuous flat metal strip alongside said inner member,
d. means for rolling said strip around said extrusion nozzle to form said strip into an outer member surrounding said inner member, and
e. means for joining the longitudinal edge portions of the formed strip while the strip is still around said extrusion nozzle so that the outer member is completed to enclose the inner member and insulating material when the outer member is advanced beyond the extrusion nozzle.

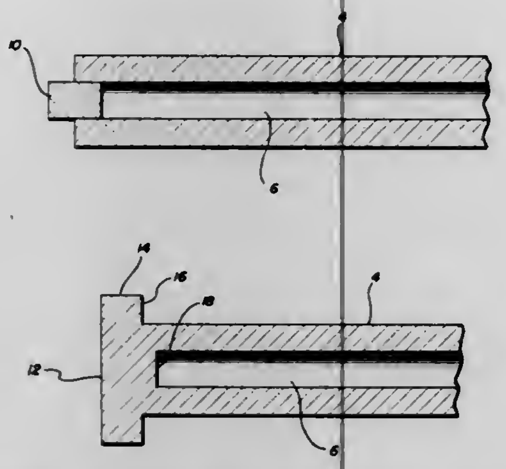
3,968,919
METHOD OF FORGING A SOLID HEAD ON A HOLLOW STEEL TUBE

James H. Beijen, Glenwood, Ill., assignor to Fabsco Corporation, Lansing, Ill.

Filed Apr. 2, 1975, Ser. No. 564,286

Int. Cl.^{2} B21J *5/00*

U.S. Cl. 228—153 **3 Claims**



1. A method for making a forged stopper rod having an integrally formed head of steel on one end of a cylindrical steel tube which includes the steps of

selecting a length of hollow steel tubing,

frictionally inserting a cylindrical steel plug of the same grade steel as the steel tube into an open end of the tube so a body portion of the cylindrical plug enters and is frictionally held within the passageway of the tube and a substantial body portion of said cylindrical plug extends beyond the end of the tube,

heating the end of the tube with the extending cylindrical plug beyond the critical temperation of the steel of the plug and tube, and

forging the softened cylindrical plug at the end of the tube to form a flattened flanged head integral with the tube.

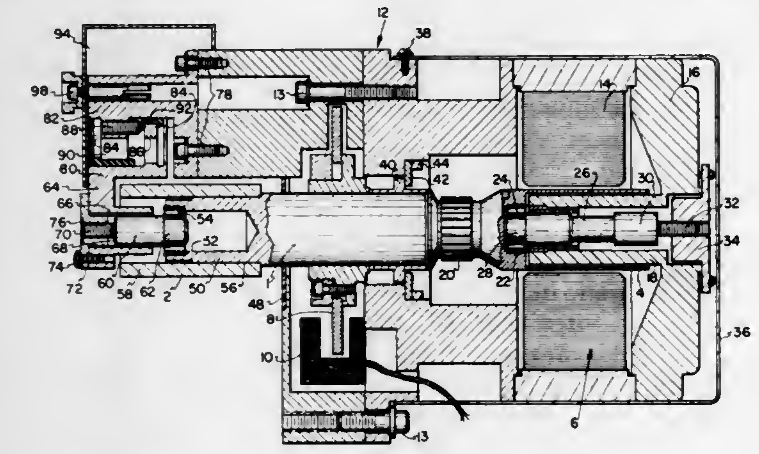
3,968,920
CAPSTAN AND MOTOR ASSEMBLY

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 12, 1975, Ser. No. 549,317

Int. Cl.^{2} B65H *17/20*

U.S. Cl. 226—188 **5 Claims**



1. A motor-capstan assembly comprising

a motor means,

a capstan means,

means connecting said motor means to said capstan means,

bearing means for rotatably supporting said motor means, said capstan means, and said last-mentioned means, and

bearing support means including a flexible cantilevered structure for supporting said bearing means at least at one end of the combination of said motor means, said capstan means and said means connecting said motor means to said capstan means.

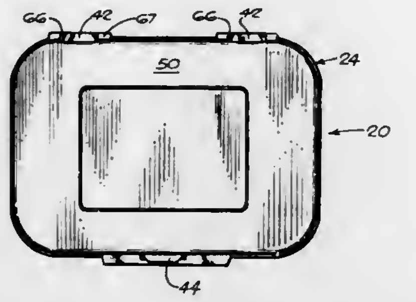
3,968,921
FOAM PACKAGE FOR BREAKFAST FOODS

Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Aug. 6, 1975, Ser. No. 602,147

Int. Cl.^{2} B65D *43/10, 1/26*

U.S. Cl. 229—2.5 R **5 Claims**



1. A flat foam package for breakfast foods comprising:

a shallow lower dish section having a food support floor and an upstanding peripheral sidewall including front, back and first and second sidewalls which extend upwardly and outwardly from said floor to an upper peripheral wall edge, said lower dish section defining an outwardly extending peripheral flange which circumscribes a major portion of said upper peripheral wall edge and which includes an expansive handle means projecting laterally from each of said first and second sidewalls for carrying said dish section, said floor being proportioned to support said dish section on a table surface, said floor having an inner surface which is relatively hard to resist cutting when food supported on said upper surface is cut;

a relatively flat cover section for covering said dish section, said cover section having a top wall and a sidewall extending downwardly and outwardly from said top wall to a lower peripheral wall edge, said cover section being proportioned such that a marginal portion of said top wall embraces said flange on said dish section when said cover section is juxtaposed with said dish section;

a hinging mechanism for said dish and cover sections including at least one hinging tongue on said dish section projecting generally rearwardly from said back sidewall, and a complementary hinging aperture defined by said sidewall of said cover section for each hinging tongue, each said hinging aperture opening laterally of the sidewall of said cover section, being positioned adjacent said lower peripheral wall edge, and having a width at least as great as the width of said hinging tongue; and

a latching mechanism for said dish and cover sections including a latching tongue on said dish section projecting forwardly from said front sidewall and lying in a plane substantially parallel to said floor of said dish, and a complementary latching aperture defined by said sidewall of said cover section, said latching aperture opening laterally of the sidewall of said cover section, being positioned adjacent said lower peripheral wall edge, and having a width at least as great as the width of said latching tongue;

a web at the base of each said hinging aperture and latching aperture and integral with and projecting outwardly of said sidewall of said cover section, one of said webs being proportioned to underlie each of said hinging and latching tongues when said cover and dish sections are juxtaposed and latched;

said front sidewall of said dish section being sufficiently resilient when pushed inwardly to allow the latching tongue to be retracted inwardly of the inner edge of the surfaces defining said latching aperture and to bias said latching tongue outwardly through said latching aperture when said front sidewall of said dish section is released so that said latching tongue projects over its associated web, and said sidewall of said dish section maintaining an outward bias against said sidewall of said cover section to maintain said hinging and latching mechanisms in a hinged and latched condition and to help prevent accidental opening of said package.

3,968,922
FRUSTO-PYRAMIDAL BOX WITH HINGED LID

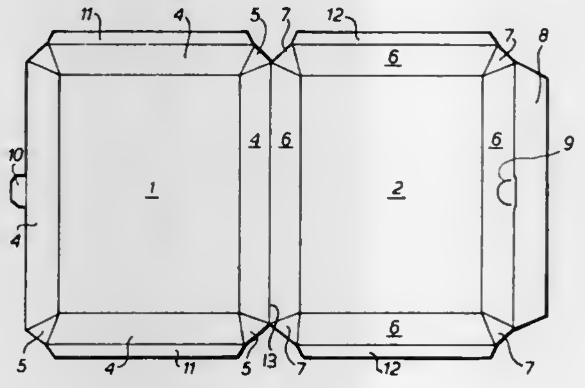
Gunnar Ruud, Lundgardsvel 63, 1700 Sarpsborg, Norway

Filed Mar. 4, 1975, Ser. No. 555,251

Claims priority, application Norway, Mar. 6, 1974, 740778/74

Int. Cl.^{2} B65D *5/26, 5/66*

U.S. Cl. 229—33 **1 Claim**



1. A box having a frusto-pyramidal base and a frusto-pyramidal lid hinged thereto, the box sidewall opposite the hinge having a locking tab thereon, the lid having a support tab foldably connected to the lid sidewall which is opposite said hinge, said support tab having a width such that when the box is closed and the support tab is disposed inside the box, the free edge of the support tab contacts the bottom of the box to support the lid, there being a slot through said lid adjacent said support tab to receive said locking tab.

3,968,923
HOLLOW WALL CARTON CORNER ARRANGEMENT

Richard L. Bell, Phoenixville, and Richard T. Walter, Norristown, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed July 28, 1975, Ser. No. 599,668

Int. Cl.^{2} B65D *5/22*

U.S. Cl. 229—34 HW **5 Claims**

1. In a reinforced, interlocking, corner construction arrangement for a hollow wall carton formed from a unitary blank of foldable paperboard, the combination of:

a. a bottom wall;
b. opposed pairs of hollow first and second side walls upstanding from said bottom wall and joined to each other at the corners of said carton to form a tray open at the top;
c. each of said side walls being hollow and comprising:
    i. an outer panel foldably connected at its lower edge to a related side edge of said bottom wall;
    ii. a top panel foldably connected at its outer edge to the upper edge of said outer panel;
    iii. an inner panel foldably connected at its upper edge to the inner edge of said top panel;
    iv. a retaining flap foldably connected at its outer edge to the lower edge of said inner panel, and disposed in full-face engagement with said bottom wall;
d. a first corner flap foldably connected at one edge to an end of said first wall inner panel, and having a reinforcing panel foldably connected thereto along a side edge extending normal to said one edge thereof;
e. a second corner flap foldably connected at one edge to an end of said second wall outer panel, and having a reinforcing panel foldably connected thereto along a side edge extending normal to said one edge thereof;
f. said first corner flap being folded normal to said first wall inner panel and being secured in full-face engagement to the inner surface of said second side wall outer panel;
g. said first corner flap reinforcing panel being interposed between the inner and outer panels of said second side wall to provide added rigidity for said second side wall;
h. said second corner flap being folded normal to said second wall outer panel and being secured in full-face engagement to the inner surface of said first side wall outer panel;
i. said second corner flap reinforcing panel being interposed between the inner and outer panels of said first side wall to provide added rigidity for said first side wall.

3,968,924
BULB CARTON

Walter J. Tyrseck, Quaker Hill, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

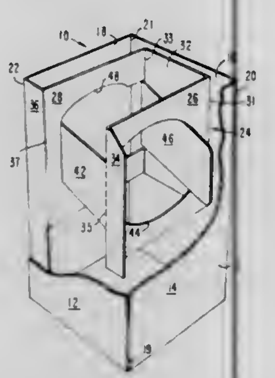
Filed July 28, 1975, Ser. No. 599,389

Int. Cl.^{2} B65D *85/42*

U.S. Cl. 229—39 B **4 Claims**

1. A carton for protectively enclosing a bulbous article comprising

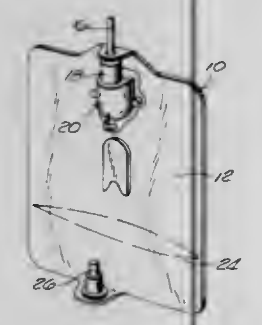
A. four wall panels hinged together to form a tube,
B. a generally U-shaped partition structure within the tube, the legs of said partition structure constituting partition panels spaced generally parallel to a first pair of opposite wall panels,
C. means for hinging opposite side edges of the bridging portion of the U-shaped partition structure to one panel in the second pair of opposite wall panels,
D. means for hinging the free end edges of the legs of the U-shaped structure to the other wall panel in the second pair of opposite wall panels, and
E. a single lateral tongue struck from each partition panel leaving an opening in each partition panel, said tongues

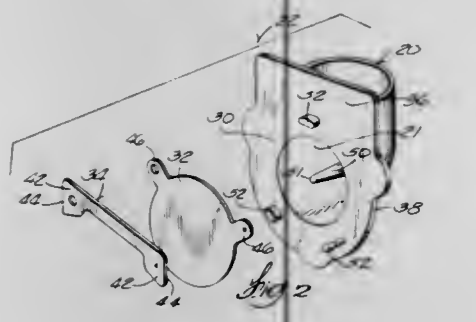


having their roots at the hinges of said bridging portion and leg respectively to the second pair of wall panels, being longer than the width of the bridging portion, and positioned to extend between the wall panels and an article positioned between the partition panels and received and retained in the openings.

3,968,925
ANTI-REFLUX VALVE

Ray H. Johnston, Greenfield; Bryon L. Mather, Milwakee, and Clark, James L., Whitefish Bay, all of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.
Filed May 12, 1975, Ser. No. 576,377
Int. Cl.² F16K ***15/14***
U.S. Cl. 229—62.5 **4 Claims**

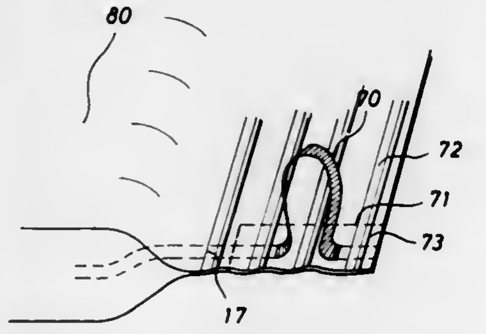




1. An anti-reflux valve for a fluid drainage bag comprising:
a connector member fastened to a wall of said bag and having an inlet port communicating with the inside of said bag;
a valve seat surface on said connector member surrounding said inlet port thereof;
a flexible valve element mounted on said connector member on the inside of said bag and generally overlying said valve seat surface at said inlet port, said valve element being of generally circular shape and having two radially extending ears; and
valve element retaining means for retaining said valve element on said connector member, said valve element retaining means including a retaining member in the form of a strip of plastic material having a pair of end portions with the edges of said end portions bonded to said connector member to form a pair of retaining pockets in which said radially extending ears of said valve element are slidably captured so that said valve element will be retained for limited relative transverse movement with respect to said valve seat surface, said valve element adapted for movement to an open position upon flow of fluid through said inlet port into the bag and further adapted for movement to a closed position into sealing engagement with said valve seat surface in response to fluid pressure exerted on said valve element from inside the bag.

3,968,926
TEARSTRIP PACKAGE

Albert Emiel Smolderen, Aartselaar, and Joseph Marie Cappuyns, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium
Division of Ser. No. 192,021, Oct. 26, 1971, Pat. No. 3,795,080. This application Oct. 26, 1973, Ser. No. 409,966
Claims priority, application United Kingdom, Oct. 26, 1970, 50835/70
Int. Cl.² B65D ***5/54***
U.S. Cl. 229—66 **3 Claims**



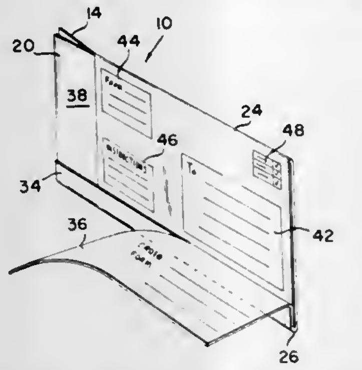
1. A package comprising a wrapping of flexible sheet material sealed along side edges to form a flat tube and having the front and rear marginal strip portions transversally sealed together along end edges of said material, a tearstrip for opening said wrapping disposed lengthwise inside said wrapping with its ends embedded within the respective sealed together marginal strip portions, said tearstrip having a length exceeding the overall length of said wrapping to provide a reserve tearstrip length intermediate said embedded ends, a corner section of at least one of said sealed marginal portions which has the tearstrip end embedded therein being connected to the remainder of said marginal portion through a line of weakening, and an opening in said sheet material spaced from the end edges of said sealed material and adjacent said weakened corner section through which opening said reserve tearstrip length projects exteriorly in the form of a loop, whereby when said corner section is manually separated from said package along said line of weakening with the tearstrip end embedded therein, said reserve length is released permitting said corner section and tearstrip end to be firmly gripped by hand and pulled to sever said wrapper and open said package.

3,968,927
MAIL ORDER ENVELOPE ASSEMBLY

Robert E. Katz, 17 Camelot Drive, Livingston, N.J. 07039, and Leo Zern, 48 Old Field Lane, Great Neck, N.Y. 11020
Filed Mar. 5, 1975, Ser. No. 555,340
Int. Cl.² B65D ***27/00***
U.S. Cl. 229—70 **5 Claims**

1. A pre-printed mail order envelope assembly, comprising:
a. a single pre-printed elongated sheet folded along two parallel fold lines to give three superposed rectangular panels, both ends of each panel being in registry with the corresponding ends of the other panels,
b. a major portion of the intermediate panel and the opposed portion of one outside panel, forming opposed, elongated envelope sections which extend from one end of the pre-printed sheet and which are of the same width,

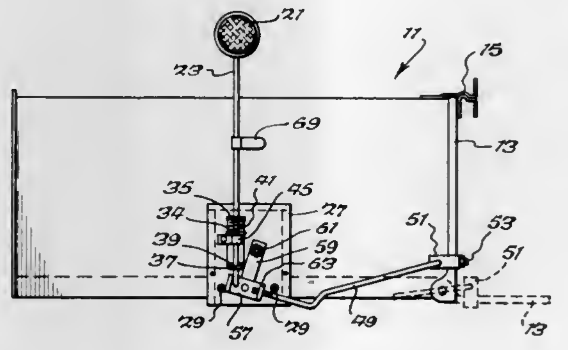
c. a strip of adhesive disposed between said opposed envelope sections adjacent and parallel to their one end and joining them together to form the bottom of an envelope,
d. the two parallel fold lines forming elongated side edges of the envelope,
e. the remaining part of one of the panels having an envelope section being an envelope flap to which glue has been applied,
f. the remaining part of the other of the panels having an envelope section being an address coupon which is separated from its envelope section by a transverse perforate line,
g. the envelope flap and the address coupon being separated from each other along two slits which extend from and are in alignment with the two parallel fold lines,



h. a glue strip disposed between the intermediate and the other outside panel adjacent one of said fold lines, said fold line connecting the two outside panels together, said glue strip joining said other outside panel and said intermediate panel together along that side,
i. the third panel being a coupon which is separable from the envelope along a perforate line extending parallel and adjacent to the glue strip for the entire length of said other outside panel,
j. the glue strips being applied to the surface of the single pre-printed sheet such that they are disposed on only one side thereof prior to folding,
k. the outside surfaces of the two outer panels containing printed advertising material.

3,968,928
MAIL BOX ROTATABLE SIGNAL

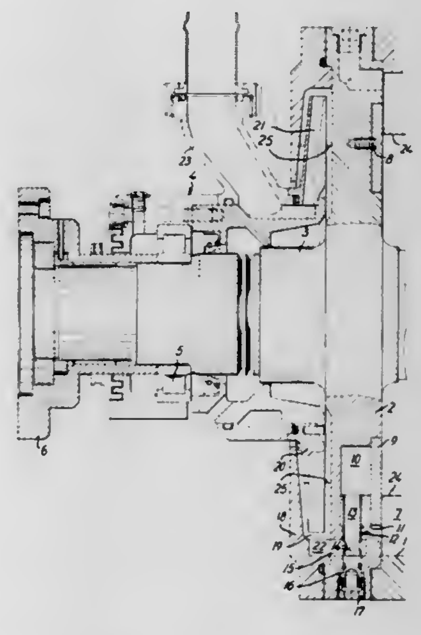
Victor L. Caldwell, R.D. No. 1, Medina, N.Y. 14103
Filed Mar. 21, 1975, Ser. No. 560,621
Int. Cl.² B65D ***91/00***
U.S. Cl. 232—35 **7 Claims**



1. A signalling device for a rural mail box having a door comprising: a signal adjustably mounted on a vertical spindle for rotation with said spindle, said spindle having its lower end bent to project substantially horizontally; a pull rod detachably and pivotally connected at one end to said door and adapted to be moved in generally horizontal, opposite directions as said door is opened or closed; said spindle and said pull rod being operatively connected by a pivotally mounted yoke, said yoke having a lug thereon adapted to engage said bent lower end of said spindle whereby to turn said spindle only when said lug is moved in one direction by opening of said door but not engaging said spindle when said lug is moved in the other direction by subsequently closing said door, said yoke having an adjustable connection with the other end of said pull rod whereby to vary the movement of said yoke.

3,968,929
CENTRIFUGE

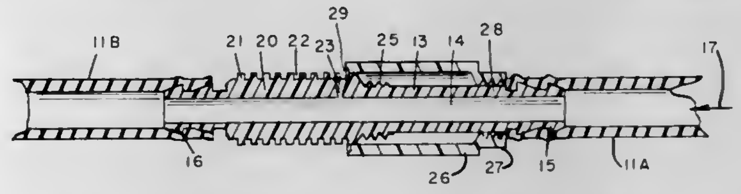
Henry Frederik Olesen, Lyngby, Denmark, assignor to Titan Separator A/S, Soborg, Denmark
Filed Apr. 15, 1975, Ser. No. 568,352
Claims priority, application Germany, Apr. 22, 1974, 2419355
Int. Cl.² B04B ***11/00***
U.S. Cl. 233—21 **7 Claims**



1. A centrifuge comprising means defining a separating space having an end wall and a peripheral wall, means for introducing a raw material into said separating space, a discharge chamber separate from said separating space, at least one liquid flow conduit connecting said separating space with said discharge chamber and having a liquid inlet end opening into said separating space, said liquid inlet end being formed by an insert mounted in an outer wall of the centrifuge and accessible for replacement from the outside of said outer wall, and a skimmer disc mounted in said discharge chamber for withdrawing liquid therefrom.

3,968,930
DRIP IRRIGATION DEVICE

Ralph L. Hendrickson, 3649 Noble Ave. North, Robbinsdale, Minn. 55422
Filed Mar. 31, 1975, Ser. No. 563,721
Int. Cl.² B05B ***15/02***
U.S. Cl. 239—107 **10 Claims**

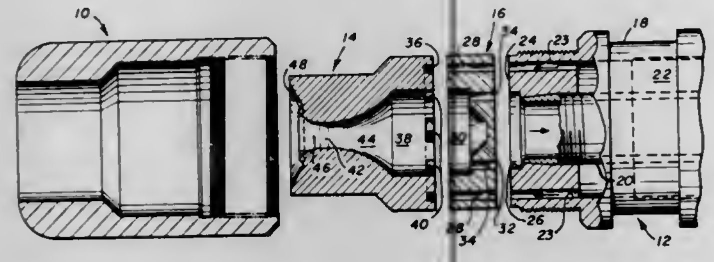


1. A device for providing a restricted flow of a fluid comprising a core having opposite ends, means to attach the core member to a source of a fluid, said core member having an interior passageway carrying said fluid, a discharge passageway leading from the interior passageway of said core member to the exterior thereof, and a housing member overlying portions of said core member when in a first position, means cooperating between said housing member and the exterior of said core member to define an enclosed restricted flow path from said discharge passageway to atmosphere, said core

member and said housing being of relative length so that said housing can be shifted axially relative to said core member to a second position where substantially all of said restricted flow path is uncovered for cleaning while said housing is located between the ends of the core member and the core member is attached to the source of fluid.

3,968,931
PRESSURE JET ATOMISER

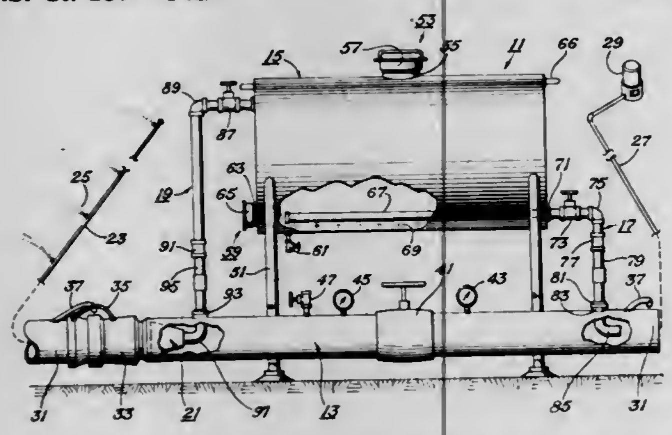
Donald A. Smith, Haddam, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Oct. 6, 1975, Ser. No. 619,975
Int. Cl.² B05B *9/00, 1/34*
U.S. Cl. 239—125 **25 Claims**



1. A pressure jet atomiser comprising:
- swirl chamber means, said chamber means defining a vortex chamber having a cylindrical shape, said chamber being open at least at a first discharge end;
- means for delivering a fluid to be atomised to said vortex chamber, said delivering means discharging the fluid into said chamber tangentially to the chamber wall whereby a forced vortex is formed;
- means for accelerating the forced vortex, said accelerating means being connected to the open first end of said cylindrical vortex chamber and having a smooth curved contracting passage therethrough, said passage being coaxial with said chamber whereby the diameter of the forced vortex exiting said chamber is reduced at a decreasing rate;
- a diffuser, said diffuser having a smoothly curved wall which diverges away from an extension of the axis of said cylindrical vortex chamber and accelerating means passage; and
- means defining a nozzle throat, said throat coupling the minimum diameter downstream end of said accelerating means to the minimum diameter upstream end of said diffuser, said throat having a constant diameter, the wall of said throat being tangent to the walls of said accelerating means passage and said diffuser.

3,968,932
APPLICATOR

Ardean Kimmell, Rte. 3, DeLeon, Tex. 76444
Filed Nov. 3, 1975, Ser. No. 627,944
Int. Cl.² B05B *7/24*
U.S. Cl. 239—142 **14 Claims**



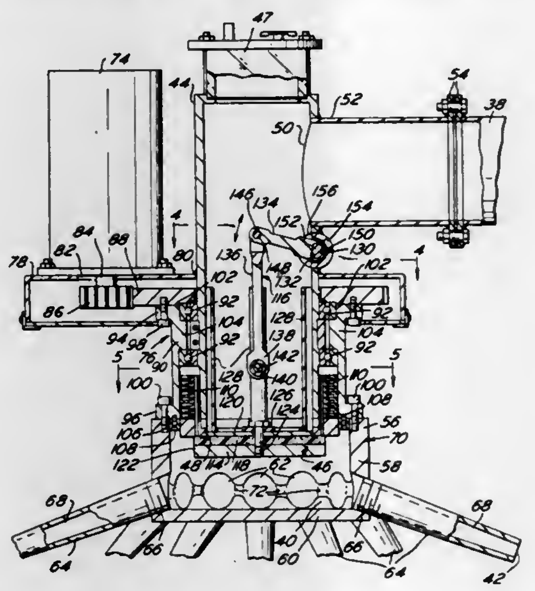
1. An applicator for applying chemicals to soil and the like comprising:
- a. a section of main tubular conduit having at its respective ends connection means for being connected into an irrigation line having a plurality of sprinklers connected with a source of pressurized water;
- b. a main container disposed adjacent said main tubular conduit;
- c. fill means for filling said main container with said chemicals to be applied to said soil; said fill means being disposed adjacent the top of said main container and communicating with the interior thereof;
- d. drain means for draining said main container; said drain means being disposed adjacent the bottom of said main container and communicating with the interior thereof;
- e. fluid inlet conduit disposed linearly of said main container adjacent the bottom thereof for conducting water into said main container; said fluid inlet conduit having spray means directed toward the bottom of said main container for maintaining said chemicals agitated in said water within said main container; said fluid inlet conduit extending into, sealingly penetrating through side walls of and communicating with the interior of said main tubular conduit for conducting water therefrom;
- f. effluent conduit sealingly connected with said main container for conducting fluid containing said chemicals therein into said main tubular conduit; said effluent conduit extending into, sealingly penetrating through side walls of, and communicating at its terminal end with the interior of said main tubular conduit for dispensing certain chemicals thereinto;
- g. admixing nozzle means connected with said terminal end of said effluent conduit within said main tubular conduit for effecting dilute, substantially uniform admixture of said chemicals at widely varying flow rates and widely varying pressures; said admixing nozzle means including an entry chamber having a plurality of apertures for dispensing said fluid containing said chemicals, and having a flaring skirt portion directed downstream and extending radially outwardly to within a distance of said side walls of said main tubular conduit sufficient to cause turbulence immediately downstream of said apertures in said admixing nozzle means and back pressure on said fluid inlet conduit adequate to effect substantially uniform admixture of said chemicals at said widely varying pressures and flow rates;

whereby substantially uniform application of said chemicals is made on a field having even large elongate dimension.

3,968,933
APPARATUS FOR HYDRAULIC PLANTING

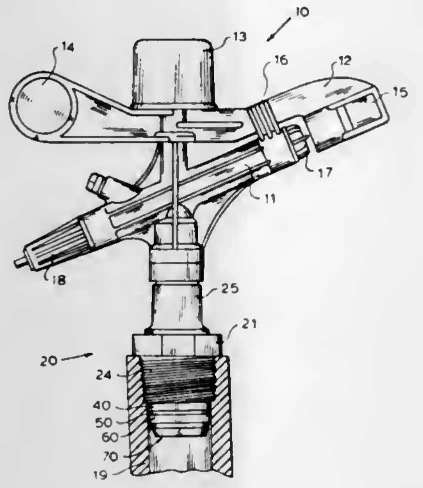
John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.
Division of Ser. No. 422,817, Dec. 7, 1973, Pat. No. 3,920,184. This application Jan. 27, 1975, Ser. No. 544,091
Int. Cl.² B05B *17/02;* **B64D** *1/18*
U.S. Cl. 239—171 **19 Claims**

1. Apparatus for dispensing a suspension of particulate matter and an elastic carrier fluid in a well defined area on the ground from above the ground, said apparatus comprising, a spray head and means for rotating said spray head, said spray head having a common central chamber having an entrance, with plural nozzles projecting radially therefrom and in fluid communication therewith, each of said nozzles including an open orifice and with no valve means between said chamber and said orifices, means for feeding the suspension to said chamber, and a common valve at the entrance of said chamber and in fluid communication with said feeding means and said chamber for adjusting the rate at which said suspension is supplied to said chamber, whereupon said suspension is enabled to freely flow through said valve means, said chamber and out of said open orifices as the result of the rotation of said spray head.



3,968,934
SPRINKLER HEAD BEARING MEANS

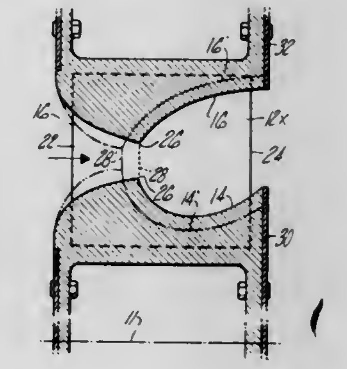
Mark Healy, 1738 Blossomwood Lane, Orlando, Fla. 32808
Filed July 7, 1975, Ser. No. 593,373
Int. Cl.² B05B *3/14;* **F16L** *19/00*
U.S. Cl. 239—230 **16 Claims**



1. A rotatable sprinkler head apparatus comprising in combination:
- a swivel having attaching means for connection to a source of water under pressure, said swivel having a bore therethrough, and further having a coupling ridge on one end thereof;
- spindle means movably mounted through said bore of said swivel and connected at one end to said sprinkler head apparatus, said spindle means having a flange at the opposite end thereof, and further having a bore between its ends;
- wear washer means located on said spindle means and being located between said flange and said coupling ridge of said swivel;
- a first seal located on said spindle means between said coupling ridge of said swivel and said wear washer means, said first seal having on one side thereof a first lip extending about the edge portion thereof overlapping said coupling ridge of said swivel, and first seal having a second lip extending about the edge portion thereof on the opposite side thereof and overlapping with said wear washer means;
- a second seal located on said spindle means between said flange and said wear washer means, said second seal having a first lip on one side thereof extending about the edge portion thereof overlapping said wear washer means, with said second seal having further a second lip on the opposite side thereof extending about the edge portion thereof and overlapping said flange section of said spindle means, whereby surfaces of said wear washer, said spindle means, and said swivel are protected from the entry of sand or other contaminants.

3,968,935
CONTOURED SUPERSONIC NOZZLE

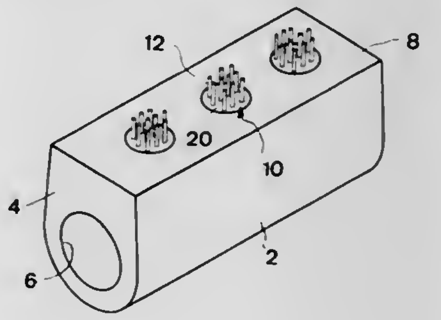
John S. Sohre, 1 Lake View Circle, Beaver Lake, Ware, Mass. 01082
Continuation-in-part of Ser. No. 362,402, May 21, 1973, abandoned. This application July 24, 1974, Ser. No. 491,392
Int. Cl.² B05B *15/00, 17/00*
U.S. Cl. 239—289 **23 Claims**



1. A convergent-divergent nozzle including:
- a pair of opposed spaced apart side walls;
- a top wall extending between said side walls; and
- a bottom wall spaced from said top wall and extending between said side walls;
- said top and bottom walls and said side walls cooperating to define a flow passageway; and
- said top and bottom walls being contoured to cooperate with each other to define at least the throat of the nozzle and a divergent section downstream of the throat, said contouring of said top and bottom walls defining a symmetric flow passage therebetween in the direction of flow downstream of said throat.

3,968,936
AIR OUTLET APPARATUS

Josef Brühlmeier, Wettingen, Switzerland, assignor to Luwa AG, Zurich, Switzerland
Filed Sept. 30, 1974, Ser. No. 510,429
Claims priority, application Switzerland, Oct. 8, 1973, 14306/73
Int. Cl.² B05B *1/14*
U.S. Cl. 239—550 **5 Claims**



1. An air outlet apparatus comprising an air compartment, a plate bounding said air compartment, said plate being provided with openings distributively arranged over its length, each of the openings in the plate possessing an essentially circular-shaped configuration and bounded by an edge means, each of said openings being sealingly occupied by a detach-

ably secured nozzle block, each nozzle block containing a number of protruding nozzles, each nozzle block possessing a flange which engages over the plate and cam means which engage beneath the plate for detachably securing each nozzle block inserted into one of said openings at the plate, the cam means of each nozzle block being formed at the region of a substantially cylindrical portion of the nozzle block which is bounded in axial direction by the flange, and each of the edge means bounding the associated opening in the plate possess recesses which permit the throughpassage of the cam means.

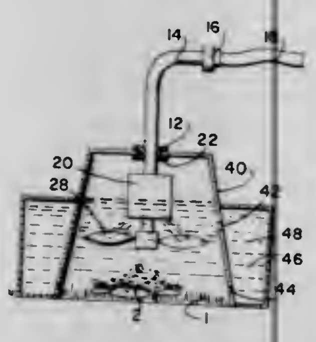
3,968,937
DROPPING DISPOSING

Gaylord R. Miller, 6561 Hawaii Kai Drive, Honolulu, Hawaii 96825

Filed Apr. 19, 1974, Ser. No. 462,503

Int. Cl.² B02C *19/12*

U.S. Cl. 241—5 **10 Claims**



7. The method of disposing of droppings comprising placing a chamber over the droppings and spinning water into the chamber; solubilizing the droppings, dissolving the droppings, flowing water from the chamber into a ballast tank and holding water within the ballast tank and the chamber while dissolving the dropping, and lifting the chamber from the droppings and flowing the dissolved droppings and water from the chamber, and dispersing the solution.

3,968,938
SYSTEM FOR HANDLING DEBRIS

Walter Franklin Ruhl; Albert W. Nelson; Jesse J. Lucy, all of Greenville, Ohio, and Gerald N. Marshall, Union City, Ind., assignors to Lambert Corporation, Dayton, Ohio

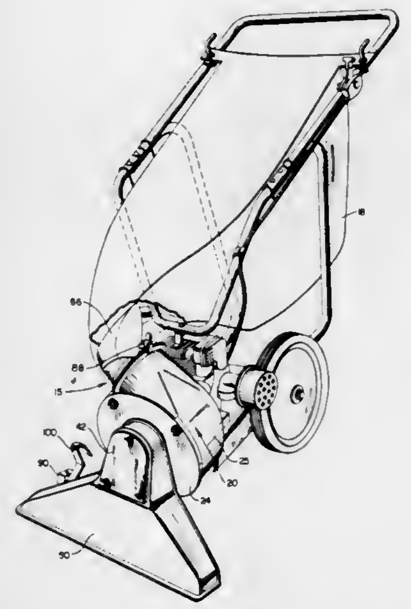
Filed Sept. 10, 1974, Ser. No. 504,484

Int. Cl.² B02C *18/06*

U.S. Cl. 241—101.1 **5 Claims**

1. A system for handling debris, such as leaves, twigs, refuse and the like, convertible for use as a blower or as a vacuum, comprising:

- a wheeled frame;
- a device mounted on said frame including an impeller housing having a vertical rear wall, a vertical front wall and a side wall therebetween having a cylindrical inner surface and a top discharge chute extending tangentially outwardly from said surface, an impeller having a circular disc vertical rear support and a hub extending axially forward from said support and two substantially radial blades extending longitudinally of and substantially diametrically outwardly from the hub, said hub being adapted for coupling to a rotatable stub shaft extending through said rear wall, said front wall being spaced forwardly of said impeller and having an inlet hole larger than and axially aligned with said hub, a vacuum nozzle connected to and extending forwardly and downwardly from said front wall past said front wall and said frontwall inlet hole and having a front inlet hole in axial alignment with said front wall inlet hole;
- an intake device optionally and removably mounted on said vacuum nozzle over said front inlet hole to allow for flow through said front wall inlet hole;
- an exhaust device optionally and removably mounted on said discharge chute to allow exhaust flow therethrough;
- three shredding bars longitudinally connected to the housing inner surface, each having a leading shredding elongated corner presenting a radial face, an edge and a peripheral face for debris shredding, one of the bars being positioned at the tangential connection of the chute to the inner surface and the other two bars being positioned at 120° locations therefrom so that only one blade at a time passes a shredding bar;
- said blades each having an outer longitudinal peripheral edge and a forwardly flaring radial flange extending in the direction of rotation for coacting with said inner surface and shredding bars to produce an air and debris flow through the front wall inlet hole and the housing and the discharge chute and to shred the debris while in the housing.



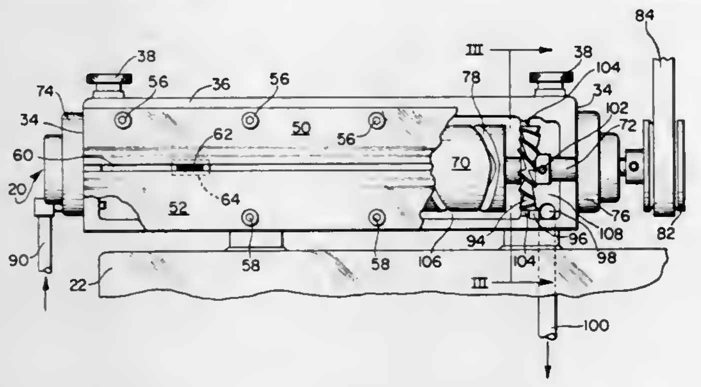
3,968,939
TRAVERSE CAM LUBRICATION

William Malcolm Bense, Barrington, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed May 2, 1975, Ser. No. 573,873

Int. Cl.² B65H *54/28;* **F16N** *17/06*

U.S. Cl. 242—43 R **5 Claims**



1. In a traverse mechanism for winding apparatus the combination comprising, a housing having an elongated slot therein, an elongated member supported on a shaft rotatably journaled in said housing, said member being operatively connected with a strand guide, said guide extending through said slot and reciprocated from end to end of said slot on rotation of said member in a position to engage and traverse an advancing strand onto a rotating package, means for introducing oil mist into one end of said housing, and an impeller mounted on said shaft near the other end of said housing adjacent vent means whereby on rotation of said member said impeller creates a zone of reduced pressure within said housing thereby drawing said oil mist within the housing and directionally away from said slot and venting the pressure through said vent means.

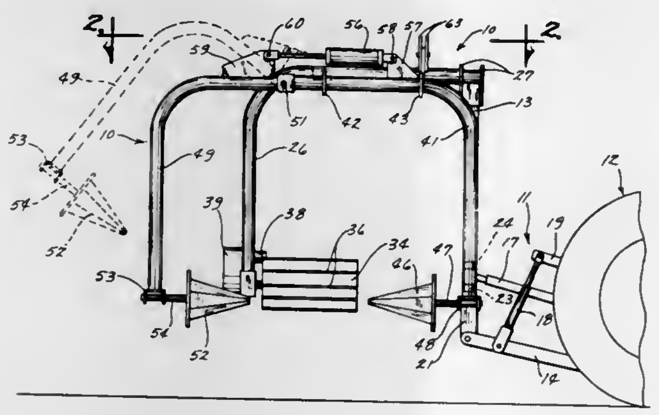
3,968,940
APPARATUS FOR HANDLING BALES

Byron L. Godbersen, 710 Circle Drive, Ida Grove, Iowa 51445

Filed July 10, 1974, Ser. No. 487,244

Int. Cl.² B65H *17/06, 75/42*

U.S. Cl. 242—86.5 R **18 Claims**



18. An apparatus for attachment to the three-point hitch of a tractor for handling round bales comprising:

- frame means adapted to be connected to the hitch for vertical movement thereby;
- first means secured to the frame means and extended rearwardly therefrom, said first means including a rotatable drum the axis of rotation of which extends parallel to the direction of movement of the tractor;
- second means mounted on said first means for movement laterally thereof, said second means including a first arm pivotally mounted on said first means, and a second arm pivotally connected to said first arm, each of said pivotally connected arms having a hub rotatably mounted thereon;
- means mounted on said second means for pivotally moving said second arm from a first position wherein said hubs are axially aligned for holding a bale therebetween in engagement with said drum, to a second position wherein said second arm and its hub are spaced upwardly and away from the other arm and hub; and
- means for axially rotating said drum to unroll the bale completely until it is gone from between said hubs, said second means freely movable toward said first means as the bale is unrolled.

3,968,941
INTERBIASED DOUBLE TAPE SPOOL ASSEMBLY

Kenneth A. Catto, Beaverton, Oreg., assignor to Telephonax, Inc., Portland, Oreg.

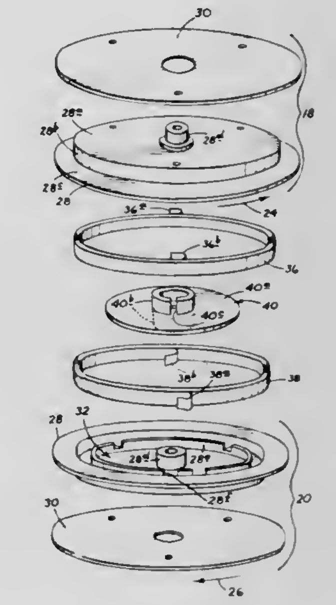
Filed Apr. 4, 1975, Ser. No. 565,203

Int. Cl.² G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—193 **10 Claims**

1. A tape spool assembly for accommodating reversible movement of a magnetic recording tape, or the like, comprising

- a pair of spools for carrying such a tape mounted in side-by-side relation for rotation on a common axis,
- a plate positioned between said spools and mounted for rotation relative to both spools on the same common axis, and
- a pair of biasing means with one operatively interposed and acting between said plate and one of said spools tending to urge relative rotation therebetween in one direction, and with the other operatively interposed and acting between said plate and the other spool tending to urge relative rotation therebetween in the opposite direction.



3,968,942
MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

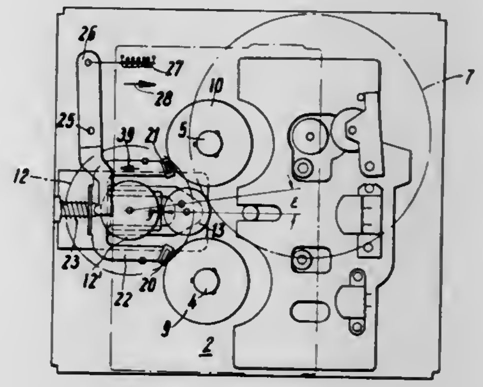
Günter Wrobel, Villingen, and Georg Papst, St. Georgen, both of Germany, assignors to Papst-Motoren KG, Germany

Filed Oct. 21, 1974, Ser. No. 516,782

Claims priority, application Germany, Oct. 26, 1973, 2353856

Int. Cl.² G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—204 **19 Claims**

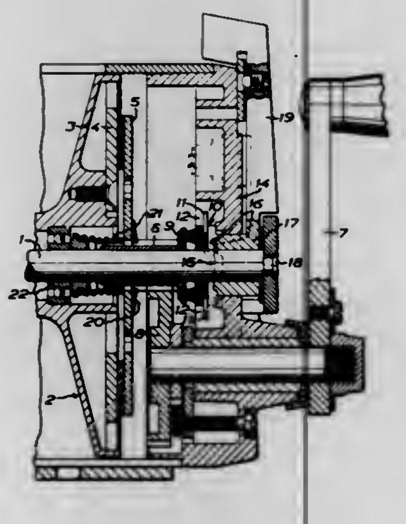


1. Magnetic tape recording and/or reproducing apparatus comprising in combination:

- two tape winding hubs;
- a first electric motor for driving said hubs and having a drive shaft disposed non-coaxially with the rotational axes of said hubs;
- means for selectively coupling the drive shaft of said first motor to either one of said hubs depending on the required direction of movement of a magnetic tape;
- a tape drive capstan;
- and a second electric motor for driving said tape and having a drive shaft coaxial with and coupled to said capstan, said second motor being generally flat in shape, having at least four pairs of poles, and being disposed at substantially the same level and alongside said first motor.

3,968,943
SLIDING CLUTCH FISHING REEL

Åke Eugen Murvall, Svangsta, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden
Filed Dec. 4, 1974, Ser. No. 529,378
Claims priority, application Sweden, Nov. 20, 1973, 7315660
Int. Cl.^{2} A01K *89/00*
U.S. Cl. 242—212 **5 Claims**

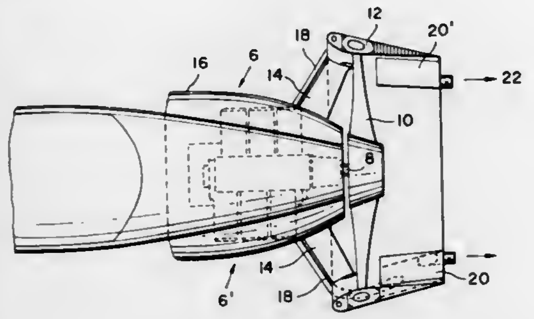


1. A fishing reel comprising a rotatable part, a hand crank, a transmission and an adjustable clutch in said transmission for connection of said crank with said rotatable part with an adjustable sliding force, said clutch comprising two clutch members, at least one of which is movable in relation to the other to and from a fully inter-engaged position of said clutch members, adjustable spring means for exerting adjustable resilient inter-engagement force on said sliding clutch members, and adjusting means for adjusting said spring means and thereby adjusting said inter-engagement force of said sliding clutch, said spring means comprising two washers mounted coaxial and relatively movable, one of said washers being an arched spring washer mounted between and in contact with two surfaces, one of which is movable by said adjusting means to press said spring washer with adjustable force against the other surface for exerting said adjustable resilient inter-engagement force on said clutch members, wherein said arched spring washer has a diameter substantially greater than that of the other washer and said other washer is mounted between the concave side of said arched spring washer and adjacent one of said surfaces for dividing the total spring plane of the arched spring washer into two coaxial portions, whereby the arched spring washer, when pressed between said surfaces, is first subjected to resilient deformation over an area which comprises the portion thereof situated outwardly of the outer circumferential edge of said other washer and then, when in contact with said other washer and further pressed, is subjected to resilient deformation restricted substantially to the portion thereof situated inwardly of the outer circumferential edge of the said other washer.

3,968,944
AIRCRAFT WITH SHROUDED PROPELLER DRIVE

Friedhelm Zimmer, Markdorf, and Zimmer Herbert, Friedrichshafen, both of Germany, assignors to Dornier GmbH, Germany
Filed Feb. 27, 1975, Ser. No. 553,611
Claims priority, application Germany, May 31, 1974, 2426628
Int. Cl.^{2} B64D *33/06*
U.S. Cl. 244—1 N **1 Claim**

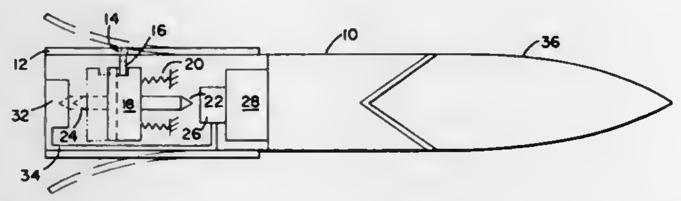
1. In an aircraft having a tail-mounted, shrouded pusher-type propeller and an engine mounted in front of the shroud,
the improvement comprising exhaust pipe means running from said engine to said shroud,
said shroud having sound absorbing means therein including a plurality of means connected to individual cylinders or cylinder groups,



and said exhaust pipe means forming the leading edges of struts supporting said shroud and being connected to a circular pipe line in the nose of the shroud.

3,968,945
SHAPED MINI CHARGE ROUND

John E. Walton, Camillus, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed July 11, 1974, Ser. No. 487,359
Int. Cl.^{2} F42B *13/10, 13/32*
U.S. Cl. 244—3.28 **2 Claims**



1. A mini charged round having a shaped charge for destroying incoming mortar, rocket and artillery shells, said round comprising: a case having a plurality of spring fins attached on the outside thereof; an inertia block mounted for axial movement within said case; means for exerting a force on said block; said block being provided with a recess therein; a locking pin attached to one of said fins for entering said recess and preventing axial movement of said block; said round including a charge and means for igniting said charge positioned forward of said block; means carried by said block for striking said ignition means; delay ignition means in said case and means for striking and igniting said delay ignition means, said means for igniting said delay ignition being a striker carried on the rear side of said block.

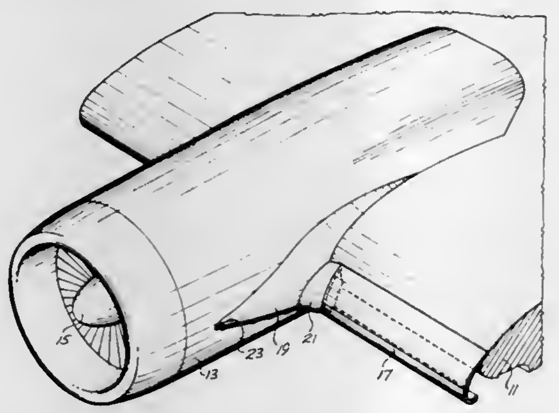
3,968,946
EXTENDABLE AERODYNAMIC FAIRING

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 31, 1975, Ser. No. 563,297
Int. Cl.^{2} B64C *7/00*
U.S. Cl. 244—42 D **6 Claims**

1. An extendable aerodynamic fairing suitable for use between an engine nacelle and a wing leading edge flap for filling the gap between said engine nacelle and said wing leading edge flap when said wing leading edge flap is extended, said extendable aerodynamic fairing comprising:

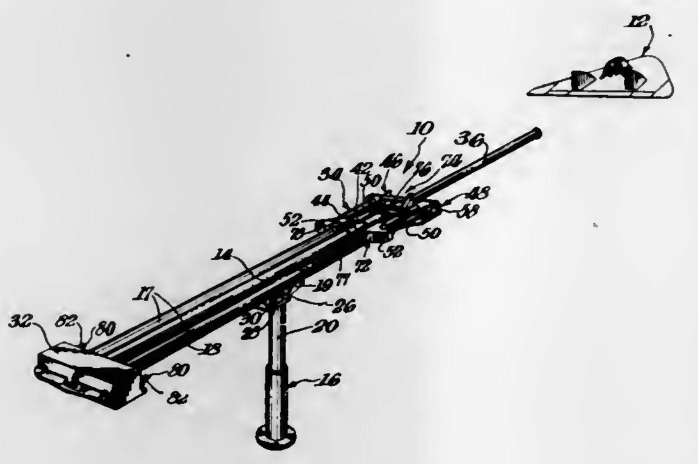
a fixed fairing section attached to said engine nacelle in an aerodynamic manner, said fixed fairing section starting at a point on the outer surface of said nacelle substantially forwardly of the leading edge of the wing with which said leading edge flap is associated and flairing outwardly toward the upper and lower surfaces of said wing, said fixed fairing section also diverging outwardly into a plateau spaced from said nacelle, a cavity formed in said plateau, said cavity having an opening generally aligned with said leading edge flap when said leading edge flap is extended; and,

an extendable fairing section mounted in said cavity in said fixed fairing section for lateral movement between a retracted position whereat said extendable fairing section is substantially entirely housed within said cavity and an extended position whereat said extendable fairing section is brought to a position adjacent to the nearest edge of said leading edge flap when said leading edge flap is extended, said extendable fairing section being formed such that it forms a smooth aerodynamic joint with said leading edge flap when positioned adjacent said leading edge flap and the leading edge flap is extended.



3,968,947
LAUNCHING APPARATUS FOR FLYING DEVICE

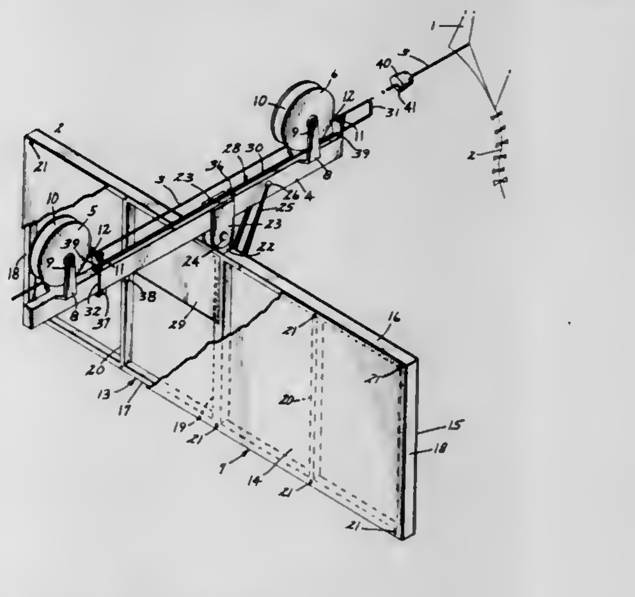
William R. Schlegel, Wilmington, Del., and John J. Hennessey, Springfield, Pa., assignors to All American Industries, Inc., Tomaston, Conn.
Filed Jan. 14, 1975, Ser. No. 540,864
Int. Cl.^{2} B64F *1/06*
U.S. Cl. 244—63 **25 Claims**



1. A launching apparatus for a flying device comprising an elongated telescopic tube assembly, said telescopic tube assembly being mounted upon a support and having rear and front ends, said telescopic tube assembly having a rear open end and a closed front end having at least one stationary tube and at least one movable launching tube, a hollow space within said telescopic tube assembly, a base, a receiver of pressurized fluid being directly connected to said hollow space by conduit means, said conduit means having cross-sectional area large enough to substantially prevent throttling when said pressurized fluid expands, latching means securing said launching tube to said base for restraining said launching tube to said base against the force of said pressurized fluid, bracket means on said launching tube for connection of the forward motion of said launching tube to said flying device, latch release means connected to said latching means for allowing said launching tube to be propelled forward in a full launching stroke in response to the expansion of the pressurized fluid whereby said flying device connected to said launching tube is rapidly propelled toward and past said front end of said telescopic tube assembly to launch said flying device into the air, said receiver of pressurized fluid being sufficient in conjunction with said hollow space to provide said full launching stroke, a source of pressurized fluid connected to said receiver and said latch release means being actuated after said receiver and telescopic tube assembly are charged with said pressurized fluid.

3,968,948
KITE ACCESSORY TOY

Willard C. Schmidt, 713 W. 7th St., Willmar, Minn. 56201
Filed June 4, 1975, Ser. No. 583,596
Int. Cl.^{2} B64C *31/06*
U.S. Cl. 244—155 R **1 Claim**



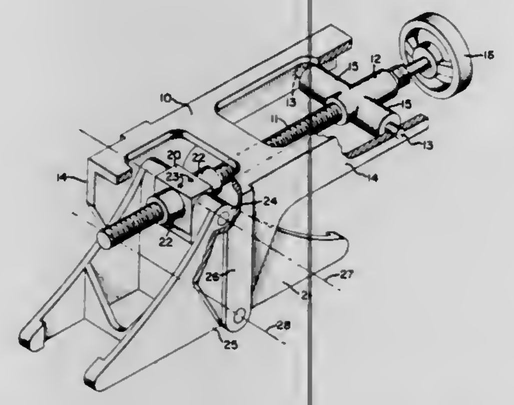
1. A kite accessory toy comprising:
a. an elongated body;
b. a pair of brackets each mounted on said body adjacent a different end of said body and projecting upwardly from said body;
c. a pair of trolley wheels each rotatably mounted in a different one of said brackets above said body, said trolley wheels having aligned circumferential radially outwardly opening grooves for reception of a kite string when the trolley wheels are placed in overlying engagement with said kite string;
d. a pair of retainer members, each retainer member projecting upwardly from said body adjacent a different one of said trolley wheels and disposed to closely underlie the kite string when said trolley wheels are in rolling engagement with the kite string, to retain the kite string in said trolley wheel grooves;
e. a sail extending generally transversely of said body;
f. a pair of cooperating pivotally connected hinge elements, one of said hinge elements being secured to said body and the other of said hinge elements being secured to said sail, said hinge elements hingedly mounting said sail to said body in underlying relationship to the body for swinging movements of the sail on a normally horizontal axis extending transversely of said body and between an operative position of said sail in a plane generally normal to the longitudinal dimension of the body and a folded position in a plane generally parallel to said longitudinal dimension;
g. yielding means urging said sail toward said folded position thereof;
h. an elongated latch element having a portion extending longitudinally of said body in overlying relationship to said body, said retainer members having openings therein supporting said latch element portion for sliding movements longitudinally of said body, said latch element having one end portion disposed longitudinally outwardly of one end of said body and in closely spaced relation to the kite string when said trolley wheels are mounted on

the kite string, said latch element having an opposite end underlying said body;
i. a stop element adapted to be mounted on the kite string for abutting enngagement with said one end portion of the latch element;
j. and a stop member on said sail disposed to engage said body to limit swinging movement of said sail toward its operative position, said stop member having a lip portion engaged by said opposite end of the latch element to releasably hold the sail in said operative position thereof.

3,968,949

PROJECTOR TILT MECHANISM

Frank A. Romano, Jr., Syracuse, N.Y., assignor to General Electric Company, Portsmouth, Va.
Filed July 18, 1974, Ser. No. 489,759
Int. Cl.^{2} F16F *15/00*
U.S. Cl. 248—11 **18 Claims**



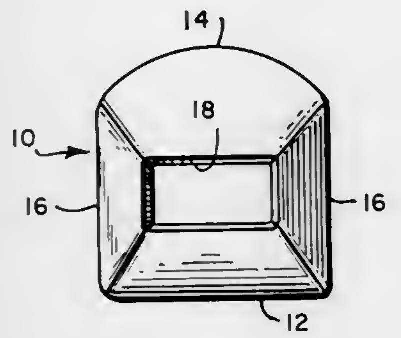
1. A mechanism having a platform for tilting a load carried on said platform, comprising:
a threaded shaft;
support means engaging said shaft and coupled to said platform so as to maintain said platform generally at a predetermined position with respect to said shaft;
a base, having first and second ends, said base being pivotable about said first end thereof for affecting movement of said platform in a first direction, said base being pivotable about said second end thereof for affecting movement of said platform in a second direction, said base pivoting responsive to the rotation of said shaft; and
threaded means pivotably mounted about an axis at a first location upon said base so as to be free to rotate through a first plane substantially orthogonal to said axis, said threaded means engaging said threaded shaft, said threaded means and said threaded shaft being rotatable relative to each other,
said platform being pivotally mounted at a second location upon said base, spaced apart from said first location so as to be free to rotate through a second plane substantially parallel to said first plane.

3,968,950

COMBINATION SUPPORT AND GUARD FOR A TOOTHBRUSH

George T. Gallo, 15 Cataldo Drive, Revere, Mass. 02151
Filed Apr. 10, 1975, Ser. No. 566,668
Int. Cl.^{2} F16M *13/00*; A46B *17/00*
U.S. Cl. 248—359 **4 Claims**

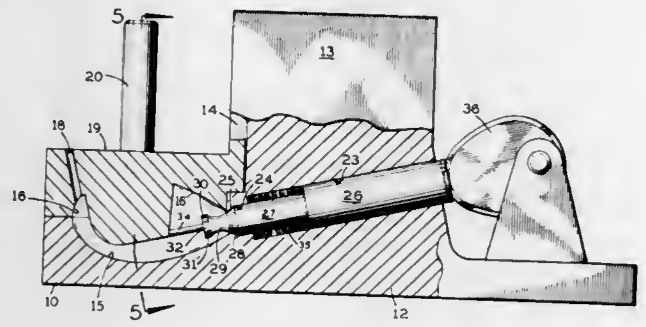
3. A combination support and guide for a toothbrush comprising, a part having a rigid periphery within which there is an elastically enlargeable opening for receiving the handles of toothbrushes having handles of different cross section, said peripheral surface embodying a straight bottom edge symmetrical with respect to the opening and spaced from the center thereof a distance such that when the part rests on said edge it supports a brush engaged within the opening with its back spaced from the surface on which the part rests, a curved top edge which is symmetrical with respect to the opening and is spaced from the center thereof a distance such that when the part is placed down on said edge it will support the bristles of the brush above the surface while rolling over to one side or the other and straight side edges at distances from the center such that when the part rolls over onto one side or the other the corresponding side of the head of the brush will be held spaced from the surface on which the part rests, said part being comprised of elastic material and being split axially along one side to enable enlarging the opening for receiving handles of different cross section.



3,968,951

METHOD AND APPARATUS FOR MOLDING AN ELASTOMERIC FISHING LURE BODY

Jack R. Zeman, P.O. Box 10167, Fort Lauderdale, Fla. 33305
Filed Oct. 9, 1974, Ser. No. 513,480
Int. Cl.^{2} B29F *1/10, 1/022*
U.S. Cl. 249—55 **1 Claim**

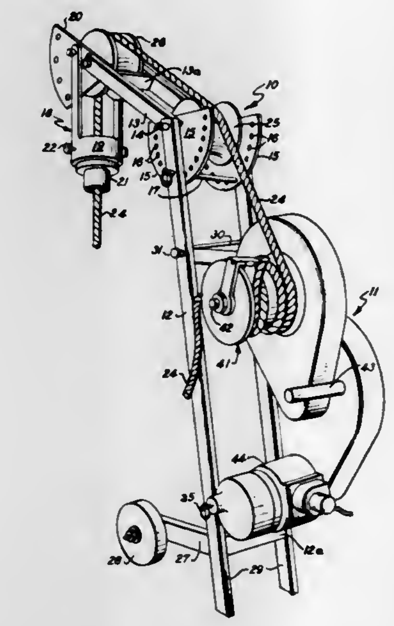


1. In an apparatus for molding an elastomeric, weedless fishing lure, said apparatus having first and second confronting dies which, when brought together, define a mold cavity between them, and a plunger reciprocable with respect to said dies at one end of the mold cavity for forming in the mold body a passageway, the improvement wherein:
said first die comprises a fixed base having an upwardly extending standard at one end thereof and a shelf at the other end thereof below said standard, said shelf having a bottom face and an upwardly-facing, concave recess therein that is generally the shape of half an egg;
said second die being reciprocable up and down above said shelf and having a downwardy-facing, concave recess therein that is generally the shape of half an egg, so that when said second die is lowered against said shelf, said concave recesses come together and define an egg-shaped mold cavity between them;
said second die having a narrow, elongated rib projecting downwardly from said downwardly facing, concave recess below said bottom face so that said rib extends into said upwardly-facing recess when said dies are brought together for forming in the molded body a deep, narrow, elongated recess which is open at the side of the molded body formed by said second die;
said rib having a bottom edge and an upstanding side edge facing toward the end of said cavity nearest said standard and spaced therefrom;
said recesses having at said end of said cavity a pair of semi-circular openings which, when brought together, form a circular opening leading into said cavity opposite said upstanding side edge, said circular opening having an edge;
said base having a bore therein extending from said opening under said standard through said base to the side thereof opposite said cavity;
a plunger reciprocable in said bore with respect to said end of said cavity, substantially in the direction of elongation of said rib, between a retracted position out of said cavity and an extended position abutting said upstanding edge of said rib and substantially aligned with the bottom edge of said rib, for forming in the molded body a passageway leading from the corresponding end of the molded body into the bottom of the recess therein;
said plunger having an inner end in the form of a stem which engages said upstanding edge of said rib in the extended position of the plunger with the dies brought together;
and said plunger having outward along its length beyond said stem an enlargement of larger cross section than said stem engageable with the edge of said circular opening to close the same when said plunger is in the extended position thereof;
said enlargement extending through said opening into said cavity in the extended position of said plunger for forming in the molded body an enlargement in said passageway which is spaced outward along the latter from said recess formed by said rib;
and said enlargement having a reduced neck of smaller cross section than the remainder of said enlargement lying within said cavity in the extended position of said plunger for forming an anchoring projection along said enlargement of the passageway in the molded body;
said enlargement also having a tapered surface at one end of said recess providing the surface which engages the edge of said opening when said dies are brought together and said plunger is in the extended position thereof;
said enlargement further having an inner end opposite said tapered surface with a pair of opposed grooves therein for forming in the molded body projections for preventing rotation thereof on a head inserted in said passageway.

3,968,952

ASSEMBLY FOR PULLING A LINE

E. Strohm Newell, 2350 Sixth Ave., San Diego, Calif. 92101
Filed Aug. 22, 1974, Ser. No. 499,674
Int. Cl.^{2} E21C *29/16*
U.S. Cl. 254—134.3 R **13 Claims**

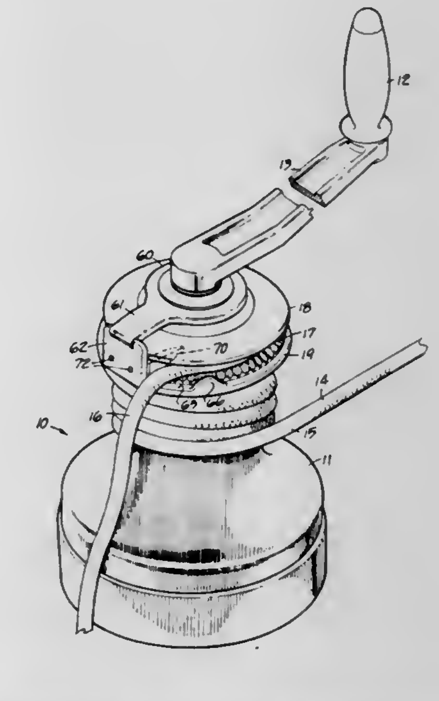


1. An assembly for pulling a line comprising:
a. a frame structure having a base frame section and a structural configuration that is adjustable to a plurality of working positions,
b. a power unit mounted on the frame structure, and
c. means for guiding a line from the power unit along the frame structure,
d. a power unit including means for hanging the unit onto the base frame section,
e. said base frame section including a horizontal support member,
f. said power unit hanging means including a bracket member having an open channel shape attached at the line pulling end of the power unit,
g. said open channel shape of the bracket being effective to hang over the horizontal support member.

3,968,953

SELF-TAILING WINCH

Jesus Guangorena, Atherton, Calif., assignor to Barient Company, San Carlos, Calif.
Filed Jan. 27, 1975, Ser. No. 544,125
Int. Cl.^{2} B66D *1/30*
U.S. Cl. 254—150 R **6 Claims**

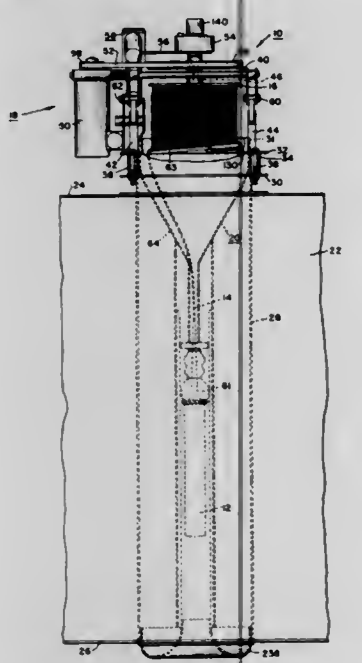


2. A self-tailing winch for a rope, including in combination:
a stationary frame,
a rotary input shaft rotatably supported by said frame,
a rotary drum rotatably supported by said frame,
a gear train connecting said rotary input shaft to said rotary drum so that said drum is driven by said shaft,
a facing pair of ring-shaped clamping means operably connected to said drum for rotation therewith and defining a groove between them, at least one of said clamping means having a serrated face for better gripping of a rope in the groove and at least one clamping means being axially movable with respect to the other,
spring means for urging said clamping means toward each other yieldably,
a generally cylindrical member mounted for rotation with said drum adjacent to and interior of the groove defined by said pair of clamping means, providing an inner boundary of said groove to define a constant winding diameter for the rope, said cylindrical member being of diameter substantially equal to the winding diameter of the drum,
a stationary member adjacent to the groove and anchored to said frame,
rope guide means supported by said stationary member for assisting in feeding said rope between said drum and said groove, and
rope stripping means supported by said stationary member for assisting in paying out said rope from said groove and for guiding it out therefrom.

3,968,954

OCEANOGRAPHIC APPARATUS

Ernest L. Casco, and Ralph F. Kosic, both of San Diego, Calif., assignors to General Dynamics Corporation, St. Louis, Mo.
Filed May 17, 1974, Ser. No. 471,085
Int. Cl.² B66D *1/00*
U.S. Cl. 254—186 R **18 Claims**

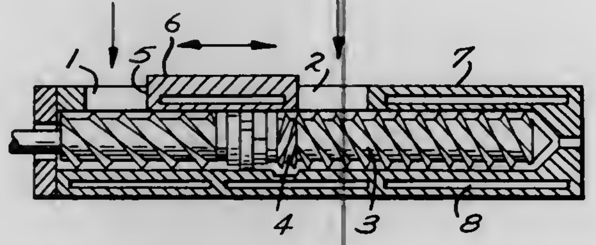


1. Oceanographic apparatus comprising
- a. a body which descends into and is then retrieved from the ocean,
- b. a cable to which said body is attached,
- c. a reel on which said cable is adapted to be wound when said body is retrieved,
- d. said reel having an opening therethrough which extends between the opposite ends thereof, said cable extending through said opening,
- e. means for tilting said reel downwardly to bring said one end down to face the ocean thus allowing said cable to become detached from said reel as said body descends into the ocean, and then upwardly to bring said one end to a position when said cable extends vertically over said one end, and
- f. means for rotating said reel while it is in its upward position to wind said cable thereon and retrieve said body.

3,968,955

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF VULCANIZABLE MIXTURES

Rudolf Paul Fritsch, Goslarer Strasse 58, 7, Stuttgart-Weilimdorf, Germany
Division of Ser. No. 429,069, Dec. 28, 1973, Pat. No. 3,904,719, which is a continuation of Ser. No. 850,168, Aug. 14, 1969, abandoned. This application June 20, 1975, Ser. No. 588,943
Claims priority, application Germany, Aug. 14, 1968, 1779465
Int. Cl.² B29B *1/00*
U.S. Cl. 259—192 **1 Claim**

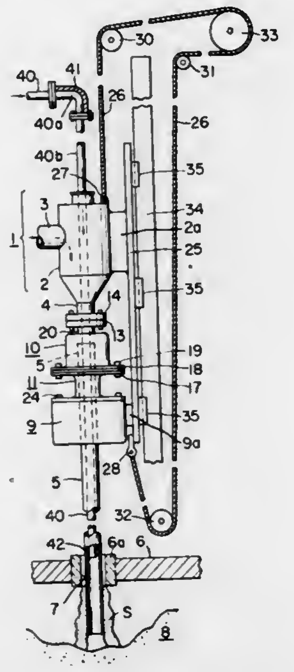


1. A screw extruding apparatus for continuously and controllably proportioning the components of a vulcanizable mixture, said apparatus having a bore, at least one screw shaft located in said bore, a back-pressure device located in said bore, a first inlet located upstream of said back-pressure device, a second inlet located downstream of the back-pressure device, means for controllably adjusting the distance between said back-pressure device and said first inlet which includes, a slide member slidably mounted for movement on said apparatus, said slide member defining, in part, a back-pressure zone in said bore extending between said downstream edge of said first inlet and said back-pressure device, so that said back-pressure zone will have a length that is variable corresponding to sliding movement of said slide member on said apparatus.

3,968,956

LANCING APPARATUS WITH MEANS FOR READY REPLACEMENT OR RENEWAL OF LANCES FOR TOP BLOWN METALLURGICAL FURNACES

Junsuke Sugiura, Iwaki; Junetsu Takahashi, Kagawa; Takeyoshi Shibasaki, and Motoaki Yoneda, both of Iwaki, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1974, Ser. No. 523,877
Int. Cl.² C21C *5/32*
U.S. Cl. 266—226 **5 Claims**

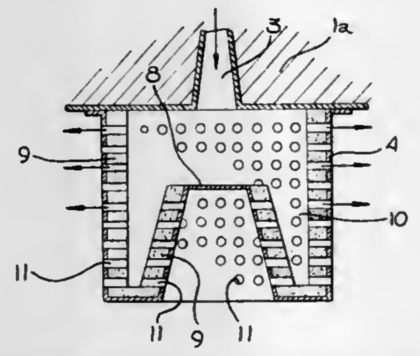


1. An apparatus for blowing air or oxygen under pressure into a metallurgical furnace through a lance inserted therein through its mouth, said apparatus comprising:
- a vessel defining a pressure-tight air or oxygen chamber therein and having an inlet conduit and an outlet conduit communicating with said pressure-tight chamber, said outlet conduit extending downwardly from said vessel;
- a packing box rotatably supported coaxially under said outlet conduit of said vessel in open communication therewith;
- a chuck supported coaxially under said packing box and adapted to permit the lance to be inserted upwardly therethrough into said packing box, said chuck being rotatably supported and including means for releasably holding the lance in axial alignment with the mouth of the furnace located below said chuck;
- packing means within said packing box for effectively establishing pressure-tight communication between said outlet conduit of said vessel and the lance, said packing means being adapted for sealing contact with the lance;
- a carriage movable vertically and combinedly supporting said vessel, said packing box, and said chuck thereon;
- first drive means for imparting up-and-down motion to said vessel, said packing box, and said chuck toward and away from the furnace; and
- second drive means for imparting rotation to said packing box and said chuck.

3,968,957

GAS CARBURIZING FURNACE

Takeji Asai, and Kaishu Yamazumi, both of Toyama, Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan
Filed Sept. 10, 1975, Ser. No. 612,186
Claims priority, application Japan, Apr. 9, 1975, 50-43500
Int. Cl.² C21D *1/74*
U.S. Cl. 266—257 **5 Claims**

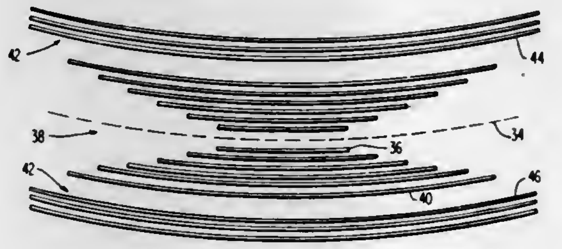


1. A gas carburizing furnace having a dropping port to supply liquid organic composition into the interior of said furnace and a vaporizing and catalyzing device, the improvement comprising:
- a thermal plate, said plate being directly under said dropping port; and
- a perforated housing, said housing being integral with and surrounding said thermal plate, said housing further being coupled to the interior of said furnace and together with said thermal plate and the interior of said furnace forms a chamber into which said liquid organic composition is supplied.

3,968,958

COMPOSITE MATERIAL SPRINGS AND MANUFACTURE

Paul V. Huchette, Latrobe, and Homer H. Hall, Jr., Vandergrift, both of Pa., assignors to Edgewater Corporation, Oakmont, Pa.
Division of Ser. No. 310,815, Nov. 30, 1972, Pat. No. 3,900,357, which is a continuation-in-part of Ser. No. 34,117, May 4, 1970, abandoned. This application June 11, 1975, Ser. No. 585,747
Int. Cl.² F16F *1/22*
U.S. Cl. 267—47 **16 Claims**

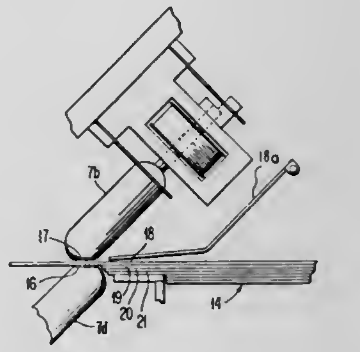


1. An elongated fiber-reinforced composite spring having a tension side, a compression side, a neutral axis extending between its longitudinal ends, and a varying cross-sectional area as measured in a plane perpendicular to the neutral axis, with the cross-sectional area diminishing in approaching at least one of the longitudinal ends of the spring providing a tapered configuration, such spring comprising
- a neutral axis portion, a centrally located core portion, and a peripheral portion,
- the neutral axis portion comprising at least one elongated ply comprising solely non-woven fibers in the side-by-side, longitudinally-oriented, unidirectional relationship extending along the neutral axis between longitudinal ends of such spring,
- the centrally located core portion comprising a plurality of varying length plies of solely non-woven fibers, such fibers being in side-by-side. longitudinally-oriented, unidirectional relationship in each ply, such plies being of varying length dimension in the longitudinal direction of such spring and oriented longitudinally in overlying relationship with shorter length plies of the varying-length plies being centrally located contiguous to the neutral axis and plies of progressively increasing length being located outwardly from such neutral axis in the direction of both the tension and compression sides of such spring,
- the peripheral portion comprising a plurality of elongated full-length plies comprising solely non-woven fibers, such fibers being in side-by-side, longitudinally-oriented, unidirectional relationship in each ply, with such elongated full-length plies extending between longitudinal ends of such spring in overlying relationship to the neutral axis portion and the centrally located core portion,
- such fibers in the neutral axis portion, centrally located core portion, and peripheral portion being bonded together in a matrix material forming a unitary structure.

3,968,959

DOCUMENT TRANSPORT AND SEPARATING DEVICE

Oliver Duane Johnson, Austin, Tex., and Frederick Fenn Quist, Jr., Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 31, 1974, Ser. No. 537,732
Int. Cl.² B65H *3/42, 3/46*
U.S. Cl. 271—137 **2 Claims**



1. A sheet separator, transport and alignment device capable of feeding, transporting and aligning a single sheet from a stack of sheets responsive to a source of electrical pulses, said device comprising:
- means for driving sheets of paper from said stack;
- separator restraint means associated with said means for driving for receiving sheets driven thereby;
- said separator restraint means comprising a pair of intermittent motion imparting means responsive to said source of electrical pulses including tips being mounted one above the other each having substantially flat ends which are moved in a substantially elliptical path with the upper tip end being rotated in a direction at the lower portion of said ellipse as said tip end is moving in the desired direction of transport of said sheet and in contact therewith and the end of the tip of said other intermittent motion imparting device being rotated in a direction opposite to said desired direction of transport of said sheet at the upper portion of its said ellipse such that the lower portion of the upper tip and the upper portion of the lower tip reach their lower most and upper most positions substantially simultaneously by timewise controlling the application of said electrical pulses; and
- each said intermittent motion imparting means including a solenoid mounted on a frame with its armature being driven in a rectilinear manner in the direction of said paper by said electric pulses being applied to its windings at least one spring for returning said armature in the opposite direction with said spring being mounted on said frame such that the longitudinal motion of the portion of said tip farthest from said paper is converted at the opposite end thereof to said substantially elliptical path.

3,968,960

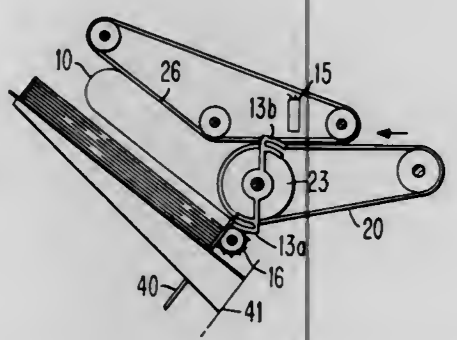
SHEET INVERTING AND STACKING APPARATUS

John Fedor, and James V. Vetrone, both of Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,510

Int. Cl.² B65H *29/40*

U.S. Cl. 271—187 **4 Claims**



1. Apparatus for stacking a sheet conveyed along a path to a discharge region comprising:
- a stacking platform for receiving said sheet;
- first means for conveying a sheet along a path to said discharge region adjacent said stacking platform;
- means at said discharge region operable for deflecting the leading edge of a moving sheet from said path to said stacking platform;
- control means energized by said sheet at a designated location in said path for operating said deflection means, said control means being settable to alter the movement of said deflecting means in accordance with the length of said sheets; and
- second conveying means at said discharge region for engaging and moving the trailing portion of said sheet beyond said deflected leading edge to thereby invert said sheet.

3,968,961

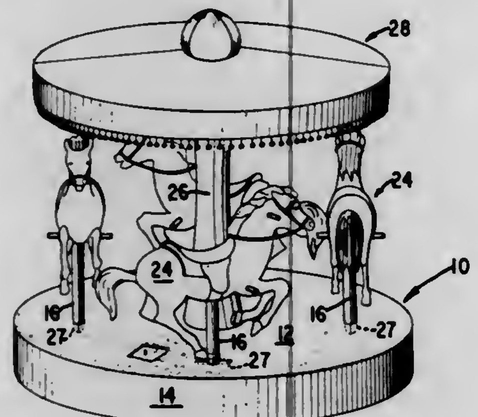
MERRY-GO-ROUND

Joseph J. Mancusi, Jr., Altair, Inc., 50 Altair Ave., Plymouth, Conn. 06782

Filed Dec. 11, 1974, Ser. No. 531,694

Int. Cl.² A63G *1/34*

U.S. Cl. 272—44 **1 Claim**



1. A compact and easily assembled merry-go-round comprising a turntable having a generally flat portion terminating in a depending curtain about its periphery, a column mounted on said turntable about its central portion, a canopy mounted on said column for rotation therewith and extending over said turntable, imitation animals carried by said turntable in its direction of rotation but movably disposed for up and down and forward and backward tilting motion by being mounted at the upper ends of straight elements extending from above to below the turntable through apertures therein and rigidly fixed to cam follower elements pivotally connected to the underside of the turntable, a carpet on the upper surface of the generally flat portion of said turntable and closely fitted to said straight elements to close off the space between each straight element and the edge of its aperture, a rigid frame underneath said turntable and inside its depending curtain, a circular track lying underneath said cam follower elements and fixed upon said frame, said circular track having vertical undulations, a turntable driving assembly including an electric motor mounted on said frame and establishing a driving connection with the central portion of the turntable, spaced frictionless rollers mounted on said frame and engaging the underside of the turntable for rotatable support thereof, and adjustable frame leveling devices located on said frame underneath said rollers in vertically aligned relationship therewith.

3,968,962

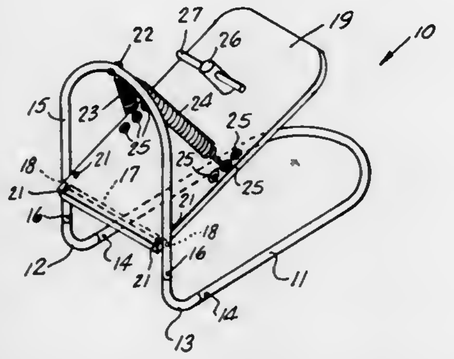
CHILD'S TEETER TOTTER

Luther C. Atkins; Jimmy G. Atkins, and Vonniebelle Atkins, all of 5207 N. Villa No. 7, Clovis, Calif. 93612

Filed May 15, 1975, Ser. No. 577,677

Int. Cl.² A63G *11/00*

U.S. Cl. 272—55 **5 Claims**



1. A child's teeter totter comprising a generally U-shaped tubular base frame, an inverted generally U-shaped upright frame extending perpendicularly upwardly from said base frame, means connecting the open ends of said U-shaped frames at their juncture, a generally rectangular seat board, means mounting one end of said board in the lower end of said upright frame for pivotal movement about a horizontal axis, a pair of springs connected at one end to the upper end portion of said upright frame, and means selectively adjustably connecting the lower ends of said springs to opposite sides of the upper surface of said seat board.

3,968,963

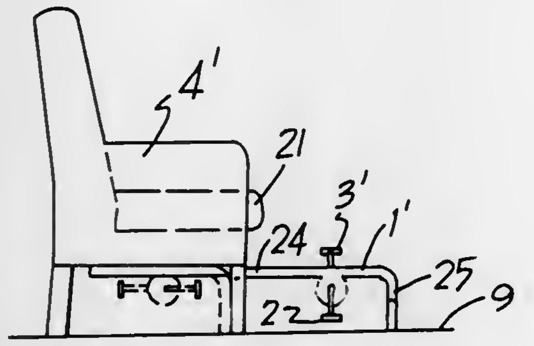
CHAIR-TYPE BICYCLE EXERCISE DEVICE

Rocco M. Sileo, Stamford, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 27, 1975, Ser. No. 544,122

Int. Cl.² A63B *21/00*

U.S. Cl. 272—134 **1 Claim**



1. An exercise device, comprising
- a frame having spaced opposite first and second ends;
- a chair having a seat having an undersurface and supported a predetermined distance above a supporting surface by legs, guide means of channel configuration affixed to the undersurface of the seat of the chair for slidably accommodating and supporting said frame for movement of said first and second ends under and for movement of said second end in front of said chair;
- bicycle-type pedal means rotatably mounted on the frame intermediate the first and second ends thereof in a manner whereby the pedal means is rotatable by a user seated in said seat in proximity with the frame; and
- adjustable support means on the second end of the frame for adjustably mounting the second end of the frame relative to said supporting surface with the pedal means a selected distance above the surface whereby the pedal means are positionable relative to the chair by a user seated in the chair and the pedal means are rotatable by the user.

3,968,964

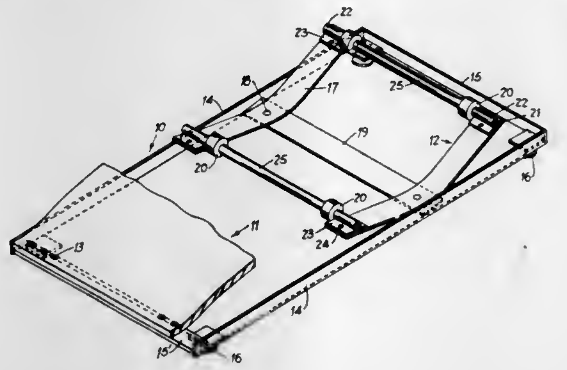
VAULTING BOARD

Richard W. Grosser, Boone, and Virgil L. Long, Jefferson, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,897

Int. Cl.² A63B *5/08*

U.S. Cl. 272—65 **5 Claims**



1. A vaulting board device comprising a generally rectangular shaped base frame, a generally rectangular shaped board overlying said frame, one end of said board being fixed to one end of said frame and the other end of said board being free with respect to said frame for movement towards and away therefrom, a pair of elongated leaf springs positioned beneath said board, said leaf springs being fixed at their central portions to said frame along opposite sides thereof, opposite ends of said springs being free with respect to said frame for movement towards and away therefrom, and roller means on the ends of said springs in contact with the underside of said board.

3,968,965

GAME RACKET

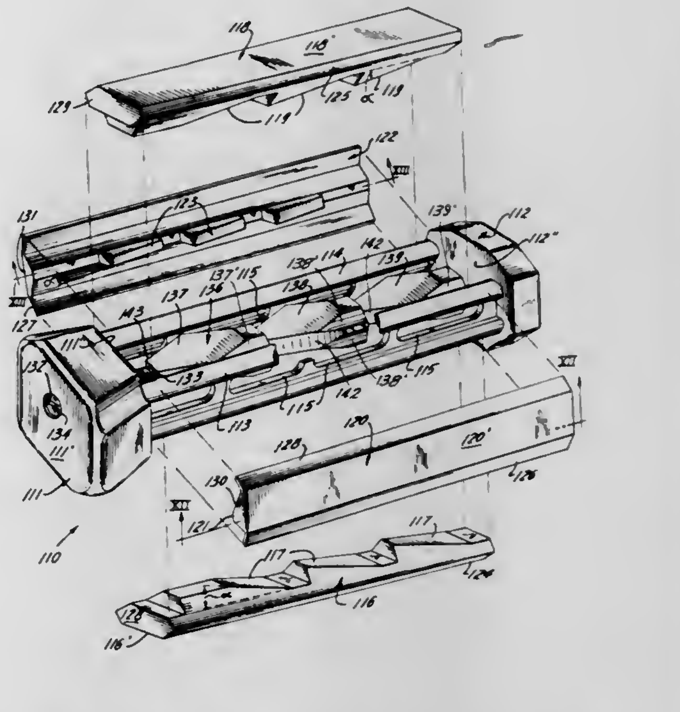
Richard E. Frenkel, 17 Kingston Road, Scarsdale, N.Y. 10583, and Allan E. Schwartz, 3 Bristol Place, Yonkers, N.Y. 10710

Continuation-in-part of Ser. No. 341,156, March 14, 1973, Pat. No. 3,833,218. This application Jan. 22, 1974, Ser. No. 435,484

Int. Cl.² A63B *49/08*

U.S. Cl. 273—73 J **7 Claims**

1. A game racket comprising a head, having a surface for contacting a playing ball and a partially hollow handle connected to said head, said handle being formed of a frame having two end pieces and struts extending therebetween defining a grip portion, and a flexible grip surrounding said handle, a rotatable member having a threaded external surface and carried by said handle axially therethrough, radially movable wall plates forming the external structure of said partially hollow portion of said handle and supported by said frame, a cam member carried on said rotatable member within said handle and comprising a plurality of body sections each of which has more than one cam surface inclined at an angle to the longitudinal axis of said handle, each body section being of identical configuration and orientation so that corresponding cam surfaces of each body section lie in parallel planes, each of said cam surfaces being in contact with cooperating surfaces on said wall plates, and means for rotating said rotatable member so that said cam member will apply pressure to said wall plates for varying the diameter of said grip.



3,968,966

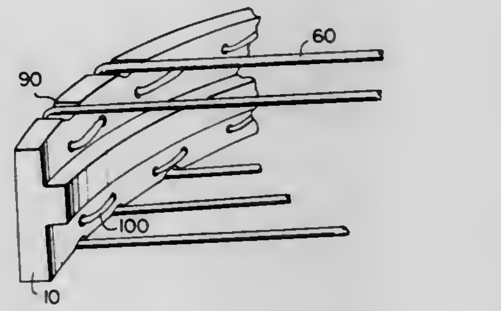
RACQUET WITH TWO INDEPENDENTLY STRUNG FACES

Cesare A. D'Aquanni, Pleasant Valley, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 5, 1975, Ser. No. 574,413

Int. Cl.² A63B *51/06*

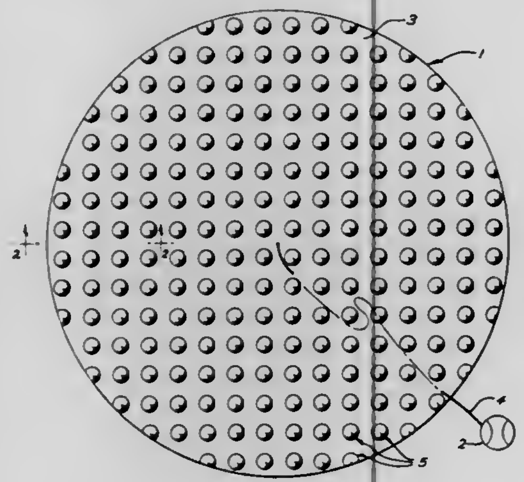
U.S. Cl. 273—73 D **6 Claims**



1. A racquet comprising:
- a handle;
- an elongated metal band bent generally into the form of an ellipse and attached to the handle to form a racquet frame;
- string support means on the band; and
- two racquet strings supported by the string support means and wrapped around the elliptical portion of the band to form two parallel faces which are spaced apart from each other, each face having the form of a flat rectangular grid and being strung by a corresponding one of the strings in a manner at which each string forms the longitudinal and transverse runs of its respective face, thus forming two independently strung faces.

3,968,967
SYMMETRICALLY ARRANGED, HEMISPHERICAL BALL REBOUNDING ELEMENTS

Phillip L. Nally, 302 W. Muir, Bardstown, Ky. 40222
Filed Mar. 28, 1975, Ser. No. 563,090
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 A **3 Claims**



1. A game apparatus for deflecting a resilient ball in an unpredictable manner comprising:

a body member having a horizontally disposed base and a flat upper surface;

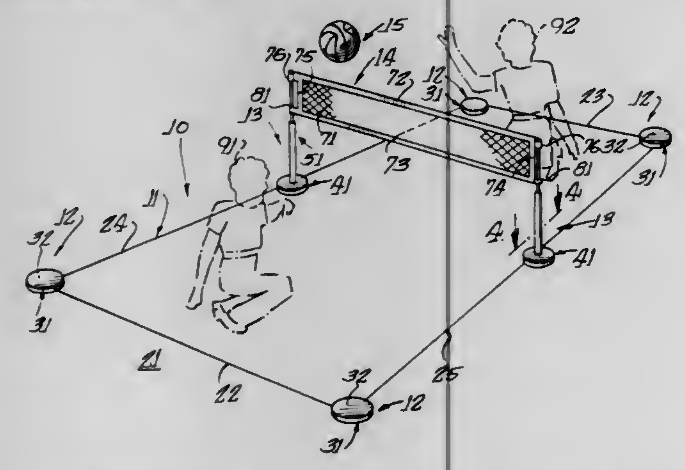
a tether member attached between said upper surface of said body member and said ball to provide limited movement of said ball relative to said body member;

a plurality of hemispheric ball-deflecting means projecting from said flat upper surface and arranged in an ordered pattern, the outer surface of each of said deflecting means providing bounce-producing surface means;

said deflecting means, each being symetrical about a vertical axis and being positioned a distance relative to each other sufficient to cause the surface of said ball when forcibly received against said upper surface to contact at least a portion of one of said bounce-producing surfaces rather than contacting only a flat portion of said upper surface, thereby causing the elastic bouncing of said resilient ball off said bounce-producing surface in an unpredictable manner the length of the tether.

3,968,968
MINI-VOLLEYBALL COURT LAYOUT

Richard C. Peterson, 425 Apollo Drive, Joliet, Ill. 60435
Filed Apr. 28, 1975, Ser. No. 572,144
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 H **5 Claims**



1. A mini-volleyball game apparatus comprising, in combination:

a playing court defining means consisting of a one-piece unitary length of endless flexible cord to be restingly positioned on the ground and oriented into a rectangular closed loop shape defining a rectangular playing court having opposed parallel spaced apart end lines and opposed parallel spaced apart side lines;

a set of four identically configured weight members for retaining the corners of the cord of the playing court defining means, each weight member having a flat circular disc-shaped body member, a flat top surface, a flat bottom surface, and cylindrical side wall surfaces;

an L-shaped slot disposed in the bottom surface of each of said weight members, said slot opening out of the bottom surface to releaseably engage a portion of said cord therein, said slot being of a key-hole cross-sectional configuration having a generally cylindrical top section joined tangentially to the top portion of a truncated triangular section, the distance between the point of intersection between the triangular section and the cylindrical top section being less than the diameter of the cord whereby said cord is forced through the triangular section to be releaseably frictionally engaged in the cylindrical section;

net means adapted to divide the playing court area in half;

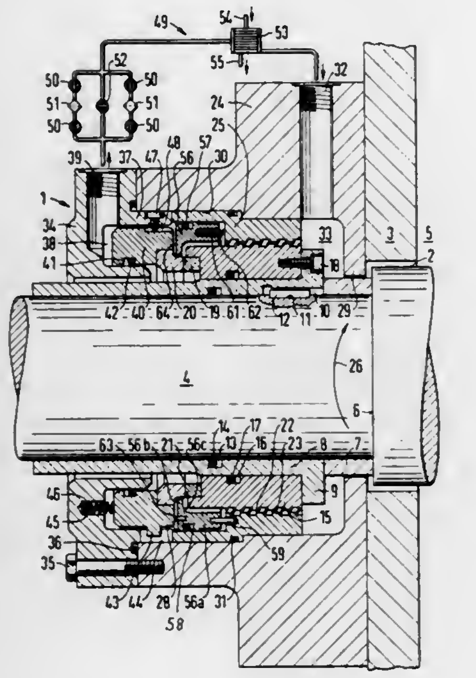
post means adapted to hold the net means in the desired location;

a spherical playing ball; and

means associated with said net holding means and adapted to engage said court defining means for assisting and holding said court defining means in said predetermined configuration.

3,968,969
SEALING ARRANGEMENT

Ehrhard Mayer, Birkenallee 13, D-8191 Eurasburg; Ludwig Findler, Margeritenstrasse 30, D-8190 Wolfratshausen; Wolfgang Mathes, Geiselgasteigstr. 96, D-8000 Munich 90, and Michael Steigenberger, Hauptstr. 25, D-8191 Eurasburg, all of Germany
Filed Feb. 26, 1975, Ser. No. 553,295
Claims priority, application Germany, Mar. 1, 1974, 2409954
Int. Cl.² F16J *15/34*
U.S. Cl. 277—15 **13 Claims**



1. Mechanical seal assembly for an axially extending elongated shaft comprising,

means defining an annular slide ring seal with rubbing slide ring and counter ring elements,

means defining a housing containing said seal and rotationally fixedly mounting said slide ring,

said counter ring being mountable on said shaft via counter ring support structure,

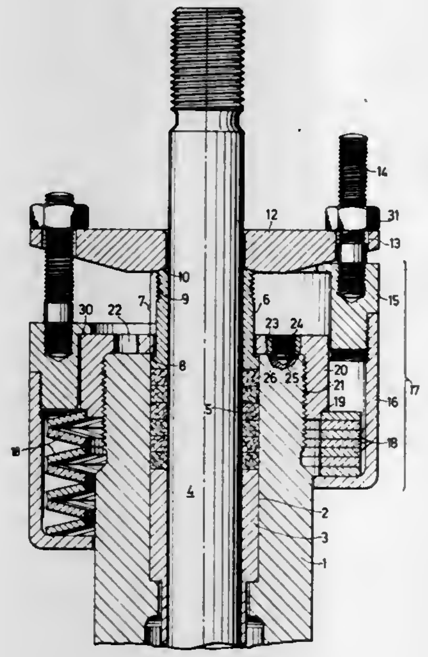
means defining a coolant circuit that conducts a coolant through the seal housing in an axial direction and including a pump device with inlet and outlet ends for pumping coolant liquid through the circuit, which circuit further comprises an annular space surrounding said seal and distributor guiding means that conduct the coolant to an edge of the sealing interface of the slide ring and counter ring within said annular space and which are sealed with respect to the seal housing,

and further comprising means for supporting and displacing the distributor guiding means in said axial direction and constructed and arranged to maintain the distributor guiding means at a constant axial distance from the slide ring,

the slide ring being mounted in the seal housing in a rotationally fixed manner and being axially displaceable against springs.

3,968,970
STUFFING BOX

Ernst Vogeli, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Mar. 3, 1975, Ser. No. 554,710
Claims priority, application Switzerland, Mar. 5, 1974, 3033/74
Int. Cl.² F16J *15/18*
U.S. Cl. 277—106 **10 Claims**



1. A stuffing box comprising

a housing;

a packing within said housing;

a sleeve mounted coaxially of said packing for movement relative to said housing to apply pressure on said packing;

a yoke abutting said sleeve;

a cap nut threadably mounted on said housing;

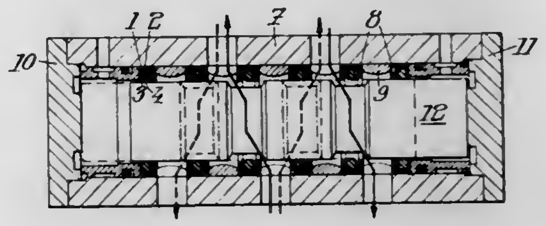
an annular carrier;

at least one pressure spring mounted between said cap nut and said carrier and biasing said cap nut and said carrier apart, said spring being mounted in a line of force between said housing and said yoke; and

at least two bolts threadably mounted in said carrier and passing through said yoke for moving said yoke towards said sleeve and said sleeve against said packing in opposition to the biasing force of said spring.

3,968,971
FLUID-TIGHT PACKING

Claude Mariaulle, Le Palais-sur-Vienne, France, assignor to Automatisation - Sogemo, Saint-Junien, France
Continuation of Ser. No. 469,850, May 14, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,395
Claims priority, application France, May 22, 1973, 73.18504
Int. Cl.² F16J *15/32*; F16R *3/02*
U.S. Cl. 277—177 **7 Claims**



1. A fluid-tight packing for relatively moving parts, comprising:

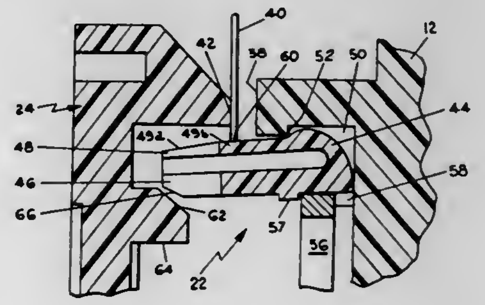
a base portion fixedly connected to a first of said parts so as to be immovable relative thereto,

an active portion united to the base portion at an articulated connection, said articulated connection forming a pivot point for turning movement of the active portion relative to the fixed base portion over a given angular distance to a limit angular position in the direction of relative movement of said parts,

the surface of the active portion on the side thereof opposite its articulated connection with the base portion sealingly engaging the second of the relatively moving parts, said surface of the active portion being part-circular in its natural uncompressed state, as viewed transversely to the direction of relative movement of the parts, with the center of curvature of the part-circular surface being located at the location of the said articulated connection so that as the active part turns about its said center of curvature to change its zone of contact with the second part, thereby enabling normal lubrication to tend to be re-established, the said surface of the active part rolls in the circle of which it is a part, and wherein the said part-circular surface extends circumferentially a sufficient distance to remain in sealing contact with the second part when the active portion has turned to said limit angular position.

3,968,972
SELF CENTERING HUB FOR FLEXIBLE RECORDING DISCS AND THE LIKE

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.
Filed June 21, 1974, Ser. No. 481,523
Int. Cl.² B23B *31/18*
U.S. Cl. 279—2 R **31 Claims**



1. A self-centering hub construction for mounting a disc in centered position thereupon, comprising in combination: a rotatable hub member and means for driving the same, said hub including a surface for receiving part of said disc in

clamped relation thereagainst; a plurality of centering finger portions and means movably mounting said portions on said hub member, for movement at least toward and away from the axis of said hub member; a clamping means movable generally toward and away from said hub member and having a first surface for engaging said disc and clamping it against said surface of said hub member; and means for moving said centering finger portions outwardly and away relative to the axis of said hub member and the center of said disc, contacting at least a portion of an aperture in said disc and moving the latter relative to said axis and thereby centering it upon such axis.

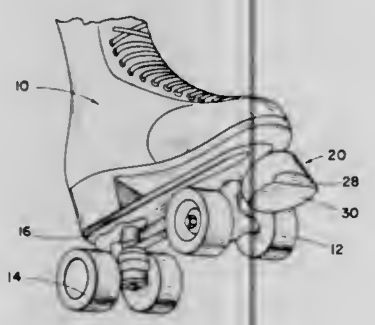
3,968,973
TOE STOP FOR ROLLER SKATES

Darrell W. McCormack, Tulsa, Okla., assignor to Fo-Mac, Inc., Tulsa, Okla.

Filed Jan. 6, 1975, Ser. No. 539,023

Int. Cl.² A63C *17/14*

U.S. Cl. 280—11.2 **2 Claims**



1. A toe stop for roller skates comprising a main body portion having a bottom surface including two flat surfaces disposed at angles with respect to each other, one of said flat surfaces having a lesser exposed surface area than the other of said flat surfaces, and means carried by the main body portion for securing the toe stop to the roller skate with a lesser flat surface being orientated forwardly on the skate, and wherein the outer periphery of the main body portion is substantially arcuate but having a relatively short straight chord portion intersecting the arcuate periphery at the forward portion of the toe stop conterminous with the lesser flat surface.

3,968,974
BRAKEABLE HAND TRUCK

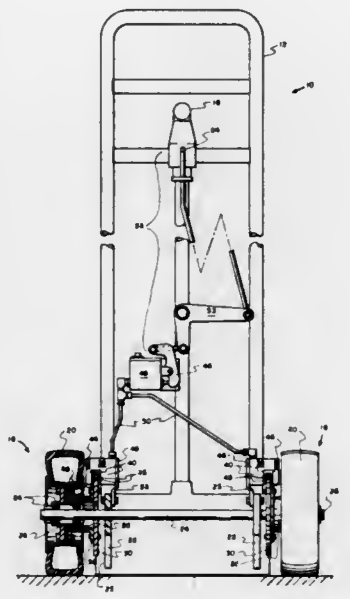
Nelson Wetzel, Rte. 2, Box 100, Hillsboro, Oreg. 97123

Filed Feb. 21, 1975, Ser. No. 551,725

Int. Cl.² B62B *5/04*

U.S. Cl. 280—47.27 **7 Claims**

1. A brakeable hand truck comprising, in combination:
- a. a generally upright, load-supporting frame having a lifting blade projecting forwardly adjacent the bottom of said frame;
- b. a pair of laterally spaced wheels rotatable independently from one another mounted to the rear of said frame adjacent the bottom thereof on a single common axle attached to said frame, for movably supporting said hand truck;
- c. a disc coaxially fixed directly to each of said wheels so as to rotate in unison therewith;
- d. a pair of calipers fixedly attached to said frame respectively on each side thereof, each caliper having two spaced finger members disposed respectively on each side of a respective disc for forcibly pinching said disc therebetween;
- e. bearings mounting said wheels on said axle, said bearings permitting said wheels to move laterally on said axle with respect to said frame; and



- f. actuator means connected to said calipers for causing said finger members to pinch said respective disc.

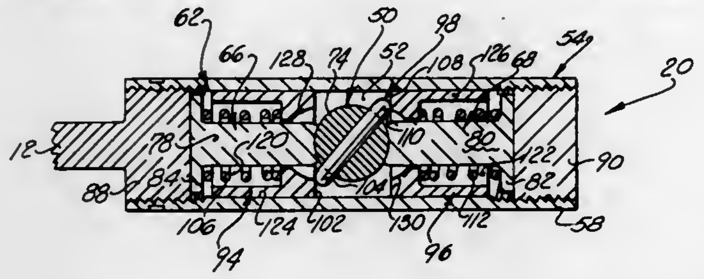
3,968,975
JOINT ASSEMBLY

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed June 9, 1975, Ser. No. 585,252

Int. Cl.² F16C *11/06*

U.S. Cl. 280—95 R **18 Claims**



1. A ball and socket assembly for interconnecting parts of a vehicle steering system and for applying a force to the steering system tending to return it to a straight ahead condition upon actuation of the steering system to a turning condition, said ball and socket assembly including socket wall means for defining a socket chamber and adapted to be connected with a first part of the steering system, ball means disposed within said socket chamber and having an outer surface defining at least a portion of a sphere, shank means connected with said ball means and extending out of said socket chamber, said shank means having an outer end portion which is adapted to be connected with a second part of the steering system, ball seat means fixedly connected with said socket wall means and engaging opposite side portions of the spherical outer surface of said ball means for continuously retaining said ball means in said socket chamber with the center of said ball means in a predetermined position while enabling said ball means to rotate relative to said socket wall means about a central axis of said shank means from an initial position to an actuated position upon actuation of the steering system from the straight ahead condition to the turning condition, and biasing means for applying a force to said ball means tending to rotate said ball means relative to said socket wall means about the central axis of said shank means from the actuated position toward the initial position to thereby apply a force to the steering system tending to urge the steering system from the turning condition toward the straight ahead condition.

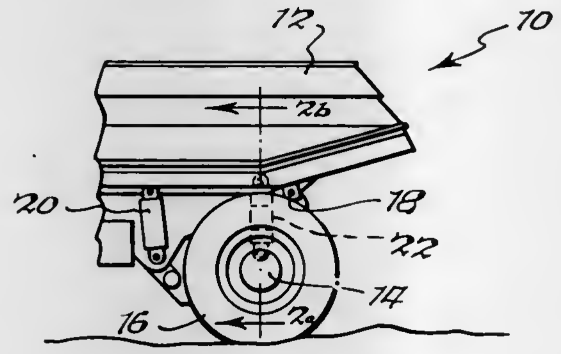
3,968,976
DUAL RATE LIQUID SUSPENSION STRUT

Ward Sievenpiper, Alden, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jan. 10, 1975, Ser. No. 540,006

Int. Cl.² B60G *11/28*

U.S. Cl. 280—709 **13 Claims**



1. A composite suspension strut adapted for connection to vehicles experiencing a side range of loading conditions, said composite suspension strut comprising:
- first and second cylinder means, each of said first and second cylinder means having a compressible hydraulic fluid sealed therein and said cylinder means being axially aligned one to another,
- first and second displacement rod means, said first and second displacement rod means having end portions concentrically disposed within the non-adjacent ends of said first and second cylinder means respectively and being reciprocably slidable in a sealed manner through said non-adjacent ends to compressibly displace said hydraulic fluid therein and the ratio of the total internal volume of said first cylinder means to the volumetric displacement per unit of axial length of said first displacement rod means being different from each corresponding ratio of said second cylinder and second displacement rod means so that the combination of said first displacement rod and first cylinder means forms a first liquid spring having a first spring constant and the combination of said second displacement rod means and second cylinder means forms a second liquid spring having a second spring constant, the latter spring constant being different from said first spring constant.

3,968,977
TILTABLE INDICIA CONSTRUCTED AS RADIATOR EMBLEM

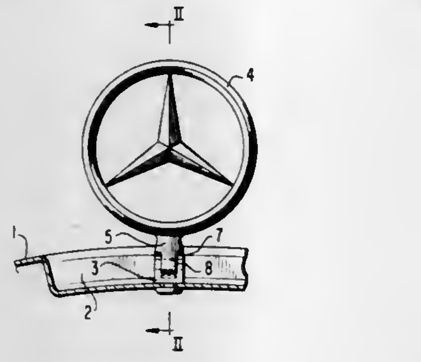
Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 13, 1974, Ser. No. 523,416

Claims priority, application Germany, Nov. 14, 1973, 2356761

Int. Cl.² B60R *13/04*

U.S. Cl. 280—727 **10 Claims**



1. A company sign constructed as radiator figure which is adapted to be recessed and operable to be tilted over by a force of predetermined magnitude and which projects beyond the body of a motor vehicle, characterized in that the radiator figure includes a base means mounted within a recess provided in the engine hood and carrying a joint means which enables a tilting over of the radiator figure into the recess in such a manner that neither parts of the radiator figure nor of the base means project beyond the edges of the recess.

3,968,978
AUTOMATIC SAFETY BELT APPARATUS FOR RESTRAINING THE OCCUPANT SITTING ON THE SEAT OF A VEHICLE

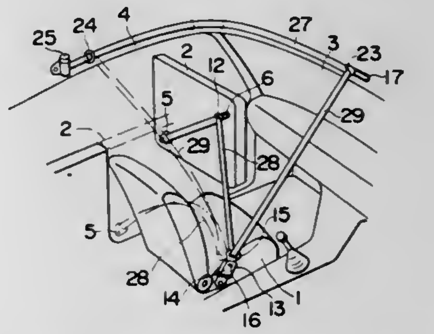
Yoshihiro Hayashi, Toyota, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Dec. 20, 1971, Ser. No. 210,033

Claims priority, application Japan, Dec. 18, 1970, 45-114631

Int. Cl.² B60R *21/02*

U.S. Cl. 280—745 **21 Claims**

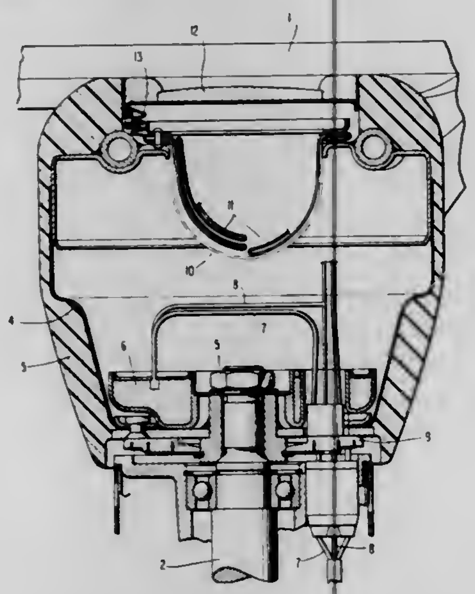


1. An automatic safety belt apparatus for restraining the occupant sitting on a seat within a vehicle body having at least one door hingedly supported by the vehicle body for selectively opening and closing the doorway from the outside of the vehicle body toward the seat, which comprises;
- a. a flexible belt of suitable width having first and second ends, said first end of said belt being connected with the door,
- b. automatic winding means rigidly connected with said second end of said belt for forcibly winding up said belt thereby holding said belt under tension,
- c. stationary holding means comprising a holding member for holding a first substantially intermediate portion of said belt, and a buckle detachably engageable with said holding member and rigidly connected with a portion of the vehicle body, thereby permitting a first length of said belt between said first end and said first substantially intermediate portion of said belt to extend over the hip portion of the occupant for restraining the same when the occupant is sitting on the seat within the vehicle body with the door closed,
- d. movable holding means for holding a second substantially intermediate portion of said belt between said stationary holding means and said second end thereby providing a second length of said belt adaptable for restraining the shoulder portion of the occupant on the seat, said movable holding means being movable between releasing and fastening positions, said releasing position being located substantially obliquely, upwardly and forward of the occupant on the seat and said fastening position being substantially above the door and obliquely, upwardly, behind the occupant on the seat,
- e. motor means for effectuating the movement of said movable holding means between said releasing and fastening positions whereby, when said movable holding means is in said releasing position, said second length of said belt extends substantially obliquely, upwardly from said stationary holding means on one side of the hip portion of the occupant remote from the door and forwardly of the occupant and, when said movable holding means is in said fastening position, said second length of said belt extends obliquely from said stationary holding means across the chest portion and over the shoulder portion of the occupant on the other side of said occupant to fasten said chest portion and said shoulder portion, and

f. guide means fixedly extending substantially above the occupant on the seat for guiding the movement of said movable holding means and providing said releasing and fastening positions for said movable holding means.

3,968,979
SAFETY STEERING FOR MOTOR VEHICLE

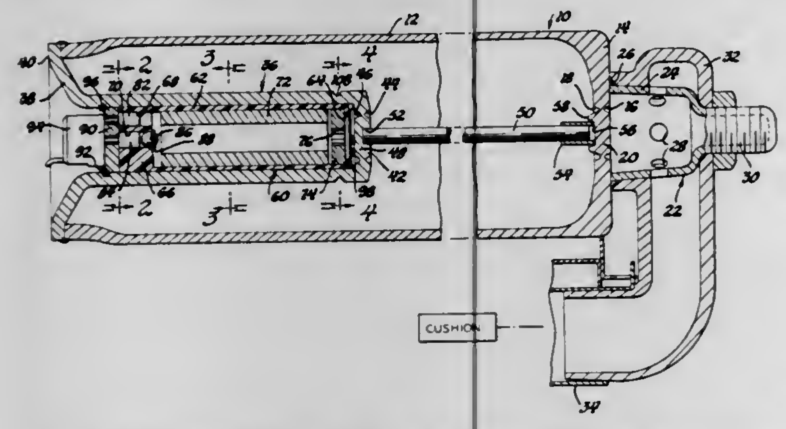
Gerhard Schiesterl, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed July 9, 1971, Ser. No. 161,102
Claims priority, application Germany, July 9, 1970, 2034008
Int. Cl.² B60R ***21/08***
U.S. Cl. 280—731 **29 Claims**



1. A safety steering for motor vehicles with a plastically deformable deformation member arranged between a steering wheel and the upper end of a steering spindle, characterized in that a gas cushion means automatically inflatable upon exceeding a predetermined deceleration of the vehicle is arranged on the inside of the deformation member.

3,968,980
OCCUPANT RESTRAINT SYSTEM

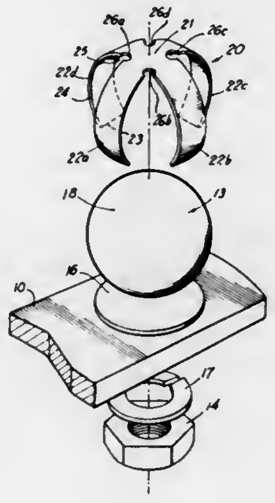
Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 12, 1973, Ser. No. 331,663
Int. Cl.² B60R ***21/10***
U.S. Cl. 280—734 **4 Claims**



1. In combination with a vehicle subject to low level impact conditions and high level impact conditions and including an inflatable occupant restraint cushion, inflating means for inflating the cushion at a relatively high rate under high level impact conditions and at a relatively low rate under low level impact conditions comprising, a combustion chamber containing a mass of propellant having an opening therethrough and capable of producing pressure fluid by burning and having a burn rate responsive to the pressure within the chamber, outlet means of predetermined orifice area controlling the rate of flow of the pressure fluid from the chamber to control the pressure within the chamber and the rate of burning, means communicating the outlet means with the cushion, the outlet means normally setting a rate of flow of pressure fluid to the cushion to inflate the cushion at the relatively low rate, a ball, means mounting the ball within the combustion chamber to one side of the mass of propellant and in general spaced alignment with the opening therethrough and the outlet means, and means responsive to the occurrence of high level impact conditions for firing the ball through the opening in the mass of propellant and into the outlet means to reduce the orifice area thereof and thereby increase the pressure within the combustion chamber to increase the rate of burn and provide inflation of the cushion at the relatively high rate.

3,968,981
VARIABLE SIZE TRAILER HITCH ASSEMBLY

Roderick A. Suarez, P.O. Box 11, Forest Park, Ga. 30050
Filed Aug. 28, 1975, Ser. No. 608,668
Int. Cl.² B60D ***1/06***
U.S. Cl. 280—511 **8 Claims**



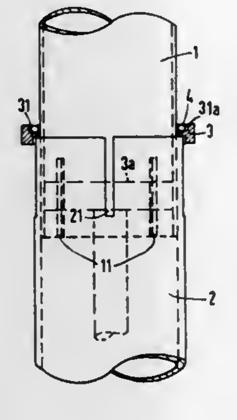
1. An adaptor for being received over the ball of a trailer hitch for increasing the effective diameter of the spherical surface of the ball, comprising a hub and a plurality of fingers radiating from said hub, said fingers each being arcuate so as to conform to and be received on the outer surface of the spherical ball.

3,968,982
COAXIAL METALLURGICAL CONNECTION

Martin Belicic, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Sept. 12, 1974, Ser. No. 505,248
Claims priority, application Germany, Sept. 19, 1973, 2347203
Int. Cl.² F16L ***13/00***
U.S. Cl. 285—287 **1 Claim**

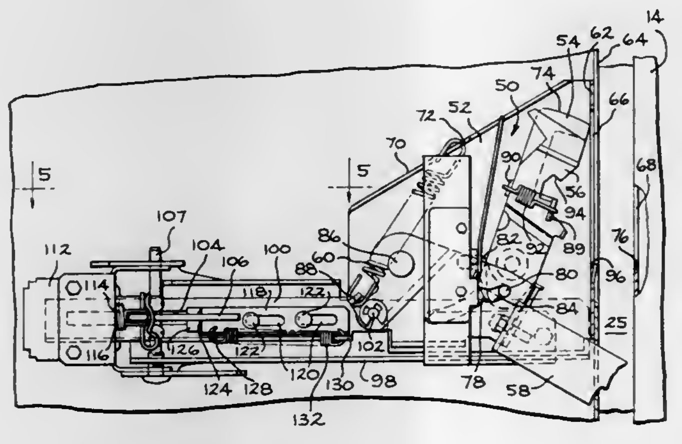
1. A joint comprising an inner part and an outer tubular part telescoped over said inner part and joined therewith by solidified molten metal, said parts having differing thermal expansion coefficients, both of said parts being tubes and each having a plurality of slots extending from their respective ends

and parallel to their longitudinal axis and circumferentially interspaced with the slots of one part positioned centrally between the slots of the other part and covered by said other parts.



3,968,983
TWO POSITION, THREE FUNCTION LATCHING MECHANISM

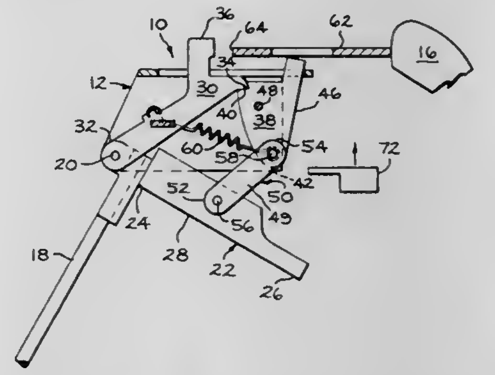
Henry J. Heit, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Filed July 2, 1975, Ser. No. 592,546
Int. Cl.² E05C ***3/34***
U.S. Cl. 292—201 **7 Claims**



1. A two position three function sliding latch mechanism comprising a base, a latch handle pivotally connected to the base, a latching bolt pivotally connected to the base and joined to both the latch handle and the base by lost motion means whereby movement of the latch handle toward and away from a first unlatched position causes a turning action of the latching bolt, and a locking bar pivotally connected to the latch handle and movable in response thereto, lock means associated with the locking bar for engaging the locking bar and holding the latching mechanism against further movement when the latch handle is in its second latched and locked position, and operating means for controlling the lock means so the handle lever may be shifted toward the first unlatched position, and shutter means associated with the locking bar for supporting the lock means and keeping the lock means from engaging the locking bar in a second latched but unlocked position, said shutter means being set into a cocked position by the lock means when the latch handle is moved from the first unlatched position into the second latched but unlocked position, whereby when the lock means is shifted by the operating means the shutter is released causing it to trip and move away from the lock means so the lock means may engage the locking bar as in the second latched and locked position.

3,968,984
DOOR LATCH

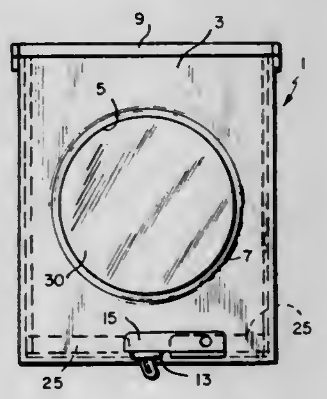
Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 14, 1975, Ser. No. 567,934
Int. Cl.² E05C ***3/02***
U.S. Cl. 292—229 **3 Claims**



1. A door latch for a dishwasher door comprising:
a frame;
a handle pivotally connected to the frame;
a lever connected to the handle and extending therefrom;
a detent having first, second, and third end portions, said detent being pivotally connected to the frame at the first end portion for pivotal movement between engaged and disengaged positions;
a keeper having first and second end sections and a midsection, said keeper being pivotally connected to the frame at its midsection for pivotal movement between an unlatched position at which the detent engages said keeper and a latched position at which said keeper is spaced from said detent;
toggle linkage means pivotally connecting the second section of said keeper to the lever for pivotal movement of said keeper in response to movement of said lever between extended and retracted positions;
biasing means for urging said detent toward its engaged position when the dishwasher door is open and additionally biasing said toggle linkage means in an over-center relationship when the door is in its closed position;
striker means for causing said detent to move toward its disengaged position in response to closing the door; and
means for contacting the lever and moving it in a direction away from the keeper, thereby causing said keeper to move from its latched position toward its unlatched position.

3,968,985
LOCKS FOR ELECTRIC METER BOXES

Anker J. Nielsen, Jr., 410 Bailey Road, R.F.D. 114, Holden, Mass. 01520, and Lynn H. Morse, Box 1505, W. Venice Ave., Venice, Fla. 33595
Filed Apr. 9, 1975, Ser. No. 566,181
Int. Cl.² E05B ***15/02***
U.S. Cl. 292—340 **9 Claims**



1. A locking adaptor assembly for securing the flat apertured cover firmly against a flange of the hollow body of a

receptacle for a wattmeter or the like by use of a completely removable bolt type lock having a cylindrical barrel with locking balls extending laterally near one end of the barrel and with an enlarged head permanently fixed at the other end of the barrel, said locking adaptor assembly comprising:

a. a supporting element detachably mounted within the hollow body of the receptacle, said supporting element having at least one resilient mounting finger for gripping the flange of the hollow receptacle body;

b. said supporting element having an annular retaining shoulder positioned within the hollow body of the receptacle, said retaining shoulder having an inner diameter which is smaller than the diameter of the lock barrel with locking balls extended and which is larger than the diameter of the lock barrel with locking balls retracted; and

c. said annular retaining shoulder being axially aligned with the aperture of the closed cover and being spaced inwardly from the closed cover by a distance sufficient to enable the bolt type lock to maintain the cover firmly closed.

3,968,986

ELECTROMAGNETIC LIFTING DEVICE

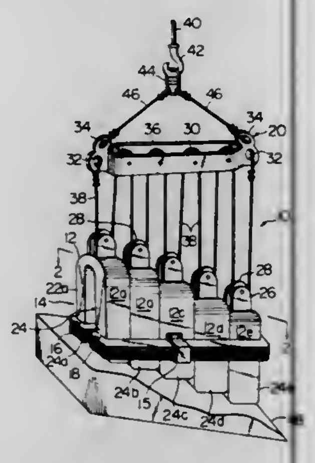
Toshio Nagata, Tokyo, Japan, assignor to Kohan Sendan Kikai Kabushikikaisha, Japan

Filed July 25, 1975, Ser. No. 599,150

Claims priority, application Japan, Aug. 8, 1974, 49-94079[U]; Oct. 7, 1974, 49-120268[U]

Int. Cl.² B66C *1/06*

U.S. Cl. 294—65.5 **11 Claims**



1. An electromagnetic lifting device for handling ferromagnetic material comprising:

a magnetic pole assembly consisting of a plurality of magnetic pole members disposed in side-by-side relation to each other, said magnetic pole members each having a pair of opposing yokes;

a first magnet-exciting coil surrounding said yokes on one side and a second-magnet exciting coil surrounding said yokes on the other side, of said magnetic pole members, said first and second coils being incorporated in said magnetic pole assembly; and

means for connecting said magnetic pole members in a relatively movable relation to each other.

3,968,987

BELL HOUSING ASSEMBLY UNIT

Harvey E. Powell, P.O. Box 142, Blue Mountain, Miss. 38610

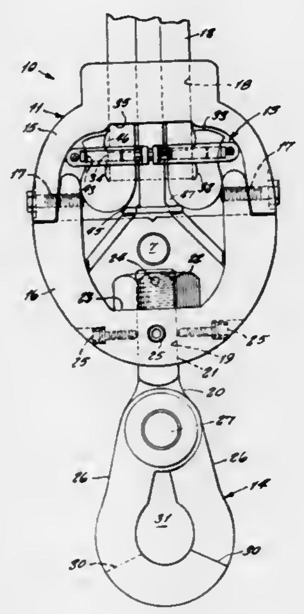
Filed Jan. 6, 1975, Ser. No. 538,590

Int. Cl.² B66C *1/14*

U.S. Cl. 294—78 R **4 Claims**

1. In a bell housing assembly, the combination of a swing ring assembly to be fitted on a cable or rope, a securement band unit for securement to said cable or rope and a claw hook unit supported on said swing ring assembly;

said swing ring assembly comprising an upper U-shaped member and a lower U-shaped member pivotally attached together by axially aligned bolts through opposite ends of said U-shaped members, a vertical opening on said upper member for receiving said cable or rope and a vertical opening in said lower member for receiving said claw hook unit;



said claw hook unit comprising an eye bolt having a shank received through said vertical opening of said lower member and fitted with a nut and a pair of claw hook members pivotally depending on a transverse pin received through an eye of said eye bolt; and

said securement band comprising a sleeve, a circular contraction band and a wedge band.

3,968,988

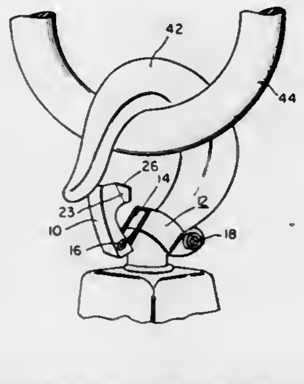
SAFETY LATCH

Angelo J. Carfagno, Philadelphia, Pa., assignor to L. H. Shingle Company, Plymouth Meeting, Pa.

Filed Feb. 15, 1973, Ser. No. 332,891

Int. Cl.² B66C *1/36*

U.S. Cl. 294—82 R **1 Claim**



1. A safety latch for industrial load hooks comprising:

a latch member comprising a body portion having a pivot end and a hook-engaging end, with finger lugs being carried by said body portion on opposite sides thereof and each projecting away from said body portion, said finger lugs having edges disposed most remote from said pivot end of said body portion that define a substantially obtuse included angle therebetween;

and a deeply indented positioning dimple in the center of the bottom outer surface of said latch member, said dimple comprising means facilitating secured seating of said latch member against lateral movement relative to a load hook surface;

a clamp member, said clamp member being of a one-piece sheet metal construction and comprising a ring portion and a shank portion, said shank portion being integral with said ring portion and said shank portion terminating in a hinge portion having its centerline positioned inboard of the inner circumference of the ring portion of said clamp member, said hinge portion terminating in a loop portion curling inboard, wherein said shank portion is inclined outwardly away from said inner circumference of said ring portion of said clamp member at an angle of approximately 5°, such that said pivot end of said latch member clears the body of the hook when said latch member is depressed during hook removal, said shank portion being of a length relative to the length of said latch member such that said ring portion of said clamp member is at a position on the hook no farther interiorly from the throat opening of the hook than said hook-engaging end of said latch member when said latch member is in a hook-engaging position, whereby said ring portion of said clamp member can be positioned close to the throat opening;

means for securing said clamp member to the hook, said securing means comprising a bolt and nut, said bolt passing through respective holes in opposite ends of said ring portion of said clamp member at a point on the hook behind and opposite said shank portion of said clamp member, said opposite ends being in bent relation out of the plane of the ring of said ring portion so as to enable said safety latch to be positioned closer to the throat opening;

means facilitating relative pivoting between said latch member and said clamp member comprising a bolt passing through said loop portion of said hinge portion of said shank portion of said clamp member and the pivot end of said latch member;

and a spring wrapped about said pivoting means having its ends supported against the inner surface of said latch member, said ends terminating at a point no farther than two-thirds of the distance from said pivot end to said hook-engaging end and its middle portion supported against the outer circumference of said clamp member, so as to result in moment arms of said spring of about equal length.

3,968,989

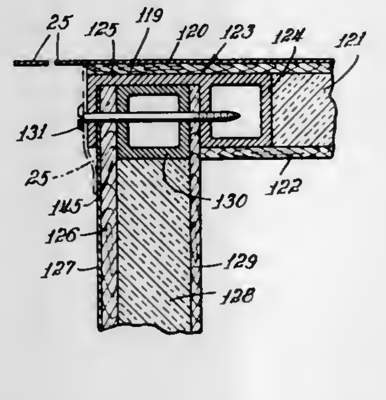
ENCLOSURE STRUCTURE

Ronald Schippers, R.R. 1, P.O. Box 155, Thomson, Ill. 61285

Filed July 18, 1974, Ser. No. 489,499

Int. Cl.² B62D *27/00*

U.S. Cl. 296—29 **33 Claims**



25. An enclosure structure comprising side wall panels and end wall panels affixed thereto and top and bottom panels, said top and bottom panels comprising a plurality of frame members and means forming inner and outer panel surfaces affixed thereto, the frame members at the lateral edges of said top and bottom comprising elongate tubular members and flange members affixed thereto underlying the outer panel surface and cooperating to define a channel, the upper and lower edges of said side wall panels being engaged in said channels and affixed thereto.

3,968,990

DENTAL PATIENT'S CHAIR INCLUDING PADDED BACKREST

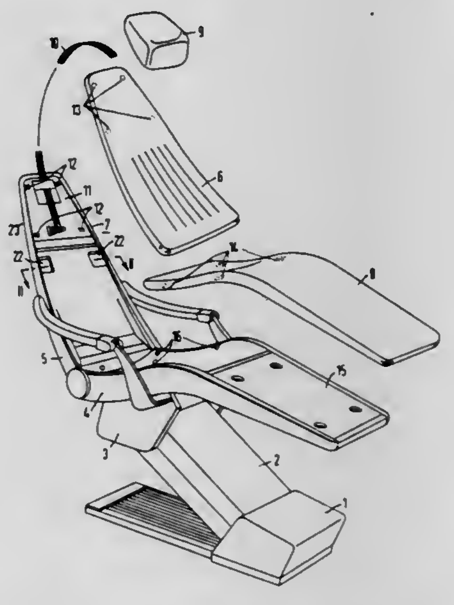
Erich Heubeck, Bensheim/Zell, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Aug. 7, 1974, Ser. No. 496,015

Claims priority, application Germany, Aug. 10, 1973, 2340605

Int. Cl.² A47C *7/02*

U.S. Cl. 297—452 **3 Claims**



1. In a dental patient's chair including a seat and a backrest forming an upper patient-supporting surface; and a padding cover being supported on the upper patient-supporting surface of said backrest, the improvement comprising; said upper patient-supporting backrest including a generally flat, plate-like rigid support frame extending over essentially the major surface area of said backrest and having upstanding side walls extending along the edges thereof; means for detachably fastening said padding cover to said support frame; a shaped element being fastened to said support frame on the side of said frame opposite to that supporting said padding cover; and a rigid form-defining support element being embedded in said shaped element, said shaped element being a shell-like shaped component encompassing the rear surface and having portions cupping the side walls of said support frame, said shaped element being resiliently elastic in planes extending perpendicular to the plane of said backrest and having an exterior washable surface, said padding cover covering the entire front surface of said backrest and extending out so as to contact the portions of the shaped element cupping the upstanding side walls of said support frame whereby the frame is covered in its entirety.

3,968,991

COLLAPSIBLE SEAT STRUCTURES

Owen Finlay Maclaren, Barby, near Rugby, England, assignor to Gannet Holdings Limited, Guernsey, Guernsey (Channel Is.)

Filed Oct. 25, 1973, Ser. No. 409,590

Claims priority, application United Kingdom, Nov. 1, 1972, 50331/72; Mar. 2, 1973, 10246/73

Int. Cl.² A47C *4/28*

U.S. Cl. 297—45 **16 Claims**

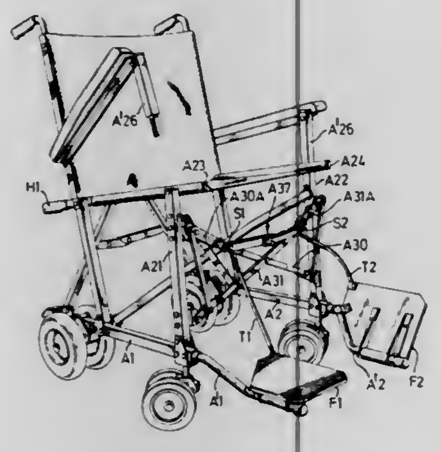
1. A volume frame foldable in two dimensions mutually at right angles, comprising, when extended,

a pair of opposite sides of corresponding form, each such side comprising elongate elements and a first plurality of pivot connection means, the elements of each such side including at least an upright front leg, an element which is an upright back leg, and a rigid element which joins the front leg to the back leg through said pivot connection means, said pivot connection means being a pair spaced along said rigid element and disposed at two corners of a theoretical quadrilateral of which said front leg and said back leg are opposite sides, each pivot connection means of said pair affording a horizontal axis directed from side to side of the volume frame, thereby enabling folding of the frame in one of said dimensions by pivoting of each said front leg about one horizontal axis and pivoting of each said back leg about another horizontal axis in the back to front sense of the frame with concurrent mutual approach of said front leg, said back leg and said rigid element in each said side frame,

the frame further comprising:

at least one collapsible X frame and a second plurality of pivot connection means each having two degrees of pivotal freedom including pivotal freedom about a horizontal axis directed from side to side of the volume frame, said second plurality of pivot connection means being spaced in the side frames from said first plurality of pivot connection means, which X frame lies in a plane extending in the lateral sense of the volume frame and inclined to a front plane and a back plane which contain, respectively, each said front leg and each said back leg, said X frame having a pair of lower ends and a pair of upper ends, of which X frame one such lower end and one such upper end are each pivotally connected by a respective pivot connection means of said second plurality thereof to one of said opposite sides of the volume frame whereas the other such lower end and the other such upper end are each pivotally connected by a respective pivot connection means of said second plurality thereof to the other of said opposite sides of the volume frame, thereby enabling folding of the frame in the other of said dimensions by collapse of said X frame; and

at least one tie means having two ends of limited separability by which ends said tie means are connected in the volume frame in triangulating relationship with said X frame for supporting the volume frame when extended.



5. A volume frame as claimed in claim 1 in which each of said opposite sides comprises four elongate elements joined serially by said first plurality of pivot connection means to form a closed quadrilateral space frame including the front leg, the back leg, the said rigid element and a second rigid element extending generally parallel to, but spaced from, said rigid element.

.6. A volume frame as claimed in claim 5 in which ground wheels are mounted thereon and adapt the volume frame for use as the frame of a wheel chair, a fabric seat extends between said pair of opposite sides and is attached thereto,

each said back leg has an upward extension, and

a fabric back support extends between each said upward extension and is attached thereto.

3,968,992
FOLD DOWN TABLE FOR AIRCRAFT SEAT

Gerard T. Hogan, Southington, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 20, 1974, Ser. No. 534,992

Int. Cl.² A47B *39/00*

U.S. Cl. 297—162 **16 Claims**

1. In a seat of the type having a seat base and a desk mounted for movement relative to the seat base between a use position overlying the seat and a storage position beside the seat, the improvement comprising a pivot arm mounted for pivotal movement relative to the seat base in a generally vertical plane which is parallel to one side of the seat, said desk being pivotally mounted to said pivot arm for movement between an upper generally horizontal use position wherein said desk overlies said seat and a vertical position wherein said desk is movable with said pivot arm in said generally vertical plane to a storage position beside said seat, and complementary fastening means on said desk and on said pivoted arm for permitting quick removal of said desk from said arm, said desk including means for retaining papers.

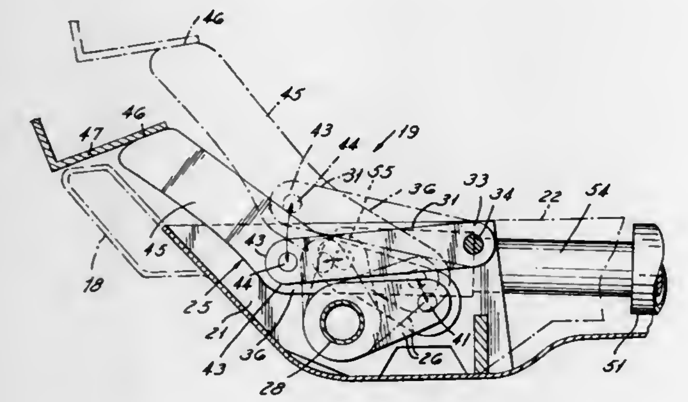
3,968,993
VEHICLE SEAT ASSEMBLY

Timothy K. Doyle, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1975, Ser. No. 580,073

Int. Cl.² A47C *1/024;* B60N *1/06*

U.S. Cl. 297—355 **2 Claims**



1. A vehicle seat assembly comprising:
a substantially horizontal seat structure and a normally upright backrest structure,
the backrest structure being carried on support arms pivotally connected to the seat structure for swinging movement about a single fixed pivot axis extending laterally of the latter,
a four-bar linkage adjuster mechanism interposed between the seat structure and the backrest structure,
the four-bar linkage of the adjuster mechanism terminating in a movable abutment engageable by an abutting portion of the backrest structure,
the four-bar linkage adjuster mechanism comprising a first crank coupled to a drive shaft journalled on the seat structure for rotation about a fixed pivot axis paralleling the backrest structure,
the drive shaft being coupled by a second crank to the brake means,
a follower link having one end pivotally coupled to the seat structure for movement about a pivot axis paralleling the drive shaft pivot axis,
and a connecting rod extending from the first crank to the other end of the follower link,
the abutment being located on the distal end of an extension of the connecting rod,
the abutment being movable under control of the linkage in a path substantially complementary to that taken by the abutting portion of the backrest when the latter is swung rearwardly from its normal upright position to a predetermined rearwardly reclined position,
and releasable brake means holding the four-bar linkage and thereby the abutment against movement to block rearward inclination of the backrest structure,
the backrest being forwardly swingable relative to the seat structure from any position independently of engagement with the adjuster mechanism.

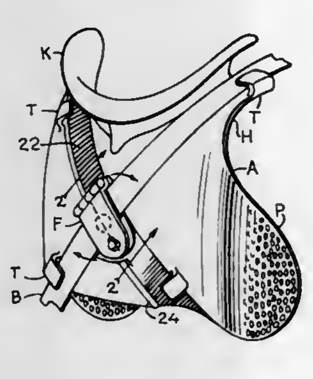
3,968,994
AUXILLIARY BODY RESTRAINING DEVICE

John J. Chika, 1350 Orchard Ridge Road, Bloomfield Hills, Mich. 48013

Filed Oct. 24, 1972, Ser. No. 300,314

Int. Cl.² A62B *35/00*

U.S. Cl. 297—390 **45 Claims**



1. An auxiliary body restraining device to provide additional protection and restraint for the head and the upper torso of an occupant of a transportation vehicle seat which is equipped with any type of a lap-belt and shoulder-belt body restraining system, the device comprising in combination:
an auxiliary protective guard for the seat occupant's thorax, head and neck, said guard being easily attachable and detachable to and from the upper section of the existing restraining system crossing the front of the seat occupant's chest;
said guard comprising a relatively thin, rigid, panel-like chest-shield portion which is adjustably positionable substantially transversely and vertically in front of and immediately adjacent to the seat occupant's chest by inserting it underneath and securing it to said upper section of said restraining system crossing his chest, so that the chest-shield will absorb and distribute the impact force of said restraining system over greater area of said occupant's thorax whenever he is being restrained by it;
the upper portion of said chest-shield configured to fit under said occupant's chin and partially around his neck to form a unique head-guard element to limit unwanted movement of the occupant's head and to protect the occupant's head from severe whiplash and other injuries caused by said upper section of said system coming into direct and violent contact with said occupant's head, neck and face while he is being restrained by said upper portion of said chest-shield during any severe deceleration of said vehicle.

3,968,995
CONTINUOUS MINING MACHINE WITH A CHAIN DRIVE FOR THE CUTTING HEAD

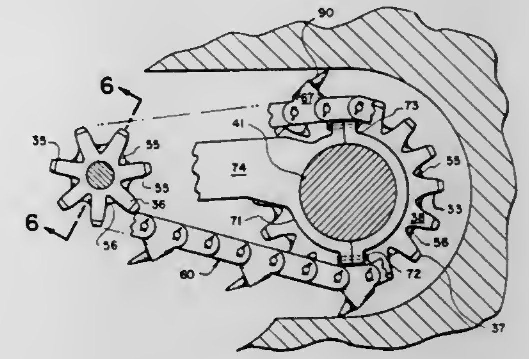
Einar M. Arentzen, Charleroi, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 8, 1974, Ser. No. 431,625

Int. Cl.² E21C *25/52, 25/36*

U.S. Cl. 299—76 **2 Claims**

1. In a continuous mining machine having a frame mounted for movement toward a mine face, a mining head supported forward of the frame and supporting a rotatable cutter drum on an axis extending transverse to the direction of movement of the frame, rotary power means mounted on the frame, a drive sprocket connected to the power means, a driven sprocket connected to the cutter drum, and a cutter chain connecting said sprockets to transmit power from the power means to the cutter drum, the improvement wherein the chain comprises a succession of articulately connected roller chain links having a pair of spaced side bars connected to adjacent links by a pin and a roller rotatably mounted about said pin between the pair of side bars, wherein some of said links include bit support blocks which extend outwardly from said links opposite the sprocket engaging side of said links with sufficient space between the support block and adjacent rollers and under said support block to allow the teeth of the sprockets to fully engage the roller of said link and further having openings between the support and the rollers effective to allow trapped foreign material such as dirt or coal to escape therebetween as the sprocket teeth squeeze the material against the rollers and support blocks to lessen the build up of foreign matter between the sprockets and the chain; and cutter bits mounted in said support blocks to cut clearance in the mine face for said chains and sprockets.



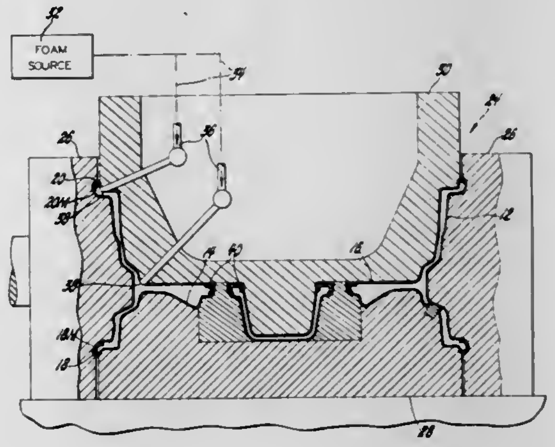
3,968,996
VEHICLE WHEEL

Raymond J. Wilcox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

Filed Nov. 27, 1974, Ser. No. 527,555

Int. Cl.² B60B *3/06*

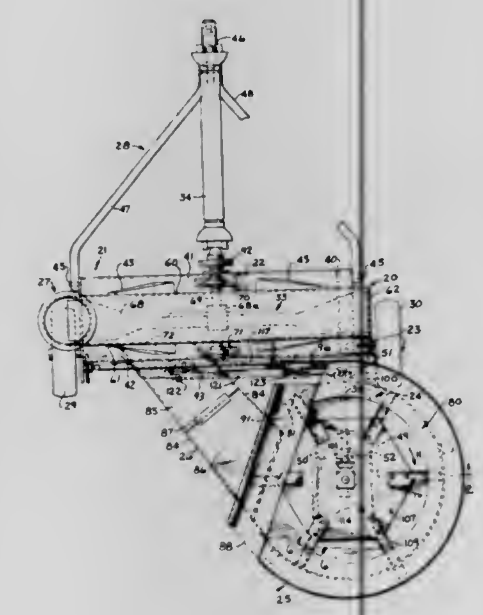
U.S. Cl. 301—37 R **11 Claims**



1. A vehicle wheel, comprising: an outer skin including a plurality of members secured to each other to define a cavity, the cavity including an annular rim portion and an interconnected disc portion located within the annular configuration of the rim portion, the rim portion of the cavity projecting axially from the disc portion to the opposite axial sides of the wheel, and foam filling said cavity and engaging and being adhered to the members of said outer skin so as to cooperate therewith as a load bearing and transmitting component of the wheel.

3,968,997
FEED MATERIAL HANDLING APPARATUS

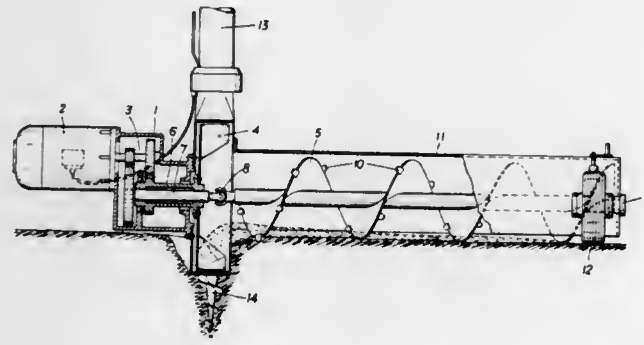
Aquila D. Mast, and Jean Paul Lyet, II, both of Lancaster, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Jan. 12, 1970, Ser. No. 2,017
Int. Cl.² B65G *53/08*
U.S. Cl. 302—37 **12 Claims**



1. A material conveying apparatus adapted to initially break up heavy clumps of received crop material and then impel the crop material into a blower and subsequently blow the crop material through a transition member to a silo or the like, said apparatus comprising:
- a frame;
- a blower housing mounted on the frame and including spaced apart vertically extending side walls, a wrapper and a transition member;
- a blower fan journalled for rotation within said housing about a generally horizontal axis spaced above an aperture in one of the spaced apart side walls;
- an open top hopper mounted on the frame in operative communication with the apertured side wall, said hopper comprising a bottom wall and crop confining means extending upwardly from said bottom wall to define an initial feed opening for receiving crop material dropped in the hopper;
- feed material transfer means extending tangentially from said hopper to the aperture in the apertured side wall, said feed material transfer means being a tubular structure and disposed at an acute angle relative to the apertured side wall;
- horizontal rotor means mounted within said hopper and having radially outwardly extending blades;
- said initial feed opening being open upwardly to permit crop material to be dumped directly onto a substantial portion of said rotor blades under conditions where said rotor is rotated about a vertical axis;
- means operable to rotate said rotor means at a speed sufficient to cause clumps of crop material engaged by said rotor means to be broken up and impelled in a generally tangential direction by said rotor means into the blower housing through said apertured side wall via said feed material transfer means, in a generally airborne state; and
- means operable to rotate said blower fan at a speed sufficient to cause crop material impelled into the blower housing to be blown through the transition member to a silo or the like.

3,968,998
TOP UNLOADER FOR SILOS

Johann Wolf, Scharnstein, Austria, assignor to Firma Johann Wolf Gesellschaft m.b.H. KG, Scharnstein, Austria
Filed Dec. 6, 1974, Ser. No. 530,502
Claims priority, application Austria, Jan. 21, 1974, 484/74; Sept. 25, 1974, 7732/74
Int. Cl.² B65G *53/48*
U.S. Cl. 302—56 **8 Claims**

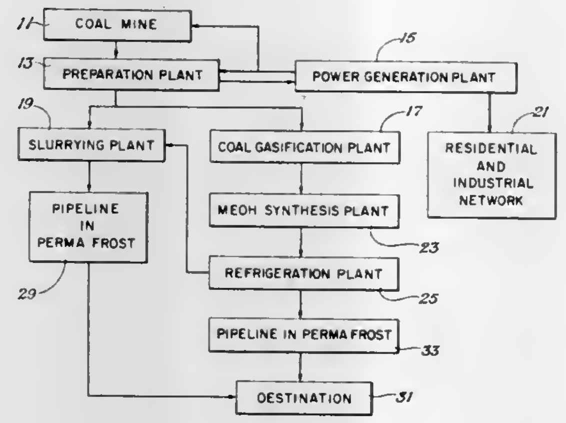


1. A top unloader for removing chopped silage from a circular silo, comprising
- a frame,
- a unit which is carried by said frame and mounted for rotation on a vertical axis at the center of said frame and comprises
- a radially extending cutting and feeding screw provided at its periphery with cutting and tearing elements,
- an ejecting blower disposed radially inwardly of said screw and comprsing an impeller and an intake opening, which faces said screw and is at least as large in diameter as said screw and exposed throughout its periphery,
- drive means for driving said screw and blower, which drive means comprise a hollow shaft, which carries said impeller and is operable to rotate the same, and a drive shaft, which extends through said hollow shaft and is operatively connected to said screw,
- said ejecting blower having a diameter which is not more than twice the diameter of said screw,
- said drive means being operable to drive said impeller at a speed which is at least four times the speed of said screw,
- said drive means comprising a drive motor and a transmission connecting said drive motor to said hollow shaft,
- said transmission being contained in a closed transmission housing in which said hollow shaft is cantilever supported,
- said screw being surrounded by a casing which is open only on its underside.

3,968,999
METHOD OF MAKING AVAILABLE FUELS FROM ARCTIC ENVIRONMENTS

Leonard J. Keller, Sarasota, Fla., assignor to The Keller Corporation, Dallas, Tex.
Continuation of Ser. No. 405,682, Oct. 11, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,754
Int. Cl.² B65G *53/30*
U.S. Cl. 302—66 **2 Claims**

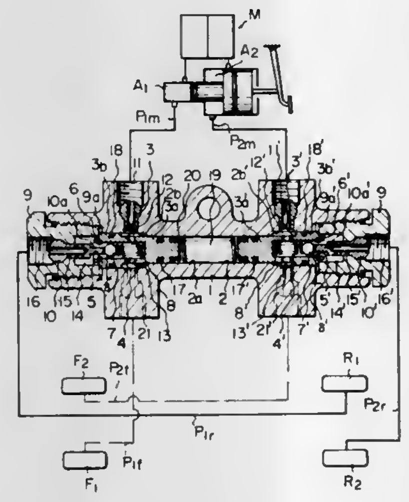
1. A method of making available economical fuel from arctic and subarctic environments without melting the permafrost along a transportation right of way comprising the steps of;
- a. preparing a liquid fuel comprising methanol;
- b. preparing a solid fuel comprising coal of —200 mesh particle size;
- c. forming a cold combustible mixture of said liquid fuel and said solid fuel at a temperature of less than 32°F.; including the steps of admixing and cooling said coal and said methanol; and



- d. pumping the cold combustible mixture through a pipeline in the frozen permafrost at a temperature below 32°F. to a destination.

3,969,000
BRAKE HYDRAULIC PRESSURE CONTROL VALVE

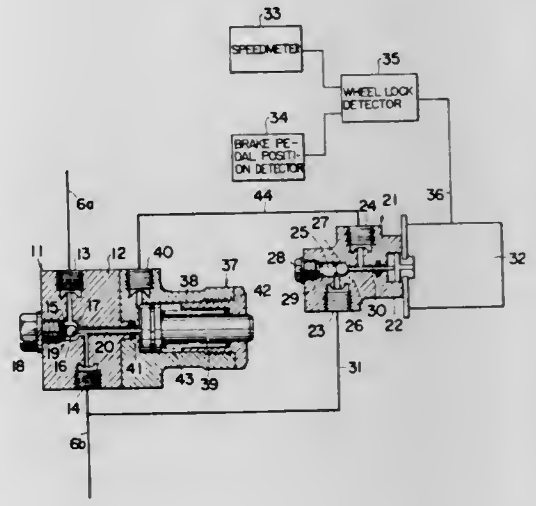
Yoshimoto Ohta, Kawasaki; Yoshihiro Hayashida, Chigasaki, and Haruyuki Amano, Ebina, all of Japan, assignors to Tokico Ltd., Japan
Filed Jan. 30, 1975, Ser. No. 545,699
Claims priority, application Japan, Feb. 5, 1974, 49-14789; Feb. 6, 1974, 49-15222; Nov. 28, 1974, 49-137190
Int. Cl.² B60T *8/26*
U.S. Cl. 303—6 C **6 Claims**



1. A brake hydraulic pressure control valve comprising:
- a housing;
- two separate liquid passages provided in said housing, each said passage having a first end connected to a respective separate source of hydraulic pressure and a second end connected to a respective brake cylinder;
- two valve members slidably disposed in said housing, each said valve member having a first end, said first ends opposing each other, and a second end exposed to a respective one of said liquid passages, and each said valve member being provided with valve means for opening and closing said respective one liquid passage; and
- a single spring means disposed between said opposed first ends of the valve members acting simultaneously on said two valve members for moving said two valve members away from each other to opened valve positions and for transmitting forces between said two valve members.

3,969,001
CONTROL MECHANISM FOR AUTOMOTIVE VEHICLE HYDRAULIC BRAKING SYSTEM

Hiroyuki Nakamura, Toyota; Hiroshi Kawaguchi, and Hideyuki Hayashi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Aug. 29, 1974, Ser. No. 501,831
Claims priority, application Japan, Dec. 7, 1973, 48-136234
Int. Cl.² B60T *8/12*
U.S. Cl. 303—21 F **4 Claims**



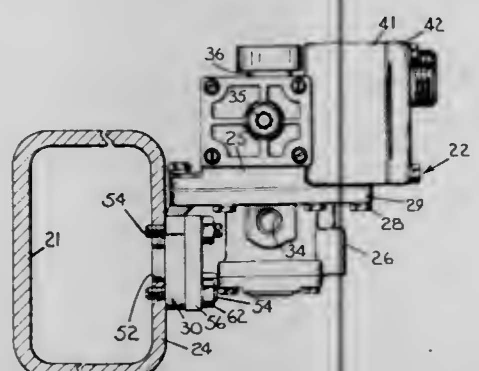
1. In a hydraulic braking system for a vehicle having front and rear wheels, said system including front and rear master cylinder means, front and rear wheel cylinder means, hydraulic braking fluid pressure means and hydraulic brake fluid circuit means for distributing hydraulic fluid pressure in said system, said circuit means including rear brake cylinder circuit means extending between said rear master cylinder means and said rear wheel cylinder means, the combination comprising means for sensing locking of said wheels and for generating a signal indicating the occurrence of wheel lock, a hydraulic brake pressure control device responsive to said wheel lock sensing means adapted to be actuated to a first and a second operative condition, said control device being actuated to said first operative condition to lower wheel cylinder fluid pressure upon receipt from said wheel lock sensing means of the first signal indicating wheel lock occurring while said control device is in said second operative condition, said control device while in said first operative condition being nonresponsive to subsequent wheel lock signals received from said wheel lock sensing means until said control device is subsequently actuated back to said second operative condition, and pressure regulating means connected in parallel with said hydraulic brake pressure control device within said rear brake hydraulic circuit means extending between said master cylinder means and said rear wheel cylinder means, said pressure regulating means being operative while said control device is in said first operative condition to control wheel cylinder fluid pressure in accordance with a predetermined relationship in correspondence with the relationship between braking forces applied to said front and rear wheels after wheel lock has been released.

3,969,002
MOUNTING PLATE FOR SECURING A BRAKE CONTROL VALVE TO A VEHICLE AXLE

Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Oct. 9, 1975, Ser. No. 621,221
Int. Cl.² B60T *8/04*
U.S. Cl. 303—21 F **11 Claims**

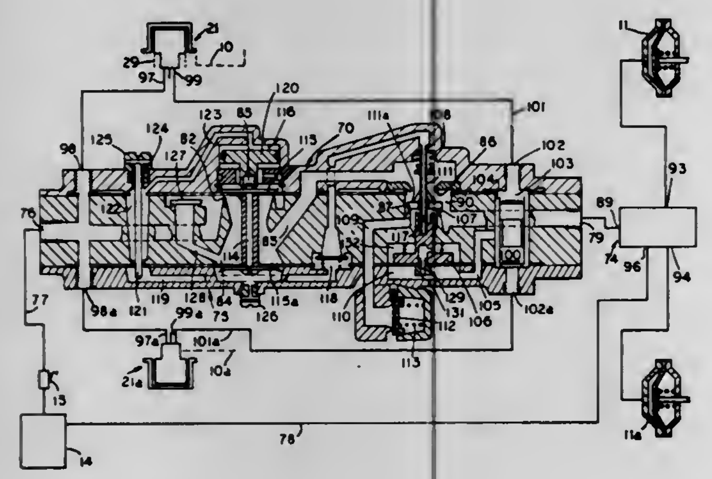
1. A vehicle axle assembly comprising an axle, means for rotatably mounting a ground engaging wheel at each end of said axle, a fluid powered brake mechanism mounted to said axle adjacent each end thereof, each brake mechanism being operative when actuated to restrain rotation of a wheel rotat-

ably mounted at that end of the axle, a relay valve body having a mounting flange formed integral therewith, means providing a source of pressurized fluid to said valve body, conduits connecting said relay valve body to said brake mechanisms at each end of said axle, relay valve means within said body and operable when actuated to supply fluid pressure from said source to said brake mechanism, a plurality of holes extending through said mounting flange, a mounting plate contiguous with surface portions of said mounting flange adjacent each of said holes, a plurality of holes extending through said mounting plate, said holes through said mounting plate being axially aligned with said holes through said mounting flange, and fastening means extending through each of said axially aligned holes and fixing said valve body to said axle with said mounting flange secured between said mounting plate and said axle.



3,969,003
ANTI-SKID CONTROL DEVICE AND SYSTEM

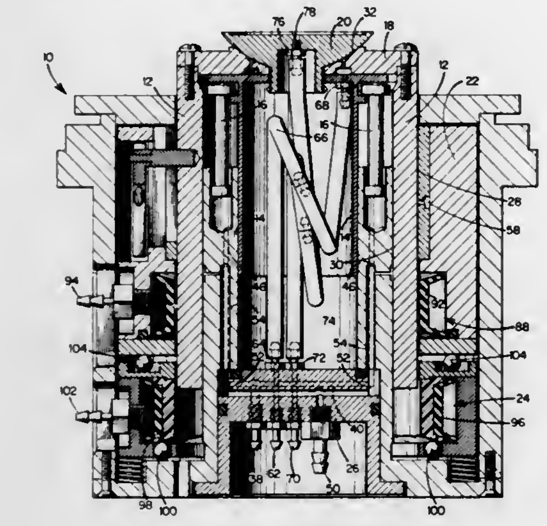
Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company Limited, West Hartford, Conn.
Division of Ser. No. 431,952, Jan. 9, 1974. This application Apr. 10, 1975, Ser. No. 566,761
Int. Cl.^{2} B60T *8/06*
U.S. Cl. 303—21 F **11 Claims**



1. A brake service air module comprising a unitary housing having a main inlet connectible with a brake service air source, a main outlet connectible with an air operable braking mechanism, a flow passage through the housing normally communicating the main inlet with the main outlet, an air signal outlet from the housing branching off the flow passage adjacent the main inlet connectible with an air inlet of a wheel lock-up air signal transmitting control device, quick acting valve means in the housing having response upon application to it of an air signal to interrupt communication of the flow passage with the main outlet and to connect the main outlet with a vent passage, an air signal admission port to the housing adjacent the main outlet connectible with an air signal outlet of the control device, the admission port being connected in the housing for application of an admitted air signal to the quick acting valve means.

3,969,004
AIR BEARING PISTON ASSEMBLY FOR SEMICONDUCTOR MASK-TO-WAFER ALIGNER

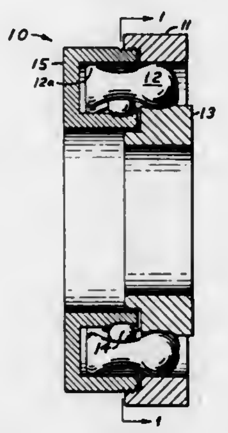
Gerd Schliemann, Saratoga, Calif., assignor to The Computervision Corporation, Bedford, Mass.
Filed Aug. 2, 1974, Ser. No. 494,111
Int. Cl.^{2} F16C *7/04*
U.S. Cl. 308—9 **7 Claims**



1. In a semiconductor mask-to-wafer aligner, an air bearing piston assembly for raising a semiconductor wafer to a mask comprising:
movable piston means;
a ball table mounted on said piston means with a hemispherical leveling ball movably positioned in said ball table;
means for establishing an air bearing between said ball and ball table; means for establishing either a vacuum or a pressure at the central portion of the flat surface of the hemispherical leveling ball;
means for guiding said piston means;
means for establishing an air bearing between said piston means and said piston guide means; and,
means for moving said piston means.

3,969,005
ROLLING CONTACT DEVICES

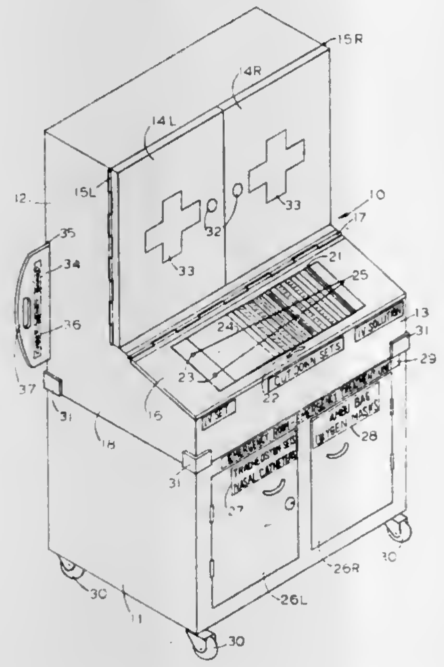
Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811
Filed Dec. 13, 1973, Ser. No. 424,553
Int. Cl.^{2} F16C *19/20*
U.S. Cl. 308—209 **8 Claims**



1. A rolling contact device comprising:
at least two bearing races,
said bearing races including circular surfaces,
first rotating means,
said first rotating means including a plurality of major rotating elements in rolling contact with said circular surfaces of said races,
second rotating means,
said second rotating means including a plurality of minor rotating elements alternately interposed between said major rotating elements to prevent their mutual contact and engaging the same in rolling contact,
circular retaining means,
said circular retaining means being in rolling contact with said secondary rotating means and serving to hold the same in position,
there being only one contact between adjacent rotating elements,
there being no sliding contact in said device.

3,969,006
MEDICAL EMERGENCY TREATMENT CABINET

Loy G. Brown, 609 Fairchild Drive, Fort Worth, Tex. 76114
Filed Sept. 13, 1973, Ser. No. 396,746
Int. Cl.^{2} A47B *81/00;* **B42F** *1/00*
U.S. Cl. 312—234.1 **1 Claim**

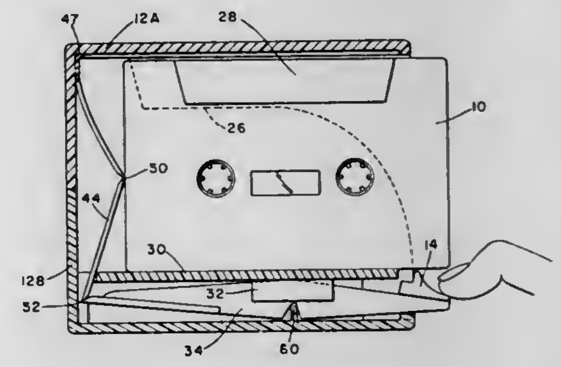


1. In a medical emergency patient treatment unit, a cabinet structure with doors opening to display accessibly located medications, supplies, and equipment located in coordinate use groups; wherein such cabinet structure includes an upper section having said doors mounted by vertical hinges at the outer edges to close and open in and out from the mid-region, a bin below and extending forward from said upper section having the doors, a lid on the top of said bin, hinged at the rear adjacent the front of said upper section, with the bin lid and the top forepart of the bin sloping downwardly from the lid hinge to the front of the bin; emergency treatment instructions being fastened to the top of said bin lid, said instructions comprising color code indexed emergency treatment instruction sections respectively color coordinated with color coding of said coordinate use groups; a quick release elastic cord connected at opposite ends to emergency treatment instruction book bin lid fastening means, cord loop hook means fastened to said bin lid in position for book-page-hold-down by said elastic cord, when the cord is looped over said hook means; and bulk storage locations correspondingly color code labeled for special treatment equipment.

3,969,007
CASSETTE DISPENSER

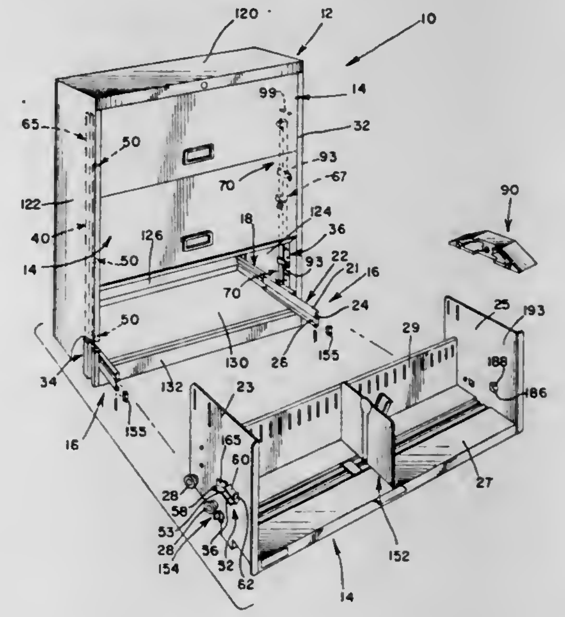
Alan B. Lowry, Canton, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Filed Feb. 21, 1975, Ser. No. 551,513
Int. Cl.^{2} A47B *81/06*
U.S. Cl. 312—15 **11 Claims**

1. A cassette dispenser comprising;
a housing,
means dividing the housing into a plurality of cassette accommodating compartments,
a plurality of release keys, one being associated with each compartment and each having means for locking the cassette in the compartment when the key is not actuated including a lip for contacting a front edge of the cassette.
means for supporting each key so that the key is movable to an actuated position,
and means coupled from each key supporting means forming a hinge that is integrally formed with the supporting means and that contacts the cassette so that upon actuation of the key the hinge bends and urges the cassette from the housing.



3,969,008
SAFETY LATCH AND DRAWER MOVEMENT SEQUENCING CONTROL ARRANGEMENT FOR FILE CABINETS

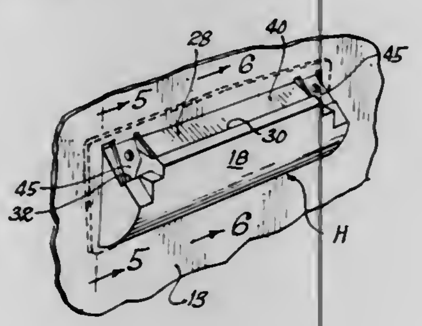
Charles C. Pergler, Aurora, Ill., assignor to All-Steel Inc., Aurora, Ill.
Filed June 27, 1975, Ser. No. 590,880
Int. Cl.^{2} E05C *7/06, 15/04*
U.S. Cl. 312—221 **14 Claims**



1. In a filing cabinet comprising a frame mounting a plurality of superposed drawers for independent horizontal shifting movement between open and closed positions, and a safety latch arrangement, for precluding the movement of more than one of said drawers at a time from said closed to said open position, including a vertically disposed latch bar mounted adjacent the drawers and means for actuating said bar, when one of the drawers is moved to open position, to latch the remaining drawers against movement to open position, the improvement wherein the cabinet includes a drawer movement sequencing device,
said device comprising:
a vertically disposed slideway positioned along one side of the drawers,

said slideway having disposed therein a latch bar segment for operative association with each of said drawers,
said segments being in discrete vertically stacked relation and being mounted in said slideway for vertical movement therealong from an inoperative at rest position lengthwise of the slideway,
said segments each including:
a lower lug disposed at the level of the drawer with which the respective segments are to be operatively associated and an upper lug disposed at the level of the next vertically adjacent upper drawer,
said drawers each including on said side of same a cam member disposed to cooperate with the lower lug of the latch bar segment that is operatively associated therewith,
said cam members each defining:
forward and rearward upwardly facing ramp surfaces separated by an elevated upwardly facing horizontal guide surface,
and a downwardly facing horizontal abutment surface,
said lower lugs of said segments being elevationally located thereon to dispose the lower lug of the respective segments, in said at rest position thereof, at the level of and for camming engagement by said ramp surfaces of the cam member of the drawer operatively associated therewith,
said upper lugs of said segments being elevationally located thereon, in the at rest position of said segments, to dispose the upper lugs of the respective segments, adjacent to but below the level of the cam member abutment surface of the next vertically adjacent upper drawer, for abutting engagement therewith,
whereby, when a lower segment is elevated by moving a first lower drawer from its closed position toward its open position, the cam member of such lower drawer at its upwardly facing surfaces engages the lower lug of the latch bar segment operatively associated therewith to cam same and the segments supported thereon upwardly whereby a second drawer above such moving lower drawer if also moving toward its open position has its cam member abutment surface jammingly engaged by the upper lug of the latch bar segment operatively associated with the drawer next vertically adjacent and below such second drawer, whereby further outward movement of such lower moving drawer is blocked by those of said segments between such lower and upper drawer cam members while permitting such second drawer to be moved to its open position to actuate said latch bar actuating means to preclude further drawers from being moved to open position.

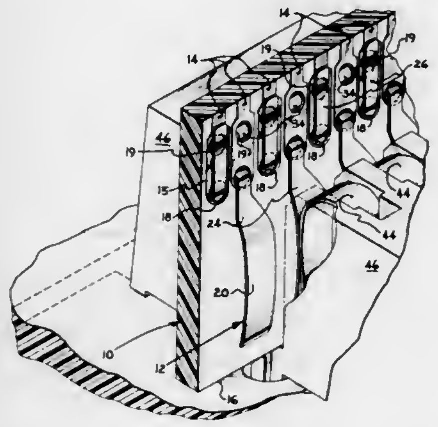
3,969,009
HANDLE
John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Co., Chicago, Ill.
Filed May 21, 1975, Ser. No. 579,674
Int. Cl.² A47B *95/02*
U.S. Cl. 312—320 **3 Claims**



1. In combination with a sheet-material front member for a movable element, said front member having an aperture therein, a handle seated in said aperture comprising

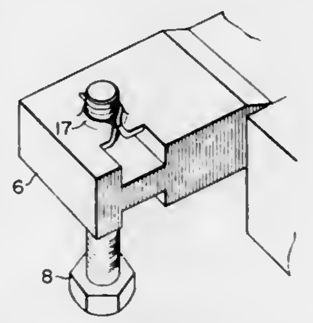
a. an escutcheon plate overlapping said aperture on the outer face thereof,
b. a cup portion extending rearwardly of the escutcheon plate to facilitate digital manipulation of the movable element and including an upper wall member,
c. said upper wall member having an angular shoulder portion on the outer face thereof, and
d. a resilient detent member extending downwardly and inwardly from said front member adjacent said aperture, said detent member engaging said shoulder for releasably locking the handle to the front member.

3,969,010
SUBSTRATE WITH IMPROVED CONTACT TERMINALS
William Kirby Nailor, III, Camp Hill, and David Clyde Thompson, Mechanicsburg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 17, 1974, Ser. No. 471,023
Int. Cl.² H05K *1/06*
U.S. Cl. 339—17 C **11 Claims**



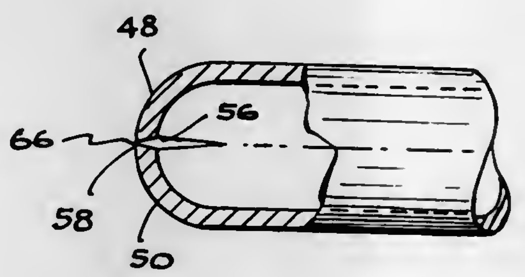
9. A contact terminal for mounting on a substrate along an edge thereof comprising, a contact having an outward bow, a transition section extending from said contact at an angle to the longitudinal axis of said contact, and a narrowed tail connected to said contact through said transition section, said tail having a longitudinal axis substantially parallel with and offset from the longitudinal axis of said contact.

3,969,011
ATTACHMENT ASSEMBLY FOR PREVENTING IMPROPER POSITIONAL MOUNTING
Shinji Yamada, Yoyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Aug. 19, 1974, Ser. No. 498,622
Claims priority, application Japan, Aug. 22, 1973, 48-97570[U]; June 22, 1974, 49-72724[U]
Int. Cl.² H02B *1/02;* **F16B** *39/284*
U.S. Cl. 339—125 R **3 Claims**



1. An attachment assembly for mounting one of a pair of male and female connectors to a frame body in a manner preventing improper positioning thereof, said assembly comprising a threaded bolt, means on said frame body through which said bolt may extend into engagement with said one connector for mounting said connector to said frame body, a nut mounted on said one connector and including a central threaded bore adapted to be threadedly engaged by said bolt, resiliently deformable means fixed relative to said one connector and located proximate said nut on one side thereof, said resiliently deformable means being configured to prevent threaded engagement of said nut by said bolt from the side thereof upon which said deformable means are located but to permit said bolt to become threadedly engaged with said nut when said bolt is inserted from the opposite side thereof, with said bolt acting to cause resilient deformation of said deformable means as said bolt is turned in threaded engagement with said nut to extend first through said nut and then into abutment with said deformable means thereby to permit secure threaded engagement between said bolt and said nut, said assembly being configured to permit said one connector to be mounted upon said frame body only when positioned relative thereto in a manner to permit said bolt to pass through said means on said frame body through which said bolt may extend into engagement with said connector and subsequently through said nut from the side thereof opposite the side upon which said resiliently deformable means are located, a flange extending from said one connector upon which said nut and said resiliently deformable means are located, means defining in said flange a recess having at least a pair of parallel walls within which said nut is fitted, said nut including at least a pair of parallel walls cooperating with said parallel walls of said recess to prevent rotation of said nut within said recess, said flange being positioned to extend relative to said means on said frame body through which said bolt may extend into engagement with said one connector to permit mounting of connector upon said frame body in a desired position by threaded engagement of said nut by said bolt, said resiliently deformable means comprising a thin-walled fin-like section extending from said connector and integrally formed therewith having a slot defined therein, said slot having a width less than the crest diameter of said central threaded bore and being located to extend relative to said nut to be engaged generally centrally by the threaded end of said bolt after passage thereof through said nut, said fin-like section being configured to be deformed by passage of said bolt therethrough in a manner to create a resilient engaging force between said fin-like section and said bolt.

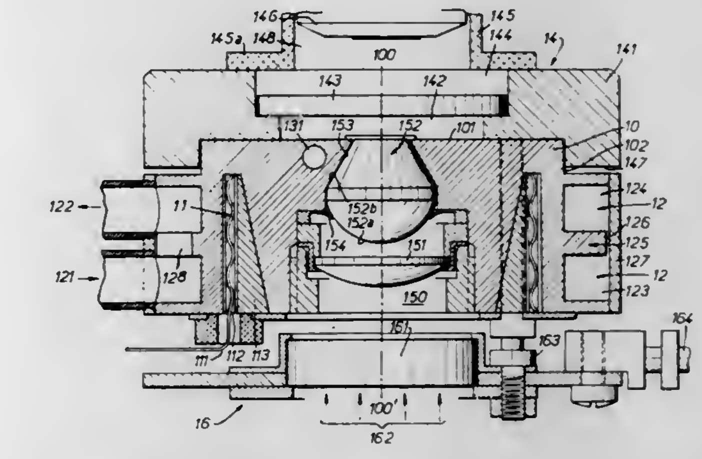
3,969,012
STAMPED CONTACT TIP
Anton Ernst Bauer, Neckarsulm, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Oct. 31, 1974, Ser. No. 519,420
Int. Cl.² H01R *13/06*
U.S. Cl. 339—252 P **8 Claims**



1. A pin contact formed from a stamping rolled into an annularly shaped wall with one end adapted to be inserted in a receptacle contact, the improvement comprising:

spaced cutaway portions extending axially from said one end with each cutaway portion having a bevelled end edge surface extending between an outer and an inner annular surface with the outer surface of said annular shape extending axially beyond the end of the inner surface of said annular shape and the ends of the outer surface of said cutaway portions engaging to form a closed seam in response to the folding of said cutaway portions towards each other and the axis of said annular shape.

3,969,013
THERMALLY CONTROLLED MICROSCOPE STAGE ASSEMBLY
Bernard Poty, Gondreville; Jacques Leroy, Vandoeuvre-les-Nancy, and Leon Jachimowicz, Saulxures-les-Nancy, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France
Filed Mar. 25, 1975, Ser. No. 562,039
Claims priority, application France, Mar. 26, 1974, 74.10227
Int. Cl.² G02B *21/06, 21/34*
U.S. Cl. 350—87 **15 Claims**

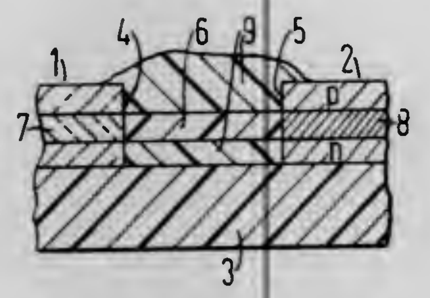


1. A thermally controlled microscope stage assembly for use in measuring transformation temperatures between −180° and +600°C, comprising a thick-walled platen with means for heating and means for cooling a specimen, a lighting well extending through said platen so as to be along the optical axis of the objective of a microscope associated therewith, a condenser for an illuminating beam built in said lighting well, the surface of the condenser facing the objective of the microscope containing the isophote plane of the condenser and lying level with the top surface of said platen, a specimen chamber bounded along its bottom by said platen, along its sides by a thick lateral wall in thermal contact with said platen, and along its top by a thin transparent platen member, heating supply means and cooling supply means for supplying respectively said means for heating and cooling the specimen, thermometric means including a resistance probe disposed in said platen adjacent the bottom of said specimen chamber and voltage measuring means, said resistance probe forming one arm of a linearizer bridge, heating relay means and cooling relay means connected respectively in series with said heating supply means and said cooling supply means and thermostat control means, said thermostat control means selectively controlling one of said relay means in response to the sign of the voltage difference between the output voltage of said linearizer bridge and a set voltage, said set voltage being provided by an adjustable voltage source and corresponding to a desired set temperature.

3,969,014
PHOTORESIST LAYER WAVEGUIDE COUPLING DEVICE
Franz Auracher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Dec. 16, 1974, Ser. No. 533,323
Claims priority, application Germany, Dec. 19, 1973, 2363253
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **10 Claims**

1. A coupling device for the transfer of light transmissions containing signals between optical components comprising a substrate, two optical components each having an end face,

said components having a portion adjacent its end face disposed on the substrate with the end faces of the two components being in spaced relationship, a developed, transparent, negative photo-resist layer disposed on the substrate between



said end faces and in contact therewith, said photo-resist layer being formed so that its end faces are matched and coextensive with the end faces of the optical components to form a continuous light guiding junction therebetween.

3,969,015
CABLE CONNECTOR FOR OPTICAL FIBER TRANSMISSION

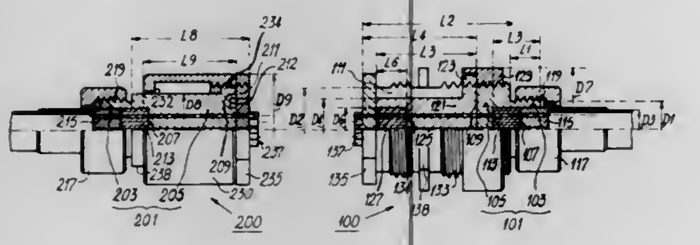
Georges E. Le Noane, Kerrougant, Bras, Tregastel, France 22730

Filed July 7, 1975, Ser. No. 593,503

Claims priority, application France, July 26, 1974, 74.25994

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **4 Claims**



1. A connector for armored cables used for transmission via optical fibres adapted to connect a first cable end having a threaded male element to a second cable end having a threaded female element comprising:
- a threaded male connecting element having a body portion, a front half-portion, a rear gripping portion, an elastic unit and a first nut to longitudinally secure the armor of said first cable end and simultaneously secure each optical fibre of said first end, said elastic unit consisting of an elastomer pad-metal piston unit constituting the fibre securing assembly of said male connecting element;
- said front half portion of male connecting element consisting of a second nut, a second elastomer pad-metal unit and an embedded washer at the front end thereof whereby each of the ends of the optical fibres of said first cable end lies in the end surface at the face of said embedded washer to provide a smooth surface of fibre ends which is coplanar with the front surface of said washer, and said embedded washer being adapted to be expelled from said fron half connecting element by means of said second nut;
- a threaded female connecting element on the second cable end receiving said male connecting element and front half connecting portion, said female connecting element having a body portion, a rear gripping portion, a front half connector portion, a third nut and an elastomer pad-metal piston unit to longitudinally secure said second cable end and the armor of said second end while securing the optical fibres of said second end;
- said front half connection portion of said female connecting element having a fourth nut and a second embedded washer at its joining end, the washer adapted to be expelled by said fourth nut of said female element in a manner similar to and simultaneous with the expulsion of the first washer by the second nut when the male and female element are joined;
- said second and fourth nuts being constructed, dimensioned and arranged in relation to the outer thread of said male connecting element to provide similar male and female assemblies of similar longitudinal dimensions with the second and fourth nuts providing the ends of said assemblies in abutting relationship and in a predetermined angular position of one assembly with respect to the other;
- and said second nut in cooperation with said elastomeric-pad-piston of said male connecting element being adapted for guiding the fibre ends of the two ends in the axial direction while coaxially aligning the fibre ends of the male connecting element with those fibre ends of the female connecting element.

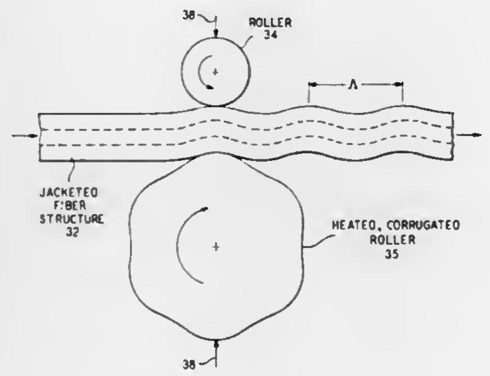
3,969,016
LOW DISPERSION OPTICAL FIBER WAVE GUIDING STRUCTURES WITH PERIODICALLY DEFORMED WAVEGUIDE AXIS

Peter Kaiser, Middletown, and Enrique Alfredo Jose Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1975, Ser. No. 576,043

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG **3 Claims**



1. An optical fiber waveguiding structure including at least one optical fiber waveguide having a longitudinal axis, core and cladding regions and being capable of guiding optical wave energy along said axis in a plurality of different modes of wave propagation having different group velocities, said structure further including means for reducing dispersion due to said difference in group velocities comprising means for enhancing coupling among said modes in said fiber, said structure being characterized in that said mode coupling means comprises an outer jacket enveloping said fiber, said outer jacket being selectively deformed so as to modify the straightness of said fiber axis in a spatially periodic manner effective in providing said mode coupling.

3,969,017
METHOD OF IMAGE ENHANCEMENT

Hans Dammann, Tangstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 374,512, June 28, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,694

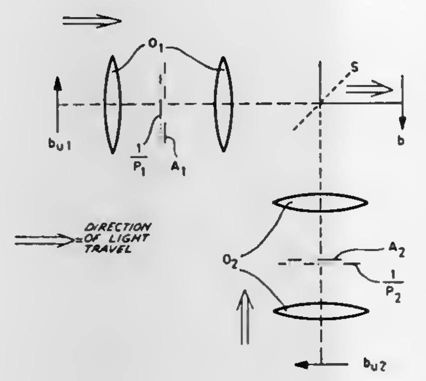
Claims priority, application Germany, July 1, 1972, 2232359

Int. Cl.² G02B *27/10*

U.S. Cl. 350—162 SF **4 Claims**

1. A method of enhancing blurred images of an object with the aid of inverse filters, comprising the steps of separately forming Fourier transforms of at least two blurred images of the object blurred by different blurring factors of different imaging sources into Fourier transforms, separately filtering the Fourier transforms by inverse filters each comprising the

inverse of the Fourier transform of the blurring factor of the imaging source used to produce the respective image, and having complementary apertures separated by opaque areas covering poles of each inverse filter, and converting the Fourier transforms into Fourier transforms to produce images of the object, and superimposing the images to produce an enhanced image.



3,969,018
OBJECTIVE SYSTEM WITH ZOOM LENS FOR PHOTOGRAPHIC APPARATUS

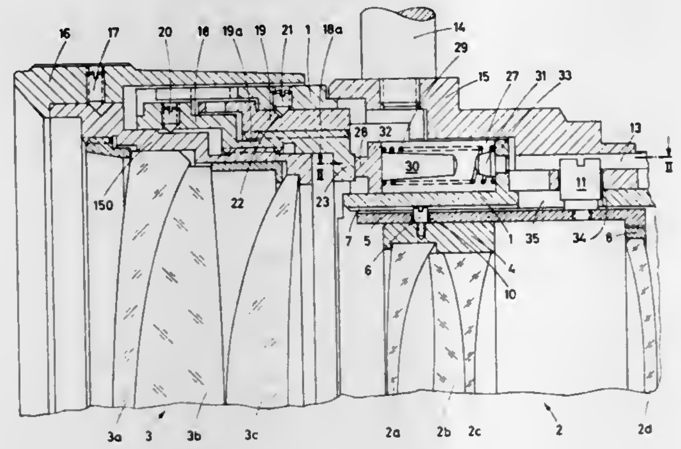
Herbert Reinsch, Kongen, and Peter Korner, Reichenbach, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1974, Ser. No. 505,601

Claims priority, application Germany, Sept. 17, 1973, 2346758

Int. Cl.² G02B *15/00*

U.S. Cl. 350—187 **11 Claims**



1. In an objective system for photographic apparatus, a combination comprising a barrel; a variable-focus picture-taking lens having a plurality of optical elements disposed in and movable axially of said barrel to thereby focus the image of a subject; a focus selector element movably mounted on said barrel; first connecting means for connecting said selector element with said plurality of optical elements so as to move selected optical elements axially in response to movement of said selector element relative to said barrel, said selector element being displaceable between a first plurality of positions to thereby move at least one first optical element of said plurality of optical elements through the medium of said connecting means during normal focusing of the image of a subject which is located within a range of first distances from the barrel, and said selector element being displaceable beyond said first plurality of positions to any one of a second plurality of positions to thereby move at least one second optical element of said plurality of optical elements through the medium of said connecting means during close-up focussing of the image of a subject which is located within a range of shorter second distances from the barrel such as correspond to the making of close-up shots, said connecting means comprising a cam, a motion transmitting member engaging said cam and operatively connected with said second optical element in each of said plurality of second positions of said selector element, and means for biasing said motion transmitting member against said cam, said motion transmitting member including a slide which is reciprocable in said barrel in parallelism with the optical axis of said lens; selector means and second connecting means for connecting said selector means with said second optical element, said selector means being movable with respect to said barrel to thereby move said second optical element axially and to thus change the focal length of said lens, said second connecting means comprising a second cam in said barrel and a follower operatively connected with said first optical element, tracking said second cam and rotatable by said selector means, said barrel further having a longitudinally extending groove and said slide having a slot into which said follower extends in a predetermined axial position of said second optical element, said follower further extending into said groove in response to movement of said second optical element to said predetermined axial position whereby said slide can move said second optical element axially in response to movement of said selector element between said second plurality of positions, said first connecting means comprising a third cam which is engaged by said slide in each of said plurality of first positions of said selector element, the slope of said third cam being such that the axial position of said second optical element remains unchanged while said selector element moves between said plurality of first positions, said first connecting means further comprising a ring which surrounds said first optical element and is rotatably and axially movably mounted in said barrel, said first mentioned and third cams being provided on said ring, and said ring comprising a protuberance disposed between said first mentioned and third cams and over which said slide rides against the opposition of said biasing means during movement of said selector element beyond said plurality of first positions; and means for confining said selector element to a single type of movement with respect to said barrel both during its displacement between said first plurality of positions and during its displacement between said second plurality of positions.

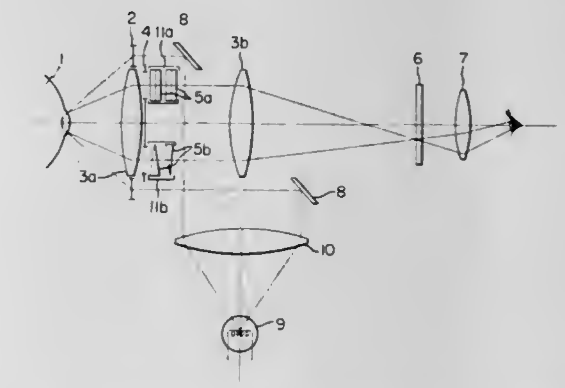
3,969,019
CURVATURE MEASURING OPTICAL SYSTEM IN OPHTHALMOMETER

Masao Nohda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 7, 1975, Ser. No. 565,619

Int. Cl.² A61B *3/02*

U.S. Cl. 351—13 **3 Claims**



1. In a curvature measuring optical system in an ophthalmometer comprising a first lens group having a focal point thereof lying at the location of the virtual image of an index projected on the cornea of an eye to be examined, a second lens group for focusing on the focal plane thereof a light beam made parallel by said first lens groups, and rotary prisms disposed between said first and said second lens group to separate the image into two images and rotatable in the opposite directions from each other, whereby said rotary prisms may be rotated by a rotating member therefor to align the separate reflected images with each other on the focal plane

in a predetermined relationship, thereby measuring the curvature radii of the cornea from the angles of rotation of said rotary prisms, the improvements residing in the provision of a light-intercepting member formed with at least three openings and disposed just behind said first lens group to divide the light beam between said first and said second lens group, a first rotary prism member disposed just behind one of the openings in the light-intercepting member to receive the light passing through the first lens group and said one opening and to cause a light beam corresponding to said one opening to be deflected on the focal plane in a predetermined direction, a second rotary prism member disposed just behind another one of said openings to receive the light passing through the first lens group and said another opening and to cause a light beam corresponding to said another opening to be deflected on the focal plane in a direction perpendicular to the direction of deflection by said first rotary prism member, and means for measuring the respective angle of rotation of said first and second rotary prism members.

3,969,020

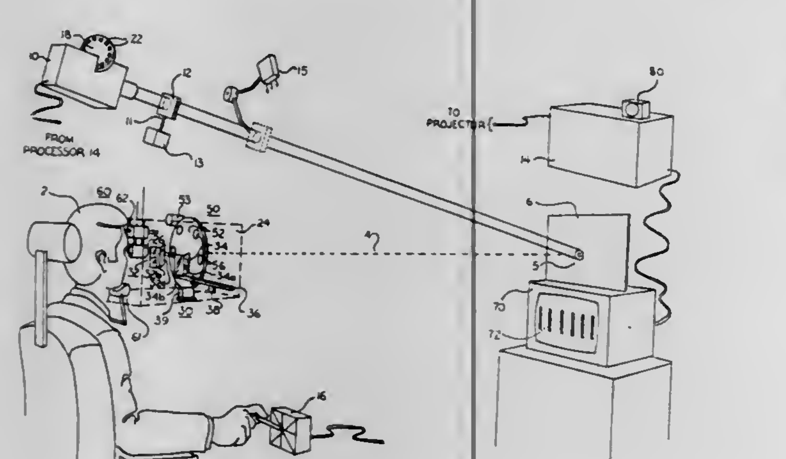
AUTOMATIC REFRACTION APPARATUS AND METHOD

John R. Lynn, and George W. Tate, Jr., both of Dallas, Tex., assignors to Giles C. Clegg, Jr., Dallas, Tex., a part interest

Filed Dec. 28, 1973, Ser. No. 429,143

Int. Cl.² A61B *3/02*

U.S. Cl. 351—17 **48 Claims**



1. In an automatic process for subjectively determining the refractive error of a subject wherein the power of lenses of a trial lens system presented to the subject is controlled by a data processing system in response to responses derived from the subject choosing between choices of images presented to the subject until an optimum lense power is determined and thereafter providing a readout of a lense prescription which provides refractive correction for the subject, the improvement comprising the steps of:

- a. determining under control of the data processing system the visual acuity of the subject when viewing test stimuli through a trial lens system set at a selected power,
- b. presenting test stimuli for viewing by the subject through the trial lens system set alternatively at the selected power $+\Delta D$ and at the selected power $-\Delta D$, where ΔD has a first value if the visual acuity is determined in step(a) to be greater than a predetermined threshold value and where ΔD has a second value greater than said first value, if the visual acuity is determined in step (a) to be less than the threshold value,
- c. determining under control of the data processing system whether one of the trial lens system power settings of selected power $+\Delta D$ or $-\Delta D$ is preferred by the subject over the other for viewing the test stimuli, and
- d. repeating steps (a) – (c) above at frequent intervals during the process.

10. Apparatus for measuring refractive error of a subject comprising:

- display means for displaying test symbols,
- a trial lens system continuously variable over a range of powers through which the subject views the displayed test symbols,
- control means for setting said trial lens systems at any selected power setting within said range of powers,
- a manual response device operable by the subject for providing a plurality of output signals,
- objective means for objectively determining the visual acuity of the subject for any discrete power setting of the trial lens system and providing an output signal indicating the test results,
- display means for indicating the refraction error, if any, of the subject,
- data processing system means coupled to said response device, said display means, said control means, said objective refraction means and said display means and responsive to signals received from said response device and said objective refraction means to control the control means to set the trial lens system at discrete settings of cylinder and spherical power which provide a refractive correction most desired by the subject and control the display means to indicate the test results.

3,969,021

MOTION PICTURE CAMERA WITH SOUND RECORDING MEANS

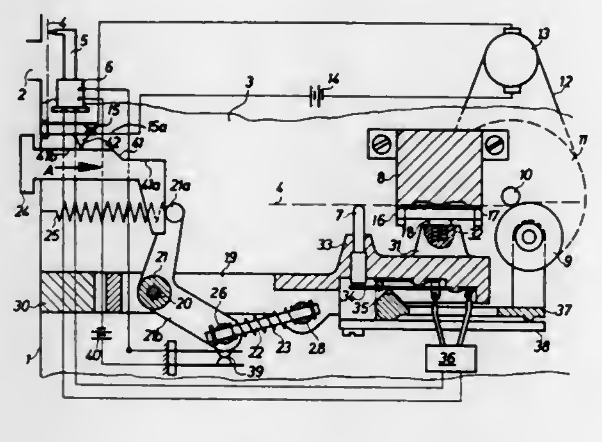
Kurt Bode, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Apr. 18, 1975, Ser. No. 569,355

Claims priority, application Germany, May 29, 1974, 2426293

Int. Cl.² G03B *31/02*

U.S. Cl. 352—27 **8 Claims**



1. A motion picture camera with sound recording means, comprising a recording head and a capstan mounted in fixed locations in the camera, a mounting lever in the camera, said mounting lever being swingable between an effective position and an ineffective position, a film loop sensor for sensing a loop in said film strip, a pressure plate for pressing the film strip against said recording head, and a drum for pressing the film strip against said capstan, said loop sensor, plate, and drum being mounted on said mounting lever to move bodily therewith between respective effective and ineffective positions, spring means for respectively biasing said loop sensor, plate, and drum relative to said mounting lever, a mounting plate having a front surface and a rear surface, and a flywheel operatively connected to said capstan, said flywheel being located on the rear side of said mounting plate in close proximity to the rear face thereof, said recording head being mounted on the front surface of said plate, said capstan projecting forwardly from the front surface of the plate, and said mounting lever being arranged along said front surface of said plate and swinging in a direction substantially parallel to the front surface of said plate.

3,969,022

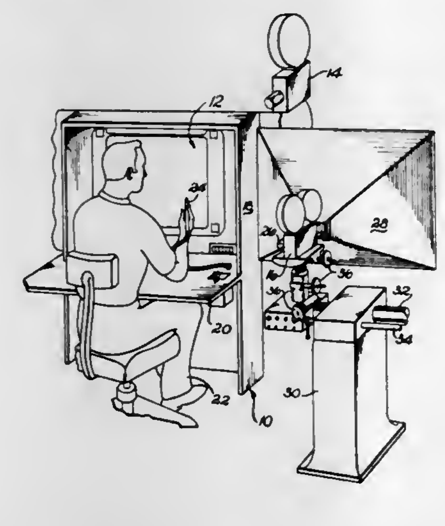
SYSTEM FOR PRODUCING A COLORED MOTION PICTURE FILM FROM BLACK-AND-WHITE MEDIUM

Deloy J. White, Andes 51, Mexico City 20, Mexico

Filed Mar. 9, 1971, Ser. No. 122,299

Int. Cl.² G03C *11/18*

U.S. Cl. 352—38 **1 Claim**



1. The method of converting a black-and-white motion picture film to a colored motion picture film comprising:

- projecting a first black-and-white light image from a first frame of the black-and-white motion picture film onto a surface of a screen;
- painting a spreadable adhering coloring substance on said screen at selected areas of the projected first black-and-white image to provide a first composite of applied color substance and superimposed first black-and-white image;
- while maintaining the projection of the first black-and-white image on said surface, photographing with color-sensitive film said first composite;
- projecting a second black-and-white light image from a second frame of the black-and-white motion picture film onto the surface of the screen;
- painting a spreadable adhering coloring substance on said screen at selected areas as necessary to synchronize the colored areas with said black-and-white image to provide a second composite of applied color substance and superimposed second black-and-white image; and
- while maintaining the projection of the second black-and-white image on said surface, photographing with the color-sensitive film said second composite where the surface bearing coloring substance as applied to register with the first projected frame is horizontally and vertically moveable to effect partial or total registration of previously applied coloring substance to the black-and-white image from the second projected frame.

3,969,023

METHOD AND APPARATUS FOR DETECTING LAYERS OF STRESS IN LENSES

Neill M. Brandt, Sturbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

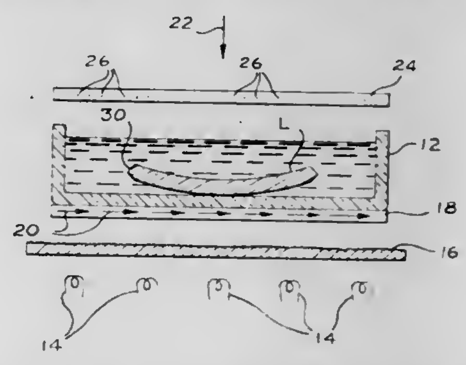
Filed Mar. 6, 1975, Ser. No. 556,023

Int. Cl.² G01B *11/16*

U.S. Cl. 356—33 **1 Claim**

1. The method of determining the presence, absence and type of treatment of lenses for impact resistance by visual observance of layers of surface stress in the lenses comprising the steps of:

- immersing a test lens of glass having a predetermined index of refraction in a liquid having a refractive index at least approximating that of the lens;
- directing light which is linearly polarized in a given fixed direction through said immersed lens for transmittance away therefrom toward a remote observation location;
- interposing between said observation location and immersed lens a linear light-polarizing analyzer having an axis of polarization directed approximately orthogonally to said given direction of polarization of said light whereby patterns of alternate areas of brightness and darkness produced by the test lens and observed directly upon said lens from said observation location will indicate layers of stress in said lens while an absence of such patterns will indicate a lack of surface stress in the lens and particular configurations of observed patterns will indicate the type of treatment; and
- rotating the test lens in said liquid and observing whether said patterns of alternate areas of darkness move with rotation of the lens, non-movement of said patterns of darkness verifying a finding of layers of stress in the lens.



3,969,024

SIGNAL SEPARATION SYSTEM USED FOR AN AUTOMATED CLASSIFICATION OF WHITE BLOOD CELLS

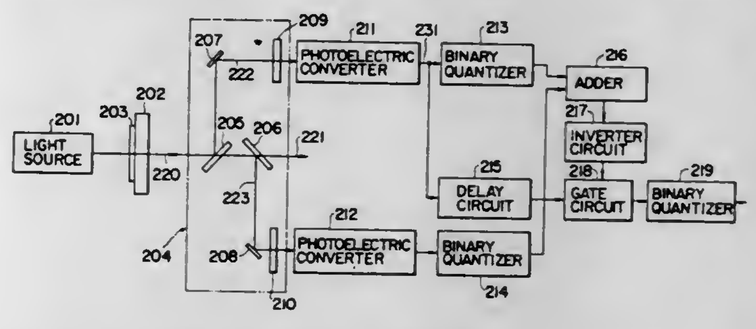
Akihide Hashizume, Kokubunji; Hideki Kohno, Tokyo, and Shinji Yamamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 13, 1975, Ser. No. 604,185

Claims priority, application Japan, Aug. 14, 1974, 49-92329

Int. Cl.² G01N *33/16*

U.S. Cl. 356—39 **15 Claims**



1. A signal separation system comprising:

- first means for generating a beam of light and directing said beam of light through a sample of whole blood;
- second means, disposed in the path of the light beam which has passed through said sample of whole blood, for separating said light beam into first and second light beams, the magnitude of information representative of the nuclei of white blood cells in said sample being higher in said first light beam than in said second light beam, and the magnitude of information representative of red blood cells in said sample being higher in said second light beam than in said first light beam;
- third means, disposed to receive said first and second light beams, for generating first and second electric signals representative thereof;
- fourth means, receiving the first and second electric signals generated by said third means, for quantizing said first and second electric signals with respect to first and second prescribed threshold levels, and producing respective first and second binary signals representative of the quantized first and second electric signals;
- fifth means, coupled to said fourth means, for combining said first and second binary signals and producing a first

separation signal which contains a signal component representative of the nuclei of white blood cells in said sample and a signal component representative of red blood cells in said sample; and

sixth means, coupled to said fifth means, and said third means, and responsive to said first separation signal and the output of said third means, for producing a second separation signal representative of the cytoplasm in the white blood cells of said sample.

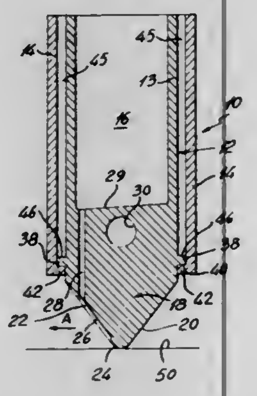
3,969,025
WAX APPLICATING DEVICE

James A. Brodie, P.O. Box 1448, Lennoxville, Quebec, Canada (J0B 1Z0)

Filed Jan. 20, 1975, Ser. No. 542,199

Int. Cl.² A47L *13/32*

U.S. Cl. 401—2 **9 Claims**



1. A portable wax-applicating device for manually applying a thin coat of wax on the running surface of skis or the like, comprising: a wax-holder having a bottom surface and comprising a compartment for holding a piece of solid wax to be progressively melted at its inner end at the bottom surface; a gripping portion circumposed in insulated relation about said wax-holder for accommodating the hand of a user as wax is melted and applied to a running surface;

a wax-applicating head of a heat-conducting material depending from said wax-holder and gripping portion;

heater means on the wax-applicating head adjacent the bottom surface of the wax-holder for concentrating heat where the wax is melted at the inner end of the wax being melted, and maintaining the wax-applicating head at a temperature for applying liquid wax and ironing the wax into a thin layer after it has been applied, said applicator head including internal conduit means communicating with the bottom surface of the wax-holder for receiving melted wax, said applicator head having a substantial width defined by two convergent faces extending the width of the applicator and terminating in a lower transverse edge, said conduit means opening into one of the faces which one face comprises an application face when the melted wax discharges onto the one face and is applied as a thin coat the width of the applicator head when the device is moved in one direction, said other face comprising an ironing face for ironing a thin layer of the melted wax as the device is moved in an opposite direction, said transverse edge comprising means for forming a liquid head of melted wax between the respective faces and the surface upon which the wax is applied.

3,969,026
WAXING AND POLISHING APPARATUS

Jerry W. Johnson, 5351 Bechtol Court, Marion, Ind. 46952

Filed Apr. 21, 1975, Ser. No. 570,272

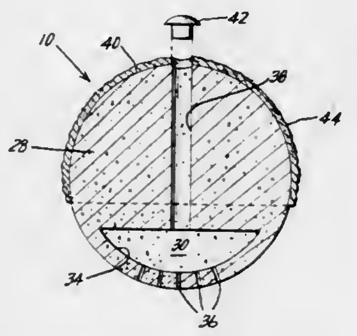
Int. Cl.² A47L *13/26*

U.S. Cl. 401—37 **5 Claims**

1. A waxing and polishing apparatus comprising a spherically-shaped body of elastically resilient material having a cavity therein that cooperates with a first portion of the spherical surface of said body to define a wall therebetween, having a plurality of fluid-communicating apertures for fluid dispersal upon a forceful rubbing applied to said body, said apertures interconnecting said cavity and said first portion, and having a passage interconnecting said cavity and a second portion of said spherical surface distal from said first portion;

means for removably plugging said passage; and

a spherically-shaped housing comprising a first shell of substantially hemispherical shape sized to encase and to conform with said body, a second shell of substantially hemispherical shape sized to nest with said first shell on the outside thereof, and means for pivotally interconnecting said shells to permit said shells to be relatively positioned to form a spherical case enclosing said body and to permit said shells to be nested in a first position thereby selectively exposing said apertures for fluid dispersal and nested in a second position thereby selectively covering said apertures and exposing a second portion of body surface for polishing.



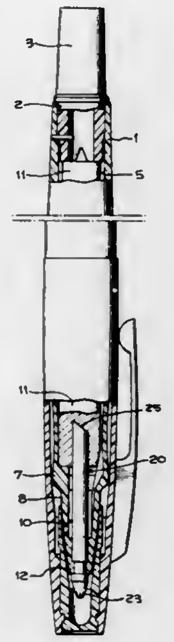
3,969,027
WRITING INSTRUMENT

George Andrew Randar, Canoga Park, and Harris William Young, Oxnard, both of Calif., assignors to The Gillette Company, Santa Monica, Calif.

Filed Apr. 3, 1975, Ser. No. 564,784

Int. Cl.² B43K *5/00, 1/02*

U.S. Cl. 401—199 **1 Claim**



1. In a writing instrument having a main hollow barrel portion containing an absorbent ink-impregnated filler and a tapering frontal barrel portion providing an external elongated finger positioning surface area, the improvement comprising the provision of:

said tapering frontal barrel portion being so provided as to be resiliently deformable radially outwardly of an axial bore thereof;

locking shoulder means formed in said frontal barrel portion at the frontal entrance to said bore for presenting a pair of inwardly extending shoulders facing in opposing axial directions; and

an elongated writing element being relatively non-deformable relative to said frontal barrel portion and composed of a homogenous thermoplastic polymeric composition, including a shank having a frusto-conical frontal portion terminating in a contoured writing tip surface, and a rear end surface,

an axial channel for conveying liquid,

a plurality of liquid conducting channels radially extending therefrom, all of said channels extending from said rear surface to and terminating within the contoured writing tip surface, and

a circumferential groove with oppositely facing walls formed in the shank at a predetermined distance from the frusto-conical portion and contoured tip surface, said groove being adapted to receive the locking shoulder means when the frontal barrel portion is temporarily deformed radially outwardly by the element being inserted into the axial bore of the tapering frontal barrel portion until said shoulder means fits into said groove, the locking shoulder means being then retained in the groove by the resilience of the frontal barrel portion, a constrictive effect thereof being absorbed by a continuous layer of thermoplastic polymer composition over the array of radial liquid-conducting channels, the element being thereby restrained from axial displacement in said bore under shock and writing pressure without constriction or impairment of said channels or variation in relative spatial position of said contoured writing tip surface and finger positioning area.

3,969,028
DRAWING AND WRITING BRUSH-PEN WITH ROUND AND FLAT HAIR AND ADJUSTABLE FLOW OF PERMANENT LIQUID INK

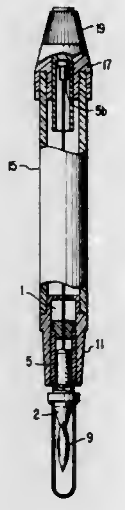
Salvio Correia Lima Negreiros, Rua Marques de Olinda 90 No. 43, Rio de Janeiro, Brazil

Filed July 11, 1974, Ser. No. 487,637

Claims priority, application Brazil, July 12, 1973, 5194

Int. Cl. A46b *11/04*

U.S. Cl. 401—279 **8 Claims**



1. A brush-pen of round and flat hair and permanent liquid ink with adjustable flow for drawing and writing, comprising a cylindrical ink container having on one end a threaded removable cap for refueling and on the other end a ferrule with a brush tip, a passage for ink flow from the ink container through the ferrule to the brush tip including a stopper adjacent said ferrule and adapted to vary the passage through said ferrule in response to the position of said stopper relative to said ferrule, a shaft extending from said cap through said ink container and connected to said stopper, means for biasing said shaft into pressure contact with said cap, a freely movable hollow piston carried adjacent said stopper and cooperating in abutting relation with said biasing means, said hollow piston being movable axially within said cylindrical ink container against said biasing means in response to the axial shaking of the brush-pen to thereby clear dried ink from the interior of the ink container and means on said cap for selectively moving said shaft and thereby positioning said stopper relative to said ferrule in response to rotation of said cap so as to vary the ink passage through said ferrule to said brush tip.

3,969,029
SHAFT COUPLING

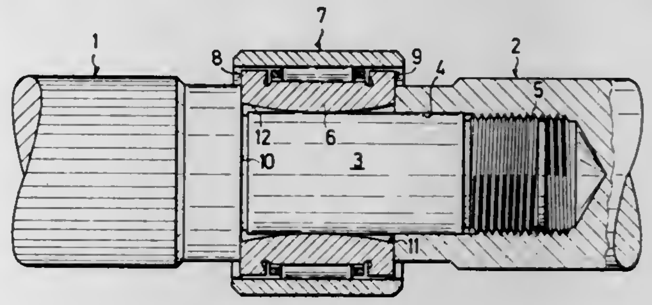
Georg Schaeffler, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed July 15, 1975, Ser. No. 596,071

Claims priority, application Germany, Aug. 16, 1974, 2439334

Int. Cl.² F16D *1/00*

U.S. Cl. 403—26 **2 Claims**



1. A shaft coupling comprising a first shaft provided at its end with an extension of a reduced diameter engaging a longitudinal bore in the end of a second shaft with the connection in the bore being effected by a screw thread, a roller bearing with its inner race arranged on the extension between the two shafts with the end surfaces of the two shafts bearing firmly on the end surfaces of the inner race of the bearing, the inner race having a bore with a slightly convex contour so that its longitudinal axis can slightly deviate from the longitudinal axis of the shaft when mounted.

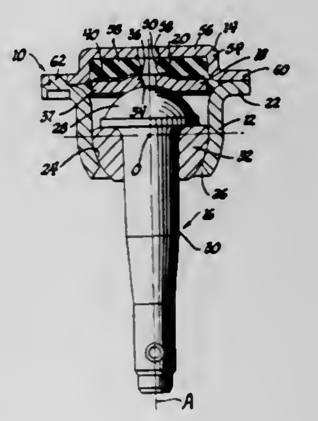
3,969,030
BALL JOINT WITH COMPOSITE COMPRESSION SPRING

Leo S. Sullivan, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,211

Int. Cl.² F16C *11/06*

U.S. Cl. 403—132 **4 Claims**



1. A ball joint comprising:

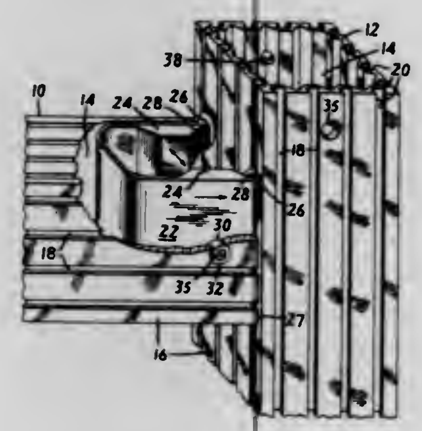
a housing having an outward peripheral flange at an open end thereof and a reduced opening at the opposite end,

a ball stud unit having a ball portion engaging a fixed bearing seat in said housing adjacent said reduced opening

and a stud portion disposed outwardly of said reduced opening;
- a movable bearing seat disposed in said housing and having a dome shaped central portion engaging said ball portion,
- a hat-shaped cover having an outward peripheral flange secured to the outward peripheral flange of said housing and forming an internal crevice shaped peripheral groove at the juncture therewith; and
- a composite compression spring disposed between said cover and said movable bearing seat preloading said bearing seats into engagement with said ball portion and taking up wear therebetween,

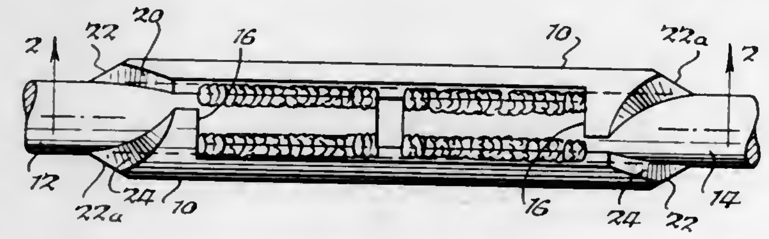
said composite compression spring comprising an elastomeric element having a depending peripheral skirt portion adjacent an outer peripheral edge of said upper bearing seat which seals the junction between said housing and said cover, and
- a stabilizer disc bonded to an end surface of said elastomeric element inward of said skirt portion and engaging a surface of said movable bearing seat for inhibiting the migration of said elastomeric element past the outer peripheral edge of said movable bearing seat responsive to compressive loads applied to said elastomeric element via said movable bearing seat.

3,969,031
ASSEMBLY OF STRUCTURAL MEMBERS
Karl-Gunnar Kroopp, Farnebogatan 62, 123 42 Farsta, Sweden
Filed Nov. 15, 1974, Ser. No. 524,054
Int. Cl.^{2} F16B *9/00*; B25G *3/00*
U.S. Cl. 403—239 **5 Claims**



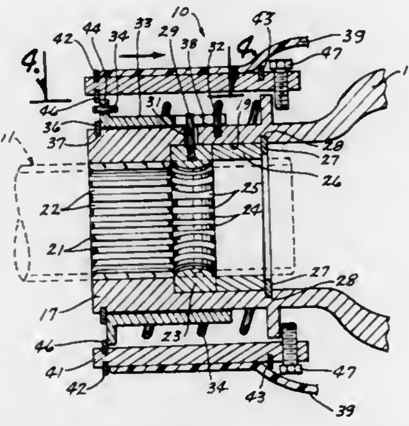
1. An assembly of structural members comprising one structural member having an opening in one surface thereof, another structural member having spaced, parallel grooves extending along an outer surface, and a coupling inserted in the opening, the coupling comprising:
- yieldably spaced body portions, each body portion having a claw protruding from the opening and received in a different one of the grooves of the other structural member while the members are in assembled relation, each claw having an inclined, groove-gripping surface cooperative with the groove for drawing the coupling toward the grooved member when the claw grips the groove; and
- a fastener engaging the body portions for moving the body portions toward each other until the claws grip the grooves, the fastener also connecting the one structural member to the coupling for drawing the one structural member toward the other with the coupling until the structural members are in butting engagement.

3,969,032
ROD SPLICE
Richard J. Wolicki, Buffalo, N.Y., assignor to Buffalo Brake Beam Company, Lackawanna, N.Y.
Filed Apr. 7, 1975, Ser. No. 565,521
Int. Cl.^{2} F16B *2/02*, *7/04*; F16D *1/00*, *1/02*
U.S. Cl. 403—310 **5 Claims**



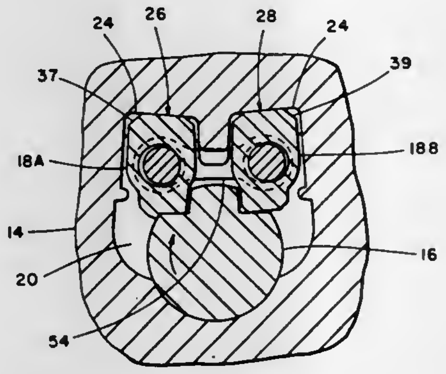
1. A rod repair splice means for repairing a rod to be spliced, said repair splice comprising:
- a pair of body members, each said body member being of generally trough shaped cross section for fitting partially about the periphery of the rod to be spliced;
- each of said body members having opposite, longitudinally extending side edge portions and opposite end portions and at least one arcuate flange adjacent to at least one end thereof and extending laterally beyond one of said side edge portions thereof; said members being mounted diametrically opposite to each other on the rod to be spliced with said flange of each member at opposite ends of the splice; and said side edge portions of said body members being adapted to be welded to the rod to be spliced and at least one pair of diametrically opposite end portions of said members sloping toward the rod in a manner avoiding shoulders which might cause hang-up upon axial movement of the repaired rod wherein each of said pair of diametrically opposite end portions includes a central sloping portion extending from the outer surface of said respective body member to the inner surface thereof and longitudinally receding, laterally extending sloping portions on opposite sides of said central portion and also extending from the outer surface of said respective body member to the inner surface thereof, said latter portions intersecting said central portion to form a plurality of distinct camming surfaces.

3,969,033
TORQUE TRANSMITTING COUPLING
Florian B. Recker, 802 First St., SE., Dyersville, Iowa 52040
Filed July 10, 1975, Ser. No. 594,784
Int. Cl.^{2} F16B *7/00*
U.S. Cl. 403—322 **14 Claims**



1. A torque transmitting coupling comprising:
- a housing;
- an opening in said housing, a portion of said opening being circular and a portion of said opening being non-circular, said opening being adapted to receive a non-circular portion of a shaft;
- a sleeve rotatably disposed within said circular portion of said opening, the inner configuration of said sleeve being of the same general shape as the shape of the noncircular portion of the opening in the housing;
- a collar surrounding a portion of said housing, said collar being longitudinally slidable and having a first position and a second position;
- means for preventing said collar from rotating with respect to the housing;
- a radial slot formed in said housing;
- a pin connected to said sleeve and extending radially therefrom, a portion of said pin being disposed in said radial slot and a portion thereof extending beyond said radial slot in the housing; and
- camming means connected to said collar for moving said pin and thereby said sleeve to one position when said collar is moved to said first position and for moving said pin and thereby said sleeve to another position when the collar is mvoed to the second position.

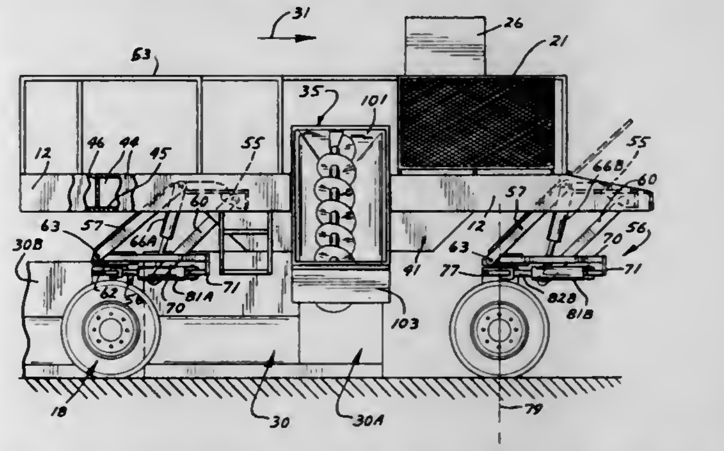
3,969,034
WEDGE LOCK WHEEL ASSEMBLY
Edward M. Gaul, Naperville; Aldo Allori, Brookfield, and Thomas Hillstrom, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.
Substitute for Ser. No. 457,046, April 1, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,510
Int. Cl.^{2} F16D *1/08*; B60B *37/04*
U.S. Cl. 403—357 **6 Claims**



1. A wedge lock wheel assembly for mounting a tire rim having a vertical center disc, the assembly comprising:
- a hub rigidly attached to said rim having chamber with a centerline substantially perpendicular to said disc, said chamber comprising;
  - a plurality of stops;
  - a plurality of sets of paired ramps with a known hardness having complex angles relative to said disc;
- at least two sets of paired wedges positioned within said chamber, capable of relative motion therebetween, and having an aperture passing through each of said pairs, a generally flat bottom surface, a sloped top surface and a hardness greater than said ramps's hardness;
- a plurality of restraining means for limiting the motion between said sets of said wedge pairs;
- an axle having horizontal contact surfaces with a hardness greater than said wedge hardness; and
- a plurality of connecting means passing through said wedge apertures for establishing contact between said ramps and said sloped surfaces, and between said bottom surfaces and said contact surfaces.

3,969,035
SLIP FROM PAVING MACHINE
Frederick J. Silbernagel, Huron, S. Dak., assignor to Precision Paving Products Corporation, Minneapolis, Minn.
Filed Feb. 28, 1974, Ser. No. 446,731
Int. Cl.^{2} E01C *19/52*
U.S. Cl. 404—98 **21 Claims**

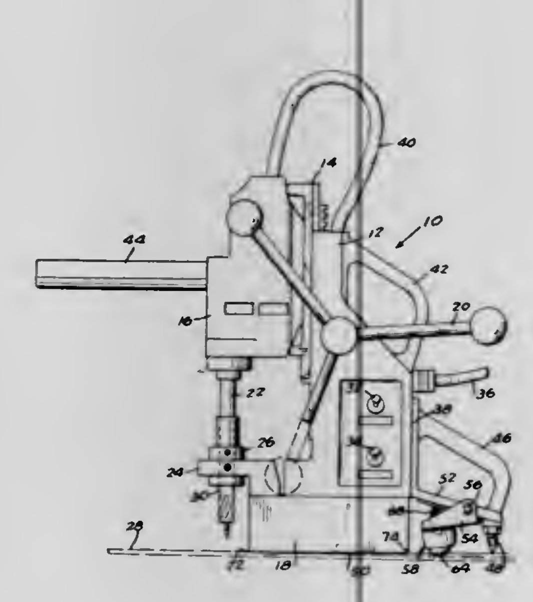
1. A mobile machine for slip form paving using a paving material to form a structure comprising a frame member having a leading end and a trailing end and lateral side edges, said frame member having a load conveyor mounted thereon, and means to mount a slip form on said frame for forming said paving material into the desired structure as the machine is moved forwardly, means mounting said frame for movement along a surface comprising a pair of forward surface engaging members mounted to said frame member adjacent the leading end thereof when moving in normal direction of movement for paving, means mounting said pair of surface engaging members closely adjacent the side edges and within the periphery of said frame member, a single third surface engaging member, means mounting said single surface engaging member with respect to said frame member closely adjacent one side thereof and within the frame periphery and to normally move substantially in the track of one of said forward surface engaging members as the machine moves in said normal direction of movement, and positioned adjacent to the rear of said frame member and laterally displaced from a slip form mounted on said machine, said means to mount a slip form being positioned to trail behind the other of said forward surface engaging members, and power means mounted on said frame for powering said surface engaging members for propelling said machine including an engine positioned adjacent the forward end of said frame member between and at least partially overlying said forward surface engaging members to balance and stablize said machine, said means mounting said surface engaging members including separate movable parallel linkages for each surface engaging member, each separate parallel linkage comprising a pair of links having first ends pivotally mounted with respect to said frame member about axes positioned at fixed locations on said frame member, said links having second ends pivotally mounted to its respective surface engaging member with the links in parallel relationship about axes parallel to the spaced axes, whereby the surface engaging members remain oriented with respect to a vertical plane as the parallel linkages are moved to facilitate steering movement of the surface engaging members.



3,969,036
MAGNETIC DRILL
Everett D. Hougen, G-5072 Corunna Road, Flint, Mich. 48504
Filed Jan. 23, 1975, Ser. No. 543,415
Int. Cl.^{2} B23B *39/14*
U.S. Cl. 408—76 **9 Claims**

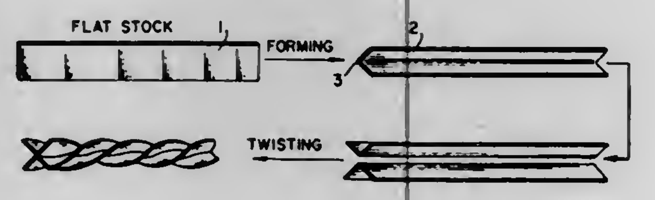
1. In a portable magnet base drill unit of the type including a support on which a motor-driven drill is mounted, said support having an electromagnet base of generally rectangular shape, said base having a generally flat bottom face perpendicular to the axis of the drill spindle, said electromagnet when energized being adapted to magnetically adhere to an underlying flat magnetic support surface to support the drill unit thereon in a fixed location with the drill spindle projecting vertically downwardly along an axis located forwardly of the front end of the magnet base, the front edge of the bottom face of the magnet base extending transversely of the base in a generally straight line, that improvement which comprises anti-friction means mounted on said support adjacent the rear end of said magnet base and resiliently biased to project downwardly at least slightly beyond the plane of said bottom face,

said anti-friction means cooperating with the front edge of the base to slidably support the drill unit on said support surface when the magnet is in a de-energized condition with the bottom face of the magnet inclined upwardly and rearwardly at a slight angle from said front edge whereby when the drill unit is moved forwardly on said support surface to locate the drill spindle vertically above the location of the hole to be drilled therein, said front edge of the magnet base scrapes debris and chips from the underlying support surface traversed by said front edge, the electromagnet being of sufficient strength to overcome the bias on said anti-friction means so that when the magnet is energized the bottom face thereof is magnetically attracted into firm coplanar engagement with the scraped underlying portion of the support surface and the drill unit is supported on the support surface in a firm stable position, the drill spindle axis extending perpendicular to the plane of the support surface.



3,969,037
TURBULATORS

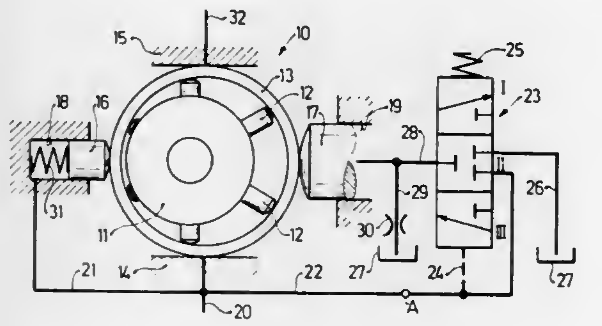
Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.
Division of Ser. No. 490,432, July 18, 1974. This application May 7, 1975, Ser. No. 575,327
Int. Cl.² B01F ***7/08***
U.S. Cl. 416—176 **6 Claims**



1. A multi-vane turbulator comprising;
a plurality of relatively elongated members, each of said members being V-shaped in cross section with two straight segments integral with and joined to each other at a bend in said member and with each of said cross sectional straight segments lying on a spiral vane encircling the longitudinal axis of said turbulator, each of said bends being in contact with the other of said bends substantially along the length of said turbulator.

3,969,038
PRESSURE REGULATOR FOR AN ADJUSTABLE PUMP

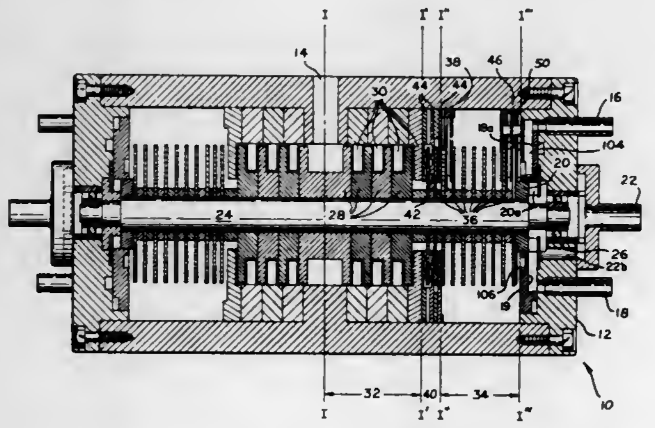
Gerhard Nonnenmacher, Korntal; Paul Bosch, Ludwigsburg, and Hans-Jürgen Fricke, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Nov. 8, 1974, Ser. No. 522,216
Claims priority, application Germany, Nov. 20, 1973, 2357801
Int. Cl.² F04B ***49/00***
U.S. Cl. 417—218 **6 Claims**



1. A pressure regulator for an adjustable pump having an outlet through which fluid under pressure is delivered by the pump, the pressure regulator comprising an adjustable member for regulating the amount of fluid delivered by said pump; a pair of pistons respectively axially movable in cylinder bores and arranged to act from opposite sides on said adjustable member for adjusting the position of the latter and thus the amount of fluid delivered by the pump, one of said pistons having a larger diameter than the other of said pistons; first passage means connecting the outlet of the pump to the cylinder bore of said one piston; a control valve in said first passage means for controlling passage of fluid through said first passage means, flow of fluid through said first passage means and into the cylinder bore of said one piston causing said one piston to move said adjustable member in a direction decreasing the amount of fluid delivered by said pump; second passage means communicating at one end with said first passage means between said control valve and the cylinder bore of said one piston and at the other end with a space at atmospheric pressure; a throttle in said second passage means; and a further passage means connecting the cylinder bore of the other of said pistons with the outlet of the pump.

3,969,039
VACUUM PUMP

Kenneth R. Shoulders, Woodside, Calif., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 1, 1974, Ser. No. 494,016
Int. Cl.² F04D ***19/04***
U.S. Cl. 417—244 **4 Claims**

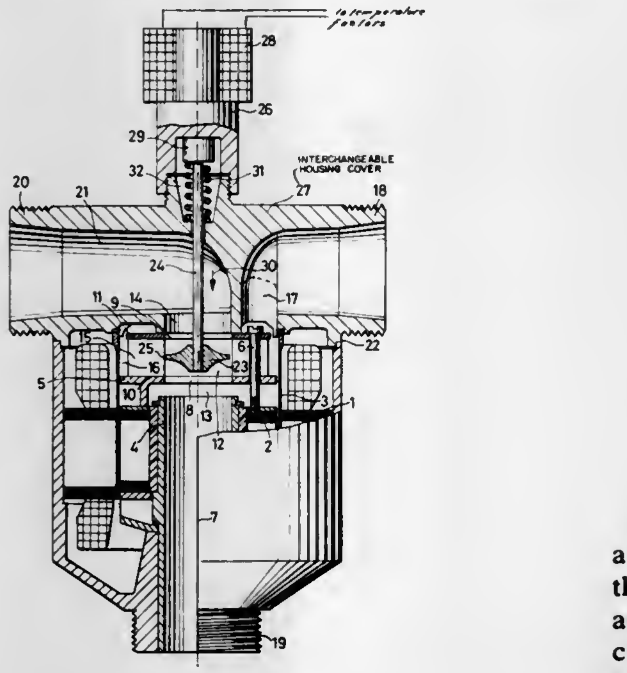


1. An integral vacuum pump for evacuating a fluid, such as air, from a sealed chamber as in a scientific instrument of the type of an electron microscope comprising:

a housing having an inlet to be connected in sealed relation to said chamber and an exhaust at an opposite end thereof;
a shaft axially disposed in said housing;
motor means for providing rotary motion to said shaft;
axial flow turbomolecular pumping means disposed in said housing, adjacent said inlet, and alternately including stators fixedly secured to said housing and rotors fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators to provide turbomolecular pumping;
centrifugal compressor pumping means disposed in said housing intermediate said axial flow turbomolecular pumping means and said exhaust, including stators fixedly secured to said housing and rotor fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators to provide centrifugal compressor pumping;
fluid diode pumping means disposed in said housing intermediate said centrifugal compressor pumping means and said exhaust including stators fixedly secured to said housing and rotors fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators.

3,969,040
PUMP, ESPECIALLY CIRCULATING PUMP

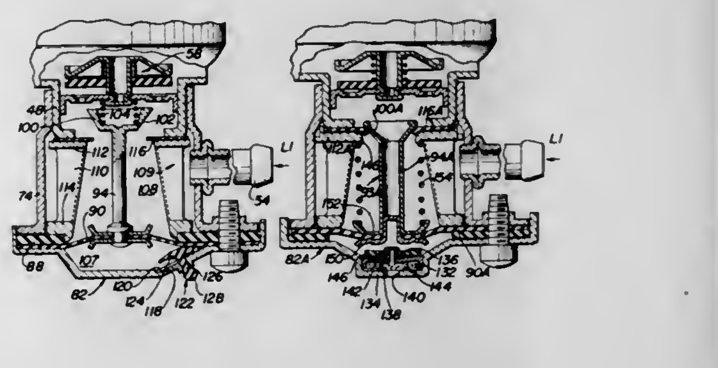
Falko Hamm, Stuttgart, and Günter Kratz, Plochingen, both of Germany, assignors to G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken, Stuttgart, Germany
Filed Aug. 22, 1974, Ser. No. 499,566
Claims priority, application Germany, Aug. 23, 1973, 2342605
Int. Cl.² F04B ***49/00***
U.S. Cl. 417—292 **10 Claims**

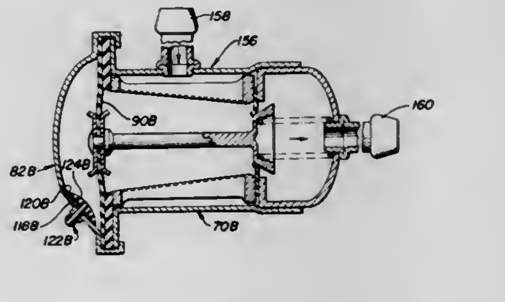


1. A pump, especially circulating pump, which includes: housing means; a pump wheel rotatably but non-displaceably arranged within said housing means: said housing means comprising two suction chambers arranged in axial direction of said pump wheel and respectively located on opposite sides of said pump wheel, said housing means also comprising at least one pressure chamber extending around said pump wheel and its axis of rotation; said pump wheel having two suction openings located in the vicinity of the axis of rotation of said pump wheel and at opposite sides thereof while communicating with the respective adjacent suction chamber; said pump wheel also comprising vanes extending radially with regard to said axis of rotation of said pump wheel and also comprising a substantially central fluid receiving chamber establishing fluid communication between said two suction openings and adapted to convey fluid to said vanes; and a control member having a circumferential contour and size approximately corresponding to the circumferential contour and size of said suction openings and being displaceable in a continuous manner in said fluid receiving chamber in the axial direction of said pump wheel for controlling the inflow of fluid from said suction chambers through the respective suction openings into said fluid receiving chamber, a plug axle arranged in said housing means and having an axial bore with an outer mouth for connection to a fluid supply and with an inner mouth leading to one of said suction chambers.

3,969,041
SHUT-OFF VALVE FOR AUTOMOTIVE FUEL FLOW

Heinrich E. Thausing, St. Louis, Mo., and Roger G. Wallis, Belleville, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,912
Int. Cl.² F04B ***49/10***
U.S. Cl. 417—295 **8 Claims**

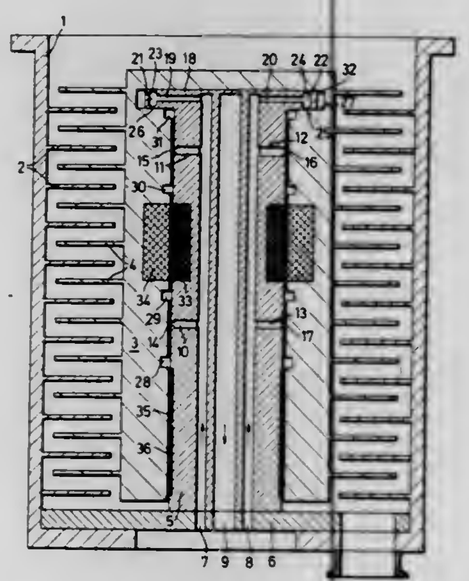




1. In a fuel system the combination of a shut-off valve and a fuel pump, said shut-off valve structure being positioned in the feed line of an automotive vehicle between the fuel supply and the inlet valve of said fuel pump comprising an outer circumferential housing, a cap secured adjacent an end of said housing, a flexible diaphragm secured between the cap and housing to define an air chamber between the cap and one side of the diaphragm and a fuel chamber adjacent the other side of the diaphragm, a fuel inlet extending through the housing and in fluid communication with the fuel chamber, a shut-off valve member connected to the diaphragm for movement therewith and an outlet for the fuel chamber receiving the valve member for movement between open and closed positions relative to the outlet, said cap having a vent opening therein to permit the bleeding in and exhaust of air from the air chamber, and a vent valve structure on the cap adjacent the vent opening for controlling the flow of air through the vent opening, said vent valve structure providing a relatively fast rate of air flow within the air chamber during movement of the diaphragm and shut-off valve member toward an open position and providing a relatively slow rate of air flow from the air chamber during movement of the diaphragm and shut-off valve member toward a closed position.

3,969,042
TURBOMOLECULAR VACUUM PUMP HAVING A GAS BEARING-SUPPORTED ROTOR

Werner Bächler, Hoffnungsthal, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany
Filed Nov. 25, 1974, Ser. No. 526,979
Claims priority, application Germany, Nov. 29, 1973, 2359456
Int. Cl.^{2} F04B *35/04;* **F04D** *29/20;* **F03B** *5/00*
U.S. Cl. 417—354 **8 Claims**

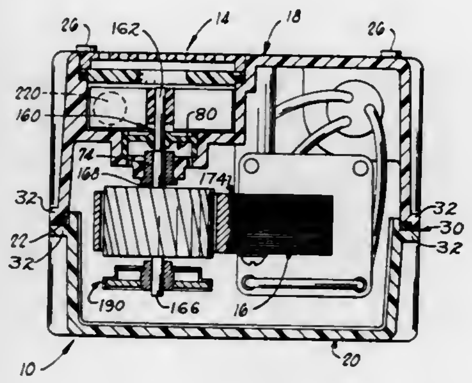


1. A turbomolecular vacuum pump including a stator; a rotor having a vertical axis of rotation and disposed in the stator, comprising in combination:
- a. means defining a downwardly open, axially extending chamber in said rotor;
- b. a vertically oriented stub shaft projecting into said chamber and having a foot portion;
- c. means for fixedly supporting said stub shaft at said foot portion;
- d. first and second axially spaced radial gas bearings disposed within said chamber for generating gas cushions between said rotor and said stub shaft;
- e. an axial gas bearing disposed within said chamber for generating a gas cushion between said rotor and said stub shaft;
- f. means defining gas intake and gas outlet channels in said stub shaft for supplying gas to and withdrawing gas from said axial and radial gas bearings; and
- g. an electric motor of the outer runner type disposed between the two radial gas bearings and connected to said rotor.

3,969,043
PROCESS COOLED SUBMERSIBLE PUMP AND MOTOR ASSEMBLY

Hugh H. Bright, Oklahoma City; Lee W. Davis, Del City, and Frank J. Stanaszek, Bethany, all of Okla., assignors to Little Giant Corporation, Oklahoma City, Okla.
Continuation-in-part of Ser. No. 430,657, Jan. 4, 1974, abandoned. This application Mar. 25, 1974, Ser. No. 454,254
Int. Cl.^{2} F04B *39/06*
U.S. Cl. 417—366 **23 Claims**

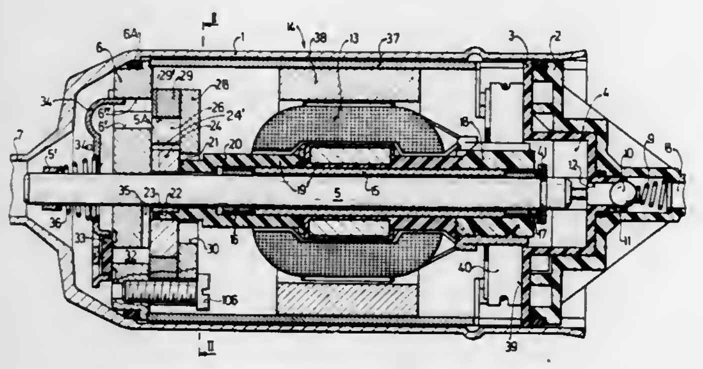
1. A pump and motor assembly, comprising:
- a housing assembly;
- a first bearing securedly connected to said housing assembly;
- a self aligning second bearing adjustably connected to said housing assembly and held in spatial relationship to said first bearing;
- a drive shaft rotatingly held by said first and second bearings;
- a volume chamber having a volute wall extending into said housing assembly;
- an impeller disposed within said volume chamber and connected to said drive shaft;
- motor means for rotating said drive shaft;
- seal means for providing a seal between said volume chamber and said drive shaft;



- inlet port means for providing fluid communication with said volume chamber; and,
- outlet port means for providing fluid communication with the volume chamber at a location removed from said inlet port means.

3,969,044
FUEL PUMP ASSEMBLY

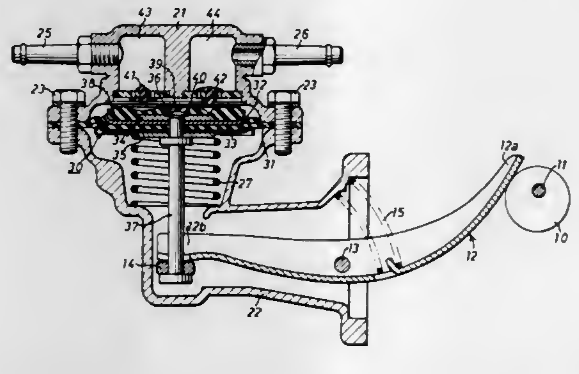
Paul Füssner, Sindelfingen, and Horst Salmanzig, Ludwigsburg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Jan. 18, 1974, Ser. No. 434,575
Claims priority, application Germany, Jan. 26, 1973, 2303687
Int. Cl.^{2} F04B *17/00*
U.S. Cl. 417—410 **11 Claims**



1. In an apparatus for conveying a liquid, particularly fuel, a combination comprising a housing having a liquid admitting inlet and a liquid discharging outlet; a shaft fixedly mounted in said housing; an electric motor installed in said housing and including a first rotor mounted on and rotatable relative to said shaft; a pump installed in said housing and having a second rotor mounted on and rotatable relative to said shaft to thereby cause a liquid to flow from said inlet to said outlet, said second rotor having five axially extending sockets; said first rotor comprising a cylindrical extension extending short of said second rotor; and elastic torque-transmitting means connecting said rotors and comprising five discrete complementary projections for each of said sockets each projecting in axial direction from said cylindrical extension into each of said respective sockets of said second rotor.

3,969,045
DIAPHRAGM VACUUM PUMP FOR VEHICLES

Toshimitsu Sakai; Tadashi Saito, both of Toyota, and Isamu Suzuki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Obu, both of, Japan
Filed Dec. 16, 1974, Ser. No. 533,216
Claims priority, application Japan, Dec. 28, 1973, 48-1957
Int. Cl.^{2} F04B *39/00;* **F01B** *11/02*
U.S. Cl. 417—471 **4 Claims**



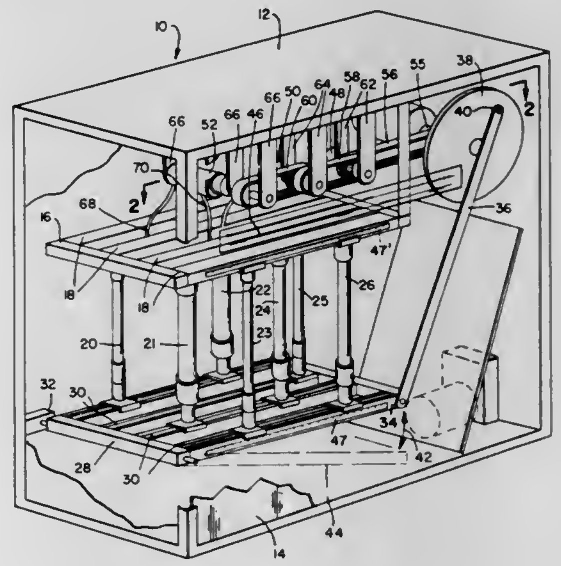
1. In a diaphragm vacuum pump for a vehicle, comprising a pump housing mounted on a body portion of the vehicle and including thereon an inlet port connected to a pneumatically operated device and an exhaust port connected to the atmosphere; a diaphragm piston assembly hermetically assembled within said housing for forming a pressure reduction chamber at one side thereof, said chamber being connected respectively with said inlet and exhaust ports; valve means assembled within said chamber and including a suction valve to suck the air from said pneumatically operated device into said chamber through said inlet port and an exhaust valve to discharge the sucked air externally through said exhaust port; an operation rod for reciprocating said diaphragm piston assembly for subsequently producing vacuum in said pressure reduction chamber; a drive mechanism driven by the prime engine of the vehicle for operating said operation rod; and a resilient means for biasing said diaphragm piston assembly to its upper dead point against the operation torque from said drive mechanism by way of said operating rod,

the improvement wherein a resilient cushion material is integrally secured on said diaphragm piston assembly within said pressure reduction chamber and between said diaphragm piston assembly and said valve means to constantly minimize the volume of said chamber when said diaphragm piston assembly reaches its upper dead point and to absorb touching pressure against said valve means, and said resilient cushion material is an elastic synthetic resin member of predetermined thickness with a cross-section corresponding with the shape of the inner wall facing said diaphragm piston assembly within said pressure reduction chamber.

3,969,046
METERING PUMP SYSTEM

James M. Wynn, 1137 Walpert No. 18, Hayward, Calif. 94541
Filed July 12, 1974, Ser. No. 487,960
Int. Cl.^{2} F04B *17/00, 15/00, 23/06*
U.S. Cl. 417—517 **12 Claims**

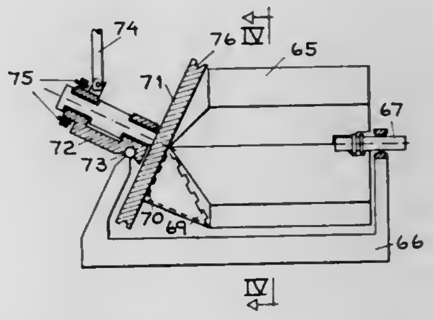
1. A system for metering and pumping a plurality of fluids, said system comprising:
- a pumping stage including a plurality of piston pumps extending from a substantially rigid support to a rack hinged at one end and having an opposite free end, each pump associated with one of the respective fluids, each said pump having an expansion cycle for drawing a preselected amount of fluid into the pump and a contraction cycle for pumping the fluid, the amount of fluid drawn into each of the pumps during the expansion cycle depending on the distance of the different pumps from the hinged end of the rack;
- a valve stage comprising a valve body having a plurality of sets of externally opening ports communicating with a central passageway, each set including an inlet port, an outlet port generally opposed to the inlet port and a common port connected to one of the respective pumps, and a valve spool rotatably mounted within the passageway and having a flat portion corresponding to the inlet and outlet ports of each said set of ports and a circumferential indentation corresponding to the common port of each set and integral to the flat portion corresponding therewith; and



- power supply means adapted to reciprocate the free end of the rack and to operate the valve stage in synchronization with the reciprocation of the rack to pump metered amounts of the respective fluids, said power supply means adapted to rotate the valve spool so that the flat portion corresponding to each set of ports is serially aligned with the inlet port and then the outlet port to first allow fluid to pass to the pumps and then allow fluid to be discharged from the pumps.

3,969,047
ROTARY FLUID DEVICE WITH PIVOTED WEDGE-SHAPED RADIAL VANES

Peder S. Mortensen, Box 396, Sunset Drive, Hudson, Quebec, Canada
Division of Ser. No. 294,517, Oct. 3, 1972, abandoned. This application Oct. 17, 1974, Ser. No. 515,461
Int. Cl.^{2} F01C *1/00, 21/16;* **F04C** *17/00, 29/10*
U.S. Cl. 418—18 **2 Claims**



1. A device to displace fluids and to change the volume and pressure of compressible fluids comprising a number of vanes extending radially outwards from a hinge line and pivoted so that their circumferential spacing can be varied;
- the vanes having a wedge shaped cross section substantially in the configuration of a sector of a circle;
- a structure supporting said vane assembly so that it can revolve about an axis coinciding with the hinge line;
- same structure also supporting a vane governing rotator at least at one end of the vane assembly, governing the

variation of the circumferential spacing of the vanes as the vane assembly revolves;

said vane governing rotator comprising a wheel which can revolve about an axis intersecting the hinge line at an angle;

the end of each vane having a pivotally attached connecting panel the other end of which is pivotally attached to the wheel along a radial line.

3,969,048
ROTARY PISTON INTERNAL COMBUSTION ENGINE OF TROCHOIDAL CONSTRUCTION

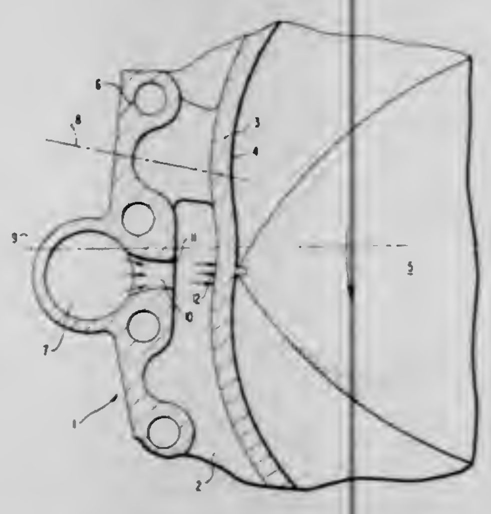
Helmut Dobler, Esslingen; Kurt Nadolny, Erdmannhausen; Karl Zeilinger, Endersbach; Heinz Lamm, Esslingen-St. Bernhardt, and Horst Piry, Deizisau, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed May 15, 1974, Ser. No. 470,278

Claims priority, application Germany, May 18, 1973, 2325249

Int. Cl.² F01C *21/06*

U.S. Cl. 418—83 **7 Claims**



1. A rotary piston internal combustion engine of trochoidal construction, which includes a housing casing means, provided with hollow space means disposed between the housing inner and housing outer wall means for a cooling medium, the outer wall means including a cooling medium channel means, and a polygonal piston means rotating within the housing casing means and sliding along the inner wall means, characterized in that at least one cooling medium bore means in communication with the cooling medium channel means, is arranged in the housing outer wall means, the cooling medium bore means being directed toward the hottest area of the housing inner wall means, the cooling medium bore means being constructed as a conically shaped nozzle having its narrowest cross-section at the end thereof opening into said hollow space means, whereby said cooling medium is discharged from said medium bore means so as to impinge at said hottest area of the housing inner wall means at a high velocity.

3,969,049
ROTARY ENGINE ROTOR AND OIL SEAL CONFIGURATION

Walter L. Hermes, Cedar Grove, and Robert C. Davis, Ramsey, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed July 17, 1975, Ser. No. 596,728

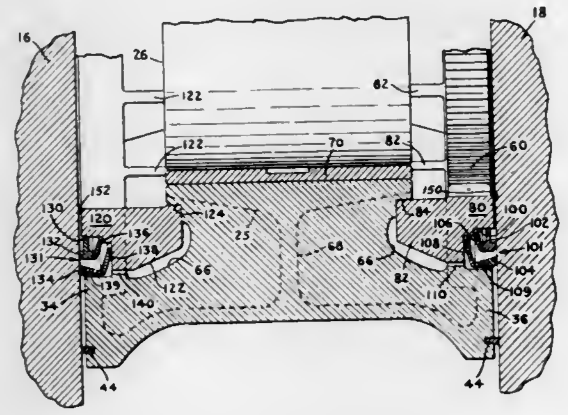
Int. Cl.² F01C *21/08, 19/08*

U.S. Cl. 418—91 **9 Claims**

1. A composite rotor for a rotary mechanism including a housing having a pair of axially-spaced end walls and a peripheral wall between said end walls to form a cavity therebetween and a shaft coaxial with said cavity and having an eccentric portion disposed within said cavity and upon which said rotor is journaled for relative rotation and for cooperation with the inner multi-lobe surface of said peripheral wall to form a plurality of working chambers between said rotor and peripheral wall surface, said composite rotor comprising:

a. a main rotor portion having a peripheral wall, a pair of axially-spaced end walls at opposite sides of said rotor and extending radially inwardly from said peripheral wall, a hub portion and a plurality of circumferentially-spaced partitions interconnecting said hub portion with said end walls and peripheral wall and dividing the interior of the rotor into a plurality of circumferentially-spaced compartments;

b. a pair of rings coaxially disposed adjacent to and radially inwardly of said opposite rotor end walls with each of said rings being secured to the rotor hub portion at circumferentially-spaced points to leave a substantial annular gap between said ring and the adjacent end of the rotor hub portion and with one of said rings having internal gear teeth formed thereon, each of said rings having circumferentially-spaced ribs extending axially inwardly across said annular gap and disposed in alignment with said rotor partitions;



c. seal means disposed between the radially facing surfaces of each of said rings and the adjacent rotor end wall for sealing cooperation with the adjacent housing end wall; and

d. means for supplying cooling oil to said rotor compartments for drainage through said annular gaps at each side of the rotor hub portion.

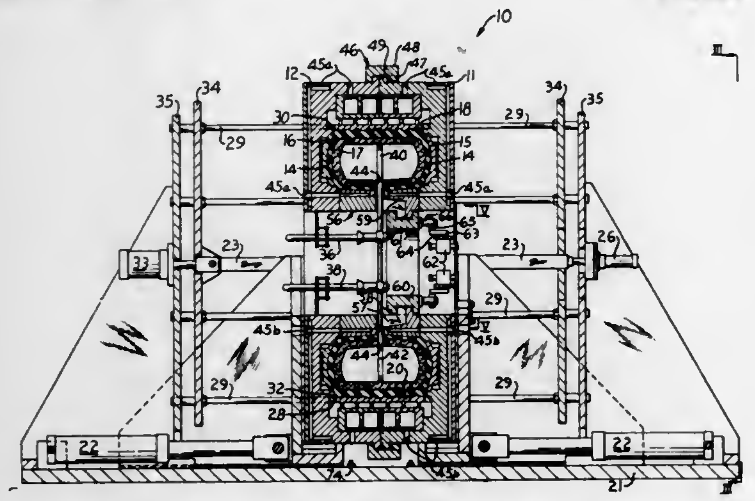
3,969,050
VERTICAL CURING MOLD FOR TUBE-TIRES

Arlynn Wesley Anderson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 23, 1975, Ser. No. 589,169

Int. Cl.² B29B *5/02*

U.S. Cl. 425—40 **5 Claims**



1. A tube-tire curing apparatus useful for curing a vertically positioned tube-tire, comprising:

a rigid tire restrainer ring fittable in mating relation about the outer circumference of an uncured tube-tire;

a mold comprising a pair of vertically disposed opposing generally circular mold members defining when moved together a cavity therebetween adapted to mateably hold said tube-tire and including a tire side mating portion and a tire inner circumference mating portion;

means for moving at least one of said mold members towards and away from the other;

means communicating with each of said mold members for supportingly engaging said restrainer rings;

means communicating with each of said mold members for sealingly abutting against a respective adjacent edge of said restrainer ring;

means for retracting and extending said abutting means responsive to expansion and contraction of said restrainer ring; and

means within said mold for directing a heated fluid into and out of said tube-tire.

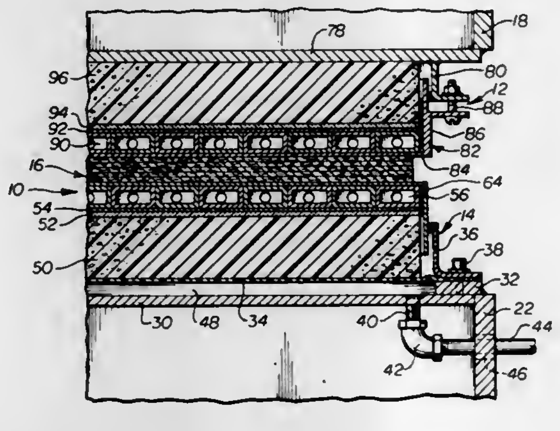
3,969,051
VULCANIZING APPARATUS

Harry Hovila, Bothell, Wash., assignor to D.G. Rung Industries, Inc., Seattle, Wash.

Filed June 13, 1975, Ser. No. 586,818

Int. Cl.² B29D *29/04*

U.S. Cl. 425—11 **11 Claims**



1. A vulcanizing apparatus comprising:

a. a first platen assembly including
  1. a first frame member; and
  2. first means forming a first platen surface, said first means being fixed to said first frame member,

b. a second platen assembly including
  1. a second frame member,
  2. second means forming a second platen surface, said second means being associated with said second platen assembly for movement toward and away from said second frame member in a direction generally transverse to said second platen surface,
  3. a flexible diaphragm associated with said second frame member, said diaphragm being spaced therefrom and being substantially coextensive with said second platen surface, said diaphragm having a periphery,
  4. third means affixing the periphery of said diaphragm to said second frame member, said diaphragm and said second frame member being so constructed as to form a fluid chamber between a first surface of said diaphragm and said second frame member,
  5. heat exchange means for cooling said second platen surface, said heat exchange means having a heat transfer surface that is substantially coextensive with said second platen surface,
  6. heating means forming a heat transfer surface substantially coextensive with said second platen surface,
  7. insulating means forming a layer of insulation interposed between said diaphragm and said second means, said heating means and said heat exchange means being sandwiched between said insulating means and said second means,

c. fourth means removably coupling said first and second platen assemblies so as to orient said first and second platens surfaces in generally parallel, spaced, mutually opposing relationship, and

d. fifth means associated with said second platen assembly for admitting and exhausting fluid from said chamber for increasing and decreasing the fluid pressure in said chamber to move said diaphragm relative to said second frame member and to thereby move said second platen surface toward and away from said platen surface.

3,969,052
PROCESS OF THE MAKING OF EXTRUDED THERMOPLASTIC BODIES AND DEVICE FOR THE CARRYING OUT OF THE SAID PROCESS

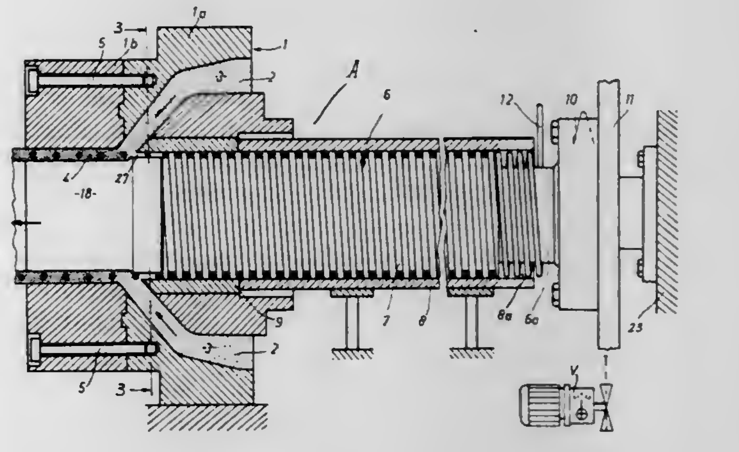
Ariberto Tamborini, and Giancarlo Tamborini, both of Via 25 Aprile, Daverio, Italy

Filed Apr. 12, 1974, Ser. No. 460,378

Claims priority, application Italy, May 29, 1973, 24685/73

Int. Cl.² F16L *11/08*

U.S. Cl. 425—113 **11 Claims**



1. A device for embedding an elongated helically shaped reinforcing element within a molded thermoplastic body of annular cross section comprising an extrusion head having a forward portion and a rearward portion, a source of thermoplastic material, said extrusion head rearward portion having a feed duct with an inlet communicating with said source of thermoplastic material, said duct extending through said extrusion head and opening through the forward portion of the inner face thereof providing a feed duct outlet, said extrusion head forward portion embodying a longitudinally extending, annular sizing run having a rearward end communicating with said feed duct outlet, means provided internally of said extrusion head rearward portion, rearwardly of said sizing run and said feed duct outlet, defining an annular passage coaxial with said sizing run, but having a cross section less than that of said sizing run, said annular passage having a forward outlet end communicating with the rearward end of said sizing run substantially at the confluence of the latter with said feed duct outlet, means provided rearwardly of said annular passage and communicating with same at its rearward outlet carrying a supply of said reinforcing element, and means for advancing said supply carrying means whereby said reinforcing element is introduced into said passage, forced therethrough, and thence forced into said sizing run whereby in view of the coaxiality of said annular passage and said sizing run said reinforcing element is centered within said sizing run.

3,969,053
DEVICE FOR DISTRIBUTING DYESTUFFS OR OTHER ADDITIONAL MATERIALS IN EXTRUDERS OR THE LIKE

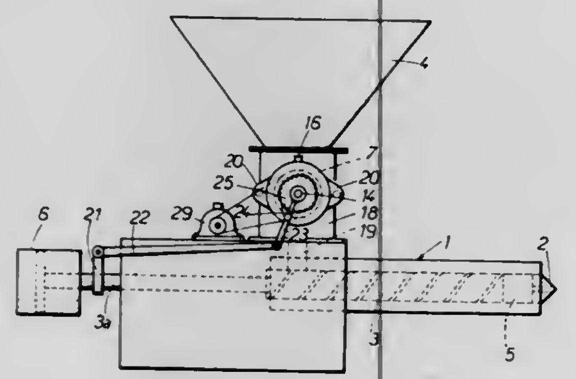
Emile Felix Baconnier, Route d'Arlix, 07600 Vals, and Francois Delicheres, Quartier des Bastides, 07200 Aubenas, both of France

Filed Dec. 4, 1974, Ser. No. 529,506

Claims priority, application France, Dec. 7, 1973, 73.43726

Int. Cl.^{2} B29F *3/00*

U.S. Cl. 425—132 **8 Claims**



1. In combination with an extruding machine having a screw extruder and a chute for feeding material to said screw extruder, wherein said chute being provided with a lateral aperture; a device for adding an additional substance in a pulverulent state to said material, said device comprising a cylindrical cartridge container for a mass of the said additional substance; means at one end of said container for securing it in a removable manner to said chute in register with said aperture; rotatable scraping means at the same end of said container for progressively removing a portion of said mass allowing said removed portion to fall into said chute; means in said container including a pressure actuated piston for pushing said mass towards said scraping means; means for rotating said scraping means; and transmission means between said screw extruder and said rotating means for communicating to said scraping means a rotational movement proportional to the axial movement of the extruder screw.

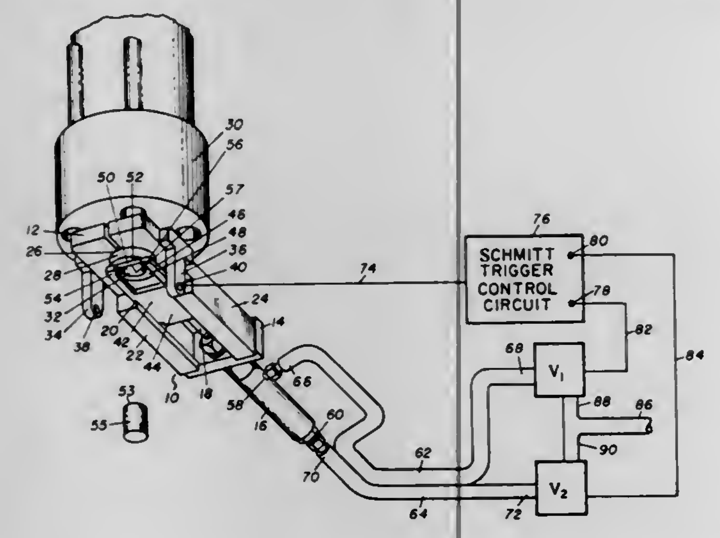
3,969,054
LENGTH SENSING SINGLE STRAND SHUTTLE CUTTER APPARATUS FOR CUTTING PROPELLANT GRAIN

Asa E. Roane, Blacksburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,192

Int. Cl.^{2} B26D *3/20, 5/12, 5/38*

U.S. Cl. 425—142 **5 Claims**



1. A length sensing single strand shuttle cutter apparatus for cutting substantially uniform propellant grain lengths from a variable rate continuously extruded propellant mixture which comprises:

a slide housing having a bifurcated front end, a rear end, side walls having longitudinally positioned parallel spaced slide grooves therein, a pair of downwardly protruding housing length-positioning bosses, and an agate bore positioned in said birfurcated front end intermediate said bosses;

an agate fixedly positioned in said agate bore, said agate having a die orifice therein which is axially in line with and intermediate said bosses;

cutter means slidably positioned in said slide grooves for repetitively and uniformly cutting said propellant grain lengths from said extruded propellant mixture;

optical means for sensing the leading edge of said extruded propellant mixture and generating an output signal in response to the passage of said leading edge in front of said optical means;

electronic circuit means electrically coupled to and responsive to said optical means for alternately generating output signals to first and second output terminals; and

pneumatic means for reciprocating said cutter means in said slide grooves in response to said output signals from said electronic circuit means.

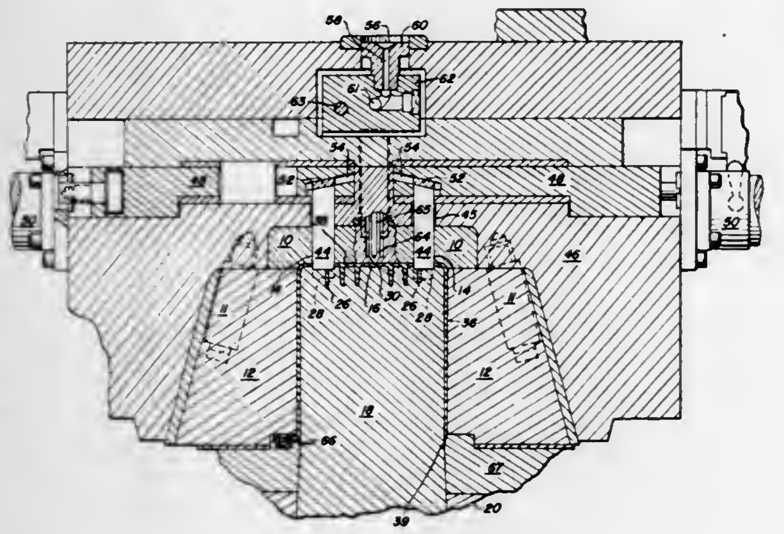
3,969,055
INJECTION MOLD CONTROL SYSTEM

Paul J. Buckethal, Villa Hills, Ky., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Dec. 17, 1973, Ser. No. 425,302

Int. Cl.^{2} B29F *1/06*

U.S. Cl. 425—145 **16 Claims**



1. In an injection-molding apparatus for repetitively forming a molded article, said apparatus having surfaces defining a cavity and at least two openings for the injection of material into said cavity to form said molded article, the improvement which comprises:

a. a plurality of sensing means forming part of said surfaces, said sensing means being spaced apart from one another and being spaced from said openings, each of said sensing means developing an indication of the arrival of said material thereat and thus the respective flow rate of said material through each of said openings into said cavity and of unbalanced flow conditions of the material injected into said cavity while forming said article;

b. control means for measuring the time between the arrival of material at the respective sensing means; and

c. regulating means for adjusting in response to a differential time indication from said control means the relative amounts of material passing through each of said openings into said cavity while forming a subsequent article.

3,969,056
MACHINE FOR SURFACE TREATMENT OF CONCRETE PANELS OR SECTIONS

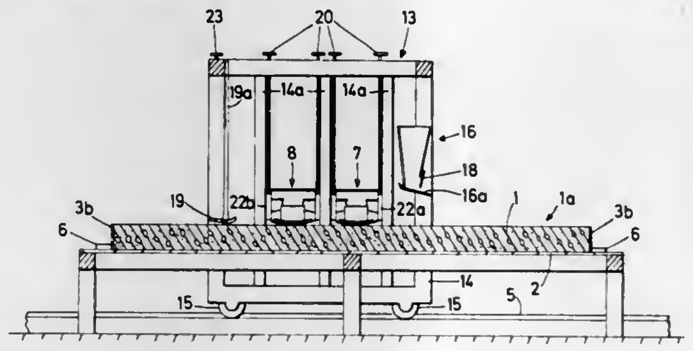
Rasmus Andreas Larsen, Rungsted Kyst, and Axel Nielsen, Copenhagen, both of Denmark, assignors to Larsen & Nielsen Enterprise A/S, Birkerod, Denmark

Continuation-in-part of Ser. No. 232,547, March 7, 1972. This application Feb. 5, 1975, Ser. No. 547,307

Claims priority, application Denmark, Mar. 9, 1971, 1086/71

Int. Cl.^{2} B28B *17/00*

U.S. Cl. 425—218 **9 Claims**



1. Machine for surface treatment of horizontally cast concrete units, such as walls, partitions, and floor decks, which are used in the erection of prefabricated houses and which are cast in mold frames having lateral boundaries, the top edges of which are flush with the upper surface of the concrete unit, the finishing being performed while the units rest in their mold frames, comprising a horizontal rectangular framework, opposed vertical supports on opposite sides of said framework, wheels mounted on said opposed vertical supports for guiding said framework for movement along parallel longitudinal tracks disposed under each of said opposed vertical supports, vertically adjustable transverse support means extending between said vertical supports, a plurality of pairs of rollers, the rollers of each pair being mounted at opposite ends of said vertically adjustable transverse support means, a plurality of parallel endless belts, each of said belts passing over one of said pairs of rollers, means mounted on said machine for driving said belts in mutually opposite directions, a mold frame mounted beneath said horizontal framework for containing a cast concrete unit to be finished, sides on said mold frame parallel to said vertical supports, said mold frame sides having a width greater than the cast concrete unit, each said belt having a lower run and an upper run, said lower run spanning at least the entire width between said mold frame sides and overlying the surface of the cast concrete unit, a plurality of support plate means mounted on said framework, each of said support plate means positioned above and in contact with the lower run of an endless belt to direct the respective said belt downward against the surface of the cast concrete unit, and separately driven means connected to each of said support plate means for vibrating the respective support plate means substantially perpendicular to the surface of the cast concrete unit.

3,969,057
PRESS FOR MOULDING GRAMOPHONE RECORDS AND THE LIKE

Marcel J. Pierre, Cheptainville, France, assignor to Societe Materiel pour Toutes Applications Plastiques - M.A.P., Paris, France

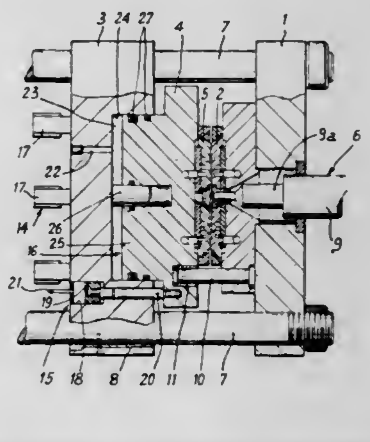
Filed Feb. 10, 1975, Ser. No. 548,752

Claims priority, application France, Feb. 21, 1974, 74.05980

Int. Cl.^{2} B29F *1/00;* **B29H** *3/08*

U.S. Cl. 425—242 R **4 Claims**

1. Press for moulding gramophone disc records, comprising: a fixed press platen adapted to carry a first mould element; parallel guide columns fast with the fixed press platen; a movable press platen mounted on and movable relatively to said columns; a movable intermediate platen adapted to carry a second mould element, said first and second mould elements having cavities which together form the shape of a gramophone disc record, the movable press and intermediate platens co-operating one within the other as an arrangement of a piston in a cylinder with the intermediate platen supported wholly by the movable press platen; means including a constant-stroke closing mechanism of the toggle type for moving the movable press platen along the guide columns, between an operative position close to the fixed press platen and an inoperative position remote from the fixed press platen; a circuit for the admission of fluid under pressure between the movable press and intermediate platens to effect relative movement of the piston of said piston and cylinder arrangement out of its cylinder; and a feed system for plastics material in the fluid state capable of introducing under pressure a metered charge of this plastics material between the two mould elements when



the movable press platen occupies its operative position and when the said circuit delivers fluid under pressure as aforesaid between the movable press and intermediate platens, said means for moving the movable press platen and the circuit for the admission of fluid under pressure being operable, after the movable platen has been moved toward the fixed platen by the constant stroke mechanism, to act upon the intermediate platen, on each operation of introduction of plastics material under pressure, in two successive stages, the first of which consists in driving the intermediate platen towards the fixed platen with a resilient force calibrated to a value lower than the opposing force which is produced by the introduction of the plastics material into the mould and which tends to separate the mould elements of the fixed and intermediate platens, and the second of which is a stage of compression with a force sufficient to move the two mould elements one against the other after introduction of the charge of plastics material.

3,969,058
APPARATUS FOR MAKING PLASTIC CONTAINERS

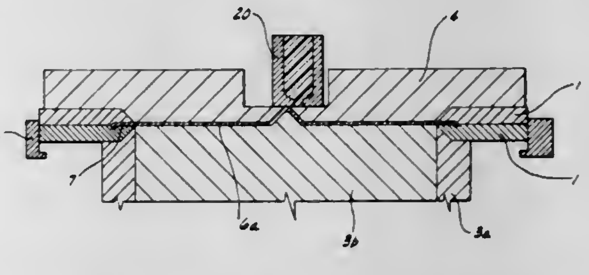
Brian Procter, Stroud, England, assignor to Hayssen Manufacturing Co., Sheboygan, Wis.

Division of Ser. No. 456,074, March 29, 1974, abandoned. This application Feb. 12, 1975, Ser. No. 549,280

Claims priority, application United Kingdom, Apr. 10, 1973, 17274/73

Int. Cl.^{2} B29D *23/02*

U.S. Cl. 425—242 B **8 Claims**



1. Apparatus for making plastic containers comprising means for first molding a pre-form and means for then molding the pre-form into a container having an open end, said pre-form molding means comprising a transfer means having

opposite sides, an aperture therethrough from one side to the other, and a groove formation surrounding the aperture adapted to receive plastic during the molding of the pre-form and defining the configuration for the open end of the container whereby said open end of the container is molded as an integral part of the pre-form when the pre-form is molded, said apparatus having a station for the molding of the pre-form, means at said station for closing the aperture in said transfer means comprising a metering plate on one side and a compression means on the other side of said transfer means at said station, said compression means comprising a compression ring and a compression piston movable in the compression ring, said compression ring having an end engageable with the said other side of the transfer means around said aperture at substantially the location of the groove formation in the transfer means, said compression ring being movable relative to the metering plate from an open position relative to the transfer means and the metering plate and a closed position wherein said end of the compression ring engages said other side of the transfer means and clamps the transfer means between the metering plate and the compression ring thereby to form a closed space including the aperture in the transfer means and said groove formation for the molding of the pre-form, said metering plate having a passage for flow of plastic into said closed space, means for delivering into said closed space through said passage in the metering plate a volume of thermoplastic plastic less than the volume of said closed space, said compression piston then being movable in and relative to said compression ring in the direction toward the metering plate to compress the plastic in said closed space and form it into the pre-form with the plastic filling said groove formation thereby to mold the open end of the container which is to be formed from said pre-form as an integral part of the pre-form and also to retain the pre-form in the transfer means.

3,969,059
CONTINUOUS ROTARY APPARATUS FOR BLOW-MOLDING PLASTIC HOLLOW BODIES

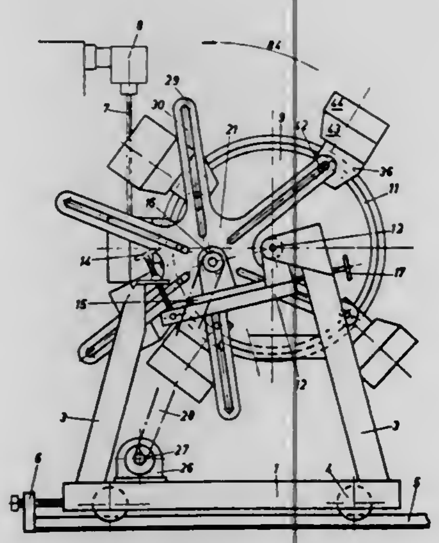
Edmond Michel, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed June 25, 1974, Ser. No. 483,071

Claims priority, application France, July 6, 1973, 73.25153

Int. Cl.² B29C *5/06*

U.S. Cl. 425—342 11 Claims



1. In a continuous rotary apparatus for blow-moulding plastic hollow bodies, including a fixed framework, moulds, means of opening and closing the moulds and means for introducing a blowing fluid, the improvement comprising:

a. a fixed track which is integral with the framework;

b. a plurality of independent moveable moulding units which carry the moulds, and travel successively over the track; and

c. a device for driving the moulding units, which includes a rotary platen mounted on a shaft, said shaft being moveable relative to the fixed framework and said platen being equipped with equidistant slots which act on the drive devices of the moulding units.

3,969,060
APPARATUS FOR DEFORMING A TUBULAR SLUG OF THERMOPLASTIC MATERIAL

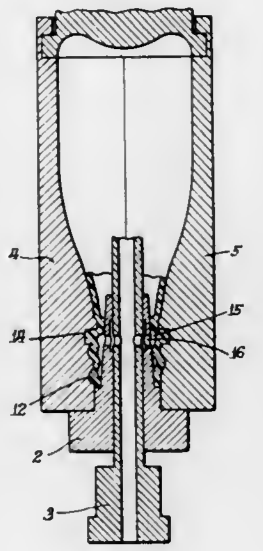
Otto Rosenkranz; Karl-Heinrich Seifert, and Claus Horwege, all of Hamburg, Germany, assignors to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Germany

Continuation of Ser. No. 275,139, July 26, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,486

Claims priority, application Germany, Aug. 20, 1971, 2141755

Int. Cl.² B29D *23/03*

U.S. Cl. 425—387 B 4 Claims



1. An apparatus for forming a blown plastic article from an elongated, essentially tubular parison having a longitudinal axis, said parison having one longitudinal portion destined to be blown to the configuration of the blown body portion of said article and a second longitudinal portion destined to form a profiled finish portion of the plastic article, comprising:

a first mold member including an essentially cylindrical core axially insertable into said second parison portion, and an annular shoulder for engaging the annular end of said parison adjacent said second parison portion, said core having generally radial openings therein to receive fluid under pressure;

a sectional blow mold closable onto said parison with said first mold member inserted in said parison, the sections of said blow mold in the displace position defining (a) a blow molding cavity corresponding to the configuration of said article blown body portion, (b) a profiled finish region adjacent the second portion of said parison, and (c) an annular restricting ring between said molding cavity and said finish region, said restricting ring extending radially inwardly and having a diameter less than the corresponding outer diameter of the parison to grip the parison between said molding cavity and the finish region and between said cylindrical core and said restricting ring;

means for displacing said first mold member axially of said parison toward said blow molding cavity to diaplace the annular end of said parison axially toward said profiled finish region by said annular shoulder and to displace at least a portion of said second parison portion radially outwardly into said profiled finish region of the mold; and

means for supplying air under pressure through the radial openings in said core to assist in displacing the plastic material of said second parison portion radially outwardly into said profiled finish region.

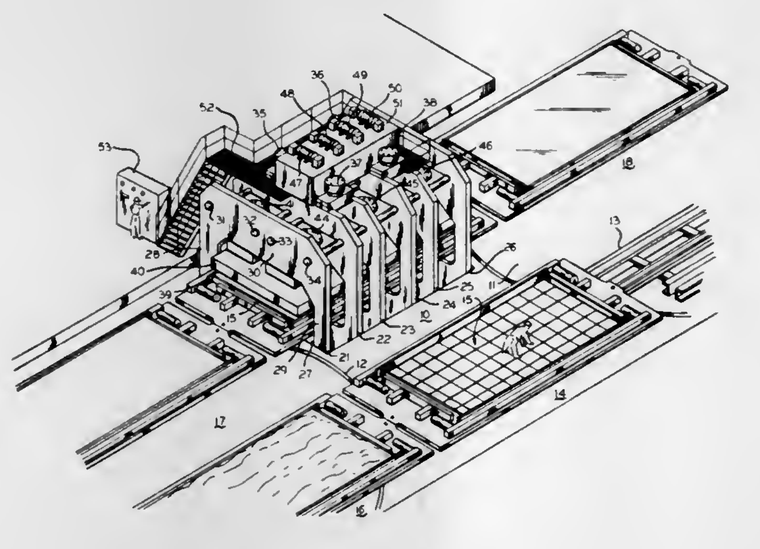
3,969,061
CONCRETE PRESS WITH MOLD CLAMPING MEANS

Howard M. Fisher, and Bernd G. Albers, both of New Castle, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 225,575, Feb. 11, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,455

Int. Cl.² B28B *3/00*

U.S. Cl. 425—423 10 Claims



1. A press for making articles from a high water-to-cement ratio concrete slurry, said press comprising a plurality of spaced apart, generally vertically oriented frame means disposed adjacent the opposite sides of and defining a platen receiving space,

upper and lower platen means disposed within said space in generally parallel spaced apart relation, said lower platen means being constructed and arranged to support a concrete containing mold having sides presented toward the frame means on the opposite sides of said space,

first force producing means coupled to one of said platen means for moving the same toward the other of said platen means thereby to compress the concrete in said mold,

a plurality of wedge means, at least one of said wedge means being disposed between each of the sides of said mold and said frame means disposed on each of the sides of said space, each of said wedge means being mounted for generally vertical movement into and out of high pressure wedging engagement between the respectve sides of said mold and said spaced apart frame means on the opposite sides thereof for exerting a force inwardly toward said mold in opposition to the forces tending to deform the mold laterally as said mold is compressed between said platen means,

selectively operable force producing means for selectively moving each of said wedge means vertically on said frame means and into and out of high pressure engagement with the adjacent side of said mold,

means for conveying said mold into and out of said space through the ends of said frame means, pivotally mounted clamping means positioned adjacent the path of said mold and each of the ends of said mold,

and third force producing means operatively connected to said clamping means for selectively pivoting said clamping means out of said mold path and into said path for exerting a longitudinal clamping force on the ends of said mold and for moving said clamping means out of the path of said mold to permit insertion and withdrawal thereof.

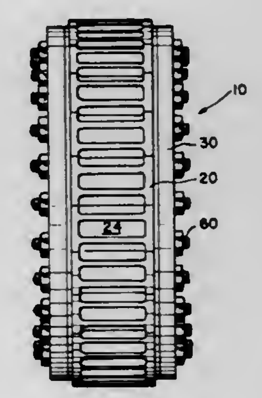
3,969,062
BRIQUETTING ROLL HAVING REMOVABLE MOLD SEGMENTS

Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.

Filed July 22, 1975, Ser. No. 598,056

Int. Cl.² B29C *1/00*

U.S. Cl. 425—471 20 Claims



1. A briquetting roll comprising the combination of:

a. a central cylindrical core having two side walls, each of said side walls having core locking means for detachably connecting a retaining ring to said core;

b. a plurality of mold segments around the periphery of said core, each of said mold segments comprising:
   1. a top working surface;
   2. a bottom surface opposite said top surface;
   3. two opposite end walls connecting said top working surface and said bottom surface, said end walls diverging with respect to each other relative to said bottom surface; and
   4. two opposite side walls connecting said top working surface and said bottom surface, each of said side walls having at least one hole therein;

c. two annular retaining rings, one on each side of said central core, each spanning the interface between said mold segments and said central core, with each of said retaining rings having a plurality of pins engaging the holes in said side walls of said mold segments and an inner locking means for engaging said core locking means; and

d. means for drawing the two annular retaining rings toward each other thereby affixing said mold segments to said central core.

3,969,063
APPARATUS FOR MANUFACTURING A PLASTIC NAME TAG HOLDER

Edward Dantowitz, Chestnut Hill, Mass., assignor to Albany Novelty Mfg. Co., Boston, Mass.

Filed June 12, 1975, Ser. No. 586,508

Int. Cl.² B29C *17/00, 27/00*

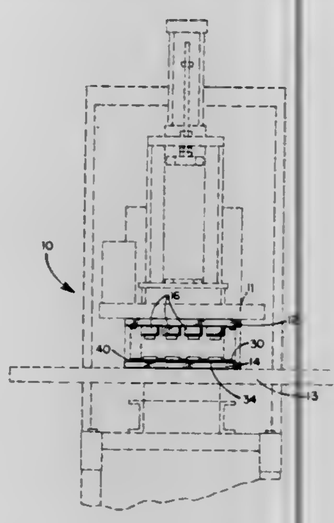
U.S. Cl. 425—520 6 Claims

1. For use with a dielectric sealing machine, apparatus for sealing plastic name tag holders and the like comprising:

a. an upper platen having at least one electrically energized substantially U-shaped hollow electrode die secured to its lower surface, said die having a downwardly extending outer periphery terminating in a horizontal substantially U-shaped lower cutting edge, said die also having a downwardly extending inner periphery terminating in a horizontal substantially U-shaped lower sealing edge, the plane of said cutting edge being disposed below the plane of said sealing edge;

b. compression means secured to the lower surface of said upper platen within said hollow die, said compression means having a lower substantially horizontal bearing surface which, in its uncompressed condition, is disposed below the horizontal plane of said cutting edge of said outer periphery; and

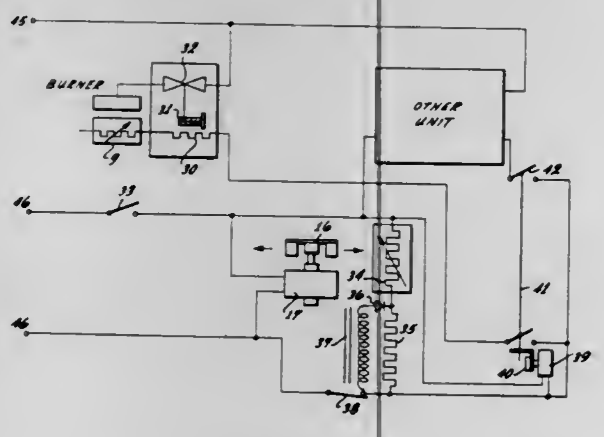
c. a lower platen underlying said upper platen, said lower platen having a male mold assembly secured to its upper surface, said male mold assembly having at least one substantially planar insert finger having a substantially U-shaped perimeter, said insert finger being slightly narrower than said electrode die, said insert finger being normally positioned horizontally in telescopic registration beneath said electrode die, said insert finger being movably attached to said mold assembly to permit a bottom sheet of plastic to be inserted between said insert finger and said lower platen, and to permit a top sheet of plastic to be positioned over said insert finger;



d. said upper platen being lowered by said dielectric sealing machine to cause said compression means and said die to contact the top plastic sheet, said compression means urging the top plastic sheet into a horizontal plane against said insert finger, said substantially U-shaped sealing edge drawing the top sheet down and electronically sealing it to the bottom plastic sheet beyond the perimeter of said insert finger, and said substantially U-shaped cutting edge cutting the sealed top and bottom sheets further beyond the perimeter of said insert finger, said upper platen being raised to permit the cut-off sheet waste to be stripped away and the completed name tag holder to be removed from said insert finger.

3,969,064
PROTECTION OF GAS BURNERS

Earle W. Ballentine, 3641 Via Palomina St., Palos Verdes Estates, Calif. 90274
Continuation-in-part of Ser. No. 518,473, Oct. 29, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,112
Int. Cl.^{2} F23H *1/02*
U.S. Cl. 431—90 1 Claim



1. A burner for heating a cooking pan having a burner means, a combustion chamber above the burner means and an impeller driven by a motor for feeding air to the combustion chamber, an electrical control system for and connected to the motor, comprising:

ballast resistor means positioned in the stream of air flowing radially from the impeller means, one terminal of the ballast resistor means being connected to one side of the power line;

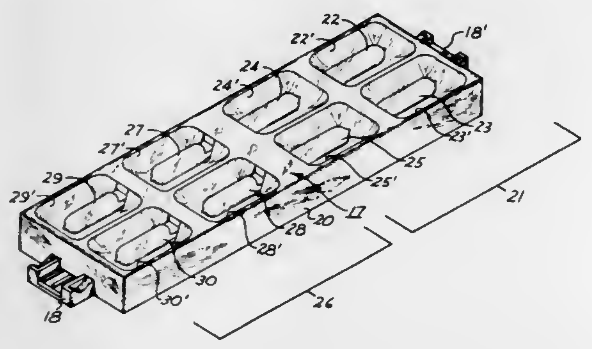
a fixed resistor connected to the other terminal of the ballast resistor;

relay means having a switch and a coil, the coil being connected to one terminal of a diode means, the other terminal of the diode means being connected to one terminal of the fixed resistor means, the relay being connected additionally to the other terminal of the fixed resistor means; and

the switch of the relay controlling the power supply to the motor to turn the impeller off when the airflow across the ballast resistor decreases to a small value.

3,969,065
SWITCHING DEVICES FOR PHOTOFLASH UNIT

Robert L. Smialek, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 4, 1974, Ser. No. 520,968
Int. Cl.^{2} F21K *5/02*
U.S. Cl. 431—95 A 3 Claims



1. A multilamp photoflash unit comprising:

a. a pair of flashlamps,

b. an electrical circuit into which said lamps are arranged to fire individually and in sequence, and

c. a solid state radiation switch located external of the lamps and forming part of said electrical circuit, said switch being located adjacent one of said flashlamps to receive radiant energy emitted by that flashlamp, said photoflash unit being characterized by said switch being a high relative humidity resistant mass of a material comprising a mixture of a solid copper salt of an organic acid, a humidity resistant organic polymer binder selected from the group consisting of cellulose esters, cellulose ethers, polyalkylacrylates, polyalkylmethacrylates, polystyrene, styrene copolymers, and polycarbonate, and which further contains a finely divided metal reducing agent.

3,969,066
SWITCHING DEVICES FOR PHOTOFLASH UNIT

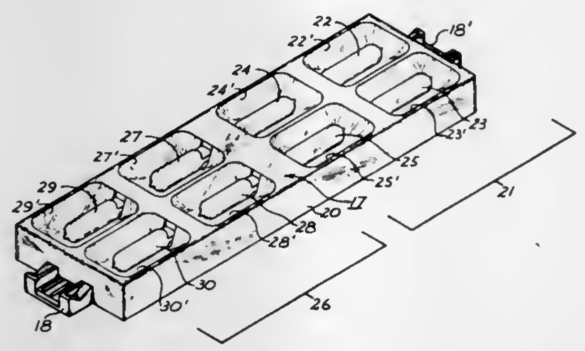
Robert L. Smialek, Pepper Pike, and Mary S. Jaffe, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 5, 1974, Ser. No. 520,967
Int. Cl.^{2} F21K *5/02*
U.S. Cl. 431—95 A 2 Claims

1. A multilamp photoflash unit comprising:

a. a pair of flashlamps,

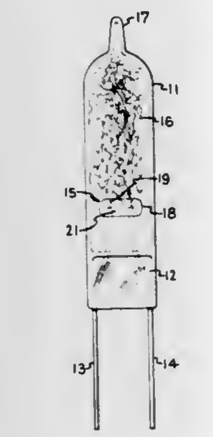
b. an electrical circuit into which said lamps are arranged to fire individually and in sequence, and

c. a solid state radiation switch located external of the lamps and forming part of said electrical circuit with said switch being located adjacent one of said flashlamps to receive radiant energy emitted by that flashlamp, said photoflash unit being characterized by said switch being a high relative humidity resistant mass of a material comprising a mixture of finely divided cupric oxide having an average particle size less than one micron with a humidity resistant organic polymer binder selected from the group consisting of cellulose esters, cellulose ethers, polyalkylacrylates, polyalkylmethacrylates, polystyrene, styrene copolymers and polycarbonate.



3,969,067
PHOTOFLASH LAMP

Lewis J. Schupp, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 12, 1975, Ser. No. 557,624
Int. Cl.^{2} F21K *5/02*
U.S. Cl. 431—95 R 14 Claims

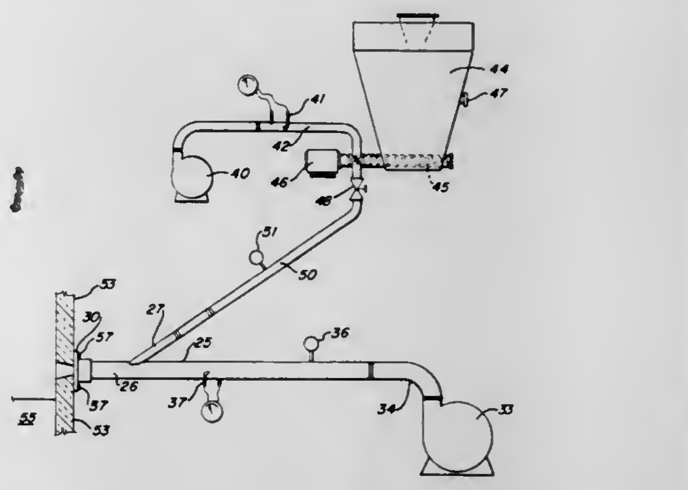


1. A primer material for a high-voltage activated flashlamp which comprises a solid mixture of a combustible fuel, an oxidizer for said combustible fuel, a combustion-supporting oxide which is converted to a lower oxide upon combustion of the mixture and a small but effective amount of an alumina gel additive.

3,969,068
METHOD FOR COAL FIRING GLASS FURNACES

Karl A. Miller, Denver, and Clement V. Fogelberg, Arvada, both of Colo., assignors to Tusco Engineering Co., Inc., Commerce City, Colo.
Filed Dec. 16, 1974, Ser. No. 533,388
Int. Cl.^{2} F27B *14/00*
U.S. Cl. 432—13 7 Claims

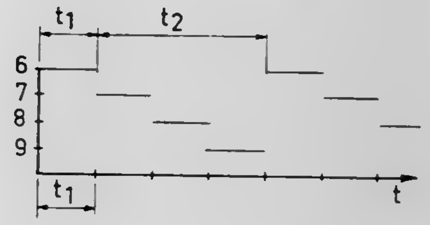
1. A method for producing molten glass from a glass batch comprising: placing a quantity of glass batch material in a glass tank furnace, and combusting fluidized, pulverous coal entrained in an airstream to produce a flame in the glass tank furnace immediately above the batch material and resulting



molten glass, whereby glass is produced utilizing pulverized coal to direct fire the glass tank furnace.

3,969,069
BURNER SYSTEMS FOR OVENS AND METHODS OF OPERATING SUCH SYSTEMS

Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf-Heerdt, Germany
Filed Apr. 10, 1974, Ser. No. 459,687
Claims priority, application Germany, Apr. 14, 1973, 2318971
Int. Cl.^{2} F27B *9/14*; F27D *7/00*
U.S. Cl. 432—25 5 Claims



1. A method of heating workpieces in ovens, comprising heating a workpiece which extends along at least one zone of an oven chamber by supplying heat to said zone from at least one burner nozzle; steadily controlling the temperature in said zone for a first time interval by thermostatically regulating the heat output from said nozzle during said first time interval in response to temperature variations in said zone; maintaining said heat ouput approximately constant at one of a plurality of magnitudes for a second time interval, said plurality of magnitudes including zero heat output; and repeating said regulating and maintaining operations in cycles having approximately a predetermined duration at heating loads corresponding to a predetermined percentage of the rated heating capacity for said nozzle, said zone being heated by a plurality of groups each of which comprises at least a single burner nozzle; and wherein each of said groups is subjected to said regulating and maintaining operations, said one zone communicating with at least one additional heating zone; and wherein each additional zone is heated similarly to said one zone and by a different plurality of groups, said zones each being heated by four heating groups; and wherein at heating loads less than about 12.5 percent of the rated heating capacity for the respective groups said second time interval includes a shorter interval which approximately equals three times said first time interval and a longer interval which approximately equals twice said shorter interval plus said first time interval, said one magni-

tude of heat output for each of said groups being at least near zero heat output during said shorter and longer intervals, and said groups being controlled so that said shorter and longer intervals alternate for each group and so that where the number of zones is such that there is always at least one zone where all of the respective groups have a heat output at least near zero heat output the zone where this occurs changes sequentially.

3,969,070

CLOTHES DRYER WITH HEAT RECLAIMER

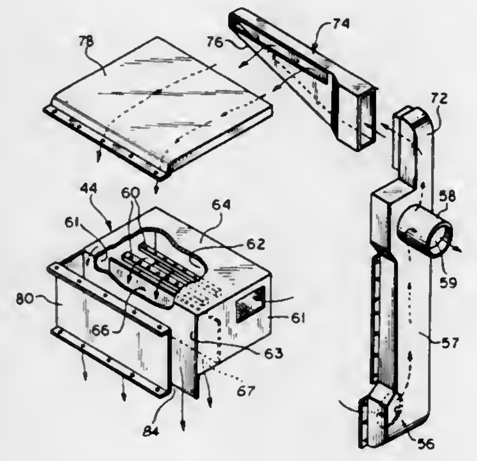
Richard D. Thompson, Cincinnati, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 12, 1975, Ser. No. 549,167

Int. Cl.^{2} F27B *7/36*

U.S. Cl. 432—105 4 Claims

1. A dryer comprising the combination of air baffle walls shaped in part to define a cylindrical drum chamber, a drum mounted for rotation in the drum chamber and having perforated cylindrical walls disposed in close proximity to the air baffle walls, a burner operable for combusting fuel with ambient air and a box shaped housing surrounding the burner and having wall structure for directing the combustion gases through an opening in one air baffle wall to the drum chamber, duct means for directing gases through an opening in the other air baffle wall from the drum chamber to the outdoor atmosphere, a tee connection in the duct means operable for diverting part of the gases therein for discharge other than to the outdoor atmosphere, a reclaiming housing having wall structure disposed in outwardly spaced adjacent relationship relative to the burner housing to define therebetween a tortuous passageway isolated from the combustion gases but in heat exchange relation therewith, manifold means for directing the diverted gases downstream of the tee to and only to the reclaiming housing passageway, said passageway wall structure terminating as an opening in the one air baffle wall immediately adjacent the opening therein for the combustion gases and downstream therefrom relative to the direction of rotation of the rotating drum and the burning housing and reclaiming housing wall structures including a common divider wall between said openings for the combustion gases and the diverted gases, and the latter mentioned wall structures further including opposing outer faces disposed parallel to one another and to the common wall and terminating just short of the cylindrical drum wall and being disposed approximately normal thereto for providing a directional discharge of the gases for penetration into the drum interior and minimal side slip of the gases around the drum.



CHEMICAL

3,969,071

CARRIERS AND THEIR USE IN PRINTING AND DYEING

Bernard Hugelin, Gaillard, France, assignor to Sublistatic Holding S.A., Glaris, Switzerland

Filed Sept. 4, 1974, Ser. No. 503,163

Claims priority, application Switzerland, Sept. 13, 1973, 13176/73

Int. Cl.^{2} D06P *3/70*

U.S. Cl. 8—2.5 R 12 Claims

1. In a temporary carrier for use in the dry transfer printing or dyeing process said temporary carrier comprising an inert, heat-resistant base sheet bearing on at least one face thereof a transfer coating

the improvement according to which the transfer coating comprises (a) a layer comprising (1) at least one cationic dyestuff which after reacting with an alkalizing agent passes into the vapor state at a temperature of from 160°C to 210°C and (2) a binder which upon drying forms a film sufficient to bond the dyestuff to the carrier base, which film is inert to the dyestuff and does not decompose under conditions of transfer, and (b) a layer comprising (1) an alkalizing agent which is capable of reacting with cationic dyestuff present in layer (a) to render said dyestuff vaporizable at a temperature of from 160°C to 210°C said agent being selected from the group consisting of an alkali or alkaline earth metal hydroxide, an alkali or alkaline earth metal alcoholate and an alkali or alkaline earth metal salt of a weak acid and (2) a binder which is stable to electrolytes, which upon drying forms a film which is inert to dyestuff present during transfer and which does not decompose under conditions of transfer.

12. In a method for the dry transfer printing or dyeing or organic material which comprises bringing into contact the surface of the organic material to be dyed or printeed and the transfer coated surface of a temporary carrier, subjecting the temporary carrier and organic material to heating at a temperature of about 160° to about 220° for a time sufficient to effect transfer and separating the organic material and temporary carrier,

the improvement according to which the organic material is a material which can be dyed or printed with cationic dyestuff, the temporary carrier is as defined in claim 1, and the time of heating to effect transfer is sufficient to permit reaction between the alkalizing agent and cationic dyestuff and for the thus formed vaporizable dyestuff to pass from the temporary carrier to the organic material and to penetrate into the said organic material.

3,969,072

PERPHTHALIC ACID AFTER-TREATMENT OF PHOSPHONATE FLAMEPROOFED FABRICS

Dudley K. Moses, Wadsworth, and George L. Brodmann, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 600,993

Int. Cl.^{2} D06L *3/02;* **D06M** *13/32*

U.S. Cl. 8—111 8 Claims

1. A method for removing discoloration from heat-cured phosphonate flameproofed substrate by contacting the substrate with a solution of perphthalic acid.

3,969,073

DRY CLEANING ADDITIVE FOR DECREASING SOIL REDEPOSITION

Albert Robert Eanzel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1975, Ser. No. 542,235

Int. Cl.^{2} D06L *1/04, 1/08;* **C11D** *7/52*

U.S. Cl. 8—142 4 Claims

EXAMPLE 1

1. A textile cleaning composition comprising textile dry cleaning organic solvent and, by weight of the cleaning composition, about from 0.1% to 2.0% of dry cleaning detergent and about from 0.01% to 0.3% of organic ester of ortho-titanic acid.

4. In a process of agitating textile material in a dry cleaning composition comprising textile dry cleaning organic solvent and about from 0.1% to 2.0%, by weight of the dry cleaning composition, of dry cleaning detergent; separating the textile material from the bath; and drying the textile material; the improvement comprising including in the composition about from 0.01% to 0.3% by weight of the composition of organic ester of ortho-titanic acid.

3,969,074

PROCESS FOR DYEING YARN HANKS

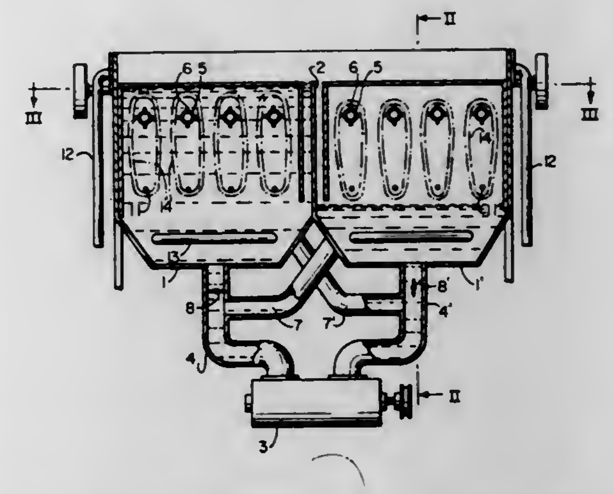
Hui Do Chung, 361 Kaya-dong, Pusanjin, Pusan, South Korea

Filed Mar. 25, 1975, Ser. No. 562,033

Claims priority, application South Korea, May 7, 1974, 2378

Int. Cl.^{2} D06B *5/20*

U.S. Cl. 8—155.2 2 Claims



1. A process for dyeing yarn hanks, said process comprising: suspending yarn hanks in each of two separate baths; and repeatedly alternately subjecting said yarn hanks in each of said baths to a dipping dyeing operation and a spraying dyeing operation, said step of subjecting comprising supplying dye into a first of said baths and dip dyeing said yarn hanks therein, while simultaneously spraying dye into a second of said baths and spray dyeing said yarn hanks therein, and then repeatedly alternating said dip dyeing and spray dyeing between said first and second baths.

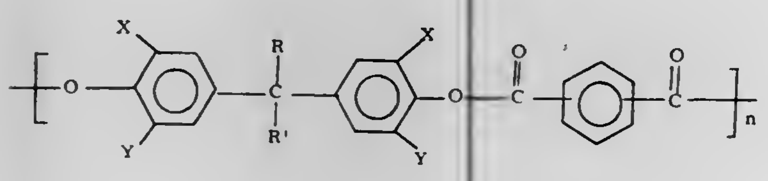
3,969,075
DYEING HALOGENATED AROMATIC POLYESTER FIBROUS MATERIALS WITH ACETOPHENONE

Alex S. Forschirm, Lake Hiawatha, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed July 28, 1975, Ser. No. 599,557
Int. Cl.^{2} D06P *3/54*

U.S. Cl. 8—172 R **14 Claims**

1. An improved process for the dyeing of a halogenated aromatic polyester fibrous material having recurring units of the formula:



where X is chlorine or bromine, Y is hydrogen, chlorine or bromine, R and R′ may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and *n* = at least 25, comprising contacting said fibrous material with an aqueous dyebath at substantially atmospheric pressure and at a temperature of about 80° to 100°C. containing a disperse dye and an effective concentration of an acetophenone dye carrier in the substantial absence of fiber degradation.

3,969,076
METHOD FOR THE ANALYSIS OF IONIC SURFACTANTS

Lawrence K. Wang, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation of Ser. No. 385,775, Aug. 6, 1973, abandoned. This application May 27, 1975, Ser. No. 580,646
Int. Cl.^{2} G01N *31/00, 31/16, 31/22*

U.S. Cl. 23—230 R **5 Claims**

1. A method for the analysis of ionic surfactants present in an aqueous solution including the steps of:

obtaining a known volume sample of the aqueous solution to be tested;

adding a standard, cationic, nonaromatic quarternary ammonia solution to the sample in a known amount sufficient to ensure a cationic character to the sample independent of its original condition;

adding buffer solution, indicator and chloroform to the sample and mixing therewith to form a water-chloroform two phase mixture; and

titrating the sample with a standard solution of sodium tetraphenylboron, whereby the actual concentration of ionic surfactant is given by the difference between the amount of quarternary ammonia compound added to the sample and that found by titration with the standard solution of sodium tetraphenylboron.

3,969,077
ALKALI METAL LEAK DETECTION METHOD AND APPARATUS

Eugene F. Hill, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 208,733, Dec. 16, 1971, abandoned. This application Mar. 13, 1974, Ser. No. 450,625
Int. Cl.^{2} G01N *31/00, 33/20*

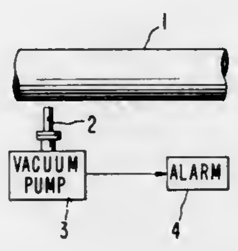
U.S. Cl. 23—230 L **25 Claims**

1. A method of determining whether or not an alkali metal leak exists in a structure confining the alkali metal comprising the steps of:

exposing the exterior of said structure to a substance including hydrogen in a form chemically replaceable by said alkali metal to form hydrogen gas;

detecting any of said formed hydrogen gas exterior to said structure with a hydrogen gas detection apparatus which provides a signal when said hydrogen is detected; and

evaluating said signal to determine whether or not said alkali metal leak exists.

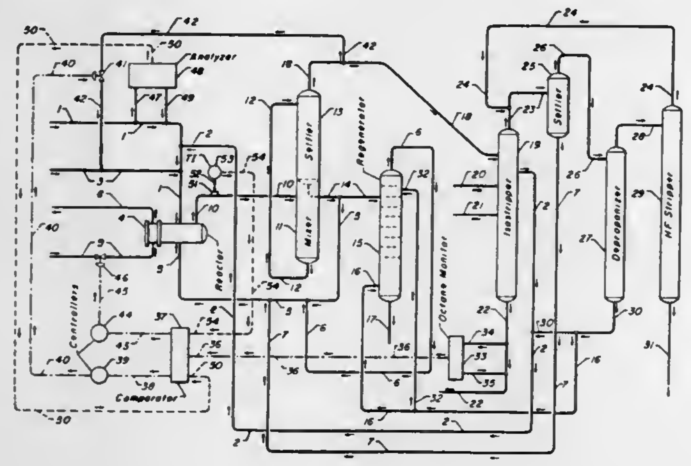


3,969,078
HF ALKYLATION REACTION TEMPERATURE CONTROL SYSTEM

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 468,955, May 10, 1974. This application Dec. 19, 1974, Ser. No. 534,399
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.^{2} G05B *21/02;* **G06G** *7/58;* **C07C** *3/54*

U.S. Cl. 23—253 A **3 Claims**



1. For a process for alkylating an isoparaffin with an olefinic feed stream, to produce a normally liquid alkylate product, wherein (1) said feed stream contains at least two olefinic hydrocarbons and is contacted in admixture with a hydrogen fluoride catalyst, in a reaction zone, and (2) at least a portion of the reaction zone effluent is recycled thereto, the control system, for regulating the temperature within said reaction zone, which comprises, in cooperative combination:

a. conduit means for introducing a cooling medium into said reaction zone, and for removing it therefrom, said cooling medium indirectly contacting the reaction mixture within said zone;

b. first flow-varying means for adjusting the flow of said cooling medium into said reaction zone;

c. second flow-varying means for adjusting the flow of effluent recycled to said reaction zone;

d. a first hydrocarbon analyzer receiving a sample of said olefinic feed stream and developing a first process output signal representative of a composition characteristic thereof;

e. temperature-sensing means for sensing a reaction zone temperature and, in operative association therewith, temperature-indicating means developing a second process output signal representative of said temperature;

f. a second hydrocarbon analyzer receiving a sample of said normally liquid alkylate product and developing a third process output signal representative of a composition characteristic of said sample;

g. process signal-transmitting means through which said three process output signals are transmitted to computer/comparator means developing a computer output signal in response to, and as a function of said three process output signals; and,

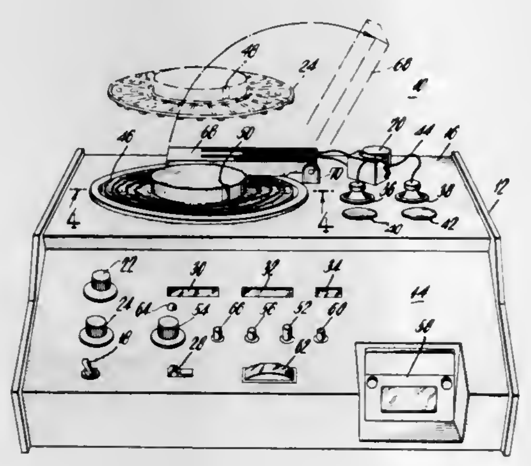
h. computer output signal-transmitting means through which said computer output signal is transmitted to said first and second flow-varying means.

3,969,079
DUAL CHANNEL PHOTO-OPTICAL CLOT DETECTION APPARATUS

Joseph Catarious, Harleysville, Pa.; Lyman Bethke, Trenton, N.J., and Richard Berman, Dresher, Pa., assignors to Alphamedics Mfg. Corporation, Levittown, Pa.

Filed Jan. 8, 1975, Ser. No. 539,520
Int. Cl.^{2} G01N *33/16, 21/24*

U.S. Cl. 23—253 R **8 Claims**



1. A photo-optical clot detection apparatus comprising:

a plurality of plasma sampling stations,

means for indexing said plasma sampling stations into a readout position in between a radiant source and a radiation detector for measuring sample density,

reagent feeding means for automatically feeding reagent to said plasma sampling stations at said readout position and a predetermined number of positions before said readout position,

heating means for heating said plasma sampling station only between said readout position and said predetermined number of positions before said readout position, and

timing means for controlling said indexing means to cause a sample of plasma to remain in said readout position and in the predetermined number of positions immediately prior thereto for only a set period of time.

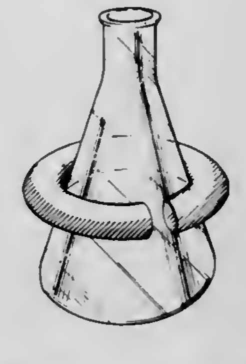
3,969,080
STABILIZING MEANS FOR LABORATORY WARE

Daniel R. Conlon, 600 Meeting House Road, Jenkintown, Pa. 19046

Filed Aug. 20, 1974, Ser. No. 498,946
Int. Cl.^{2} B01L *3/00, 9/00*

U.S. Cl. 23—259 **12 Claims**

1. A stabilized container having a base area enlarged with respect to a portion of the container above the base area comprising in combination, said container and in cooperative relationship a heavy metal split torus surrounding and resting



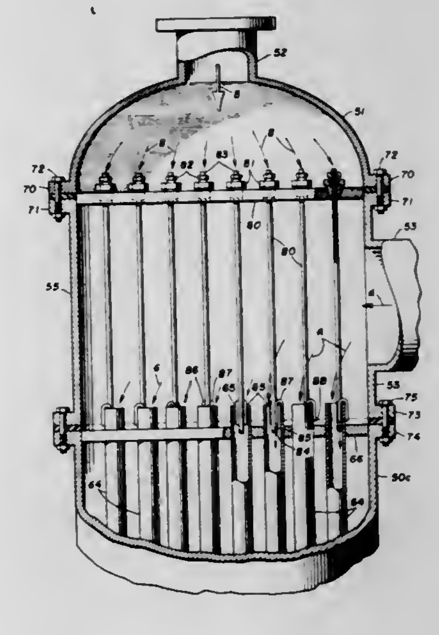
on said container at the base area of said container to stabilize said container in its upright resting position.

3,969,081
TWO-PHASE CONTACT REACTOR

Ronnie D. Jackson, El Dorado, Ark., assignor to Lion Oil Company, El Dorado, Ark.

Continuation-in-part of Ser. No. 293,629, Oct. 13, 1972, Pat. No. 3,839,548. This application Aug. 16, 1974, Ser. No. 498,232
Int. Cl.^{2} B01J *10/00;* **B01D** *1/06, 3/00*

U.S. Cl. 23—284 **3 Claims**



1. A liquid-gas two-phase interfacial cocurrent flow reactor comprising a unitary shell and tube reactor having

a. a distribution header comprising (1) an annular housing, (2) fluid inlet means therein, (3) a first distributor plate, (4) a plurality of first conduit tubes passing through said first distributor plate for downward passage of a first fluid, (5) a second distributor plate positioned remote from said first distributor plate, (6) a second fluid inlet means positioned in the annular housing between the first and second distributor plates, (7) a plurality of second tubes surrounding a portion of said first conduit tubes and passing through said second distributor plate for downward passage of a second fluid, said first conduit tubes terminating within said second tubes and beyond said second distributor plate, wherein said first tubes are fixed to the interior walls of said second tubes and said first tubes are provided with fluid outlet means for directing flow of said first fluid tangent to said interior walls of said second tubes

b. a reactor section comprising (1) an annular housing, (2) a plurality of said second tubes passing through said second distributor plate and through a holder plate at the end of the reactor section remote from said second distributor plate, (3) fluid inlet and outlet means in said annular housing providing for passage of a third fluid about said plurality of second tubes, and

c. a collection header at the end of the reactor remote from the distributing header comprising (1) an annular housing, (2) said holder plate of said reactor section, (3) a plurality of said second tubes passing through and terminating beyond said holder plate and (4) a fluid outlet means in said annular housing for removal of fluids from said reactor.

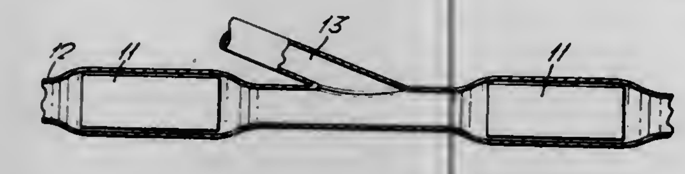
3,969,082
APPARATUS FOR PURIFYING EXHAUST WASTE GASES
James Anthony Cairns, Wantage; Richard Stuart Nelson, Goring on Thames, and Stanley Frederick Pugh, Abingdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed July 2, 1973, Ser. No. 375,773

Claims priority, application United Kingdom, Mar. 30, 1973, 15579/73

Int. Cl.^{2} F01N *3/15, 7/04*

U.S. Cl. 23—288 FC **11 Claims**



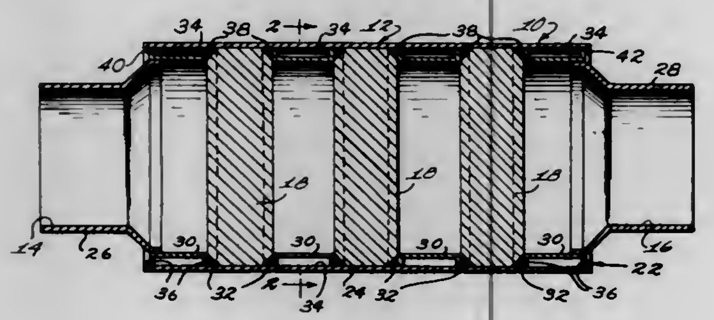
1. Apparatus for catalytic purification of waste exhaust gases of an internal combustion engine, which apparatus comprises: a housing providing a catalytic reaction chamber; inlet means for supplying air and exhaust gases to said chamber; outlet means for gases to exit from said chamber; and a catalytic element in said chamber, said catalytic element including a metal alloy substrate having an alumina surface layer, upon which surface layer a layer of catalytic material has been deposited, said alloy principally comprising iron with additions of chromium, aluminium and yttrium, the alloy substrate having the essentially alumina surface layer formed on the substrate by heat treatment of the metal alloy substrate in an oxidizing atmosphere to form the alumina surface layer from aluminium in the metal alloy substrate, and wherein, the major proportion of said layer of catalytic material comprises an unagglomerated atomic dispersion thereof.

3,969,083
CATALYTIC CONVERTER FOR PURIFYING GASES
William R. Givens, Hoffman Estates, and Charles D. Lemme, Oak Park, both of Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Nov. 26, 1973, Ser. No. 419,132

Int. Cl.^{2} B01J *8/02, 35/04;* **F01N** *3/15*

U.S. Cl. 23—288 FB **7 Claims**



1. A catalytic converter comprising:

an annular casing structure having an inlet for receiving a flow of exhaust gases emitted from an automotive engine or the like and an outlet for discharging the gases received in said inlet after flowing through said casing structure;

a plurality of separate catalyst carrier elements of porous, inert, solid, refractory material in skeletal form providing a multiplicity of generally parallel closely adjacent flow passages each extending throughout the longitudinal extent thereof;

catalyst means deposited on surfaces of macropores communicating with said passages and surfaces defining said passages of each catalyst carrier element;

means for mounting said catalyst carrier elements in spaced relation within said casing structure for the flow of gases through substantially the entire extent of said catalyst carrier elements in series;

the total surface area provided by said plurality of catalyst carrier elements on which said catalyst means is deposited being of an extent sufficient that when contacted by the exhaust gases normally emitted by known automotive engines a required pollutant conversion is effected;

the longitudinal extent of the passages of each catalyst carrier element being so interrelated with the size and number of passages provided within the aforesaid substantially entire extent thereof as to insure that the flowing exhaust gases, which enter the passages in a turbulent condition without appreciable back pressure when the automotive engine is at fast idle, will contact the associated catalyst means throughout substantially the entire longitudinal extent of the associated passages before being changed to a fully developed laminar condition thereby insuring maximum heat transfer between the gases and said catalyst carrier elements during cold startup and maximum conversion efficiency during subsequent operation, the longitudinal extent of the passages of each catalyst carrier element being less than 40 times the hydraulic diameter thereof;

the space between each catalyst carrier element and an adjacent catalyst carrier element disposed upstream thereof being open and of sufficient longitudinal extent to insure that the gases will issue from the upstream catalyst carrier element passages unobstructed and will enter the adjacent downstream catalyst carrier element passages in a turbulent condition, the space between each catalyst carrier element and an adjacent catalyst carrier element disposed upstream thereof being greater than 10 times the hydraulic diameter of the passages thereof.

3,969,084
COPPER-BASE BEARING MATERIAL CONTAINING CORROSION-RESISTANT LEAD ALLOY
Sakae Watanabe, Tokyo, and Heihachiro Ohigawa, Funabashi, both of Japan, assignors to Nissan Motor Co., Ltd. and Nippon Dia Clevite Company, Limited, both of, Japan

Filed May 21, 1974, Ser. No. 472,057

Claims priority, application Japan, June 1, 1973, 48-61607

Int. Cl.^{2} B22F *3/00*

U.S. Cl. 29—182.1 **3 Claims**

1. A bearing material consisting essentially of 45 to 90% of a sintered mass of copper powder impregnated with 10 to 55% of an alloy consisting of essentially 1 to 3% Sn, 0.5 to 3.5% Bi and the balance of Pb.

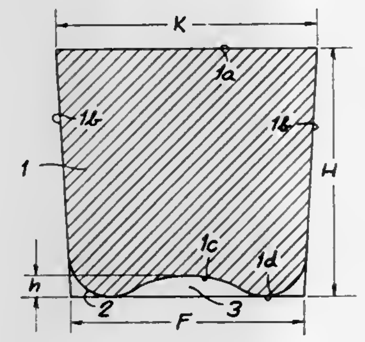
3,969,085
WIRE AND METHOD FOR MAKING STEEL WOOL
Hermann Josef Boeckenhoff, Blecher; Günter Thoms, and Erich Pueschner, both of Cologne, all of Germany, assignors to Arbed-Felten & Guilleaume Drahtwerke GmbH, Cologne-Mulheim, Germany

Filed June 9, 1975, Ser. No. 584,819

Claims priority, application Germany, June 8, 1974, 2427780

Int. Cl.^{2} E04C *5/00;* **B21C** *37/00*

U.S. Cl. 29—193 **9 Claims**



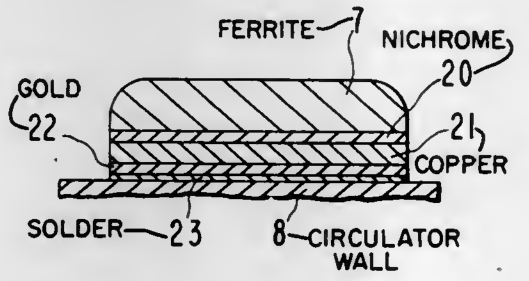
1. A wire for making steel wool, said wire being solid and having a cross-sectional profile with a straight top, a pair of sides extending down from said top, and a downwardly and outwardly concave bottom, said wire being narrower at said bottom than at said top.

3,969,086
METALLIZED GYROMAGNETIC FERRITE
Victor A. Vaguine, Palo Alto, and Dennis R. Nichols, San Jose, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 337,059, March 1, 1973, Pat. No. 3,873,944. This application Oct. 8, 1974, Ser. No. 513,021

Int. Cl.^{2} B32B *15/04*

U.S. Cl. 29—195 **5 Claims**



1. In combination, a body of gyromagnetic ferrite material for causing nonreciprocal trnsmission of microwave power, and a metallic coating, said metallic coating covering a portion of said gyromagnetic ferrite body whereby said body can be affixed by soldering to a metal object, said metallic coating comprising at least three metal layers, a first one of said layers adhering to said gyromagnetic ferrite material and comprising a metal selected from the group consisting of nichrome, molybdenum and chromium, a second one of said layers adhering to said first layer and comprising copper, and a third one of said layers adhering to said second layer and comprising gold.

3,969,087
GELS OF NONPOLAR LIQUIDS WITH N-ACYL AMINO ACIDS AND DERIVATIVES THEREOF AS GELLING AGENTS
Tadaomi Saito; Yoshimasa Matsuzawa; Sadayoshi Ninagawa, all of Yokohama; Masao Honna, Kawasaki; Masahiko Takesada, Tokyo, and Masahiro Takehara, Fujisawa, all of Japan, assignors to Ajinomoto Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,488

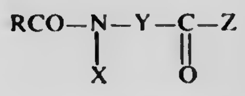
Claims priority, application Japan, Aug. 7, 1974, 49-90633; Aug. 7, 1974, 49-90634

Int. Cl.^{2} C10L *7/02*

U.S. Cl. 44—7 C **30 Claims**

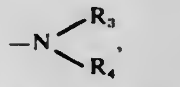
25. A gel, consisting essentially of:

a homogeneous mixture of a non-polar organic liquid having a dielectric constant of less than 20 and having a solubility less than 10% by weight in water and 0.05% to 20% by weight of at least one compound containing an N-acylamino acid component having the formula



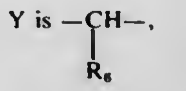
$$\mathrm{RCO{-}\underset{\displaystyle X}{\underset{|}{N}}{-}Y{-}\underset{\displaystyle O}{\underset{\|}{C}}{-}Z}$$

wherein RCO is a C_2 to C_{30} aliphatic acyl group or an aralkyl acyl group; Z is hydroxy, $-NH_2$, $-OR_1$, $-NHR_2$,



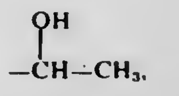
$$-N\begin{matrix}\nearrow R_3\\ \searrow R_4\end{matrix},$$

or $-O^-R_5NH_3^+$, wherein R_1, R_2, R_3, R_4 and R_5 is a C_2 to C_{30} aliphatic hydrocarbon group and aralkyl groups; X is hydrogen or methyl; and



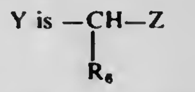
$$\text{Y is }-\underset{\displaystyle R_6}{\underset{|}{C}}H-,$$

wherein R_6 is C_1 to C_4 alkyl, benzyl, phenyl, $-CH_2OH$,



$$\overset{\displaystyle OH}{\overset{|}{-CH}}-CH_3,$$

$-CH_2SH$, $-CH_2CH_2-S-CH_3$ or $-(CH_2)_pCOZ$; and p is a positive integer of 1 or 2, and Z is the same as above; $-(CH_2)_mNHCOR$, wherein m is a positive integer of 3 or 4 and COR is the same as above, or $-(CH_2)_n-$, wherein n is a positive integer of 1 to 6, with the proviso that when Z is $-OR_1$,



$$\text{Y is }-\underset{\displaystyle R_6}{\underset{|}{C}}H-Z$$

wherein R_6 is $-(CH_2)_mNHCOR$ and that at least one of R, R_1, R_2, R_3, R_4 and R_5 is a C_5 to C_{30} aliphatic hydrocarbon group.

3,969,088
FORMCOKE PROCESS
Vaughn Mansfield, Gallatin, and Charles M. Whitten, Columbia, both of Tenn., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 572,317

Int. Cl.^{2} C10L *5/00*

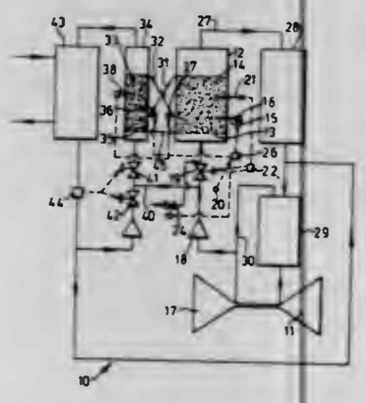
U.S. Cl. 44—10 C **12 Claims**

1. A process for producing formcoke comprising,

charring sized green coal and reducing the volatile content thereof by continuously feeding the same through pretreatment carbonizer having an oxidizing atmosphere and rapidly increasing the temperature thereof by combustion of primarily volatile matter in the green coal and limited quantities of air,

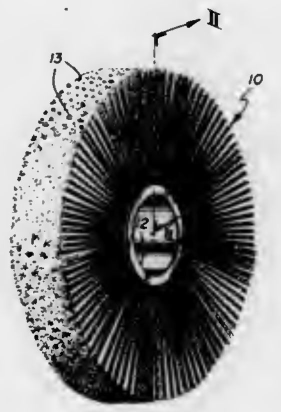
further reducing the volatile content of the char by feeding the same through a post-treatment carbonizer having a reducing atmosphere,
passing the char from the carbonizer through a cooler,
crushing the cooled char,
mixing the crushed char with pitch,
forming the mixture of crushed char and pitch into green briquettes,
curing and cooling the green briquettes by recycling the same with the sized green coal through at least one of the carbonizers and the cooler,
and separating the cooled briquettes from the char.

3,969,089
MANUFACTURE OF COMBUSTIBLE GASES
Gerald Moss, Oxford, and John William Thomas Craig, Wantage, both of England, assignors to Exxon Research and Engineering Company, Linden, N.J.
Continuation of Ser. No. 305,319, Nov. 10, 1972, abandoned.
This application June 9, 1975, Ser. No. 584,963
Claims priority, application United Kingdom, Nov. 12, 1971, 52656/71
Int. Cl.^{2} C10J *3/54;* C01B *2/14*
U.S. Cl. 48—197 R 8 Claims



1. A method for producing a substantially sulphur-free combustible fuel gas from a sulphur-containing fuel comprising: feeding a sulphur-containing fuel into a bed of particles comprising an alkaline earth metal oxide and contained within a reactor, said bed of particles being fluidized by an upwardly flowing stream of an oxygen-containing gas at a superatmospheric pressure, the rate of supply of said oxygen-containing gas and the partial pressure or concentration of oxygen therein being so adjusted in relation to the fuel feed rate that the oxygen supplied is insufficient for complete combustion of the fuel, whereby the sulphur-containing fuel is partially combusted at a temperature in the range from about 800° to about 1000°C. which is varied above and below the recarbonation temperature of said alkaline earth metal oxide at the superatmospheric pressure employed such that the average temperature in the reactor bed is below the recarbonation temperature of the alkaline earth metal oxide whereby a portion of the alkaline earth metal oxide is converted to the corresponding carbonate and a substantially sulphur-free combustible gas is formed as the result of the sulphur from the sulphur-containing fuel becoming fixed in the particles of the bed as an alkaline earth metal sulphide by reaction with the corresponding alkaline earth metal oxide in the particles; recovering a substantially sulphur-free combustible gas from the reactor bed; transferring particles comprising an alkaline earth metal carbonate and an alkaline earth metal sulphide from a first region of the reaction bed of particles to a first region of a regenerator wherein said particles are contained and contacted with an upwardly flowing stream of an oxygen-containing gas at a temperature within the range from 1035°C. to 1300°C., whereby said alkaline earth metal sulphide and said alkaline earth metal carbonate are converted to the corresponding alkaline earth metal oxide with the liberation of sulphur dioxide and carbon dioxide, the temperature in said regenerator being at least partially controlled by controlling the amount of alkaline earth metal carbonate actually formed in said reactor.

3,969,090
INDUSTRIAL BRUSH
Robert C. Sasena, Irwin, Pa., and Roger E. Priest, Holden, Mass., assignors to Anderson Corporation, Worcester, Mass.
Filed June 22, 1973, Ser. No. 372,597
Int. Cl.^{2} B24D *11/00;* A46B *13/00;* A46D *1/00*
U.S. Cl. 51—400 6 Claims



1. An industrial brush, comprising:
a. a base having a central bore through which a spindle can pass for rotation of the base, and
b. a plurality of generally cylindrical filaments with their axes extending radially from the base, each filament consisting of a tube braided from strands of a synthetic resin, a core extending through the center of the braided tube, the core being formed of nylon in which is embedded fine particles of abrasive.

3,969,091
PROCESS FOR DESICCANT DRIER REGENERATION
Bruce R. Tegge, Madison, N.J., and Barry M. Rosenbaum, New York, N.Y., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed July 13, 1972, Ser. No. 271,344
Int. Cl.^{2} B01D *53/02;* C07C *11/02, 11/06;* B01J *21/20*
U.S. Cl. 55—33 11 Claims

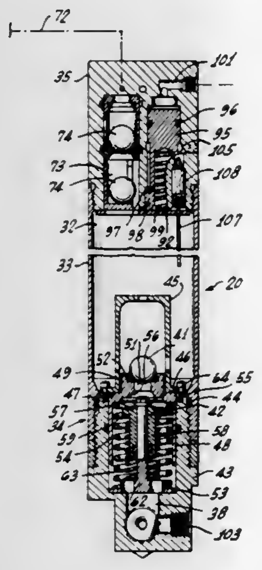
1. A method for regenerating a desiccant drier deactivated by the dehydration of a higher alpha olefin, said alpha olefin being used in a process comprising copolymerization of ethylene and said higher alpha olefin and employing Ziegler-type catalysis which comprises the steps of:
a. contacting said drier with a portion of dry recycle polymerization diluent for a period of time sufficient to remove substantially all adsorbed water therefrom and reactivate the desiccant in said drier, and
b. passing the diluent used in regeneration from said drier to a polymerization diluent purification system employed for recycle of diluent in the copolymerization process.

2. The method of claim 1 wherein the dry polymerization diluent used in regeneration of said drier is heated to a vaporous state prior to contact with said drier and which method additionally comprises the subsequent step of contacting said drier after reactivation of said desiccant with a portion of dry liquid recycle polymerization diluent for a period of time sufficient to cool said desiccant to a temperature suitable for dehydration of said alpha olefin.

3. The method of claim 2 wherein said diluent is hexane.

5. The method of claim 1 wherein said copolymerization process is a terpolymerization process and the termonomer is a nonconjugated diene.

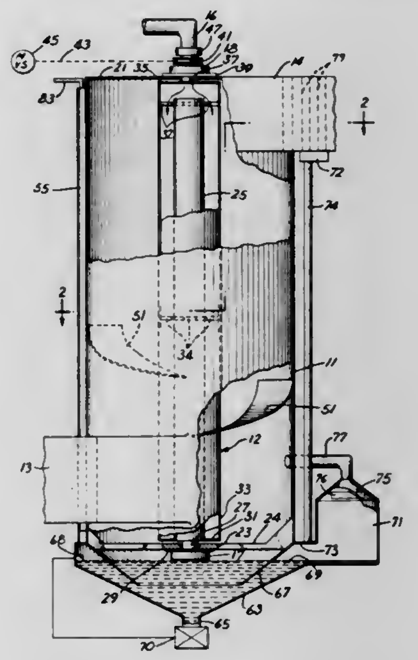
3,969,092
LIQUID DEGASSING DEVICE
John A. Huffman, Northridge, and Vincent G. Magorien, Granada Hills, both of Calif., assignors to Seaton-Wilson, Incorporated, Burbank, Calif.
Filed Jan. 10, 1974, Ser. No. 432,184
Int. Cl.^{2} B01D *19/00*
U.S. Cl. 55—160 18 Claims



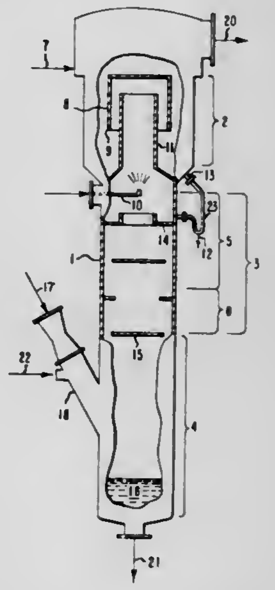
1. In a device for removing dissolved and entrained gas from a liquid, a combination comprising:
chamber means having inlet means for receiving oil to be degassed and outlet means for discharging degassed oil;
means for producing a relatively low pressure in said chamber means;
automatic cycling valve means comprising
level-actuated means for closing said outlet means at a first location when liquid in said chamber means falls to a certain level, and
pressure-actuated means independent of said level-actuated means, for closing said outlet means at a second location, opening said outlet means at said first location, and rapidly opening said outlet means at said second location when a preselected increased pressure is reached after closing of said outlet means by said level-actuated means; and
gas venting means in said chamber means, for releasing separated gas as the liquid level rises after closing of said outlet means;
whereby said automatic cycling valve means operates automatically to alternatively close and open said outlet means continuously even in industrial and airborne environments.

3,969,093
CYCLONIC GAS SCRUBBING SYSTEM
Daniel N. Murray, Jr., Erie, Pa., assignor to Hammermill Paper Company, Erie, Pa.
Continuation of Ser. No. 321,777, Jan. 8, 1973, abandoned.
This application Nov. 5, 1974, Ser. No. 521,147
Int. Cl.^{2} B01D *47/00*
U.S. Cl. 55—229 7 Claims

5. A cyclonic gas cleaning system comprising, an elongated housing, an elongated spray header mounted centrally of said housing along the axis thereof, a gas inlet duct and a gas outlet duct at opposite ends of said housing and being tangential to the interior thereof to impart a generally helical flow to gas passing from said inlet duct to said outlet duct in the space between said spray header and said housing, means for conducting a scrubbing fluid to said spray header, means for supproting said spray header for rotation relative to said housing, means associated with said spray header for varying the speed and direction of rotation of said spray header, a plurality of elongated collection headers extending axially along the outside of said housing and having slots opening into said housing, said housing having an open region at its lower end, means associated with said housing and said collection headers and defining a closed reservoir for receiving solid and gas particles entering said collection headers, means between the lower ends of said collection headers and siad open region of said housing for isolating said gases received within said reservoir from said collection headers from direct communication with said open region of said housing, and means associated with said reservoir for effecting reentry of gases received within said reservoir from said collection headers into the interior of said housing for passing said gases into the flow of gas within said housing from said inlet duct to said outlet duct.



3,969,094
FLUE GAS SCRUBBER
James B. Dunson, Jr., and Robert L. Lucas, both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 11, 1973, Ser. No. 423,728
Int. Cl.^{2} B01D *47/06*
U.S. Cl. 55—242 6 Claims



1. A scrubber for removing contaminants from a gas stream by contacting the gas with a scrubbing liquid to form a froth in which the scrubbing liquid constitutes the continuous phase comprising a vertical column having in fluid communication an upper liquid de-entrainment area, an intermediate scrubbing area and lower open area
a. the de-entrainment area having means for de-entrainment of liquids from the gas stream, an outlet for the gas from which entrained liquids have been removed an inlet for

feeding a liquid scrubbing stream into the deentrainment area and means for removing de-entrained liquids from the de-entrainment area;

b. the scrubbing area having a plurality of baffle trays, means between the liquid scrubbing stream inlet and the topmost baffle tray for receiving deentrained liquid and discharging it on the top most baffle tray, the free open area of the topmost baffle tray being less than the free open area of the lower baffle trays; and

c. the lower open area having an inlet for the contaminated gas stream and scrubbing liquid collection means communicating with a liquid outlet therefrom.

3,969,095
AIR FILTER APPARATUS

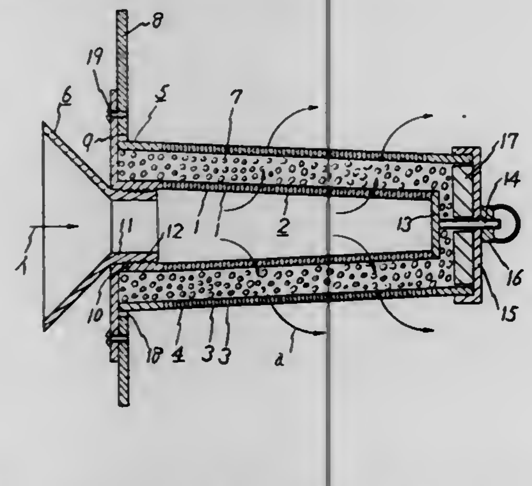
Shigeru Kurahashi, 28, 5-chome, Nishisuminoe-cho, Sumiyoshi, Osaka, Japan

Filed Aug. 23, 1974, Ser. No. 499,917

Claims priority, application Japan, Aug. 25, 1973, 48-99772[U]; May 22, 1974, 49-59123[U]

Int. Cl.² B01D *46/30*

U.S. Cl. 55—350 **5 Claims**



1. An apparatus for use in the filtration of air which comprises a frusto-conically shaped inner sleeve defining a central zone and containing a plurality of small apertures and a frusto-conically shaped outer sleeve containing a plurality of small apertures, the number of said small apertures per unit area being gradually increased from the rear end toward the front end of said inner and outer sleeves, said inner sleeve being coaxially disposed within and spaced apart from said outer sleeve and defining therebetween a space which is adapted to contain a filter material, said space being closed at the front end with an attachment plate member which connects the inner and outer sleeves, and the rear end of the inner sleeve being closed by a rear plate and the rear end of the outer sleeve being closed by a removable cover, said inner and outer frusto-conically shaped sleeves being cover, said inner and outer frusto-conically shaped sleeves being tapered from the front end thereof having the larger diameter to the rear end thereof having the smaller diameter, and a funnel-shaped suction port disposed at the inlet end of the central zone and associated with the inner sleeve.

3,969,096
CYCLONE SEPARATOR HAVING MULTIPLE-VANED GAS INLETS

Paul Herbert Richard, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 16, 1974, Ser. No. 515,242

Int. Cl.² B01D *45/12;* **B04C** *5/04*

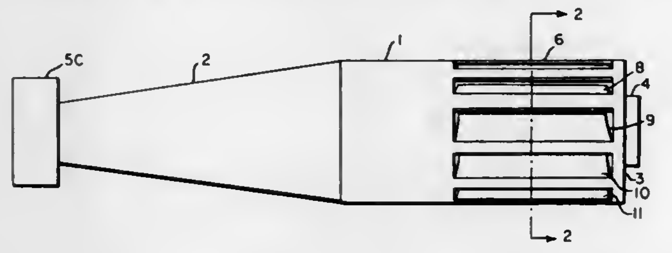
U.S. Cl. 55—455 **1 Claim**

1. A cyclone separator for separating suspended solid particles from a gas, comprising

i. a cylindrical first shell having an open first end and a second end closed except for an opening designed to accommodate a gas outlet tube; said shell haing a gas inlet in its periphery near its second end, said shell having a gas outlet tube sealably mounted in the opening in the second end of the shell, said outlet tube being coaxial with the shell, extending into the shell past the gas inlet, and separated from the gas inlet; and

ii. a second shell of circular periphery having two open ends, the first open end sealably engaging, communicating with, and coextensive with the open first end of the cylindrical first shell, and the second open end being a solids discharge opening located beyond the end of the gas outlet tube that extends into the cylindrical shell, in the direction away from the closed end of the cylindrical shell; wherein the improvement comprises

iii. the gas inlet consisting of from 3 to 30 elongated inlet openings circumferentially spaced in the periphery of the cylindrical shell, and disposed axially therein, said inlet openings having a depth which is defined as the shortest distance between the surface of one vane and the surface of another vane, which surfaces restrict gas flow into the separator, each opening having a guide vane positioned to deflect incoming gas away from the gas outlet tube, in a circular path,



wherein all guide vanes are of the same length and axial orientation,

wherein each guide vane begins at the shell periphery and extends inside the cylindrical shell periphery, and

wherein the ratio of inlet opening depth to the radial distance between the outlet tube and the cylindrical shell is in the range 0.1 to 0.7, and the product of this ratio times the number of inlet openings is in the range 1 to 4.5.

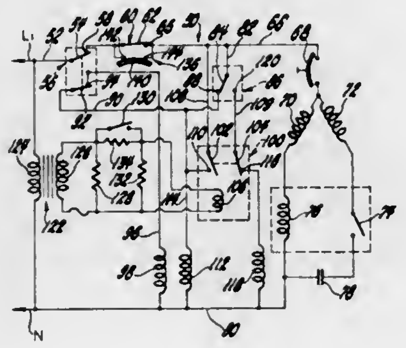
3,969,097
SLAB COMPLETION THERMOSTAT WITH TIME DELAY FUNCTION

Ralph S. Braden, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,471

Int. Cl.² F25C *1/12*

U.S. Cl. 62—137 **2 Claims**



1. In a slab type ice maker having an electrically driven compressor refrigerant system for flow of cold refrigerant through the inlet tube of an evaporator to cool an evaporator plate with water circulation produced thereover by electrically energized pump means for build up of an ice slab on the plate and including an electrically energized grid located below the plate for receiving an ice slab therefrom for subsequent separation into individual cubes to be received in an ice storage bin located below the grid, the improvement comprising: first circuit means for energizing the compressor and pump means including a slab thickness switch having first and second positions and bin level switch means responsive to ice accumulation within the bin, thermal delay relay means being operative to bypass the bin level switch means immediately upon maximum buildup of a predetermined ice level in the bin, an evaporator inlet tube, said thermal delay relay means including a bimetallic element and a temperature sensing portion located on said evaporator inlet tube for sensing the temperature of refrigerant therein, said bimetallic element being located in shunt relationship to the bin level switch means and in series connection with said slab thickness switch to maintain the compressor and pump means operative following maximum ice build up when said slab thickness switch is in its first position, defrost means energized when a predetermined ice thickness is sensed by said slab thickness switch to cause it to assume its second position, said defrost means including means to maintain a flow of hot gas through the evaporator inlet tube and evaporator to the slab to release it upon opening of the slab thickness switch, thereby to direct a fresh slab of ice onto the grid for division into the cubes representing a termination of a build up of ice therein and to assure the feed of an ice having the desired clarity into the bin at the end of each of the ice bin fill cycles of operation, said bimetallic disc being responsive to flow of hot gas through the evaporator inlet tube to concurrently terminate a defrost cycle and machine operation following a predetermined time delay when the bin is filled with ice.

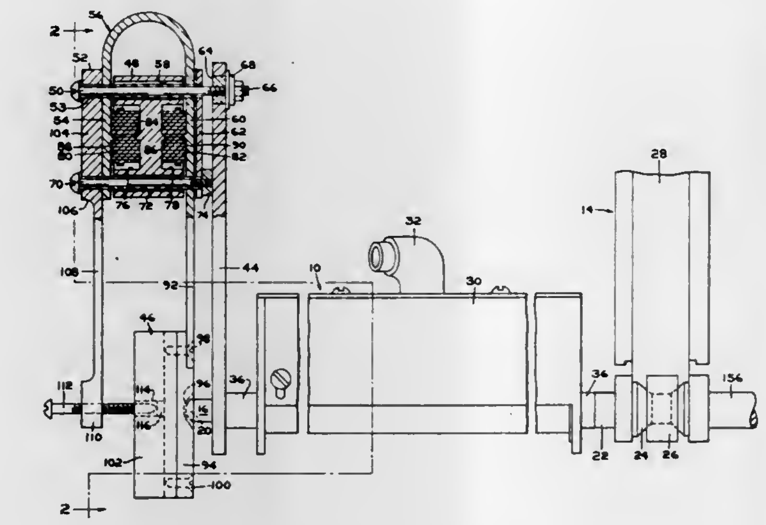
3,969,098
CONTROL APPARATUS AND SYSTEM FOR CLOSELY SPACED HEATING ELEMENTS

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 531,942, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,381, Jan. 2, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,930

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **8 Claims**



1. A heating control system for supplying individually controlled heating currents to a plurality of orifice tubes utiliized to form glass fibers comprising a manifold in communication with a molten glass supply means and said orifice tubes for delivering molten glass thereto, a common power source for said plurality of orifice tubes, said power source including a bus bar connected to and energized by the secondary winding of a power supply transformer, an individual clamping arm for each of said orifice tubes, each arm being pivotally secured at one end to, but electrically insulated from, said bus bar and having means at its other end for mechanically positioning its corresponding orifice tube in engagement with its electrical supply, an individual electrically conductive contact arm connected between said bus bar and each of said orifice tubes for supplying current from said power source to each orifice tube, each said contact arm being secured at one end to said bus bar and insulated therefrom, a spring arm spaced from and generally parallel to each said contact arm, each said spring arm being secured at one end and electrically insulated from said bus bar and including at its other end releasable means for urging its corresponding contact arm toward said orifice tube, individual, controllable semiconductive current regulating means interposed between said bus bar and each said contact arm and individual circuit means controlling each of said current regulating means.

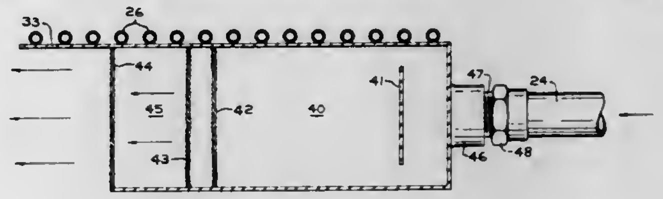
3,969,099
BUSHING ENVIRONMENTAL CONTROL SYSTEM

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 512,647

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **9 Claims**



1. In the manufacture of glass fibers comprising attenuating glass fibers from molten glass through bushing tips; the improvement comprising passing directly at about right angles to the bushing tips and at a level with or slightly below said tips, a gaseous fluid as a stream, said gaseous fluid being passed thereto from a pressurized means for supplying said gaseous fluid; passing said gaseous fluid through a chamber having a baffle plate followed by a plurality of screens to divert and irregularly deflect said gaseous fluid before release to said bushing tips to provide an even flow of gaseous fluid across the length of the bushing.

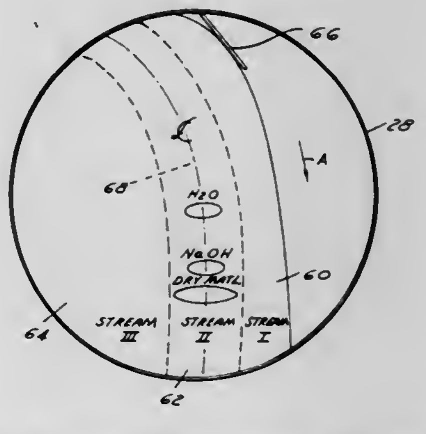
3,969,100
METHOD OF PELLETIZING GLASS BATCH MATERIALS

Kenneth J. Kuna, Plymouth, and James P. Sowman, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 27, 1975, Ser. No. 553,859

Int. Cl.² C09C *1/56*

U.S. Cl. 65—27 **5 Claims**



1. A method of pelletizing glass batch materials including commercially available sand, soda ash (sodium carbonate), salt cake (sodium sulfate), other minor glass forming materials, dolomite having an average (statistical mean) particle size less than 15 microns, and limestone having an average (statistical mean) particle size less than 250 microns which comprises the steps of:

mixing the glass batch materials together;

establishing on a rotating pelletizing disc a pelletizing regime in which three zones of pelletization exist in the form of a pellet nucleation zone, a pellet growth zone, and a pellet tumbling zone; each of the zones existing generally from the top of the pelletizing disc downwardly over an area of the pelletizing disc with each zone having a decernable width;

adding a prescribed amount of water to a portion of the pellet growth zone;

adding a prescribed amount of a caustic soda solution to a portion of the pellet growth zone spaced downwardly from the top of the zone, the caustic addition being in the form of a wide stream generally centered with respect to the centerline of the pellet growth zone and spread across a substantial portion of the width of the pellet growth zone; and

adding a prescribed amount of the mixed glass batch materials to a portion of the pellet growth zone spaced downwardly from the caustic addition position, the mixed batch materials addition being in the form of a wide stream generally centered with respect to the centerline of the pellet growth zone and spread across a substantial portion of the width of the pellet growth zone, the caustic addition stream being in the range from slightly less than the width of the glass batch materials addition stream with both addition streams being centered with respect to each other.

3,969,101

AGENT FOR CONTROLLING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

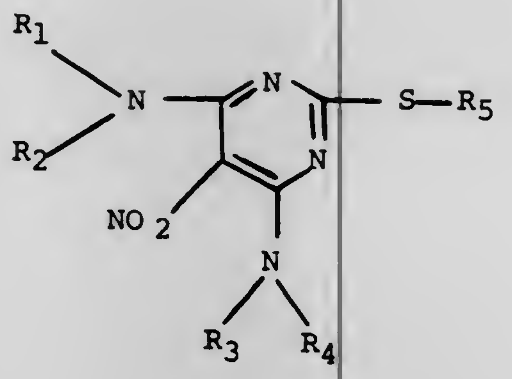
Division of Ser. No. 252,385, May 11, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,438

Claims priority, application Switzerland, May 17, 1971, 7229/71

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—92 **14 Claims**

1. A composition for the control of undesired plant growth in cultivated crops which comprises (a) as active substance, an effective growth controlling amount of a 5-nitropyrimidine of the formula



wherein

R_1 represents an alkyl radical having 2 to 6 carbon atoms; an alkenyl radical or alkinyl radical having 3 to 5 carbon atoms; an alkoxyalkyl, alkylaminoalkyl, or trialkylammonioalkyl radical having 1 to 6 carbon atoms in the alkyl groups thereof; a hydroxyalkyl or cyanoalkyl radical having 1 to 4 carbon atoms; or a cycloalkyl radical having 3 to 6 carbon atoms;

R_2 and R_3 each independently represent hydrogen, or a lower alkyl radical;

R_4 represents hydrogen, a lower alkyl radical, a cycloalkyl radical having 3 to 6 carbon atoms;

R_5 represents a lower alkyl radical;

together with (b) an inert carrier therefor.

3,969,102

HERBICIDES

Takeo Yoshimoto; Keiichi Igarashi, both of Yokohama; Takeo Harayama, Kamakura; Masaaki Ura, Kamakura; Naoki Sato, Kamakura; Teruhiko Toyama, Fujisawa; Osamu Morikawa; Yoshio Takasawa, both of Chigasaki, and Taisuke Kurechi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,284

Claims priority, application Japan, Aug. 28, 1973, 48-95712

Int. Cl.^{2} A01N *9/24;* **C07C** *43/20*

U.S. Cl. 71—124 **5 Claims**

1. 2,4-Dichloro-3′-(β-chloroethoxy)-4′-nitrodiphenyl ether.

2. A herbicide comprising 2,4-dichloro-3′-(β-chloroethoxy)-4′-nitrodiphenyl ether in a herbicidally effective amount and an inert carrier or vehicle.

3,969,103

METHOD OF PRODUCING BALL AGGLOMERATED PARTICULATE MATERIAL

Charles E. Capes; Allan E. McIlhinney, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 29, 1974, Ser. No. 528,541

Claims priority, application Canada, Feb. 25, 1974, 193397

Int. Cl.^{2} C22B *1/08;* **C09C** *1/56*

U.S. Cl. 75—3 **5 Claims**

1. A method of producing ball agglomerated particulate material, comprising:

a. comminuting the material to produce particulate material therefrom consisting of coarse particles having a particle size predominantly within the range 0.3 mm to 1.4 mm, and fines having particles predominantly less than 0.2 mm,

b. feeding into a rotating, ball agglomerating mill a feed consisting of the coarse particles, the fines and an agglomerating liquid, with the volume fraction (m) of the coarse particles being in the range 20% to 80% of the total solids content of the total feed,

c. continuing rotation of the ball agglomerating mill until agglomerated balls of the particulate material are produced having a continuous network of the fines interspersed with the coarse particles such that:

$$\left(\frac{1-\epsilon}{\epsilon}\right) \Big/ \left(\frac{1-\epsilon_o}{\epsilon_o}\right) = K \left(\frac{1}{1-m}\right)$$

where

ϵ = the porosity of the agglomerates,

ϵ_o = the porosity of similar agglomerates formed entirely of the fines, m is the above mentioned volume fraction of coarse particles, and

k = 0.7 to 1.0 and then

d. removing the agglomerated balls from the ball agglomerating mill.

3,969,104

GRANULES OF MAGNESIUM AND ITS ALLOYS

Ivan Andreevich Barannik, ulitsa Lenina, 182a, kv. 22, Zaporozhie; Gennady Ivanovich Belkin, ulitsa Kaliinaya, 7, kv. 13, Solikamsk; Viktor Ivanovich Borodin, ulitsa Fersmana, 18, kv. 13, Apatity Murmanskoi oblasti; Natalya Alexandrovna Voronova, pereulok Uritskogo, 11, kv. 4, Dnepropetrovsk; Oleg Nikolaevich Romanenko, ulitsa Sevastopolskaya, 6, kv. 46, Kalush Ivano-Frankovskoi oblasti; Alexandr Petrovich Bogdanov, bulvar Tsentralny, 3, kv. 44, Zaporozhie; Valery Sergeevich Belosludtsev, ulitsa Kaliinaya, 144, kv. 13; Vladimir Dmitrievich Marfin, ulitsa Kaliinaya, 153, kv. 33, both of Solikamsk; Nikolai Yakovlevich Shish, ulitsa Gryaznova, 88, kv. 3, Zaporozhie; Anatoly Filippovich Shevchenko, ulitsa G. Pushkina, 1b, kv. 52; Ivan Yakovlevich Emelyanov, ulitsa G. Pushkina, 1b, kv. 58, both of Dnepropetrovsk; Jury Nikolaevich Boiko, prospekt Lenina, 155, kv. 10, Zaporozhie; Mikhail Nikolaevich Kljuchnik, ulitsa Kalinovaya, 94, kv. 46, Dnepropetrovsk; Nikolai Vasilievich Khaber, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi olbasti; Viktor Georgievich Raskatov, ulitsa Khimikov, 14, kv. 18, Kalush Ivano-Frankovskoi oblasti; Alexandr Fedorovich Trukhin, ulitsa Zhdanova, 11, kv. 32, Kalush Ivano-Frankovskoi oblasti; Anatoly Borisovich Kondratenko, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi oblasti; Vladimir Dmitrievich Yazev, ulitsa Bogdana Khmelnitskogo, 66, kv. 59, Kalush Ivano-Frankovskoi oblasti; Viktor Stepanovich Alontsev, ulitsa Kaliinaya, 124, kv. 15; Valery Alexeevich Startsev, ulitsa Kaliinaya 124, kv. 4, both of Solikamsk, and Jury Alexandrovich Sergeev, prospekt Lenina, 182a, kv. 23, Zaporozhie, all of U.S.S.R.

Division of Ser. No. 443,845, Feb. 19, 1974, Pat. No. 3,881,913. This application Feb. 18, 1975, Ser. No. 550,767

Int. Cl.^{2} B22D *23/08*

U.S. Cl. 75—.5 B **7 Claims**

1. A magnesium-salt powder consisting essentially in weight percent of 65 to 97 granulated magnesium, 0.3 to 16 magnesium and alkali metal chlorides, 0.1 to 10 of a fluoride selected from the group consisting of alkali and alkaline-earth metal fluorides, up to 3 alkaline-earth metal chlorides, and up to 6 magnesium oxide.

3,969,105

TREATING AGENT FOR HIGH MELTING TEMPERATURE METALS

Jack J. Ott, Hemlock, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,048

Int. Cl.^{2} C22C *33/08*

U.S. Cl. 75—53 **17 Claims**

1. A method of impregnating a porous body having interconnecting pores therein with magnesium comprising coating the surface of the body with a layer of magnesium, oxidizing at least a portion of the magnesium surface layer and then immersing at least a portion of the body with the oxide coating into molten magnesium to form a magnesium impregnated body with at least a portion of the surface coated with oxidized magnesium.

3,969,106

SELECTIVE HYDROMETALLURGICAL SEPARATION OF LEAD FROM COMPLEX LEAD-ZINC-COPPER SULFIDE ORES OR DERIVED CONCENTRATES

William John Wark, Bridgewater, Canada, assignor to Zeo-Mag Research Limited, Nova Scotia, Canada

Filed June 3, 1975, Ser. No. 583,326

Int. Cl.^{2} C22B *13/04*

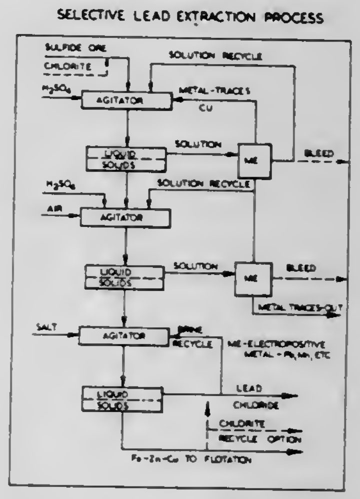
U.S. Cl. 75—101 R **28 Claims**

1. A hydrometallurgical process for the selective separation of lead values from complex sulfide ores containing lead sulfide (galena) or derived concentrates thereof, which comprises the following steps, in sequence:

1. reacting said sulfide ore or concentrate in finely divided form with a dilute non-oxidizing mineral acid under reducing conditions, and adjusting the system to a pH of 0.5, thereby to extract substantially all readily soluble iron in the system from said ore or concentrate, said mineral acid being added to the system while the ore suspension is being mildly agitated, at a rate such that hydrogen sulfide evolution is substantially inhibited;
2. effecting a liquid-solids separation while maintaining said system under reducing conditions, to remove said readily soluble iron from the system;
3. repulping the solids in dilute sulfuric acid to form an aqueous suspension of said solids, and adjusting the pH of the suspension to a value of 0.5, while contacting said suspension with an oxygen-containing gas under strong conditions of agitation;
4. adding to said suspension a water-soluble copper salt in an amount sufficient to yield a free excess of approximately 0.001 gm/liter of cupric ion (Cu^{++}) in terms of the aqueous ore suspension system, and intimately contacting under strong conditions of agitation said aqueous suspension of ore for a period of 8–10 hours with an oxygen-containing gas in the presence of a naturally occurring insoluble material having a cation exchange capacity of the order of 40 milliequivalents/100 gm. and an anion exchange capacity of the order of 20 milliequivalents/100 gm. whereby there is provided a controlled amount of Fe^{++} in the system and said amount of Fe^{++} in the system and said amount of Fe^{++} is maintained throughout said oxidation step, said lead sulfide being substantially quantitatively converted to lead sulfate;
5. effecting a second liquid-solids separation;

and

6. removing the lead values of said ores, present in the solid residue resulting from said second liquid-solids separation in the form of lead sulfate, or lead complexes, from said residue.



3,969,107

COMBINED PROCESS FOR WORKING UP PURE AND COMPLEX COPPER CONCENTRATES

Karl Lippert, and Herbert Kudelka, both of Duisburg, Germany, assignors to Duisburger Kupferhutte, Duisburg, Germany

Filed June 4, 1975, Ser. No. 583,828

Claims priority, application Germany, June 14, 1974, 2428793

Int. Cl.^{2} C22B *13/04, 11/04, 15/08*

U.S. Cl. 75—101 R **8 Claims**

1. A process for working up of a concentrate containing Cu, Zn, and precious metal including at least one of Ag or Au, which comprises:

a. in a first stage, leaching the concentrate, the concentrate activated by a pre-treatment, or the concentrate after sulfatizing roasting thereof, for hydrometallurgically dissolving out the copper and zinc and leaving a residue

containing the precious metal, and separating the leach liquor from the residue, and
b. in a second stage, subjecting the residue to a chlorinating sulfatizing roasting, and leaching the roasted residue with a selective solvent for the precious metal for dissolving the precious metal out of the residue.

3,969,108
RECOVERY OF GALLIUM

John James MacGregor, London, England, assignor to Johnson Matthey & Co., Limited, London, England
Filed Sept. 10, 1975, Ser. No. 612,025
Claims priority, application United Kingdom, Sept. 25, 1974, 41688/74
Int. Cl.^{2} C22B *58/00*
U.S. Cl. 75—101 R **7 Claims**

1. A process for the recovery of gallium from a particulate solid, which process comprises the following steps:
a. preparing a mixture of the solid with an excess of an alkali;
b. sintering the said mixture;
c. leaching the sintered product obtained with an aqueous solution;
d. cementation of the gallium present in the resulting aqueous solution with a metal more electropositive than gallium; and
e. collecting the gallium precipitate obtained by cementation.

3,969,109
OXIDATION AND SULFIDATION RESISTANT AUSTENITIC STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Aug. 12, 1974, Ser. No. 496,583
Int. Cl.^{2} C22C *38/58*
U.S. Cl. 75—128 N **8 Claims**

1. An austenitic stainless steel which in solution treated condition contains less than about 1% by volume of insoluble carbides, exhibits a weight loss of not greater than 0.400 grams per square decimeter at 1500°F by the 100 hour air-oxidation test described herein, a weight loss of not greater than 0.400 grams per square decimeter at 1700°F by the 90–10 sulfidation test described herein, a stress elongation of greater than 9500 psi for 1% stretch in 100 hours at 1500°F, and good resistance against stress corrosion cracking in halogen-containing environments, said steel consisting essentially of, by weight percent, from about 0.25 to about 0.45% carbon, about 0.01 to about 2.5% manganese, about 21 to about 30% chromium, about 2 to about 10% nickel, about 0.35 to about 0.55% nitrogen, about 0.10% maximum phosphorus, about 0.10% maximum sulfur, about 2% maximum silicon, and remainder iron, except for incidental impurities.

3,969,110
SOLDERING ALLOY FOR CONNECTING PARTS OF WHICH AT LEAST SOME ARE MADE OF ALUMINIUM

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France
Filed Apr. 11, 1975, Ser. No. 566,991
Claims priority, application France, Apr. 18, 1974, 74.13565
Int. Cl.^{2} C22C *11/08*
U.S. Cl. 75—166 C **3 Claims**

1. Soldering alloy having a lead base for the soldering or soft brazing of parts of which at least one part is made of aluminum or aluminum alloy and another part is made of a heavy metal selected from copper,, brass, stainless steel and the like, comprising at least:
65 to 85 % lead in weight
12 to 30 % cadmium in weight
1 to 6 % antimony in weight 0.5 to 1 % tin in weight.

3,969,111
ALLOY COMPOSITIONS

Dennis S. Acuncius, Kokomo, and Steven J. Matthews, Greentown, both of Ind., assignors to Cabot Corporation, Kokomo, Ind.
Filed Mar. 27, 1975, Ser. No. 562,439
Int. Cl.^{2} C22C *19/05*
U.S. Cl. 75—171 **4 Claims**

1. A cast alloy composition having high thermal stability and oxidation resistance up to about 1600°F., and high retention of ductility on aging consisting essentially of:

Mo	13.7% to 15.5%
Cr	14.7% to 16.5%
C	0.02% max.
B	Up to 0.015%
Mn	0.3% to 1.0%
Si	0.2% to 0.75%
Co	2.0% max.
Fe	3.0% max.
W	1.0% max.
P	0.02% max.
S	0.015% max.
Al	0.1% to 0.5%
Ni	Balance

said alloy having an Nv number between 2.23 and 2.31.

3,969,112
PROCESS FOR PREPARING SILVER-CADMIUM OXIDE ALLOYS

Han J. Kim, Chelmsford, and F. Joseph Reid, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Nov. 11, 1974, Ser. No. 521,609
Int. Cl.^{2} B22F *8/00, 3/00;* **C22C** *1/04, 28/00*
U.S. Cl. 75—206 **13 Claims**

1. A method for preparing a silver-cadmium oxide alloy comprising forming a compact of silver particles, cadmium oxide particles and a density-increasing additive selected from the group consisting of the alkali metal and alkaline earth metal salts of nitric acid; heating said additive-containing compact to a temperature below the final sintering temperature for a period of time sufficient to decompose said additive; and then sintering said heated compact to form a silver-cadmium oxide alloy having improved sintered density as compared to alloys prepared without said additive.

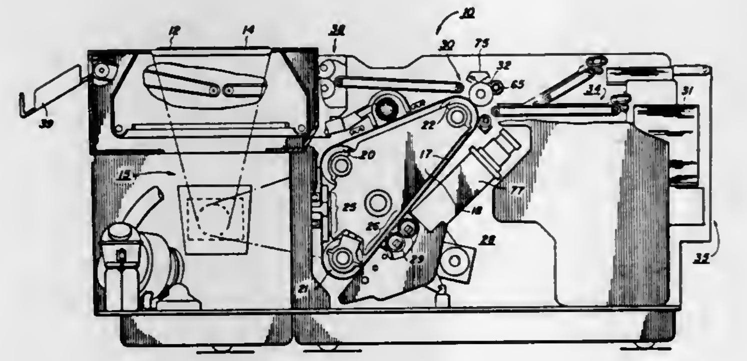
3,969,113
PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY CONTAINING TITANIUM OXIDE AND A CADMIUM PIGMENT

Hajime Miyatuka, Asaka, Japan, assignor to Rank Xerox Ltd., London, England
Division of Ser. No. 193,483, Oct. 28, 1971. This application July 23, 1973, Ser. No. 381,819
Int. Cl.^{2} G03G *13/10*
U.S. Cl. 96—1 LY **14 Claims**

1. In a method for obtaining continuous tone xerographic reproduction by liquid developing an electrostatically charged and exposed photoconductive binder layer, the improvement comprising utilizing as photoconductive binder layer a particulate mixture essentially comprising titanium oxide and cadmium pigment in a film forming electrically insulating organic resin, the ratio of titanium-to-cadmium pigment being 50:50 to about 99.5:0.5 by weight and the weight ratio of pigment-to-resin binder ranging from about 2:1 to 15:1.

3,969,114
METHOD FOR MONITORING COPY QUALITY

Danny J. Prats, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 382,808, July 26, 1973, Pat. No. 3,894,799. This application Nov. 29, 1974, Ser. No. 527,985
Int. Cl.^{2} G03G *13/14;* **B05B** *5/02;* **G01B** *11/00*
U.S. Cl. 96—1.4 **4 Claims**



1. The method of operating a copying machine of the type having a photoconductive member in which the images of the original being copied are developed, a transfer roller cooperable with the photoconductive member to transfer the developed image to copy sheets, and feeding means for feeding copy sheets along a preset path to said transfer roller for transfer of the developed images thereto, comprising the steps of:
developing a test image on said photoconductive member for use in testing developer activity,
transferring the test image directly to the transfer roller, outside said copy sheet preset path and
monitoring the test image on the transfer roller to determine image quality.

3,969,115
GRAPHICS PROCESS USING A COMPOSITE OF COLOR SEPARATED NEGATIVES

Salvatore P. Savia, West Islip, N.Y., assignor to RCS Color Labs, New York, N.Y.
Filed Oct. 15, 1974, Ser. No. 514,943
Int. Cl.^{2} G03C *7/16, 5/04*
U.S. Cl. 96—14 **8 Claims**

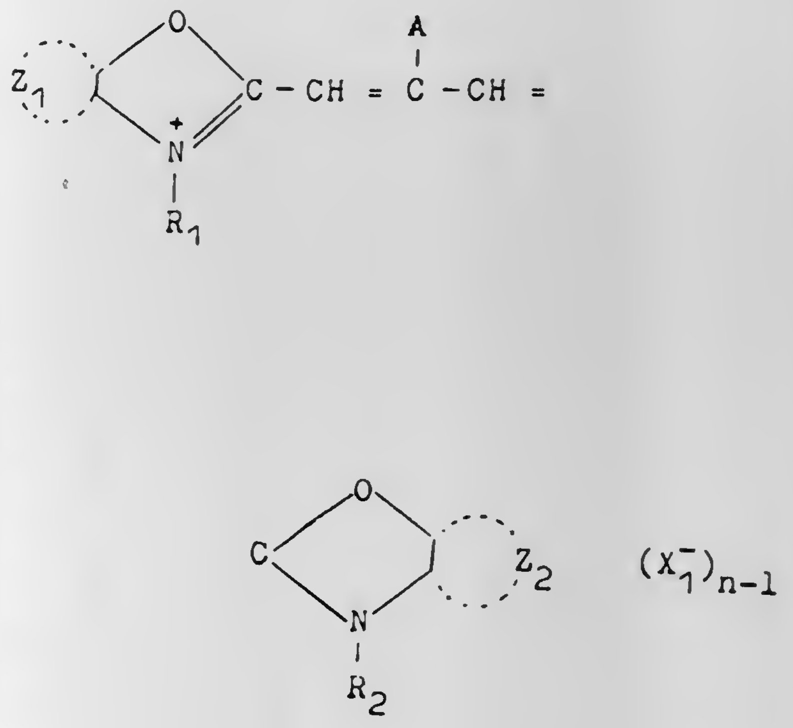
1. A method of making a primary color separated negative of improved sharpness, clarity, texture and definition suitable for use in printing which comprises
a. making a primary color separated negative on panchromatic film of the image to be printed;
b. making a separated primary color positive on panchromatic film from the separated color negative;
c. making a reversal primary color positive from the separated color positive on direct reversal film so as to produce a panchromatic primary color separated reversal positive; and
d. making a primary composite color separated negative from the separated color positive and the primary reversal positive.

3,969,116
SILVER HALIDE PHOTOGRAPHIC SENSITIVE ELEMENT FOR FLASH EXPOSURE

Keisuke Shiba, and Seiiti Kubodera, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Continuation of Ser. No. 219,047, Jan. 19, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 525,036
Claims priority, application Japan, Jan. 19, 1971, 46-1320
Int. Cl.^{2} G03C *5/04, 1/14*
U.S. Cl. 96—27 E **9 Claims**

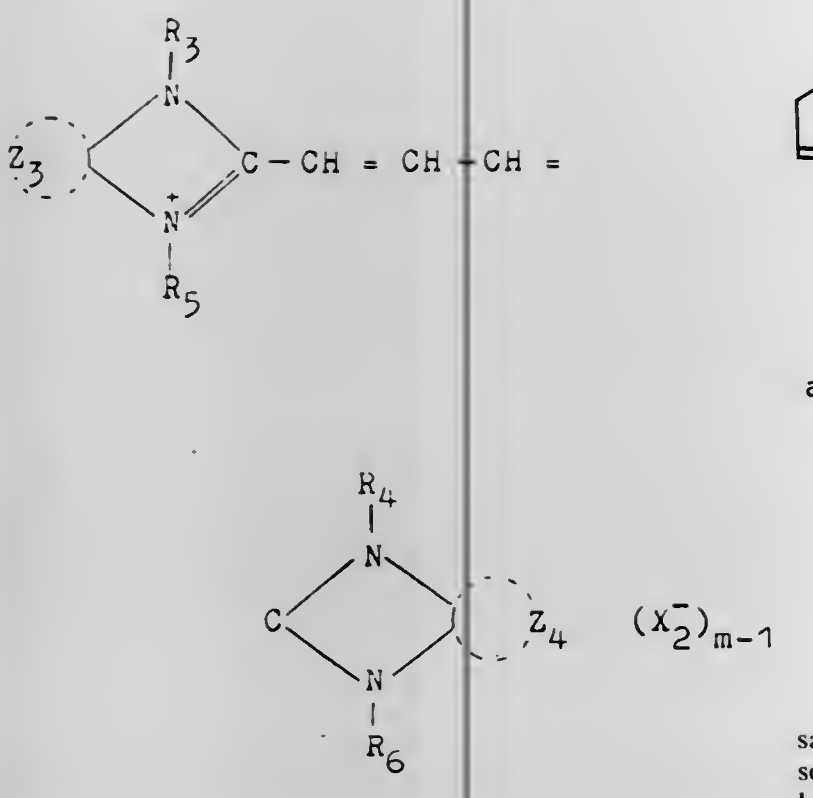
1. A photographic process which comprises exposing to a flash light a silver halide photographic light-sensitive element having at least a photographic silver halide emulsion layer which is characterized by containing at least a sensitizing dye I and at least a sensitizing dye II as a combination having a supersensitization function, for a time shorter than 1×10^{-3} seconds, and developing said photographic element, said sensitizing dyes I and II being selected from dyes of the structural formula below

I.



wherein Z_1 and Z_2 each represents a group of atoms necessary to complete a benzene ring, which is unsubstituted or substituted with a member selected from the group consisting of a lower alkyl group, a halogen atom, a phenyl group, a hydroxyl group, an alkoxy group of from 1 to 4 carbon atoms, a carboxyl group, an alkoxycarbonyl group, an alkyl sulfamoyl group, an alkylcarbamoyl group, an acetyl group, a cyano group and a trifluoromethyl group, or a group of atoms necessary to complete a naphthyl ring; wherein R_1 and R_2 each represents a member selected from the group consisting of an alkyl group of from 1 to 5 carbon atoms, a substituted alkyl group having a carboxyl group, a substituted alkyl group having a sulfo group, an allyl group, and a substituted alkyl group, commonly employed as a N-substituent of a conventional cyanine dye; wherein A represents a member selected from the group consisting of a methyl group and an ethyl group; wherein X_1^- represents an acid anion employed in common cyanine dyes; and wherein n represents an integer of 1 to 2, with the proviso that n is 1 in the case where said dye contains a betaine moiety;

II.



wherein Z_3 and Z_4 each represents a group of atoms necessary to complete a benzene ring, which is unsubstituted or substituted with a member selected from the group consisting of a halogen atom, a cyano group, a trifluoromethyl group, a carboxyl group, an alkoxycarbonyl group, an alkyl sulfamoyl group, an alkyl carbamoyl group and an acetoxy group, or a group of atoms necessary to complete a naphthyl ring; wherein R_3 and R_4 each represents a member selected from the group consisting of an alkyl group, an allyl group, and a substituted alkyl group commonly employed as a N-substituent of a cyanine dye; wherein R_5, R_6, X_2^-, and *m*, respectively, each are defined in the same manner as R_1, R_2, X_1^- and *n* in the formula (I) above, said R_5 and said R_6 further capable of forming an alkylene bridge through linkage to the alpha-methine group of said dye of formula (II).

3,969,117
LITHOGRAPHIC DEVELOPING PROCESS UTILIZING A SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING HYDROIMIDAZO-S-TRIAZINE AND POLYALKYLENE OXIDE DERIVATIVE

Hidemaru Sakai, 940-18 Utsuki-cho, Hachioji, Tokyo, and Shigeji Baba, 1017, Sagamidai, Zama, Koza, Kanagawa, both of Japan

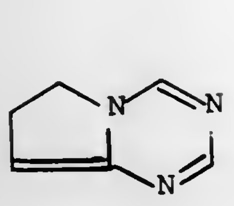
Continuation of Ser. No. 280,713, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 72,501, Sept. 15, 1970, abandoned. This application June 11, 1974, Ser. No. 478,397

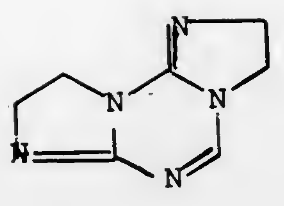
Claims priority, application Japan, Sept. 22, 1969, 44-74675

Int. Cl.² G03C *5/20*

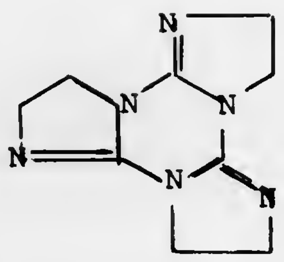
U.S. Cl. 96—66 R **3 Claims**

1. A process for lithographically developing a silver halide photographic material which has been imagewise exposed to light comprising developing said material with a lithographic developer comprising formaldehyde, sodium sulfite and hydroquinone as the sole developing agent, wherein the photographic material contains in at least one of the emulsion-layer and the layers adjacent thereto at least one hydroimidazo-s-triazine compound having at least one ring structure selected from the group consisting of

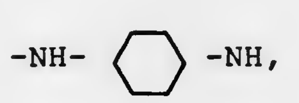




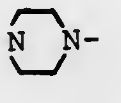
and



said ring structure optionally having one or more substituents selected from the group consisting of hydroxy, lower alkoxy, lower alkyl, amino, amino hydrochloride and wherein two of said substituted or unsubstituted ring structures may be joined together by a group selected from $—NH—(CH_2)_xNH—$ wherein $x = 2$ to 6,



and



and a polyalkylene oxide derivative selected from the group consisting of the condensation products of alkylene oxides with water, aliphatic alcohols, aliphatic thioalcohols, glycols, fatty acids, amines, phenols, thiophenols and hexitols.

3,969,118
LIGHT-SENSITIVE O-QUINONE DIAZIDE CONTAINING COPYING LAYER

Paul Stahlhofen, Wiesbaden, and Rainer Beutel, Florsheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed June 17, 1974, Ser. No. 480,226

Claims priority, application Germany, June 20, 1973, 2331377

Int. Cl.² G03C *1/54;* **G03F** *7/08*

U.S. Cl. 96—91 D **3 Claims**

1. In a light-sensitive supported copying composition in layer form containing an ester or an amide of an o-naphthoquinone diazide sulfonic acid or carboxylic acid together with an organic dyestuff and which changes its color shade upon exposure to actinic light, the improvement that it contains, calculated on its total content of o-naphthoquinone diazide compounds, 10 to 75 percent by weight of a halide of o-naphthoquinone diazide-4-sulfonic acid and, as the dyestuff, a compound selected from the group consisting of triphenyl methane dyes, azine dyes, and anthraquinone dyes in a quantity of 1 to 50 percent by weight, calculated on its total content of o-naphthoquinone diazide compounds.

3,969,119
PHOTOREACTIVE COMPOSITIONS COMPRISING POLYMERS CONTAINING ALKOXYAROMATICGLYOXY GROUPS

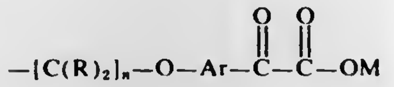
Thaddeus M. Muzyczko, Downers Grove, and Thomas H. Jones, Naperville, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Division of Ser. No. 267,475, June 29, 1972, Pat. No. 3,888,671. This application June 9, 1975, Ser. No. 585,215

Int. Cl.² G03C *1/68*

U.S. Cl. 96—115 R **18 Claims**

1. A light sensitive composition comprising a polymeric compound which includes as a recurring structure:



$$—[C(R)_2]_n—O—Ar—\overset{O}{\overset{\|}{C}}—\overset{O}{\overset{\|}{C}}—OM$$

wherein R is selected from the group consisting of H, aryl, alkyl, halo and aralkyl having up to 10 carbon atoms and n is an integer from 1 to 18, Ar is an aromatic substituent and M is selected from the class consisting of H, alkali metal, ammonium and substituted ammonium.

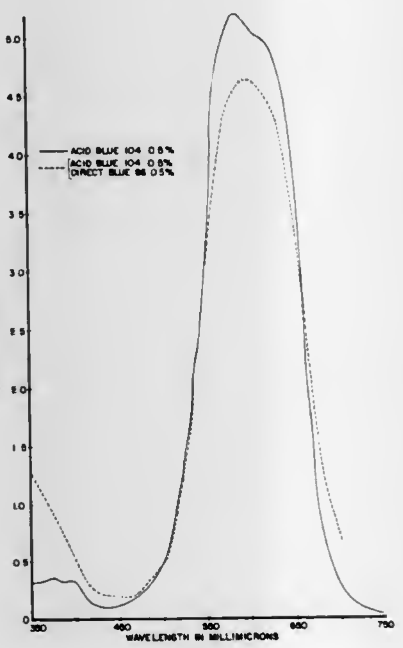
3,969,120
PHOTOGRAPHIC MULTICOLOR SCREEN ELEMENT AND METHOD FOR MAKING SAME

Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 319,905, Dec. 29, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,461

Int. Cl.² G03F *5/00;* **G03C** *1/84*

U.S. Cl. 96—118 **9 Claims**



1. A photographic multicolor screen element which comprises, in combination, a geometrically repetitive plurality of chromatic filter element series; at least one of said chromatic filter element series comprising filter elements comprising a hydrophilic colloid dyed with an acid triphenyl methane dye and a phthalocyanine dye containing at least two sulfonic acid groups.

3,969,121
GLASS COMPOSITIONS AND FIBERS MADE THEREFROM

Alan W. Atkinson, Rochdale, England, assignor to TBA Industrial Products Limited, Manchester, England

Continuation-in-part of Ser. No. 441,984, Feb. 13, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,988

Claims priority, application United Kingdom, Feb. 14, 1973, 7151/73

Int. Cl.² C03C *13/00, 3/04;* **C04B** *31/06*

U.S. Cl. 106—50 **21 Claims**

1. A glass composition, having improved chemical resistance to alkali attack, consisting essentially of:

from 50 to 75 percent by weight Silica
from 10 to 25 percent by weight R_2O
from 1 to 15 percent by weight Titania
from 1 to 20 percent by weight Zirconia
from 0.8 to 20 percent by weight Rare Earth Oxide
from 0 to 20 percent by weight Boric Oxide
from 0 to 10 percent by weight R^1O
from 0 to 1 percent by weight Fluorine (as fluoride)
from 0 to 2 percent by weight Al_2O_3
from 0 to 1 percent by weight P_2O_5
from 0 to 1 percent by weight Chlorine (as chloride)

wherein R_2O is selected from the group consisting of Na_2O, K_2O, mixtures thereof, and mixtures thereof containing up to 5% by weight lithium oxide (based on the total weight of the composition) and R^1O is selected from the group consisting of MgO, CaO, BaO, and SrO, and mixtures of two or more thereof.

3,969,122
FORMULATION FOR PRODUCING SODA-LIME GLASS INCLUDING COAL ASH

Karl A. Miller, Denver, and Clement V. Fogelberg, Arvada, both of Colo., assignors to Tusco Engineering Co., Inc., Commerce City, Colo.

Filed Dec. 16, 1974, Ser. No. 533,387

Int. Cl.² C03C *3/04*

U.S. Cl. 106—52 **1 Claim**

1. A batch formulation for producing transparent glass, consisting essentially of 71.6 parts by weight of SiO_2, 2.2 parts by weight Al_2O_3, 10.8 parts by weight CaO, 14.7 parts by weight Na_2O, 0.7 parts by weight SO_3, and 0.2 parts by weight C, and 6 parts by weight coal ash, and in which the coal ash comprises 51.1 percent by weight SiO_2, 21.3 percent by weight Al_2O_3, 6.4 percent by weight Fe_2O_3, 8.2 percent by weight CaO, 0.9 percent by weight MgO, 5.7 percent by weight Na_2O, 1.2 percent by weight SO_3, and 1.1 percent by weight TiO_2.

3,969,123
REFRACTORY CERAMIC COMPOSITIONS AND METHOD FOR PREPARING SAME

Cressie E. Holcombe, Jr., Knoxville, and Margaret K. Morrow, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 548,940

Int. Cl.² C04B *35/66, 35/68, 35/70, 35/48*

U.S. Cl. 106—55 **6 Claims**

1. An article of manufacture comprising a sintered composition consisting of a solid solution of tungsten oxide in a concentration in the range of 27 to 69 mole percent tantalum oxide in a concentration in a range of 73 to 31 mole percent and up to about 33 ⁻ mole percent of a metal oxide selected from the group consisting of hafnium oxide, titanium oxide, zirconium oxide, vanadium oxide, niobium oxide, and molybdenum oxide, with said metal oxide being substituted for one of the tungsten oxide and the tantalum oxide said article being characterized by possessing a coefficient of thermal expansion in the range of about zero to about a negative 5.1×10^{-6} cm/(cm-°C) over a temperature range of about 20° to 1000°C.

3,969,124
CARBON ARTICLES

Wilford S. Stewart, Plainfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed Feb. 11, 1974, Ser. No. 441,434
Int. Cl.^{2} C04B *35/52, 35/54*
U.S. Cl. 106—56 **9 Claims**

1. A process for the manufacture of low porosity, high density shaped carbonaceous articles comprising: combining carbonaceous particles of predetermined particle size and particle size distribution with a polymeric resin binder, forming the resin binder and particles into a shaped article, curing the so shaped resin binder and particles and thereafter pyrolyzing the article so shaped and cured, said carbonaceous particles being selected from the group consisting of carbon, graphite and mixtures thereof and said particles having particle sizes ranging from about 100 microns to about 0.001 microns with about 50 wt. % of the carbonaceous particles finer than 10 microns in equivalent spherical diameter.

8. The method of preparing a shaped, carbonaceous article comprising:

a. combining carbonaceous particles with from about 20 to about 25 wt. % of a phenolic resin binder, said carbonaceous particles having equivalent spherical diameters less than about 100 microns and with from about 50 wt. % of said particles having equivalent spherical diameters finer than about 10 microns said carbonaceous particles selected from carbon, graphite and mixtures thereof;

b. forming the mixture of resin and particles into a shaped article; and,

c. treating the shaped article under conditions sufficient to cure the resin.

3,969,125
HEAT RESISTIVE AND REINFORCED COMPOSITE MATERIAL

Katsutoshi Komeya, Kawasaki; Hiroshi Inoue, Kawaguchi, and Akihiko Tsuge, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Continuation-in-part of Ser. No. 169,821, Aug. 6, 1971, abandoned. This application July 23, 1973, Ser. No. 381,672
Claims priority, application Japan, Aug. 10, 1970, 45-69308
Int. Cl.^{2} C04B *35/50*
U.S. Cl. 106—73.2 **19 Claims**

1. A method of producing heat resistive, reinforced articles formed of composite materials substantially consisting of fibrous crystals of trisilicon tetranitride and a matrix of nonmetallic compound of Si-X-Al-O-N system, wherein X is an element selected from the group consisting of Y, Sc, La, Ce and mixtures thereof, which comprises:

providing a powdered mixture consisting essentially of 70 to 90 weight percent of trisilicon tetranitride, 1 to 20 weight percent aluminum oxide and 5 to 20 weight percent of an oxide material selected from the group consisting of yttrium oxide, scandium oxide, lanthanum oxide, cerium oxide and mixtures thereof, the particle size of said powdered mixture being in the range from about 0.1 to 2.0 microns;

press-molding said powdered mixture into a shaped article with the addition of about 5 weight percent of a temporary binder based upon the weight of the mixed raw materials; and

subjecting the resultant shaped article in a non-oxidizing gas atmosphere to a further step of sintering at a temperature from about 1400 to 1900°C.

3,969,126
BRAZING MIXTURE FOR FORMING A CORROSION-RESISTANT VACUUM-TIGHT SEAL BETWEEN A CERAMIC BODY AND A REFRACTORY METAL

Norman C. Anderson, Foster City, Calif., assignor to Varian Associates, Palo Alto, Calif.
Division of Ser. No. 330,376, Feb. 7, 1973, Pat. No. 3,918,922. This application Oct. 17, 1974, Ser. No. 515,731
Int. Cl.^{2} C09K *15/04*
U.S. Cl. 106—290 **6 Claims**

1. A brazing mixture comprising a volatile vehicle in which is suspended a powdered mixture, said volatile vehicle consisting essentially of a methyl methacrylate based lacquer, and said powdered mixture consisting essentially of columbium powder and a second metal powder, said columbium powder constituting the major part by weight of said powdered mixture, and said second powder being selected from a class consisting of iron and nickel.

3,969,127
MOLYBDATE CORROSION INHIBITING PIGMENT AND METHOD FOR PREPARING SAME

Dennis R. Robitaille, Detroit; Mark S. Vukasovich, and Henry F. Barry, both of Ann Arbor, all of Mich., assignors to The Sherwin-Williams Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 269,508, July 6, 1972, abandoned, which is a continuation of Ser. No. 365,697, May 31, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,593
Int. Cl.^{2} C09C *1/02, 1/04*
U.S. Cl. 106—292 **12 Claims**

1. A method for the manufacture of a substantially nontoxic complex corrosion inhibiting pigment which comprises the steps of (1) dispersing a water-insoluble inert inorganic pigmentary sized solid particulate carrier in an aqueous carrier, (2) further dispersing a quantity of pigmentary sized molybdenum trioxide in said aqueous carrier to effect sufficient dissolution thereof to produce reactively available molybdate ions, (3) adding to said slurry and slurrying therein a metal oxide also in a pigmentary size range selected from the group consisting of zinc oxide, calcium oxide, strontium oxide, barium oxide and mixtures thereof thereby producing corresponding reactive, available metal ions in said aqueous carrier slurry, (4) reacting said metal ions with said molybdate ions to precipitate substantially insoluble metal molybdate compounds as an adherent deposit on said particulated inert carrier, continuing said acid-base type reaction and precipitation of the corresponding metal molybdate reaction products on said inert carrier particles until the reaction is substantially completed, separating the thus formed salt-free complex molybdated pigment product from the gross aqueous salt-free reaction medium, drying and removing substantially all the remaining moisture including water of hydration therefrom.

3,969,128
PIGMENT ADDITIVE FOR PROTECTIVE AND DECORATIVE COATINGS

Bhaskar Raj Urs, 3021 Simpson St., Evanston, Ill. 60201
Filed Dec. 6, 1973, Ser. No. 422,359
Int. Cl.^{2} C09C *3/00*
U.S. Cl. 106—291 **7 Claims**

1. A protective coating composition for application to a substrate, said coating composition comprising an admixture of:

a paint composition; and

a plurality of fractured pieces of a hollow bubble having a wall thickness of one-half to ten microns, wherein said hollow bubble is treated with a leafing agent and then fractured into a plurality of fractured pieces, each of the plurality of fractured pieces having the leafing agent attached to only its convex surface, and the leafing agent being such as to enable the fractured pieces of material to migrate to the outer surface of the paint composition; the untreated surfaces of each of the fragmented pieces inhibiting the fractured pieces from being removed from the outer surface of the coating composition when the coating composition is applied to the substrate.

3,969,129
METHOD OF PRODUCING INORGANIC PIGMENTS

Zinaida Alexandrovna Savenkova, ulitsa Frunze, 108, kv. 12; Dmitry Danilovich Logvinenko, ulitsa Kalinina, 5, kv. 5; Karl Lazarevich Tsantker, ulitsa Gogolya, 19, kv. 4; Oleg Porfirievich Shelyakov, ulitsa Kalinina, 5, kv. 100; Alexandra Pavlovna Manzhely, ulitsa Tsiolkovskogo, 43, kv. 53, all of Poltava; Gennady Grigorievich Bobrov, ulitsa Tolubkhina, 68, kv. 65, Yaroslavl; Genrikh Samuilovich Ioffe, ulitsa Pushkina, 18, kv. 31, Yaroslavl; Boris Vasilievich Mironov, ulitsa Chkalova, 60, kv. 57, Yaroslavl; Pavel Iosifovich Kestelman, ulitsa Chkalova, 51, kv. 53, Yaroslavl, and Galina Vasilievna Egorycheva, ulitsa Chkalova, 51, kv. 18, Yaroslavl, all of U.S.S.R.
Continuation of Ser. No. 485,105, July 2, 1974, abandoned, which is a continuation of Ser. No. 186,762, Oct. 5, 1971, abandoned. This application Aug. 18, 1975, Ser. No. 605,556
Claims priority, application U.S.S.R., Oct. 12, 1970, 1483630
Int. Cl.^{2} B03C *1/02;* **C09C** *3/04*
U.S. Cl. 106—309 **2 Claims**

1. A method of producing inorganic pigments comprising the steps of: (a) generating a rotating electromagnetic field inside a reaction vessel having an inlet and an outlet opening, said electromagnetic field having an induction of at least 0.1 T; (b) introducing magnetically soft non-equiaxial ferromagnetic particles into the reaction vessel within the zone of said electromagnetic field; (c) passing a continuous flow of a solution of a salt of a metal selected from the group consisting of lead, iron, copper and titanium through the zone of the rotating electromagnetic field, thus forming a pigment precipitate; (d) subjecting the precipitate to the rotating electromagnetic field to destroy the ion crystalline lattice of the pigment so that additional crystallization centers are formed; and (e) recovering the pigment product.

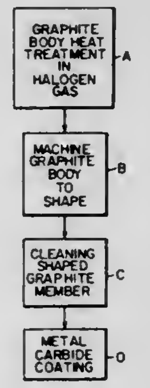
3,969,130
CARBON-COATED ARTICLES AND METHOD OF MAKING SAME

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.
Filed Feb. 5, 1973, Ser. No. 329,526
Int. Cl. B44d *1/12;* **C01b** *31/00*
U.S. Cl. 117—332 **10 Claims**

7. A method of making a pyrolytic carbon-coated article having improved wear resistance, which method comprises heating an appropriate substrate to a temperature about 1000°C. in a reaction zone, effecting deposition of pyrolytic carbon onto the surface of said heated substrate from an atmosphere containing a mixture of a hydrocarbon and an inert gas, after depositing at least about 0.003 inch of pyrolytic carbon, varying the composition of said mixture in said reaction zone without discontinuing deposition to provide a volatile compound containing a carbide-forming element in an amount sufficient to deposit an alloy of carbon and carbide, wherein said carbide constitutes between about 25 and about 80 volume percent, for time sufficient to deposit a wear-resistant layer, and then decreasing the amount of said volatile compound without discontinuing deposition so that the outermost portion of the coating contains no more than a minor amount of alloyed carbide.

3,969,131
COATED GRAPHITE MEMBERS AND PROCESS FOR PRODUCING THE SAME

Elmer G. Fatzer, Brunswick, Ohio, and Cody P. Murphree, Decatur, Tex., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 24, 1972, Ser. No. 274,697
Int. Cl. B44d *1/20;* **C23c** *11/00*
U.S. Cl. 428—316 **14 Claims**


GRAPHITE BODY HEAT TREATMENT IN HALOGEN GAS
A
MACHINE GRAPHITE BODY TO SHAPE
B
CLEANING SHAPED GRAPHITE MEMBER
C
METAL CARBIDE COATING
D

1. A composite structure comprising

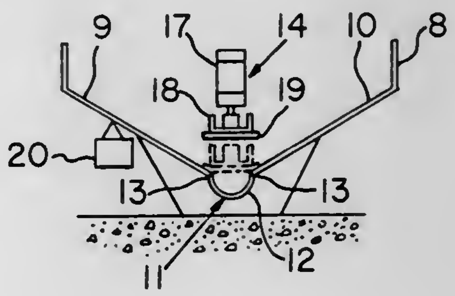
a. a substrate comprising a fine grained isotropic graphite member of a density of at least about 1.75 gr./cc., of a coefficient of thermal expansion of the order of 7.5 to 8.3 inch per inch per °C×10^{-6}, in which the grains are of a maximum particle size of less than 0.001 inch, and characterized by a relatively uniform distribution of many interconnected fine pores of an average diameter of about 5 microns and less, the pores extending to the surface of the member, an ash content not exceeding about 10 ppm, and

b. a refractory metal carbide coating of a thickness of at least 0.1 mil firmly bonded to and conforming to the surface of the isotropic graphite member, said coating comprising at least one metal carbide selected from the group consisting of niobium carbide, zirconium carbide, titanium carbide, hafnium carbide, tantalum carbide, molybdenum carbide, and chromium carbide,

the refractory metal carbide coating and the isotropic graphite member having closely matching coefficients of thermal expansion.

3,969,132
SELF-CLEANING WATER TABLE SYSTEM

Harry E. Anderson, Pittsburgh; Kenneth E. Helsel, Sewickley, and Raymond E. Heasley, McKees Rocks, all of Pa., assignors to Anderson Engineers, Inc., Carnegie, Pa.
Filed July 22, 1975, Ser. No. 598,063
Int. Cl.^{2} B08B *3/00;* **F23J** *1/00*
U.S. Cl. 134—18 **17 Claims**



14. A method of cleaning a water table suitable for use in burning operations wherein waste material is precipitated upon a sloped bottom member of the table for movement into a drain channel having a part of the top length thereof open

and located at the lowermost portion of the sloped bottom member comprising:

- A. closing the open top length of the drain channel against admission of waste material;
- B. flushing the closed drain channel by forcing fluid under pressure through said channel; and
- C. opening the drain channel to permit admission of waste material into the drain channel.

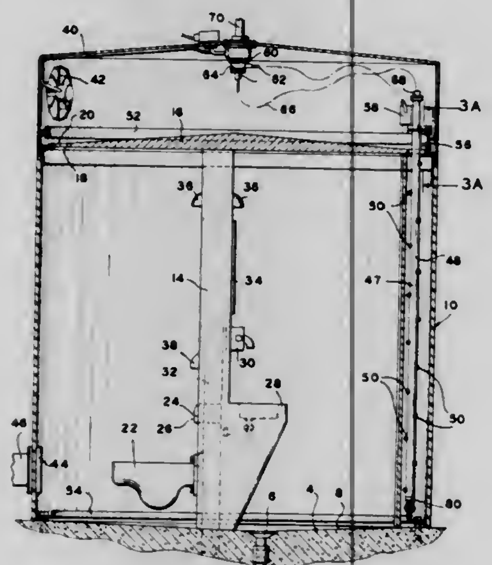
3,969,133
METHOD FOR SELF-CLEANING A RESTROOM

Gilbert T. McTighe, 804 N. Winsor St., Apt. 10, Mitchell, S. Dak. 57301, and Sture A. Johansson, Bunett Gardens Apt. 147, Kendall Park, N.J. 08824

Division of Ser. No. 140,227, May 4, 1971, Pat. No. 3,837,011. This application June 25, 1974, Ser. No. 483,081

Int. Cl.^{2} B08B *3/02, 3/04*

U.S. Cl. 134—21 **7 Claims**



1. The method for cleaning a restroom, said restroom including an enclosure having at least one bathroom fixture mounted centrally therein, comprising: spraying the interior of said enclosure and all fixtures mounted therein with cleansing fluids by moving an elongated, vertical spray boom in a manner so as to generally track the interior periphery of said enclosure; draining said fluids out of said enclosure; evacuating from said enclosure vapors resulting from said spraying step; and passing heated drying air through said enclosure.

3,969,134
PROCESS FOR USING CLEAR RINSING AGENTS IN MECHANICAL DISHWASHING

Heimold Batka, Dusseldorf-Reisholz, and Theodor Altenschopfer, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Feb. 11, 1972, Ser. No. 225,603

Claims priority, application Germany, Feb. 12, 1971, 2106819

Int. Cl.^{2} B08B *30/00;* **C07C** *43/14*

U.S. Cl. 134—26 **5 Claims**

1. In the process for the mechanical washing of dishes which comprises subjecting dirty dishes to the action of a washing solution, subjecting the washed dishes to at least one clear-rinsing solution and recovering said washed dishes, the improvement consisting of utilizing an aqueous solution containing from 0.01 to 1.0 grams per liter of a clear-rinsing agent consisting essentially of (a) from 50% to 100% by weight of an adduct of first from 5 to 20 moles of ethylene oxide and then from 1 to 10 moles of propylene oxide to a secondary alkanol having a linear alkane chain of from 10 to 20 carbon atoms and (b) from 0 to 50% by weight of an adduct of from 5 to 10 moles of ethylene oxide to a secondary alkanol having a chain length of from 11 to 15 carbon atoms, as said at least one clear-rinsing solution.

3,969,135
LOW TEMPERATURE ALUMINUM CLEANING COMPOSITION AND PROCESS

Peter F. King, Farmington Hills, and Douglas D. Fekete, Warren, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 13, 1975, Ser. No. 549,644

Int. Cl.^{2} C11D *1/72, 7/08*

U.S. Cl. 134—41 **8 Claims**

1. An aqueous acidic composition suitable for the low temperature cleaning of aluminum surfaces comprising both a first hydrocarbon derivative surfactant having the general formula:

$R(OR')_nOH$

and a second abietic acid derivative surfactant having the general formula:

$A(R'O)_nH$

wherein R is an alkyl or alkylaryl group of 8–22 carbon atoms; R′ is a divalent radical selected from ethylene, propylene and combinations thereof; each n is an integer from 7 to 22; and A is the abietic acid radical; said surfactants being present in amounts sufficient to remove both readily emulsifiable and difficult-to-emulsify oils.

5. The composition of claim 1, containing fluoride in an effective concentration of from 0.001 to 0.4 wt. %.

6. A process for cleaning an aluminum surface comprising contacting the surface with the composition of claim 1.

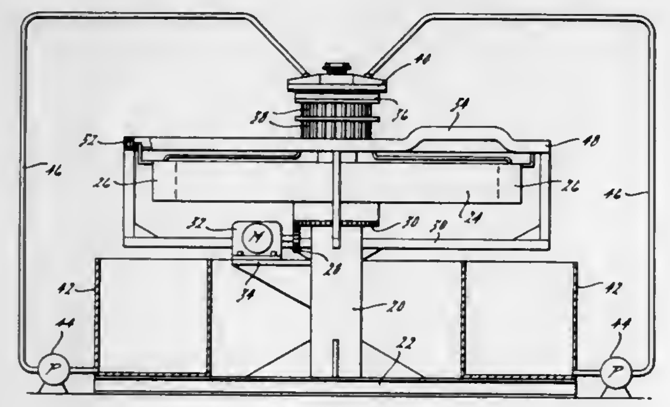
3,969,136
LIQUID TREATING APPARATUS

Peter Miskech, Warren, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Apr. 28, 1975, Ser. No. 572,166

Int. Cl.^{2} B08B *3/02, 9/08*

U.S. Cl. 134—48 **14 Claims**



1. An apparatus for treating cup-shaped workpieces or the like comprising an outer housing defining a chamber adapted to be disposed in clearance-spaced relationship to the exterior surfaces of a workpiece and a conforming nozzle adapted to be disposed in telescopic clearance-spaced relationship to the interior surfaces of a workpiece defining in combination with the walls of a workpiece communicating radial and annular inner and outer fluid flow passages, a port formed in the inner end of said nozzle for discharging a pressurized fluid in impinging relationship against the interior bottom surface of a workpiece for radial flow outwardly of said radial passageway and sequentially through said annular inner and said annular outer passageways, supply means for supplying a pressurized fluid to said nozzle, said housing including a base portion formed with a discharge port disposed adjacent to the exterior bottom surface of a workpiece when disposed in said chamber for discharging fluid therefrom, deflection means on said base portion for deflecting fluid passing from said outer annular passageway in impinging relationship against the exterior bottom surface of a workpiece, said housing including a section movable to and from an open position and a closed position for providing access to said chamber, and actuating means for moving said section between said open and said closed position for loading and unloading a workpiece therefrom.

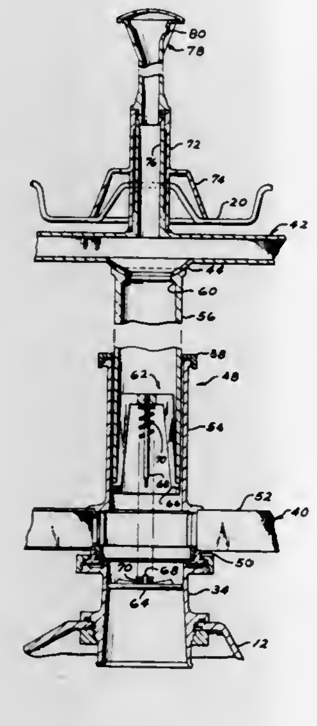
3,969,137
CONDUIT FOR TRANSMITTING WASHING LIQUID TO AN UPPER SPRAY ARM IN A DISHWASHER

Thomas E. Jenkins, and Donald S. Cushing, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 25, 1975, Ser. No. 599,393

Int. Cl.^{2} B08B *3/02*

U.S. Cl. 134—176 **2 Claims**



1. A dishwashing apparatus comprising a tub; upper and lower racks within said tub to receive articles to be washed, said racks being in vertical spaced relation; a first spray arm device disposed for rotational movement within said tub below said lower rack and a second spray arm device rotatably attached to said upper rack and disposed intermediate said upper and lower racks, each of said spray arm devices having orifices to discharge liquid against articles in said racks; said orifices of said first and second spray arm devices additionally being directed to induce said devices into rotation in response to water flowing therethrough; means for mounting said first and second spray arm devices for rotation relative to said racks; a telescoping conduit attached in flow communication and rotatable with said first spray arm device, extensible upwardly to said second spray arm device; means for supplying washing liquid to said first spray arm device through said telescopic conduit and to said second spray arm device; and means attached to said second spray arm device for mechanically receiving said telescopic conduit for transmission of liquid to said second spray arm device while rotating; and telescopically extensible stabilizing means within said telescopic conduit to stabilize said conduit during transmission of washing water therethrough said means for mechanically receiving said telescopic conduit being a downwardly convex-shaped hub and the telescopic conduit including a conforming end portion for association therewith; and said stabilizing means including a base and a double-arched member attached by a telescoping rod assembly, said base being attached within a lower tube of said telescopic conduit and the double-arched member being attached to an upper tube of said telescopic conduit for stabilizing thereof.

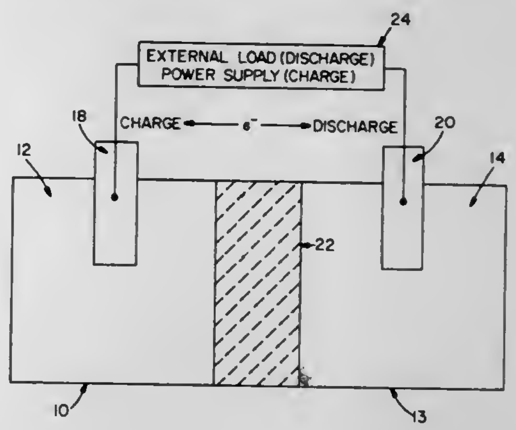
3,969,138
SODIUM-ALUMINUM HALIDE, SULFUR BATTERY

John Werth, Princeton, and Jack C. Sklarchuk, Trenton, both of N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed June 9, 1975, Ser. No. 585,021

Int. Cl.^{2} H01M *43/00*

U.S. Cl. 136—6 FS **6 Claims**



1. A secondary battery comprising in combination:

- a. a molten sodium negative reactant;
- b. a positive reactant comprising molten aluminum halide and molten sulfur;
- c. a solid member separating the negative and positive reactants, said member being selectively ionically conductive to sodium cations;
- d. a molten sodium halide-aluminum halide electrolyte on the positive reactant side of the solid member;
- e. a carbon powder dispersed within the molten sodium halide, molten aluminum halide and molten sulfur; and
- f. a current collector disposed in each the positive and negative reactants.

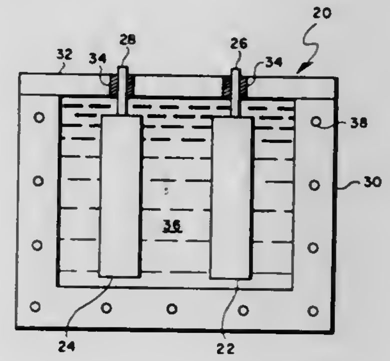
3,969,139
LITHIUM ELECTRODE AND AN ELECTRICAL ENERGY STORAGE DEVICE CONTAINING THE SAME

San-Cheng Lai, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 512,635, Oct. 7, 1974. This application Aug. 18, 1975, Ser. No. 605,691

Int. Cl.^{2} H01M *10/00*

U.S. Cl. 136—6 LN **17 Claims**



1. A composite negative electrode structure for an electrical energy storage device having a lithium-containing electrolyte wherein said composite electrode structure comprises:

a supporting current-collecting matrix in intimate contact with an alloy of lithium and silicon, said lithium being present in said alloy in an amount from about 28 to 80 wt.% and said silicon being present in said alloy in an amount from about 20 to 72 wt.%.

8. An electrical energy storage device including a positive electrode and composite negative electrode structure spaced apart from one another and in contact with a lithium-containing electrolyte wherein said composite negative electrode structure comprises a supporting current-collecting matrix in

intimate contact with an alloy of lithium and silicon, said lithium being present in said alloy in an amount of from about 80 to 28 wt.% and said silicon being present in said alloy in an amount of from about 20 to 72 wt.%.

3,969,140
ELECTRIC CELLS

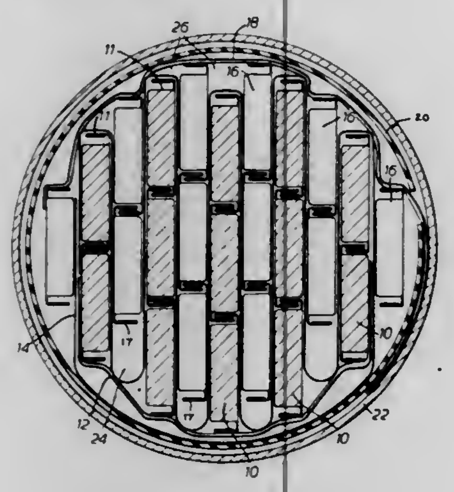
Charles Arthur John White, Redditch, England, assignor to Chloride Alcad Limited, Redditch, England

Filed July 5, 1973, Ser. No. 376,375

Claims priority, application United Kingdom, July 6, 1972, 31756/72

Int. Cl.^{2} H01M *35/04*

U.S. Cl. 136—14 **8 Claims**



1. An electric storage cell of a gas-tight type comprising: a gas-tight casing being at least partially cylindrical in shape; a plurality of flat rectangular positive and negative plates intercalated with one another in said casing and arranged in planes parallel to the axis of said casing, some neighboring plates being of the same width, the outer ones of said plates being narrower than the middle ones of said plates in a direction perpendicular to said axis so that their edges are stepped and substantially follow said partially cylindrical shape of said casing, the intercalation of such plates being asymmetrical so that at least at one edge such plates are not flush and at least at one edge one of said plates projects beyond the other so as to expose both an edge and a marginal portion of its face, and each of said plates being made of an integral number of standard size pocket-type plate members, each pocket extending parallel to the axis, so that the width of each plate is an integral multiple of the width of a pocket, and said pocket members having active perforated areas extending substantially to their edges, so that portions of said plates projecting beyond plates adjacent thereto provide exposed active areas for enabling recombination of gases evolved from adjacent plates.

3,969,141
POWDER MIXTURE FOR PRODUCTION OF LEAD STORAGE BATTERY ELECTRODES AND METHOD

Tore Eriksson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Nov. 1, 1974, Ser. No. 520,123

Claims priority, application Sweden, Nov. 1, 1973, 7314902

Int. Cl.^{2} H01M *4/36*

U.S. Cl. 136—26 **16 Claims**

1. An isovolumetric powder mixture for the production of tubular lead storage battery electrodes comprising a mixture of lead and lead oxide as the active material and at least two non-lead additive compounds, one of said compounds comprising an oxide or salt of a metal, said compound being very slightly soluble in alkaline solution and being capable of reacting with sulfuric acid to produce a readily soluble sulfate.

2. An isovolumetric powder mixture for the production of tubular lead storage battery electrodes, said mixture comprising particles of lead, lead oxide, and at least two non-lead additive compounds, one of said additive compounds being magnesium sulfate and at least one of the remaining of said additive compounds comprising an oxide or a salt of a metal, said oxide or salt being very slightly soluble in alkaline solution, but being capable of reacting with sulfuric acid to produce a readily soluble sulfate.

13. A method for producing lead storage battery tubular electrodes which comprises:

- a. placing a tubular sheath over an electrical conductor element;
- b. filling the space between the conductor and the sheath with a powdered isovolumetric mixture containing lead, lead oxide, and at least two non-lead additive compounds, at least one of said compounds comprising a metal oxide or salt which is very slightly soluble in alkaline solution but is capable of reacting with sulfuric acid to produce a readily soluble sulfate; and
- c. forming the electrode by subjecting the filled sheath to charging while immersed in an electrolyte.

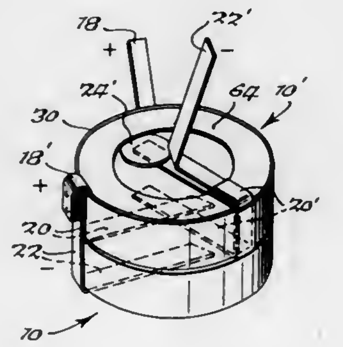
3,969,142
LITHIUM IODINE BATTERY

Wilson Greatbatch, Clarence; Ralph T. Mead, Kenmore; Frank W. Rudolph, Depew, and Norbert W. Frenz, North Tonawanda, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,101

Int. Cl.^{2} H01M *43/00*

U.S. Cl. 136—83 R **18 Claims**



1. A lithium-iodine cell comprising:

- a. cathode means comprising a region of iodine-containing material having at least two surface portions and a current collector element in said material spaced from said surface portions;
- b. cathode electrical conductor means operatively connected to said current collector element and extending from said cathode material;
- c. first and second lithium anode elements, each of said lithium anode elements having a generally planar portion including opposite surfaces, one of the opposite surfaces of each of said elements operatively contacting said cathode material;
- d. first and second anode holders embracing said first and second lithium anode elements, respectively, in a manner exposing the one surface of said first and second lithium element, respectively, to said cathode material, each of said holders being generally cup-shaped having a base portion and a rim portion, the other surface of each lithium element facing said base portion, said first holder having a perimeter smaller than the perimeter of said second holder, a portion of the rim of said first holder being received within the rim of the second holder;
- e. said cathode material being contained within said holders and said cathode electrical conductor means extending between said rims of said holders and outwardly therefrom;
- f. separator means of insulating material between said rims of said holders and embracing a portion of said cathode electrical conductor means for insulating said cathode conductor from said lithium anode elements; and
- g. anode electrical conductor means operatively connected to said lithium anode elements.

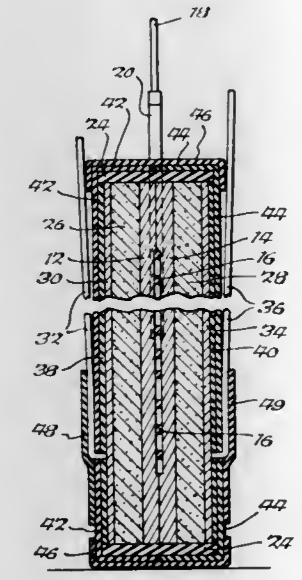
3,969,143
ENCLOSURE FOR LITHIUM-IODINE CELL AND METHOD OF MAKING THE SAME

Ralph T. Mead, Kenmore; Norbert W. Frenz, North Tonawanda, and Frank W. Rudolph, Depew, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed July 22, 1975, Ser. No. 597,976

Int. Cl.^{2} H01M *4/36*

U.S. Cl. 136—83 R **16 Claims**



1. An enclosure for a lithium-iodine cell comprising:

- a. a frame of a material which is non-reactive with iodine and being open at opposite ends thereof, said frame containing a lithium-iodine cell comprising a lithium anode, iodine-containing cathode material and a lithium-iodine electrolyte said frame having a cross sectional shape conforming with the peripheral shape of said lithium anode;
- b. first and second closure elements on said opposite ends of said frame, said closure elements sealing the open ends of said frame and peripheral portions of said elements being folded onto the peripheral surface of said frame with the terminal edges of said elements being in substantially abutting relation; and
- c. a band of iodine impermeable material overlying the edges of said closure elements and embracing said frame.

11. A method of enclosing a lithium-iodine cell comprising the steps of:

- a. providing a frame which has a continuous peripheral side surface defining a cross sectional shape and which is open at each opposite end;
- b. placing a lithium anode in said frame in a manner separating the interior of said frame into two distinct regions each between a surface of said anode and a corresponding open end of said frame the cross sectional shape of said frame conforming with the peripheral shape of said lithium anode;
- c. introducing iodine-containing cathode material into each of said regions and placing a cathode current collector in operative contact with said material in each of said regions;
- d. placing a sheet element against said frame at each end thereof in a manner closing said frame at each end and sealing said sheet elements to said frame; and
- e. applying a band of iodine impermeable material over said peripheral surface of said frame and onto a portion of each of said sheet elements and sealing said band in place.

3,969,144
ELECTROCHEMICAL POWER GENERATION

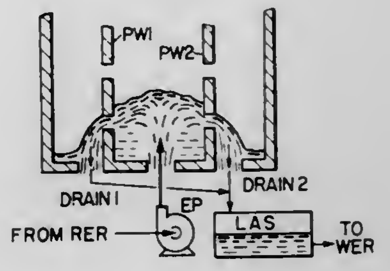
Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 101,284, Dec. 24, 1970, Pat. No. 3,788,899, which is a continuation-in-part of Ser. No. 633,348, April 12, 1967, Pat. No. 3,554,810, which is a continuation of Ser. No. 354,084, March 23, 1964, abandoned, which is a continuation of Ser. No. 656,595, July 27, 1967, Pat. No. 3,513,031. This application Jan. 21, 1974, Ser. No. 434,910

The portion of the term of this patent subsequent to Jan. 12, 1988, has been disclaimed.

Int. Cl.^{2} H01M *2/00*

U.S. Cl. 136—86 A **14 Claims**



1. A method for controlling power generation from an electrochemical battery formed from one or more cells having a consumable-metal anode, an oxygen- or hydrogen peroxide-depolarized cathode, a liquid electrolyte solution, an electrolyte reservoir, and circulation means for said electrolyte, wherein said method comprises the steps of:

- a. introducing the electrolyte solution into the cell;
- b. adjusting the level of the electrolyte solution in said cell to achieve a desired initial battery voltage output;
- c. maintaining the temperature of the electrolyte below a maximum preset value of up to 50° centigrade; and
- d. maintaining the desired battery performance by continual adjustments of said electrolyte level.

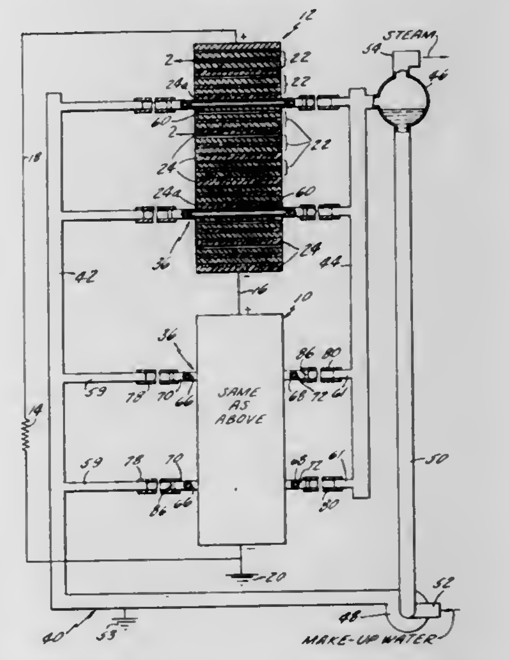
3,969,145
FUEL CELL COOLING SYSTEM USING A NON-DIELECTRIC COOLANT

Paul E. Grevstad, West Hartford, and Raymond L. Gelting, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 21, 1975, Ser. No. 597,613

Int. Cl.^{2} H01M *8/04*

U.S. Cl. 136—86 R **21 Claims**



1. In a fuel cell cooling system including a stack comprising a plurality of cells connected electrically in series said stack

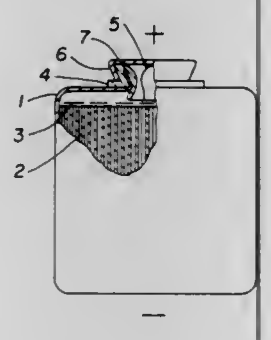
connected electrically to ground and electrically conductive separator plate means disposed between each pair of adjacent cells, an improvement to said stack comprising:

at least one of said separator plate means including passageways formed therein parallel to the plane of said plate means;

cooler means for carrying an electrically conductive coolant between said cells and including a plurality of cooler tubes disposed in said passageways and passing through said plate means, said tubes comprising electrically conductive wall means;

a dielectric material disposed between said electrically conductive plate means and said electrically conductive wall means adapted to provide an electrical barrier between said plate means and said wall means and Coolant circulation means in fluid Communication with said cooler means.

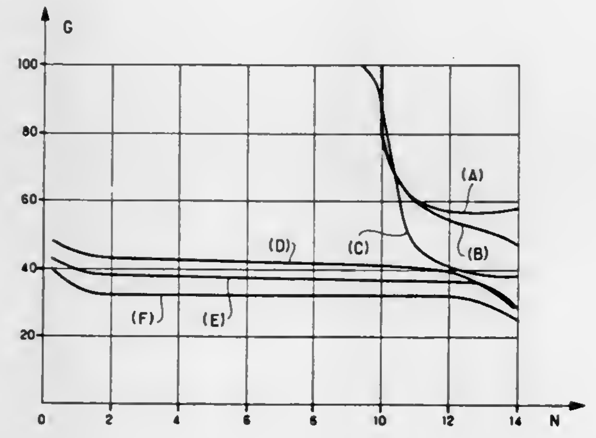
3,969,146
GAS-TIGHT SEALED GALVANIC CELL
Werner Tietze, Hagen, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany
Continuation of Ser. No. 374,071, June 27, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,174
Claims priority, application Germany, July 19, 1973, 2235299
Int. Cl.² H01M *2/04*
U.S. Cl. 136—133 **3 Claims**



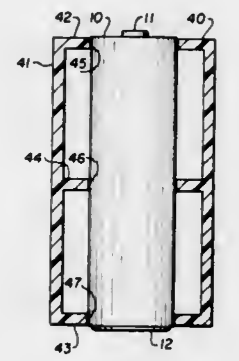
1. A gas-tight, liquid-tight, cylindrical galvanic cell comprising a cylindrical, cup-shaped container, the open end of which is bent over thereby forming a cover having an opening coaxial with the cylindrical container, a collar formed on the cover, the collar extending above and away from the cover of the container and being of smaller diameter than the container, said cover and said collar formed by re-shaping said cylindrical cup-shaped container as a unitary single structure free of joints and seals between said cover and said container and said collar and said cover, an electrically insulating ring force-fit onto the collar and an electrically conducting cap force-fit onto the insulating ring.

3,969,147
GELLED ALKALINE ELECTROLYTE
Pierre Croissant, Smarves, and Rolande Coudrin, Antogny-le-Tillac, both of France, assignors to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France
Continuation of Ser. No. 268,016, June 30, 1972, abandoned. This application July 25, 1974, Ser. No. 491,751
Claims priority, application France, June 30, 1971, 71.24030
Int. Cl.² H01M *6/06, 6/22*
U.S. Cl. 136—157 **13 Claims**

1. Gelled alkaline electrolyte for electrochemical generators consisting of potassium hydroxide solution together with added gelling agent, said gelling agent consisting of mixtures of reticulated starches having a processing index of from 25–50 and native starches, and said processing index of said reticulated starches being ascertained from a mixture of 5 grams thereof with 100 cc of water at approximately 100°C. that will after a 24 hour rest period settle a volume of from 25 to 50 cc of said reticulated starches, said electrolyte viscosity being independent of the concentration of said potassium hydroxide therein.

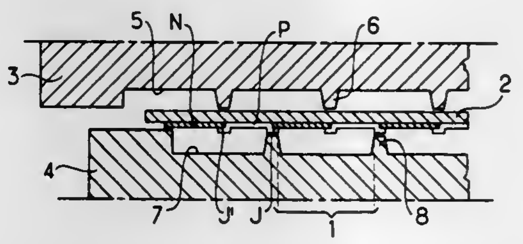


3,969,148
ADAPTER FOR DRY CELL BATTERIES
Burton C. Trattner, Hempstead, N.Y., assignor to Albert C. Nolte, Jr., Jericho, N.Y., a part interest
Continuation of Ser. No. 441,731, March 13, 1974, abandoned, which is a continuation of Ser. No. 321,610, Jan. 8, 1973, abandoned, which is a continuation of Ser. No. 135,289, April 19, 1971, abandoned. This application May 21, 1975, Ser. No. 579,632
Int. Cl.² H01M *2/10*
U.S. Cl. 136—173 **4 Claims**



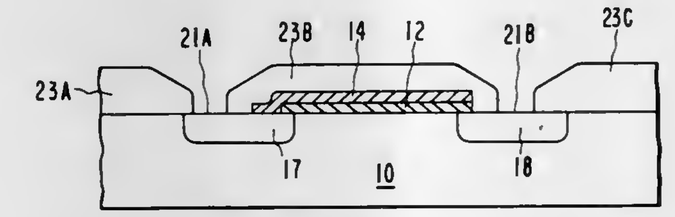
1. In combination; a dry cell battery of a first nominal cross section and an adapter to render the battery interchangeable with a battery of a second, larger nominal cross section, said adapter comprising a body having a central passage opening at opposite ends thereof and constituting means for receiving a battery of said first nominal size insertable therein and removable therefrom from both ends of the body, said passage having the battery received therein and said body having at least two internal flanges projecting into said passage, radially innermost surfaces of said flanges being cylindrical and constituting means engaging and supporting said battery, the external transverse dimensions of the body being substantially similar to those of a battery of said second and larger nominal size.

3,969,149
THERMOELECTRIC MICROGENERATOR
Pierre Thomas, Briis-sous-Forges, and Michel Alais, Orsay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France
Filed Sept. 13, 1973, Ser. No. 396,706
Claims priority, application France, Sept. 13, 1972, 72.32442
Int. Cl.² H01L *35/02*
U.S. Cl. 136—225 **19 Claims**



1. A thermoelectric microgenerator comprising a plurality of thermocouples connected in series, said thermocouples being formed by rows of alternately arranged positive and negative elements connected together to form a continuous conductor, said positve and negative elements being thin layers disposed on one side of a thin support, said thin support being an electrical insulating material and a poor heat conductor, a cold source having spaced projections disposed in thermal contact with alternate junctions of said thermocouples, and a hot source having spaced projections disposed in thermal contact with other alternate junctions of said thermocouples not in thermal contact with said projections of said cold source.

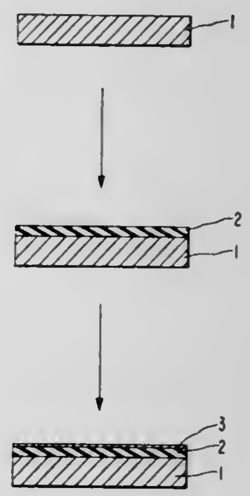
3,969,150
METHOD OF MOS TRANSISTOR MANUFACTURE
Robert L. Luce, Los Altos Hills, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Division of Ser. No. 421,195, Dec. 3, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,445
Int. Cl.² H01L *21/265*
U.S. Cl. 148—1.5 **2 Claims**



1. A method of manufacturing a semiconductor structure having spaced diffused regions for source and drain elements and a gate region therebetween, said gate region including an overlying electrode insulatively spaced therefrom and ohmically connected to one of said diffused regions, comprising the steps of:

a. forming an insulating layer over the surface of a semiconductor substrate including the area for said structure;
b. defining and etching a first opening in said insulating layer thereby exposing a first area of the surface of said substrate for a first of said diffused regions;
c. forming a layer of polycrystalline silicon over said insulating layer and within said first opening;
d. defining and etching said polycrystalline silicon layer over said first area thereby exposing a portion of said first area such that a portion of said polycrystalline silicon layer remains in contact with the surface of said substrate and the remainder of said polycrystalline silicon layer extends from said first area over said insulating layer adjacent to said first area;
e. defining and etching a second opening in said insulating layer adjacent to said polycrystalline silicon layer and spaced from said first area thereby exposing a second area of the surface of said substrate;
f. diffusing an impurity into the structure thereby rendering said polycrystalline silicon layer conductive as a gate electrode, and thereby forming said first and second diffused regions in said substrate beneath said first and second areas of the surface of said substrate, wherein said gate electrode is formed in ohmic contact with said first region.

3,969,151
TREATMENT OF STAINLESS STEEL AND SIMILAR ALLOYS TO REDUCE HYDROGEN OUTGASSING
Eugene F. Hill, Belmont, and Jack L. Walls, Saratoga, both of Calif., assignors to Varian Associates, Palo Alto, Calif.
Continuation of Ser. No. 436,557, Jan. 25, 1974, abandoned, which is a division of Ser. No. 318,139, Dec. 26, 1972, Pat. No. 3,833,430. This application Oct. 14, 1975, Ser. No. 622,301
Int. Cl.² C23F *7/02*
U.S. Cl. 148—6.3 **7 Claims**



1. The method of treating a stainless steel article intended for use as a component of a vacuum system, said method consisting of the following two steps, namely

the first step of forming on the surface of said stainless steel article a first layer, said first layer comprising an oxidized form of said stainless steel and having a rate of permeation for hydrogen which is substantially less than the rate of permeation of hydrogen through said stainless steel, and

the second step of forming on the surface of said first layer a second layer, said second layer being distinct from said first layer, said second layer comprising a chemically reduced form of said first layer, the heat of adsorption for water of said second layer being less than the heat of adsorption for water of said first layer, said second layer exhibiting less hydrogen outgassing than the untreated stainless steel article.

3,969,152
RARE EARTH METAL RINSE FOR METAL COATINGS
Donald J. Melotik, Dearborn Heights, Mich., assignor to Stauffer Chemical Company, Westport, Conn.
Filed Apr. 15, 1974, Ser. No. 461,185
Claims priority, application Canada, June 6, 1973, 173338
Int. Cl.² C23F *7/10*
U.S. Cl. 148—6.15 Z **13 Claims**

1. A process for increasing the corrosion resistance of conversion coated metal surfaces which comprises rinsing said conversion coated surface with an aqueous acidic solution consisting essentially of a rare earth metal salt, said solution having a molarity of at least 0.000001M and a pH adjusted to a value in the range from about 2.0 to about 6.5

3,969,153

METHOD OF MANUFACTURING A STAINLESS STEEL BOILER TUBE WITH ANTICORROSIVE COATING

Katsumi Suzuki, Hitachi; Toshio Kawakami, Mito, and Osamu Asai, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushika Kaisha, both of Japan

Filed Jan. 15, 1975, Ser. No. 541,115

Claims priority, application Japan, Jan. 18, 1974, 49-7847

Int. Cl.^{2} C23F *7/04*

U.S. Cl. 148—6.35 **20 Claims**

1. A method for manufacturing a stainless steel boiler tube with an anticorrosive coating comprising the steps of providing a boiler tube of a stainless steel selected from iron-chromium stainless steel with a chromium content of at least 9% and iron-chromium-nickel stainless steel containing iron as a major component and chromium and nickel as minor components, heat-treating at least a inner surface of said boiler tube under a steam environment at 500° to 1,100°C. until an anticorrosive coating having a thickness of at least 40 μ is formed and subsequently removing a Fe_3O_4 layer formed on the anticorrosive coating during heat treatment of said at least the inner surface of said boiler tube by subjecting the Fe_2O_3 layer to an exfoliating treatment.

3,969,154

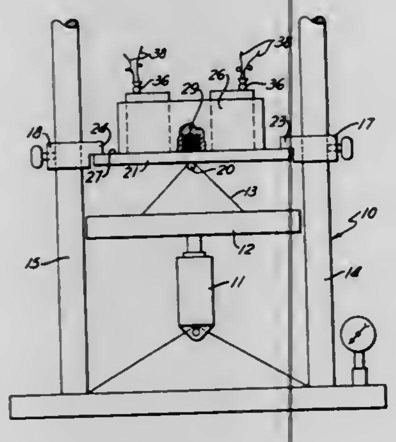
CATASTROPHIC FAILURE OF METALS

William H. Collins, Timonium; Richard L. Blucher, and Edward R. Evans, both of Baltimore, all of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed June 22, 1960, Ser. No. 38,073

Int. Cl.^{2} B23K *7/00*

U.S. Cl. 148—9 R **10 Claims**



1. A method of inducing rapid failure in a shape that is under stress and is composed of cold rolled steel comprising applying against a surface of said cold rolled steel shape a mixture composed of lithium metal, lithium chloride and potassium chloride, rapidly heating that mixture as well as the surface of the steel shape in contact therewith sufficiently to melt the mixture but below the annealing temperature of the steel, and maintaining that temperature until the steel shape cracks.

7. Apparatus for inducing catastrophic failure in a structural metal shape comprising means to apply a stress to a localized area of the surface of the shape, a material selected from the group consisting of alkali metals and alkaline earth metals together with an alkali metal halide, retaining means for maintaining that material at a surface opposite the application of stress therein, heating means extending about said material and its retaining means attached to raise the temperature of said material at least to its melting point and to maintain that temperature for a short period of time.

3,969,155

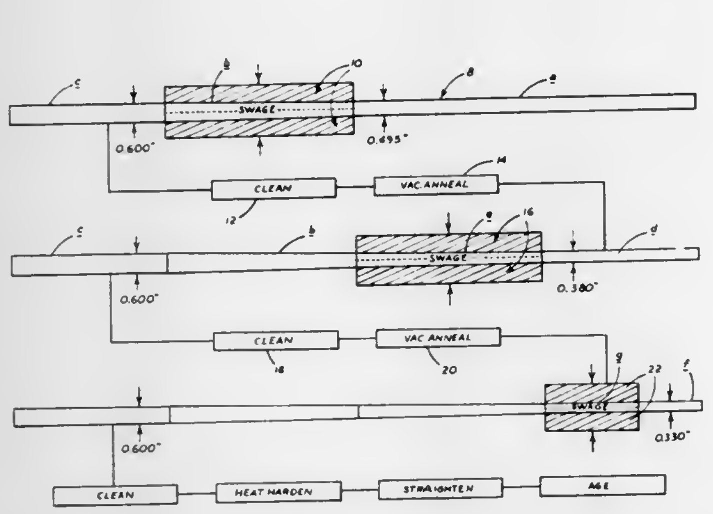
PRODUCTION OF TAPERED TITANIUM ALLOY TUBE

James F. McKeighen, Huntington Beach, Calif., assignor to Kawecki Berylco Industries, Inc., Reading, Pa.

Filed Apr. 8, 1975, Ser. No. 566,141

Int. Cl.^{2} C21D *1/74, 1/80, 9/08;* C22F *1/18*

U.S. Cl. 148—11.5 F **6 Claims**



1. In the manufacture of a length of tapered, alpha beta titanium alloy tube, the method comprising
shaping by cold working part of a length of a cylindrically shaped tube which is in an annealed state to produce a tapered portion in the length of tube with work hardening of said portion, and to leave a remainder portion in said length of tube substantially unworked and in an annealed state, and heat hardening the length of tube including said tapered portion and said remainder portion of said length of tube by heating said portions at an elevated temperature which is below the beta transus temperature with rapid quenching following said heating, said heating during heat hardening being performed under noncarbonaceous conditions where atmospheric gases are present with the absorption of up to about 0.4% by weight oxygen, said heat hardening producing an increased yield strength throughout the entire length of the tube which yield strength is substantially uniform.

3,969,156

METHOD OF MAKING DISPERSION STRENGTHENED PRODUCTS

Hans-Joachim Wallbaum, Osnabruck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Apr. 23, 1975, Ser. No. 570,592

Int. Cl.^{2} B23P *3/00;* C22F *1/08*

U.S. Cl. 148—11.5 R **10 Claims**

1. Method of making dispersion-hardened objects, comprising the steps of:
providing a sheet or strip of metal amenable to dispersion strengthening;
punching disks from the sheet or strip;
annealing the disks or sheet or strip in an oxidizing atmosphere;
stacking the disks as a blank assembly; and extruding the blank.

3,969,157

METHOD OF PROVIDING DECARBONIZATION PROTECTION FOR METALLIC SURFACES

Klaus Hutterer; Walter Schwarz, and Ekkehart Krainer, all of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Aug. 6, 1974, Ser. No. 495,150

Claims priority, application Austria, Aug. 7, 1973, 6910/73

Int. Cl.^{2} C21D *1/34*

U.S. Cl. 148—14 **5 Claims**

1. In a method of providing decarbonization protection of a metallic surface, particularly the surface of a ferrous material, during heat treatment thereof, wherein a boron-containing substance is deposited on the surface to form an adherent scale during the heat treatment step, and wherein the scale is removed after such heat treatment, the improvement wherein the depositing comprises the step of coating the surface to be protected with a thin paste-like substance prior to the heat treatment, said substance consisting essentially of from about 12 to about 80% of at least one boron-emitting material, an activator, and an aqueous binder, the maximum thickness of such coating being 1 mm, whereby the required decarbonization protection is provided without undesired hardening of the surface by significant infusion of boron atoms therein.

3,969,158

PROCESS FOR TREATING 9% NICKEL STEEL

Albert S. Holbert, Garland, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Aug. 10, 1972, Ser. No. 279,521

Int. Cl.^{2} C23C *11/12;* C21D *6/04*

U.S. Cl. 148—16.5 **3 Claims**

1. The method of treating nine percent nickel steel comprising,
carburize selected surface areas at about 1600° to 1750°F. for sufficient time to obtain the desired case hardened properties and air cool,
normalize at about 1650° to 1750°F. for at least about one hour per inch of thickness and air cool,
again normalize at about 1450°F. for at least about one hour per inch of thickness and air cool,
temper at about 1100°F. for about 2 hours after the steel is uniformly hot and air cool,
surface harden selected carburized surfaces by heating them to about 1450° to 1525°F. and immediately air cooling such surfaces after they have reached the desired temperature,
subcool to at least about −120°F. for about 1 hour after the steel is uniformly cold and warm,
and temper at about 300° to 350°F. for about 2 hours after the steel is uniformly hot and cool.

3,969,159

CASTING POWDER

Heinz-Joachim Eitel, Lonsweg 58, 433 Mulheim, Germany

Filed Sept. 3, 1974, Ser. No. 502,797

Claims priority, application Germany, Sept. 6, 1973, 2344840

Int. Cl.^{2} B23K *35/34;* C22B *9/10*

U.S. Cl. 148—26 **9 Claims**

1. A casting powder for steel casting consisting of a first casting powder component selected from the group which consists of silicon dioxide, aluminum oxide, calcium oxide, sodium carbonate, potassium carbonate, magnesium oxide, sodium oxide, and potassium oxide and a second casting powder component of titanium dioxide in a fluoride-free and borate-free composition.

3,969,160

HIGH-STRENGTH DUCTILE URANIUM ALLOY

Vernon C. Hemperly, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,368

Int. Cl.^{2} C22C *28/00*

U.S. Cl. 148—32.5 **3 Claims**

1. A solution-treated age-hardened uranium alloy having high strength and ductility; consisting essentially of 0.7 to 0.8 weight percent titanium, 0.1 to 0.5 weight percent vanadium in an amount effective to inhibit titanium carbide growth with the balance being uranium.

3,969,161

CR-NI SYSTEM AUSTENITIC HEAT-RESISTING STEEL

Tohru Mimino, Tokyo; Kazuhisa Kinoshita, Yokohama; Takayuki Shinoda, Tokyo, and Isao Minegishi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 413,629, Nov. 7, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,225

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.^{2} C22C *38/48, 38/50*

U.S. Cl. 148—38 **3 Claims**

1. A Cr-Ni system austenitic heat-resisting steel consisting by weight substantially of
C: 0.05 to 0.30%,
Si: up to 1.0%,
Mn: up to 2.0%,
Cr: 15.0 to 26.0%
Ni: 7.0 to 22.0%, and at least one of
Ti: 0.01 to 0.8% and Nb: 0.01 to 1.7%
and further, in the above contents, the atomic ratio of C to Ti and/or Nb is within the range of 1.3 to 7, which is calculated by the following formula:

$$\text{atomic ratio} = \frac{\frac{C\ wt\%}{C\ awt}}{\frac{Ti\ wt\%}{Ti\ awt} + \frac{Nb\ wt\%}{Nb\ awt}} \text{ or }$$

$$\frac{C\ wt\%}{C\ awt} \qquad \frac{C\ wt\%}{C\ awt}$$

or

$$\overline{\frac{Ti\ wt\%}{Ti\ awt}} \qquad \overline{\frac{Nb\ wt\%}{Nb\ awt}}$$

where:
wt% = weight %
awt = atomic weight
and the grain size of said steel is within the range of ASTM No. 3 to 8.

3,969,162

METHOD OF PRODUCING SILICON STEEL STRIP

Robert H. Henke, 4 Foxwood Drive, Pittsburgh, Pa. 15238

Division of Ser. No. 239,538, March 30, 1972, Pat. No. 3,843,422. This application Aug. 1, 1974, Ser. No. 493,531

Int. Cl.^{2} H01F *1/04*

U.S. Cl. 148—111 **3 Claims**

1. The method of producing oriented silicon steel strip of improved physical properties having a silicon content in the range 2.5 to 4.0 percent comprising the steps of:
a. bringing hot rolled strip having a thickness in the range 0.060 to 0.150 inch following normalizing to a temperature below 1500°F. and above 600°F.,

- b. reducing the strip in thickness to final finish thickness prior to recrystallize normalizing to about 0.020 to 0.030 inch while in said temperature range 600°F. to 1500°F.,
- c. normalizing at about 1725°F. to recrystallize grain strength, and
- d. cold rolling to a selected thickness without further heating.

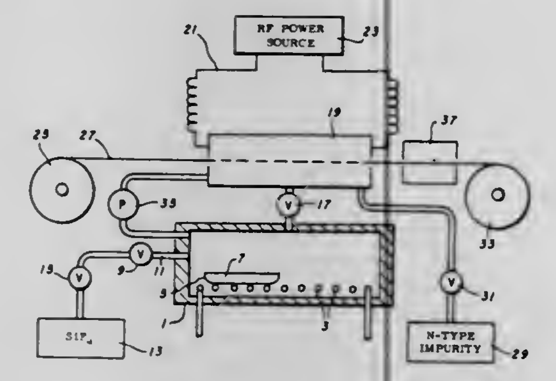
3,969,163
VAPOR DEPOSITION METHOD OF FORMING LOW COST SEMICONDUCTOR SOLAR CELLS INCLUDING RECONSTITUTION OF THE REACTED GASES

Gene Felix Wakefield, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 19, 1974, Ser. No. 507,329

Int. Cl.^{2} H01L *21/205, 21/84, 31/00*

U.S. Cl. 148—174 **5 Claims**



1. A method of forming semiconductor grade silicon from lower grade silicon, which comprises the steps of:
- a. providing a first chamber having at least a zone thereof maintained at a temperature below about 700° C,
- b. passing a graphite fiber substrate through said zone,
- c. passing a gaseous mixture of silicon difluoride and a suitable dopant into said first chamber including said zone whereby said silicon difluoride decomposes to pure silicon which deposits on said substrate and gaseous silicon tetrafluoride,
- d. removing said silicon tetrafluoride from said first chamber,
- e. providing a second chamber containing impure silicon,
- f. heating said chamber to a temperature in the range of 750° to about 1200° C, and
- g. passing silicon tetrafluoride, including at least a portion of the silicon tetrafluoride removed from said first chamber, into said second chamber to form additional silicon difluoride which is then introduced into said first chamber.

3,969,164
NATIVE OXIDE TECHNIQUE FOR PREPARING CLEAN SUBSTRATE SURFACES

Alfred Yi Cho, New Providence, N.J., and Joseph Charles Tracy, Jr., Romeo, Mich., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 506,346, Sept. 16, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,041

Int. Cl.^{2} H01L *21/203, 21/306, 21/316*

U.S. Cl. 148—175 **1 Claim**

1. A method of preparing a gallium arsenide substrate surface for molecular beam epitaxy comprising the steps of: a) etch-polishing the substrate surface by submerging it in bromine-methanol; b) while said substrate is still submerged in said bromine-methanol, diluting said bromine-methanol with pure methanol effective to virtually stop the etching action of said bromine-methanol; c) while said substrate is still submerged in said methanol, forming a native oxide coating on said surface by diluting said methanol with deionized water; d) drying said substrate with a stream of dried freon effective to remove the water before any particulate matter contained therein can precipitate on the surface; e) mounting said substrate in an evacuable chamber of an apparatus adapted for molecular beam epitaxy; f) reducing pressure of said chamber; g) heating said substrate to a temperature sufficient to remove said native oxide coating; and h) growing at least one epitaxial layer on said substrate surface.

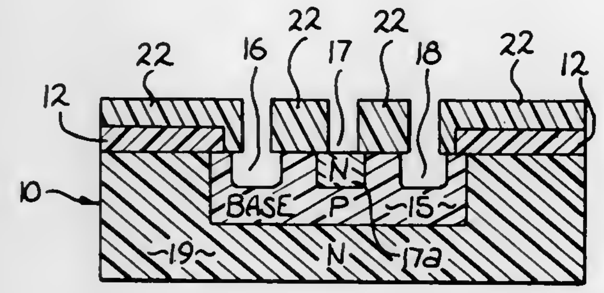
3,969,165
SIMPLIFIED METHOD OF TRANSISTOR MANUFACTURE

William B. Henderson, Marina Del Rey, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed June 2, 1975, Ser. No. 582,736

Int. Cl.^{2} H01L *21/22*

U.S. Cl. 148—187 **15 Claims**



1. A method for fabricating a semiconductor device having at least a first and a second active region comprising the steps of:
- a. forming a plurality of separate openings in an insulating layer disposed on a surface of said semiconductor, said semiconductor having a preferential conductivity type and determining said first active region;
- b. diffusing an impurity having an opposite conductivity type from that of said semiconductor through said plurality of separate openings in said insulating layer into separate upper regions in said semiconductor, said impurity determining a plurality of second active regions; and
- c. selectively removing some of said second active regions such that at least one of said second active regions remains whereby said first active region and said remaining second active regions are exposed through said insulating layer.

3,969,166
ANTI-EROSIVE, SOLID ROCKET PROPELLANT COMPOSITIONS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,655

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.4 **3 Claims**

1. In a solid propellant composition comprised of a binder selected from a carboxyl-terminated polybutadiene and a hydroxyl-terminated polybutadiene, a curative and crosslinking agent selected from an epoxy compound for said carboxyl-terminated polybutadiene and a curative and crosslinking agent selected from a diisocyanate compound for said hydroxyl-terminated polybutadiene, an oxidizer of a high solids loading of ammonium perchlorate, and an optional metal fuel, the improvement to reduce erosive burning which is achieved by incorporating into said solid propellant composition limited percentages from about 0.1 to about 1.0% of a silicate which reduces erosive burning which takes place during the burning phase of said solid propellant composition when said solid propellant composition is encased in a solid propellant rocket motor having a large length-to-diameter ratio, said silicate selected from talc, kaolinite, kaolin, muscovite mica, and feldspar.

3,969,167
NITROCELLULOSE EXPLOSIVE PROCESS INVOLVING A KETONE

Gerald E. Johannes, 565 Frank Ave., SW., Huron, S. Dak. 57350

Continuation of Ser. No. 341,355, March 15, 1973, abandoned, and a continuation of Ser. No. 261,317, June 9, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,531

Int. Cl.^{2} C06B *33/08*

U.S. Cl. 149—38 **7 Claims**

1. The method of making an explosive composition suitable for use as a high explosive, and having a prolonged shelf life, improved temperature and weather resistance characteristics and improved ballistics properties which includes the steps of combining a nitrocellulose propellant having a nitrogen content of at least 12 percent with a lower alkyl ketone solvent in liquid form, the ratio of ketone to nitrocellulose by volume being in the range of from 1:8 to 100:8; blending said mixture in a non-aqueous environment for on the order of 1–24 hours and until the nitrocellulose dissolves and a homogeneous plastic or fluid mass is obtained; forming said mass to shape; and evaporating excess solvent from the resulting mass.

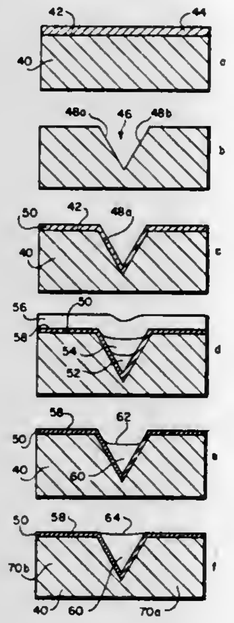
3,969,168
METHOD FOR FILLING GROOVES AND MOATS USED ON SEMICONDUCTOR DEVICES

Gregory L. Kuhn, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 446,834, Feb. 28, 1974, Pat. No. 3,892,608. This application Nov. 29, 1974, Ser. No. 528,363

Int. Cl.^{2} H01L *21/306*

U.S. Cl. 156—17 **11 Claims**



1. A method for filling an evacuated space on a substrate with an insulating filler;
- providing a substrate having an upper surface and an evacuated space extending from said upper surface into the body of said substrate;
- forming an undoped silicon dioxide layer on said upper surface including said evacuated space;
- forming a highly P+ doped silicon layer on said upper surface including said evacuated space; and
- etchably removing said highly P+ doped silicon dioxide layer positioned on said surface, and leaving said highly doped oxide within said evacuated space.

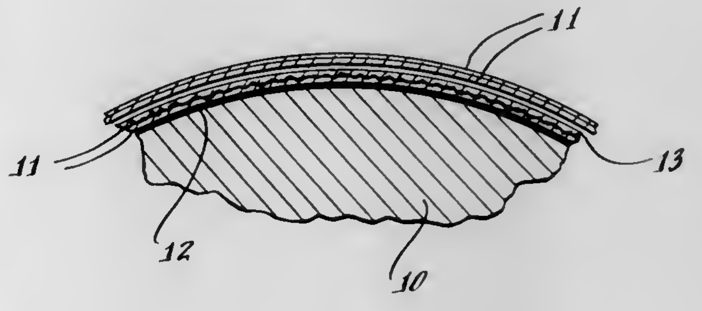
3,969,169
METHOD OF MAKING PAPER-INSULATED ELECTRICAL CONDUCTOR

Adrian Y. Santos, Jr., Yonkers, and Charles Feder, Riverdale, both of N.Y., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Continuation of Ser. No. 362,102, May 21, 1973, abandoned, which is a division of Ser. No. 256,896, May 25, 1972, Pat. No. 3,781,462. This application Apr. 11, 1975, Ser. No. 567,382

Int. Cl.^{2} H01B *13/06, 13/16, 13/26*

U.S. Cl. 156—56 **3 Claims**



1. In the manufacture of paper-insulated electrical conductor by wrapping the paper around the conductor in at least three lays to form an insulating sheath and subjecting the sheathed conductor to a drying operation to extract moisture from the paper, the improvement which comprises saturating the innermost paper lay with an emulsion which contacts the next outer lay prior to the drying operation but leaving at least one outer paper lay unexposed to the emulsion, said emulsion being inert except that it is self-setting and being non-metal-bearing and having adhesive properties, whereby said innermost lay is adhered to the next outer lay and a reinforcing film of the emulsion solids, remaining after the drying operation, is formed between the peripheral surface of the conductor and the innermost surface of the insulating sheath, and whereby said outer lay unexposed to the emulsion is free of adherence to the next inner lay and thus remains loosely formed around the conductor.

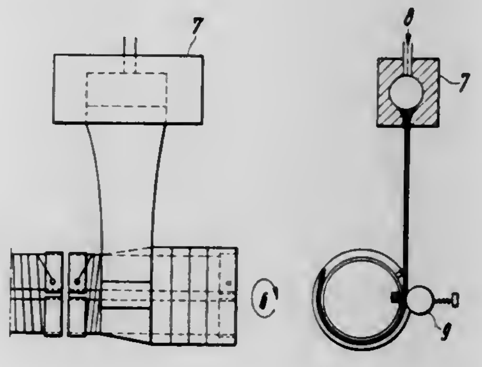
3,969,170
METHOD FOR MAKING A THERMOPLASTIC SLEEVE TO BE USED AS COUPLER FITTING FOR TUBES

Helmut Landgraf, Rumeln-Kaldenhausen, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 22, 1971, Ser. No. 191,875

Int. Cl.^{2} F16L *13/02, 47/02*

U.S. Cl. 156—158 **16 Claims**

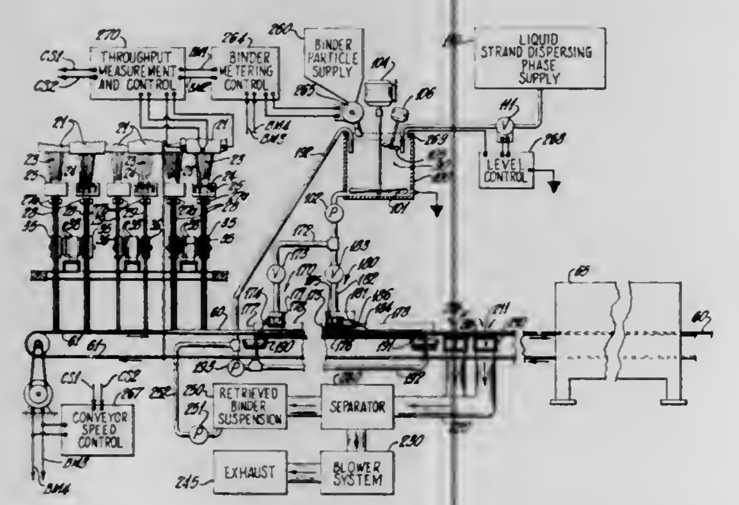


1. Method of interconnecting two thermoplastic tubes or pipes, comprising:
- providing a heating conductor coil in helical configuration and onto a mandrel, leaving spacing in-between the loops of the resulting helix;
- extruding a thermoplastic ribbon wider than the spacing between the loops to cover several, more than two loops at once;

wrapping the ribbon as paid by the extrusion onto the coil as provided on the mandrel by causing the mandrel as carrying the coil to rotate at a speed faster than the speed of extrusion of the ribbon so that the ribbon is stretched as it is wrapped and in plural layers above as well as in-between the loops so as to obtain a coupler sleeve: inserting the tubes from opposite ends into the sleeve; and applying welding current to the coil thereby causing the ribbon material to soften and melt and the tensioned ribbon material fuses with the thermoplastic material of the tubes, the spacing between the loops of the coil permitting penetration of the ribbon material when softened upon heating of the sleeve by the coil.

3,969,171
FIBROUS BODIES AND METHOD AND APPARATUS FOR PRODUCING SAME

Gerhard N. Bolen; Sidney G. Dunbar, both of Granville, and George E. Smock, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Division of Ser. No. 233,549, March 10, 1972, abandoned.
This application May 2, 1974, Ser. No. 466,439
Int. Cl.² B32B *17/02, 31/30*
U.S. Cl. 156—167 **23 Claims**



1. A method for selectively depositing binder in one layer of a multi-layer mat-like mass, comprising the steps of

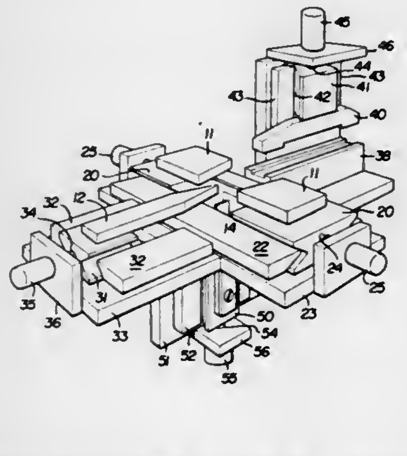
a. depositing a plurality of successive layers of multi-filament strands on a collecting surface in a mat-like mass;
b. distributing binder particles throughout the mat-like mass, the binder particles having a mesh size with respect to the mesh size of the layers which enables circulation of the binder particles through the mat-like mass;
c. opening the strands in one of said layers to separate the filaments of the strands from each other and change the mesh size of that layer to mechanically entrap more binder particles therein; and
d. removing excess binder particles from said mat-like mass.

3,969,172
METHOD AND APPARATUS FOR FORMING JOINTS IN THERMOPLASTIC STRIP

Joseph G. Hotton, Sterling Heights, Mich., assignor to Neumann Engraving Co., Madison Heights, Mich.
Filed May 22, 1975, Ser. No. 579,955
Int. Cl.² B31F *3/00*
U.S. Cl. 156—211 **9 Claims**

1. Apparatus for forming a joint in a strip of thermal plastic material having a notch, defined by laterally opposed notch walls, formed therein, comprising:

a pair of opposed jaws mounted for substantially rectilinear movement inwardly toward and outwardly, away from each other;
means for holding the strip between the jaws, with the notch substantially axially centered therebetween, whereby inward movement of the jaws toward each other compresses the strip portions adjacent the notch and causes the walls defining the notch to move together;
a thin heated blade arranged in a plane centrally between the jaws and aligned with the axis of the notch, said blade having opposed, generally parallel faces, and being movable in a direction generally perpendicular to the axis of movement of each of the jaws, and means for reciprocating the blade inwardly to a position between the jaws and outwardly to a position remote from the jaws for withdrawing the blade; and
means for (*a*) moving the jaws to engage the strip portions adjacent the notch and to press the notch walls against the opposite generally parallel faces of the heated blade for momentarily heating such walls, and (*b*) thereafter moving the jaws further toward one another after withdrawal of the heated blade to compress and hold the walls of the notch together until the faces thereof are joined.



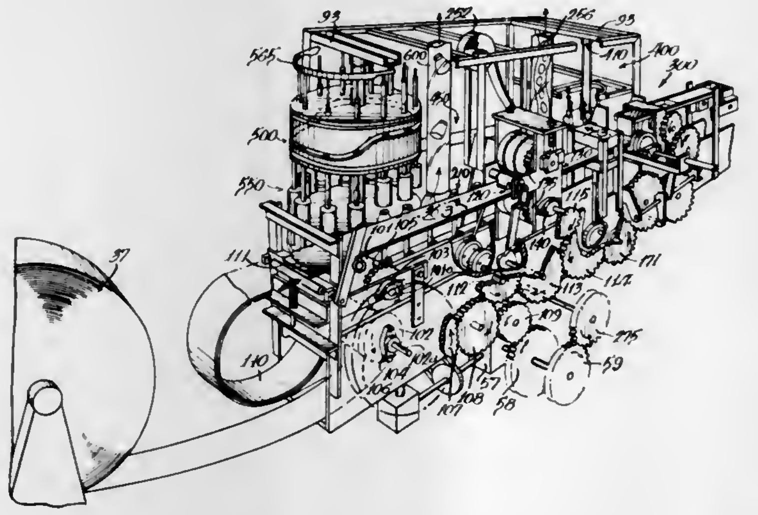
7. A method for forming a joint in a strip of thermoplastic material, comprising the steps of:

forming a notch in the strip;
positioning the notch in alignment with a pair of opposed, axially movable compression jaws;
displacing a thin, heated blade generally perpendicular to the axis of movement of each of the compression jaws to a position within the notch along the central axis of the notch;
displacing the compression jaws toward each other and bending the strip about the apex of the notch to move the walls defining the notch towards each other and against the opposite sides of the blade for heating said walls;
removing the blade from between the walls; and then
placing the heated strip walls in contact and holding them in contact until they are fused together.

3,969,173
METHOD AND APPARATUS FOR FABRICATING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, Toledo, Ohio, and Ralph G. Amberg, Monticello, Ind., assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 23, 1973, Ser. No. 418,562
Int. Cl.² B29D *23/10*
U.S. Cl. 156—218 **19 Claims**

1. The method of forming a sheet of thermoplastic material into a sleeve comprising the steps of: providing a continuous supply of thermoplastic sheet stock material; feeding said material along a processing path; severing said material into individual sheets having a leading end and a trailing end; serially introducing the leading end of each sheet into a hollow cylindrically shaped support; directing the sheet around the interior of said cylindrically shaped support perpendicular to the axis of said support and along an arc concentric with the axis thereof to form said sheet into a generally tubular shape with the trailing end portion overlapping the leading end portion and with surfaces on said trailing and leading end portions facing one another; moving each tubular sheet axially relative to said support; directing air from a heating means toward the facing surfaces of said overlapping trailing and leading end portions as said sheet is moved past said heating means, whereby said air softens said facing surfaces; and forming a liquid-tight seam between said end portions by pressing said overlapping trailing end portion and said leading end portion against one another to form a sleeve as said sheet is moved axially.



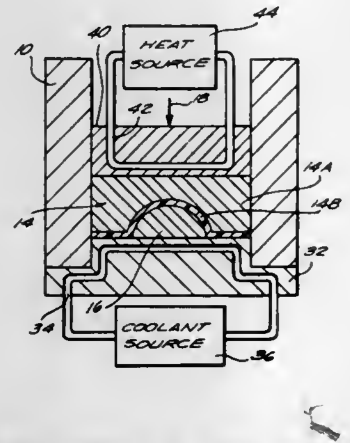
3,969,174
PLASTIC LAMINATE

Peter B. Kelly, Coshocton, and Donald G. Pucci, West Lafayette, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 20, 1974, Ser. No. 535,071
Int. Cl.² B44C *1/24*
U.S. Cl. 156—219 **7 Claims**

1. The process of improving the surface smoothness of decorative plastic laminates prepared by the heat and pressure consolidation without caul plates of at least one lay-up consisting consecutively from bottom to top surface of a plurality of thermosetting resin impregnated paper core sheets, a thermosetting resin impregnated print sheet and a thermosetting resin impregnated overlay sheet which improvement consists of placing at the surface of each laminate lay-up to be consolidated a sandwich consisting of a thermoplastic layer which melts or softens and flows at the consolidation temperature, and a release layer on either side of said thermoplastic layer.

3,969,175
METHOD OF MAKING A HEAT TRANSFERABLE MOLD SECTION

Richard Posner, East Northport, N.Y., assignor to Creative Polymer Products Co., Bayshore, N.Y.
Filed Oct. 15, 1974, Ser. No. 514,768
The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl.² B29C *1/04*
U.S. Cl. 156—221 **9 Claims**



1. The method of making a mold section for an object comprising the steps of making a cavity in a slab of metal, the size of said cavity being greater than the item to be molded, abutting a pre-etched surface of a sheet of plastic material which is flowable under heat and pressure against the surface of said cavity, at least one of said surfaces being initially coated with a heat activatable bonding agent, abutting a pattern of the object against the exposed surface of said sheet in said cavity, initially applying a sufficiently compressive force to said sheet via said pattern and said slab at a first temperature below the temperature for activating said heat activatable bonding agent for a period of time to permit said sheet to cold flow to its final surface whereby said sheet is deformed to conform to said pattern and thereafter applying heat with sufficient temperature to activate said heat activatable bonding agent to cause said sheet to adhere to said slab.

3,969,176
METHOD FOR HEAT SEALING POLYESTER FILM

Howard D. Bassett, Downers Grove; Franklin E. Schrage, Flossmoor, and George F. Kirkpatrick, Downers Grove, all of Ill., assignors to Union Carbide Corporation, New York, N.Y.
Division of Ser. No. 190,277, Oct. 18, 1971, Pat. No. 3,798,116. This application Dec. 18, 1973, Ser. No. 425,860
Int. Cl.² B32B *31/26, 31/28*
U.S. Cl. 156—251 **6 Claims**

1. A method for heat sealing superimposed layers of flexible, biaxially oriented, heat set polyester polymeric films, prepared from polyethylene terephthalic esters including the steps of:

a. superimposing a first ply of said flexible, biaxially oriented, heat set polyester polymeric film over a second ply of said polyester film each of said plies of film being characterized as having a tensile strength of at least about 15,000 psi and a ratio of transverse to machine direction tensile strengths between about 0.67 and 1.5;
b. clamping a portion of said plies of super-imposed film adjacent to and for at least the length thereof coextensive with the portion to be heat sealed so as to press the first and second plies of said film against each other and maintain the portion of said film to be heat sealed in a substantially untensioned state;
c. imposing on the portion of said superimposed plies of film to be heat sealed heat from a heat energy source of sufficient intensity for the time necessary to fuse in a bead type seal the portion of untensioned superimposed film; and
d. maintaining said plies of film pressed together until the source of heat energy is retracted therefrom.

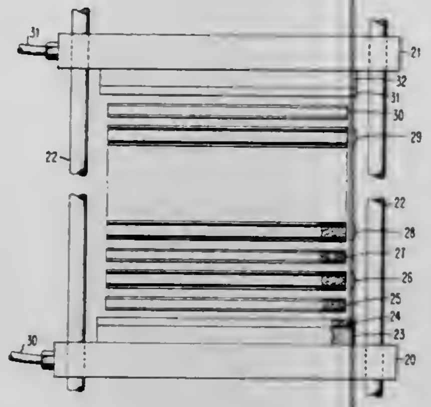
3,969,177
LAMINATING METHOD

Donald E. Doran, New Milford, Pa., and Carl E. Samuelson, Johnson City, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 24, 1974, Ser. No. 482,055
Int. Cl.² H05K *3/00*
U.S. Cl. 156—288 **8 Claims**

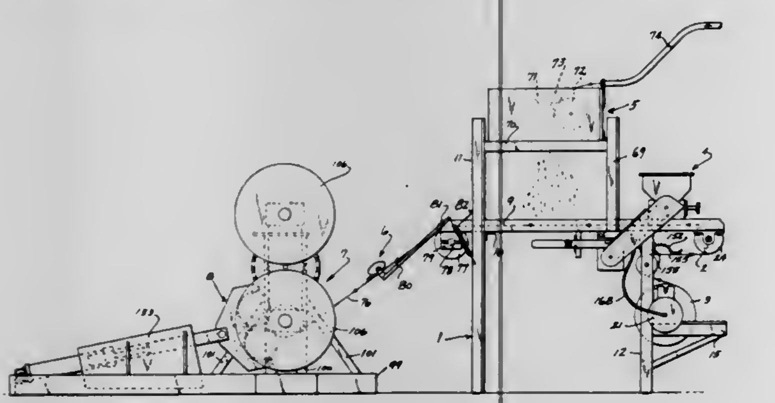
1. The method of laminating sheet pluralities into laminated panels comprising the steps of:

alternating stacking in a press layup pluralities of sheets of material having uncured heat curable adhesive thereon and other pluralities of said sheets of material and adhesive that have been partially cured to a laminate form, said sheet pluralities having therebetween at least one non-cohesive surface;
subjecting said stack of uncured and partially cured sheet pluralities to heat and pressure for a predetermined time to partially cure as newly formed laminates said uncured sheet pluralities and advance the cure of said partially

cured laminates; and
using said partially cured, newly formed laminates as alternate separators between other uncured sheet pluralities in a succeeding press layup.



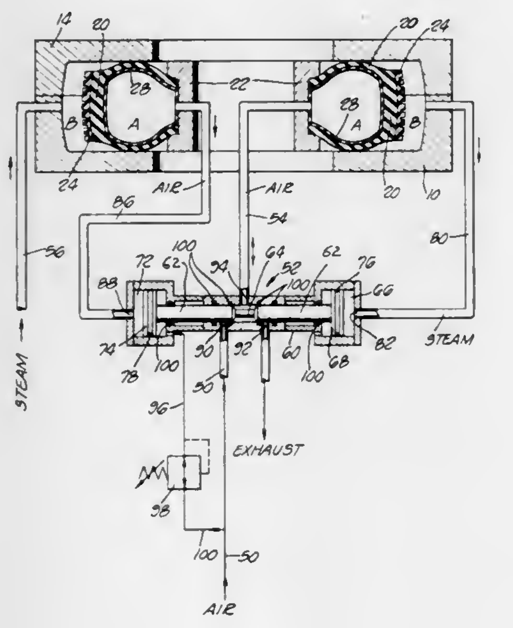
3,969,178
APPARATUS FOR MAKING A SHEET MOLDING COMPOUND
Richard L. Jeanson, Watertown, Wis., assignor to Menasha Corporation, Neenah, Wis.
Division of Ser. No. 329,524, Feb. 5, 1973. This application Jan. 20, 1975, Ser. No. 542,690
Int. Cl.^{2} B65H *27/04*
U.S. Cl. 156—361 **23 Claims**



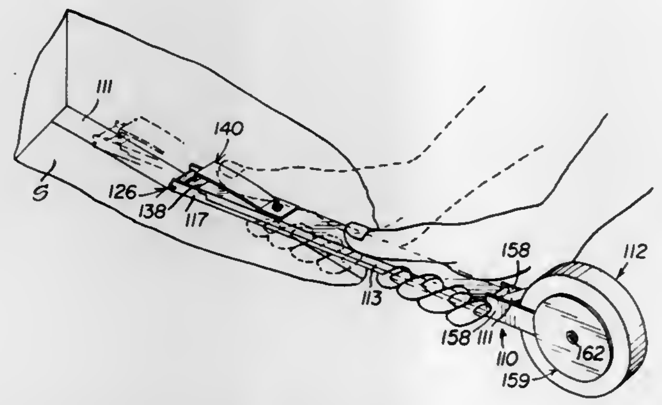
1. An apparatus for forming a composite structure, comprising means for moving a film of sheet material in a given path, resin supply means for depositing a coating of resin on the film as it moves in said path, fiber supply means for depositing a layer of fibers on the resin coating to provide a composite structure, said coating of resin and said layer of fibers being spaced from a side edge of said film, folding means for folding said side edge of the film partially over the coating of resin and the layer of fibers in a first fold, means for winding the composite structure in coiled form to provide a wound coil, and pressure means for applying pressure to the wound coil at a series of first locations spaced along the length of the wound coil to thoroughly impregnate the fibers and the resin.

3,969,179
CURING APPARATUS FOR RETREADING SYSTEM
Herman J. Foegelle, Lodi, Calif., assignor to Lodi Division Intercole Automation, Inc., Lodi, Calif.
Continuation-in-part of Ser. No. 381,218, July 20, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 543,996
Int. Cl.^{2} B29H *5/04*
U.S. Cl. 156—394 **6 Claims**

1. Apparatus for bonding a pre-cured strip of retread stock to the periphery of a tire casing, said apparatus comprising: at least one annular-shaped member defining a curing chamber for receiving the tire casing to be processed with the strip of retread stock extending around the periphery of the tire casing and in a position spaced radially inwardly from the inner peripheral surface of the chamber with the sides of the casing engaging the walls of the chamber to form a seal for the annular space between the strip and the inner peripheral surface of the annular-shaped member; an inner rim member for engaging the beads of the tire casing positioned within said annular-shaped member to hold the beads with a predetermined axial spacing and to provide an enclosed chamber within the tire casing; a valve including a central elongated cylindrical section and first and second cylindrical end sections, an elongated spool reciprocally slidable in the central elongated cylindrical section and connected to a first piston in said first cylindrical end section and to a second piston in said second cylindrical end section, said central elongated section having a central port therein and second and third ports displaced on either side of the central port, and said spool having a central section shaped to provide a path between the central port and the first port when the spool moves in one direction, and to provide a path between the central port and the second port when the spool moves in the opposite direction; a first pipeline extending from said central port through said inner rim member for introducing a first pressurized fluid into the interior of said tire casing when said spool moves in one direction, and for exhausting the first pressurized fluid from the interior of said tire casing when said spool moves in the opposite direction; a second pipeline extending through said annular-shaped member for introducing a second pressurized fluid at a relatively high temperature into the annular space between the tire and the inner peripheral surface of the annular-shaped member; a source of the first pressurized fluid coupled to the second port; an exhaust line coupled to the third port; a third pipeline extending through the annular-shaped member and coupled to the interior of the first cylindrical end section to introduce the second pressurized fluid from said annular space to one side of the first piston; and a fourth pipeline extending through said inner rim member and coupled to the interior of the second cylindrical end section to introduce the first pressurized fluid from the interior of said tire casing to one side of the second piston, thereby to cause the valve to couple the first pipeline to the source of first pressurized fluid when the pressure of the first pressurized fluid in the tire casing falls below the pressure of the second pressurized fluid in the annular space, and to cause the valve to couple the first pipeline to the exhaust line when the pressure of the first pressurized fluid in the tire casing rises above the pressure of the second pressurized fluid in the annular space, for maintaining a predetermined pressure differential between said first pressurized fluid in the interior of the tire casing and said second pressurized fluid in the annular space.



3,969,180
APPARATUS FOR LAYING DOWN A TAPE STRIP
Donald Ravesloot, 15646 S. Emerald Ave., Harvey, Ill. 60426
Continuation-in-part of Ser. No. 259,746, June 5, 1972, abandoned. This application May 17, 1974, Ser. No. 470,989
Int. Cl.^{2} B32B *31/18;* **B65H** *35/10*
U.S. Cl. 156—523 **20 Claims**

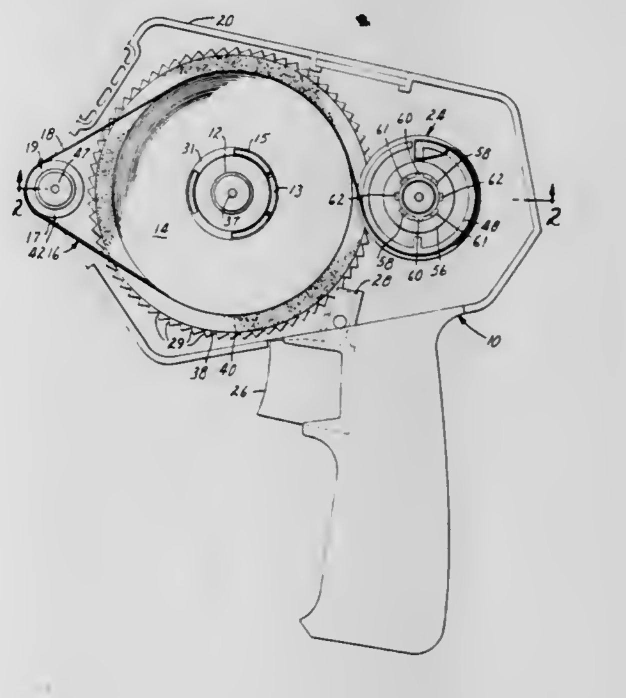


1. Apparatus for applying to a surface a strip of flexible tape from a roll supply, comprising: an elongated handle defining opposite first and second ends and a through passage between said ends for conducting tape from said supply for application of the tape to a surface at said first end; means disposed at a position within said handle passage for partially separating thereat a distal portion of the tape applied to the surface from the tape strip within said handle passage; means on said handle first end for holding the partially separated distal portion against a surface to which it is to be applied; and manually operable means for selectively holding the supply portion of the partially severed tape strip in said handle passage against withdrawal movement to effect full separation of said distal portion therefrom as an incident of a concurrent holding of the tape strip by said holding means and movement of said handle first end away from the applied distal portion.

12. Apparatus for applying to a surface a strip of flexible tape from a roll supply, comprising: an elongated handle having a pair of spaced side walls defining an end of the handle and a through passage through said end for conducting tape from said supply for application of the tape to a surface at said handle end; means for separating a distal portion of the tape applied to the surface from the tape strip within said handle passage; and means for transversely adjusting the spacing of said side walls from a centerline of the handle end to provide accurate centered guiding of the tape strip as it is applied from said first end.

3,969,181
TRANSFER ADHESIVE DISPENSING DEVICE
Thomas W. Seabold, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 3, 1974, Ser. No. 475,662
Int. Cl.^{2} B32B *31/00*
U.S. Cl. 156—577 **6 Claims**

1. A transfer adhesive dispensing device suitable for dispensing adhesive onto a substrate from a convolutely wound roll of transfer adhesive consisting of a web of adhesive, a release liner and a core having axially extending blind cavities terminating at edge walls, said device comprising:
a housing;
an applicating roller mounted on the forward portion of said housing, a portion of said roller's periphery projecting beyond said housing;
a tape support rotatively mounted in said housing, said support having axially extending projection means engaging said core for interlocking engagement and for engaging edge walls of a said core thereby positioning said core with the axis thereof in a predetermined parallel spaced relationship to the axis of said roller and in a predetermined axial relationship to said tape support holding said adhesive and said liner on said core in alignment with respect to a predetermined axial portion of the surface of said applicating roller;
a takeup roller mounted in said housing for receiving and holding spent liner after said adhesive web has been applied to said substrate, said takeup roller being mounted in spaced parallel relationship to said applicating roller;
said roll of transfer adhesive being positioned from a said core about said applicating roller, with the liner engaging the applicating roller, then with the liner extending around the wound roll engaging the web of adhesive therein and then contacting said takeup roller;
drive means associated with said tape support and said takeup roller for transmitting rotational motion from said tape support to said takeup roller upon rotation of said tape support by rotation of said core during unwinding of said web of adhesive and application of said adhesive strip to said substrate, said takeup roller being simultaneously rotated in the opposite direction to increase the contact of the liner with the wound roll; and
brake means for stopping the rotation of the tape support and thereby said core, whereby when said device is pulled after said brake is applied, the adhesive applied to the substrate will be severed from the adhesive remaining in the device.

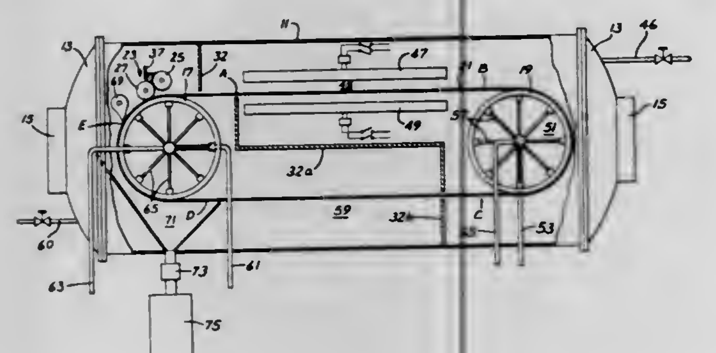


3,969,182
GROWTH OF MERCURIC IODIDE SINGLE CRYSTALS FROM DIMETHYLSULFOXIDE
Richard C. Carlston, San Luis Obispo, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed July 16, 1975, Ser. No. 596,547
Int. Cl.^{2} B01D *9/02;* **B01J** *17/04;* **C01G** *13/04*
U.S. Cl. 156—621 **9 Claims**

1. A process for growing large euhedral tetragonal mercuric iodide single crystals comprising the steps of: forming a solution of mercuric iodide and dimethylsulfoxide, containing the thus formed solution in a vessel at a temperature in the range of about 20° to 80°C and in contact with air of 15 to 50% humidity which allows water to enter into the solution for a time period sufficient to form clear red crystals in the solution, and removing the thus formed crystals from the solution.

3,969,183
VACUUM DEHYDRATION OF HEAT SENSITIVE MATERIALS

James B. Redd, Clearwater, Fla., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.
Filed Oct. 4, 1974, Ser. No. 512,631
Int. Cl.^{2} B01D *1/22*
U.S. Cl. 159—49 9 Claims



1. A method for dehydrating a heat sensitive material which comprises applying a thin film of liquid material having a thickness from 0.005 to 0.05 inch to a supporting surface, by means of an applicator system comprising a metering roll having a lateral surface provided with a plurality of annular grooves and a counter-rotating applicator roll having a smooth lateral surface, subjecting said thin film to vacuum conditions and carefully controlled uniform heating throughout subsequent dehydration, moving said supporting surface and said thin film through a first dehydration zone wherein said thin film is subjected to only sufficient radiant heat to remove from about 50 to about 90 percent by weight of the total moisture from said thin film without damage to the heat sensitive material, moving said supporting surface and said partially dehydrated thin film to a second dehydration zone wherein said thin film is further heated to a temperature in the range of from about 105°F. to about 210°F. to remove additional moisture without damage to the heat sensitive material, and then moving said supporting surface and the almost dry thin film to a third dehydration zone to effect further controlled dehydration of the almost dry thin film without damage to the heat sensitive material.

3,969,184
DIGESTION ODOR CONTROL

Karl Nicolaus Cederquist, Stockholm, Sweden, assignor to Defibrator AB, Stockholm, Sweden
Continuation of Ser. No. 484,779, July 1, 1974, abandoned, which is a continuation of Ser. No. 258,547, June 1, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,917
Int. Cl.^{2} D21C *11/08*
U.S. Cl. 162—19 3 Claims

1. Method of producing cellulosic pulp having a yield ranging between 65–90% from lignocellulosic material by digesting said material with a digesting liquor containing Na_2S and Na_2CO_3, said pulp and the by-products resulting from the digestion being substantially free from malororous constituents prior to withdrawal from the digesting process without the need for individual isolation and treatment comprising:

a. impregnating the lignocellulosic material with digesting liquor and digesting the impregnated material in a digester at a temperature ranging between 150°–190°C in vapor phase in an atmosphere of saturated steam corresponding to the digesting temperature;

b. thereafter cooling the digester with its total contents including solids, fluids, vapors and noncondensable gases to a temperature ranging between 120°–150°C by spraying cold oxidized spent liquor over the entire digester contents and introducing molecular oxygen into the digester at said temperature and under superatmospheric pressure for a time sufficient to obtain rapid oxidation of said total contents without decomposition of the pulp while substantially eliminating the malodorous constituents from the contents;

c. then discharging pulp and spent liquor from the digester and recovering the spent liquor from the pulp;

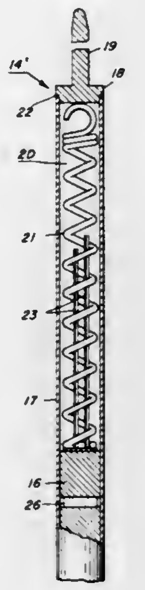
d. concentrating the recovered spent liquor by evaporation of water;

e. burning the concentrated spent liquor to yield a smelt consisting essentially of Na_2S and Na_2CO_3; and

f. dissolving said smelt in water for regenerating fresh digesting liquor for re-use.

3,969,185
GETTER FOR NUCLEAR FUEL ELEMENTS

Wilfred T. Ross, Wilmington, N.C., and Harold E. Williamson, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.
Filed May 9, 1973, Ser. No. 358,736
Int. Cl.^{2} G21C *3/16*
U.S. Cl. 176—68 40 Claims

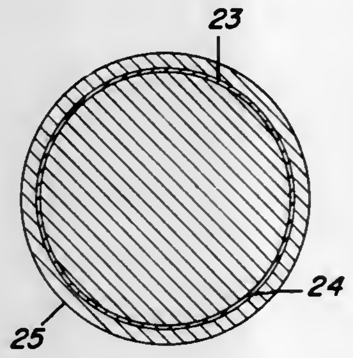


1. A nuclear fuel element which comprises an elongated container, a body of nuclear fuel material disposed in and partially filling said container and forming an internal cavity, an enclosure integrally secured and sealed at each end of said container, and a composite getter disposed within said container, said composite getter being comprised of a metallic substrate having thereon a coating of a material capable of gettering reactive gases covering at least a portion of the substrate with the substrate having a greater thermal coefficient of expansion than the coating and being capable of producing tensile stress in said coating whereby said coating is intermittantly fractured by changes in temperature of said composite getter to thereby expose fresh gettering surfaces in said coating.

3,969,186
NUCLEAR FUEL ELEMENT

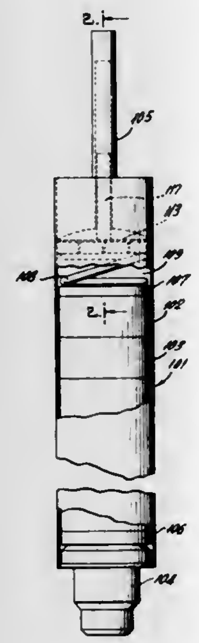
John R. Thompson, San Jose, Calif., and Trevor C. Rowland, Halden, Norway, assignors to General Electric Company, San Jose, Calif.
Filed Feb. 11, 1974, Ser. No. 441,131
Int. Cl. G21c *3/20*
U.S. Cl. 176—68 1 Claim

1. A nuclear fuel element comprising: an elongated cladding tube having the form of a right circular cylinder and formed of a material from the group consisting of zirconium and zirconium alloy; a body of nuclear fuel material disposed in said container with an annular gap between said fuel material and said tube; a liner formed of a material from the group consisting of molybdenum and molybdenum alloy disposed in said annular gap between said fuel material and said tube and partially filling said gap to provide an interaction barrier between said cladding tube and said fuel material and to provide an initial gap between said liner and said fuel material; and means for sealing each end of said tube.



3,969,187
DETECTION OF FUEL ROD LEAKAGE

Dan L. Worlton, deceased, late of Richland, Wash. by June S. Worlton, administratrix, and Dan L. Robinson, Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.
Continuation-in-part of Ser. No. 251,936, May 10, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,383
Int. Cl.^{2} G21C *3/16*
U.S. Cl. 176—79 5 Claims



1. A fuel rod for use in a nuclear reactor which comprises:

a. a hollow longitudinal body containing nuclear fuel for producing fission product gases;

b. a lower end cap attached to and sealing the lower end of said body;

c. an upper end cap assembly attached to and sealing the upper end of said body, said assembly comprising:

  i. end cap means extending longitudinally upward from said upper end and having a concave lower surface facing said fuel and including a first cavity extending upward from said lower surface and terminating in said end cap means above said upper end of said body,

  ii. resilient, flexible means operably disposed in said hollow body below and in contact at its edges with said concave lower surface to form a second cavity between said concave lower surface and one side of said flexible means into which said resilient, flexible means can flex, and sealing at least said second cavity from the portion of said hollow body located below said flexible means, said flexible means being flat in its undistorted position, and

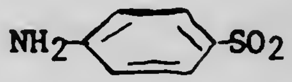
  iii. rigid means operably in contact with the inner surface of said hollow body adjacent to said resilient, flexible means on the side thereof opposite said second cavity, said rigid means having at least one bleed hole which allows any gases developed in said hollow body to contact said flexible means, and

  iv. contact means having at least a portion thereof normally located in said first and second cavities with one end in contact with said resilient, flexible means, said contact means being freely movable in said first cavity and inducing vibrations in said flexible means when said contact means is raised into said first cavity and thereafter dropped into contact with said flexible means whereby the frequency of said vibrations is a function of pressure applied to the opposite side of said resilient, flexible means.

3,969,188
METHOD OF PRODUCING GUANOSINE BY FERMENTATION

Hitoshi Enei, Zushi; Katsuaki Sato; Yasuo Anzai, both of Kawasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Oct. 24, 1974, Ser. No. 517,631
Claims priority, application Japan, Oct. 24, 1973, 48-119749
Int. Cl.^{2} C12D *13/06*
U.S. Cl. 195—28 N 5 Claims

1. A method for producing guanosine which comprises culturing a guanosine-producing mutant of the genus Bacillus under aerobic conditions in an aqueous culture medium until guanosine accumulates in the medium, and recovering accumulated guanosine therefrom; the mutant being characterized by a requirement for adenine for growth and by being resistant to at least one sulfa drug at a level of 100 gamma per cubic centimeter, said sulfa drug containing the group



and having anti-microbial action which is suppressed at least in part by p-aminobenzoic acid.

3,969,189
CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF

Reisuke Kobayashi, Shizuoka; Hironari Sato; Kiyoshi Takita, both of Shimizu, and Nobuo Toyama, Miyazaki, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 314,933, Dec. 14, 1972, Pat. No. 3,890,198. This application Nov. 8, 1974, Ser. No. 522,304
Claims priority, application Japan, Dec. 14, 1971, 46-100700; Jan. 27, 1972, 47-9486
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.^{2} C07G *7/028;* C12D *13/10*
U.S. Cl. 195—62 10 Claims

1. A powdery complex enzyme isolated from Pellicularia culture media, capable of lysing cell walls and having the following characteristics:

a. being active to lyse the cell walls of living cells and dead cells of *Aspergillus niger*, *Penicillium steckii*, *Saccaromyces cerevisiae*, *Candida utilis*, *Canadida albicans*, *Candida lipolitica*, *Lentinus edodes*, *Bacillus subtilis*, *Lactobacillus lactis* and *Chlorella;*

b. having cell wall-lysing activities stable in a pH range of 3 to 9, the optimum pH being in the range of 5 to 7;

c. said cell wall-lysing activities being optimal in a temperature range of 30° or 40°C., but the optimum temperature varying depending on the nature of the microorganisms of which cells are to be lysed;

- d. said cell wall-lysing activities being stable in a low temperature range but rapidly inactivated at a temperature of higher than 50°C.;
- e. said cell wall-lysing activities being inhibited by the presence of Mn^{++}, Ni^{++} or Zn^{++};
- f. exhibiting the enzymatic activities of cellulase and β-1,3-glucanase at an optimum temperature of 40°–50°C. and an optimum pH of 5.0, chitinase at an optimum temperature of about 35°C. and an optimum pH of 4.0–5.5, protease, hemicellulase and amylase; and
- g. consisting essentially of component enzymes each having a molecular weight of at least 50,000.

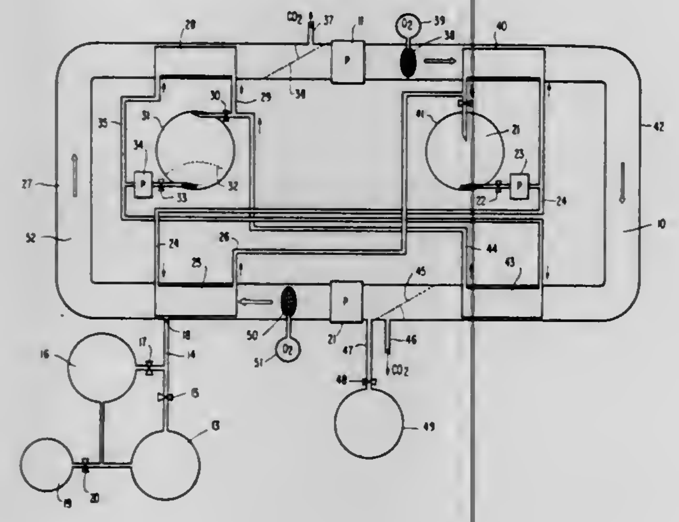
3,969,190
APPARATUS AND METHOD FOR MICROBIAL FERMENTATION IN A ZERO GRAVITY ENVIRONMENT

Ralph E. Hise, Littleton, and Russell T. Jordan, Denver, both of Colo., assignors to Martin Marietta Corporation, Washington, D.C.

Division of Ser. No. 143,808, May 17, 1971, Pat. No. 3,769,176. This application Aug. 13, 1973, Ser. No. 387,641

Int. Cl. C12b *1/14*

U.S. Cl. 195—142 **12 Claims**



1. Apparatus for conducting the propagation and growth of micro-organisms in a substantially zero gravity environment and for the recovery of fermentation products therefrom comprising:
  - closed circulation loop fermenter means for containing a liquid culture suspension;
  - circulating means operably connected to said fermenter means for circulating said liquid culture suspension within said fermenter means;
  - means for supplying nutrients, said means including a nutrient reservoir and first dialysis means;
  - means for accumulating metabolic products from said fermenter means, said means including a metabolic product reservoir and second dialysis means;
  - means for introducing oxygen into said fermenter means;
  - means for removing carbon dioxide gas from said fermenter means; and,
  - means for collecting micro-organism cells and fermentation products from said fermenter means.

3,969,191
CONTROL FOR REGENERATORS OF A HORIZONTAL COKE OVEN

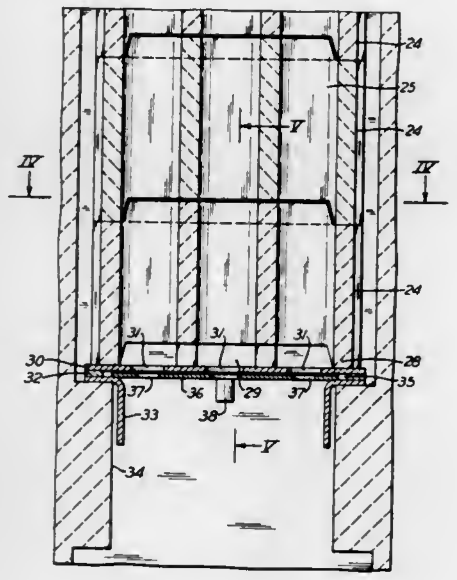
Gunther Bollenbach, Herne, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed May 30, 1974, Ser. No. 474,374

Claims priority, application Germany, June 1, 1973, 2327983

Int. Cl.² C10B *5/12*

U.S. Cl. 202—141 **7 Claims**



1. In a horizontal coke oven having vertical regenerators for heat exchange between combustion supporting gases and burnt gases, a sole flue communicating with said vertical regenerators for the supply and removal of gaseous media, and a stationary horizontal partition having ports therein for the conduction of the gaseous media between the sole flue and various sections of said vertical regenerators which include fillings of checkerbricks having longitudinal and transverse walls that bound continuous passages of oblong cross section, the outer walls of said checkerbricks having projecting ribs engageable with the projections of the checkerbricks above and below, the improvement comprising a plurality of plates arranged end-to-end in a gaseous controlling relation below said stationary horizontal partition with adjacent ends of the plates being normally spaced from each other, each of said plates being associated with a different one of discrete various sections of the vertical regenerators, said plates having portal openings contiguous with the stationary ports of said horizontal partition, ribs depending from the lowermost checkerbrick in each section for engaging the top surface of said stationary horizontal partition, said plates being independently adjustable in the direction of the length of the sole flues for determining the extent to which said ports of the stationary horizontal partition are masked by said plates, and means extending downwardly from the underside of said plurality of plates for separate adjustable movement thereof.

3,969,192
PROCESS AND APPARATUS FOR QUENCHING HOT COKE

Carl-Heinz Struck, Bochum-Dahlhausen, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

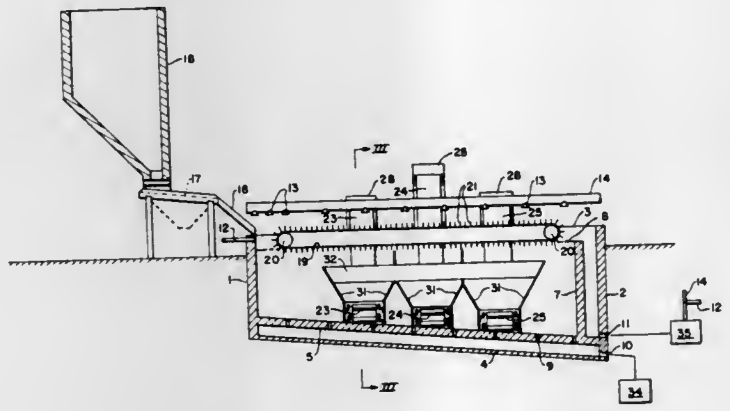
Division of Ser. No. 260,766, June 8, 1972. This application Oct. 26, 1973, Ser. No. 409,812

Int. Cl.² C10B *39/12*

U.S. Cl. 202—230 **6 Claims**

1. A coke quenching apparatus comprising a substantially rectangular water tank adapted to be filled with water to a predetermined level for the quenching of pieces of hot coke, hopper means receiving hot coke for quenching in said tank, means for separating fines from those pieces of hot coke which are to be quenched by the water in said tank, means for delivering the hot pieces of coke from said hopper means into

the water contained by said tank at a location which is adjacent one side wall of the tank, spray nozzles above the tank for spraying water on the hot coke as it enters the tank, means for supplying the main quantity of water at said one-side wall of the tank, conveyor means above the water in the tank for moving pieces of coke floating in the water from a location which is adjacent said one side wall toward the opposite side wall of the tank, said conveyor means being constructed to advance the pieces of coke in the tank only while floating in the water until each piece of coke becomes saturated due to absorption of a quantity of water in relation to the weight of the pieces of coke, and an endless conveyor belt means in the tank for receiving the pieces of coke which become saturated and sink onto it, said endless conveyor belt means being arranged to carry the pieces of coke which sink onto it in a direction transversely of the direction of movement of said conveyor means to discharge the saturated pieces of coke from said tank.



3,969,193
METHOD FOR PREVENTING SCALE IN SALINE WATER DESALTING APPARATUS AND SALINE WATER RECLAMATION APPARATUS FOR CARRYING OUT SAID METHOD

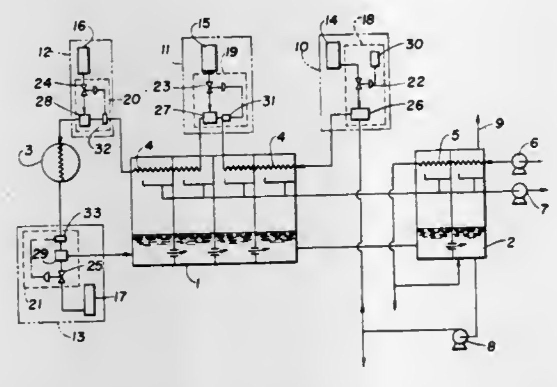
Junichi Sakuma, and Shigeo Takahashi, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1971, Ser. No. 104,392

Claims priority, application Japan, July 11, 1970, 45-60766

Int. Cl.² C23F *14/00*

U.S. Cl. 203—7 **5 Claims**



1. A method for preventing the formation of scale during the operation of a saline water desalting apparatus of the type in which saline water is passed through a system of condenser and heater passages having heating surfaces, said method comprising periodically charging said saline water with an acid at predetermined time intervals, and thereafter passing the charged saline water into said system of passages at a point intermediate the ends of the passages, whereby alkali scale formed upon said heating surfaces is periodically dissolved and removed at a stage at which very fine nuclei of scale are being formed.

3,969,194
METHOD AND APPARATUS FOR THE PURIFICATION OF A LIQUID CONTAMINATED WITH RADIOACTIVE SUBSTANCES

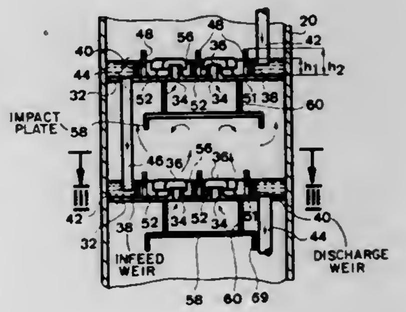
Hanns Mende, Bad Nauheim, Germany, assignor to Luwa AG, Zurich, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,806

Claims priority, application Switzerland, Oct. 30, 1973, 15242/73

Int. Cl.² B01D *3/00, 3/14, 1/26, 47/00*

U.S. Cl. 203—40 **7 Claims**



1. A method of purifying a liquid contaminated with radioactive substances, comprising the steps of: supplying the contaminated liquid into an evaporator with which there is connected a column having a multiplicity of superposed floors, generating vapors in the evaporator, providing a washing reflux liquid, substantially uniformly distributing the washing liquid at the floors, guiding the generated vapors through the washing liquid, said washing liquid flowing at each floor in substantially horizontal countercurrent direction with respect to the vapors, said washing liquid arriving at each floor from a region of lower radioactive concentration of the washing liquid from the superjacent floor and flowing to a region of higher radioactive concentration thereof in the subjacent lower floor, deflecting the washing liquid at each floor a number of times in such a manner that the washing liquid together with droplets entrained by and in the vapors are substantially uniformly admixed, impeding the flow of vapors in the vertical direction at each floor by confining the vapors above the liquid thereon to relatively close proximity with the liquid surface, controlling the flow of the vapors in horizontal direction along each floor so that at least a portion of the vapors flow towards the infeed region of lower radioactive concentration of the washing liquid on each floor, to thereby force at least a portion of the washing liquid and the droplets entrained by the vapors to move countercurrently in the direction of said region of lower radioactive concentration, the forced back droplets thus being intensively commingled with the washing liquid in order to increase the removal of the droplets entrained by the vapors into the washing liquid and to subject the washing liquid to an intensive substantially constant intake of the radioactive substances.

3,969,195
METHODS OF COATING AND SURFACE FINISHING ARTICLES MADE OF METALS AND THEIR ALLOYS

Richard Dötzer, and Klaus Stöger, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 249,279, May 1, 1972. This application Oct. 26, 1972, Ser. No. 300,906

Claims priority, application Germany, May 7, 1971, 2122610; Oct. 28, 1971, 2153831

Int. Cl.² C25D *1/00, 5/34, 5/44*

U.S. Cl. 204—14 N **11 Claims**

1. A process for electroplating a metal article comprising:
- a. eroding the surface of said article with finely-divided abrasive particles suspended in an anhydrous aprotic liquid; and

b. electroplating said article in an aprotic organo metal electroplating electrolyte free of water and molecular oxygen.

3,969,196
PROCESS FOR THE SEPARATION OF MIXTURES OF SUBSTANCES

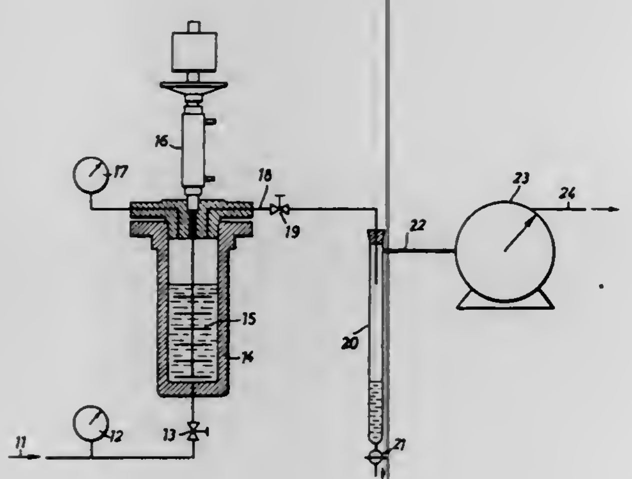
Kurt Zosel, Oberhausen-Rhineland, Germany, assignor to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Continuation of Ser. No. 359,680, April 14, 1964, abandoned. This application Dec. 9, 1969, Ser. No. 880,475

Claims priority, application Austria, Apr. 16, 1963, 3085/63; July 26, 1963, 6005/63; July 26, 1963, 6006/63; Aug. 7, 1963, 6366/63; Nov. 20, 1963, 9310/63; Dec. 18, 1963, 10203/63

Int. Cl.^{2} B01D *3/24;* C10G *21/14*

U.S. Cl. 203—49 24 Claims



1. The process of separating a mixture which is in liquid state or solid state or liquid and solid state composed of a plurality of compounds at least one of which contains an organic group which comprises:

a. contacting said mixture with a gas phase preferentially taking up said compound containing an organic group at the contacting conditions, said gas phase during said contacting being maintained under supercritical conditions of temperature and pressure such that the gas takes up at least a portion of said compound containing an organic group, the temperature being in a range in which the quantity of said compound containing an organic group taken up by said gas phase varies inversely with said temperature, and effecting said contacting in a manner so that this occurs, and so that there is a substantial gas component that is identifiable as a gaseous component, the critical temperature of said gas phase being in the range of 0°–200°C, the temperature of said gas phase during said contacting being within about 100°C above the critical temperature,

b. separating the gas phase in the form of said identifiable gaseous component loaded with said portion of the compound containing an organic group taken up during said contacting from any of the mixture not taken up by the gas phase while still maintaining supercritical conditions as aforesaid,

c. thereafter separating at least part of the compound containing an organic group taken up, from the gas phase.

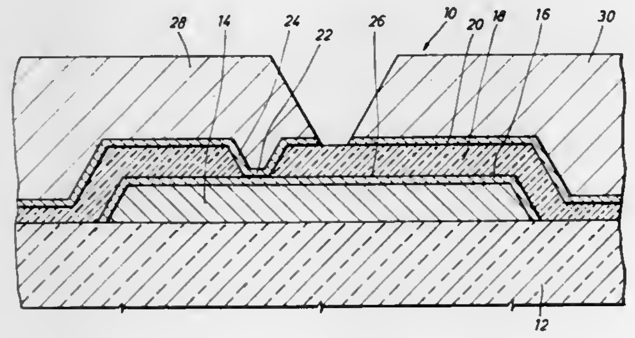
3,969,197
METHOD FOR FABRICATING A THIN FILM CAPACITOR

Neal Jay Tolar; Robert Curlee Hooper, both of Plano; Prabhakar Bhimrao Ghate, Dallas, and Clyde Rhea Fuller, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 8, 1974, Ser. No. 440,878

Int. Cl.^{2} C25D *5/02, 5/12*

U.S. Cl. 204—15 19 Claims



1. A method of fabricating a thin film capacitor for use as a component of a thin film circuit or for use in beam lead assembly as part of a hybrid circuit, said method comprising the steps of:

a. providing a capacitor substrate;
b. depositing on said substrate a thin film counter electrode;
c. patterning said thin film counter electrode;
d. depositing a first thin metallic film over said patterned counter electrode;
e. patterning said first thin metallic film;
f. depositing a dielectric film over said patterned metallic film;
g. selectively removing a portion of the dielectric film to provide a path for electrical contact to the bottom electrode; and
h. depositing a second thin metallic film over the dielectric film thereby establishing contact to the bottom electrode, the coefficient of expansion of said thin metallic films and said dielectric film being sufficiently close to prevent overstressing of said dielectric film as said capacitor is heated and cooled, and patterning said second thin metallic film to provide first and second terminals for said capacitor.

3,969,198
NI-FE ELECTRO-PLATING

Malcolm John Law, Dorking, and Peter James Hutchinson, Langley, both of England, assignors to Permalite Chemicals Ltd., Middlesex, England

Filed Jan. 9, 1975, Ser. No. 540,036

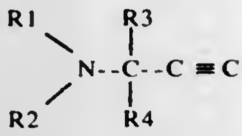
Int. Cl.^{2} C25D *3/56*

U.S. Cl. 204—43 T 3 Claims

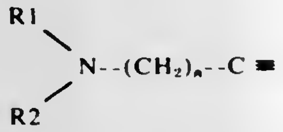
1. An electrolyte having a pH value not exceeding 3.8 for electroplating a base with nickel iron (Ni-Fe) alloy containing 22 to 30% iron comprising an aqueous solution of:

A. nickel sulphate 60 to 110 grams/liter;
B. nickel chloride 60 to 110 grams/liter;
C. boric acid 30 to 45 grams/liter;
D. 8 to 16 grams/liter of a ferrous salt;
E. 10 to 30 grams/liter of an alkali metal fluoborate;
F. an amount effective to yield a bright nickel-iron coating of at least one compound selected from the group consisting of
1. unsaturated aliphatic sulphonic acids, and the alkali metal, ammonium, magnesium, and nickel salts thereof;
2. mononuclear aromatic sulphonic acids and the alkali metal, ammonium, magnesium and nickel salts thereof;
3. monuclear aromatic sulphonamides and sulphonimides;
4. binuclear aromatic sulphonic acids and alkali metal, ammonium, magnesium and nickel salts thereof; and

5. heterocyclic sulphonic acids and alkali metal, ammonium, magnesium and nickel salts thereof;
G. 0.001 to 0.2 grams/liter of a hydrochloride of an amino compound having either of the following formulae:



$$R1R2N\text{--}C(R3)(R4)\text{--}C\equiv CH \qquad (1)$$



$$R1R2N\text{--}(CH_2)_n\text{--}C\equiv CH \qquad (2)$$

wherein R1 is alkyl, alkenyl, alkynyl, hydroxy alkyl, alkoxy, alkoxy alkyl, aryl, aralkyl, alkaryl, cycoalkyl, cycloalkenyl, or heterocyclic; R2 is methyl, ethyl, propyl, butyl, alkenyl, alkynyl, hydroxyalkyl, alkoxy, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl or heterocyclic; or where R1 and R2 are joined so that the nitrogen is part of a heterocyclic ring structure; R3 is hydrogen or a methyl or ethyl group, and R4 is hydrogen or an alkyl group containing 1 to 6 carbon atoms providing that if there are more than 2 carbon atoms in R4, R3 is hydrogen; and n is 1, 2 or 3; and

H. a minor proportion effective to prevent oxidation of the ferrous ion to the ferric state of a compound selected from the group consisting of sodium bisulphite, sodium benzene sulphinate and sodium para-toluene sulphinate.

3,969,199
COATING ALUMINUM WITH A STRIPPABLE COPPER DEPOSIT

Betty L. Berdan, and Betty M. Luce, both of Willowick, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed July 7, 1975, Ser. No. 593,894

Int. Cl.^{2} C25D *5/44, 1/00*

U.S. Cl. 204—33 13 Claims

1. A method of electroplating an aluminum carrier with a mechanically strippable copper electroplate, which method comprises providing said carrier with a coating by contacting said carrier with an aqueous, alkaline solution of alkali metal zincate containing at least about 0.25 g/l of a water soluble salt of a metal selected from the group consisting of iron, cobalt, nickel and mixtures thereof, and a complexing agent for the metal ions introduced as said water soluble salt,

contacting said coated carrier with an acid to remove substantially all of said coating, and

electroplating copper on the treated surfaces of said carrier.

3,969,200
MANUFACTURE OF PROPIOLIC ACID

Heinz Nohe, Meckenheim; Peter Jaeger, Ludwigshafen, both of Germany, and BASF Aktiengesellschaft, 03, Ludwigshafen, Rhine, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 14, 1975, Ser. No. 549,912

Claims priority, application Germany, Feb. 26, 1974, 2409117

Int. Cl.^{2} C25B *3/02, 11/10, 11/16*

U.S. Cl. 204—79 7 Claims

1. A process for the manufacture of propiolic acid by anodic oxidation of propargyl alcohol in aqueous sulfuric acid solution at a temperature not exceeding 40°C, wherein one or more lead dioxide/titanium composite electrodes are used as anodes and the propiolic acid is extracted from the aqueous sulfuric acid electrolyte with a straight-chain aliphatic ether which contains three oxygen atoms and boils above propiolic acid.

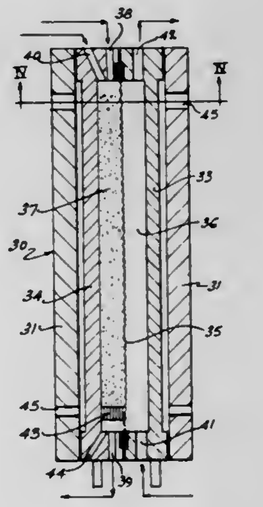
3,969,201
ELECTROLYTIC PRODUCTION OF ALKALINE PEROXIDE SOLUTIONS

Colin William Oloman, and Alan Paul Watkinson, both of Vancouver, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 13, 1975, Ser. No. 540,533

Int. Cl.^{2} C25B *1/30*

U.S. Cl. 204—83 16 Claims



1. A process for producing an alkaline peroxidecontaining solution by the electrolysis of an alkaline electrolyte in an electrolytic cell, which comprises passing an aqueous alkaline electrolyte and oxygen simultaneously in a direction normal to the electric current, through a fluid permeable conductive mass forming a cathode bed in said cell, said bed being separated from the anode by a barrier wall, whereby alkaline peroxide is generated in the solution within the cathode bed by reaction between the aqueous alkaline electrolyte and oxygen on the surfaces of the fluid permeable conductive mass forming the cathode bed.

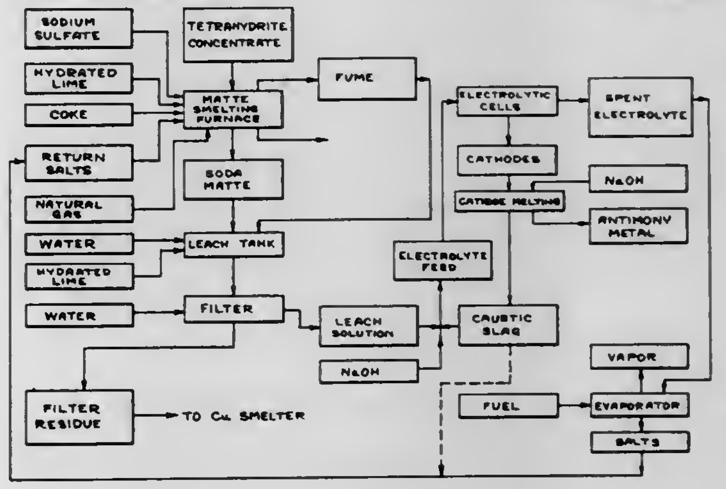
3,969,202
PROCESS FOR THE RECOVERY OF ANTIMONY VALUES FROM ORES CONTAINING SULFO-ANTIMONY COMPOUNDS OF COPPER, AND ARSENIC

Adrian E. Albrethsen, Somerville; Max L. Hollander, Plainfield, both of N.J., and William H. Wetherill, Staten Island, N.Y., assignors to Asarco Incorporated, New York, N.Y.

Filed June 2, 1975, Ser. No. 582,954

Int. Cl.^{2} C25C *1/22*

U.S. Cl. 204—105 R 27 Claims



1. A process for recovery of antimony values from a material containing a sulfo-antimony compound of copper and arsenic which comprises:

a. smelting a charge comprising the material containing the sulfo-antimony compound of copper and arsenic, sodium sulfide, calcium values supplied as lime and/or limestone, and a reducing agent for a period sufficient to convert at least a major portion of the antimony to a water-soluble sodium compound of antimony and sulfur and convert at least a major portion of the arsenic to at least one water-insoluble calcium compound of arsenic and oxygen;

b. the sodium sulfide being incorporated in the charge for the smelting in an amount sufficient to convert at least a major portion of the antimony to the water-soluble sodium compound of antimony and sulfur, and the calcium values being incorporated into the smelting charge in an amount sufficient to convert at least a major portion of the arsenic to the water-insoluble calcium compound of arsenic and oxygen;

c. leaching an alkaline matte obtained from the smelting of (a) containing the water-soluble sodium compound of antimony and sulfur and the water-insoluble calcium compound of arsenic and oxygen with an aqueous liquid to dissolve the soluble sodium compound of antimony and sulfur to the substantial exclusion of the calcium compound of arsenic and oxygen and a water-insoluble sulfur compound of copper; and

d. separating an aqueous leach solution containing the soluble sodium compound of antimony and sulfur from an insoluble leach residue containing the insoluble calcium compound of arsenic and the insoluble sulfur compound of copper.

3,969,203
WASTE WATER TREATMENT

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Feb. 19, 1974, Ser. No. 443,613
Int. Cl.^{2} C25F *1/00;* C25B *1/04*

U.S. Cl. 204—149 **11 Claims**

1. A method of treating industrial waste water containing about 0.1% to about 5% by volume of oily material for the removal of organic and oily material therein which comprises exposing said waste water to impressed current by means of a plurality of spaced apart ferrosilicon alloy electrodes, said waste water containing about 10 to about 10,000 ppm of coagulant, some of which would normally deposit on the cathode, impressing direct current with a constant voltage of between about 10 to about 20 volts on a circuit including said electrodes thereby causing microbubbles to be formed in an amount in excess of 10^5 microbubbles per liter and having an average size of about 200 microns or less which carry the oily material to the surface, and periodically reversing the current in said circuit often enough so that the size of the microbubbles does not exceed about 200 microns and whereby the electrodes are kept essentially clean from deposition of a coagulant.

3,969,204
METHOD FOR SEPARATING GASEOUS MIXTURES OF ISOTOPES

Hans-Joachim Neimann; Eberhard Schuster, and Arno Kersting, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

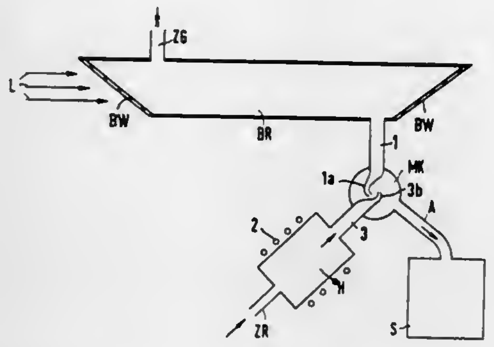
Filed June 9, 1975, Ser. No. 585,058

Claims priority, application Germany, June 14, 1974, 2428577

Int. Cl.^{2} B01J *1/10;* B01K *1/00*

U.S. Cl. 204—157.1 R **2 Claims**

1. A method for chemically separating isotopes from a mixture of gaseous matter formed by mixed isotopes, by a chemical reaction partner, by a reaction directed by a light beam projected through the mixture with the light beam having a narrow band of wave lengths molecularly exciting mainly the isotope to be separated and thereby promoting its reaction with the reaction partner, and molecularly exciting the reaction partner with addition energy to a degree substantially reducing the energy of the laser beam required to promote said reaction in the absence of the addition of the energy to the reaction partner; wherein the improvement comprises maintaining said mixed isotopes and said partner physically separated from each other during the exciting of each, and prior to loss of their excited states mixing them together to cause said reaction.



3,969,205
PROCESS FOR PRODUCING 2-CHLOROPYRIDINE

Masao Kawamura, Akashi; Tadaaki Nishi, Kakogawa, and Syuzi Takagi, Akashi, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

Filed Dec. 6, 1974, Ser. No. 530,563
Claims priority, application Japan, Dec. 8, 1973, 48-139851
Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—158 HA **15 Claims**

1. A process for producing 2-chloropyridine by reaction of pyridine with chlorine in a molar ratio of pyridine to chlorine of 0.5 – 10 : 1 under irradiation of photolytic light of 2,000 to 5,000 A using at least 0.5 moles of halogenated hydrocarbon as a diluent per one mole of pyridine, an improvement comprising carrying out the reaction in the presence of at least 0.2 moles of water per mole of pyridine.

3,969,206
PROCESS FOR STABILIZATION OF ULTRAVIOLET LIGHT CURABLE UNSATURATED POLYESTER RESIN MIXTURE

Lodewijk Roskott, Gorssel, and Arnoldus Adrianus Maria Groenendaal, Vorden, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed June 18, 1973, Ser. No. 370,671

Claims priority, application Netherlands, June 20, 1972, 7208381

Int. Cl.^{2} C08G *63/02;* C08K *67/06, 5/04;* C08F *8/00*

U.S. Cl. 204—159.15 **26 Claims**

1. A process for stabilizing a composition curable by ultraviolet light consisting essentially of an unsaturated polyester resin which is a mixture of an unsaturated polyester resin obtained by condensation of a polyhydric alcohol and and α, β unsaturated dibasic carboxylic acid and at least one polymerizable ethylenically unsaturated monomer and as photosensitizer a benzoin compound comprising

incorporating into said composition a stabilizing amount of methyl p-benzoquinone.

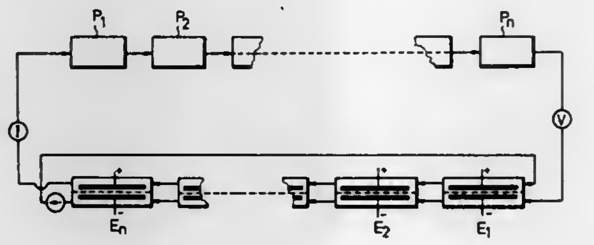
3,969,207
METHOD FOR THE CYCLIC ELECTROCHEMICAL PROCESSING OF SULFURIC ACID-CONTAINING PICKLE WASTE LIQUORS

József Kerti; Andor Mándoki, both of Budapest, and Miklós Széky, Salgotarjan, all of Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Mar. 5, 1975, Ser. No. 555,430
Int. Cl.^{2} C25F *7/02*

U.S. Cl. 204—180 P **4 Claims**

1. A process for the cyclic electrochemical processing of pickle waste liquors containing a maximum of 100 g. of sulfuric acid and a minimum of 25 g. of iron ions per liter, by the electrochemical decomposition of iron sulfate and the electrodialytic separation of the acid and sulfate salt components of the pickle waste liquor, in which the ammonium, magnesium or alkali metal sulfate concentration of the waste liquor is adjusted to 0.5 to 1.0 mol./l. by introducing an ammonium, magnesium or alkali-metal salt, and the acid content of the waste liquor is reduced to a value not exceeding 100 g. of sulfuric acid/liter, then the waste liquor is fed into and passed as catholyte through the cathode chambers of a series of dual electrolytic cells with diaphragms, whereupon the iron content of the waste liquor is reduced to a value of 7 to 15 g. of Fe^{2+}/liter, thereafter the waste liquor is fed into and passed as anolyte through the anode chambers of said electrolytic cells in parallel with the cathode flow, and a current density of 15 to 22 A/dm^2. of diaphragm surface and an electrolysis temperature of 70 to 90°C is maintained in said cells.



3,969,208
ULTRASONIC APPARATUS

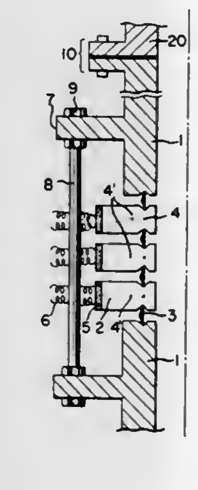
Setsuya Isshiki; Tetsuo Shiromizu; Hiroto Oshima, all of Tokyo; Kozo Okada, Nagoya; Kiyoshi Kazunaga, and Eiji Mori, both of Tokyo, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo; NGK Spark Plug Co., Ltd., Nagoya and Seidensha Electronics Co., Ltd., Tokyo, all of, Japan

Filed Apr. 8, 1974, Ser. No. 458,971

Claims priority, application Japan, Apr. 13, 1973, 48-041428; Apr. 13, 1973, 48-041429

Int. Cl.^{2} B01J *1/12*

U.S. Cl. 204—193 **15 Claims**



1. An ultrasonic apparatus of substantially tubular form for transmitting ultrasonic waves to a fluid contained therein, comprising:

a container of tubular form including a pair of axially spaced annular wall segments;

at least one ring-shaped metallic resonator, spaced coaxially between said container segments, and means including an ultrasonic wave transducing element on the radially outer edge of each said resonator for oscillating ultrasonic waves to the interior of said container radially through said resonator;

a ring-shaped metal ultrasonic wave transfer preventive member at each end of said resonator, each said preventive member having an axially pointed cross section end pressed in tight line contact against the opposed end of said resonator at a nodal portion of the ultrasonic waves transferred by said resonator, and means pressing at least one said ring-shaped resonator and a pair of said preventative members contacting opposite ends of said resonator in an axially extending stack between the ends of said spaced container segments for continuing the central opening of said tubular container therethrough;

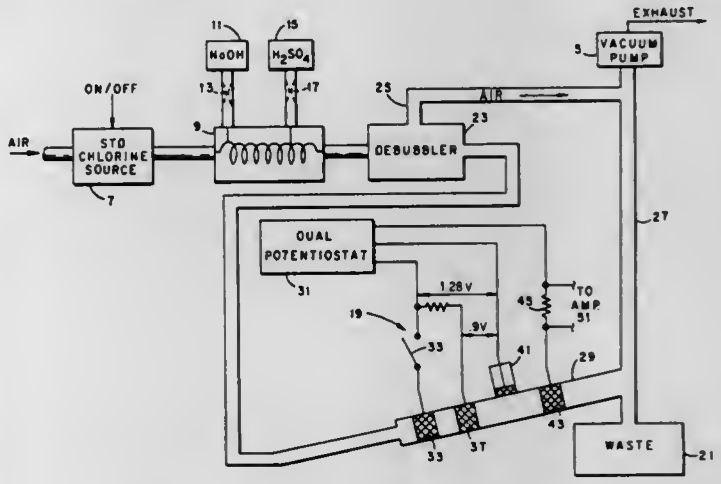
whereby said preventative members limit loss of ultrasonic energy to said container segments and act as seals to prevent radial outward loss of a fluid medium from said container.

3,969,209
AUTOMATIC ELECTROCHEMICAL AMBIENT AIR MONITOR FOR CHLORIDE AND CHLORINE

Theodore R. Mueller, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,164
Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—195 R **6 Claims**



1. A system for electrochemical monitoring of the chlorine and/or chloride level in atmospheric air mixed with a flowing electrolyte, comprising:

a flow-through electrochemical cell disposed to receive said flowing electrolyte including a conditioning electrode disposed in said cell for contacting said flowing electrolyte entering said cell, an analytical electrode disposed to contact said flowing electrolyte downstream of said conditioning electrode, a reference electrode disposed to contact said flowing electrolyte downstream of said analytical electrode, and a counter electrode disposed to contact said flowing electrolyte downstream of said reference electrode;

an absorber connected in fluid communication with the flow-receiving end of said cell;

means connected in fluid communication with said absorber for introducing said electrolyte into said absorber at a predetermined flow rate;

means for selectively introducing air at a controlled flow rate into said absorber wherein the chlorine and/or chloride content is sorbed by said electrolyte;

a standard chlorine source disposed to generate and introduce upon command chlorine gas at a predetermined rate into the air flow upstream of said absorber;

means connected to said electrodes for applying a positive direct voltage between said reference electrode and said analytical electrode to effect reduction of chlorine sorbed in said electrolyte flowing through said cell and selectively applying upon command a greater positive voltage between said reference electrode and said conditioning electrode to provide oxidation of chloride sorbed in said electrolyte flowing through said cell which is subsequently reduced to chlorine at said analytical electrode; and

process control means responsive to a repeating programmed schedule for controlling the introduction of chlorine gas from said standard chlorine source selectively actuating said conditioning electrode and sensing the reduction currents flowing through said counter electrode indicative of the chlorine concentration in said cell for different periods when said chlorine source is "on" and "off" and said conditioning electrode is activated or inactivated to separately determine and indicate the chlorine and/or chloride level content in the air introduced into said system.

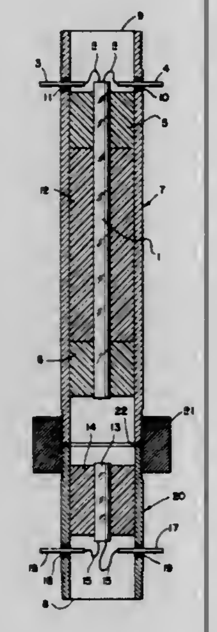
3,969,210
APPARATUS FOR WATER DETERMINATION

Gustav Bergson, Cedarbrook Hill Apts. 11 Apt. B-117, Wyncote, Pa. 19095

Filed Apr. 21, 1975, Ser. No. 569,868

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—195 W **8 Claims**



1. An electrolytic cell comprising a first hollow element adapted to pass sample fluid and containing electrodes bridged by a hygroscopic material and a second, separate, hollow element adapted to pass sample fluid and containing electrodes bridged by a hygroscopic material in series of a further point from the standpoint of the passage of the fluid with the first element, the length of the first element being at most one-third of the length of the second element.

3,969,211
CONTINUOUS APPARATUS FOR ELECTROLYTIC TREATMENT ON A LONG STRUCTURE OF ALUMINUM OR ITS ALLOYS

Hiroshi Watanabe; Isao Shimamura, both of Hiratsuka; Norio Murohushi, Yamakita; Masao Abe, Yokohama; Yoshio Ando, and Masaaki Takahashi, both of Tokyo, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

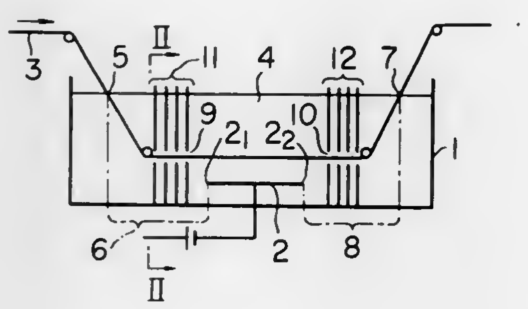
Filed June 3, 1975, Ser. No. 583,393

Claims priority, application Japan, June 8, 1974, 49-65330

Int. Cl.^{2} C25D *11/02, 11/04*

U.S. Cl. 204—211 **13 Claims**

1. In an apparatus for continuous electrolytical treatment of a long structure of aluminum or an alloy thereof including an electrolytic cell, an electrolytic treating solution contained therein, and an electrode, said electrode and said structure constituting an electric circuit and supplied with an electric potential, the improvement which further comprises electric field buffer means having a through opening therein for passage of said structure therethrough and being disposed at least in one zone between a position where said structure is introduced into the solution and one edge of said electrode facing said position.



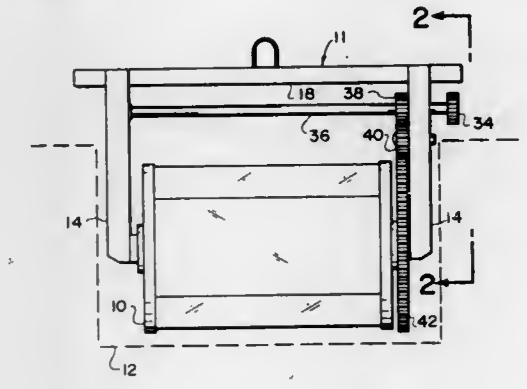
3,969,212
REINFORCED HANGER BRACKET FOR ELECTROPLATING BARREL AND METHOD OF REINFORCING A PLASTIC BAR

Albert Singleton, Middleburg Heights, and Carel H. Neffenger, Elyria, both of Ohio, assignors to The Albert Singleton Corporation, Cleveland, Ohio

Filed Apr. 3, 1975, Ser. No. 564,809

Int. Cl.^{2} C25D *17/06, 17/20;* B29D *3/00;* B01F *9/00*

U.S. Cl. 204—213 **17 Claims**



1. An improved hanger bracket for supporting a rotatable barrel within a fluid treatment tank wherein the bracket is connected to the barrel by means for allowing the barrel to rotate relative to the bracket about an axis passing through the bracket and to a barrel support frame which in turn may be supported on the tank,

said bracket being constructed of a resin material having encased therein, in fluid tight arrangement, a metal strip to strengthen the bracket against bending, said strip having a width W, a thickness T, and a length L, the improvement comprising,

said bracket being curved inward from its connection with the frame toward its connection with the barrel to compensate for changes in barrel length due to thermal expansion and contraction of the barrel.

3,969,213
ALUMINUM ELECTROLYTIC CELLS

Shoji Yamamoto; Masahiko Eki, and Kimihiko Kato, all of Tomakomai, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Oct. 25, 1974, Ser. No. 517,968

Claims priority, application Japan, Oct. 26, 1973, 48-119977

Int. Cl.^{2} C25C *3/06, 3/16*

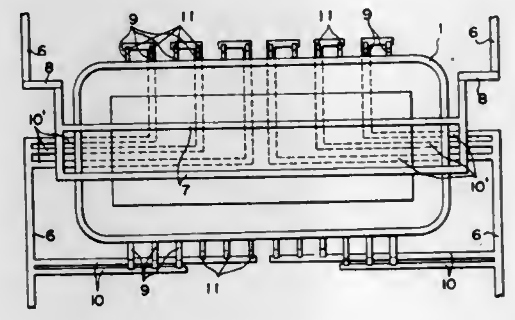
U.S. Cl. 204—244 **5 Claims**

1. In a potline having a plurality of electrolytic cells for the reduction of aluminum, each cell having a rectangular potshell adapted to be arranged with other similar potshells in serially electrically connected side by side relationship to make a row of electrolytic cells wherein the lengthwise axis of each potshell is arranged generally perpendicularly to the row of cells, each potshell having an electrically conductive cathode potlining and a plurality of cathode collector elements extending generally normal to the lengthwise potshell axis in electrical engagement with said potlining with their ends projecting exteriorly of said potshell, and a current carrying bus structure disposed exteriorly of said potshell for carrying current from its cathode collector elements to the anode of the next downstream cell in said row of cells, said bus structure including pluralities of upstream and downstream cathode bus bars connected to the corresponding ends of said cathode collector elements, anode bus bars connected to the anode, and line bus bars connecting the cathode bus bars of one potshell in series to the anode bus bars of the next potshell, the improvement wherein said line bus bars at their cathode ends at least in the vicinity of each potshell extend along the opposite ends of the potshell outside its confines to connect with the ends of two opposed groups of upstream cathode bus bars, the bus bars in said groups including

a. transverse sections extending perpendicularly of the lengthwise potshell axis spaced intervals along said axis, each such transverse section being connected to the upstream end of at least one cathode collector bar, and

b. longitudinal sections stretching outwardly to the potshell ends in opposite directions beneath the potshell generally parallel to the lengthwise potshell axis, with the longitudinal sections in each group having their inward ends terminating at spaced apart points beneath said potshell connecting with the corresponding transverse sections,

and said downstream cathode bus bars extend in oppositely directed groups generally parallel to the lengthwise potshell axis adjacent to and exteriorly of the downstream side of said potshell, each such downstream cathode bus bar being connected between one of said line bus bars and the downstream ends of a group of said cathode collector bars.



3,969,214
PERMANENT MAGNET HYDROGEN OXYGEN GENERATING CELLS

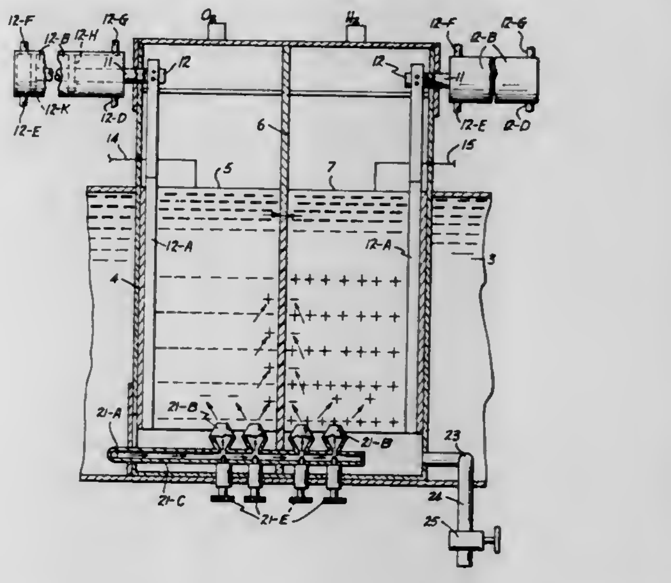
Mack Harris, 3005 Cumberland, Little Rock, Ark. 72206

Filed May 31, 1973, Ser. No. 359,550

Int. Cl.^{2} C25B *1/02, 1/04, 1/10, 9/00*

U.S. Cl. 204—275 **13 Claims**

1. A gas generating device comprising:
a. a cell;
b. first and second electrodes disposed within said cell, said electrodes being electrically connected;
c. means for producing magnetic flux within said cell, said flux acting substantially along a single direction;
d. a mixing chamber having a first input port for feeding sulfuric acid thereto and a second input port for feeding water thereto;
e. said mixing chamber having an interior portion for receiving said sulfuric acid and water from said first and second ports respectively;
f. said mixing chamber having an outlet port in communication with said cell for releasing the resultant mixture into said cell, and
g. said mixing chamber being oriented for releasing said resultant mixture in a direction substantially perpendicular to the direction of said magnetic flux whereby the ions emanating from said mixing chamber are urged toward said first and second electrodes.



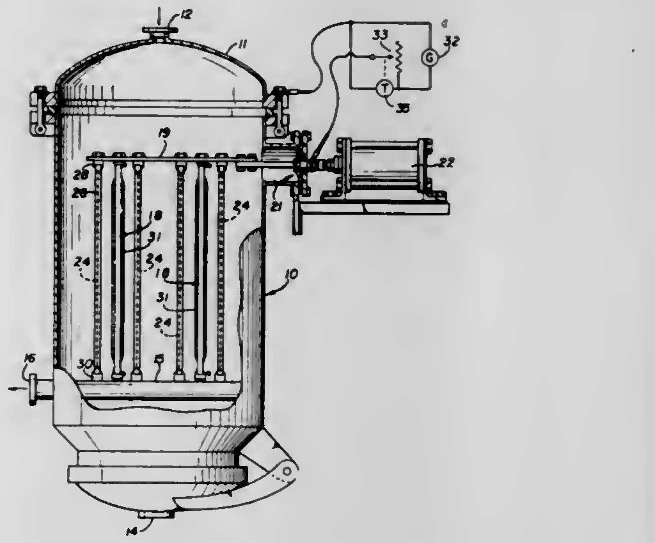
3,969,215
PROCESS AND APPARATUS FOR REMOVING METALLIC IONS FROM AN ELECTROLYTIC SOLUTION

James F. Zievers, La Grange, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Division of Ser. No. 445,544, Feb. 25, 1974, Pat. No. 3,896,013. This application Jan. 8, 1975, Ser. No. 539,399

Int. Cl.^{2} B01K *1/00;* C25B *9/00, 9/02*

U.S. Cl. 204—276 **4 Claims**



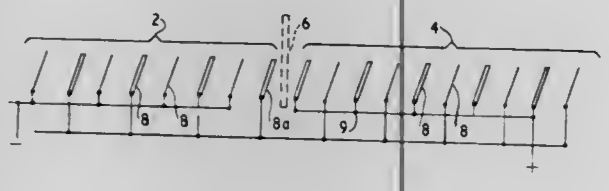
1. Liquid treating apparatus for removing metal ions from a liquid solution, comprising
tank means having a pressure chamber therein,
a first member having a cavity therein and mounted in said chamber,
said first member having a foraminous outer surface separating said cavity from said chamber,
a porous cake of carbon particles deposited on the outside of said foraminous surface,
a second member mounted in said chamber in spaced relationship with said cake,
means for maintaining a potential difference between said members to establish an electric field through said cake,
a liquid inlet through which said liquid solution is supplied to said chamber, and
a liquid outlet connected to said cavity for carrying the treated liquid from said tank,
whereby as said liquid passes through said cake into said cavity metal ions are deposited on the interior surfaces of said cake.

3,969,216

FLOTATION SEPARATION

Doreen Veronica Barrett, Hill View, Davenport Road, Heswall, Merseyside, England

Filed Dec. 27, 1974, Ser. No. 536,765
Int. Cl.² C25B *9/00, 9/02*
U.S. Cl. 204—286 **12 Claims**



1. A rigid electrode grid structure assembly which includes:
- a. a plurality of anodes composed of elongated metal members,
- b. a plurality of cathodes composed of elongated metal members,
- c. said anodes being alternately arranged in a spaced apart substantially parallel relationship with one another,
- d. a first electrically conductive member and a second electrically conductive member, said members being disposed in a spaced apart parallel relationship with each other, both members being disposed transversely with respect to said anodes and cathodes,
- e. means for joining at least some of said anodes to said first electrically conductive member,
- f. means for joining at least some of said cathodes to said second electrically conductive member,
- g. a first electrical insulating member located adjacent said first electrically conductive member and being disposed so as to separate said first electrically conductive member and the anodes joined to it from the ends of the cathodes, which are not attached to said first electrically conductive member,
- h. a second electrical insulating member located adjacent said second electrically conductive member and being disposed so as to separate said second electrically conductive member and the cathodes joined to it from the ends of the anodes, which are not attached to said second electrically conductive member,
- i. a first mass of water-resistant synthetic resin material surrounding said first electrically conductive member, said first insulating member and the ends of the anodes and cathodes located adjacent these members, and a second mass of water-resistant synthetic resin material surrounding said second electrically conductive member, said second insulating member and the ends of the anodes and cathodes located adjacent these members, said first and second masses serving to form the entire assembly of cathodes, anodes, conductive members and insulating members into a rigid electrode grid structure, and
- j. means to supply electrical power to said first and second electrically conducting members.

3,969,217

ELECTROLYTIC ANODE

Tilak V. Bommaraju, and Donald E. Stephens, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 7, 1974, Ser. No. 513,009
Int. Cl.² C25B *11/06, 1/34, 10/10*
U.S. Cl. 204—290 F **11 Claims**

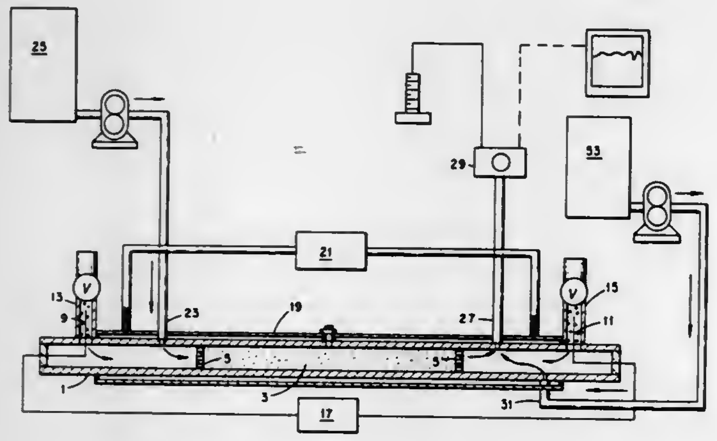
1. An electrode which comprises an electrically conductive substrate having adhered thereto and extending over at least a portion of the surface thereof, a coating of mixed oxides comprising about 10 to about 80 mole percent indium oxide, and about 10 to about 90 mole percent of a platinum group metal oxide.

3,969,218

ELUTION ELECTROPHORESIS

Charles D. Scott, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 548,941
Int. Cl.² G01N *27/26, 27/28*
U.S. Cl. 204—299 R **3 Claims**



1. An apparatus for separating macromolecules, comprising:
- a column packed with a particulate anticonvective medium;
- sample introduction means communicating with a central portion of said column;
- electrode means for applying an emf across the length of said column and positioned adjacent the extremities of said column;
- eluent introduction means at one end of said column;
- eluate extraction means at the other end of said column;
- flow balancing means positioned downstream from said eluate extraction means for preventing samples from flowing past said eluate extraction means;
- an eluent source communicating with said balancing means; and means for detecting separated molecules communicating with said extraction means.

3,969,219

ZINC OR CADMIUM ELECTROPLATING BRIGHTENER COMPOSITIONS AND PROCESS

John C. Kosmos, Hasbrouck Heights, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,247
Int. Cl.² C25D *3/24, 3/28*
U.S. Cl. 204—50 Y **12 Claims**

1. In a process for bright plating of zinc or cadmium from aqueous alkaline cyanide electroplating baths, the improvement which comprises adding to said baths an aqueous composition containing, in parts by weight:

Sodium lignin sulfonate	1.1–4.8
Veratraldehyde	1.0
Vanillin	0.1–2.5
Corn syrup or glucose	1.7–5.0
Niacinamide	0.007–0.14

and a molar equivalent amount of sodium bisulfite equal to the total molar equivalent amount of the vanillin and veratraldehyde.

7. An electroplating brightener composition for addition to zinc or cadmium alkaline cyanide electroplating baths comprising an aqueous solution containing, in parts by weight:

Sodium lignin sulfonate	1.1–4.8
Veratraldehyde	1.0
Vanillin	0.1–2.5
Corn syrup or glucose	1.7–5.0
Niacinamide	0.007–0.14

and a molar equivalent amount of sodium bisulfite equal to the total molar equivalent amount of the vanillin and veratraldehyde.

3,969,220

AERATING TAR SANDS-WATER MIXTURE PRIOR TO SETTLING IN A GRAVITY SETTLING ZONE

Joseph C. Anderson, Fort McMurray, and H. James Davitt, Edmonton, both of Canada, assignors to Great Canadian Oil Sands Limited, Toronto, Canada and Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 16, 1974, Ser. No. 506,371
Int. Cl.² C10G *1/04*
U.S. Cl. 208—11 LE **1 Claim**

1. An improved process for the recovery of bitumen from tar sands comprising:
- a. forming a mixture of tar sands and water at a temperature in the range of 130° to 210°F. including that of the hereinafter specified recycle stream of aerated bitumen-rich middlings material; said mixture containing 0.2 to 3.0 pounds of water per pound of tar sands;
- b. settling the mixture in a separation zone to form an upper bitumen froth layer, a middlings layer containing water, silt, clay, and bitumen, and a sand tailings layer;
- c. separately removing the bitumen froth layer and the sand tailings layer;
- d. passing a stream of middlings layer into an air scavenger zone and therein aerating said stream to provide additional bitumen froth;
- e. recovering the froth from the scavenger zone;
- f. passing a second bitumen-rich middlings stream to an aeration zone and mixing air into the middlings stream in said aeration zone and
- g. admixing the aerated bitumen-rich middlings from said aeration zone with the mixture of step (a).

3,969,221

IRIDIUM-CONTAINING CATALYSTS

Howard Lee Mitchell, III, and James Richard Hays, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 4, 1974, Ser. No. 430,775
Int. Cl.² C10G *35/08;* **B01J** *27/02*
U.S. Cl. 208—139 **27 Claims**

1. A catalyst suitable for conversion of hydrocarbons comprising a composite of a porous inorganic oxide support, platinum in concentration ranging from about 0.05 to about 3 percent, iridium in concentration ranging from about 0.05 to about 3 percent, silver in concentration ranging from about 0.005 to about 5 percent, and sulfur in concentration ranging from about 0.001 to about 2 percent, based on the total weight of the catalyst, the atom ratio of the platinum:iridium ranging from about 0.25:1 to about 5:1, and the atom ratio of iridium:silver ranging from about 10:1 to about 1:12.

3,969,222

HYDROGENATION AND HYDRODESULFURIZATION OF HYDROCARBON DISTILLATE WITH A CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 443,046, Feb. 15, 1974, Pat. No. 3,900,386, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, and a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,954
Int. Cl.² C10G *23/04*
U.S. Cl. 208—210 **4 Claims**

1. A hydroprocess for saturating diolefinic and monoolefinic hydrocarbons and for desulfurizing sulfurous compounds present in a hydrocarbon distillate fraction containing aromatic hydrocarbons, said process comprising:
- a. contacting said distillate in a first reaction zone with hydrogen and with a first catalytic composite comprising (1) platinum or palladium metal, (2) iridium metal, (3) a germanium component wherein the germanium is present in an oxidation state above that of the elemental metal, (4) an alkali metal or alkaline earth metal, and (5) porous alumina carrier, said contacting being carried out to selectively hydrogenate said diolefinic hydrocarbons to monoolefinic hydrocarbons;
- b. passing the first stage effluent to a second reaction zone and contacting said effluent with a second catalytic composite comprising (1) platinum or palladium metal, (2) iridium metal, (3) a germanium component wherein the germanium is present in an oxidation state above that of the elemental metal and (4) alumina, said contacting being carried out to hydrogenate the monoolefinic hydrocarbons and to convert the sulfurous components into hydrogen sulfide and hydrocarbons, and
- c. separating a desulfurized hydrocarbon distillate from said second reaction zone containing said aromatic hydrocarbons therein.

3,969,223

OLEFIN SEPARATION PROCESS

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 423,599, Dec. 10, 1973, abandoned, which is a division of Ser. No. 317,861, Dec. 22, 1972, Pat. No. 3,929,669. This application Dec. 11, 1974, Ser. No. 531,656
Int. Cl.² C10G *25/04*
U.S. Cl. 208—310 Z **6 Claims**

1. In a process for the separation of olefins from a hydrocarbon feed mixture comprising olefins from a hydrocarbon feed mixture comprising olefins and saturates, which process comprises the steps of:
- a. contacting said feed mixture with a bed of zeolite adsorbent at adsorption conditions to effect the selective adsorption of said olefins by said adsorbent;
- b. withdrawing from said bed of adsorbent a raffinate stream comprising less selectively adsorbed saturates;
- c. contacting the adsorbent bed with a desorbent material at desorption conditions to effect desorption of said olefins from said adsorbent; and,
- d. withdrawing a stream containing olefins and desorbent material from said bed of adsorbent; THE IMPROVEMENT WHICH COMPRISES employing a zeolite adsorbent prepared by the steps of:
- i. contacting a precursor mass comprising an X structured zeolite, and an amorphous binder selected from the group consisting of silica, alumina, and silica-alumina, and having a Na_2O/Al_2O_3 ratio of less than about 0.7 with an aqueous sodium hydroxide solution at ion exchange conditions for 0.5 to 5 hours to increase the sodium cation content to a $Na_2O/Al\ 2O_3$ ratio of greater than about 0.7

and to remove from about 1 to about 15 wt. % of SiO_2 and Al_2O_3 from the precursor mass;
- ii. washing said mass with water maintained at a pH within the range of 7 to 10 to remove therefrom excess sodium hydroxide; and,
- iii. at least partially dehydrating said meass at dehydrating conditions.

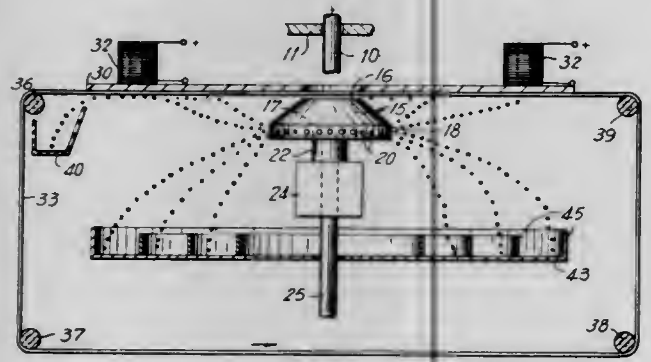
3,969,224
METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIAL

Thomas A. Cerbo, Carlstadt, N.J., assignor to Potters Industries Inc., Carlstadt, N.J.

Filed May 22, 1974, Ser. No. 472,503

Int. Cl.² B07B *13/10*

U.S. Cl. 209—12 **7 Claims**



1. A method for separating particles of different physical characteristics, comprising the steps of:
- directing a supply of particles having different masses and magnetic characteristics into a rotary receptacle, the receptacle including an upstanding side wall which defines a series of apertures;
- continuously rotating the receptacle at a speed sufficient to centrifugally project the particles through the apertures;
- subjecting the projected particles to a magnetic field, the magnetic field drawing the particles having magnetic characteristics upwardly away from the remaining particles;
- magnetically attracting the thus separated particles onto a continuously moving carrier to withdraw the separated particles from the vicinity of the receptacle;
- the rotary receptacle projecting the remaining particles over different distances proportional to their masses; and
- collecting successive mass gradations of said remaining particles.

3,969,225
DIFFERENTIAL SEPARATION OF PARTICULATES BY COMBINED ELECTRO-STATIC AND RADIO FREQUENCY MEANS

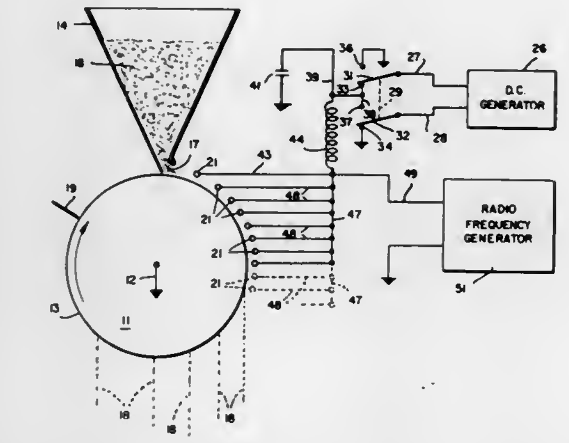
Arnold S. Horowitz, Scarsdale, N.Y., assignor to I. Jordan Kunik, New York, N.Y., a part interest

Continuation-in-part of Ser. No. 457,981, April 4, 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,548

Int. Cl.² B03C *7/00*

U.S. Cl. 209—127 A **13 Claims**

1. The method for selectively separating different homogeneous types of particulate materials from a random heterogeneous mixture of two or more of said homogeneous types of materials where the combination dielectric constant and loss factor of each homogeneous type of material is different from that of the other homogeneous types of material in said mixture, which comprises placing a mass of said heterogeneous materials in motion on a materials carrier and subjecting said moving mass both to an electrostatic charge and to a radio frequency electric field, said materials becoming electrostatically charged and differentially heated in said fields in accordance with their respective combination dielectric constants and loss factors, said materials losing their respective electrostatic charges differentially in different intervals of time proportional to their respective combined dielectric constants and loss factors and consequently falling off said carrier into separate successive receptacles.



3,969,226
HORIZONTAL DRUM-TYPE MAGNETIC SEPARATOR FOR GRANULAR FEEDS

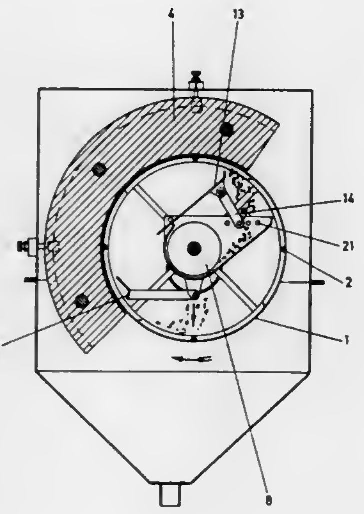
Johann Moelders, Bergisch-Gladbach, Germany, assignor to Berger Maschinenfabriken G.m.b.H. & Co., Bergisch-Gladbach, Germany

Filed Mar. 28, 1974, Ser. No. 455,859

Claims priority, application Germany, Mar. 28, 1973, 2315451

Int. Cl.² B03C *1/14*

U.S. Cl. 209—39 **10 Claims**



1. A drum-type magnetic separator for granular feeds of magnetic and nonmagnetic materials comprising: a rotatable drum having an axis of rotation, means for feeding the granular feeds into said drum, means for regulating infeed of the granular feed inside and throughout the length of said drum, means to adjust the position of said regulating means with respect to the inner surface of said drum, means for thrusting the granular feed of magnetic and nonmagnetic material thru said drum means for creating a magnetic field disposed about a portion of the outer periphery of said drum, a first chute located substantially above said axis of rotation and below said means for creating a magnetic field for collecting any nonmagnetic material carried with the magnetic material above said axis of rotation, a second chute extending substantially radially of said axis of rotation and having an opening above said axis of rotation and behind said first chute for collecting the magnetic material after the granular feed passes through the magnetic field, and means for adjusting said first chute with respect to said second chute and the inner surface of said drum.

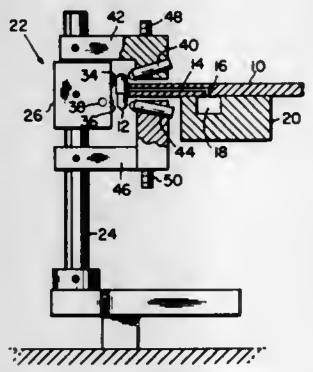
3,969,227
PHOTOELECTRIC INSPECTION OF TRANSPARENT OR TRANSLUCENT MEDICINAL CAPSULES

Charles R. Garris, Stratford, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 1, 1974, Ser. No. 519,838

Int. Cl.² B07C *5/10*

U.S. Cl. 209—73 **3 Claims**



1. In a medicinal capsule filling machine wherein a plurality of capsules are filled with a flowable solid medicament,
- a rotatable disc for transporting elongated capsules temporarily secured to its periphery.
- means for temporarily securing capsules to the periphery of said disc in an orientation such that the long axes of the capsules are substantially parallel to the axis of rotation of the disc,
- inspection means comprising a light source and photoelectric detecting means both arranged adjacent to the periphery of said disc, and related to each other and to said disc so that light passes from the source to the detecting means in a straight line which is oblique with respect to the long axes of the capsules, which intersects the path of travel of the capsules, and which, if extended, will not pass through said disc, said light source and photoelectric detecting means being arranged so that the light passing from the source toward the detecting means is directed through a passing capsule near one of its ends, and
- said inspection means including a second photoelectric detecting means arranged adjacent the periphery of the disc and related to the light source so that light passes from the light source to the second detecting means in a straight line which is oblique to the long axes of the capsules and which intersects the path of travel of the capsules, and is directed through said passing capsule near the other of its ends in a direction such that said straight line, if extended, will not pass through said disc.

3,969,228
QUALITY CONTROL MONITOR

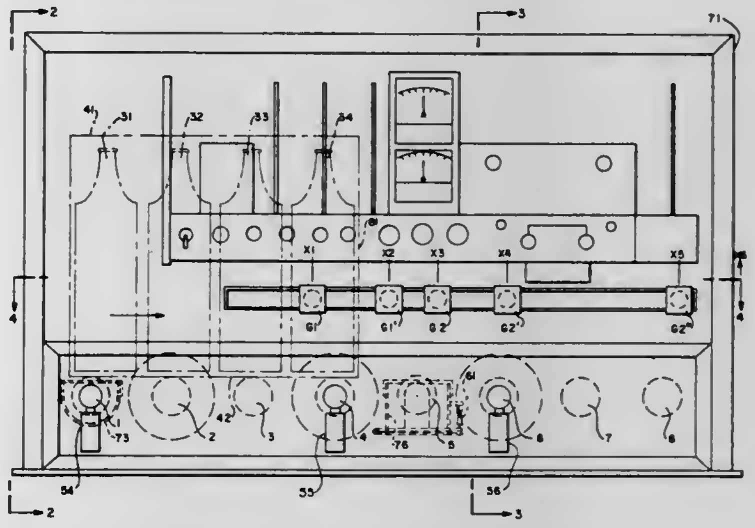
Gordon D. Browning, 19056 Stanton Ave., Castro Valley, Calif. 94546

Filed Dec. 30, 1974, Ser. No. 537,199

Int. Cl.² B07C *5/08*

U.S. Cl. 209—73 **21 Claims**

1. Apparatus for detecting a plurality of objects mounted on or proximate to one side of a wall comprising:
- means mounted at the opposite side of said wall and transmitting energy thereto;
- said energy and wall providing for transmission of energy through said wall to said objects, and said energy and objects providing for return energy transmission through said wall;
- means receiving said return energy from a plurality of wall areas, each of said areas being associated with one of said objects;
- comparator means connected to said return energy receiving means and comparing energy quantities received from said areas;
- means connected to said comparator means and responsive to a predetermined dissimilarity between said received energy quantities to provide a rejection signal;
- means sensing energy transmission through said wall between spaced points thereon; and



- second comparator means connected to said energy transmission sensing means and comparing said energy transmission with a standard and providing an output signal when said energy transmission deviates from said standard by a predetermined amount.

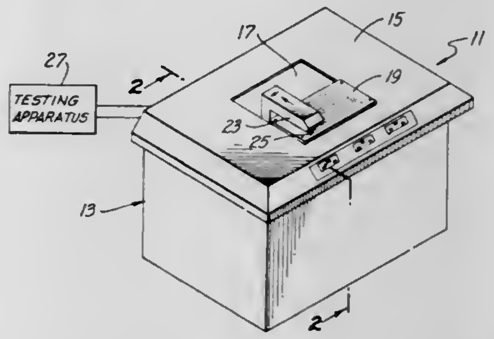
3,969,229
COMPONENT HANDLER WITH AUTOMATIC SORTER

James W. Horner, Long Beach, Calif., assignor to GTI Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1975, Ser. No. 550,479

Int. Cl.² B07C *5/08*

U.S. Cl. 209—74 R **13 Claims**



1. A component sorting apparatus useable with a testing apparatus wherein the testing apparatus is adapted to test components, said component sorting apparatus comprising:
- a supporting structure;
- holding means on the supporting structure for holding a plurality of components to be tested at holding locations, respectively, said apparatus having a plurality of component paths beneath at least preselected ones of said holding locations, respectively;
- said holding means including movable means for releasing the components at said preselected holding locations from the holding means to allow such components to move under the influence of gravity along the associated component path away from the holding means;
- means defining a plurality of separate zones accessible from said component path;
- programmable means on the supporting structure responsive to the results of the test of each of the components at said preselected holding locations for directing the components from said component paths into said zones in accordance with the test results; and
- said movable means including a plate beneath the holding locations for retaining the components in the holding means, said plate being movable to leave the components at said preselected holding locations unsupported and free to fall along their associated component paths.

3,969,230

BROMINATED CARBAMOYL DERIVATIVES USEFUL TO IMPART FLAME RETARDING PROPERTY TO COMBUSTIBLE SUBSTRATES

Daniel J. Scharf, East Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,528

Int. Cl.² B27K *3/00;* **C07C** *69/00, 101/00*

U.S. Cl. 252—8.1 **14 Claims**

1. A method of imparting a flame retarding property to a combustible material comprising treating the combustible material with an effective flame retarding imparting amount of a composition of the structure

$$(X^1)(X^2)C - CH_2 - (R^2)_n - O - C(O)N(R)(R^1) \quad (X)$$

wherein:

R and R^1 independently selected from the group consisting of hydrogen, alkyl, alkanol, cycloalkyl of from 5 to 7 carbon atoms, phenyl, alkyl substituted by phenyl, phenyl substituted by alkyl, hydroxy terminated oxyalkylene, hydroxy substituted hydroxy terminated oxyalkylene and halogen substituted hydroxy terminated oxyalkylene;

R^2 is independently selected from the group consisting of alkylene, oxyalkylene, hydroxy substituted oxyalkylene, halogen substituted oxyalkylene and alkylene or oxyalkylene substituted by the group $- O - C(O)N(R)(R^1)$;

X, X^1 and X^2 are independently selected from the group consisting of halogen and halogen substituted alkyl, wherein the halogen is chlorine or bromine; said alkyl, alkanol and alkylene each independently has from 1 to 4 carbon atoms; said oxyalkylene having from 2 to 4 carbon atoms; n is 0 to 20;

provided one of X, X^1 or X^2 is a bromo or a bromo substituted alkyl; and that each carbamoyl group has a replaceable hydrogen in the R or R^1 group.

3,969,231

FLAME-RETARDANT SOFTENING AGENTS

Peter M. Hay, Summit, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 16, 1974, Ser. No. 506,233

The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² D06M *13/26*

U.S. Cl. 252—8.8 **23 Claims**

1. A textile softening agent produced by reacting A) the phosphate compound of the formula:

$$(BrCH_2CHBrCH_2O)_3PO$$

with B) the reaction product of i) a fatty acid or an ester derivative thereof, wherein said fatty acid or ester derivative thereof is selected from the group consisting of:

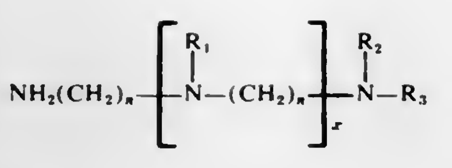
a. a saturated fatty acid of 12 to 22 carbon atoms, or a mixture thereof,

b. a lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 cabon atoms, or a mixture thereof,

c. a mixture of at least one saturated fatty acid of 12 to 22 carbon atoms with one or more monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of monounsaturated fatty acids,

d. a mixture of at least one lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 carbon atoms with one or more lower alkyl (C_1–C_4) or glycerol esters of monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of esters of monounsaturated fatty acids, and

e. mixtures thereof, and ii) a polyamine or mixture of polyamines of the formula II:



$$NH_2(CH_2)_n - \left[\overset{\overset{R_1}{|}}{N} - (CH_2)_n - \right]_x \overset{\overset{R_2}{|}}{N} - R_3$$

wherein

R_1, R_2 and R_3 are independently hydrogen or lower alkyl of 1 to 3 carbon atoms,

n is an integer of 2 or 3, and

x is an integer of 0 to 3,

the mol ratio of the fatty acid or ester derivative thereof expressed as the fatty acyl radical to the polyamine being in the range of 1:1 to 3:1, subject to the proviso that the reaction product of i) and ii) is substantially free of unreacted polyamine, said reaction product produced by the reaction of said fatty acid or ester derivative thereof and said polyamine at a temperature between 100° and 220°C. for a time sufficient to produce substantially the entire amount of water or alcohol theoretically indicated by the fatty acid or fatty ester/amide-forming condensation reaction but not in excess of 36 hours, said reaction product and said phosphate compound being reacted in a weight ratio of from 10:1 to 0.5:1 at a temperature between 30° and 150°C. for a period of time between 2 minutes and 12 hours.

3,969,232

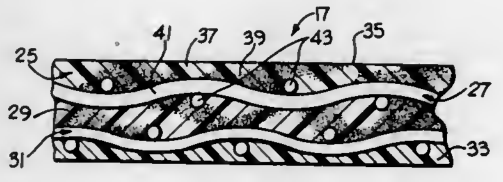
BEARING AND BEARING LINER WEAR RESISTANT COMPLIANT LAYER

Peter H. Turner, Burbank, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed Jan. 25, 1974, Ser. No. 436,651

Int. Cl.² C10M *5/00, 7/00;* **F16C** *9/06, 27/00*

U.S. Cl. 252—12.6 **27 Claims**



1. A bearing liner for attachment to a substrate having at least one projection thereon, said bearing liner comprising:

a first wear resistant layer, said first wear resistant layer having a wear surface;

said first wear resistant layer being deformable under load whereby application of said wear resistant layer directly to said substrate would cause the projections to cause a protrusion on the wear surface, the first wear resistant layer including a first porous backing member and an adhesive and a first plurality of particles intimately mixed with the adhesive and providing a low friction and having a sufficiently small size to be mechanically bonded in the pores of the first backing member, the particles being mechanically bonded within the pores of the backing member and being chemically bonded by the adhesive;

a compliant layer disposed between the first wear resistant layer and the substrate, said compliant layer being deformable to permit the compliant layer to at least partially receive the projection whereby the tendency of the projection to cause the protrusion is reduced; and

said compliant layer having a second wear surface, said first wear resistant layer covering said second wear surface until said first wear resistant layer is worn away to expose the second wear surface, the second compliant layer including a second porous backing member and an adhesive and a second plurality of particles intimately mixed with the adhesive and providing a low friction and having a sufficiently small size to be mechanically bonded in the pores of the second backing member, the particles being mechanically bonded within the pores of the backing member and being chemically bonded in the adhesive.

3,969,233

BIODEGRADABLE INTERNAL COMBUSTION ENGINE LUBRICANTS AND MOTOR FUEL COMPOSITIONS

William J. Lucas, Ridge Road, R.R. No. 1, Birmingham, Mich. 49436

Continuation-in-part of Ser. No. 188,518, Oct. 12, 1971, abandoned, and a continuation-in-part of Ser. No. 38,547, May 26, 1970, abandoned. This application Aug. 23, 1974, Ser. No. 499,902

Int. Cl.² C10M *3/18*

U.S. Cl. 252—22 **22 Claims**

1. A hydrocarbon oil-miscible and water-miscible, biodegradable lubricant composition consisting of biodegradable components consisting of at least two members selected from the group of (a) (b) and (c) components;

a. higher carboxylic acids having from 6 to 30 carbon atoms selected from the group consisting of fatty acids, rosin acids, naphthenic acids and tall oil acids in quantity of 5 to 75% by weight;

b. a member selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic primary amines, said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms; said lower alkyl amines being primary, secondary or tertiary alkyl, in quantity of 2 to 25% by weight;

c. soaps of said higher carboxylic acids having a cation selected from the group consisting of ammonium and amine cations, said amine cation being derived from an amine selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic primary amines, said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms, said lower alkyl amines being primary, secondary or tertiary alkyl, said soaps in quantity of 5 to 75% by weight; and in addition at least one each of the (d) (e) and (f) components

d. polyloweralkyleneoxy esters of higher carboxylic acids having from 6 to 30 carbon atoms selected from the group consisting of fatty acids, rosin acids, naphthenic acids and tall oil acids, the lower alkylene group having 2 or 3 carbon atoms, the polyalkyleneoxy groups, in quantity of 0.5 to 25% by weight;

e. polyloweralkyleneoxy esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups, the lower alkylene group having 2 to 3 carbon atoms, in quantity of 0.5 to 25% by weight; and

f. at least 20% by weight of a water-miscible solvent selected from the group consisting of lower alkanols, lower alkyl ketones and a lower polyhydric alcohol having 2 to 4 carbon atoms, said lubricant composition being blended with gasoline as an upper lubricant in quantity between about 0.1 gallon and 5,500 gallons of said lubricant per one thousand barrels of gasolines; said soaps and polyloweralkyleneoxy esters and ethers being present in quantity sufficient to render said composition miscible or emulsifiable in said gasoline.

3. A motor fuel composition containing, per one thousand barrels of gasoline, 0.1 to 5,500 gallons of the biodegradable composition consisting essentially of

a. a diluent selected from the group consisting of lower alkyl ketones, and lowr monohydric alcohols having 1 to 4 carbon atoms in quantity of 20 to 75% by weight;

b. a higher carboxylic acid having 6 to 30 carbon atoms selected from the group consisting of saturated and unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acid in quantity of 10 to 50% by weight;

c. a member selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic, primary amines said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms, said lower alkyl amines being primary, secondary or tertiary alkyl in quantity of 3 to 25% by weight;

d. polyloweralkyleneoxy fatty acid esters in which the lower alkylene has 2 to 3 carbon atoms and the fatty acid has 6 to 30 carbon atoms, and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25% by weight; and

e. polyoxyloweralkylene esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups in which the lower alkylene has 2 to 3 carbon atoms and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25%, said percentages being by weight.

9. The lubricant composition for use as a gear, transmission and crankcase lubricant, said composition comprising

a. 5 to 75 weight percent of alkali metal, alkaline earth metal, ammonium or amine soaps of higher carboxylic acids having 6 to 30 carbon atoms selected from the group consisting of saturated fatty acids, unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acids, said amine selected from the group consisting of lower alkyl amines of 1 to 6 carbon atoms, lower alkanol amines of 1 to 6 carbon atoms and lower hydrocarbyl monocarbocyclic amines;

b. an amine selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, lower alkanol amines of 1 to 6 carbon atoms and hydrocarbyl monocarbocyclic amines in quantity of 2 to 25%;

c. higher carboxylic acids having 6 to 30 carbon atoms selected from the group consisting of saturated fatty acids, unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acids in quantity of 5 to 75%;

d. heavy metal soaps of the carboxylic acids of group (c), the metal being selected from the group consisting of zinc, manganese, copper, cobalt, zirconium and cerium ranging in quantity from 0.001 to 20%;

e. polyoxyalkylene higher carboxylic acid esters or ethers, the acid being selected from the group consisting of saturated and unsaturated naphthenic acids, rosin acids, tall oil acids and fatty acids having from 6 to 30 carbon atoms, the polyoxyalkylene having from 10 to 60 polyloweralkyleneoxy groups in which the alkylene has 2 to 3 carbon atoms in quantity of 0.5 to 25% in which the percentage quantities are by weight;

f. polyoxyloweralkylene esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups in which the lower alkylene has 2 to 3 carbon atoms, and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25%, said percentages being by weight.

3,969,234

LUBRICANT AND MOTOR FUEL ADDITIVES

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 8, 1975, Ser. No. 610,967

Int. Cl.² C10M *1/40;* **C10L** *1/22;* **C10M** *3/34*

U.S. Cl. 252—33 **14 Claims**

1. As a new composition, an oil-soluble boron-containing composition having a boron concentration in the range of 0.75 to 1.5 percent by weight which is the reaction product obtained upon reacting

a. a petroleum sulfonic acid,

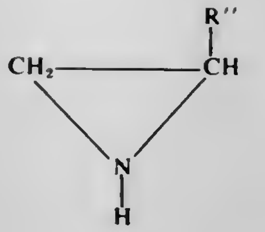
b. a polyamine selected from the group consisting of

  1. amines of the formula

  $H_2N[(CH_2)_xNH]_yH$

  wherein x equals 2–6 and y equals 1–100, and

  2. polymers of alkylene imines of the formula



wherein R'' is selected from hydrogen and alkyl radicals having 1–14 carbon atoms, and

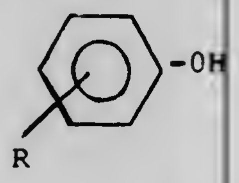
c. a boron compound.

3,969,235
SULFURIZED CALCIUM ALKYLPHENOLATE COMPOSITIONS

Rodney L. Sung, Fishkill; Harry Chafetz, Poughkeepsie; Benjamin H. Zoleski, Beacon, and Walter D. Foucher, Jr., Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Aug. 26, 1974, Ser. No. 500,965
Int. Cl.^{2} C10M *1/38*
U.S. Cl. 252—42.7 **11 Claims**

1. A lubricating oil composition comprising a hydrocarbon oil of lubricating viscosity containing between about 0.1 and 90 wt. % of a sulfurized calcium alkylphenolate, said alkylphenolate having a calcium metal ratio of about 1 to 1, a calcium content between about 1 and 8 wt. % and a sulfur content between about 0.5 and 12 wt. % wherein said sulfurized calcium alkylphenolate is produced by:

1. first contacting an alkylphenol



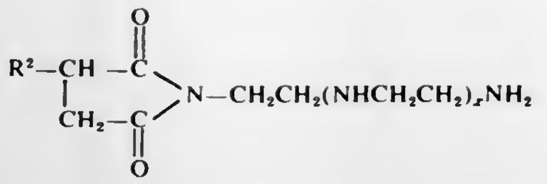
where R is alkyl of from 5 to 50 carbons with a first addition of calcium alkoxyalkoxide of the formula:

$CaO\text{-}A\text{-}OR')_2$

where A is alkanediyl of from 1 to 6 carbons and R' is alkyl of from 1 to 25 carbons at a first temperature between about 200° and 420°F. utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of between about 0.225:1 and 0.45:1,

2. second contacting the resultant mixture with sulfur in the presence of hydrocarbon lubricating oil at a second temperature between about 440° and 460°F. utilizing a mole ratio of sulfur to initial alkylphenol of between about 0.5:1 and 8:1, said hydrocarbon oil in said second contacting constituting between about 13 and 20 wt. % of said reaction mixture and
3. subsequently third contacting the mixture with a second addition of calcium alkoxyalkoxide at said first temperature in a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.15:1 and 0.375:1 in sufficient amount so that the total calcium alkoxyalkoxide employed in the first and third contacting will total a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.5:1 and 0.6:1.

7. A lubricating oil composition in accordance with claim 2 containing between about 0.1 and 10 wt. % said sulfurized calcium alkylphenolate, and between about 1 and 10 wt. % of a supplementary dispersant selected from the group consisting of 1). ethoxylated inorganic phosphorus acid free, steam hydrolyzed polybutene (800-2500 mw.)-P_2S_5 reaction product, said ethylene oxide moiety being present in respect to said hydrolyzed polybutene-P_2S_5 reaction product in a mole ratio of about 1:1 and polybutene-P_2S_5 component being present in a mole ratio to one another of between about 1:1, 2). and an alkenyl succinic anhydride derivative of alkylene polyamine characterized by the formula:



where R^2 is alkenyl of from 50 to 200 carbons, *x* is an integer of from 0 to 10.

3,969,236
COMPOSITIONS CONTAINING MONOALKANOLAMIDE BORATES

David A. Waldstein, 622 Bergen Ave., Jersey City, N.J. 07607
Filed Mar. 13, 1974, Ser. No. 450,565
Int. Cl.^{2} C10M *1/06*
U.S. Cl. 252—49.5 **3 Claims**

1. A composition comprising a liquid carrier selected from the group consisting of oil-in-water emulsions and water-in-oil emulsions, and a rust-inhibiting-effective amount of an alkanolamide borate which is the reaction product of orthoboric acid and a primary alkanolamine selected from the group consisting of monomethanolamine, monoethanolamine, 1-isopropanolamine, mono-n-propanolamine and 2-amino-2-methyl-propanolamine in a ratio of 1 gram mole of boric acid to 1 to 2 gram moles of alkanolamide, the reaction taking place in a closed reactor for about 4 to 5 hours at a temperature between about 130° C to about 165° C with the water formed being removed during the reaction.

3,969,237
LUBRICANT COMPOSITIONS CONTAINING BENZOTRIAZOLE DERIVATIVES AS COPPER PASSIVATORS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 344,007, March 22, 1973, abandoned. This application Jan. 4, 1974, Ser. No. 430,870
Int. Cl.^{2} C10M *1/10*
U.S. Cl. 252—49.9 **14 Claims**

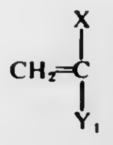
1. A lubricant composition comprising a major proportion of an oil lubricating viscosity and greases thereof and normally susceptible of corroding copper, containing, in an amount sufficient to inhibit such corrosion, the reaction product of (A) benzotriazole and (B) a reactant selected from the group consisting of hydrocarbyl carboxylic acids having at least 18 carbon atoms, mono and di-substituted hydrocarbyl phosphates and mono and di-substituted organic phosphonates wherein the hydrocarbyl substituent contains at least 15 carbon atoms, and wherein said reaction is conducted at a temperature from about 100°C to about 200°C and in a mole ratio of (A) to (B) of from about 1:1 to about 1:0.5.

3,969,238
LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY AND PROCESS FOR DEVELOPING LATENT IMAGES

Terukuni Tsuneda, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 10, 1973, Ser. No. 387,473
Claims priority, application Japan, Aug. 15, 1972, 47-81728; Aug. 15, 1972, 47-81729
Int. Cl.^{2} G03G *9/12, 13/10*
U.S. Cl. 252—62.1 L **14 Claims**

1. A liquid developer for electrophotography comprising toner particles dispersed in a highly insulating carrier liquid having therein an addition polymer produced from at least one member selected from the monomers of the formula (1) and at least one member selected from the monomers of the formula (2):

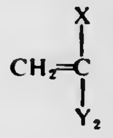
General formula (1)



$$CH_2{=}C(X)Y_1$$

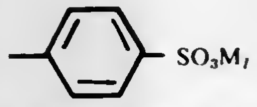
Where
X : —H, —CH_3
Y_1: —C_nH_{2n+1}, —OC_nH_{2n+1}
—$COOC_nH_{2n+1}$
$(8 \leqq n \leqq 20)$

General formula (2)



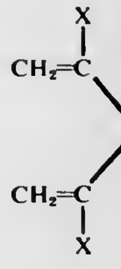
$$CH_2{=}C(X)Y_2$$

Where
X : —H, —CH_3
Y_2: —SO_3M_I, —$CH_2SO_3M_I$

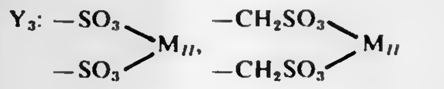


(M_I is alkali metal or —NH_4)

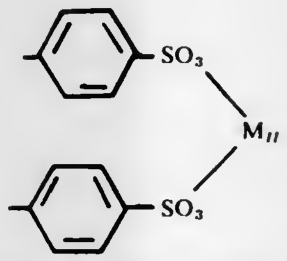
Or



Where
X : —H, —CH_3



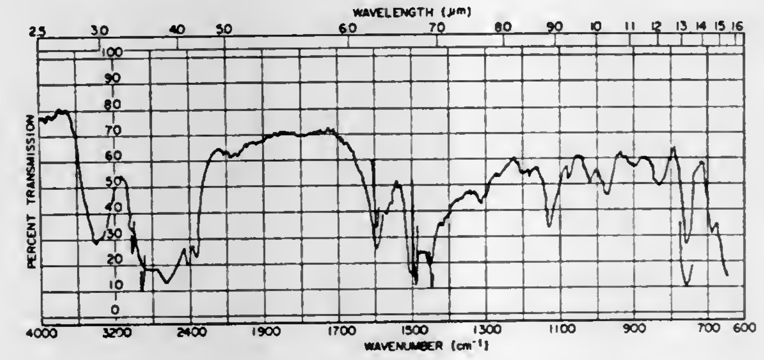
Y_3: $(—SO_3)_2M_{II}$, $(—CH_2SO_3)_2M_{II}$



(M_{II} is alkaline earth metal).

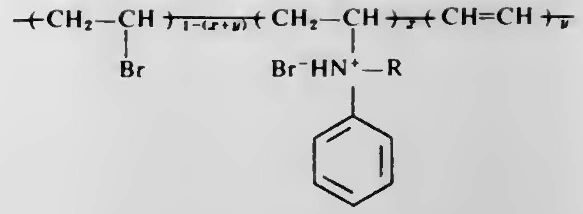
3,969,239
METHOD FOR USING MACROAMINE POLYMERS AS FLOCCULATING AGENTS

Isao Shinohara, and Juro Aoyagi, both of Tokyo, Japan, assignors to B. R. Chemical Co., Ltd., Tokyo, Japan
Division of Ser. No. 479,631, June 17, 1974, Pat. No. 3,933,717, which is a continuation-in-part of Ser. Nos. 323,731, Jan. 18, 1973, abandoned, and Ser. No. 345,122, March 26, 1973, abandoned. This application July 9, 1975, Ser. No. 594,841
Int. Cl.^{2} B01D *21/01*
U.S. Cl. 210—54 **4 Claims**



1. In a process for treating water to remove dissolved and suspended impurities including metallic ions, bentonite or dyestuffs by floculation, the improvement comprising

a. dissolving in said water an effective amount of a water soluble linear macroamine polymer consisting essentially of a structural unit shown by the following formula:



wherein R represents alkyl group containing 1 to 4 carbon atoms, *x* is a mol decimal fraction between about 0.65 and 0.95, and *y* is a mol decimal fraction between about 0.23 and 0.04, and

b. separating floc formed in step (*a*) from said water.

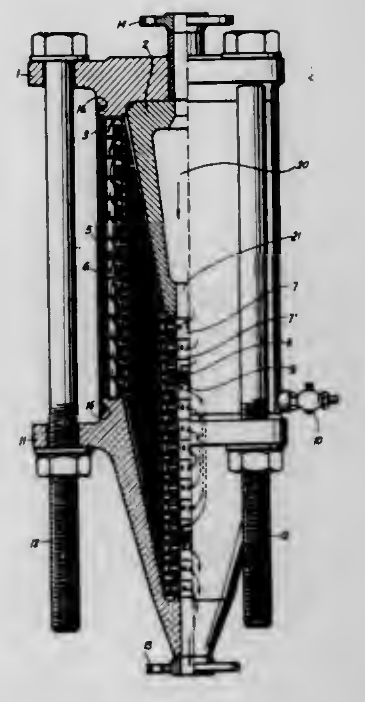
3,969,240
POLYSILOXANE MEMBRANE LUNG

Theodor Kolobow, Rockville, Md.; Fusakazu Hayano, Tokyo, Japan, and Paul Weathersby, Rockville, Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.
Filed Feb. 3, 1975, Ser. No. 546,786
Int. Cl.^{2} B01D *31/00, 13/00*
U.S. Cl. 210—22 A **7 Claims**

1. In an artificial membrane lung having blood contacting surfaces, including a pair of spaced silicone rubber membranes formed of silica filled silicone, the improvement wherein said silica filled silicone rubber is coated with a polydimethylsiloxane gum having no silica filler.

3,969,241
METHOD OF AND APPARATUS FOR SEPARATING CHEMICAL SOLUTIONS IN MEMBRANE PROCESSES

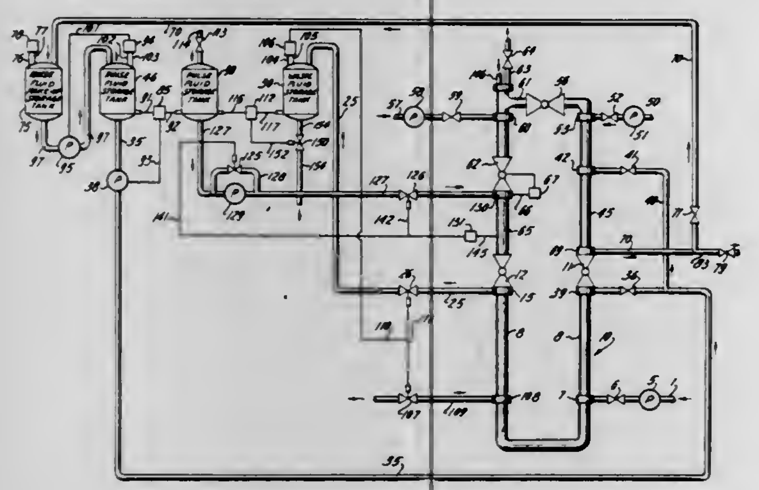
Michal Skrabak; Ernest Vavrik; Stanislav Kolarik, and Milos Mazak, all of Bratislava, Czechoslovakia, assignors to Slovenska Vysoka Skola Technicka, Bratislava, Czechoslovakia
Filed July 29, 1974, Ser. No. 492,407
Int. Cl.^{2} B01D *31/00*
U.S. Cl. 210—23 H **3 Claims**



1. A method of separating chemical solutions in membrane processes of the type including reverse osmosis, ultrafiltration and electrodialysis, comprising flowing the solution serially through a plurality of nested frustoconical membrane-lined ducts whereby the solution flows alternately outwardly and inwardly through adjacent ducts, and separating components from said solution through the membrane lining of each duct.

3,969,242
CONTROL SYSTEM FOR LIQUID-SOLID CONTACTING APPARATUS

David C. Kruse, Pittsburgh, Pa., assignor to Dart Environment and Services Company, Los Angeles, Calif.
Continuation of Ser. No. 349,153, April 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 241,639, April 6, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,336
Int. Cl.^{2} B01D *15/02*
U.S. Cl. 210—25 **17 Claims**



1. A method of controlling the position of liquid-liquid interfaces in a cyclical process employing a liquid-solids contacting apparatus comprising a loop having a pulsing section, a loading section, and a stripping section, at least a major portion of said loop being filled with a solid sorption medium, wherein during a pulse cycle solids are moved a predetermined distance corresponding to volume V_P by means of a pulse fluid introduced to the pulsing section, and wherein during a treatment cycle feed containing at least one sorbable material and at least one non-sorbable material is introduced to the loading section, stripping fluid is introduced to the stripping section, a first product comprising sorbable material is recovered from a location between the feed and stripping fluid inlet points and a second product comprising non-sorbable material is recovered from a location between the feed and pulse fluid inlet points, which method comprises:

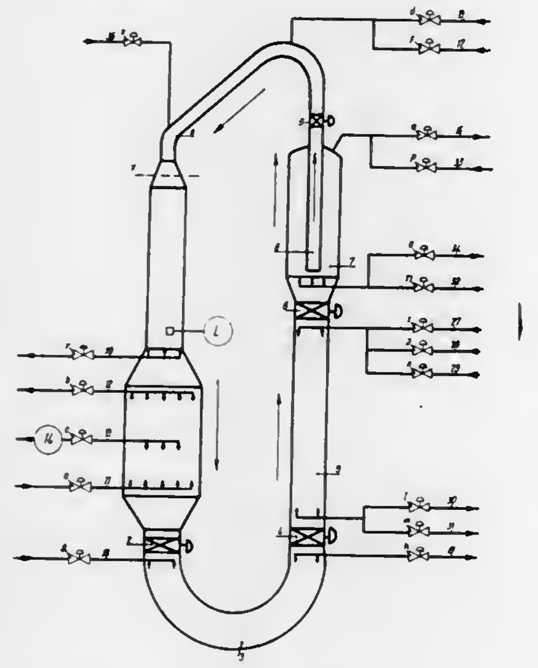
a. measuring the volume V_{PL} of pulse fluid necessary to move the solids said predetermined distance V_P during a pulse cycle;
b. after completion of said pulse cycle introducing during the subsequent treatment cycle a volume V_R of rinse fluid into the loop countercurrent to the direction of flow of said pulse fluid, the relationship between volumes V_R, V_{PL}, and V_P being about $V_R = V_{PL} - V_P(1-\alpha)$, where α is the void fraction of the solids,
c. removing a waste fluid which includes a substantial portion of said pulse fluid from a section of the loop adjacent to said pulsing section prior to recovery of the second product, and
d. recovering about a volume V_R of rinse fluid from the stripping section prior to recovery of the first product.

3,969,243
MOVING BED ION-EXCHANGE APPARATUS AND OPERATING METHOD THEREOF

Nicolae Mihail Arion, Bucharest, Romania, assignor to Institutul de Proiectari Tehnologice Pentru Industria Chimica-Iprochim, Bucharest, Romania
Filed Aug. 5, 1974, Ser. No. 495,070
Claims priority, application Romania, Aug. 6, 1973, 75734
Int. Cl.^{2} B01D *15/02*
U.S. Cl. 210—25 **6 Claims**

1. An ion-exchange apparatus having therein a movable bed of an ion-exchange resin for treating an ion-containing liquid influent for loading the ion-exchange resin with ions from said influent followed by regeneration of the ion-exchange resin and recovery of an effluent from said resin constituting a concentrated solution of said ion, said apparatus comprising two vertical columns connected to one another at their upper and lower ends, said columns being formed with:

a. a loading first section for the loading of the preselected kind of ion from the influent onto said ion-exchange resin, said loading section having:
   a central cylindrical portion terminating at its top and bottom in tapered portions,
   a first resin valve at a lower part of said column adjacent the lower tapered portion,
   means which includes an inlet pipe provided with a valve for introducing said liquid influent across a horizontal cross section of said cylindrical portion, said liquid influent traversing the bed of resin in said cylindrical portion upwardly toward the upper part of said loading section, said means further including an outlet pipe provided with a valve for removing said liquid influent over the horizontal cross section of said upper part, and
   a sample-removing pipe for continuously removing a sample of flowing influent connected to said cylindrical portion at a level of about two thirds the height of said bed, said sample-removing pipe being connected to an analyzer responsive to the concentration of said preselected kind of ion in the liquid influent;



b. a conditioning-rinsing second section extending from said first resin valve along the portion of the apparatus connecting said columns at the bottoms thereof and terminating at a second resin valve provided at the lower end of the second column, said conditioning-rinsing section being constructed and arranged to receive by hydraulic transfer a batch of the ion-exchange resin exhausted in said loading section, the conditioning-rinsing section being provided:
   adjacent said first resin valve with means for introducing a conditioning liquid and rinsing water through an inlet pipe controlled by a valve, and
   adjacent said second resin valve with means for removing said conditioning liquid and rinsing water connected to an outlet pipe controlled by a valve;
c. a third regenerating and first rinsing section in said second column above said second resin valve, said regenerating and first rinsing section terminating at a third resin valve in said second column, said resin batch being hydraulically displaced upwardly from said conditioning-rinsing section to said regenerating and first rinsing section, said regenerating and first rinsing section comprising:
   first distributing means adjacent third resin valve and including a cylindrical filter connected to three pipes each controlled by a respective valve for feeding strongly concentrated liquid regenerating agent, rinsing water and inert gas into the resin batch, the fluids thus introduced passing downwardly through the resin batch in said regenerating and first rinsing section, and
   second distributing means adjacent said second resin valve and including a cylindrical filter connected to two conduits each controlled by a respective valve for discharging an effluent concentrated in eluted salts and excess regenerant;
d. a final-rinsing fourth section for the final rinsing and backwashing of the ion-exchange resin upon regeneration and rinsing thereof in said third section, said fourth section extending above said third resin valve in said second column to the upper part thereof, said fourth section comprising:
   a siphon conduit reaching downwardly through the interior of said fourth section and opening close to the bottom thereof,
   means including two pipes each controlled by a respective valve for respectively introducing rinsing and backwashing water into said fourth section at a lower part thereof and for the discharge of compacting water at the lower part of said fourth section, and
   means at an upper part of said fourth section including two pipes and respective values for respectively removing the rinsing and backwashing water from and for feeding compacting water to said fourth section, said compacting water further causing the resin to transfer through said siphon conduit;
e. an hydraulic transfer conduit connecting said columns at the tops thereof and communicating with said siphon conduit, said hydraulic transfer conduit further including:
   a fourth resin valve connecting said hydraulic transfer conduit to said siphon conduit,
   means including at least one pipe and a pair of valves for respectively feeding resin shifting water and resin compacting water to said hydraulic transfer conduit, and
   means for introducing additional resin to said apparatus at an end of said hydraulic transfer conduit connected to said first column; and
f. a resin-storage fifth section formed in said first column above said first section and communicating with said end of said hydraulic transfer conduit, said fifth section comprising:
   a tapered portion at the upper end of said fifth section connecting same with said hydraulic transfer conduit,
   a resin/water interface sensor at a lower portion of said fifth section for detection of the advance of a resin/interface from the top of said fifth section toward said first section, and
   means including a pipe and a valve at the bottom of said fifth section for removing transfer water.

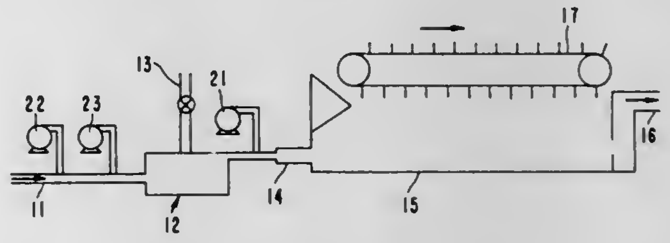
3,969,244
METHOD OF ADSORBING HEAVY METALS

Yoshitaka Kobayashi, Yokohama, Japan; Kinjiro Sugai, deceased, late of Yokohama, Japan; by Katsuno Suqai, legal successor, Yokohama, Japan; by Hajime Sugai, legal successor, Yokohama, Japan; by Minoru Sugai, legal successor, Yokohama, Japan; by Shunji Sugai, legal successor, Yokohama, Japan; by Hiroshi Sugai, legal successor, Yokohama, Japan, and Minoru Sugai, Yokohama, Japan, assignors to Hokuetsu Carbon Industry Co., Ltd and Yoshitaka Kobayashi, both of Yokohama, Japan, part interest to each
Continuation of Ser. No. 357,620, May 7, 1973, abandoned, which is a division of Ser. No. 149,772, June 3, 1971, abandoned. This application May 12, 1975, Ser. No. 576,332
Claims priority, application Japan, June 9, 1970, 45-50105; Apr. 9, 1971, 46-21766
Int. Cl.^{2} C02B *1/14*
U.S. Cl. 210—38 B **9 Claims**

1. A method of removing a heavy metal from an aqueous solution of a salt of said heavy metal which comprises contacting said solution with a particulate resin, said resin essentially consisting of a polycondensation product of a sulfur-bearing constituent, a hydroxy- or aminobenzene, and an aldehyde, said resin being prepared from 1 to 15 moles of said aldehyde and 0.2 to 2.0 moles of said hydroxy- or aminobenzene per mole of said sulfur-bearing constituent, said sulfur-bearing constituent being thiourea, thiosemicarbazide, or thiocarbazide, and hydroxybenzene being phenol, hydroquinone, resorcinol, catechol, pyrogallol, or cresol, said aminobenzene being aniline, m-phenylenediamine, or toluidine, and said aldehyde being formaldehyde, paraldehyde, acetaldehyde, benzaldehyde, or furfural.

3,969,245
ELECTROCOAGULATION SYSTEM FOR REMOVING POLLUTANTS FROM WASTEWATER

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.
Filed Oct. 21, 1974, Ser. No. 516,176
Int. Cl.^{2} B01D *5/00*
U.S. Cl. 210—44 **11 Claims**



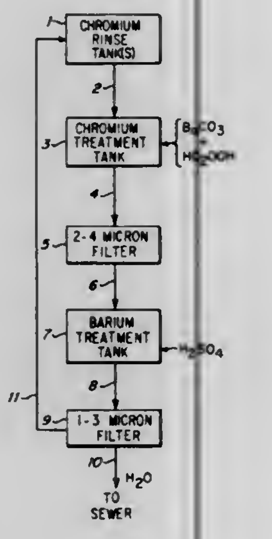
1. A method for removing pollutants from raw wastewater comprising the steps of: providing a bubble supply produced electrolytically by decomposing a flow of wastewater; positioning said bubble supply as a cylindrically shaped dense zone of fine bubbles, said positioning being longitudinal along the flow of wastewater; rapidly flowing said wastewater through said dense zone of fine bubbles; simultaneously turbulently contacting said fine bubbles with pollutants within said wastewater while said wastewater flows through said zone, thereby forming a buoyant embryo floc within said wastewater, said embryo floc remaining unseparated from said flow of wastewater; venting said zone to atmosphere to prevent pressure buildup within said zone; then removing said unseparated flow of wastewater and embryo floc out of said dense zone of fine bubbles whereby some of said buoyant embryo floc is combined into a buoyant full floc; introducing said full floc and wastewater into a downstream flotation basin without realizing any appreciable pressure differential, whereby the buoyant full floc rises to near the surface of the wastewater in a manner approximating a laminar flow; and then clarifying the wastewater by separating the full floc from the wastewater, said clarifying step being the initial removal of floc from the flow of wastewater.

3,969,246
CHROMIUM REMOVAL AND RECOVERY PROCESS

Edward J. Feltz, Dayton, and Ross Cunningham, Mount Gilead, both of Ohio, assignors to John Cunningham, Portsmouth, Ohio
Filed Aug. 26, 1974, Ser. No. 500,606
Int. Cl.^{2} C02C *5/02*
U.S. Cl. 210—45 **9 Claims**

1. A process for removing chromium from waste water comprising determining the chromium content thereof, contacting said chromium-containing water with barium carbonate and acetic acid in aqueous media at a pH ranging from about 3 to about 6 utilizing a weight concentration of barium carbonate to chromium present ranging from about 1.5 to 3.5:1 and a weight ratio of barium carbonate to acetic acid ranging from about 2 to 4:1 thereafter filtering the resultant insoluble chromium material with a first acid-resistant filter media having openings ranging from about 0.5 to 6 microns, recovering the filtered chromium and removing the barium

present by contacting said chromium with sulfuric acid thereby converting said chromium to chromic acid and precipitating said barium as insoluble barium sulfate, passing said effluent from said sulfuric acid contact through a second



acid-resistant filter material to remove insoluble barium sulfate therefrom, collecting the effluent from said second filter, and reusing its chromium content in a chromium plating process.

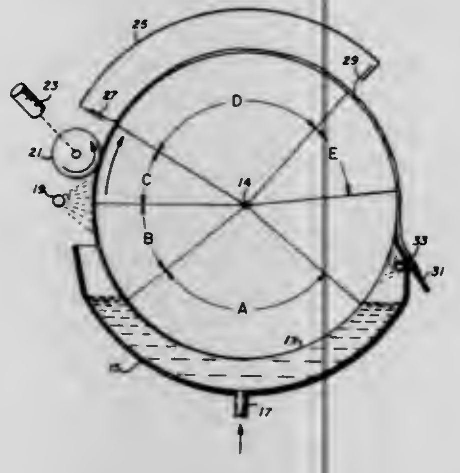
3,969,247
VACUUM FILTRATION PROCESS

Robert C. Emmett, Jr., Salt Lake City, and Benjamin K. Pocock, Tooele, both of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed June 20, 1975, Ser. No. 588,923

Int. Cl.² B01D *33/06*

U.S. Cl. 210—68 **3 Claims**



1. An improved process for dewatering a cake of solids that is formed on the filter medium of the drum of a rotary drum vacuum filter that is disposed for rotation in partial submergence in a slurry containing suspended solids, said process comprising the steps of:

a. drawing air through the cake of solids on the surface of the filter drum after the drum is rotated out of submergence from the slurry in order to partially dry the filter cake;

b. then, pressing the filter cake against the surface of the drum by means of a pressure-applying roll which is driven to rotate so that its surface velocity exceeds the velocity of the drum surface by 25 to 75%;

c. thereafter, drawing steam through the filter cake while it is still on the surface of the filter drum; and

d. then, discharging the steamed filter cake from the surface of the filter drum.

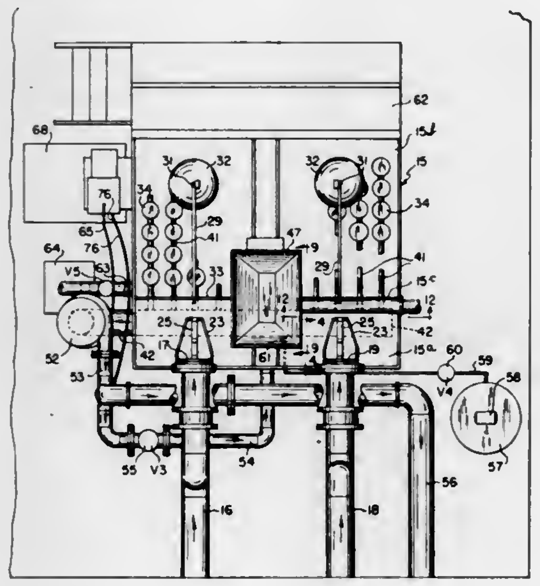
3,969,248
POOL FILTERING SYSTEM

Charles C. Whitmer, Strongsville, Ohio, assignor to The Whitmer Company, Cleveland, Ohio

Filed Nov. 1, 1974, Ser. No. 520,017

Int. Cl.² E04H *3/16;* **B01D** *29/38*

U.S. Cl. 210—126 **3 Claims**



1. A pool filtering system including a two-part filter tank with a partition between the parts, the first part of the tank forming a stilling chamber and the second part forming a filter element tank, two inlet lines leading from a pool to said stilling chamber, onē inlet line communicating with the bottom of the pool and the other line communicating with a wave trough of the pool, a plurality of vertical filter elements in said filter element portion of said tank, each of said filter elements having over substantially its entire length an inner strong coarse perforate metallic layer completely covered by a fine mesh outer layer sufficiently fine to receive and hold diatomaceous silica, each cylinder having an imperforate top at its upper end and having a bottom closure at its lower end with a single through opening, a manifold including a main line and branch lines communieating therewith in the bottom of said second portion of said tank, said filter elements having detachable connections with suitable openings in said manifold branches, each of said filter elements being sufficiently strong to withstand a pressure differential of about **150** pounds per square inch, a recirculating pump connected with said manifold line as an inlet and with an outlet line leading to said pool, a control valve where each of said inledt lines enters into said stilling chamber, a control valve there comprising a valve seat having a continuous annular ridge of uniform height extending at a vertical plane and a coacting valve having a continuous flat surface in a parallel vertical plane opposite said ridge, a valve actuator comprising a generally horizontal toggle having one link with a pivotal connection fixed relative to said flat surface and having another link with a pivotal connection fixed relative to said tank and said links having a common pivotal connection with a strut extending from said connection upwardly, a float for controlling each of said inlet lines independently, an arm adjustable as to length and extending between each of said floats and a point fixed relative to said tank, the upper end of said strut being pivotally connected to said arm, a continuous regulated feeder for diatomaceous silica mounted above said tank and discharging thereinto, means for recycling water containing diatomaceous silica directly out of and back into said tank while forming an outer coating of diatomaceous silica on said filter elements, a compressed air reservoir, means for providing a supply of compressed air in said reservoir, a back-wash line leading from said reservoir to said manifold, a quick-opening valve in said back-wash line and means for isolation said manifold from said inlet and outlet lines during back-wash, whereby to intermittently explode said air in all of said filter elements outwardly to remove the dirt-contaminated diatomaceous silica

outer coating from said filter elements when necessary, said tank being open at the top whereby to inspect said filter elements and to wash the same with a hose to remove diatomaceous silica particles after back-washing when necessary, and a drain from the bottom of said tank for removing said waste diatomaceous silica material.

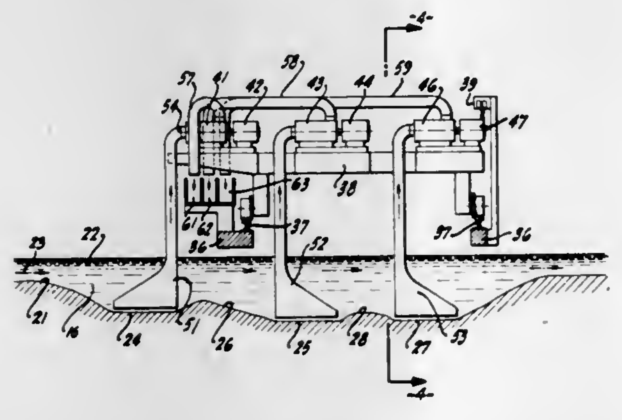
3,969,249
SOLIDS REMOVER FOR HIGH RATE ALGAE PONDS

Joseph C. Dodd, 117 Powell Drive, Werribee, Victoria 3030, Australia

Filed Apr. 9, 1975, Ser. No. 566,239

Int. Cl.² F02B *15/04*

U.S. Cl. 210—170 **6 Claims**



1. A solids remover for high rate algae ponds comprising banks forming an elongated pond having a bottom, means forming in said bottom a settling basin and physically defining in said basin a plurality of man-made zones longitudinally spaced apart axially along the length of said pond and said spaced apart zones having bottoms at different elevations for the settlement of different solids, a carriage, means for supporting said carriage for movement across said settling basin, pumping means on said carriage, a stationary solids receiving means extending across said settling basin, means for conducting discharge from said pumping means to said receiving means, and means for conducting solids from a selected one of said zones to said pumping means.

3,969,250
APPARATUS FOR PREPARING LIQUID SAMPLES FOR ANALYSIS IN AUTOMATIC ANALYZERS

Andrew F. Farr, 9321 Montemar Drive, Spring Valley, Calif. 92077

Filed Mar. 10, 1975, Ser. No. 556,784

Int. Cl.² B01D *33/00*

U.S. Cl. 210—359 **9 Claims**

1. An apparatus for separating a clear blood serum free from fibrin strands and other suspended solids comprising

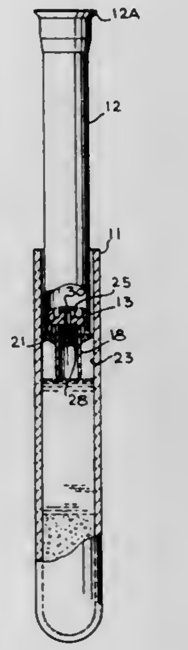
a. an outer tubular member, closed at the lower end;

b. a plunger tube longitudinally movable within said outer member;

c. a piston head attached to the lower end of said plunger tube, said piston head comprising a body having a cup-shaped upper portion with a depending skirt whose outer surface fits inside the lower end of said plunger tube, said body also having a depending tubular member communicating with said cup-shaped upper portion of the body through an apertured valve seat projecting upwardly to at least the height of the rim of said upper portion;

d. a flexible sealing ring whose outer periphery makes sliding sealing contact with the inside wall of said outer tubular member, said ring being frictionally attached to and movable axially on the outer surface of the said depending tubular member of said body;

e. an elastic membrane extending across said cupped upper portion of the body so that said membrane covers the opening of said valve seat, said membrane having at least one opening therethrough positioned away from the valve seat; and



f. a filter means frictionally fitted into said depending tubular member of said body.

3,969,251
DEVELOPER MIXTURE

Lewis O. Jones, Webster, and Robert Mermelstein, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,488

Int. Cl.² G03G *9/02*

U.S. Cl. 252—62.1 P **15 Claims**

1.. An electrostatographic developer mixture comprising toner particles electrostatically clinging to the surface of carrier materials, said toner particles comprising toner particles classified as to particle size wherein said toner particles have a particle size number distribution fine index ratio of less than about 2.50, a particle size volume distribution coarse index ratio of less than about 1.50, and a particle size distribution wherein less than about 30.0 percent by number of the toner particles have an average particle size diameter of less than about 5 microns, about 25 percent by number of the particles have a diameter between about 8 microns and about 12 microns, and less than about 5 percent by number of the toner particles have an average particle diameter greater than about 20 microns, said carrier materials comprise carrier particles classified as to surface area having a specific surface area of at least about 150 cm²/gram, a particle size volume distribution geometric standard deviation of less than about 1.3, and a volume average particle diameter of less than about 100 microns, said developer mixture being further characterized as experiencing substantially reduced toner impaction rates resulting in more stable triboelectric charging properties for substantially longer periods of time thereby increasing the developer life of said developer mixture.

3,969,252
DIELECTRIC CERAMIC COMPOSITIONS OF $BATIO_3$-$BAZRO_3$-$CATIO_3$ SYSTEM

Kazuaki Utsumi, and Tomeji Ohno, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,040

Claims priority, application Japan, Sept. 19, 1973, 48-106204

Int. Cl.² H01B *3/00;* **B61C** *11/00*

U.S. Cl. 252—63.2 **1 Claim**

1. A method of improving the time stability of permittivity properties of a dielectric ceramic consisting essentially of a composition determined by the general formula: $(BaTiO_3)_x$-

$.(BaZrO_3)_y.(CaTiO_3)_z$, wherein $x+y+z = 1.0$ and x, y and z have the following ranges, respectively: $0.4 \leq x \leq 0.89$, $0.1 \leq y \leq 0.3$ and $0.01 \leq z \leq 0.3$ which comprises, adding to said composition between 0.001 wt.% to 0.5 wt.% SiO_2 and between 0.01 mol% to 3 mol% TiO_2.

3,969,253
METHOD FOR LOWERING THE MINIMUM POUR TEMPERATURE OF FATTY ACIDS

Erwin S. Poklacki, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,294

Int. Cl.² C09K *50/06*

U.S. Cl. 252—77 **5 Claims**

1. A fatty acid composition having a lowered minimum pour temperature consisting essentially of a fatty acid and from 5 to 50 parts per hundred parts of fatty acid of at least one 2 to 18 carbon atom acyclic amine having the structure $R_1R_2R_3N$ wherein R_1, R_2 and R_3 are independently selected from the group H and C_1–C_8 lower alkyl.

3. A method for lowering the minimum pour temperature of fatty acids comprising mixing therewith from 5 to 50 parts by weight per hundred parts of fatty acid of at least one 2 to 18 carbon atom acyclic amine selected from the group consisting of $R_1R_2R_3N$ and $R_1R_2NR_4NR_1R_2$ wherein R_1, R_2 and R_3 are independently selected from the group H and C_1–C_8 lower alkyl and R_4 is a C_1–C_6 alkalene radical.

3,969,254
CHEMICAL COMPOUNDS

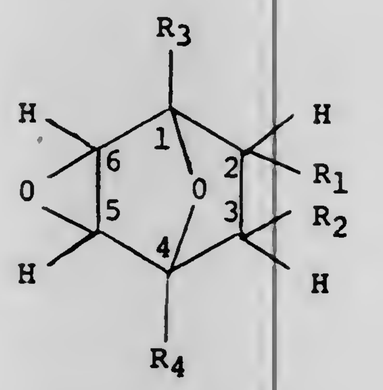
John F. Herber, St. Louis; Robert W. Street, and William R. Richard, Jr., both of Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 454,649, March 25, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,950

Int. Cl.² C10M *3/40, 3/20;* **C07D** *307/12*

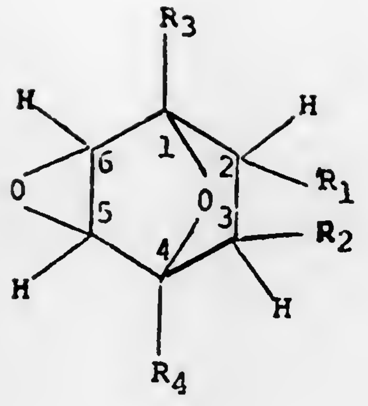
U.S. Cl. 252—78 **15 Claims**

1. A compound represented by the following formula



wherein R_1 is $—(CH_2)_{0\text{-}3}—C(O)OR$, $—C(O)R$, or CH_2OR wherein R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen or an alkyl radical having from 1 to 9 carbon atoms and R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to 4 carbon atoms; when R_1 is $—(CH_2)_0—C(O)OR$ R_2 is not H or $—(CH_2)_0—C(O)OR$.

4. A hydraulic fluid composition comprising
   - A. at least about 50 percent by weight of a base stock material selected from the group consisting of esters and amides of an acid of phosphorus, di- or tricarboxylic acid esters, esters of polyhydric compounds, and mixtures thereof, and
   - B. from about 0.1 to 10 percent by weight of an epoxide compound represented by the structure



wherein R_1 is $—(CH_2)_{0\text{-}3}—C(O)OR$, $—C(O)R$, or $—CH_2OR$ where R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen or an alkyl radical having from 1 to about 9 carbon atoms, and R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms.

3,969,255
PIPE CLEANING COMPOSITION

George F. Connelly, Jr., Golf Road & Perkins Blvd., Grand Beach, Mich. 49117

Filed Apr. 1, 1974, Ser. No. 456,468

Int. Cl.² C02B *5/06, 5/02*

U.S. Cl. 252—87 **12 Claims**

1. A pipe cleaning composition comprising an aqueous solution containing from about 7.5 to 25 parts by weight of hydrochloric acid, and a combination of inhibitors consisting essentially of 0.6 to 2.6 parts by weight of furfural, 0.5 to 1.4 parts by weight of a dialkylthiourea wherein the alkyl groups contain up to about 4 carbon atoms, and 0.05 to 0.21 parts by weight of benzyl thiocyanate.

6. A method of removing a scale deposit from metal surfaces normally in contact with water, which deposit includes at least one alkaline earth metal carbonate, which method comprises contacting said scale deposit with an aqueous composition containing from about 7.5 to 25 parts by weight of hydrochloric acid, and a combination of inhibitors consisting essentially of about 0.6 to 2.6 parts by weight of furfural about 0.5 to 1.4 parts by weight of dialkylthiourea wherein the alkyl groups contain up to about 4 carbon atoms, and about 0.05 to 0.21 parts by weight of benzyl thiocyanate, whereby said deposit is dissolved and/or dispersed.

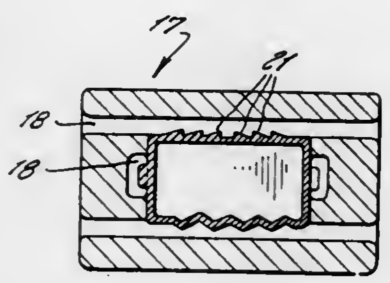
3,969,256
SOAP SAVER

Harry A. Hadley, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 15, 1974, Ser. No. 433,515

Int. Cl.² C11D *17/02, 17/04*

U.S. Cl. 252—92 **1 Claim**



1. A bar of soap comprising a hollow plastic shell in combination with soap material molded about said shell, including a jagged surface on the surface of said shell wherein the jagged surface is formed by irregular shaped teeth on the shell surface, further including longitudinal and transverse channels which intersect, wherein some of said channels communicate with the jagged surface and the outer surface of the bar of soap thereby generating turbulance for improved lathering purposes.

3,969,257
WASHING AND BLEACHING COMPOSITION CONTAINING BLEACH, ACTIVATOR AND A NITRILOTRICARBOXYLIC ACID COMPOUND

Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 165,700, July 23, 1971, abandoned, which is a continuation of Ser. No. 685,285, Nov. 24, 1967, abandoned. This application July 24, 1973, Ser. No. 382,065

Int. Cl.² D06L *3/00;* **C01B** *13/00;* **C11D** *7/54*

U.S. Cl. 252—102 **12 Claims**

1. A bleaching composition consisting essentially of (1) a stable, water-soluble inorganic peroxide bleaching agent, (2) an activator capable of reaction with said peroxide in aqueous media whereby to form oxidizing species capable of providing bleaching activity, said activator being selected from the group consisting of N-acetyl phthalimide, N-benzene-sulfonyl phthalimide, N-acetyl succinimide, and N-benzoyl succinimide and (3) a nitrilotricarboxylic compound selected from the group consisting of nitrilotriacetic acid and water-soluble sodium potassium or ammonium salts thereof, the nitrilotricarboxylic compound being present in an amount sufficient to improve the bleaching effectiveness of the composition, the activator-peroxide mol ratio being within the range of from about 0.01 to about 2.0, and the nitrilotricarboxylic compound-peroxide mol ratio being within the range of from 0.001 to 0.10.

6. A bleaching composition consisting essentially of (1) a stable, water-soluble inorganic peroxide bleaching agent, (2) an activator which is an organic carboxylic imide capable of reaction with said peroxide in aqueous media whereby to form oxidizing species capable of providing bleaching activity and (3) a compound selected from the group consisting of nitrilotriacetic acid and water-soluble sodium potassium or ammonium salts thereof, the nitrilotricarboxylic compound being present in an amount sufficient to improve the bleaching effectiveness of the composition, the activator-peroxide mol ratio being within the range of from about 0.01 to about 2.0 and the nitrilotricarboxylic compound-peroxide mol ratio being within the range of from 0.001 to 0.10.

3,969,258
LOW FOAMING ACID-ANIONIC SURFACTANT SANITIZER COMPOSITIONS

Carmen Maneclang Carandang, and George Roman Dychdala, both of Norristown, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 10, 1974, Ser. No. 513,544

Int. Cl.² C11D *1/22, 3/48*

U.S. Cl. 252—106 **8 Claims**

1. The anti-microbial sanitizer composition consisting essentially of a mixture, based on 100 parts by weight thereof, of:

5 to 25 parts of
  - a. anti-microbial anionic surfactant or a mixture of anti-microbial anionic surfactants including a normally high foaming anionic surfactant, selected from the group consisting of C_1–C_{18}-alkyl-benzene sulfonic acid, salts thereof and mixtures of said acid or salts with an alkyl- or alkenyl-phenoxy benzene disulfonic acid, naphthalene sulfonic acid, alkyl- or alkenyl-naphthalene sulfonic acid;

30 to 50 parts of
  - b. an acid selected from the group consisting of phosphoric acid, hydrochloric acid, hydroxyacetic acid, sulfuric acid, diglycolic acid, lactic acid, acetic acid and sulfamic acid;

2 to 15 parts of
  - c. a C_8–C_{18}-aliphatic alcohol, a C_8–C_{12}-alkylphenol or mixture thereof; and

0.5 to 10 parts of
  - d. a trivalent compound of iron and aluminum selected from the group consisting of ferrous aluminum sulfate, aluminum sulfate and aluminum hydroxide;

said components (c) and (d) being compatible in said composition and present in amounts sufficient to reduce foam formation in said composition compared to the foam formation which occurs in the absence of said (c) and (d) components.

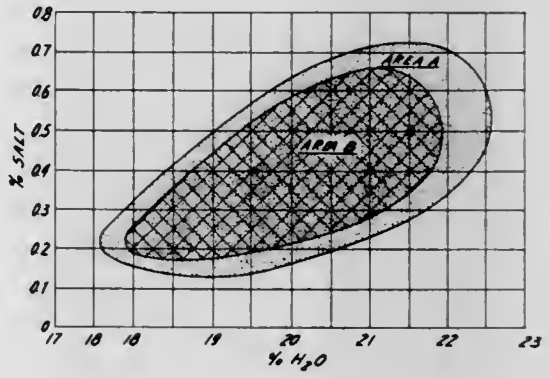
3,969,259
TRANSPARENT SOAP BAR

Robert E. Lages, Paramus, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,179

Int. Cl.² C11D *9/44, 9/50, 13/08*

U.S. Cl. 252—107 **4 Claims**



1. In a process for preparing a transparent soap bar wherein said transparency is achieved by a transparency aid selected from the group consisting of sucrose, sorbitol, glycerol, potassium soap or mixtures thereof, or by the conversion of mechanical energy to heat energy, and wherein said soap is chipped, mixed, plodded, extruded, and stamped,

the improvement comprising rendering said soap germicidal by the steps of:
  - i. preparing a visually clear solution of 1 part by weight of the germicide 2,4,4′-trichloro-2′-hydroxy diphenyl ether in about 0.7 to about 25 parts by weight of a liquid, pleasantly odorous substance, and
  - ii. incorporating said visually clear solution into said soap prior to the completion of the plodding thereof, the proportions of said 2,4,4′-trichloro-2′-hydroxy diphenyl ether being from about 0.15% to about 6%, and the proportion of said solvent being from about 0.15% to about 4%, basis of said transparent soap bar.

3,969,260
CORROSIVE INHIBITOR COMPOSITIONS

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 3, 1974, Ser. No. 485,668

The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.² C11D *7/60;* **C23G** *1/04*

U.S. Cl. 252—147 **6 Claims**

1. The synergistic mixture of from about 30% to about 40% by weight of a lower alkynyl cycloalkanol, of from about 30% to about 40% by weight of an N,N′-dicycloalkyl-thiourea and from about 30% to about 40% by weight of polyaminomethylenephosphonate.

3,969,261

POROUS SUBSTANCES HAVING ION EXCHANGE PROPERTIES

Francois Meiller, Palaiseau, France, assignor to Rhone-Progil, Courbevoie, France

Filed July 10, 1974, Ser. No. 486,819

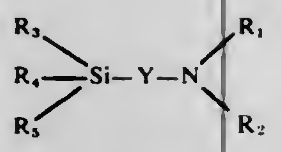
Claims priority, application France, July 13, 1973, 73.25698

Int. Cl.^{2} C02B *1/40*

U.S. Cl. 252—179 **9 Claims**

1. Porous substances having anionic ion exchanger properties consisting essentially of a porous mineral support, the surfaces of which have free hydroxyl groups, and at least one organo silicon compound grafted onto the porous mineral support by reaction with hydroxyl groups on the support, in which the organo silicon compound has an amine function in an organic group separated from the silicon atom by at least three carbon atoms and in which the porous substance has a specific surface area greater than 10 sq.m/g.

5. Process for the manufacture of porous substances according to claim 1, comprising in treating solid porous mineral supports possessing superficial hydroxyl groups with silanes having the general formula:



wherein at least one of the radicals R$_3$, R$_4$ and R$_5$ is an alkoxy radical and wherein Y is an organic group in which at least three atoms of carbon are present, the radicals R$_1$ and R$_2$ of the amine function being identical or different alkyls having from 1 to 3 carbon atoms.

3,969,262

PROCESS FOR THE PRODUCTION OF SYNTHETIC PLASTICS COMPRISING URETHANE GROUPS AND BIURET GROUPS

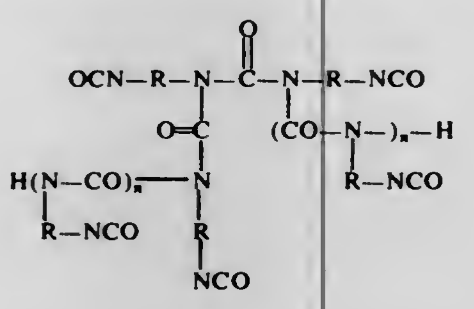
Kuno Wagner, Leverkusen; Werner Dietrich, Cologne, both of Germany; Karl-Josef Kraft, Coraopolis, Pa., and Horst Conrad, Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 360,883, May 16, 1973, Pat. No. 3,899,454, which is a continuation-in-part of Ser. No. 264,641, June 20, 1972, abandoned, which is a continuation of Ser. No. 36,500, May 11, 1970, abandoned. This application Aug. 27, 1974, Ser. No. 501,015

Int. Cl.^{2} C08G *18/72*

U.S. Cl. 252—182 **7 Claims**

1. A polyisocyanate which comprises a solution in a monomeric polyisocyanate of from about 1 to about 85 percent of a biuret polyisocyanate having the formula:



in which

R is an aromatic, araliphatic or cycloaliphatic radical and wherein n is an integer of from 0 to 5 and the proportion of biuret-polyisocyanate having more than three isocyanate groups is at least 20 percent by weight based on the total quantity of biuret-polyisocyanates and the solution contains from about 0.3 to about 5 percent by weight based on the weight of the biuret polyisocyanate of an emulsifier chemically bound to the polyisocyanate, the biuret polyisocyanate being prepared in the presence of the emulsifier, said emulsifier being selected from the group consisting of hydroxyl containing oleyl alcohol polyglycol ether, castor oil polyglycol ether, isononyl phenol polyglycol ether, higher molecular weight n-dodecyl polyglycol ethers having a terminal OH group and the corresponding amine derivatives obtained by cyanoethylation and subsequent hydrogenation by the foregoing compounds.

3,969,263

METHOD OF PRODUCING LIGHT USING CATALYST CHEMILUMINESCENT SYSTEM

Herbert P. Richter; Carl A. Heller, both of China Lake, and Ruth E. Tedrick, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,360

Int. Cl.^{2} C01B *13/00*

U.S. Cl. 252—186 **3 Claims**

1. In a method for producing light comprising bringing a hydrogen peroxide component containing a catalyst and an oxalate ester-fluorescent component together and allowing said components to react to produce said light, the improvement residing in utilizing, as said catalyst, a member selected from the group consisting of tetraalkylammonium trifluoroacetate wherein the alkyl groups contain from 1 to 4 carbon atoms, lithium trifluoroacetate and sodium trifluoroacetate.

3,969,264

CHOLESTERIC LIQUID CRYSTAL WATER BASE INK

Frederick Davis, Dublin, Calif., assignor to RPR, Inc., Dublin, Calif.

Filed Dec. 17, 1973, Ser. No. 425,006

Int. Cl.^{2} G01K *11/16;* **C09K** *3/34*

U.S. Cl. 252—299 **11 Claims**

1. A composition useful in the formation of liquid crystal films which comprises:

- a thick oil in water emulsion having from 30 to 80 weight percent solids of which 25–75 weight percent is a cholesteric liquid crystal composition and 75–25 weight percent respectively is a transparent latex film-forming polymer;
- from 20–70 weight percent liquid, having water in from 40–75 weight percent and a moderately water soluble organic solvent having a boiling point less than about 150°C for said liquid crystal composition in from 25–60 weight percent; and
- a small but sufficient amount of a thickening agent to provide the desired viscosity for film forming.

7. A method for forming a film-forming liquid crystal composition containing emulsion which comprises:

adding to a latex of a transparent film-forming polymer having from about 30–95 weight percent water, a solution of a cholesteric liquid crystal composition in a moderately water soluble organic solvent having a boiling point less than about 150°C, said solution having a sufficient amount of a thickening agent to provide a final concentration of from about 0.1 to 2 weight percent of the total composition, said liquid crystal composition being present in amount to provide from about 25–75 weight percent of the total solids content, wherein said solution is at a temperature in the range of about 40°–100°C, and stirring the resulting mixture for a time sufficient to provide a substantially uniform composition.

3,969,265

NOVEL LIQUID MEMBRANE FORMULATIONS AND USE THEREOF

Gopal H. Singhal, Westfield, N.J.; Martin L. Gorbaty, Baytown, Tex.; Richard M. Minday, North Plainfield, and Norman N. Li, Edison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 24, 1976, Ser. No. 482,592

Int. Cl.^{2} C08D *7/00, 7/10*

U.S. Cl. 252—309 **15 Claims**

1. A water-in-oil emulsion consisting of from 10 to 90 weight % of an exterior oil phase consisting of (a) a sulfonated polymer having a number average molecular weight of from about 1,000 to about 50,000, said sulfonated polymer comprising a substantially nonaromatic backbone and from 0.2 to 20 mole % sulfonic acid groups, the polymer being present at from 0.05 to 40 weight % based on weight solvent and (b) a solvent for said sulfonated polymer as the oil phase of the emulsion, said solvent being selected from the group consisting of petroleum distillates having a boiling point of greater than 200°C; paraffinic solvents bearing substituents selected from the group consisting of halogen, benzene and cycloalkyl rings; isoparaffins having an average carbon number of from about 10 to about 100 and combinations thereof and a reactive interior aqueous phase selected from the group consisting of aqueous acid and aqueous base, said reactive interior aqueous phase constituting the balance of the emulsion.

3,969,266

MICROPOROUS MEMBRANE PROCESS FOR MAKING CONCENTRATED SILICA SOLS

Ralph K. Iler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 231,716, March 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 54,864, July 14, 1970, abandoned. This application July 2, 1973, Ser. No. 375,943

Claims priority, application Canada, June 23, 1971, 116479

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—313 S **6 Claims**

1. A process for increasing the size of colloidal silica particles in an aqueous silica sol containing from 1 to 10% by weight silica consisting essentially of mixing with the sol at 80 to 100°C., a feed of sodium silicate solution and a solution of sulfuric acid, hydrochloric acid or carbon dioxide, the concentration of silica in the feed being below 0.6 times the weight ratio of SiO_2:Na_2O in the sodium silicate, the molar ratio of sodium silicate to sulfuric acid, hydrochloric acid or carbon dioxide in the feed being such to maintain the pH of the sol from 8 to 10 and the sodium salt concentration of the sol not above 0.2 normal and ultrafiltering the sol using a microporous membrane having pores smaller than the silica particles in the sol to remove sodium salt solution, while maintaining the concentration of sodium in the sol from $N = 0.005$ to $N = 0.26\text{-}0.005C\text{-}0.002\ (T\text{-}40)$ where N is the normality of the sodium in the sol, T is the temperature in degrees centigrade and C is the grams of silica per 100 milliliters of sol by the addition of water.

3,969,267

PROCESS FOR REDISPERSION OF NOBLE METAL CATALYSTS USING FLUORINE

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 11, 1974, Ser. No. 504,862

Int. Cl.^{2} B01J *23/96;* **C10G** *35/08*

U.S. Cl. 252—415 **6 Claims**

1. A method for regenerating a hydrocarbon conversion catalyst which comprises iridium supported on a refractory inorganic oxide support, and which is at least partially deactivated by the presence of carbonaceous deposits thereon which comprises, serially, the steps of

1. contacting said catalyst with an oxygen-containing gas at a temperature of at least 300°C: for a time sufficient to burn at least a substantial portion of said carbonaceous deposits from said catalyst and thereby converting at least a portion of said iridium into large particle size oxide crystallites;
2. contacting said catalyst with a reducing gas at an elevated temperature for a time sufficient to convert at least a portion of said iridium oxide into the metal;
3. contacting said catalyst with a gaseous dispersing agent comprising fluorine and an inert gas at a temperature of from between 25° and 250°C. for a time sufficient to redisperse said large crystallites to crystallites having a substantially smaller size to effect at least 43% redispersion but insufficient to volatize the iridium or to substantially reduce the surface area of the support.

3. The method of claim 1 wherein said support is alumina.

4. The method of claim 3 wherein said iridium containing catalyst additionally contains a metal selected from the group consisting of Groups IB, IV, VIIB and the noble and nonnoble metals of Group VIII of the Periodic Table of the Elements.

3,969,268

PROCESS FOR PREPARING ACTIVE CARBON FIBERS

Takashi Fukuda; Nobuo Ishizaki; Shoichi Iwahori, and Masayoshi Shimada, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Japan

Filed Dec. 31, 1974, Ser. No. 537,761

Int. Cl.^{2} B01J *21/18*

U.S. Cl. 252—423 **23 Claims**

1. A process for preparing active carbon fibers which comprises (a) providing a cellulose fiber with a phosphorus compound reactive thereto, (b) subjecting the resulting fiber to heat treatment at about 200° to 350°C until the decreased percentage of fiber becomes about 40 to 75 % (W/W) and then (c) subjecting the resultant fiber to activation treatment at about 450° to 1000°C in an atmosphere containing not less than about 5 % (V/V) of steam until the decreased percentage of fiber becomes about 65 to 95 % (W/W), the said phosphorous compound showing a residual percentage of phosphorus of not less than about 70 % (W/W) after the heat treatment of the step (b) and a residual percentage of phosphorus of not more than about 10 % (W/W) after the activation treatment of the step (c).

3,969,269

OLEFINE POLYMERIZATION CATALYST INCORPORATING AN ORGANO-PHOSPHORUS COMPOUND

Anthony David Caunt, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 268,505, July 3, 1972, abandoned. This application June 3, 1974, Ser. No. 475,840

Claims priority, application United Kingdom, July 13, 1971, 32856/71

Int. Cl.^{2} C08F *4/52, 4/64, 4/68*

U.S. Cl. 252—429 B **30 Claims**

1. An olefine polymerisation catalyst consisting essentially of

1. one molecular proportion of a solid halide of titanium, vanadium or zirconium wherein the metal has a valency below its maximum,
2. between about 1.75 and about 4 molecular proportions of a Grignard reagent which is substantially ether free, $Mg[Al(C_2H_5)_4]_2$, $Mg(C_6H_5)_2$, a lithium aluminium tetraalkyl, an aluminium hydrocarbyl halide, an aluminium hydrocarbyl sulphate, an aluminium hydrocarbyl oxyhydrocarbyl, an aluminium trihydrocarbyl or a dihydrocarbyl aluminium hydride, and
3. up to C_A/f molecular proportions of a trivalent phosphorus compound of the formula $PR'_{3-n}(X\text{-}A\text{-}Y)_n$ wherein

R′ is halogen, a hydrocarbyl group, the group -NR$_2$ or the group -OR;
X is -O-, -S- or -NR-;
A is a bivalent hydrocarbyl radical such that X and Y are separated by not more than 3 carbon atoms;
Y is -OR, -SR, -NR$_2$, -PR$_2$, a pyridyl radical, a quinolyl radical, an isoquinolyl radical, a furyl radical or a tetrahydrofuryl radical;
R is a hydrocarbyl group;
C$_A$ is the molecular proportion of component 2) and;
f is the number of functional groups in the phosphorus compound which contain O or N, there being at least one such functional group in the phosphorus compound N is 1, 2 or 3.

3,969,270
METHOD OF CATALYST MANUFACTURE

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,093

Int. Cl.^{2} B01J *31/02, 31/12*

U.S. Cl. 252—430 **13 Claims**

1. A method of manufacturing a catalytic composite which comprises:

a. commingling a refractory inorganic oxide carrier material with an impregnating solution containing a Group VIII metal component and from about 0.05 to about 0.75 wt. % polybasic carboxylic acid, said polybasic carboxylic acid effecting subsurface impregnation of said Group VIII metal component;
b. maintaining carrier material in said solution for a period of time of from about 2 to about 10 minutes, thereafter commingling sufficient sulfur-containing carboxylic acid with said solution to provide from about 1 to about 3 mols of said acid per mole of said Group VIII metal, and effecting the deposition of said Group VIII metal component concentrated in a thin surface layer on said carrier material, said sulfur-containing carboxylic acid inhibiting substantial straying of said Group VIII metal from said subsurface layer;
c. prior to calcining impregnated carrier material, further impregnating the same with a solution of an alkaline earth metal salt of an organic acid selected from the group consisting of the calcium, strontium and barium salts thereof, and evaporating said solution to dryness in contact with the impregnated carrier material; and
d. thereafter calcining the impregnated carrier material in an oxidizing atmosphere at a temperature of from about 200° to about 1000°C. or more.

3,969,271
METHOD OF MANUFACTURING A CATALYTIC COMPOSITE USEFUL FOR THE TREATMENT OF GASEOUS WASTE PRODUCTS

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,434

Int. Cl.^{2} B01J *31/04, 31/12*

U.S. Cl. 252—430 **11 Claims**

1. A method of manufacturing a catalytic composite which comprises:

a. commingling a refractory inorganic oxide carrier material with an impregnating solution containing a sulfur-containing carboxylic acid and a Group VIII metal component in an acid/metal mole ratio of from about 1 to about 3, and effecting the deposition of said Group VIII metal compound on the outer surface of said carrier material;
b. prior to calcining the impregnated carrier material, further impregnating the same with a solution of an alkaline earth metal salt of an organic acid selected from the group consisting of the calcium, strontium and barium salts thereof, and evaporating said solution to dryness in contact with the impregnated carrier material; and
c. thereafter calcining the impregnated carrier material in an oxidizing atmosphere at a temperature of from about 200° to about 1000° C. or more.

3,969,272
CHROMIUM TRIS-DIORGANO-ORTHOPHOSPHATE-ALKYL ALUMINUM HALIDE CATALYSTS FOR OLEFIN POLYMERIZATION AND ALKYLATION OF AROMATIC COMPOUNDS

Jeffrey G. Meyer, Adrian, Mich., assignor to Anderson Development Company, Adrian, Mich.

Continuation-in-part of Ser. No. 319,621, Dec. 29, 1972, Pat. No. 3,907,849. This application Dec. 12, 1974, Ser. No. 532,010

Int. Cl.^{2} B01J *31/14;* **C08F** *4/60*

U.S. Cl. 252—431 P **3 Claims**

1. A combination catalyst composition for olefin polymerization and for alkylation of aromatic hydrocarbons with olefins, said catalyst consisting essentially of the reaction product prepared by mixing (A) a chromium tris-diorgano-orthophosphate of the formula $Cr[OP(0)\ (OR)_2]_3$ in which each R is selected from the class consisting of non-aromatic hydrocarbon groups free of aliphatic unsaturation and containing one to eight carbon atoms, non-aromatic hydrocarbon ether groups free of aliphatic unsaturation and containing three to six carbon atoms and chlorinated and brominated derivatives thereof, and (B) an alkyl aluminum halide of the general formula $R'_cAl\ X_d$ in which each R′ is an alkyl group of one to six carbon atoms, each X is a halogen atom, each of *c* and *d* is 1 or 2 and the total of *c* and *d* is 3, the mol ratio of (A) to (B) ranging from 1:1 to 1:20.

3,969,273
PROCESS FOR PREPARING PHOSPHATED ALUMINA EXTRUDATES

Stanley Monty Brown, Mount Airy, and David Nelson Wallace, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,178

Int. Cl.^{2} B01J *27/16, 21/04, 23/84*

U.S. Cl. 252—435 **7 Claims**

1. A process for preparing extruded alumina catalyst supports containing 1 to 10% phosphate which consists essentially of the steps of:

a. precipitating the aluminum salt selected from the group consisting of aluminum sulfate, nitrate, and chloride with sodium or potassium aluminate within a pH range of 6.5 to 10.5, within a temperature range of 90° to 190°F. and with an alumina concentration in the precipitation slurry of from 1 to 8%,
b. washing the precipitate so as to remove contaminating cations and anions,
c. drying the washed hydrogel, and recovering an alumina powder,
d. adding a solution of water soluble phosphate containing compound, while mulling the alumina powder,
e. extruding, drying and calcining the mulled material.

3,969,274
FIXED BED CATALYST

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,259

Int. Cl.^{2} B01J *29/16, 29/26, 29/00, 29/10*

U.S. Cl. 252—456 **18 Claims**

1. In a catalyst comprising an active catalytic material and a preformed support, wherein the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups I B, II B, IV B, V, VI B, VII B and VIII of the Periodic Table of Elements and mixtures thereof, the improvement which comprises employing as the support a regular or intermediate density silica xerogel which has been steam treated at a temperature up to 300° C.

3,969,275
METHOD FOR IMPREGNATING A WATER-SENSITIVE SOLID WITH A WATER-SOLUBLE MATERIAL USING AN AQUEOUS IMPREGNATING SOLUTION

Heinz P. Weber, Berkeley, and Gordon E. Langlois, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sept. 6, 1974, Ser. No. 503,983

Int. Cl.^{2} B01J *29/06, 21/00, 23/08*

U.S. Cl. 252—455 R **11 Claims**

1. A method for impregnating a water-sensitive solid with a water-soluble material, said solid containing micropores and comprising at least one metal oxide selected from the group consisting of oxides of metals of Groups II, III and IV of the Periodic Chart of the Atoms, and said micropores containing a substantially water-insoluble gas, which comprises:

1. replacing the water-insoluble gas in said micropores with a hydrophylic gas selected from the group consisting of steam, substantially water-soluble gases and mixtures thereof by stripping said solid with said hydrophylic gas under gas-stripping conditions; and
2. impregnating said solid by immersing the stripped solid in an aqueous solution of said material, said impregnating being effected while maintaining substantial absence of water-insoluble gas from the micropores of said solid.

5. A method as in claim 1 wherein said oxide consists essentially of alumina and contains at least one oxide of the group consisting of magnesia, silica, boria and titania.

3,969,276
METHOD OF MANUFACTURING A ZEOLITIC ADSORBENT

Donald H. Rosback, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 356,666, May 2, 1973, Pat. No. 3,878,127. This application Mar. 19, 1975, Ser. No. 560,279

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.^{2} B01J *29/06*

U.S. Cl. 252—455 Z **13 Claims**

1. A method of manufacturing a solid adsorbent which method comprises the steps of:

a. contacting a base material comprising X or Y zeolite with an aqueous sodium hydroxide solution at first ion exchange conditions to effect the addition of sodium cations to said base material;
b. treating the sodium-exchanged base material at second ion exchange conditions to effect the essentially complete exchange of sodium cations with one or more cations selected from the group consisting of Group IA, Group IIA, and Group IB of the Periodic Table of Elements; and,
c. drying the material at conditions to reduce the LOI at 900° C. to less than about 10 weight percent.

3,969,277
CATALYST FOR HYDROCARBON CONVERSION

Emmanuel E. Neel, Grand-Quevilly, and Gerard F. Joachimsmann, Rouen, both of France, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1975, Ser. No. 543,739

Claims priority, application France, Feb. 13, 1974, 74.04834

Int. Cl.^{2} B01J *29/06;* **C10G** *13/02*

U.S. Cl. 252—455 Z **7 Claims**

1. A process for the preparation of a tungsten-containing catalyst suitable for the conversion of hydrocarbons, which comprises contacting particulate erionite with a non-aqueous solution of at least one tungsten salt to exchange tungsten into the erionite, washing the product to remove non-exchanged tungsten, drying the product, mixing the tungsten-exchanged erionite with carbon powder having an average particle size of 0.2 mm or less in diameter, shaping the mixture and removing the carbon by burning.

3,969,278
METALLOCERAMIC CURRENT-CONDUCTING MATERIAL AND A METHOD FOR PREPARING SAME

Yakov Dmitrievich Aksenov, pereulok Klumova, II, kv. 31; Georgy Alexandrovich Gumansky, ulitsa Danily Serdicha, 72, kv. 6; Valery Mikhailovich Drako, ul. Zm. Byaduli, 6, kv. 54, and Nikolai Konstantinovich Fedoseenko, ulitsa Narodnaya, 22, kv. 44, all of Minsk, U.S.S.R.

Continuation-in-part of Ser. No. 455,037, March 26, 1974, abandoned, which is a continuation of Ser. No. 275,958, July 28, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,266

Int. Cl.^{2} H01B *1/02*

U.S. Cl. 252—513 **3 Claims**

1. A sintered metalloceramic current-conducting material consisting essentially of 60–80 percent by weight of a nickel-chromium alloy as a current-conducting component, 17–35 percent by weight of fully oxidized aluminum as an insulating component which serves as a refractory filler material, and 3–5 percent by weight of a mixture of oxides of nickel and chromium, the mixture of oxides of nickel and chromium coating the particles of the nickel-chromium alloy which serves to separate the particles of the nickel-chromium alloy and to increase the specific resistance of the material.

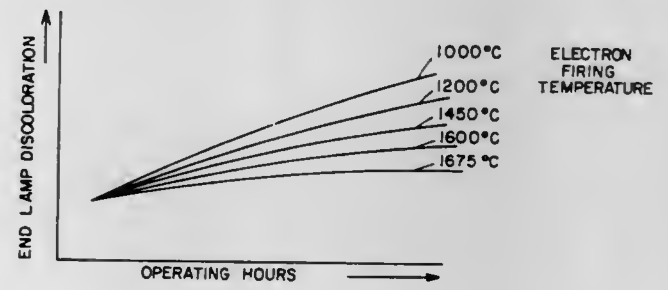
3,969,279
METHOD OF TREATING ELECTRON EMISSIVE CATHODES

Edmund R. Kern, Hampton, N.H., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 13, 1974, Ser. No. 497,026

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 252—521 **4 Claims**



1. A method of treating electron emissive barium tantalate coatings in order to improve the electron emissive properties over the operational life of the coatings comprising the following steps:

placing the coating in an oxygen free environment;
heating the coating to at least 1200°C for one to ten minutes to remove excess free barium from the tantalate; and
cooling the coating within the oxygen free environment.

3,969,280
SOLID AIR FRESHENER GELS

John G. Sayce, Headly, and David J. Brown, Sandhurst, Camberley, both of England, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 3, 1975, Ser. No. 564,970

Claims priority, application United Kingdom, Mar. 7, 1975, 9616/75

Int. Cl.^{2} A61L *9/00*

U.S. Cl. 252—522 **10 Claims**

1. An air freshener gel composition consisting essentially of in an aqueous system from 0.5–10% by weight of carboxy-

methyl cellulose selected from sodium carboxymethyl cellulose and potassium carboxymethyl cellulose; from 0.01–10% by weight of perfume; from 0.05–10% of a surfactant; a source of trivalent cations selected from chromic ions, aluminum ions and mixtures sufficient to produce a weight ratio of carboxymethyl cellulose to effective weight of trivalent cation of 1:0.01 to 1:0.1 and water to 100%.

3,969,281
WATER-SOLUBLE IMIDAZOLINE COMPOSITION FOR REMOVING IRON SULFIDE AND SLUDGE FROM METAL SURFACES

Thomas L. Sharp, 715 Nenana St., Houston, Tex. 77035

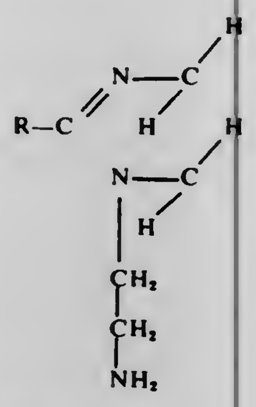
Filed Sept. 23, 1974, Ser. No. 508,655

Int. Cl.² C11D *1/62, 1/835, 3/30*

U.S. Cl. 252—542 **6 Claims**

1. A water soluble composition effective for the removal of iron sulfide and sludge from interior metal surfaces comprising:

a. from about 2 to about 15% by weight of a high molecular weight diamine;
b. from about 2.5 to about 18% by weight of acetic acid;
c. from about 1 to about 10% by weight of an organic nitrogen substituted imidazoline of the formula



wherein R is an alkyl radical
d. from about 6 to about 15% by weight of a non-ionic surfactant; and
e. from about 2 to about 8% by weight of a quaternary ammonium chloride.
f. from about 1 to about 15% by weight of an alcohol solvent selected from diacetone alcohol and lower aliphatic alcohols; and
g. the remainder, water.

3,969,282
ACIDIC SURFACTANT COMPOSITION, STOCK SURFACTANT SOLUTION PREPARED THEREFROM, AND METHOD OF WASHING SOILED SUBSTRATES EMPLOYING THE SAME

Frank R. Kappler, Wyandotte; John D. Ciko, Allen Park, and John J. Cramer, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

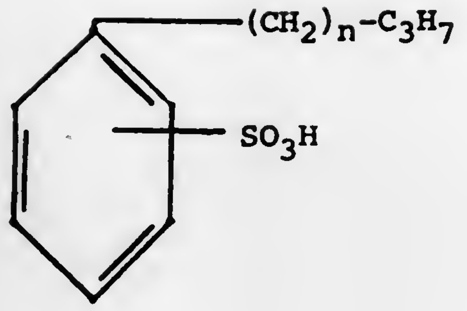
Filed Dec. 23, 1974, Ser. No. 535,260

Int. Cl.² C11D *1/22, 1/831*

U.S. Cl. 252—559 **41 Claims**

1. An acidic stable homogeneous mobile liquid biodegradable surfactant composition consisting essentially of

1. at least one liquid hydrophilic nonionic surfactant, the said nonionic surfactant being a polyoxyalkylene adduct of a hydrophobic base wherein the oxygen/carbon atom ratio in the oxyalkylene portion of the molecule is greater than 0.40 and the said oxyalkylene portion constitutes at least 60% by weight of the said molecule,
2. at least one substantially salt free liquid biodegradable alkyl benzene sulfonic acid surfactant corresponding to the structural formula:



wherein *n* is an integer having a numerical value of from 3 to 14,
3. about 0.0001–1% by weight of hydrogen peroxide, and
4. about 0–95% by weight of water,

the liquid surfactant composition containing a weight ratio of surfactant (1) to surfactant (2) from 1:5 to 5:1, the surfactant (1) having hydrophilic properties whereby the liquid surfactant composition is stable and remains homogeneous in the absence of an added hydrotrope, and the hydrogen peroxide being present in an amount to control obnoxious odors.

35. In a method of washing soiled textile materials wherein textile material having an undersirable foreign substance thereon is agitated in an aqueous medium containing a surfactant under conditions whereby at least a portion of the foreign substance is removed, the improvement which comprises washing the said soiled textile material in an alkaline aqueous medium containing (A) a surfactant composition in accordance with claim **1**, and (B) a water soluble alkaline substance which provides in solution at least one ion selected from the group consisting of ammonium ion, sodium ion, and potassium ion in an amount whereby the said alkyl benzene sulfonic acid surfactant of (A) is converted to the corresponding salt.

3,969,283
RECORDING MATERIAL

Daniel Maurice Timmerman, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

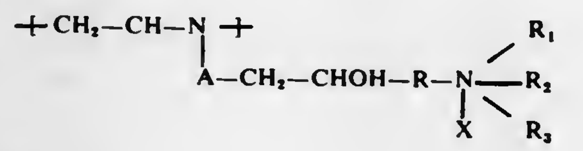
Division of Ser. No. 323,420, Jan. 15, 1973, Pat. No. 3,864,158. This application Jan. 3, 1975, Ser. No. 538,262

Claims priority, application United Kingdom, Jan. 17, 1972, 2134/72

Int. Cl.² C08G *73/00*

U.S. Cl. 260—2 EN **1 Claim**

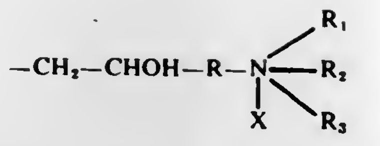
1. Electroconductive polymers comprising recurring units corresponding to the general formula:



$$\left[CH_2-CH-\underset{\displaystyle A-CH_2-CHOH-R-\underset{X}{\underset{|}{N}}\begin{smallmatrix} \diagup R_1 \\ -R_2 \\ \diagdown R_3 \end{smallmatrix}}{\underset{|}{N}} \right]$$

wherein:

A represents a single chemical bond or a group of the formula $-CH_2-CH_2-NR_4-$, wherein R_4 represents hydrogen or a group of the formula:



$$-CH_2-CHOH-R-\underset{X}{\underset{|}{N}}\begin{smallmatrix} \diagup R_1 \\ -R_2 \\ \diagdown R_3 \end{smallmatrix}$$

wherein:

R represents a branched or unbranched alkylene group having up to 4 carbon atoms,
each of R_1, R_2, and R_3 (same or different) represents an alkyl group containing up to 4 carbon atoms, a cycloalkyl group or an aralkyl group,
or wherein R_1, $_{R2}$, and R_3 together with the nitrogen atom represent a heterocyclic amine group, and
X is an anion.

3,969,284
AMINO ACID DERIVATIVES OF CHLOROMETHYLATED POLYMERS AND METHODS OF MAKING THE SAME

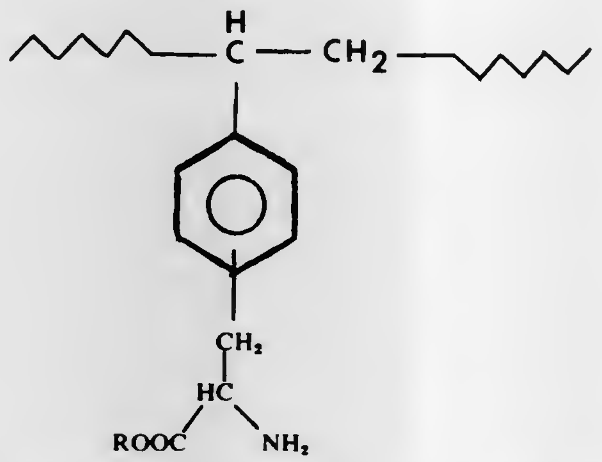
Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 24, 1973, Ser. No. 363,677

Int. Cl.² C08F *8/00, 8/32*

U.S. Cl. 260—2.1 E **5 Claims**

1. A resinous polymer consisting essentially of recurring units in its molecular formula as follows:



where R is H or a metal that is the residue of the reaction of a base with a carboxyl group to form the acid salt.

3,969,285
HEAT-TREATED FLUOROCARBON SULFONYLAMINE CATION PERMSELECTIVITY

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1973, Ser. No. 425,079

Int. Cl.² C08J *5/22*

U.S. Cl. 260—2.2 R **5 Claims**

1. A film of a fluorinated ion exchange polymer comprising

a. a first surface formed from an intermediate fluorinated polymer containing pendant sulfonyl halide groups attached to carbon atoms which have at least one fluorine atom connected thereto in which
   at least 40% of the sulfonyl halide groups to a depth of at least one micron in the intermediate polymer have been reacted with a di- or poly-amine comprising at least two groups with one primary amine group and a second amino group either primary or secondary; and
   ii. the polymer of (i) has been subjected to an elevated temperature of between 170°C. and the degradation temperature of the reacted polymer for a period of time to increase permselectivity;
b. a second surface containing pendant sulfonyl groups attached to carbon atoms which have at least one fluorine atom connected thereto with at least a majority of the sulfonyl groups present as $-(SO_2NH)_mQ$, or $-(SO_3)_nMe$ wherein Q is selected from the group consisting of H, NH_4, cation of an alkali metal, cation of an alkaline earth metal and combinations thereof, *m* is the valence of Q, Me is a cation and *n* the valence of the cation.

3,969,286
EPOXY RESIN

Glenn R. Wilson; Ival O. Salyer, both of Dayton, and George L. Ball, III, West Carrollton, all of Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 24, 1972, Ser. No. 237,872

Int. Cl.² C08J *9/30*

U.S. Cl. 260—2.5 EP **3 Claims**

1. A process for preparing a gas frothable epoxy foam that can be troweled and that cures a near room temperature which comprises the steps of:

a. preparing an amine terminated prepolymer by mixing a polyamine with a polyepoxide in at least a 2 to 1 mole ratio;
b. contacting the prepolymer with about 2 to about 10 weight percent of a fatty acid containing from about 8 to about 32 carbon atoms to form a curing agent;
c. mixing from about 20 to about 50 parts by weight of the curing agent with 100 parts by weight of an organic epoxide, the uncured mixture having a viscosity of at least 5,000 centistokes; and
d. foaming the uncured mixture by incorporating a gas comprising elemental nitrogen into the mixture.

3,969,287
CARRIER-BOUND PROTEIN PREPARED BY REACTING THE PROTEIN WITH AN ACYLATING OR ALKYLATING COMPOUND HAVING A CARRIER-BONDING GROUP AND REACTING THE PRODUCT WITH A CARRIER

Dieter Jaworek, Weilheim, Upper Bavaria; Michael Nelböck-Hochstetter, Tutzing; Klaus Beaucamp, Tutzing; Hans Ulrich Bergmeyer, Tutzing, and Karl-Heinz Botsch, Bernried, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Nov. 30, 1973, Ser. No. 420,510

Claims priority, application Germany, Dec. 8, 1972, 2260185

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² C08L *89/00*

U.S. Cl. 260—8 **17 Claims**

1. Process for the preparation of a carrier-bound protein, which process comprises reacting a protein in aqueous solution with a compound containing at least one group capable of acylating or alkylating proteins, said group being selected from the class consisting of an ethyleneimine group, a halide group activated by unsaturation, an acid-halide group, an azide group, an acid anhydride group, an aldehyde group, and an oxazolone group; and at least one additional group capable of producing a bond with a carrier material, and reacting the reducing product with a carrier material.

3,969,288
CARBODIIMIDE-ISOCYANURATE FOAMS PREPARED FROM ACID-MODIFIED TOLUENE DIISOCYANATE

Moses Cenker, Trenton, and Peter T. Kan, Plymouth, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 2, 1974, Ser. No. 511,112

Int. Cl.² C08G *18/02, 18/12, 18/14*

U.S. Cl. 260—2.5 BF **8 Claims**

1. In a process for the preparation of a rigid cellular foam characterized by carbodiimide linkages wherein an organic polyisocyanate is catalytically condensed in the presence of a catalytically sufficient amount of a carbodiimide catalyst, the improvement which comprises:

employing as the organic polyisocyanate commercial pure toluene diisocyanate which has been acid-modified by adding an excess amount of a conventional acidifying agent to achieve an acidity level of a minimum of about ten times the acidity level of the commercial pure toluene diisocyanate.

2. The process of claim 1 wherein the toluene diisocyanate is employed as an isocyanate-terminated quasi-prepolymer to prepare therefrom a urethane-modified rigid cellular foam characterized by carbodiimide linkages.

3,969,289
ONE-PART FOAMABLE LATEX COMPOSITION

Perley A. Coffin, Gloucester; Philip G. Cook, Newton, and Paul D. Demerjian, Andover, all of Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

Filed Mar. 15, 1971, Ser. No. 12[illegible],514

Int. Cl.² C08J *9/30;* **C08K** *5/16;* **C08L** *7/02, 9/08*

U.S. Cl. 260—2.5 L **27 Claims**

1. A one-part foamable latex composition which may be stored for extended periods of time prior to foaming, which foamable latex composition comprises:

a. a natural or synthetic elastomeric latex subject to cure;
b. a curing system which comprises an ammonia-retardant dibenzyl dithiocarbamate accelerating agent, which agent is inhibited in accelerating function in the presence of the base;
c. a volatile nitrogen-containing base in an amount sufficient to inhibit the cure of the latex;
d. a siloxane heat-sensitizing agent to lower the coagulation temperature of the latex to about 90°F or above; and
e. a foaming agent in an amount to permit mechanical frothing of the composition into a foam.

3,969,290
N,N'-SUBSTITUTED 2,4,5-TRIKETOIMIDAZOLIDINES

Kurt Kraft, Auringen; Johannes Reese, Wiesbaden-Biebrich, and Gerd Walz, Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jan. 23, 1974, Ser. No. 435,885

Claims priority, application Germany, Jan. 24, 1973, 2303239

Int. Cl.² C08G *18/14, 18/06, 18/10*

U.S. Cl. 260—2.5 N **19 Claims**

1. A process for the preparation of modified N,N'-substituted-2,4,5-triketoimidazolidine which comprises reacting a precondensate having terminal isocyanate groups with at least one oxamidic ester to form a product having polymerizable groups wherein the precondensate is first prepared by reacting (a) a polybasic carboxylic acid, containing from 4 to 70 carbon atoms and from 2 to 6 caboxyl groups, with an excess of (b) one or more isocyanates or isocyanate forming compounds in the presence of a solvent, said oxamidic ester containing the group NH—CO—CO—OR^V wherein R^V represents an aliphatic hydrocarbon group containing up to 18 carbon atoms, a cycloaliphatic hydrocarbon group containing up to 8 carbon atoms or a mononuclear aromatic hydrocarbon group being unsubstituted or substituted by at least one hydrocarbon group and having a total of up to 14 carbon atoms and said reaction between the precondensate and oxamidic ester taking place in the presence of a solvent.

3,969,291
INTUMESCENT FIRE-RETARDANT COATING COMPOSITIONS CONTAINING AMIDE-POLYPHOSPHATES

Kozo Fukuba, and Yasutomo Ogushi, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 6, 1975, Ser. No. 555,907

Claims priority, application Japan, Mar. 6, 1974, 49-26574; June 17, 1974, 49-69331

Int. Cl.² C08L *3/02*

U.S. Cl. 260—17.3 **13 Claims**

1. An intumescent fire-retardant coating composition comprising an aqueous dispersion of (A) a substantially water-insoluble amide polyphosphate condensate comprising the heat-condensation product of a phosphoric acid-containing material selected from the group consisting of ammonium orthophosphate, orthophosphoric acid, polyphosphoric acid, phosphoric anhydride, urea phosphate and mixtures thereof with a cyanamide derivative selected from the group consisting of melamine, dicyanamide or mixtures thereof, as nitrogen source in the presence of a condensing agent selected from the group consisting of urea, urea phosphate and a mixture thereof in a molar ratio of 0.8:1:0.05 to 1.5:1:1 of urea : phosphoric acid-containing material (as H_3PO_4) : cyanamide derivative at a temperature of from about 150° to 350°C, (B) a film forming binder comprising a polymer solution in an organic solvent or an aqueous emulsified polymer solution, and (C) a carbonific material selected from the group consisting of a saccharide and a polyhydric alcohol, with (A), (B) and (C) comprising from about 20 to 90% by weight of the total composition.

3,969,292
STABILIZED MOLDING COMPOSITIONS BASED ON POLY(OXYMETHYLENE)

Ernst Wolters; Heinz Schmidt, both of Frankfurt am Main; Karlheinz Burg, Langenhain, Taunus, and Günter Sextro, Naurod, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 432,405, Jan. 10, 1974, abandoned. This application May 30, 1975, Ser. No. 582,301

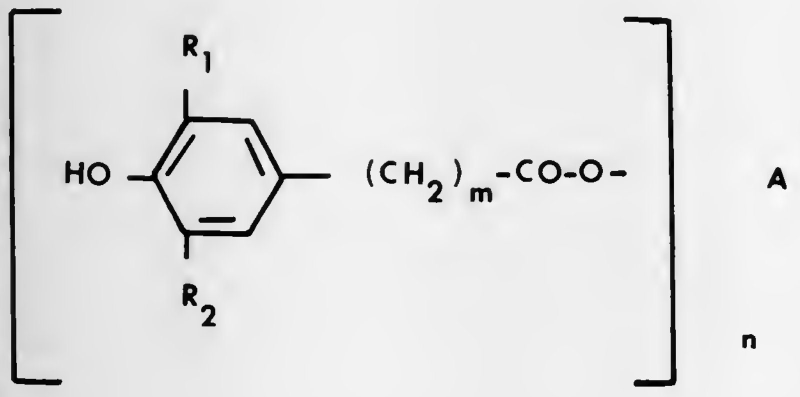
Claims priority, application Germany, Jan. 12, 1973, 2301351

Int. Cl.² C08J *3/20*

U.S. Cl. 260—18 EP **9 Claims**

1. A stabilized molding composition based on poly(oxymethylene) containing

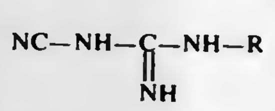
a. from 0.05 to 4 per cent by weight, calculated on the poly(oxymethylene), of a compound of the formula



in which R_1 represents an alkyl radical having from 1 to 6 carbon atoms, R_2 stands for a hydrogen atoms or an alkyl radical having from 1 to 6 carbon atoms, A is a bi- to hexavalent aliphatic hydrocarbon radical having from 1 to 12 carbon atoms, m is zero or an integer of from 1 to 6 and n corresponds to the valence of A,

b. from 0.01 to 3 per cent by weight, based on the weight of poly(oxymethylene), of an alkaline earth metal salt of an aliphatic hydroxycarboxylic acid having from 2 to 9 carbon atoms, and

c. 0.01 to 1 per cent by weight, calculated on the poly(oxymethylene), of a compound of the formula



$$NC-NH-\underset{\underset{NH}{\|}}{C}-NH-R$$

in which R represents a hydrogen atom, a cyano group, an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 6 to 12 carbon atoms, or an aryl radical having from 6 to 12 carbon atoms, and in which the alkyl, cycloalkyl or aryl radical may be substituted by 1 to 3 hydroxyl groups.

3,969,293
BASIC ZINC PHOSPHITES

Edward Louis White, Freehold; William Ernest Robertson, Trenton, and William Heng-Sen Yu, Hightstown, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 385,850, Aug. 6, 1973, Pat. No. 3,917,804. This application Mar. 24, 1975, Ser. No. 561,276

Int. Cl.² C09D *3/66, 3/80, 5/02, 5/14*

U.S. Cl. 260—22 CB **3 Claims**

1. In a latex paint coating composition, the improvement comprising having present in said latex paint coating composition an agent for rendering said latex paint coating composition color resistant toward tannin stains and possessing corrosion and mildew resistant properties, said agent comprising a basic zinc phosphite having the formula X $ZnO.ZnHPO_3$ where X is a number from ½ to 10.

3,969,294
SEGMENTED COPOLYESTER ADHESIVES STABILIZED BY ALKALINE EARTH OXIDES AND CARBOXYLIC COMPOUNDS

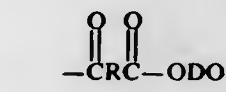
Lucien Marc Papouchado, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,078

Int. Cl.² C08L *93/00*

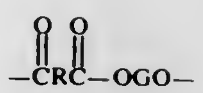
U.S. Cl. 260—26 **41 Claims**

1. A thermally stabilized thermoplastic hot melt adhesive composition which comprises, based on the total thermoplastic components, (A) 1 to 99 percent by weight of thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula



$$-\overset{\overset{O}{\|}}{C}R\overset{\overset{O}{\|}}{C}-ODO-$$

and said long chain ester units amount to 25 to 85 percent by weight of said copolyester and being of the formula



$$-\overset{\overset{O}{\|}}{C}R\overset{\overset{O}{\|}}{C}-OGO-$$

wherein R is the divalent radical taken from the group consisting of cyclic, aromatic or aliphatic radicals remaining after removal of the carboxyl groups from a cyclic, aromatic or aliphatic dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150 and a melting point of at least 90°C.; (B) 1 to 99 percent by weight of low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150°C., and has a melt viscosity of less than 10,000 centipoises at 200°C.; stabilized with (C) 5.0 to 30 percent by weight, based on the weight of elastomer and resin, of an alkaline earth oxide taken from the group consisting of beryllium, magnesium, calcium, strontium and barium oxide, in combination with (D) 0.05 to 5.0 percent by weight, based on the weight of elastomer and resin, of a carboxylic compound, taken from the group consisting of an aromatic compound having at least two carboxylic acid groups, an aliphatic compound having at least two carboxylic acid groups and anhydrides thereof, said carboxylic compound, when unsubstituted, containing up to 17 carbon atoms inclusive of said carboxylic acid groups.

3,969,295
AQUEOUS LATEX MATERIAL TO BE USED FOR PRODUCTION OF REINFORCED PLASTICS AND BINDERS AND METHOD FOR PRODUCING THE SAME

Olof Sundén, Lidingo, and Hans Erik Johansson, Kungalv, both of Sweden, assignors to Elektrokemiska Aktiebolaget, Surte, Sweden

Filed Dec. 6, 1974, Ser. No. 530,504

Claims priority, application Sweden, Dec. 21, 1973, 7317389

Int. Cl.² C08L *23/08*

U.S. Cl. 260—29.6 S **8 Claims**

1. A process for producing an aqueous latex material used in the production of reinforced plastics and binders, comprising the steps of

a. preparing an aqueous solution of monomeric and/or oligomeric silicic acid by rapid neutralization and acidification of an alkali silicate solution to a final pH below 4 by adding silicate solution to a strong acid or to a suspension of a strong, acidified cationic ion exchanger,
b. preparing an aqueous latex of a film-forming organic polymer, said latex (1)containing particles of a polymer which is film-forming at the temperatures used for drying the final product, (2) containing groups having hydrogen bonding power, and (3) being based on an emulsification system resistant to acidic conditions,
c. adding the aqueous solution of the monomeric and/or oligomeric silicic acid prepared in (a) to the aqueous latex prepared in (b) while maintaining a pH below 6 thereby to effect an encapsulation of the silicic acid on the surface of the organic polymer particles and a reversible agglomeration of the encapsulated particles, the components prepared in (a) and (b) being mixed in such proportions that between 0.5 and 50% silicic acid will be encapsulated around the latex particles, calculated as SiO_2 based on the weight of the organic polymer, and
d. adding alkali to the encapsulated and agglomerated latex up to a pH of 8 to 12 in aqueous phase, thereby to induce a negative ionic charge on the outer surface of the acidic silicic acid encapsulation layer and to cause re-emulsification.

3,969,296

VINYL ESTER COPOLYMER LATICES AND THEIR PREPARATION

Teunis C. Wassenburg, and William J. Van Westrenen, both of Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 18, 1975, Ser. No. 550,483

Claims priority, application United Kingdom, Mar. 1, 1974, 9328/74

Int. Cl.^{2} C08L *27/06*

U.S. Cl. 260—29.6 TA **6 Claims**

1. A process for the preparation of vinyl ester latices having improved scrub resistance which comprises first copolymerizing in an aqueous emulsion medium a composition comprising

1. from 10 to 50% of a vinyl ester of a saturated aliphatic alpha-branched monocarboxylic acid with
2. from 0.5 to 5.0% of a glycidyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid having from 3 to 4 carbon atoms,
3. from 49.5 to 89.5% of vinyl acetate or vinyl chloride,
4. from 0.5 to 5.0% of an alphatic alpha, beta-ethylenically unsaturated carboxylic acid having 3 to 4 carbon atoms or a partial ester thereof, and then reacting at from 60° to 90°C the resulting copolymer with ammonia in an amount sufficient to convert at least 50% of the glycidyl groups into hydroxyaminopropyl groups, said percentages being by weight based on total monomers.

3,969,297

CLEAR ETHYLENE POLYMER EMULSIONS HAVING PARTICLE SIZE LESS THAN 100 ANGSTROM UNITS AND POLISHES CONTAINING THE SAME

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 14, 1975, Ser. No. 540,848

Int. Cl.^{2} C08F *110/02*

U.S. Cl. 260—29.6 XA **17 Claims**

10. In a clear liquid polish composition which has a light transmission of at least about 60 percent and which contains an aqueous dispersion of resin particles and other additives including those selected from leveling agents, plasticizers, and fluxes, the improvement comprising:

a clear latex component admixed therein which latex has a light transmission of at least about 95% and comprises emulsion polymerized polymer particles selected from polymers and copolymers of ethylene which have an average size no larger than about 100 angstrom units, said polymer particles being formed by polymerizing ethylene under a greater than atmospheric pressure by contacting gaseous ethylene with an aqueous medium maintained at an elevated temperature in the range of from about 70°C to about 150°C, said medium containing a water soluble salt of persulfuric acid as initiator in an amount effective to initiate polymerization, from about 2 to about 5 percent by weight of said aqueous medium of an anionic emulsifier, and from about 0.3 to about 0.7 percent by weight of said aqueous medium of an alkyl mercaptan having from about 4 to about 20 carbon atoms.

3,969,298

SELECTED LIPOPHILIC AMINIMIDES AND POLYMERS DERIVED THEREFROM USEFUL FOR MAKING STABLE EMULSIONS

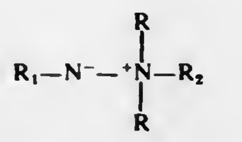
Robert C. Gasman, Schaumberg, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 381,932, Aug. 24, 1973, which is a division of Ser. No. 120,331, March 2, 1971. This application Nov. 8, 1974, Ser. No. 522,071

Int. Cl.^{2} C08F *3/90*

U.S. Cl. 260—29.6 HN **6 Claims**

1. A process for stabilizing the polymerization of ethylenically-unsaturated monomers which comprises copolymerizing in an aqueous medium with a free-radical inorganic or organic percompound catalyst at least one compound having the formula



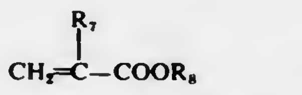
$$R_1-N^{-}-{}^{+}N(R)(R)-R_2$$

A.

wherein each R is an independently selected alkyl having 1 to 3 carbon atoms and wherein

a. R_1 is 4-hydroxymaleoyl, 4-hydroxyfumaroyl, 4-hydroxycitraconoyl or 4-hydroxyitaconoyl and R_2 is a lipophilic radical comprising an aliphatic hydrocarbon chain having about 10 to about 28 carbon atoms; or

b. R_1 is a lipopholic radical comprising an aliphatic hydrocarbon chain covalently linked to the nitrogen through an hydroxysuccinyl linkage and R_2 is -A-V wherein A is ethylene, propylene, isopropylene, 2-hydroxypropylene, acetoxypropylene or $\text{-O-CH}_2\text{-CHR}_6\text{-(O-CH}_2\text{-CHR}_6)_n\text{-}$ where R_6 is hydrogen or methyl and n is zero to 4, and V is acryloyloxy, methacryloyloxy, acrylamido, methacrylamido, vinyloxy, allyloxy, methallyloxy, vinylacetoxy, allylacetoxy, methallyloacetoxy, allyl, methallyl, 4-hydroxymaleoyloxy, 4-hydroxyfumaroyloxy, 4-hydroxycitraconoyloxy, or 4-hydroxyitaconoyloxy; with the proviso that A is zero where V is vinylacetoxy, allylacetoxy, methallylacetoxy, allyl or methally, with at least one ethylenically-unsaturated monomer selected from the group consisting of vinyl chloride, vinyl acetate, acrylonitrile and acrylic esters having the formula



$$CH_2{=}C(R_7)-COOR_8$$

B.

wherein R_7 is hydrogen or methyl and R_8 is C_1 to C_{18} alkyl.

3,969,299

SIZING OF GLASS FIBERS USING AQUEOUS DISPERSIONS OF FILM-FORMING COPOLYMER OF 90 PERCENT BY WEIGHT VINYL ACETATE WITH QUATERNARY AMMONIUM SALT DERIVATIVE OF ACRYLIC ACID COMONOMER

Robert Burns, Bramhall, and Alan Edward Johnson, St. Helens, both of England, assignors to Fibreglass Limited, England

Filed July 13, 1972, Ser. No. 271,238

Claims priority, application United Kingdom, July 15, 1971, 33349/71

Int. Cl.^{2} C08L *33/10, 31/04*

U.S. Cl. 260—29.6 HN **3 Claims**

1. An aqueous size composition for coating glass fibres comprising water, and a dispersion in said water of a film forming agent consisting essentially of about 5 to 15 percent by weight of a copolymer of at least 90 percent by weight vinyl acetate units wherein the comonomer units of said copolymer are cationic units and are a quaternary ammonium salt derivative of acrylic acid, and about 0.05 to 1 percent by weight of a silane lubricant.

3,969,300

WATER-SOLUBLE COATING MATERIALS

Nobuyoshi Nagata, Nara, and Ryuzo Mizuguchi, Osaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 182,563, Sept. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 732,556, May 28, 1968, abandoned. This application Sept. 24, 1973, Ser. No. 399,884

Int. Cl.^{2} C08L *61/20*

U.S. Cl. 260—29.4 UA **39 Claims**

1. In a coating material comprising water, a water-soluble, organic solvent and a water-soluble, thermosetting resin as substantial, film-forming component, said resin being a mixture of (A) 4 to 50 parts by weight of a water-soluble amino resin and (B) a water-soluble salt of 100 parts by weight of a copolymer with 0.5 to 2.0 equivalents of an amine with respect to carboxyl groups in said copolymer, the improvement wherein said copolymer comprises:

1. 50 to 80.5 parts by weight of at least one hydroxy-free, polymerizable, unsaturated monomer having 2 to 30 carbon atoms, and
2. a total of 19.5 to 50 parts by weight of an α,β-ethylenically unsaturated carboxylic acid having 3 to 5 carbon atoms and a polyglycidyl polyether of a dihydric phenol, said polyglycidyl polyether having at least two epoxy group, the proportion of said polyglycidyl polyether being 0.01 to 0.5 equivalent with respect to the carboxyl group contained in said α,β-ethylenically unsaturated carboxylic acid, said α,β-ethylenically unsaturated carboxylic acid having been reacted with at least 10 % of the epoxy groups of the polyglycidyl polyether.

3,969,301

POLYTETRAMETHYLENEETHER POLYURETHANE ADHESIVE COMPOSITION

Robert Dean Thurn, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 182,913, Sept. 20, 1971, abandoned. This application June 30, 1972, Ser. No. 268,046

Int. Cl.^{2} C08G *18/66*

U.S. Cl. 260—30.4 N **12 Claims**

1. A polyurethane composition which consists essentially of reaction product of (a) 4,4′-methylenebis(phenyl isocyanate), (b) tolylene diisocyanate, (c) 1,4-butanediol, and (d) polytetramethyleneether glycol having a number average molecular weight of about 900–2100; the mole ratio of (a) to (b) being about 1.2/1 to 2.5/1, the mole ratio of (c) to (d) being such that the average molecular weight of a mixture of (c) and (d) is about 450–850, and the mole ratio of (a) plus (b) to (c) plus (d) being about 1/1.015 to about 1/1.050.

3,969,302

PROCESS FOR THE DYEING OF COLORED SHAPED ARTICLES OF HIGH POLYMER, SYNTHETIC RESINS AND PREPARATIONS FOR SUCH PROCESS

Jacques Wegmann, Bettingen; Carl Becker, Basel; Guenther Zwahlen, Dornach, and Werner Kuster, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 348,383, April 5, 1974, Pat. No. 3,923,452, which is a continuation-in-part of Ser. No. 94,947, Dec. 3, 1970, abandoned. This application Sept. 26, 1974, Ser. No. 509,617

Claims priority, application Switzerland, Dec. 3, 1969, 18045/69; Jan. 8, 1970, 156/70; Jan. 30, 1970, 1297/70

Int. Cl.^{2} C08K *5/15*

U.S. Cl. 260—30.4 R **30 Claims**

1. A process for the manufacture of a colored or optically brightened shaped article of high polymer synthetic resin, comprising the steps of treating granules of water-insoluble, hydrophobic, high polymer, synthetic, thermoplastic resin with a non-emulsified two-phase mixture of a hydrophilic solvent and a lesser amount of an organophilic solvent containing a dispersed or dissolved dyestuff or optical brightener which is more soluble in the organophilic solvent than in the hydrophilic solvent, wherein the hydrophilic solvent and the organophilic solvent are soluble in each other to the extent of at least 0.1%, wherein the organophilic solvent is present to the extent of about 3% to about 1300% by weight of the resin, wherein the mixture of the hydrophilic and organophilic solvents do not dissolve or swell the resin granules, and wherein the treatment is carried out until the organophilic solvent phase and dyestuff or optical brightener is uniformly distributed on the surface of the resin granules, and finally removing the solvents and drying the treated resin granules.

3,969,303

LINING MATERIAL FOR ACRYLIC DENTURES AND METHOD OF PREPARING THE SAME

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Continuation-in-part of Ser. No. 203,423, Nov. 30, 1971, abandoned. This application Aug. 28, 1974, Ser. No. 501,148

Int. Cl.^{2} A61C *13/22;* **C08K** *5/12;* **C08L** *31/02*

U.S. Cl. 260—31.8 C **3 Claims**

1. A liner material for polymerized methylmethacrylate denture restorations consisting essentially of an admixture of approximately 40% of finely powdered methylmethacrylate polymer, approximately 10% of methylmethacrylate monomer, and approximately 50% of butyl phthalyl butyl glycolate, which has been semi-cured for approximately 15 minutes at a temperature of about 160°F. into a somewhat hard material, capable of being softened by application of heat and pressure and finally cured at approximately 212°F. with a denture to adhere thereto and to provide a soft liner therefor.

3,969,304

ETHYLENE POLYMER FILMS

Donald W. Pugh, Milford, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,783

Int. Cl.^{2} C08K *5/20*

U.S. Cl. 260—32.6 PQ **16 Claims**

1. A composition comprising (a) a film grade ethylene polymer; (b) about 0.01–0.5 weight percent of N,N′-ethylene bis erucamide; (c) about 0.01–0.5 weight percent of slip agent which is different than said bis erucamide; and (d) about 0.01–0.5 weight percent anti-block agent which is different than said bis erucamide and slip agent; said percentages based on the weight of the ethylene polymer.

3,969,305

METHOD OF MAKING AN ACRYLIC SPINNING SOLUTION

Arthur A. Armstrong, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1973, Ser. No. 428,497

Int. Cl.^{2} C08J *3/08;* **C08K** *5/20, 5/41;* **C08L** *32/20*

U.S. Cl. 260—32.6 N **3 Claims**

1. The method of making a spinning dope, comprising

a. mixing a mixture of water and a filament forming acrylonitrile-containing polymer with a solvent for said polymer to form a slurry, said polymer containing at least 35 weight percent acrylonitrile, said slurry being made up of 5 to 30 weight percent polymer, up to 20 weight percent water and 70 to 80 weight percent solvent, said solvent being selected from the group consisting of dimethylacetamide, dimethylformamide and dimethylsulfoxide,

b. heating the slurry under a pressure and at a temperature and time sufficient to dissolve the polymer in the solvent to form a polymer solution, said heat and pressure being sufficient to raise the temperature of the solution to a point above the gel profile of said solution, and then

- c. passing the polymer solution through a vaporization zone to remove a major portion of the water therefrom, said zone having a pressure which is lowered along the zone in such a manner that the pressures at points in said zone define a pressure profile which decreases along said zone, said pressure profile being sufficiently high to vaporize the water from the polymer solution while maintaining the polymer solution above the gel profile of said solution throughout said zone.

3,969,306

STABILIZED POLYESTER COMPOSITIONS

Willem F. H. Borman, Pittsfield, and Eugene P. Reilly, Lenox, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 20, 1972, Ser. No. 307,925

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—33.6 R **25 Claims**

1. A stabilized composition comprising

- i. a high molecular weight linear polyester resin normally tending to undergo thermal scission and
- ii. a stabilizing quantity of a polybutadiene, having a vinyl content of at least 85%.

3,969,307

MOLDING OF POLY(ARYLENE SULFIDE) RESINS

Charles W. Osborn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1975, Ser. No. 558,257

Int. Cl.^{2} C08G *23/00, 51/04*

U.S. Cl. 260—37 R **7 Claims**

1. In a method of molding an article from a poly(arylene sulfide) resin; the improvement which comprises incorporating a pigment in the resin and molding an article from the resulting resin at a mold temperature below about 200°F. and thereafter treating the molded article with water at a temperature of at least about 180°F. for a period of time sufficient to reduce darkening of the article.

7. A molded article formed from a poly(arylene sulfide) resin having a pigment incorporated therein, said article having been molded at a mold temperature below about 200°F. and thereafter treated with water at a temperature of at least about 180°F.

3,969,308

POLYMER COMPOSITIONS

Richard John Penneck, Lechlade, England, assignor to Raychem Limited, London, England

Continuation-in-part of Ser. No. 273,991, July 21, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,447

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **5 Claims**

1. A process for the manufacture of a composition comprising a silicone polymer, a non-silicone polymer other than polytetrafluoroethylene and a chemically treated filler, the chemically treated filler being a filler comprising an inorganic silicone-containing compound containing the Si—O—Si group and having a specific surface area (measured by the BET method) of at least 40 square meters per gram, which filler has been treated with at least one silane having bonded to each silicon atom thereof at least one organic group bonding through a silicon-carbon bond, which process comprises:

- a. blending said non-silicone polymer, said silane and said filler to form a blend of said non-silicone polymer and said treated filler; and blending the resulting blend with said silicone polymer.

3,969,309

SILICONE CHANNEL SEALANT

John H. Wright, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,320

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **26 Claims**

1. A silicone channel sealant comprising 100 parts by weight of a diorganopolysiloxane of 50 to 200,000 centipoise viscosity at 25°C, where the organo groups are selected from monovalent hydrocarbon radicals and cyanoalkyl, 10 to 150 parts by weight of powdered polytetrafluoroethylene, 4 to 25 parts by weight of untreated silica, 4 to 25 parts of a treated silica, 0.3 to 2.0 parts by weight of a titanate of the formula,

$$(RO)_4Ti$$

where R is selected from alkyl radicals and haloalkyl radicals of 2 to 5 carbon atoms, from 0.3 to 2.0 parts by weight of an aliphatic hydrocarbon compound containing at least one hydroxy group and from 10 to 50 parts by weight of styrene beads.

3,969,310

SILICONE RUBBER COMPOSITIONS

Kunio Itoh; Naohiko Harada, and Masaki Tanaka, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

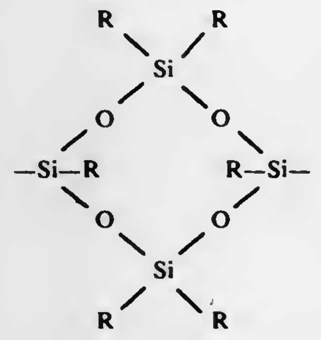
Filed Aug. 21, 1975, Ser. No. 606,345

Claims priority, application Japan, Aug. 29, 1974, 49-99286

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **11 Claims**

1. A silicone rubber composition consisting essentially of (a) an organopolysiloxane containing in a molecule at least two alkenyl groups directly bonded to silicon atoms and at least one linearly-linked cyclic siloxane unit represented by the formula



where each R which may be identical or different, and is a substituted or unsubstituted monovalent hydrocarbon group, (b) an organohydrogenpolysiloxane represented by the average formula

$$R_a'H_bSiO_{\frac{4-a-b}{2}}$$

where R′ is same as R above, a is 1 to 2, and b is 0.2 to 1.2 with the proviso that (a + b) is 1.8 to 3.0, and having at least two hydrogen atoms directly bonded to silicon atoms per molecule, in an amount enough to provide from 0.8 to 2.5 hydrogen atoms directly bonded to silicon atoms for each alkenyl group present in component (a) above, and (c) a catalytic amount of platinum or a platinum compound.

3,969,311

FIBER REINFORCED POLYESTER RESIN HAVING A LOW SURFACE PROFILE

Hideo Kubota, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1975, Ser. No. 564,713

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—40 R **4 Claims**

1. A fiber reinforced molded article, having a low profile surface, which article is formed by heating under pressure a uniformly dispersed blend consisting essentially of:

filling, reinforcing, and process aiding ingredients comprising by weight:

- a. from about 90 to about 130 parts of a fibrous reinforcing filler;
- b. from about 145 to about 250 parts of a mineral filler; and

matrix forming ingredients consisting essentially of by weight:

- c. about 50 parts of an unsaturated polyester formed from a linear aliphatic alpha, beta-unsaturated dicarboxyliic acid and/or anhydride having from 4 to 6 carbon atoms and a polyhydric alcohol, said polyester having an acid number of from 5 to 40; and
- d. 40 to 60 parts of a monomeric copolymerizable diluent solution comprising proportionally about 1 part by weight of styrene and from about 1 to 2 parts by weight of tertiary butyl styrene.

3,969,312

COLORED FILAMENTS

Gerard Lees, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 2, 1971, Ser. No. 159,242

Claims priority, application United Kingdom, July 10, 1970, 33639/70

Int. Cl.^{2} C08K *5/08, 5/23*

U.S. Cl. 260—40 P **8 Claims**

1. A process for the manufacture of filaments or films which comprises forming a melt of a fiber or film-forming polyester including a proportion of at least one coloring material which is soluble in the melt and extruding the colored melt to form filaments or films, said coloring matter being a disperse azo dye as listed in the Color Index and being further characterized by decomposing substantially completely when heated in a nitrogen atmosphere at 290°C for no longer than 120 seconds, said melt being extruded at a temperature and time in excess of the time and temperature at which said coloring matter decomposes.

3,969,313

THERMOPLASTIC COMPOSITE COMPOSITIONS

Itsuho Aishima; Yukichi Takashi; Yoshihiko Katayama; Kenji Arimoto, and Koichi Matsumoto, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 5, 1973, Ser. No. 367,311

Claims priority, application Japan, June 14, 1972, 47-58563; May 2, 1973, 48-48464

Int. Cl.^{2} C08K *9/04, 9/10*

U.S. Cl. 260—40 R **17 Claims**

1. A thermoplastic composite composition comprising

- I. about 95 to about 30 percent by weight of a thermoplastic material selected from the group consisting of polyamide, polyester, polyacetal, polycarbonate, polyphenylene oxide, polyvinylchloride and polystyrene, and
- II. about 5 to about 70 percent by weight of a polyolefin composition comprising
  - A. about 15 to about 60 percent by weight of a polyolefin and
  - B. about 85 to about 40 percent by weight of at least one reactive inorganic filler,

said reactive inorganic filler having been prepared by effecting reaction between

- a. an inorganic material substantially comprising at least one compound selected from the group consisting of metal carbonates, metal hydroxides and metal oxides, said metal being selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, zinc, cadmium and aluminum, said compound having a number average particle diameter of from about 0.01μ to about 50μ and a maximum particle diameter of about 100μ, and
- b. at least one unsaturated aliphatic or aromatic carboxylic acid having from 3 to 11 carbon atoms, one or two ethylenic unsaturations, one or two carboxyl groups, the proportion of said unsaturated aliphatic or aromatic carboxylic acid being from about 0.05 to 20 percent by weight of the total weight of said inorganic material,

with stirring and removal of the evolved water in the powder state of said inorganic material at a temperature up to the temperature at which said aliphatic or aromatic carboxylic acid begins to decompose.

3,969,314

PRODUCTION OF PLASTIC-FILLER MIXTURES

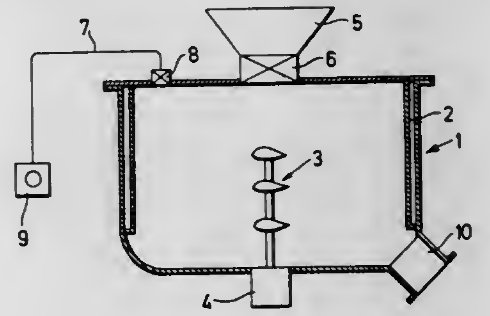
Hans Grigull, Cologne, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne-Bayental, Germany

Filed July 3, 1974, Ser. No. 485,515

Claims priority, application Germany, July 5, 1973, 2334189

Int. Cl.^{2} C08K *9/00*

U.S. Cl. 260—42 **10 Claims**



1. In a method for mixing a plastic and fillers together to produce a mixture thereof, the improvement comprising initially subjecting the fillers, prior to mixing, to intensive predrying by creating an increased temperature and maintaining the fillers under a vacuum and then maintaining the plastic and fillers free of moisture during the actual mixing process by performing the mixing process at an increased temperature and under vacuum.

3,969,315

SYNERGISTIC ANTIOXIDANT COMBINATION OF ORGANIC PHOSPHITE AND AMINE

Howard C. Beadle, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 391,235, Aug. 24, 1973, Pat. No. 3,886,114. This application Mar. 10, 1975, Ser. No. 556,672

Int. Cl.^{2} C08D *7/10*

U.S. Cl. 260—45.8 NW **9 Claims**

3. A composition with improved protection against heat and oxidation degradation comprising natural rubber and a synergistic mixture which consists essentially of about 0.50 to 1.75 parts of a phosphite selected from the group consisting of decakis (nonylphenyl) heptakis (dipropylene glycol) octaphosphite, tetrakis (nonylphenyl) polypropylene glycol 425 diphosphite, polyphenyl dipropylene glycol phosphite and mixtures thereof, and about 1.50 to 0.25 parts of an amine, selected from the group consisting of polymerized 1,2-dihy-

dro-2,2,4-trimethylquinoline, N,N′-di(2-octyl)-p-phenylenediamine, N,N′-diphenyl-p-phenylenediamine, diphenylamine-acetone reaction product, phenyl-β-naphthylamine and mixtures thereof.

3,969,316

3,5-DIALKYL-4-HYDROXYPHENYLALKYL SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

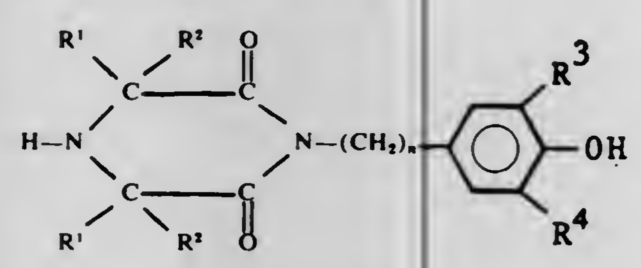
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 378,472, July 12, 1973, Pat. No. 3,919,234, which is a continuation-in-part of Ser. No. 237,981, March 24, 1972, abandoned. This application Oct. 15, 1975, Ser. No. 622,553

Int. Cl.^{2} C07D *241/08;* **C08K** *55/34*

U.S. Cl. 260—45.8 N **5 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are independently of each other methyl or ethyl;

n is an integer of from 1 to 4; and

each of R^3 and R^4 is the same or different (lower)alkyl group having from 1 to 8 carbon atoms, wherein at least one of said alkyl groups is branched on the α carbon atom.

3,969,317

PARTICULATE METALLIC NICKEL ULTRAVIOLET STABILIZER FOR POLYPROPYLENE

Gordon B. Johnson, The Sea Ranch, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1975, Ser. No. 541,807

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—45.75 N **7 Claims**

1. A poly-1-olefin composition comprising a major amount of substantially crystalline poly-1-olefin and from 0.05 to 5 percent by weight based on the poly-1-olefin of metallic nickel particles having an average particle size of from about 0.05 to about 5 microns.

3,969,318

SUBSTANTIALLY NON-INFLAMMABLE ACRYLONITRILE COPOLYMERS CONTAINING ANTIMONY

Eduard Radlmann; Heinz Schaffner; Günter Lorenz, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 12, 1975, Ser. No. 612,702

Claims priority, application Germany, Sept. 12, 1974, 2443573

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—45.75 B **4 Claims**

1. A composition of matter which comprises

A. from 95 to 99.9% by weight of a copolymer of acrylonitrile and a vinyl halide, a vinylidene halide or a mixture thereof and, optionally, at least one other copolymerisable compound: and

B. from 0.1 to 5% by weight of a substantially water-insoluble complex antimony compound containing amide groups, the complex antimony compound being obtainable by esterifying an α-hydroxy polycarboxylic acid with a polyol in a molar ratio of the carboxyl groups to the hydroxyl groups in the polyol of at least 2 : 1 and in the presence of an acid transesterification catalyst, reacting the esterification product with an antimony oxide in a polar organic solvent at a temperature in the range of from 100° to 200° C to form a clear solution still containing free carboxyl groups, adding a monoisocyanate to the resulting solution at a temperature below 100° C in such a quantity that the free carboxyl groups are converted into the corresponding amide groups, and optionally removing the solvent.

3,969,319

STABILIZATION OF HALOGEN-CONTAINING POLYMERS

Ronald Eric Hutton, Southport; Vincent Oakes, St. Helens, and Brian Rodney Iles, Liverpool, all of England, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 29, 1974, Ser. No. 528,549

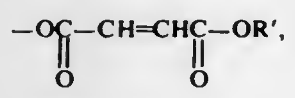
Claims priority, application United Kingdom, Nov. 30, 1973, 55549/73

Int. Cl.^{2} C08J *3/20*

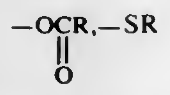
U.S. Cl. 260—45.75 S **8 Claims**

1. A composition comprising a halogen-containing resin and a stabilizing synergistic mixture of from 0.05 up to 5 parts by weight per 100 parts by weight of the resin of:

a first stabiliser (a) having the formula R_x Sn Z (4-x) where x= 1, 2 or 3, Z represents an anion selected from the group consisting of —S $(CH_2)_n$COOR′ where n=1 or 2,

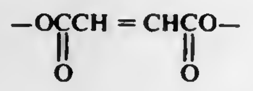


$-O\underset{\underset{O}{\|}}{C}-CH{=}CH\underset{\underset{O}{\|}}{C}-OR',$



$-O\underset{\underset{O}{\|}}{C}R,-SR$

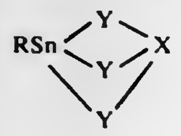
and — S —, and, in addition, where x=2,

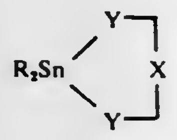


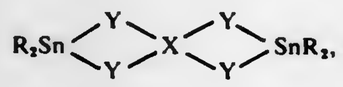
$-O\underset{\underset{O}{\|}}{C}CH = CH\underset{\underset{O}{\|}}{C}O-$

and — $S(CH_2)_2COO$ —, R represents a radical selected from the group consisting of alkyl containing 1 to 18 carbon atoms, cycloalkyl, aryl, aralkyl and alkaryl, and R′ represents a radical selected from the group consisting of the radicals represented by R and the residue of a polyol containing 2 to 6 hydroxyl radicals;

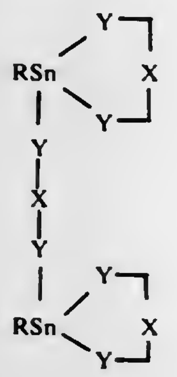
a second stabilizer (b) selected from the group consisting of







, and



where R has the above meaning, X represents the residue of a polyol containing 2 to 6 hydroxyl radicals and Y represents oxygen or sulphur.

3,969,320

RECOVERY OF RESINOUS COMPOSITIONS CONSISTING OF, AND INCLUDING, POLYPHENYLENE ETHERS IN PARTICULATE FORM FROM LIQUID MEDIA

Michael M. Modan, Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 4, 1972, Ser. No. 311,820

The portion of the term of this patent subsequent to Dec. 28, 1988, has been disclaimed.

Int. Cl.^{2} C08G *65/34, 65/44, 65/46*

U.S. Cl. 260—47 ET **19 Claims**

1. A process for recovering a resinous composition consisting of or including a polyphenylene ether resin from a liquid medium having a component which vaporizes readily, said process comprising introducing the resinous composition and said liquid medium into an enclosed chamber through means to effect the atomization thereof, said resinous composition and said liquid medium being at a temperature of from about 15°C to about 32°C, atomizing the resinous composition and said liquid medium under pressure into said enclosed chamber and producing an atomized spray of fine droplets of the resinous composition and said liquid medium in said chamber, mixing the fine droplets in said chamber with a hot inert gas, a superheated vaporized form of said component, or a mixture thereof, and flashing off said component which vaporizes readily, thereby forming particles of said resinous composition and a vaporized mixture of said component which vaporizes readily and said inert gas or said superheated vaporized form of said component, removing said vaporized mixture from said chamber, and collecting the resinous composition in a discrete particulate form.

3,969,321

MANUFACTURING PROCESS FOR PRODUCING REACTION PRODUCTS OF PHENOL-FORMALDEHYDE RESINS WITH LIQUID CHAIN-GROWTH POLYMERS OF HYDROCARBON DIENES

Yuji Kako, Shizuoka; Toyoji Kikuga, Fujieda, and Akira Toko, Yokohama, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 1, 1974, Ser. No. 510,875

Claims priority, application Japan, Oct. 3, 1973, 48-110487

Int. Cl.^{2} C08G *8/30;* **C08F** *283/00*

U.S. Cl. 260—59 R **14 Claims**

1. In the process for the preparation of a reaction product of a phenol-aldehyde resin and an olefinically unsaturated polymer the improvement which comprises employing as the unsaturated polymer a liquid chain growth polymer of a conjugated hydrocarbon diene monomer or mixture of said diene and a compatible hydrocarbon monoolefin comonomer, said mixture containing at least about 20 weight percent of said diene, said polymer being greater than a dimer, having a molecular weight less than 10,000 and being substantially devoid of conjugated unsaturation, said reaction of phenol aldehyde resin and liquid polymer being carried out in the presence of a strong acid catalyst.

3,969,322

NOVEL PROCESS AND PRODUCT

Isaac D. Rubin, Wappingers Falls; Richard F. Love, Fishkill, and Charles B. Holder, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

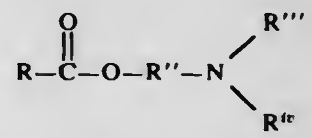
Division of Ser. No. 382,102, July 23, 1973, Pat. No. 3,890,357. This application Dec. 2, 1974, Ser. No. 528,980

Int. Cl.^{2} C08G *6/00;* **C08F** *216/36*

U.S. Cl. 260—63 N **17 Claims**

1. The method which comprises reacting (i) a nitroketonized polymer bearing pendant alpha nitroketone groups with (ii) a tertiary amino alcohol thereby forming a polymer bearing pendant aminoester groups; and recovering said polymer bearing said pendant aminoester groups.

13. A new aminoester polymer



$R-\overset{\overset{O}{\|}}{C}-O-R''-N\begin{matrix}R''' \\ R^{iv}\end{matrix}$

wherein R is a polymer moiety, R‴ and R^{iv} are monovalent saturated hydrocarbon groups, and R is divalent saturated hydrocarbon, said polymer having been prepared by the method which comprises reacting (i) a nitroketonized polymer bearing pendent alpha nitroketone groups with (ii) a tertiary amino alcohol.

3,969,323

PHOTO-CROSSLINKABLE 2-PYRONE POLYMERS AND PROCESSES FOR THE MANUFACTURE THEREOF

Harald Furrer, Frankfurt am Main; Hartmut Steppan, Wiesbaden-Dotzheim, and Gerhard Lohaus, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Feb. 26, 1974, Ser. No. 445,981

Claims priority, application Germany, Mar. 1, 1973, 2310307

Int. Cl.^{2} C08F *16/38;* **C08G** *63/46*

U.S. Cl. 260—73 R **16 Claims**

1. A photo-crosslinkable polymer comprising about 5 to 100 mole per cent of polymerized vinyl or vinylidene units bonded via an ester, amide, or acetal group to a radical of a 2-pyrone compound, and about 0 to 95 mole percent of nonphotosensitive comonomer units.

3,969,324

CONTINUOUS PROCESS FOR DRYING, CRYSTALLIZING AND SOLID STATE POLYMERIZING POLYESTERS

Eugene E. Berkau, Cincinnati, Ohio, and Cecil W. Capps, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 217,515, Jan. 13, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,055

Int. Cl.^{2} C08G *63/46*

U.S. Cl. 260—75 T **4 Claims**

1. A continuous process for drying, crystallizing and solid state polymerizing of fiber-forming crystallizable polyesters comprising conveying in a screw-type conveyor in a partial vacuum of about 0.5 mm Hg. through the transitionally coordinated steps of: (1) drying pellets of a specific viscosity of about 0.34, a carboxyl concentration of about 15 milequivalents per gram, and a particle size of between −10 and +20 mesh, at a temperature of not more than about 80°C until the water content of the flake is below 0.05%; then (2) crystallizing the pellets in a second zone during which the temperature is raised to about 230° – 240°C; and (3) solid state polymerizing the pellets at about 230° – 240°C until the specific viscosity of the polymer is about equal to or greater than 0.55.

3,969,325

PRODUCTION OF PARTICULATE BBB TYPE POLYMER HAVING AN UNUSUALLY HIGH SURFACE AREA

Anthony B. Conciatori, Chatham, and Rufus S. Jones, Jr., Dover, both of N.J., assignors to Celanese Corporation, New York, N.Y.

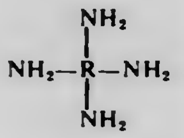
Filed Dec. 14, 1973, Ser. No. 424,996

Int. Cl.^{2} C08G *69/28, 69/32*

U.S. Cl. 260—78.41 **16 Claims**

1. In a process for forming a BBB type polymer comprising condensing with intimate admixture

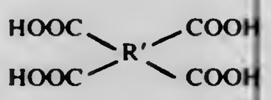
a. at least one organic tetra-amine having the structural formula



$$NH_2-\overset{\displaystyle NH_2}{\underset{\displaystyle NH_2}{\overset{|}{\underset{|}{R}}}}-NH_2$$

wherein R is an aromatic or cycloaliphatic tetravalent radical and wherein each of the four amino groups is attached directly to a carbon atom present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho or peri to another carbon atom to which another of said amino groups is also directly attached, and

b. at least one tetracarboxylic acid or its corresponding half anhydride or dianhydride having the structural formula



wherein R′ is a tetravalent aromatic or cycloaliphatic radical wherein each of the four carboxyl groups is attached directly to a carbon atom present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho or peri to another carbon atom to which another of said carboxyl groups is also directly attached; the improvement of conducting said condensation with agitation at a temperature of about 300° to 450°C. in the presence of a major concentration of a liquid aryl sulfone which is inert under the reaction conditions, with said BBB type polymer upon formation assuming the configuration of a particulate solid having an unusually high surface area of 100 to 500 square meters per gram and an inherent viscosity of at least 0.2 dl./gram.

3,969,326

CARBOXYL TERMINATED POLYCHLOROPRENES AND COMPOSITIONS CONTAINING THEM

Peter Henry Westermann, Dorking, England, assignor to BP Chemicals International Limited, London, England

Filed Sept. 12, 1974, Ser. No. 505,461

Claims priority, application United Kingdom, Sept. 28, 1973, 45436/73; Jan. 16, 1974, 1949/74

Int. Cl.^{2} C08F *4/32, 36/18*

U.S. Cl. 526—11.1 **23 Claims**

1. A process for the production of carboxyl terminated polychloroprene which comprises polymerising chloroprene under homogeneous conditions in the presence of a peroxide initiator having two carboxyl terminal groups which form internal anhydrides, the chloroprene being brought into contact initially with substantially all the peroxide initiator employed.

3,969,327

THERMOSETTING ACRYLIC POWDERS

Ralph Stein; Willy Demarteau, both of Brussels; Georges Slinckx, Bierges, and August Vrancken, Dworp, all of Belgium, assignors to U.C.B., Societe Anonyme, Brussels, Belgium

Filed July 11, 1974, Ser. No. 487,800

Claims priority, application United Kingdom, July 13, 1973, 33431/73

Int. Cl.^{2} C08F *2/38, 220/06, 220/56;* **C08J** *3/12*

U.S. Cl. 526—1 **13 Claims**

1. Telechelic or semi-telechelic polymers, the average composition of which corresponds to the formula

$$V{+}(X)_x\text{-}(Y)_y{+}Z$$

wherein

V is a hydrogen atom or Z;

X is the radical originating from the opening of the double bond of an ethylenically unsaturated monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, a hydroxy-C_2-C_4-alkyl acrylate, a hydroxy-C_2-C_4-alkyl methacrylate, glycidyl acrylate, glycidyl methacrylate, N-methylolacrylamide, N-methylolmethacrylamide, an N-C_1-C_4-alkoxymethylacrylamide, and an N-C_1-C_4-alkoxymethyl-methacrylamide;

Y is the radical originating from the opening of the double bond of an ethylenically unsaturated monomer selected from the group consisting of a C_1-C_8-alkyl acrylate, a C_1-C_8-alkyl methacrylate, acrylamide, methacrylamide, styrene and alpha-methyl-styrene;

Z is the radical derived by removing a hydrogen atom from the SH group of a mercaptan selected from the group consisting of thioglycolic acid, thiolactic acid, mercaptopropionic acid, thiomalic acid, beta-mercaptoethanol, thioglycerol, cysteamine, cysteine and the lower alkyl esters of cystein, when V is a hydrogen atom, or Z is the radical originating from the decomposition of a radical polymerization initiator selected from the group consisting of 4,4′-azo-bis(4-cyanopentanoic acid) and 3,3′-azobis(3-cyanobutanol) when $V = Z$;

x is a number between 0 to 10;

y is a positive number and represents the required number of molecules of Y to ensure that the molecular weight of the polymer chain is between 2,000 and 8,000; the x radicals X and the y radicals Y being statistically distributed along the $-(X)_x-(Y)_y-$ polymer chain according to polymerization kinetics.

6. A thermosetting acrylic powder composition comprising:

A. 100 parts by weight of at least one binder consisting of a telechelic or semi-telechelic polymer according to claim 1.
B. 0 to 100 parts by weight of cross-linking agent,
C. 0 to 100 parts by weight of pigment,
D. 0 to 100 parts by weight of conventional filler,
E. 0 to 5 parts by weight of catalyst, and
F. 0 to 80 parts by weight of conventional additives for an acrylic powder composition.

3,969,328

COPOLYMERS OF VINYL CHLORIDE AND 2-HYDROXYPROPYL-ALKYL MALEATE

Dieter Kurz, and Alex Sabel, both of Burghausen, Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Filed Mar. 29, 1974, Ser. No. 456,131

Claims priority, application Germany, Apr. 4, 1973, 2316919

Int. Cl.^{2} C08F *2/24, 214/06*

U.S. Cl. 526—320 **6 Claims**

1. Copolymers of vinyl chloride and 2-hydroxypropyl-alkyl maleates consisting of a copolymerizate with from 65% to 95% by weight of vinyl chloride monomer units, and from 5% to 35% by weight of 2-hydroxypropyl-isononyl maleate monomer units, said copolymerizate having a K-value of from 25 to 40 measured in cyclohexanone.

3,969,329

PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT ACRYLAMIDE WATER-SOLUBLE POLYMERS BY CONTROLLING THE VISCOSITY OF THE POLYMERIZATION REACTION MEDIUM WITH A WATER-MISCIBLE ORGANIC SOLVENT

Eiichi Hirata, Toyonaka; Shin-ichi Isaoka, Kyoto, and Shiro Sakai, Higashiosaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Jan. 16, 1975, Ser. No. 541,623

Claims priority, application Japan, Jan. 16, 1974, 49-8069

Int. Cl.^{2} C08F *28/00;* **C08G** *75/00;* **C08F** *120/52;* **B01D** *21/01*

U.S. Cl. 260—79.3 M **7 Claims**

1. A process for producing water-soluble high molecular weight polymers having a high degree of polymerization which comprises initiating the polymerization of acrylamide or a monovinyl monomer mixture containing a predominant amount of acrylamide in an acetone-water mixture at a temperature of not lower than 5°C. but of lower than 25°C. in the presence of polyvinyl alcohol and a catalyst, the concentration of the monomer in the polymerization reaction mixture being 15 to 30% by weight and the concentration of acetone in the acetone-water mixture being 15 35% by weight, and continuing the polymerization reaction while controlling the viscosity of the reaction system by adding at least one water-miscible organic solvent selected from the group consisting of acetone, acetonitrile, dioxane and tetrahydrofuran to the reaction system during the progress of the polymerization reaction.

3,969,330

AMINE MODIFIED POLYMERS

Evalds Lasis, and Ernest Jack Buckler, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sept. 30, 1974, Ser. No. 510,725

Claims priority, application Canada, Nov. 8, 1973, 185359

Int. Cl.^{2} C08F *236/06;* **C08C** *19/12, 19/18*

U.S. Cl. 526—14 **14 Claims**

1. A synthetic rubber composition having improved green strength comprising the reaction product of (A) a rubbery polymer of a $C_4 - C_6$ conjugated diolefin and a copolymerizable monomer having a tertiary amine group in the monomer in sufficient amount to provide along the polymer chain from about 0.5 to about 10 millimoles of tertiary amine groups per 100 grams of polymer, with (B) a halogen containing organo compound in sufficient amount to provide from 0.1 to 10 millimoles of halogen groups per 100 grams of polymer containing two or more halogen groups capable of forming quaternary ammonium salts with said tertiary amine groups, said composition being characterized by a change in modulus in the green state from 100% extension to 200% extension of not less than −10% and an elongation to break in the green state of not less than 250%.

3,969,331

HYDROCARBON POLYMER

Ernest E. Fauser, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 317,991, Dec. 26, 1972, which is a continuation of Ser. No. 72,528, Sept. 15, 1970, which is a continuation of Ser. No. 600,726, Dec. 12, 1966, abandoned. This application May 21, 1975, Ser. No. 579,351

Int. Cl.^{2} C08F *210/00, 212/00*

U.S. Cl. 526—66 **4 Claims**

1. A polymer, having a low cross-linked content, consisting essentially of from about 20 to about 73 percent by weight of units derived from ethylene, from about 25 to about 70 percent by weight of units derived from propylene, and from about 1.0 to about 3.5 percent by weight of units derived from ethylidene bicycloheptane having a boiling point of about 55°C at a reduced pressure of about 32 millimeters of mercury based on 100 percent by weight of the polymer, and wherein the said polymer has a dilute solution viscosity in the range of from about 0.8 to about 3 and a cross-linked content of less than about 1.5 percent by weight, determined by the amount of 0.25 gram of polymer which is insoluble in 50 milliliters of toluene at 80°C after 48 hours, prepared by the method which comprises polymerizing the monomers ethylene, propylene and said bicycloheptene by incremental addition of said monomers to the polymerizate at a temperature in the range of about −20°C to about 40°C in the presence of a solvent and a catalyst prepared by mixing at least one vanadium compound selected from the group consisting of vanadium tetrachloride, vanadium oxytrichloride, vanadium acetylacetonate, vanadium oxy bis(acetylacetonate) and vanadium tri-n-butoxyvanadate and at least one organoaluminum compound selected from the group consisting of aluminum triisobutyl, diethylaluminum chloride, ethylaluminum dichloride and ethylaluminum sesquichloride, where the mole ratio of aluminum to vanadium is from about 3/1 to about 10/1, where said solvent is selected from benzene, toluene, tetralin, pentane, isopentane, neopentane, heptane, hexane, 2,2,4-trimethyl pentane, petroleum ether, cyclopentane, cyclohexane, methyl cyclohexane, decalin and tetrachloroethylene, and where said dilute solution viscosity can be determined from relating the viscosities of a toluene solution of 0.5 gram of said polymer per 100 milliliters of solution and of said toluene at 30°C.

3,969,332

POLYMERIZATION OF ETHYLENE

Pierre Gloriod, Bully-les-Mines; Bernard Levresse, Lillebonne, and Jean-Pierre Machon, Bethune, all of France, assignors to Ethylene Plastique, Courbevoie, France

Filed Aug. 20, 1974, Ser. No. 499,106

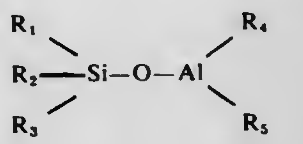
Claims priority, application France, Aug. 21, 1973, 73.30328

Int. Cl.^{2} C08F *4/66, 10/02*

U.S. Cl. 526—128 **6 Claims**

1. A method for the polymerization or copolymerization of ethylene comprising polymerizing the ethylene at a pressure greater than 500 bars, at a temperature within the range from 160° to 280°C and under conditions in which polymerization takes place in a single liquid phase, in the presence of a catalyst system comprising

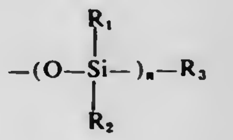
A. an alkylsiloxalane derivative of the formula:



(1)

wherein

R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrocarbon radicals having from one to ten carbon atoms, and R_5 is



$$-(O-\overset{\displaystyle R_1}{\underset{\displaystyle R_2}{\overset{|}{\underset{|}{Si}}}}-)_n-R_3 \qquad (2)$$

wherein

R_1, R_2 and R_3 are selected from the group consisting of hydrocarbon radicals having from 1 to 10 carbon atoms;

the Si:Al ratio in the alkyl siloxalane being within the range from one to three; and

B. a titanium trichloride; the constituents A and B being taken in amounts to give an Al/Ti ratio between 1 and 10.

3,969,333

MANUFACTURE OF COPOLYMERS OF 4-METHYLPENTENE-1

Johann Nickl, Bad Durkheim; Hans Schick, Mannheim, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 6, 1975, Ser. No. 547,636

Int. Cl.^{2} C08F *2/38, 4/52, 210/00, 210/14*

U.S. Cl. 526—154 **5 Claims**

1. A process for the manufacture of copolymers of 4-methylpentene-1 containing up to 10 polymerized units, by weight, of one or more other $C_{2\text{-}18}\alpha$-alkene per 100 units, by weight, of 4-methylpentene-1 by copolymerization of a liquid excess of the mixture of 4-methylpentene-1 with one or more other $C_{2\text{-}18}\alpha$-alkenes at (1) a temperature above room temperature and (2) in the presence of hydrogen using (3) a Zeigler/Natta catalyst system consisting of (3.1) a titaium trichloride component and (3.2) an alkyl aluminum component, the atomic ratio of titanium in catalyst component (3.1) to aluminum in catalyst component (3.2) being from 1:1 to 1:100, wherein polymerization is carried out

a. at a temperature of from 90° to 150°C,

b. in the presence of an inert gas consisting of nitrogen, helium, neon, argon or krypton or a mixture thereof, and

c. at a partial pressure (c_1) of inert gas of from 0.1 to 17 atmospheres absolute and a partial pressure (c_2) of hydrogen of 0.01 to 10 atmospheres absolute, with the proviso (c_3) that the sum of the partial pressures of inert gas, hydrogen and 4-methylpentene-1 is from 3 to 20 atmospheres absolute.

3,969,334

PROCESS FOR PREPARING GRANULAR CHLOROPRENE POLYMER RUBBER

Akihiko Shimizu, and Yasuhiro Sakanaka, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Oct. 15, 1975, Ser. No. 622,454

Claims priority, application Japan, Oct. 15, 1974, 49-117693

Int. Cl.^{2} C08C *1/14, 1/16*

U.S. Cl. 526—17 **5 Claims**

1. A process for preparing granular chloroprene polymer rubber which comprises adding 4 – 10 wt. parts of sodium silicate to 100 wt. parts of a cationic latex of chloroprene polymer or copolymer, then adding an alkaline earth metal salt or an acid to precipitate granules of the chloroprene polymer rubber.

3,969,335

MANUFACTURE OF HOMOPOLYMERS OF 4-METHYLPENTENE-1

Johann Nickl, Bad Durkheim; Hans Schick, Mannheim, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 6, 1975, Ser. No. 547,643

Int. Cl.^{2} C08F *4/52, 110/14*

U.S. Cl. 526—154 **7 Claims**

1. A process for the manufacture of homopolymers of 4-methylpentene-1 by homopolymerization of a liquid excess of 4-methylpentene-1 at (1) a temperature above room temperature and (2) in the presence of hydrogen, using (3) a Ziegler/-Natta catalyst system consisting of (3.1) a titanium trichloride component and (3.2) an alkyl aluminum component, the atomic ratio of titanium in the catalyst component (3.1) to aluminum in the catalyst component (3.2) being from 1:1 to 1:100, wherein polymerization is carried out

a. at a temperature of from 90° to 150°C,

b. in the presence of an inert gas consisting of one or more of nitrogen, helium, neon, argon and krypton,

c. at a total pressure of the polymerization system of from 3 to 20 atmospheres absolute and

d. with the proviso that the partial pressure (d_1) of the inert gas in the polymerization system is from 0.1 to 17 atmospheres absolute and the hydrogen partial pressure (d_2) in the polymerization system is from 0.01 to 10 atmospheres absolute.

3,969,336

METHOD OF SEPARATING AND RECOVERING SOLUBLE PROTEINS FROM PROTEIN CONTAINING SOLUTIONS EMPLOYING FOAM FRACTIONATION

Larry Grant Criswell, Columbus, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,242

Int. Cl.^{2} A23J *1/20*

U.S. Cl. 260—112 R **5 Claims**

1. A method of separting soluble proteins from a whey liquid containing said proteins employing foam fractionation, said method comprising:

providing a vessel for retaining said whey liquid;

preheating said whey liquid at a temperature from about 160° F. to about 180° F.;

introducing the liquid into the vessel to provide a pool thereof in the bottom of the vessel;

maintaining the temperature of said whey liquid in the range of about 95° F. to about 120° F.;

introducing air into said pool to form a foam;

allowing the foam to rise within said vessel;

maintaining the height of the foam at least about 2 feet above the liquid pool;

removing the foam containing the soluble protein from the top of said vessel;

said foam being removed from the whey liquid in said vessel without precipitation and acid addition to the whey liquid.

3,969,337

CHROMATOGRAPHIC FRACTIONATION OF WHEY

Karl Lauer, Schriesheim; Georg Stoeck, Mannheim-Waldhof, and Friedrich Bätz, Lampertheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Mar. 27, 1974, Ser. No. 455,484

Claims priority, application Germany, Apr. 18, 1973, 2319581

Int. Cl.^{2} A23J *1/20*

U.S. Cl. 260—112 R **8 Claims**

1. The process for the chromatographic fractionation of dairy whey containing lactose, proteins and mineral salts into a protein fraction comprising passing said whey through a column of a cation exchange material in neutral form, said cation exchange material comprising a polystyrene resin containing sulfonic acid groups, thereafter passing an aqueous eluant consisting essentially of water through said column, and collecting a plurality of sequential aqueous effluents from said column as a plurality of separate fractions.

3,969,338

PROTEIN OBTAINED FROM CAKES OF VEGETABLE ORIGIN

Thadée Joseph Staron, Noisy-le-Roi, France, assignor to Institut National de la Recherche Agronomique, Paris, France

Division of Ser. No. 124,132, March 15, 1971, Pat. No. 3,803,328. This application Jan. 17, 1974, Ser. No. 434,308

The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl.^{2} A23L *1/20;* **C12D** *13/06*

U.S. Cl. 260—123.5 **1 Claim**

1. Protein β which is the product of contacting cake obtained from vegetable seeds in maceration condition in an aqueous medium with the microorganism *Geotrichum candidum* at a temperature and for a time sufficient for removal

of the toxic substances from the cake and thereafter separating the cake from the aqueous medium, having the following composition on the basis of amino acids:

Aspartic acid	2.4	%
Threonine	3.0	
Serine	3.2	
Glutamic acid	26.0	
Proline	9.2	
Glycine	4.1	
Alanine	3.8	
Valine	3.9	
Cystine	4.8	
Methionine	2.4	
Isoleucine	3.2	
Leucine	6.1	
Tyrosine	1.4	
Phenylalanine	2.8	
Ammonia Liquor	2.3	
Lysine	6.8	
Histidine	3.5	
Arginine	5.6	
Tryptophanne	0.9	
Cellulose	0	%

said protein β being water soluble, having an ultraviolet absorption spectrum with a peak at 225 mμ, being homogeneous with electrophoresis and migrating towards the anode, having an isoelectric pH of 12.2, hydrochloric hydrolysis freeing all the amino acids, and having the property of precipitating the natural polymers polyuronides and nucleic acids.

3,969,339

WATER-SOLUBLE PENTAKIS-AZO DYESTUFFS DERIVED FROM 4,4′-DIAMINOAZOBENZENE

Andre Louis Sailer, and Pierre Frank, both of Du Rhone, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

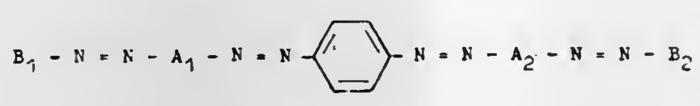
Filed Sept. 14, 1973, Ser. No. 397,177

Claims priority, application France, Sept. 14, 1972, 72.32530

Int. Cl.^{2} C09B *31/30;* **D06P** *3/32*

U.S. Cl. 260—159 **5 Claims**

1. Pentakisazo dyestuff of the formula:



$$B_1-N=N-A_1-N=N-C_6H_4-N=N-A_2-N=N-B_2 \quad (I)$$

in which A_1 and A_2 are the same or different and each is monosulpho-naphthylene, hydroxy-monosulpho-naphthylene or hydroxy-disulpho-naphthylene and B_1 and B_2 are the same or different and each is dihydroxy-phenyl, diamino-phenyl, diamino-tolyl, diamino-sulpho-phenyl, amino-hydroxy-phenyl, N-(sulpho-methyl)-amino-hydroxy-phenyl, amino-naphthyl, hydroxy-naphthyl, hydroxy-sulpho-naphthyl, amino-sulpho-naphthyl, amino-hydroxy-monosulpho-naphthyl, amino-hydroxy-disulpho-naphthyl, phenyl-methyl-hydroxy-pyrazolyl, (dichloro-sulpho-phenyl)-methyl-hydroxy-pyrazolyl, (sulphophenyl)-methyl-hydroxy-pyrazolyl, 1-carbethoxy-2-oxo-propyl, N-phenyl-1-carbamoyl-2-oxy-propyl, N-(sulphophenyl)-1-carbamoyl-2-oxo-propyl, 2,4-dioxo-3-pentyl, dicarbethoxy-methyl, phenyl-carboxy-hydroxy-pyrazolyl, N-tolyl-1-carbamoyl-2-oxo-propyl, or N-(chlorophenyl)-1-carbamoyl-2-oxo-propyl.

3,969,340

RETORT STARCHES PREPARED FROM BLENDS OF STARCH AND HIGH AMYLOSE STARCH COMPONENTS

Martin M. Tessler, Edison, and Wadym Jarowenko, Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed July 10, 1974, Ser. No. 487,013

Int. Cl.^{2} A23L *1/195;* **C08B** *31/10*

U.S. Cl. 260—233.3 R **5 Claims**

1. A cross-linked, hydroxypropylated starch product comprising:

a. 15–85% by weight, of a starch containing at least 50% amylose; and

b. the remainder of the product comprising a starch containing up to 36% amylose;

said product being hydroxypropylated and cross-linked to an extent such that an aqueous dispersion containing 5.0% of said starch product has a Brookfield viscosity measured at 180°F. of less than 2,000 cps. after being cooked at 5.0% starch solids concentration dry basis, in a pH 6.5 buffered salt solution at 212°F. for 10 minutes, followed by 15 minutes at 250°F. and standing at room temperature until it cools to 180°F.; and a Brookfield viscosity measured at 75°F. of greater than 1,500 cps. when said cooked starch is allowed to stand at room temperature for 24 hours; said viscosity measured at 75°F. being at least about five times greater than the viscosity at 180°F.; the degree of hydroxypropylation being such that when the two starch components are blended together prior to being hydroxypropylated, the resulting blend is hydroxypropylated to an M.S. of 0.10–0.30 and when the two starch components are separately hydroxypropylated prior to blending, the starch component containing at least 50% amylose has a hydroxypropyl M.S. of 0.10–0.30 and the starch containing less than 50% amylose has a hydroxypropyl M.S. of 0.06–0.30.

3,969,341

METHOD FOR THE PREPARATION OF STARCH PRODUCTS AND THE COMPOUNDS UTILIZED THEREFOR AND THE PRODUCT THEREOF

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 26, 1975, Ser. No. 552,890

Int. Cl.^{2} C08B *31/02*

U.S. Cl. 260—233.5 **11 Claims**

1. A method for preparation of modified starch products comprising the steps of:

a. reacting a starch base with about 3–125%, by weight of the starch base, of a salt of the reaction product of a 2-alkyl-2-oxazoline, wherein the alkyl group contains from 1 to 3 carbon atoms, and phosphorous oxychloride, and

b. isolating the resulting starch product; wherein said reaction with the starch base is conducted in an aqueous medium at a temperature of about 15–95°C. for a period of about 1–24 hours at a pH level of about 9.0–13.0.

3,969,342

DERIVATIVES OF PENICILLANIC ACID AND COMPOSITIONS CONTAINING THEM

Jean Bouchaudon, Morsang-Sur-Orge, France, assignor to Rhone-Poulenc Industries, Paris, France

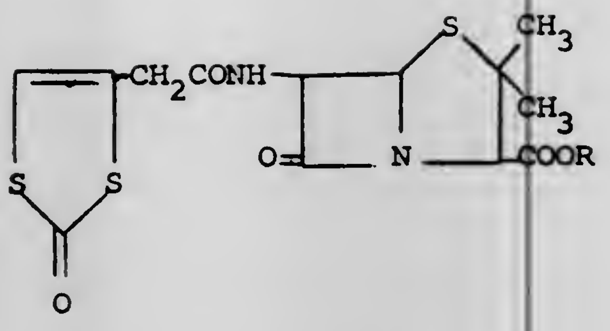
Filed Oct. 24, 1975, Ser. No. 625,503

Claims priority, application France, Oct. 28, 1974, 74.35972

Int. Cl.^{2} C07D *499/48*

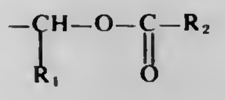
U.S. Cl. 260—239.1 **6 Claims**

1. A derivative of penicillanic acid of formula:



(I)

in which R is hydrogen or a radical which can be easily removed enzymatically of formula:



$$-\underset{|\;R_1}{CH}-O-\underset{\|\;O}{C}-R_2 \qquad (II)$$

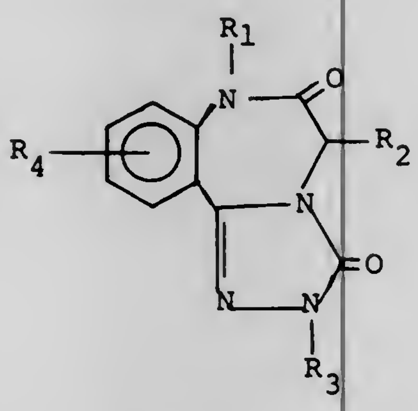
in which R_1 is hydrogen or straight or branched chain C_{1-4} alkyl, phenyl or phenyl C_{1-2} alkyl and R_2 is straight or branched C_{1-4} alkyl or alkoxy, cyclohexyl, phenyl or phenyl C_{1-2} alkyl, and, when R is hydrogen, its pharmaceutically acceptable non-toxic metal salts and addition salts with pharmaceutically acceptable nitrogen-containing bases.

3,969,343
TRIAZOLO[4,3-d][1,4]BENZODIAZEPINE-3,6-DIONES

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 27, 1975, Ser. No. 544,470
Int. Cl.² C07D *487/04*
U.S. Cl. 260—239.3 T **16 Claims**

1. A compound having the structure



wherein R_1 is hydrogen, alkyl, phenyl or benzyl; R_2 is hydrogen or alkyl R_3 is alkyl, phenyl or arylalkyl; and R_4 is hydrogen, halogen, nitro, cyano, trifluoromethyl, alkyl, alkoxy or alkylthio; and wherein alkyl in all instances is alkyl of 1 to 4 carbon atoms, alkoxy in all instances is alkoxy of 1 to 4 carbon atoms and aryl in all instances is phenyl or phenyl substituted with 1 or 2 alkyl, alkoxy or halogen substituents.

3,969,344
METHOD OF PURIFYING POLYMERIZABLE ORGANIC SUBSTANCES

Jacob Ackermann, Varese, and Pierino Radici, Como, both of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 4, 1971, Ser. No. 195,840
Claims priority, application Italy, Nov. 12, 1970, 31632/70
Int. Cl.² C07D *201/16*
U.S. Cl. 260—239.3 A **11 Claims**

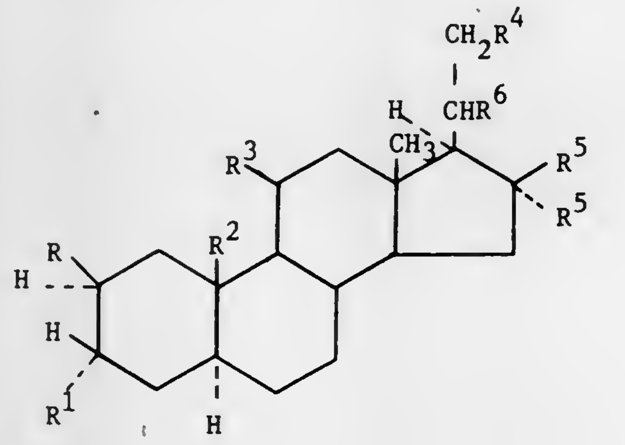
1. A process for purifying a polymerizable monomer selected from the group consisting of trioxane, 1,3-dioxolane, caprolactone and caprolactam by removing impurities in the form of water, alcohols and carboxylic acids; said process consisting of contacting a liquid consisting only of said monomer in liquid form at a temperature of not greater than 130° centigrade and at a pressure sufficient to keep said monomer in liquid form with a solid absorbent consisting essentially of a porous reticulated macromolecular alkali metal or alkaline earth metal salt of a cationic exchange resin containing carboxylic, sulfonic or phosphoric acid groups, said cationic exchange resin having a specific surface area of at least one square meter per gram and a pore diameter of from $10^{1.3}$ to 10^5 angstroms and recovering the purified monomer.

3,969,345
20β,21-EPOXY-3α-HYDROXY-5α-PREGNANES AND DERIVATIVES THEREOF

Gordon Hanley Phillipps, Wembley, and Christopher Earle Newall, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 208,961, Dec. 16, 1971, Pat. No. 3,882,151. This application Feb. 20, 1975, Ser. No. 551,315
Claims priority, application United Kingdom, Dec. 17, 1970, 60065/70
Int. Cl.² C07J *5/00*
U.S. Cl. 260—239.55 R **4 Claims**

1. A compound of the formula:



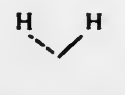
wherein:

R is hydrogen, halogen, C_1–C_6 alkanoyloxy, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_5 alkyl or thiocyanato;

R^1 is a hydroxy group, nitro-oxy group, C_{1-5} alkanoyloxy group or C_{1-5} alkanoyloxy group substituted by at least one halogen atom or carboxy or amino group;

R^2 is hydrogen or methyl;

R^3 is oxygen or



R^4 is chlorine, bromine or iodine atom, a p-toluene sulphonyloxy or methanesulphonyloxy group or a C_{1-6} alkoxy, C_{5-6} cycloalkoxy, phenyl C_{1-6} alkoxy or phenoxy group or such a hydrocarbyloxy group substituted by at least one halogen atom or carboxyl, C_{1-6} alkoxy carbonyl, C_{1-6}-alkoxy or cyano group;

R^5 is hydrogen or C_1–C_6 alkyl

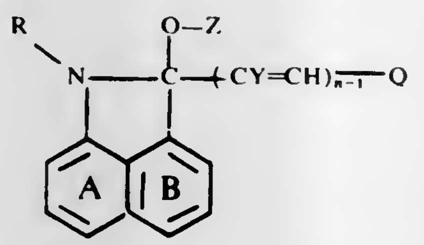
R^6 is hydroxy or R^4 and R^6 together are —O— to form an epoxy group joining the 20- and 21- positions.

3,969,346
NAPHTHOLACTAMCARBINOLS COLOR FORMERS, THEIR MANUFACTURE AND USE IN PRESSURE-SENSITIVE OR THERMOREACTIVE RECORDING MATERIAL

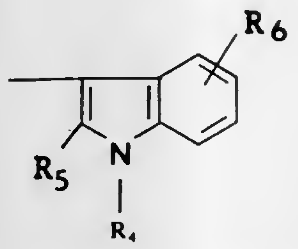
Stefan Koller, Ramlinsburg, and Jean Claude Petitpierre, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 3, 1973, Ser. No. 376,256
Claims priority, application Switzerland, July 7, 1972, 10207/72
Int. Cl.² C07D *209/90*
U.S. Cl. 260—240 E **6 Claims**

1. Color former of the formula



in which R is alkyl with 1 to 6 carbon atoms, cyclohexyl, phenyl, benzyl, 2-phenylethyl or alkyl with 1 to 6 carbon atoms substituted by halogen or alkoxy with 1 to 4 carbon atoms, Z is hydrogen or alkyl with 1 to 4 carbon atoms, Y is alkyl with 1 to 4 carbon atoms, nitrile or hydrogen, *n* is 1 or 2, Q is a radical of the formula



wherein R_4 is phenyl, tolyl, benzyl, 2-phenylethyl or alkyl or alkenyl with 1 to 18 carbon atoms or such a radical further substituted by chlorine, nitrile, carbalkoxy with 1 to 4 carbon atoms or alkylcarbonamido with 1 to 4 carbon atoms or R_4 is hydrogen; R_5 is hydrogen, phenyl or alkyl with 1 to 4 carbon atoms and R_6 is alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms or halogen.

3,969,347
PROCESS FOR THE MANUFACTURE OF THE POTASSIUM SALT OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE

Erwin Schmidt, Kelkheim, Taunus; Karl Clauss, Rossert, Taunus; Hartmut Pietsch, Hofheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 16, 1975, Ser. No. 596,217
Claims priority, application Germany, July 18, 1974, 2434548
Int. Cl.² C07D *291/06*
U.S. Cl. 260—243 R **5 Claims**

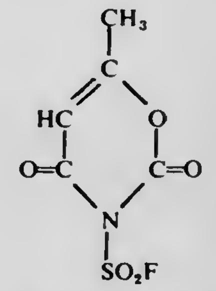
1. A process for the manufacture of the potassium salt, practically free of fluoride, of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide by cyclization of acetoacetamide-N-sulfofluoride, which comprises reacting acetoacetamide-N-sulfofluoride with at least two moles potassium hydroxide, potassium methylate or a mixture of potassium hydroxide and potassium methylate per mole of sulfofluoride in methanol as solvent containing less than 50 % by weight of water at a temperature of from −20° to +60°C and separating the crystalline potassium salt of the oxathiazinone dioxide from the reaction solution.

3,969,348
PROCESS FOR THE MANUFACTURE OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE

Hartmut Pietsch, Hofheim, Taunus; Karl Clauss, Rossert, Taunus; Erwin Schmidt, Kelkheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 16, 1975, Ser. No. 596,231
Claims priority, application Germany, July 18, 1974, 2434562
Int. Cl.² C07D *291/06*
U.S. Cl. 260—243 R **6 Claims**

1. A process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide or the nontoxic salts thereof, which comprises reacting 6-methyl-2,3-dihydro-1,3-oxazin-2,4-dione-3-sulfo-fluoride of fomrula I



(I)

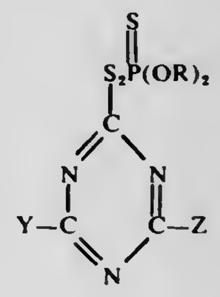
with at least one mole water per mole of fluoride to obtain acetoacetamide-N-sulfo-fluoride with splitting off of CO_2, treating the acetoacetamide-N-sulfofluoride with an aqueous or alcoholic base or combination thereof and isolating the oxathiazinone or the salts thereof.

3,969,349
VULCANIZATION OF RUBBER WITH PHOSPHORO TRIAZINE SULFIDES

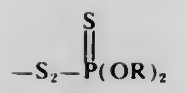
Chester D. Trivette, Jr., and Otto W. Maender, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 421,126, Dec. 3, 1973, Pat. No. 3,867,358. This application Jan. 8, 1975, Ser. No. 539,266
Int. Cl.² C07D *251/38*
U.S. Cl. 260—247.1 M **10 Claims**

1. A compound of the formula

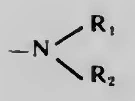


in which Y is

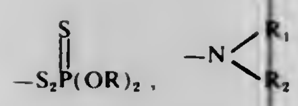


$-S_2-\overset{\overset{S}{\|}}{P}(OR)_2$

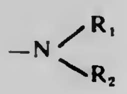
or



and Z is



or Cl in which each R independently is alkyl of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl, and R_1 and R_2 independently are hydrogen, alkyl of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl or



is a heterocyclic radical selected from the group consisting of pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino, 4-methylpiperidino, morpholino, thiomorpholino, 2,6-dimethylmorpholino, hexahydro-1H-azepin-1-yl, hexahydro-1(2H)-azocin-1-yl, and azabicyclo(3.2.2)-non-3-yl.

3,969,350

BASE CATALYSIS OF AZOLESULFENAMIDES AND SULFUR TO AMINODITHIOAZOLES

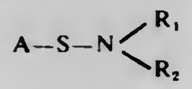
John J. D'Amico, Akron, and Darrell D. Mullins, Norton, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 235,081, March 15, 1972, abandoned. This application July 1, 1974, Ser. No. 484,675

Int. Cl.² C07D *277/78*

U.S. Cl. 260—247.1 H **9 Claims**

1. The method of preparing an aminodithioazole which comprises reacting sulfur and azolesulfenamide of the formula



in which A is selected from the class consisting of

a. aryleneazole selected from the group consisting of benzothiazolyl, naphthothiazolyl, benzoxazolyl and benzimidazolyl,
b. substituted said aryleneazole in which the substituents are chlorine, bromine, lower alkyl, lower alkoxy or nitro,
c. thiazolyl,
d. substituted thiazolyl in which the substituents are lower alkyl, lower acyl or lower alkoxy carbonyl and
e. tetrahydrobenzothiazolyl,

R_1 and R_2 are selected from the group consisting of lower alkyl, benzyl, alicyclic of 5 to 8 carbon atoms, and together with the nitrogen R_1 and R_2 form a heterocycle selected from the group consisting of morpholino, dimethylmorpholino, 3-azabicyclo(3.2.2)non-3-yl and polymethyleneimino of 4 to 8 methylenes one or more of which are optionally substituted by lower alkyl in the presence of about 5–20% of the number of moles of azolesulfenamide of a catalyst selected from the group consisting of alkali metal hydrosulfide, alkali metal hydroxide, alkali metal salt of mercaptobenzothiazole, alkali metal salt of mercaptobenzimidazole, alkali metal salt of mercaptobenzoxazole, alkali metal salt of di(lower alkyl)dithiocarbamic acid, alkali metal salt of lower alkyl xanthic acid, alkali metal salt of thiophenol, alkali metal lower alcoholate, alkali metal thiocyanate and alkali metal phosphate.

3,969,351

MORPHOLINE CONTAINING ISOTHIOCYANOBENZOXAZOLES

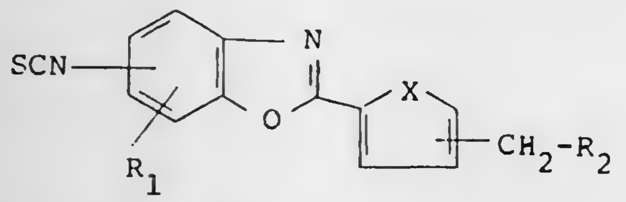
Venkatachala L. Narayanan, Hightstown; Glenn Anthony Jacobs, Princeton, and Rudiger D. Haugwitz, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 471,083, May 17, 1974, abandoned. This application May 15, 1975, Ser. No. 577,587

Int. Cl.² C07D *413/14*

U.S. Cl. 260—247.1 H **8 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, alkoxy or halogen; X is oxygen or sulfur; and R_2 is, 4-morpholinyl or 4-thiamorpholinyl; wherein alkyl and alkoxy are groups having 1 to 6 carbon atoms.

3,969,352

CRUDE CYANURIC ACID PURIFICATION

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 2, 1974, Ser. No. 511,447

Int. Cl.² C07D *251/32*

U.S. Cl. 260—248 A **45 Claims**

1. A process for purifying crude cyanuric acid, which comprises:

a. mixing in water sufficient amounts of crude cyanuric aciid and a mono- salt of an inorganic acid, wherein said inorganic acid is a dibasic or tribasic inorganic acid capable of forming a salt with a material selected from the group consisting of ammonium, potassium, sodium, lithium, rubidium, and cesium, wherein said salt contains the acid radical and one or more unreacted hydrogen atoms, to form a 10% to 45% crude cyanuric acid slurry containing about 10% to about 30% mono- salt of an inorganic acid;
b. heating the slurry to a temperature of about 160°C to about 220°C under at least the autogenously developed pressure to digest the crude cyanuric acid impurities;
c. cooling the digested cyanuric acid slurry to precipitate the cyanuric acid crystals; and
d. recovering the cyanuric acid crystals from the digestion solution.

3,969,353

TRIAZINESULFENIMIDES OF DICARBOXYLIC ACIDS

Werner Schwarze, Frankfurt, and Siegfried Wolff, Merten, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

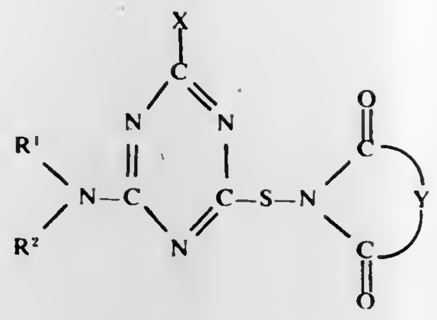
Filed June 19, 1975, Ser. No. 588,649

Claims priority, application Germany, June 24, 1974, 2430143

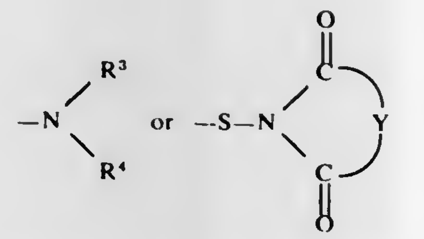
Int. Cl.² C07D *251/46, 251/52*

U.S. Cl. 260—249.5 **26 Claims**

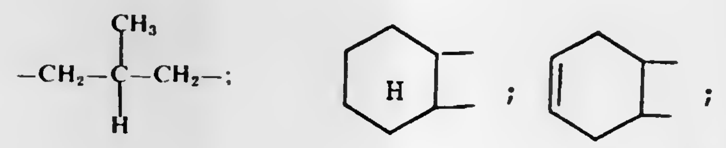
1. A triazine sulphenimide of the formula

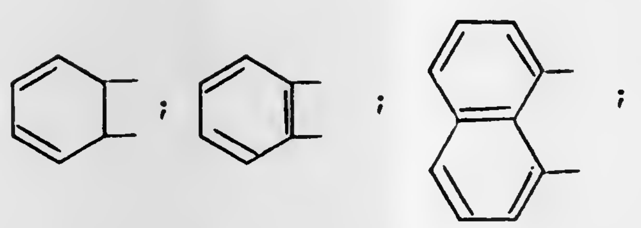


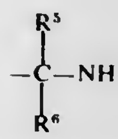
in which
X is



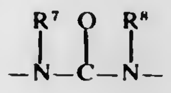
R^1, R^2, R^3 and R^4 are hydrogen or alkyl with 1 to 4 carbon atoms;
Y is $-CH_2-CH_2-$; $-CH_2-CH_2-CH_2-$; $-CH(CH_3)-CH_2-$;







where R^5 and R^6 are hydrogen, alkyl with 1 to 8 carbon atoms, alkylthioalkyl with a total of 2 to 8 carbon atoms, CH_3-S-, alkoxyalkyl with a total of 2 to 8 carbon atoms, CH_3O- or phenyl,



where R^7 and R^8 are hydrogen, alkyl with 1 to 8 carbon atoms, allyl or phenyl.

3,969,354

2-(NITROMETHYLENE)-HEXAHYDROPYRIMIDINES

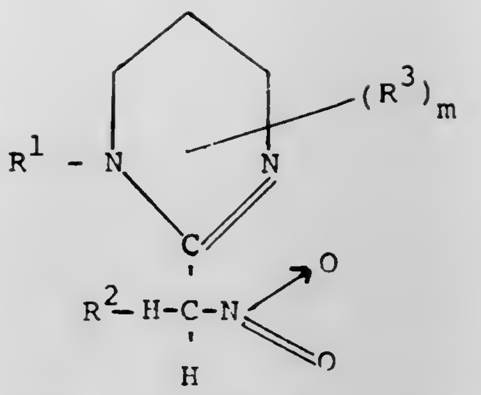
Charles H. Tieman; Willy D. Kollmeyer, and Steven A. Roman, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 510,100, Sept. 27, 1974, which is a continuation-in-part of Ser. No. 412,373, Nov. 1, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 630,069

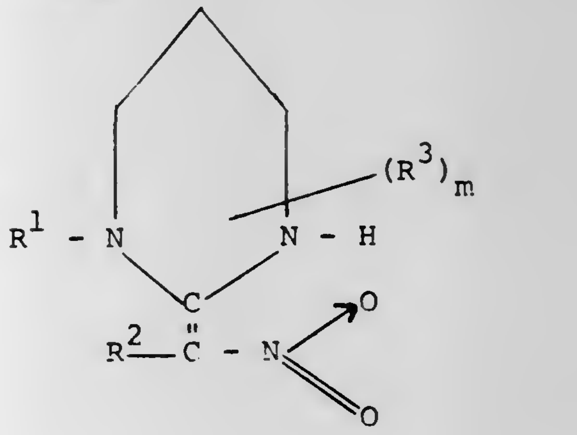
Int. Cl.² C07D *239/02*

U.S. Cl. 260—251 R **3 Claims**

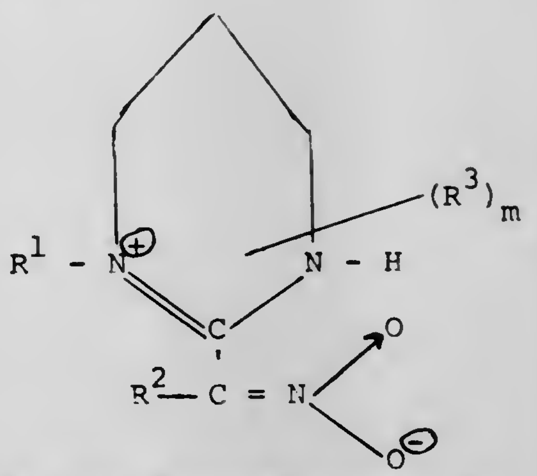
1. A compound of the group consisting of compounds of the formula:



derivatives thereof wherein the alpha hydrogen is replaced by middle halogen and resonance hybrids represented by the formulae:



and



wherein R^1 contains up to eight carbon atoms and is straight-chain alkyl, haloalkyl, alkenyl, (middle halo)alkenyl or alkynyl, R^2 is hydrogen, middle halogen or phenylthio, optionally substituted by one or more of middle halogen, nitro or alkyl or alkoxy of from 1 to 3 carbon atoms, R^3 is alkyl of one to eight carbon atoms, and m is 0 or 1, with the proviso that in said resonance hybrids the R^3 substituent may only replace a hydrogen at the carbon in the 4, 5 or 6 position.

3,969,355

5-AMINOETHYL-2,4-DIPHENYLPYRIMIDINE DIHYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 520,024, Nov. 1, 1974, Pat. No. 3,944,581. This application Oct. 24, 1975, Ser. No. 625,751

Int. Cl.² C07D *239/26*

U.S. Cl. 260—256.4 R **1 Claim**

1. The compound 1-(2,4-diphenyl-5-pyrimidyl)ethylamine dihyrobromide.

3,969,356

N-[3-(P-F-BENZOYL)-PROPYL]-N'-[2.(NITRO,NITROEL, OR METHOXYPHENYL)-ETHYL]-PIPERAZINES

Wolfgang Milkowski, Burgdorf; Horst Zeugner, Hannover; Klaus-Wolf von Eickstedt, Isernhagen N.B., and Werner Stuhmer, Eldagsen, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

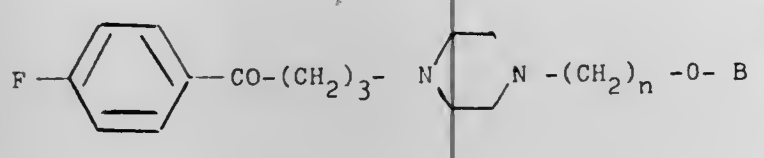
Continuation of Ser. No. 288,320, Sept. 12, 1972, abandoned. This application June 20, 1975, Ser. No. 589,121

Claims priority, application Germany, Sept. 13, 1971, 2145682; July 26, 1972, 2236680

Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 R **7 Claims**

1. A compound having the formula



in which

n is 2, and

B is a mononitrophenyl, monochloronitrophenyl, or methoxyphenyl moiety, or a pharmaceutically acceptable acid addition salt thereof.

3,969,357

3-PYRIDYLMETHYL PHENYL UREA METAL SALT COMPLEXES

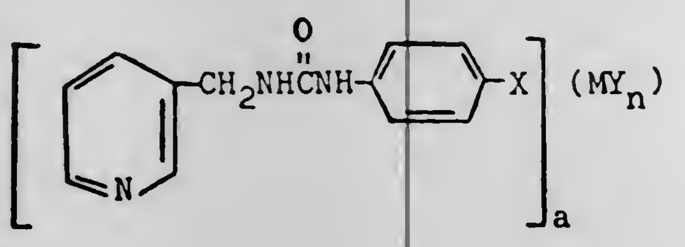
Ernest D. Weiler, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 28, 1974, Ser. No. 473,594

Int. Cl.² C07F *3/04, 3/06, 3/08, 15/06*

U.S. Cl. 260—270 PY **13 Claims**

1. A compound of the structure



wherein

X is (a) $-C(O)R_1$ wherein R_1 is methyl, ethyl or propyl, (b) $-SR_2$, wherein R_2 is alkyl of 1 to 4 carbon atoms, or (c) cyano or (d) nitro;

M is a metal ion selected from the group consisting of cadmium, calcium, cobaltous, cupric, nickelous and zinc;

Y is a halide anion;

a is the integer 2 for all cations except cadmium and for this it is 1; and

n is an integer corresponding to the valence of M.

3,969,358

PROCESS FOR THE PREPARATION OF THIENO [3,2-c] PYRIDINE AND THIENO [2,3-c] PYRIDINE

Armand Amselem, Toulouse, France, assignor to Parcor, Paris, France

Filed June 25, 1975, Ser. No. 590,132

Claims priority, application France, July 16, 1974, 74.24633

Int. Cl.² C07D *213/28*

U.S. Cl. 260—294.8 C **7 Claims**

1. Process for the preparation of a compound selected from the group consisting of thieno[3,2-c]pyridine and thieno [2,3-c]-pyridine, comprising cyclizing a compound selected from the group consisting of a N-(3,thienyl)methyl-N-[2,2-(OR)-$_2$]ethyl-para-toluene sulfonamide and a N-(2-thienyl)-methyl-N-[2,2-$(OR)_2$]-ethyl-para-toluene sulfonamide, respectively, in which the radicals R, when taken individually, are lower alkyls and, when taken together in $(OR)_2$, may also form a group selected from the 2- and 3-membered alkylene groups, by treatment with a strong mineral acid in the presence of an inert organic solvent at a temperature between about 50°C and the boiling temperature of the mixture.

3,969,359

METHOD OF PREPARING N-SUBSTITUTED 3,5-DICYAN-1,4-DIHYDROPYRIDINES

Josef Kuthan; Jaroslav Palecek, and Miroslav Sramek, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

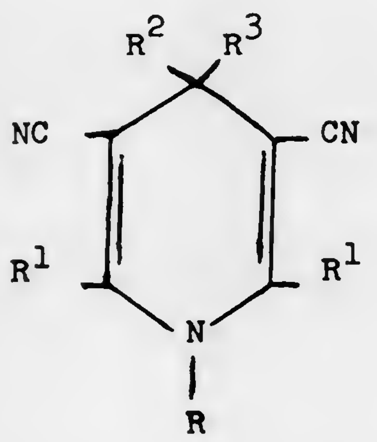
Filed Sept. 11, 1974, Ser. No. 505,006

Claims priority, application Czechoslovakia, Sept. 18, 1973, 6416-73

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **9 Claims**

1. Method for the preparation of N-substituted 3,5-dicyan-1,4-dihydropyridines of the general formula



wherein

R represents a radical selected from the group consisting of (a) alkyl groups having from 1–6 carbon atoms, (b) cycloalkyl groups having from 5–8 carbon atoms and (c) aralkyl groups having 1–3 carbon atoms in the alkyl chain and from 6–10 carbon atoms in the aryl radical,

R^1 represents a radical selected from the group consisting of (a) alkyl groups having from 1–2 carbon atoms, (b) an unsubstituted phenyl group and (c) a phenyl group having alkyl substituents thereon containing from 1–2 carbon atoms,

R^2 represents a radical selected from the group consisting of (a) hydrogen, (b) alkyl groups having from 1–3 carbon atoms and (c) a complex containing 4–7 carbon atoms formed with R^3, and

R^3 represents a radical selected from the group consisting of (a) alkyl groups containing from 1–3 carbon atoms, (b) unsubstituted phenyl groups and (c) a phenyl group bearing alkyl substituents having from 1–2 carbon atoms which comprises the steps of successively

(1) reacting the corresponding unsubstituted dihydro derivative in a polar aprotic solvent with a compound selected from the group consisting of (a) alkali metal hydrides, (b) alkaline earth metal hydrides and (c) an alkali metal amide, and

(2) alkylating the resultant product at a temperature within the range of 0°–70°C, the molar ratio of components ranging from 1:1.0 to 1.5 : 1.0 to 1.5.

3,969,360

CATALYZED ALKYLATION OF HALOPYRIDINATES

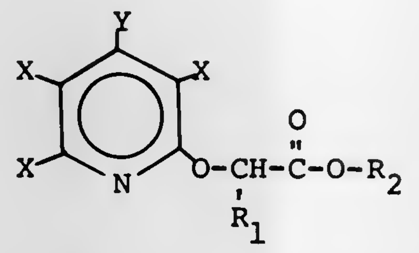
Harold H. Freedman, Newton Center, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,249

Int. Cl.² C07D *213/26*

U.S. Cl. 260—295 R **10 Claims**

1. In the process of preparing a compound corresponding to the formula



wherein:

X independently in each occurrence is hydrogen or halo and at least one X is halo;

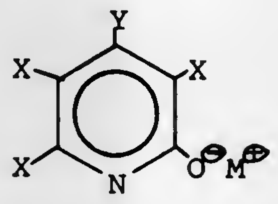
Y is hydrogen, halo or —NR'R'' wherein R' and R'' are each independently hydrogen or lower alkyl;

R_1 is hydrogen or methyl; and

R_2 is lower alkyl;

by reacting in an inert organic liquid reaction medium under alkaline conditions and with efficient blending (a) a compound corresponding to the formula

(a)



wherein M is an alkali metal and X and Y have the aforesaid meaning, in solid particulate form with (b) a compound dissolved in said liquid reaction medium and corresponding to the formula $R_3CH(R_1)-C(O)-O-R_2$, wherein R_1 and R_2 have the aforesaid meaning and R_3 is chloro or bromo;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of a quaternary ammonium salt having a minimum solubility of at least one weight percent in the liquid reaction medium at 25°C and having a total aggregate carbon content of at least about 10 carbon atoms.

3,969,361

2-BENZOYL-3-AMINO-PYRIDINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

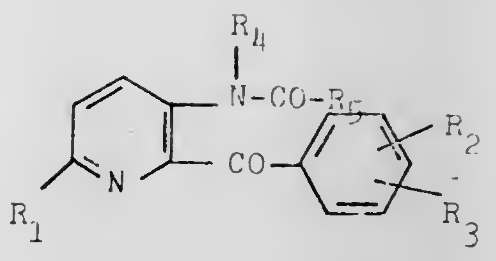
Continuation-in-part of Ser. No. 347,361, April 3, 1973, Pat. No. 3,875,176. This application Aug. 15, 1974, Ser. No. 497,750

Claims priority, application Austria, May 10, 1972, 4113/72

Int. Cl.² C07D *213/75*

U.S. Cl. 260—295 AM **11 Claims**

1. A pyridine compound of the formula



where R_1 is halogen, R_2 is hydrogen, halogen, trifluoromethyl, hydroxy, lower alkyl or lower alkoxy, R_3 is hydrogen, halogen, hydroxy or lower alkyl, R_4 is hydrogen or lower alkyl and R_5 is phenyl or halophenyl or a pharmacologically acceptable acid addition salt thereof.

3,969,362

ISOPROPYL-N-(5-BROMO OR CHLOROPYRIDYL-2)CARBAMATE

Ryohei Takahashi; Isao Yokomichi; Itaru Shigehara, and Terumasa Komyoji, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

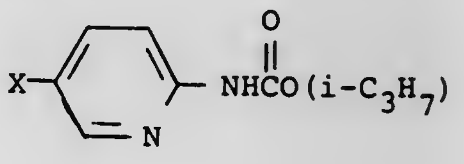
Continuation-in-part of Ser. No. 448,205, March 5, 1974, Pat. No. 3,914,240. This application Apr. 28, 1975, Ser. No. 572,288

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² C07D *213/42*

U.S. Cl. 260—295 CA **3 Claims**

1. An agricultural fungicide of the formula:



wherein X represents chlorine or bromine.

3,969,363

DERIVATIVES OF 1-PHENOXY-3-AMINO-PROPAN-2-OL AND PROCESS FOR THEIR PRODUCTION

Thomas Raabe, Rodenbach; Otto Gräwinger, Frankfurt am Main; Josef Scholtholt, Mittelbuchen; Rolf-Eberhard Nitz, Bergen-Enkheim, and Eckhard Schraven, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

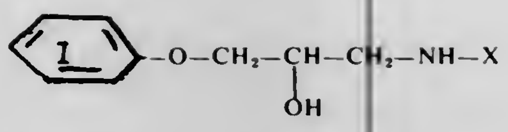
Filed Dec. 10, 1974, Ser. No. 531,325

Claims priority, application Luxemburg, Dec. 12, 1973, 69043

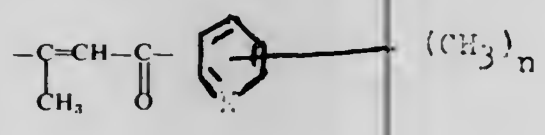
Int. Cl.² C07D *213/72*

U.S. Cl. 260—296 AE **12 Claims**

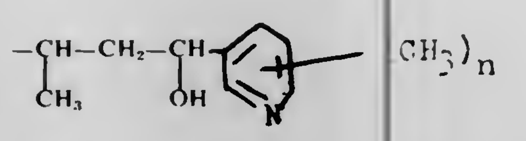
1. Derivative of 1-phenoxy-3-amino-propan-2-ol having the formula



wherein X is selected from the group consisting of



and



wherein n is 1, 2 or 3 and the phenyl radical I can be monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms, alkenyl or alkinyl having in either case up to 6 carbon atoms, cycloalkyl or cycloalkenyl having in either case a ring having 5 to 8 carbon atoms, alkoxy having up to 8 carbon atoms, alkenyloxy or alkinyloxy having in either case up to 5 carbon atoms, phenyl, chlorine or bromine, or the radical $-NR_1R_2$, wherein R_1 represents alkyl having 1 to 4 carbon atoms or aryl-substituted or alkyl-substituted carbonyl radical derived from an aromatic or aliphatic carboxilic acid having up to 11 carbon atoms, and R_2 represents hydrogen or alkyl having up to 4 carbon atoms, or a pharmaceutically acceptable acid addition salt of said derivative.

3,969,364
AMINONAPHTHOSELENAZOLE

Aaron David Ezekiel, Ilford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

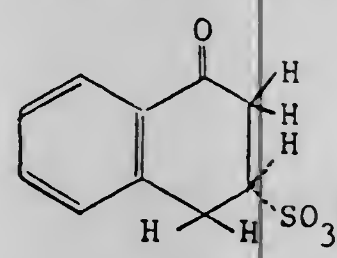
Filed Sept. 30, 1974, Ser. No. 510,945

Claims priority, application United Kingdom, Oct. 19, 1973, 48778/73; Oct. 19, 1973, 48779/73

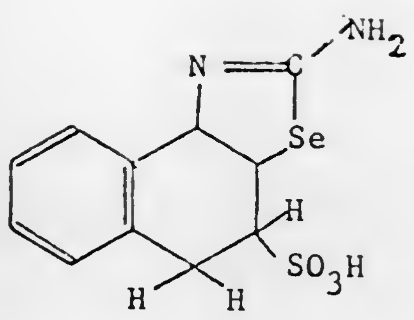
Int. Cl.² C07D *293/12*

U.S. Cl. 260—298 **3 Claims**

1. A process for the preparation of 2-aminonaphtho [1,2-d] selenazole which comprises halogenating an aqueous acetic acid solution of a 1,2,3,4-tetrahydro-1-oxonaphthalene-3-sulphonate or - sulphonic acid of the formula



wherein M is an alkali metal or a hydrogen atom by treatment with chlorine or bromine at a temperature of 20° to 100°C, increasing the pH of the reaction mixture to within the range of 5.0 to 9.5 and then reacting the halogenated compound with an aqueous solution of selenourea at a temperature of 20° to 100°C, to produce a compound of the formula



and then eliminating the sulphonic acid group by treatment with sodium hydroxide or potassium hydroxide.

3,969,365
4-(1,2,4-OXADIAZOLYLFORMAMIDOALKYL)PHENYLSULFONYL UREAS

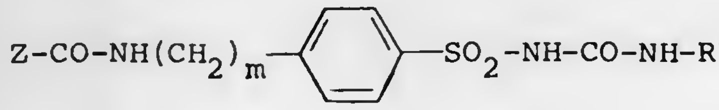
Hermann Breuer, Burgweinting, and Ivo Polacek, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 17, 1972, Ser. No. 227,276

Int. Cl.² C07D *271/06*

U.S. Cl. 260—307 G **11 Claims**

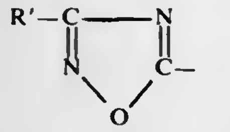
1. A compound of the formula



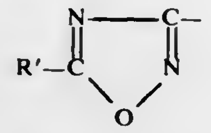
$$Z\text{-}CO\text{-}NH(CH_2)_m\text{-}C_6H_4\text{-}SO_2\text{-}NH\text{-}CO\text{-}NH\text{-}R^2$$

wherein

Z is an oxadiazole radical of the formula



or



wherein R′ is hydrogen, a straight or branched chain alkyl or alkenyl radical of from 1 to 6 carbon atoms, a cycloalkyl radical of from 3 to 6 carbon atoms, cycloalkyl-alkyl wherein the cycloalkyl moiety has from 3 to 6 carbon atoms and the alkyl moiety has from 1 to 4 carbon atoms, $(R^3)_n$-phenyl, $(R^3)_n$-pheylalkyl wherein the akyl moiety has from 1 to 4 carbon atoms, R^3 is hydrogen, an alkyl or alkoxy radical of from 1 to 4 carbon atoms, or halogen, and n is 0, 1 or 2;

m is 1, 2 or 3; and

R^2 is

1. hydrogen, a straight or branched chain alkyl or alkenyl radical of from 1 to 6 carbon atoms, mercaptoalkyl of from 2 to 8 carbon atoms, or phenyl;
2. a radical of the formula

$$-(CH_2)_p\text{-}E\text{-}(CH_2)_qCH_3$$

wherein E is oxygen, sulfur or sulfonyl, p is from 2 to 7, and q is 0 to 5, the sum of $p + q$ being from 3 to 7;

3. phenylalkyl wherein the alkyl radical has from 1 to 3 carbon atoms or phenylcycloalkyl wherein the cycloalkyl radical has from 3 to 8 carbon atoms;
4. cycloalkyl or cycloalkenyl of from 3 to 8 carbon atoms or alkyl-substituted cycloalkyl or cycloalkenyl wherein the alkyl radical has from 1 to 3 carbon atoms;
5. endoalkylene cycloalkyl, endoalkylene cycloalkenyl, bisendoalkylene cycloalkyl or bisendoalkylene cycloalkenyl wherein the endoalkylene part has from 1 to 4 carbon atoms and the cycloalkyl or cycloalkenyl part has from 5 to 8 carbon atoms;
6. a saturated, mono- or di-unsaturated heterocyclic ring containing from 4 to 6 carbon atoms and an oxygen atom or a sulfur atom or a nitrogen atom
7. a saturated, mono- or di-unsaturated heterocyclic ring linked to the nitrogen atom by means of a methylene group and containing from 4 to 5 carbon atoms and either an oxygen or a sulfur atom.

3,969,366
3[SUBSTITUTED-2-(METHYLAMINO)PHENYL]4-[2-OXO-2-(HETEROCYCLIC)ETHYL]-5-SUBSTITUTED-1,2,4-TRIAZOLES

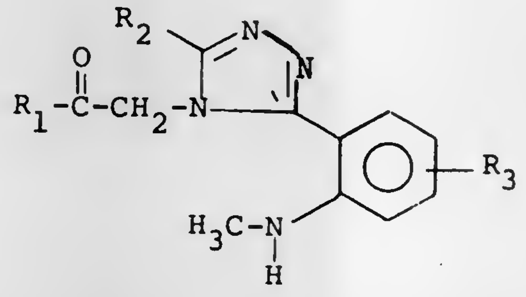
Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 30, 1975, Ser. No. 582,549

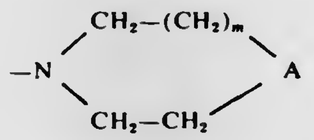
Int. Cl.² C07D *403/02*

U.S. Cl. 260—308 R **9 Claims**

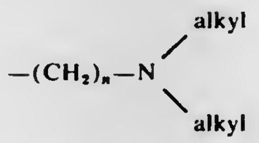
1. A compound of the formula



wherein R_1 and R_4 are the same or different and each is a N containing heterocycle of the formula



wherein m is 0 or 1; A is CH-Q; Q is hydrogen or alkyl of 1 to 4 carbons; R_2 is hydrogen, alkyl of 1–4 carbons, trifluoromethyl, phenyl, benzyl,



$$-(CH_2)_n-N(\text{alkyl})_2$$

wherein each alkyl is of 1 to 4 carbons or $-(CH_2)_n-R_4$; n is an integer from 1 to 4; and R_3 is hydrogen, halogen, nitro, trifluoromethyl, alkyl of 1–4 carbons, alkoxy of 1–4 carbons, or alkylthio of 1–4 carbons; and a pharmaceutically acceptable salt thereof.

3,969,367
OCTAHYDROINDOLE PHOSPHORYLACYLAMINES

Elmar Sturm, Aesch, Switzerland, and Hans Jörg Cellarius, deceased, late of Riehen, Switzerland (by Herta Cellarius-Haigermoser, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

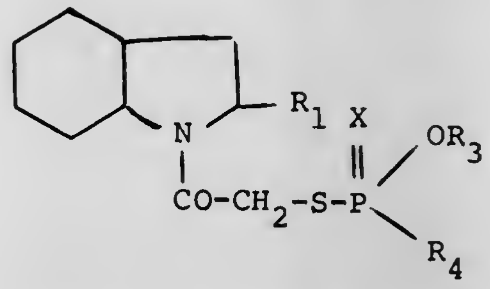
Division of Ser. No. 324,469, Jan. 17, 1973, Pat. No. 3,876,643. This application Jan. 30, 1975, Ser. No. 545,465

Claims priority, application Switzerland, Jan. 20, 1972, 910/72

Int. Cl.² C07D *209/12*

U.S. Cl. 260—326.12 R **5 Claims**

1. A phosphorylacylamine compound of the formula



wherein R_1 is hydrogen or methyl, R_3 is alkyl of from 1 to 4 carbon atoms, R_4 is alkoxy of from 1 to 4 carbon atoms, and X is oxygen or sulphur.

3,969,368
2-SUBSTITUTED BENZODIOXOLES

Elso Manghisi, Monza, and Aldo Salimbeni, Milan, both of Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

Filed Feb. 1, 1973, Ser. No. 328,633

Claims priority, application Italy, Feb. 9, 1972, 20407/72; Dec. 4, 1972, 32458/72

Int. Cl.² C07D *317/58, 317/72*

U.S. Cl. 260—340.5 **7 Claims**

1. N-((β-N′,N′-diethylamino)ethyl)-2-(2-methyl-1,3-benzodioxol-2-yl)-acetamide or a pharmaceutically acceptable salt thereof.

3,969,369
BRUCEANTIN

S. Morris Kupchan, Charlottesville, Va., and Ronald W. Britton, Camlachie, Canada, assignors to Research Corporation, New York, N.Y.

Filed June 20, 1973, Ser. No. 371,634

Int. Cl.² C07D *311/20*

U.S. Cl. 260—343.2 R **5 Claims**

1. In a process of producing bruceantin, the sequential steps comprising:

a. extracting Brucea antidysenterica with an alkanol,
b. partitioning said alkanoic extract between chloroform and water,
c. removing the solvent from the chloroform fraction and partitioning said fraction between 10% aqueous methanol and petroleum ether,
d. separating said 10% aqueous methanol fraction and adding thereto sufficient water to produce a 20% aqueous methanol solution and extracting same with carbon tetrachloride,
e. further diluting said 20% aqueous methanol solution with sufficient water to provide a 40% aqueous methanol solution and extracting same with chloroform,
f. removing the chloroform, chromatographing on silica gel and eluting with chloroform containing up to 0.5% methanol,
g. eluting with 1% methanol in chloroform and collecting the first fractions which contain a compound which upon thin layer chromatography gives an immediate dark stain with ferric chloride.

3,969,370
1-TERTIARY-ALKYL-3-(SUBSTITUTED FURYL)UREAS AS ANTIHYPERTENSIVE AGENTS

Bruce I. Dittmar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

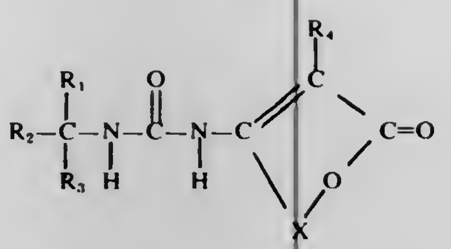
Continuation-in-part of Ser. No. 461,700, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,306

Int. Cl.^{2} C07D *307/30*

U.S. Cl. 260—343.6 **8 Claims**

1. A compound selected from

a. compounds of the formula



where

R$_1$, R$_2$, and R$_3$ are C$_1$-C$_4$ alkyl, C$_2$–C$_4$ alkenyl, C$_2$–C$_4$ alkynyl, with the provisos that the total number of carbon atoms of R$_1$ plus R$_2$ plus R$_3$ does not exceed 6, that not more than one of R$_1$, R$_2$, or R$_3$ is alkynyl, and that two of R$_1$, R$_2$, and R$_3$ may be joined to form a cycloalkyl or cycloalkenyl group;

X is —CH$_2$—, methyl-substituted methylene, ethyl-substituted methylene, propyl-substituted methylene, or butyl-substituted methylene; and

R$_4$ is hydrogen or methyl with the proviso that when R$_4$ is methyl, X is methylene; and

b. sodium, potassium or calcium salts of compounds of (a) wherein X is methylene, methyl-substituted methylene, or ethylsubstituted methylene.

3,969,371
PROCESS FOR CONVERTING γ-BUTYROLACTONE INTO TETRAHYDROFURAN

Georg Michalczyk, Neukirchen-Vluyn, and Karl-Heinz Gluzek, Alpen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed July 15, 1974, Ser. No. 488,351

Claims priority, application Germany, Aug. 3, 1973, 2339344

Int. Cl.^{2} C07D *307/08*

U.S. Cl. 260—346.1 R **4 Claims**

1. A process for converting γ-butyrolactone to tetrahydrofuran in the liquid phase which comprises treating said lactone with hydrogen in the presence of a cobalt modified copper chromite and aluminum oxide catalyst wherein said catalyst comprises from about 5.0 to 25.0 weight percent CoO, from about 5.0 to 30.0 weight percent CuO, from about 10.0 to 35.0 weight percent Cr_2O_3 and the balance aluminum oxide at a temperature of from about 100° to 350°C. and a pressure of from about 100 to 400 kg/cm^2.

3,969,372
2,3-DIHYDRO-3,3-DIMETHYL-2,5-BENZOFURANDIOL FROM ISOBUTYRALDEHYDE AND BENZOQUINONE

Robert D. Burpitt; David M. Pond, and Mary E. Dickerson, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 2, 1975, Ser. No. 583,339

Int. Cl.^{2} C07D *307/83*

U.S. Cl. 260—346.2 R **3 Claims**

1. A method for preparing 2,3-dihydro-3,3-dimethyl-2,5-benzofurandiol which comprises reacting benzoquinone with at least an equal molar amount of isobutyraldehyde at a temperature of from about 20°to about 85°C. in the presence of a basic catalyst selected from tri-lower alkyl amines, tri-lower alkyl phosphines, alkali metal lower alkoxides, triethylenediamine, 1,5-diazabicyclo[4.3.0]non-5-ene, or quinuclidine.

3,969,373
FLUOROGENIC 2-OXY-3(2H)-FURANONE MATERIALS

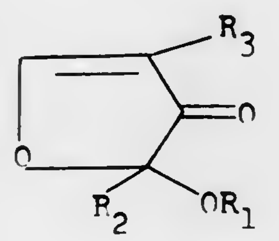
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application June 26, 1975, Ser. No. 590,655

Int. Cl.^{2} C07D *307/60*

U.S. Cl. 260—347.3 **9 Claims**

1. A compound of the formula



wherein R$_1$ is lower alkyl or phenyl lower-alkyl, R$_2$ is phenyl, lower-alkoxyphenyl, di-lower-alkoxyphenyl, carboxyphenyl or carboxy-lower-alkylphenyl and R$_3$ is phenyl or nitrophenyl.

3,969,374
PROCESS FOR PREPARING AMINO-ANTHRAQUINONES

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal-Hahnenberg, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1975, Ser. No. 549,120

Claims priority, application Germany, Feb. 28, 1974, 2409542

Int. Cl.^{2} C07C *97/24*

U.S. Cl. 260—382 **19 Claims**

1. Process for preparing 1-amino- and/or 1,5- and/or 1,8-diamino and/or 1-amino- 6-nitro- and/or 1-amino-7-nitroanthraquinone which comprises reacting 1-nitro-and/or 1,5-and/or 1,8- and/or 1,6- and/or 1,7-dinitro anthraquinone with ammonia in the presence of a nitrile.

3,969,375
METHOD OF MANUFACTURING SALT OF α-SULFOFATTY ACID ESTER

Osamu Okumura, Funabashi; Takenobu Sakatani, Chiba; Kazuo Ohbu, and Masuzo Nagayama, both of Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,709

Claims priority, application Japan, Nov. 29, 1973, 48-134693

Int. Cl.^{2} C11D *1/28;* **C07C** *143/12*

U.S. Cl. 260—400 **8 Claims**

1. A process for preparing a salt of an α-sulfofatty acid ester by sulfonating and then neutralizing a fatty acid ester having the formula RCH_2COOR', wherein R is alkyl having 8 to 18 carbon atoms and R′ is alkyl having one to 5 carbon atoms, which comprises the steps of:

1. flowing a film of said fatty acid ester through a first reaction zone and contacting said film with an SO_3-inert gas mixture containing one to 15 percent by volume of SO_3, at a molar ratio of SO_3 to said fatty acid ester of from 1.0 to 1.5, at a first reaction temperature of from 50° to 85°C, and for a first contact time of from 0.5 to 30 seconds, to form an intermediate sulfonated reaction product,
2. flowing a film of said intermediate reaction product from step 1 through a second reaction zone and contacting the latter film with said SO_3-inert gas reaction mixture, at a second reaction temperature of from 95° to 150°C, and for a second contact time of from 3 to 120 seconds, to form an α-sulfofatty acid ester reaction product, and
3. immediately neutralizing the reaction product of step 2 by mixing said reaction product of step 2 with a neutralizing agent selected from the group consisting of an aqueous solution of an alkali metal hydroxide, aqueous ammonia and an ethanol amine, at a neutralization temperature at less than 70°C and at a pH of from 6 to 10, to obtain a neutralized product containing at least 80 percent by weight of a salt of said α-sulfofatty acid ester having a low color value.

3,969,376
13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN E$_1$ ANALOGS

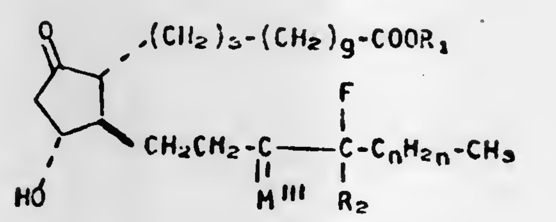
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 381,155, July 20, 1973, which is a continuation-in-part of Ser. No. 248,013, April 27, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,692

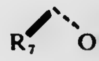
Int. Cl.^{2} C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

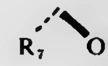
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, in the chain between —CFR$_2$— and terminal methyl; wherein M$'''$ is



or



wherein R$_7$ and R$_8$ are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R$_1$ is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R$_2$ is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R$_1$ is hydrogen.

3,969,377
16-FLUORO PROSTAGLANDIN E$_1$ ANALOGS

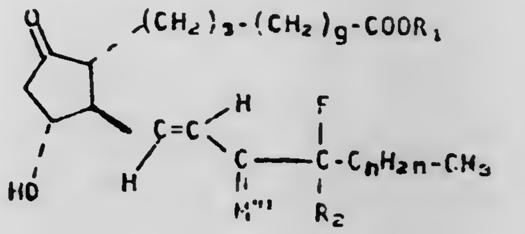
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,693

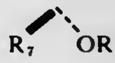
Int. Cl.^{2} C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

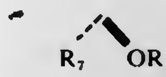
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, in the chain between —CFR$_2$— and terminal methyl; wherein M$'''$ is



or



wherein R$_7$ and R$_8$ are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R$_1$ is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R$_2$ is hydrogen, methyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R$_1$ is hydrogen.

3,969,378
16-FLUORO PROSTAGLANDIN A$_2$ ANALOGS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

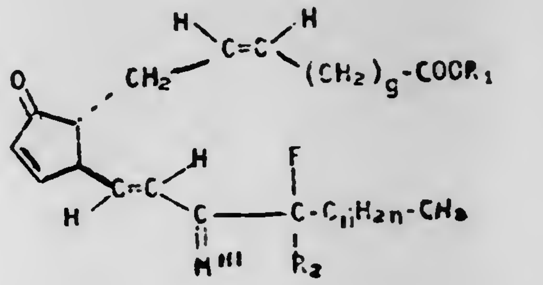
Division of Ser. No. 381,155, July 20, 1973, which is a continuation-in-part of Ser. No. 248,013, April 27, 1972, abandoned.

Filed Feb. 21, 1975, Ser. No. 551,697

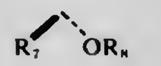
Int. Cl.^{2} C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

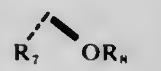
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is



or



wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,379
13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN A_1 ANALOGS

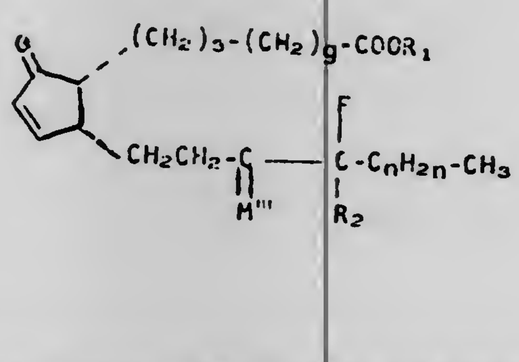
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,827

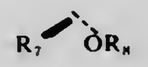
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

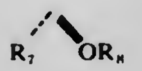
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is



or



wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,380
16-FLUORO PROSTAGLANDIN F_2 ANALOGS

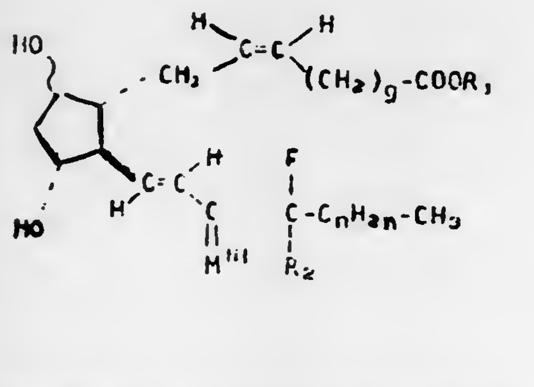
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,911

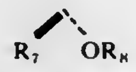
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **19 Claims**

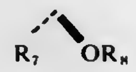
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ indicates attachment of hydroxyl to the ring in alpha or beta configuration; wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is



or



wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,381
13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN B_1 ANALOGS

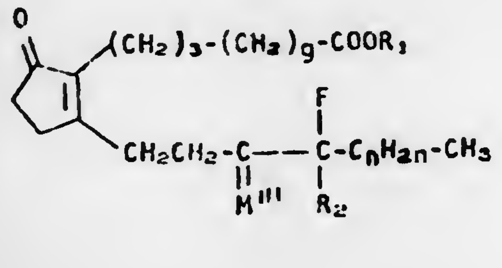
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,912

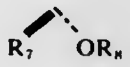
Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

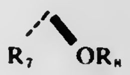
1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is



or



wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,382
PROCESS FOR THE SIMULTANEOUS HYDROGENATION AND DEODORISATION OF FATS AND/OR OILS

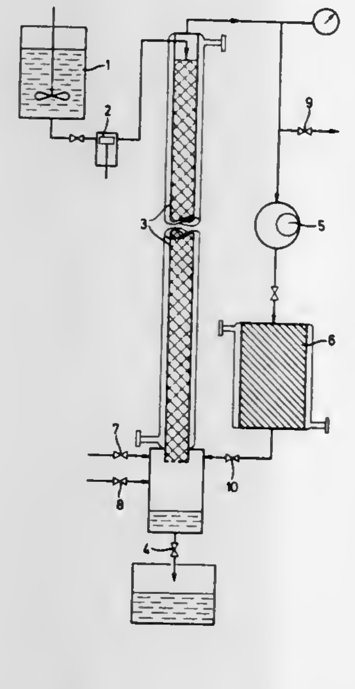
Kurt Zosel, Oberhausen, Germany, assignor to Studiengesellschaft Kohle m.b.H., Mulheim, Germany

Filed Aug. 29, 1974, Ser. No. 501,733

Claims priority, application Austria, Aug. 30, 1973, 7525/73

Int. Cl.² C11C *3/12*

U.S. Cl. 260—409 **22 Claims**



1. A process for the simultaneous hydrogenation and deodorisation of at least one product from the group consisting of fats and oils, wherein said product is contacted with carbon dioxide in an amount effective for the deodorisaton and containing hydrogen in an amount effective for the hydrogenation, at a temperature of from 100° to 250°C and a pressure of from 150 to 300 atmospheres in the presence of a catalyst for the hydrogenation.

3,969,383
FAT COMPOSITIONS STABILIZED WITH ESTERS OF FATTY ACIDS AND TERTIARY LOWER ALKYL SUBSTITUTED HYDROQUINONES AND METHOD THEREFROM

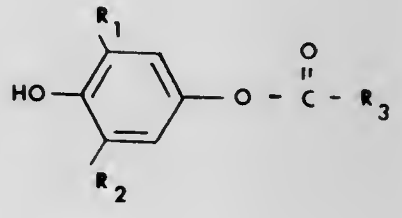
Martin Dexter, Briarcliff Manor, and Janet B. Peterson, Yonkers, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 431,179, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 129,123, March 29, 1971, abandoned, and a continuation-in-part of Ser. No. 847,390, Aug. 4, 1969, abandoned, which is a continuation-in-part of Ser. No. 590,549, Oct. 31, 1966, Pat. No. 3,459,704, which is a division of Ser. No. 224,602, Sept. 17, 1962, Pat. No. 3,294,836. This application Jan. 22, 1975, Ser. No. 543,084

Int. Cl.² C09F *5/08*

U.S. Cl. 260—410.5 **6 Claims**

1. A compound of the formula:



wherein

R_1 is an alkyl of 1 to 8 carbon atoms;
R_2 is a tertiary alkyl of 4 to 8 carbon atoms; and
R_3 is alkyl of 11 to 21 carbon atoms.

3,969,384
ESTERS OF CYCLOPROPANE ALKANOIC ACIDS

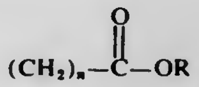
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 489,205, July 17, 1974, Pat. No. 3,925,461. This application June 11, 1975, Ser. No. 585,986

Int. Cl.² C07C *69/74*

U.S. Cl. 260—410.9 N **8 Claims**

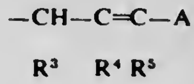
1. A compound selected from the formula:



$$(CH_2)_n\text{—}\overset{\overset{\displaystyle O}{\|}}{C}\text{—}OR$$

wherein,

n is the integer 6, 8 or 10, and
R is alkenyl of four to sixteen carbon atoms, alkynyl of four to sixteen carbon atoms, phenyl or the group



$$\underset{R^3}{\text{—}CH}\text{—}\underset{R^4}{C}\text{=}\underset{R^5}{C}\text{—}A'$$

in which each of R^3, R^4 and R^5 is hydrogen, A' is phenyl optionally substituted by chloro, lower alkyl or one to six carbon atoms or alkoxy of one to six carbon atoms, with the proviso that said compound contains at least 18 carbon atoms in the molecule.

3,969,385

ETHYL 10-METHOXY-3,7,11-TRIMETHYLDODECA-2,4-DIENOATE

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Dec. 6, 1974, Ser. No. 530,122

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.9 R **3 Claims**

1. The compound ethyl 10-methoxy-3,7,11-trimethyldodeca-2,4-dienoate.

3,969,386

ORGANO-METALLIC COMPOUNDS

Denis George Harold Ballard; Adrian Walter Parkins; Peter Anthony Robinson; Samuel Dimewere Ibekwe, all of Runcorn; Michael Franz Lappert, and Ronald Pearce, both of Brighton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 311,520, Dec. 4, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,303

Claims priority, application United Kingdom, Dec. 8, 1971, 56943/71; Dec. 8, 1971, 56944/71

Int. Cl.² C07F *9/00, 7/28, 11/00*

U.S. Cl. 260—429 R **4 Claims**

1. An organometallic compound of the formula

$M(CH_2SiR^1R^2R^3)_m$

where M is selected from transition metals of Groups IIIA to VIA of the Periodic Table of Elements, *m* is the prevailing valency of the metal M, said prevailing valency being 2, 3 or 4, and R¹, R² and R³ are selected from hydrogen, alkyl, alkenyl, benzyl and alkoxyphenyl, at least one of R¹, R² and R³ being alkenyl, benzyl or alkoxyphenyl.

3,969,387

METALIC-ORGANO-PEROXIDE AND ORGANO-METALIC-PEROXIDE AND PREPARATION THEREOF

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Filed Dec. 29, 1972, Ser. No. 319,293

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 R **31 Claims**

1. A method of forming a peroxy compound which comprises contacting and reacting:

- a. a reactive aluminum comprising highly pure aluminum permeated with a metal having an atomic volume close to hydrogen; with
- b. a liquid mixture of
  - i. hydrogen peroxide; and
  - ii. a carboxylic acid; and separating the peroxy compound from unreacted reactive aluminum.

3,969,388

MANUFACTURE OF ALKYLISOCYANATES

Hans Urbach, Lampertheim, and Albrecht Mueller, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 18, 1975, Ser. No. 569,209

Claims priority, application Germany, May 8, 1974, 2422211

Int. Cl.² C07C *118/00*

U.S. Cl. 260—453 P **12 Claims**

1. A process for the manufacture of alkylisocyanates by thermal decomposition of N-alkylcarbamic acid halides, wherein the N-alkylcarbamic acid halide is decomposed in the vapor state in from 2 to 6 successive reaction chambers at not less than 20°C above its boiling point, and the bulk of the hydrogen halide issuing from each reaction chamber is removed before the reaction mixture, in the vapor state, enters the next reaction chamber.

3,969,389

MANUFACTURE OF ALIPHATIC ISOCYANATES

Hans Urbach, Lampertheim, and Albrecht Mueller, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 3, 1975, Ser. No. 555,031

Claims priority, application Germany, Mar. 11, 1974, 2411441

Int. Cl.² C07C *118/00*

U.S. Cl. 260—453 P **11 Claims**

1. A process for the manufacture of aliphatic isocyanates by thermal decomposition of aliphatic carbamic acid halides in the presence of inert organic solvents, wherein, in a first reaction stage, an aliphatic carbamic acid halide is decomposed at a temperature not less than 25°C above its boiling point in the presence of a solvent which boils at or above this temperature, during which stage the hydrogen halide formed is removed, and then, in a second stage, the aliphatic isocyanate formed is isolated from the decomposition mixture.

3,969,390

CATALYTIC PROCESS FOR PREPARING UNSATURATED NITRILES FROM OLEFINS, AMMONIA AND OXYGEN

Franco Faletti; Nicola Giordano; Paolo Marinozzi; Joannes Bart, all of Milan, and Arsenio Castellan, Bollate (Milan), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 10, 1975, Ser. No. 540,165

Claims priority, application Italy, Jan. 11, 1974, 19334/74

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **4 Claims**

1. The process for the preparation of acrylonitrile or methacrylonitrile from propene or, respectively, isobutene, by reaction, in the gas phase, with ammonia and oxygen, in the presence of a solid catalyst system, at a temperature between 350° and 550°C, said process being characterized in that the catalyst system consists of the elements tellurium, cerium and molybdenum, and of at least one element selected from the group consisting of iron, chromium and aluminum, all of said elements being chemically combined with oxygen, and the various elements being present in the atomic ratios defined by the following empirical formula:

$A_xC_yTe_vMo_{12}O_z$

where A is at least one element selected from the group consisting of iron, chromium and aluminum, wherein:

$x = 0.3$ –4;

$y = 1$–10;

$v = 1$–10; and

z is a number indicating the amount of oxygen bound to the other elements and corresponding to the oxidation state in which they exist in the catalyst, said catalyst being obtained by mixing compounds of Te, Ce and Mo and of at least one element selected from the group consisting of Fe, Cr and Al in an aqueous medium, and then drying the mixture and heating it in the presence of air at a temperature ranging from 450° to 700°C.

3,969,391

PREPARATION OF PROSTAGLANDIN PRECURSORS

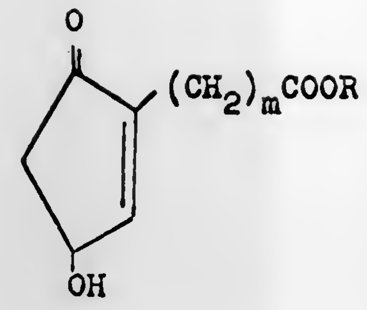
Raphael Pappo, Skokie, and Christopher Jung, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 249,667, May 2, 1972, abandoned. This application May 8, 1974, Ser. No. 467,847

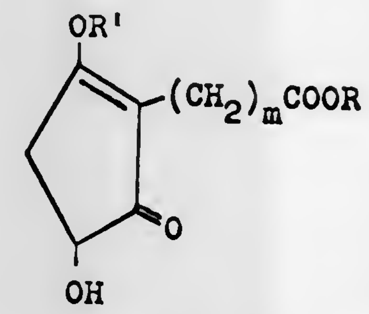
Int. Cl.² C07C *51/00*

U.S. Cl. 260—468 K **10 Claims**

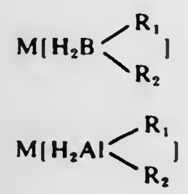
1. The process of producing a compound of the formula



which comprises contacting, in an inert solvent at a temperature between about −90° to +10°C., a compound of the formula



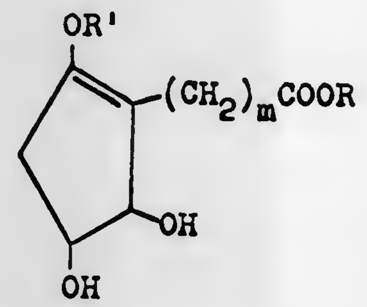
wherein R is lower alkyl, R′ is lower alkyl, (lower alkoxy) lower alkoxy and *m* is an integer greater than 4 and less than 8 with a hydride reducing agent selected from compounds of the formula



$$M[H_2B<^{R_1}_{R_2}]$$

$$M[H_2Al<^{R_1}_{R_2}]$$

wherein M is an alkali metal and R_1 and R_2 are hydrogen, lower alkyl or lower alkoxy, or from aluminum hydride, borane or zinc borohydride, to form, as an unisolated intermediate, a compound of the formula



and contacting, at about the same temperature, said unisolated intermediate with an acidic agent comprising a mineral acid or a strong organic acid.

3,969,392

TETRAHYDRO-CYCLOPROPA[B]NAPHTHALENES

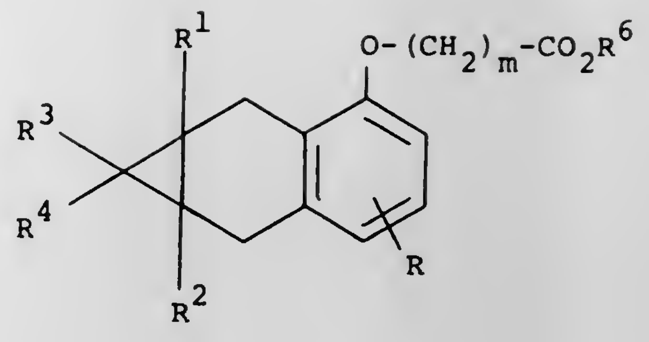
Venkatachala L. Narayanan, Hightstown, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 425,413, Dec. 17, 1973, Pat. No. 3,923,890, which is a division of Ser. No. 252,814, May 12, 1972, Pat. No. 3,796,760, which is a division of Ser. No. 73,668, Sept. 18, 1970, Pat. No. 3,694,512. This application Sept. 15, 1975, Ser. No. 613,720

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 F **1 Claim**

1. Compounds of the structure



wherein R is hydrogen, lower alkyl, lower alkoxy or cycloalkyl having 3 to 6 carbon atoms; R¹ and R² are the same or different and are hydrogen, lower alkyl or lower alkoxy; R³ and R⁴ are the same or different and are hydrogen, chlorine or bromine, at least one of R³ and R⁴ being other than hydrogen; R⁶ is hydrogen, lower alkyl or aralkyl; and *m* is 1 to 10.

3,969,393

PROCESS FOR PREPARING CYCLOPROPANE-CARBOXYLIC ACID ESTERS

Toshio Mizutani; Yoshitaka Ume, both of Toyonaka, and Takashi Matsuo, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

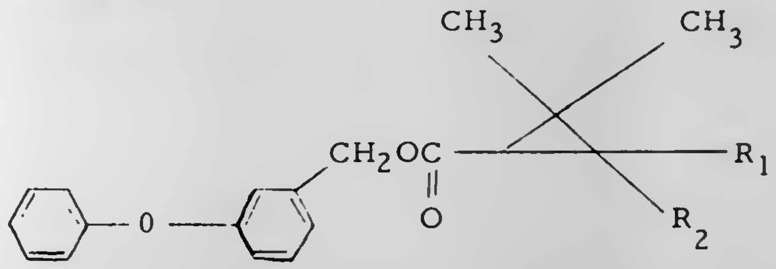
Filed Aug. 6, 1974, Ser. No. 495,154

Claims priority, application Japan, Aug. 6, 1973, 48-88674; Aug. 23, 1973, 48-94980

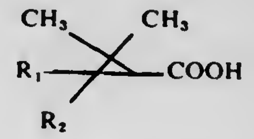
Int. Cl.² C07C *67/00*

U.S. Cl. 260—468 H **6 Claims**

1. A process for preparing an organic acid ester of the formula (I),

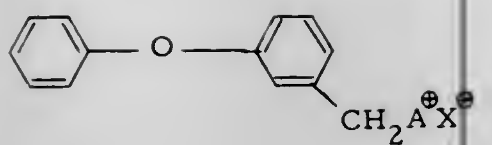


wherein R_1 is a hydrogen atom or a methyl group, R_2 is a methyl group, a vinyl group, a 2,2-dichlorovinyl group, a 1-propenyl group, a 2-methyl-1-propenyl group, a 2-carbomethoxy-1-propenyl group, a 2-methoxymethyl-1-propenyl group, a 1,3-butadienyl group, a 2-methyl-1,3-butadienyl group or a cyclopentylidenemethyl group when R_1 is a hydrogen atom, and R_2 is a methyl group when R_1 is a methyl group; which comprises reacting an acid of the formula (II).



(II)

wherein R_1 and R_2 are each as defined above, or its reactive derivative, or a mixture of the acid and its reactive derivative wherein said reactive derivative is selected from the group consisting of the alkali metal salt, ammonium salt and alkylammonium salt of the acid of formula (II), with a quaternary ammonium salt of the formula (III)



(III)

wherein X is a halogen atom, and A is an alkylamine, pyridine or an N-alkylaniline wherein said reacting is in the presence of a solvent selected from the group consisting of dimethylformamide, acetone, methyl isobutyl ketone, anisole, toluene, xylene, chlorobenzene and nitrobenzene and is conducted at a temperature lower than the boiling point of the solvent used and wherein the molar ratio of said quaternary ammonium salt to said acid or acid reactive derivative is between 1:0.76 to 1:1.27.

3,969,394

POLYURETHANES

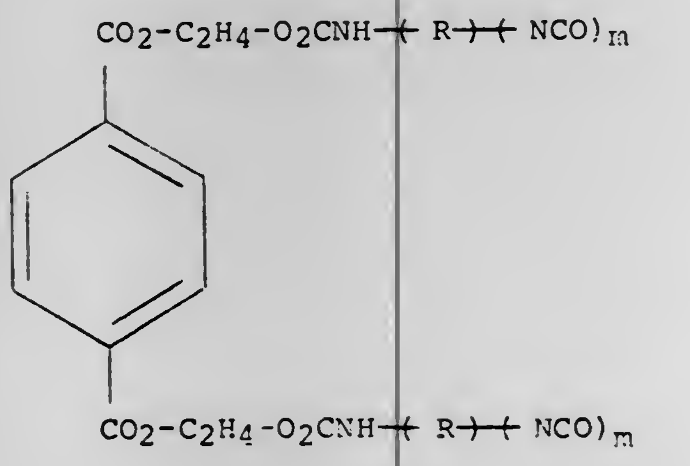
Arthur M. Reader, Waynesboro, Va., assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,082

Int. Cl.^{2} C07C *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. A polyisocyanate compound corresponding to the formula:



wherein R is a polyvalent organic radical containing between 2 and 22 carbon atoms selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals; and *m* is a positive integer having a value of from 1 to about 5.

3,969,395

POLYMERS OF HYDROXY CARBOXYLIC ACID AND A POLYHYDRIC ALCOHOL

Alf-Göran Dahlberg, Nykvarn; Karl Gustav Hogberg, Sodertalje; Sven Lindvall, Sodertalje, and Thore Oskar Verner Rydh, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Division of Ser. No. 294,930, Oct. 4, 1972, Pat. No. 3,886,267. This application July 22, 1974, Ser. No. 490,404

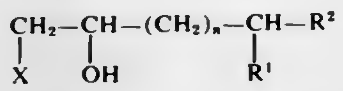
Int. Cl.^{2} C07C *69/66*

U.S. Cl. 260—484 R **25 Claims**

1. A physiologically innocuous, water swellable polymer which is the reaction product (per mole of component iii below) of

i. about 0.1 to 1.0 moles of at least one hydroxy carboxylic acid selected from the group consisting of arabonic acid, gluconic acid and glucoheptonic acid and salts and lactones derivable therefrom;

ii. about 0.05 to 5 moles of at least one polymerizing agent of the formula



$$\underset{X}{CH_2}-\underset{OH}{CH}-(CH_2)_n-\underset{R^1}{CH}-R^2 \qquad (I)$$

wherein *n* is an integer selected from the group consisting of 0,1,2,3, and 4; X is selected from the group consisting of Cl, Br, and I; R^1 is selected from the group consisting of OH, Cl, Br, and I; and R^2 is selected from the group consisting of H, and if R^1 is OH also the radical $—CH_2—X$, wherein X has the meaning specified above, and diepoxides derivable therefrom; and

iii. at least one polyhydric alcohol selected from the group consisting of glycerol, polyglycerols, tetritols pentitols, hexitols, heptitols, partial alkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms, and partial hydroxyalkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms,

the polymer components having been reacted in aqueous solution at a temperature between about 20°C and the boiling point of the reaction mixture.

3,969,396

8β, 11β, 12α-PGE$_2$ COMPOUNDS

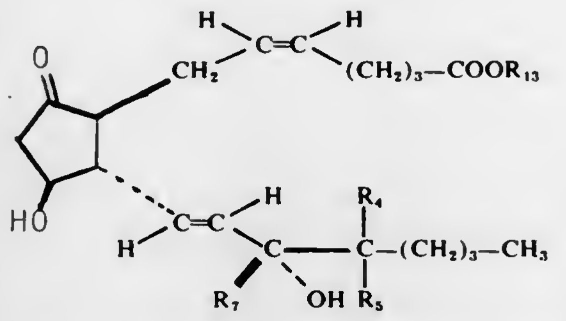
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974; Ser. No. 518,436

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—468 D **5 Claims**

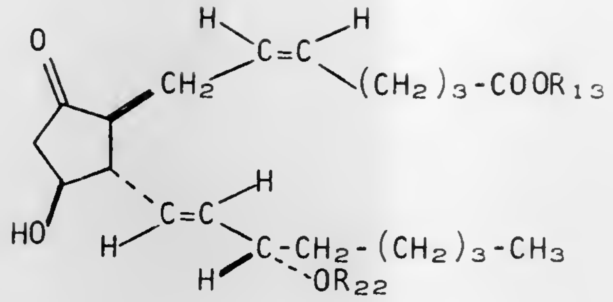
1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different; with the proviso that at least one of R_4 and R_5 is methyl; and

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

5. An optically active compound of the formula



wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen;

wherein R_{22} is alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

3,969,397

PROCESS FOR THE PREPARATION OF L-DOPA

Ado Kaiser, Neu-Frenkendorf; Marcel Scheer, Basel; Werner Häusermann, Neuallschwil, and Leo Marti, Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

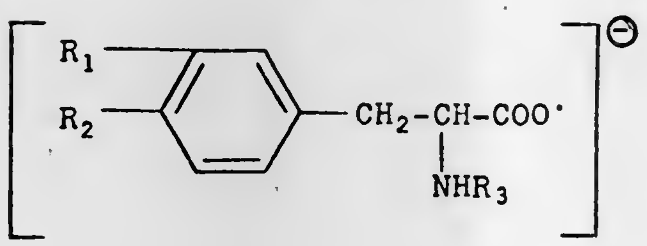
Filed Dec. 11, 1969, Ser. No. 884,333

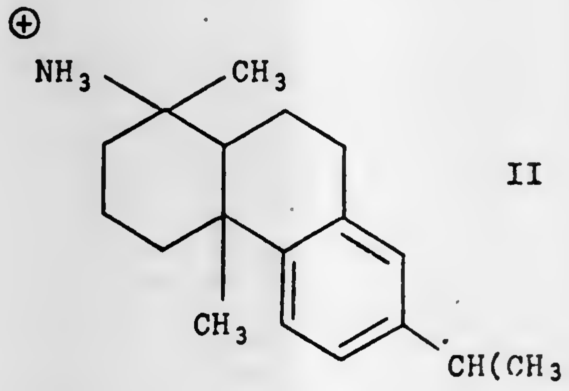
Claims priority, application Switzerland, Dec. 27, 1968, 19270/68

Int. Cl.^{2} C07C *63/50*

U.S. Cl. 260—501.11 **19 Claims**

1. A compound of the formula





II

wherein R_1 is methoxy; R_2 is hydroxy and R_3 is benzoyl.

3,969,398

PROCESS FOR PRODUCING N-PHOSPHONOMETHYL GLYCINE

Arnold Hershman, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 1, 1974, Ser. No. 465,976

Int. Cl.^{2} C07F *9/38*

U.S. Cl. 260—502.5 **12 Claims**

1. A process for the production of N-phosphonomethyl glycine which comprises contacting an aqueous solution of N-phosphonomethylimino diacetic acid with a molecular oxygen-containing gas at a temperature sufficiently elevated to initiate and sustain reaction and in the presence of a catalyst consisting essentially of activated carbon.

3,969,399

ELECTROPLATING PROCESSES AND COMPOSITIONS

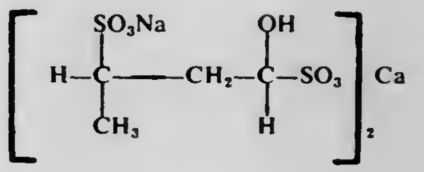
Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 55,959, July 17, 1970, Pat. No. 3,697,391. This application Oct. 26, 1971, Ser. No. 192,612

Int. Cl.^{2} C07C *143/04, 143/10*

U.S. Cl. 260—513 R **1 Claim**

1. A compound of the formula:



$$\left[H-\overset{SO_3Na}{\underset{CH_3}{C}}-CH_2-\overset{OH}{\underset{H}{C}}-SO_3\right]_2 Ca$$

3,969,400

CONTINUOUS PROCESS FOR DRYING SODIUM VINYL-SULFONATE

Jan Colle, Oostende, Belgium, assignor to U.C.B., Societe Anonyme, Brussels, Belgium

Filed Jan. 9, 1975, Ser. No. 539,933

Claims priority, application United Kingdom, Jan. 25, 1974, 3492/74

Int. Cl.^{2} C07C *143/16*

U.S. Cl. 260—513 R **5 Claims**

1. A continuous process for preparing dry and storage stable sodium vinyl-sulfonate from an aqueous solution thereof, which comprises (a) adding, in a first stage, an alkali metal hydroxide to the starting aqueous solution of sodium vinyl-sulfonate in an amount such that the solution contains from 40 to 300 mg. of sodium or potassium hydroxide per 100 g. of sodium vinyl-sulfonate, (b) concentrating the resulting alkaline solution by evaporation in a second stage at a temperature of from 50° to 100°C. at a pressure of from 40 to 200 mm.Hg. to give an aqueous solution having a sodium vinyl-sulfonate concentration of from 40 to 55% by weight and (c) in a third stage, subjecting the resulting concentrated solution to drying at a temperature of from 50° to 100°C. at a pressure of from 40 to 200 mm.Hg. to give solid sodium vinyl-sulfonate, the water content of which is, at most, 2 % by weight.

3,969,401

α-AMINOPHENYLACETIC ACID COMPOUNDS AND DERIVATIVES

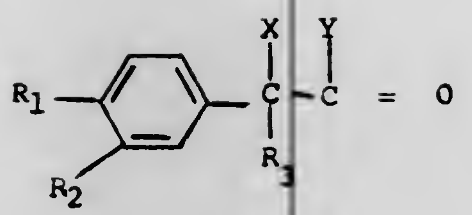
Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 34,870, May 5, 1970, Pat. No. 3,864,384. This application Aug. 14, 1973, Ser. No. 388,292

Int. Cl.^{2} C07C *101/02*

U.S. Cl. 260—518 A **6 Claims**

1. A compound of the formula



where

R$_1$ is a member selected from the group consisting of cycloalkyl with 5 to 7 carbon atoms, lower alkyl substituted cycloalkyl, alkyl with 1 to 8 carbon atoms, phenyl, and phenyl substituted by a member selected from the group consisting of trifluoromethyl, halogen, lower alkylsulfonyl, and nitro;

R$_2$ is a member selected from the group consisting of halogen, nitro, trifluoromethyl and lower alkylsulfonyl, and if R$_1$ is substituted phenyl, hydrogen;

R$_3$ is a member selected from the group consisting of hydrogen and lower alkyl with 1 to 8 carbon atoms;

X is amino, lower alkanoylamino, di-(lower alkyl) amino; or lower alkylamino; and

Y is hydroxyl.

3,969,402
PHENYLALKANOIC ACIDS

Stewart S. Adams; Bernard J. Armitage, and John S. Nicholson, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Filed June 6, 1973, Ser. No. 367,614

Claims priority, application United Kingdom, June 15, 1972, 28104/72

Int. Cl.^{2} C07C *65/14*

U.S. Cl. 260—520 R **1 Claim**

1. 2-(2-Hydroxy-4-biphenylylpropionic acid.

3,969,403
PROCESS FOR PREPARATION OF 2-METHOXY-3,6-DICHLORO-BENZOIC ACID

Heinz Manfred Becher, Bingen (Rhine), and Richard Sehring, Ingelheim am Rhein, both of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 480,685, June 19, 1974, Pat. No. 3,928,432. This application Oct. 1, 1975, Ser. No. 618,561

Claims priority, application Germany, June 22, 1973, 2331712

Int. Cl.^{2} C07C *65/02*

U.S. Cl. 260—521 H **6 Claims**

1. A process for the preparation of 2-methoxy-3,6-dichlorobenzoic acid comprising the steps of catalytically debrominating 2-methoxy-5-bromo-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3,6-dichlorobenzyl alcohol, oxidizing said 2-methoxy-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3, 6-dichloro benzonic acid, and recovering said 2-methoxy-3,6-dichlorobenzoic acid.

3,969,404
PROCESS FOR PREPARATION OF 2-METHOXY-3,6-DICHLORO-BENZOIC ACID

Heinz Manfred Becher, Bingen (Rhine), and Richard Sehring, Ingelheim am Rhein, both of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 480,685, June 19, 1974, Pat. No. 3,928,432. This application Oct. 1, 1975, Ser. No. 618,560

Claims priority, application Germany, June 22, 1973, 2331712

Int. Cl.^{2} C07C *65/02*

U.S. Cl. 260—521 H **4 Claims**

1. A process for the preparation of 2-methoxy-3,6-dichlorobenzoic acid comprising the steps of catalytically debrominating 2-hydroxy-5-bromo-3,6-dichloro-benzyl alcohol to produce 2-hydroxy-3,6-dichloro-benzyl alcohol, methylating said 2-hydroxy-3,6 -dichloro-benzyl alcohol at the 2-hydroxy group to produce 2-methoxy-3,6-dichloro-benzyl alcohol, oxidizing said 2-methoxy-3,6-dichloro-benzyl alcohol to produce 2-methoxy-3,6-dichloro-benzoic acid, and recovering said 2-methoxy-3,6-dichloro-benzoic acid.

3,969,405
OXIDATION OF ALKYLAROMATICS

Pierre M.J.G. de Radzitzky d'Ostrowick, 101, Ave. Paul Hymans, and Jacques D. V. Hanotier, 36, Avenue Dr. Decroly, both of Brussels, Belgium

Continuation-in-part of Ser. No. 884,336, Dec. 11, 1969, Pat. No. 3,665,030. This application Apr. 11, 1972, Ser. No. 243,086

The portion of the term of this patent subsequent to May 5, 1989, has been disclaimed.

Claims priority, application France, Sept. 17, 1971, 71.33504

Int. Cl.^{2} C07C *51/33*

U.S. Cl. 260—524 M **15 Claims**

1. The process of oxidizing an alkyl carbocyclic aromatic compound having at least one methyl group directly linked to the aromatic nucleus, to selectively produce an aromatic acid, comprising reacting said alkyl carbocyclic aromatic compound in the liquid phase with a cobaltic salt in the presence of a molar excess with respect to said salt of an activator selected from the group consisting of the acids having a dissociation constant higher than 10^{-3} other than hydrogen halides and which are stable in the conditions of the reaction, boron trifluoride and mixtures thereof, at a temperature between −30°C and +100°C, and under a partial pressure of oxygen between 0.1 to 50 atmospheres.

3,969,406
PROCESS FOR THE PRODUCTION OF CARNITINE

Leander Tenud, Visp, Vs, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed Apr. 28, 1975, Ser. No. 572,316

Claims priority, application Switzerland, Apr. 26, 1974, 5730/74

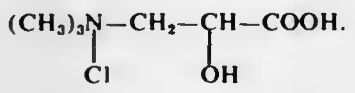
Int. Cl.^{2} C07C *101/30*

U.S. Cl. 260—534 M **9 Claims**

1. The process for the production of carnitine hydrochloride which comprises (*a*) reacting a γ-haloacetoacetanilide having the formula:

$XCH_2COCH_2CONYC_6H_5$

where X is a halogen atom and Y is a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, with trimethylamine, a γ-trimethylammonium acetoacetanilide halide resulting, (*b*) hydrogenating said γ-trimethylammonium acetoacetanilide halide, a γ-trimethylammonium-β-hydroxybutyric acid halide resulting, and (*c*) converting said γ-trimethylammonium-β-hydroxybutyric acid halide by means of aqueous hydrochloric acid into said carnitine hydrochloride, which has the formula:



$$(CH_3)_3\underset{\displaystyle Cl}{\underset{|}{N}}-CH_2-\underset{\displaystyle OH}{\underset{|}{C}}H-COOH.$$

3,969,407
SUBSTITUTED CARBAMOYL SULFINES AND THEIR MANUFACTURE

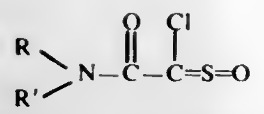
Wendell Gary Phillips, Olivette, and Kenneth Wayne Ratts, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1971, Ser. No. 194,539

Int. Cl.^{2} C07C *103/12, 103/34*

U.S. Cl. 260—561 S **30 Claims**

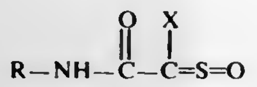
1. A substituted carbamoyl sulfine of the formula



$$\begin{matrix}R\\R'\end{matrix}\!\!>N-\overset{\displaystyle O}{\overset{\|}{C}}-\overset{\displaystyle Cl}{\overset{|}{C}}=S=O$$

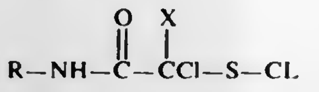
wherein R and R′ are each independently selected from hydrogen, lower alkyl, alkoxyalkyl of from 2 through 8 carbons, benzyl, phenyl, substituted phenyl wherein the ring substituents thereof total from 1 through 3 same or different substituents selected from the group of substituents consisting of lower alkyl, lower alkoxy, halo, nitro, and trihalomethyl, provided that the number of nitro substituents be from 0 through 2, and substituted benzyl wherein the substituents are on the phenyl ring and are as defined for substituted phenyl.

28. A method for the preparation of substituted carbamoyl sulfines of the formula



$$R-NH-\overset{\displaystyle O}{\overset{\|}{C}}-\overset{\displaystyle X}{\overset{|}{C}}=S=O$$

wherein R is selected from hydrogen, lower alkyl, alkoxyalkyl of from 2 through 8 carbons, benzyl, phenyl, substituted phenyl wherein the ring substituents thereof total from 1 through 3 same or different substituents selected from the group of substituents consisting of lower alkyl, lower alkoxy, halo, nitro, and trihalomethyl, provided that the number of nitro substituents be from 0 through 2, and substituted benzyl wherein the substituents are on the phenyl ring and are as defined for substituted phenyl, and X is chloro or lower alkyl, which comprises reacting at temperatures above the freezing point of the system to about 50°C about one molecular proportion of a chloromethane sulfenyl chloride of the formula



$$R-NH-\overset{\displaystyle O}{\overset{\|}{C}}-\overset{\displaystyle X}{\overset{|}{C}}Cl-S-Cl.$$

wherein R and X have the aforementioned significance and about two equivalent proportions of an aqueous base selected from the group consisting of alkali metal carbonates and bicarbonates and alkali metal hydroxides of up to 0.1 molar strength.

3,969,408
2-ALKYL-5-OXIMINOCYCLOPENTANONE AND THE METHOD OF PREPARING THE SAME

Hiroyuki Kyomori, Yachiyo; Kazuhiro Sasaki, Fuchu, and Mitsuhiro Takahashi, Tokyo, all of Japan, assignors to Kobayashi Perfumery Co., Ltd., Tokyo, Japan

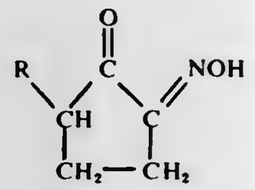
Filed Dec. 18, 1974, Ser. No. 533,792

Claims priority, application Japan, Mar. 5, 1974, 49-25518

Int. Cl.^{2} C07C *131/02*

U.S. Cl. 260—566 A **5 Claims**

1. 2-alkyl-5-oximinocyclopentanone useful as perfume raw material, the chemical structure of which may be expressed by the general formula:



where R is a lower alkyl group.

3,969,409
3-ANILINO-5,5-DISUBSTITUTED-2-AMINOMETHYL-2-CYCLOHEXEN-1-ONES AND THE SALTS THEREOF

Seiji Miyano, and Nobuhiro Abe, both of Fukuoka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

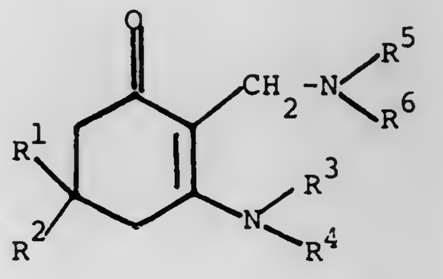
Filed Apr. 24, 1973, Ser. No. 354,139

Claims priority, application Japan, May 11, 1972, 47-47047; Dec. 22, 1972, 47-2613

Int. Cl.^{2} C07C *97/10*

U.S. Cl. 260—570.5 CA **27 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein each of R^1 and R^2 independently represents hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; one of R^3 and R^4 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, or cycloalkyl of up to 6 carbon atoms, and the other represents (a) phenyl, (b) phenyl substituted by a member of the group consisting of alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, nitro, hydroxy, mono- or di-alkylamino wherein the alkyl is of 1 to 2 carbon atoms, (c) alkyl of 1 to 6 carbon atoms, (d) alkenyl of 2 to 6 carbon atoms, (e) cycloalkyl of up to 6 carbon atoms, (f) benzyl or (g) phenethyl; one of R^5 and R^6 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or cycloalkyl of up to 6 carbon atoms, and the other represents alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of up to 6 carbon atoms, phenyl, benzyl or phenethyl, and a pharmaceutically acceptable salt thereof.

3,969,410
1-(2′-ALKYL-3′,4′-DIHYDROXY-PHENYL)-2-(PHENYLALKYL-AMINO)-ALKANOLS-(1) AND SALTS THEREOF

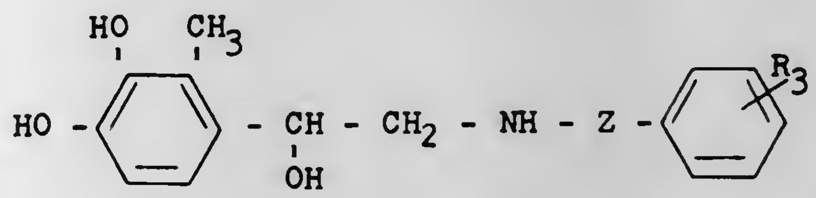
Anton Mentrup; Kurt Schromm; Otto Thomä, and Karl Zeile, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 217,291, Jan. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 713,265, Oct. 16, 1967, Pat. No. 3,657,244. This application July 3, 1974, Ser. No. 485,348

Int. Cl.^{2} C07C *91/22;* **C07D** *473/00*

U.S. Cl. 260—570.6 **6 Claims**

1. A racemic mixture of a compound of the formula



wherein

Z is alkylene of 2 to 5 carbon atoms, and

R_3 is hydrogen or hydroxyl,

a pure stereoisomer thereof; a diastereomeric antipode pair thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture, stereoisomer or diastereomeric antipode pair.

3,969,411

PROCESS FOR N-ALKYLATING AROMATIC AMINES

Joachim Schneider, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

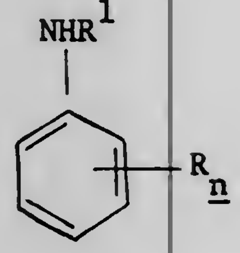
Filed Sept. 11, 1974, Ser. No. 505,115

Claims priority, application Germany, Sept. 28, 1973, 2348738

Int. Cl.² C07C *87/50, 87/54*

U.S. Cl. 260—577 **7 Claims**

1. Process for preparing N-alkylated aromatic amines which comprises heating in the liquid phase an aromatic amine having the formula:



wherein

R is selected from the group of halogen, lower alkyl, alkoxy, alkylmercapto and phenyl optionally substituted by lower alkyl, alkoxy and alkylmercapto;

R^1 is selected from the group of hydrogen, lower alkyl, phenyl and aminophenyl optionally substituted by lower alkyl, alkoxy and arylmercapto; and

n is 0, 1, 2 or 3

together with a lower aliphatic alcohol in the presence of from 0.01 to 1.0 mol of phosphoric acid per nitrogen equivalent at a temperature in the range of from 150° to 280°C, obtaining at least two liquid phases including a lower phase which contains said phosphoric acid and thereafter separating the liquid phases formed to isolate the N-alkylated aromatic amine.

3,969,412

16,17-SECO-DELTA 4,9(10) AND -DELTA 4,9(10),11 STEROIDS

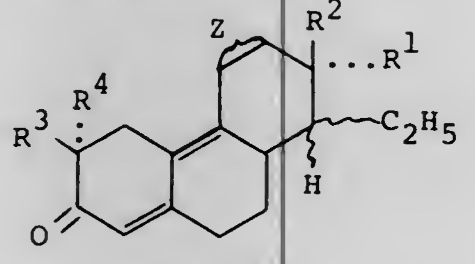
Pierre Crabbe, Mexico City, Mexico; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 440,328, Feb. 7, 1974, abandoned, which is a division of Ser. No. 142,762, May 12, 1971, Pat. No. 3,819,686. This application Nov. 22, 1974, Ser. No. 526,359

Int. Cl.² C07C *49/48*

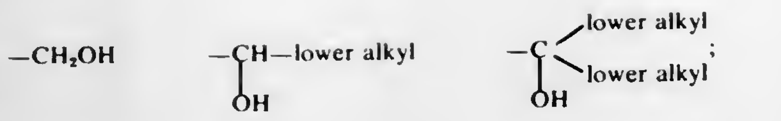
U.S. Cl. 260—586 E **8 Claims**

1. A compound selected from the group of compounds represented by the following formula:



(A)

wherein R^1 represents a conventional hydrolyzable ether of a hydroxylated hydrocarbon radical represented by the formulas:



$$—CH_2OH \qquad —\underset{\displaystyle OH}{CH}—\text{lower alkyl} \qquad —\underset{\displaystyle OH}{C}\begin{matrix}\text{lower alkyl}\\ \text{lower alkyl}\end{matrix};$$

R^2 is lower alkyl;

R^3 and R^4 are hydrogen or methyl, provided that R^4 is methyl when R^3 is methyl; and

Z is a carbon-carbon single bond or a carbon-carbon double bond.

3,969,413

HYDROFORMYLATION PROCESS USING CATALYST COMPRISING COBALT AND POLYNITROARYL COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 20, 1975, Ser. No. 542,739

Int. Cl.² C07C *27/22*

U.S. Cl. 260—604 HF **17 Claims**

1. A process for the preparation of hydroformylation products which comprises hydroformylating an olefin possessing from 3 to 20 carbon atoms with carbon monoxide and hydrogen in the presence of a catalyst comprising a polynitroaryl which may be substituted by a lower alkyl, amino, halo, hydroxy, carboxy or hydrazino radical and a cobalt-containing compound at a temperature in the range of about 75° to 300°C and a pressure of 20 atmospheres to 500 atmospheres and recovering the resultant hydroformylation products.

3,969,414

NAPHTHYLMETHYL SULFONIUM COMPOUNDS

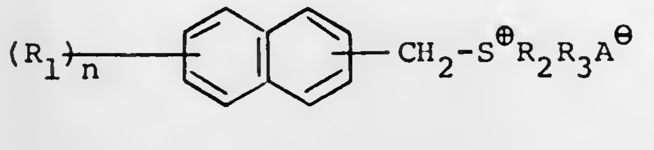
Wayne W. Frenier, and William J. Settineri, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 350,295, April 11, 1973. This application Feb. 18, 1975, Ser. No. 550,401

Int. Cl.² C07C *149/46*

U.S. Cl. 260—607 B **11 Claims**

1. A compound corresponding to the formula



wherein *n* is 1 or 2; each R_1 independently is a hydrocarbyl, hydrocarbyloxy or hydrocarbylthio group of from 1 to about 24 carbon atoms, or a hydrocarbyl group of from 1 to about 24 carbon atoms whose chain length is interrupted by an atom of oxygen or sulfur; R_2 is a hydrocarbyl radical of from 1 to about 24 carbon atoms, with the proviso that the total carbon content of R_1 and R_2 is from 7 to about 25 carbon atoms; R_3 is an alkyl radical of from 1 to 4 carbon atoms, allyl or a phenyl radical; and A^- is a neutralizing anion.

3,969,415

1-(2-NAPHTHYL)-2,3-BUTADIEN-1-OLS

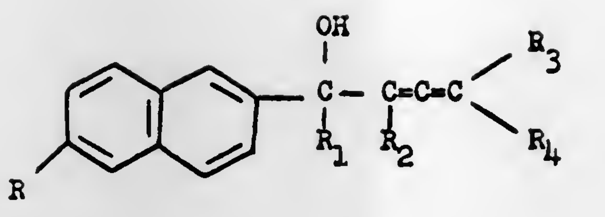
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 203,825, Dec. 1, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,468

Int. Cl.² C07C *43/20, 33/06, 149/00*

U.S. Cl. 260—613 D **14 Claims**

1. A compound of the formula



wherein

R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms or difluoromethoxy;

R_1 is hydrogen or alkyl of 1 to 3 carbon atoms;

R_2 is hydrogen or methyl; and

R_3 and R_4 are, independently, hydrogen or alkyl of 1 to 3 carbon atoms provided that at least one of R_3 and R_4 is hydrogen when R_2 is methyl.

3,969,416

PREPARATION OF KETALS

Peter Sylvester Shaw, Cross Farm, Orton Rigg, Great Orton, Cumberland, England

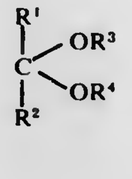
Continuation of Ser. No. 249,837, May 3, 1972, abandoned. This application May 9, 1974, Ser. No. 469,011

Claims priority, application United Kingdom, May 4, 1971, 12869/71

Int. Cl.² C07C *41/10, 41/06*

U.S. Cl. 260—615 A **7 Claims**

1. A process for the preparation of a ketal of the formula



(I)

wherein

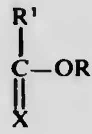
R^1 is alkyl of 1 to 4 carbon atoms,

R^2 is a primaru or secondary alkyl group of 1 to 4 carbon atoms,

R^3 is methyl and

R^4 is methyl,

which comprises reacting an unsaturated compound of the formula



$$\overset{\displaystyle R^1}{\underset{\displaystyle \| \atop X}{C}}—OR^3 \qquad \text{(II)}$$

wherein R^1 and R^3 are as defined above and X is a primary or secondary alkylidene group of 1 to 4 carbon atoms, with methanol in the presence of an inert solvent and a sulphonic acid ion exchange resin in the acid form as catalyst, at a temperature of 10°–60°C.

3,969,417

PROCESS FOR THE ALKOXYLATION OF COMPOUNDS CONTAINING ALCOHOLIC HYDROXYL GROUPS

Wilfried Umbach, Langenfeld, and Werner Stein, Erkrath-Unterbach, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

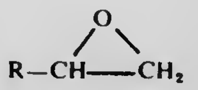
Continuation of Ser. No. 293,425, Sept. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 859,581, Sept. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 683,446, Nov. 16, 1967, abandoned. This application Apr. 3, 1975, Ser. No. 564,811

Claims priority, application Germany, May 16, 1967, 6274212; Nov. 8, 1968, 1807780

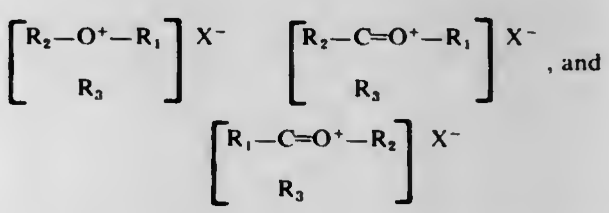
Int. Cl.² C07C *41/02, 41/10*

U.S. Cl. 260—615 B **16 Claims**

1. A process for alkoxylation of compounds containing an alcoholic hydroxyl group which compises reacting a secondary alkanol having from 8 to 15 carbon atoms with an epoxide of the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having 1 to 2 carbon atoms, hydroxyalkyl having 1 to 2 carbon atoms and haloalkyl having 1 to 2 carbon atoms, under alkoxylation conditions at temperatures between 0° and 200°C in the presence of from 0.05 % to 5% by weight, based on the weight of said compound containing hydroxyl groups, of a tertiary oxonium salt of the formula



$$\left[\begin{matrix}R_2—O^+—R_1\\ R_3\end{matrix}\right]X^- \qquad \left[\begin{matrix}R_2—C{=}O^+—R_1\\ R_3\end{matrix}\right]X^-, \text{ and} \qquad \left[\begin{matrix}R_1—C{=}O^+—R_2\\ R_3\end{matrix}\right]X^-$$

wherein X represents a halogeno-complex anion selected from the group consisting of BF_4^-, $FeCl_4^-$, $AlCl_4^-$, $SbCl_6^-$ and $SnCl_6^{=}$; R_1 represents a member selected from the group consisting of alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, haloalkyl having from 1 to 4 carbon atoms and phenyl; R_2 and R_3 are members selected from the group consisting of alkyl having 1 to 24 carbon atoms, alkoxy having from 1 to 4 carbon atoms, haloalkyl having 1 1 to 4 carbon atoms, phenyl, phenylvinyl and when taken together, alkylene having 3 to 14 carbon atoms, oxaalkylene having 2 to 13 carbon atoms, thiaalkylene having 2 to 13 carbon atoms, azaalkylene having 2 to 13 carbon atoms, alkenylene having 3 to 14 carbon atoms, alkadienylene having 4 to 14 carbon atoms and benzobutadienylene; and recovering said alkoxylated compounds.

3,969,418

(4-BIPHENYLYL)-BUTENOLS

Helmut Teufel; Wolfhard Engel, and Ernst Seeger, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

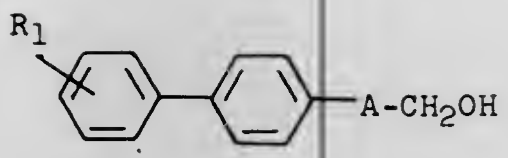
Continuation-in-part of Ser. No. 387,802, Aug. 13, 1973, Pat. No. 3,859,256. This application July 3, 1974, Ser. No. 485,574

Claims priority, application Germany, Aug. 17, 1972, 2240440

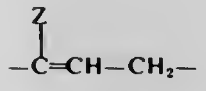
Int. Cl.² C07C *31/14, 31/34*

U.S. Cl. 260—618 R **4 Claims**

1. A compound of the formula

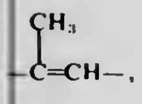


wherein A is



$$-\overset{Z}{\overset{|}{C}}{=}CH-CH_2-$$

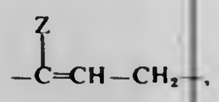
or



$$-\overset{CH_3}{\overset{|}{C}}{=}CH-,$$

where Z is hydrogen or methyl, and

R_1 is halogen or, when A is



$$-\overset{Z}{\overset{|}{C}}{=}CH-CH_2-,$$

also hydrogen.

3,969,419

3-(2-HALO-4-BIPHENYLYL)-1-BUTANOLS AND DERIVATIVES THEREOF

Wolfhard Engel; Helmut Teufel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

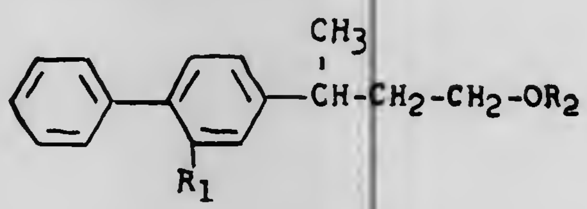
Filed Aug. 15, 1974, Ser. No. 497,716

Claims priority, application Germany, Aug. 16, 1973, 2341506

Int. Cl.² C07C *31/14, 69/14, 69/78, 69/24*

U.S. Cl. 260—618 D **3 Claims**

1. A compound of the formula



wherein R_1 is chlorine or fluorine, and

R_2 is hydrogen, alkanoyl of 1 to 10 carbon atoms or benzoyl.

3,969,420

PROCESS FOR RECOVERING RESORCINOL AND HYDROQUINONE IN MIXTURE

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 2, 1973, Ser. No. 375,920

Claims priority, application Japan, July 5, 1972, 47-67840

Int. Cl. C07c *37/24*

U.S. Cl. 260—621 A **9 Claims**

1. A process for recovering resorcinol and hydroquinone in mixture from a solution resulting from the acid catalyzed cleavage of the resulting oxidation products of the liquid phase, oxygen or oxygen containing gas oxidation of diisopropylbenzene and successive distillation of the cleavage products to remove lower and higher boiling components, which comprises adding to said solution a mixed organic solvent of (1) at least one hydrocarbon solvent selected from the group consisting of alkanes having 7 to 10 carbon atoms, benzene and lower alkyl substituted benzene and (2) at least one compound selected from the group consisting of acetone, methylethylketone, methylisopropylketone, methylisobutylketone, methanol, ethanol, isopropanol, tert.-butanol, methyl acetate and ethyl acetate, dissolving the resulting mixture by heating, slowly cooling the resulting solution, thereby separating a solid phase containing resorcinol and hydroquinone and the organic solvent layer, and recovering the solid phase of the mixture of resorcinol and hydroquinone from the organic solvent layer.

3,969,421

PROCESS FOR PRODUCING ETHYLPHENOLS

Pierre Marie Joseph Ghislain de Radzitzky d'Ostrowick, Woluwe-St.-Lambert, and Philippe Jean André Camerman, Wezembeek-Oppem, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,447

Claims priority, application Belgium, Feb. 21, 1974, 141219

Int. Cl.² C07C *39/06*

U.S. Cl. 260—621 C **7 Claims**

1. In a process for producing ethylphenol comprising the steps of reacting in liquid phase, diethylbenzene with a molecular oxygen containing gas, at a temperature between 100° and 180°C, until 5 to 30% of the diethylbenzene feed is converted into diethylbenzene hydroperoxide, withdrawing the reaction mixture, evaporating the unconverted diethylbenzene therefrom to obtain a concentrate containing at least 40% of diethylbenzene hydroperoxide, and recycling the unconverted diethylbenzene to the oxidation stage, mixing the diethylbenzene hydroperoxide concentrate with a solvent selected from the group consisting of lower alkanols, lower alkanones and mixtures thereof, decomposing said hydroperoxide by intimately contacting the mixture of diethylbenzene hydroperoxide and solvent with a strong acid which is used in an amount of between 0.05 and 5% of the weight of total reaction mixture, neutralizing the resulting mixture and thereafter distilling the neutralized mixture to recover a bottom fraction containing ethylphenol and an overhead fraction containing acetaldehyde, the improvement which comprises the further steps of treating said ethylphenol fraction with a compound reactive to the ketones within said fraction, said compound being selected from the group consisting of hydrazine, hydrazine hydrate, the substitution derivatives of hydrazine, aminoguanidine, the substitution derivatives of aminoguanidine, hydroxylamine, semicarbazide, 4-arylsemicarbazides, thiosemicarbazides, 4-aryl-thiosemicarbazides, and mixtures thereof and thereafter distilling such treated fraction to obtain ethylphenol substantially free of ketonic impurities.

3,969,422

PROCESS FOR THE SEPARATION OF CRESOL ISOMERS

Richard W. Neuzil, Downers Grove, and Donald H. Rosback, Elmhurst, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 367,685, June 6, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,456

Int. Cl.² C07C *39/06, 37/24*

U.S. Cl. 260—621 B **25 Claims**

1. A process for separating para-cresol from a feed mixture containing para-cresol and at least one other cresol isomer which process comprises the steps of:

a. contacting, at adsorption conditions including a temperature of from about 100° F. to about 500° F. and a pressure of from about atmospheric to about 500 psig., said feed mixture with an adsorbent comprising a crystalline aluminosilicate selected from the group consisting of X structured and Y structured zeolites containing at the exchangeable cationic sites one or more selected cations, thereby selectively adsorbing para-cresol;

b. withdrawing from the adsorbent a raffinate stream comprising less selectively adsorbed cresol isomers;

c. thereafter contacting said adsorbent at adsorption conditions including a temperature of from about 100° F. to about 500° F. and a pressure from about atmospheric to about 500 psig. with a desorbent material comprising a saturated alcohol of from 1 to 7 carbon atoms per molecule and which is soluble in the feed mixture at said adsorption and desorption conditions and differing by at least about 15° F. in average boiling point from the feed mixture, whereby to remove adsorbed para-cresol from the adsorbent and to increase the selectivity of the adsorbent for para-cresol in subsequent contact of the feed mixture with the adsorbent;

d. withdrawing from the adsorbent an extract stream containing desorbed para-cresol; and

e. contacting an additional quantity of said feed mixture with the resultant adsorbent of increased selectivity for para-cresol.

3,969,423

CONTINUOUS PREPARATION OF 2,4,4,4-TETRACHLOROBUTANOL

Neal E. Morganson, Lake Charles, La., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 372,178, June 21, 1973, abandoned. This application June 25, 1975, Ser. No. 590,181

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **11 Claims**

1. In a continuous process for preparing 2,4,4,4-tetrachlorobutanol which comprises reacting allyl alcohol with carbon tetrachloride at a temperature of about 70°–95°C, the improvement of carrying out the reaction in the presence of a catalyst system comprised of catalytic proportions of carbon dioxide and an iron-containing material selected from the group consisting of iron powder, ferrous chloride and a mixture thereof, said catalytic proportion of carbon dioxide being in the range of about 0.001 to about 1.2 moles per each mole of said allyl alcohol, said catalytic proportion of iron powder being in the range of about 0.5 to about 12 parts per every 100 parts by weight of said allyl alcohol, and said catalytic proportion of ferrous chloride being in the range of about 1 to about 14 parts per every 100 parts by weight of said allyl alcohol.

3,969,424

PROCESS FOR OXYCHLORINATION OF HYDROCARBONS

Jean-Claude Daumas, Marly-le-Roi, and Madeleine Le Page, Paris, both of France, assignors to Rhone-Progil, Paris, France

Division of Ser. No. 226,929, Feb. 16, 1972, Pat. No. 3,849,338. This application Sept. 3, 1974, Ser. No. 502,804

Int. Cl.² C07C *17/10, 17/15*

U.S. Cl. 260—662 A **17 Claims**

1. In the process for the oxyclorination of hydrocarbons wherein a mixture of a lower aliphatic hydrocarbon, hydrogen chloride and a molecular oxygen-containing gas are reacted to produce chlorinated hydrocarbons, the improvement comprising carrying out the reaction in the presence of a catalyst consisting essentially of copper chloride deposited on a support of silica and magnesia prepared by calcining at a temperature within the range of 530° to 700°C bodies of a silica hydrogel containing a compound selected from the group consisting of magnesium chloride, magnesium bromide, magnesium perchlorate and mixtures thereof, with the hydrogel containing 10 to 25% by weight of magnesia based on the calcined particles.

3,969,425

SATURATED HYDROCARBON ISOMERIZATION PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 445,019, Feb. 22, 1974, Pat. No. 3,919,340, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Mar. 5, 1975, Ser. No. 555,497

The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.

Int. Cl.² C07C *5/26*

U.S. Cl. 260—666 R **17 Claims**

1. A process for isomerizing an isomerizable saturated hydrocarbon which comprises contacting said saturated hydrocarbon at isomerization conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 weight percent platinum or palladium, about 0.01 to about 2 weight percent iridium, about 0.01 to about 5 weight percent germanium and about 0.1 to about 3.5 weight percent halogen, wherein the platinum or palladium, iridium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium are present in the corresponding elemental metallic states and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal.

3,969,426

CONVERSION OF METHANOL TO PRODUCTS COMPRISING GASOLINE BOILING COMPONENTS

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,733

Int. Cl.² C07C *15/04, 15/06, 1/20*

U.S. Cl. 260—668 R **15 Claims**

1. In a process for converting methanol by contacting the same over a crystalline zeolite conversion catalyst at elevated temperature, the improvement which comprises passing a methanol-containing charge in contact with said crystalline zeolite conversion catalyst in a conversion zone maintained at a temperature within the range of about 900° to about 1200°F for a reactant to catalyst contact time within the range of 0.5 to 5 seconds to produce an aliphatic product enhancing the front end octane level of gasoline boiling range material, passing another portion of a methanol-containing charge in contact with a crystalline aluminosilicate conversion catalyst in a conversion zone maintained at a temperature within the range of about 500° to about 900°F for a reactant to catalyst contact time within the range of from 10 to 60 seconds so as to provide highly aromatic products boiling in the gasoline boiling range and recovering a product of each of said methanol conversion operations as a combined product of improved octane value over the entire boiling range of gasoline boiling range material.

3,969,427

CONVERSION OF ALCOHOLS AND/OR ETHERS TO HYDROCARBONS

Weldon K. Bell, Pennington, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 535,053

Int. Cl.² C07C *9/02, 9/14*

U.S. Cl. 260—676 R **3 Claims**

1. In the process of converting a feed of at least one member selected from the group consisting of lower organic alkyl alcohols, ethers, and halides to conjunct hydrocarbon mixtures by bubbling a substantial amount of said feed as a vapor through a molten salt comprising zinc chloride at about 570 to 750°F; the improvement which comprises cofeeding hydro-

gen in a proportion of about 180 to 3600 SCF per pound mol of feed at a pressure of about 0 to 1500 psig into admixture with said vapor and passing said admixture through said molten salt.

3,969,428

PROCESS FOR THE PRODUCTION OF CONJUGATED DIOLEFINS

Toshio Ishikawa; Takashi Hayakawa, both of Tokyo; Tsutomu Nishimura, Koganei; Michio Araki, Mitaka, and Katsuomi Takehira, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 11, 1974, Ser. No. 513,959

Claims priority, application Japan, Nov. 5, 1973, 48-124139

Int. Cl.^{2} C07C *5/48*

U.S. Cl. 260—680 E **5 Claims**

1. A process for the production of conjugated diolefins having 4–6 carbon atoms from the corresponding monoolefins which comprises oxidatively dehydrogenating monoolefins having 4–6 carbon atoms in the vapor phase in the presence of molecular oxygen at a temperature of 300°–600°C, characterized in that said monoolefins are brought into contact with a catalyst consisting essentially of oxides of molybdenum, arsenic and an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium and represented by the empirical formula:

$$Mo_aMe_bAs_cO_d$$

wherein Me stands for said alkaline earth metal, *a* is 1, *b is* 0.1–1, *c* is 0.1–1 and *d* stands for the number of oxygen atoms which satisfy the valence of the metals in the oxidized state.

3,969,429

METHOD OF PRODUCING BUTENE-1

Gennady Petrovich Belov, p/o Chernogolovka, ulitsa Pervaya, 5, kv. 15; Taimuraz Savelievich Dzhabiev, p/o Chernogolovka, ulitsa Pervaya, 31, kv. 41; Fridrikh Stepanovich Dyachkovsky, p/o Chernogolovka, ulitsa Tretya, 3, kv. 2; Vyacheslav Ivanovich Smirnov, p/o Chernogolovka, ulitsa Tretya, 1, kv. 19; Nelli Dzhavkharovna Karpova, p/o Chernogolovka, ulitsa Pervaya, 29, kv. 100; Khaim-Mordkhe Aronovich Brikenshtein, p/o Chernogolovka, ulitsa Vtoraya, 5, kv. 1; Matrena Petrovna Gerasina, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 61, all of Moskovskaya oblast, Noginsky raion; Vladimir Evgenievich Kuzmin, ulitsa 50 letiya Oktyabrya, 13/12, kv. 199, Kazan; Petr Evgenievich Matkovsky, p/o Chernogolovka, ulitsa Pervaya, 16, kv. 26, Moskovskaya oblast, Noginsky raion; Ljudmila Nikolaevna Russiyan, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 41, Moskovskaya oblast, Noginsky raion; Anatoly Dmitrievich Pomogailo, p/o Chernogolovka, ulitsa Pervaya, 33, kv. 15, Moskovskaya oblast, Noginsky raion, all of U.S.S.R.; Nikolai Mikhailovich Chirkov, deceased, late of Moscow, U.S.S.R., and by Mikhail Nikolaevich Chirkov, administrator, ulitsa Vavilova, 55/5, kv. 6, Moscow, U.S.S.R.

Continuation of Ser. No. 494,918, Aug. 5, 1974, abandoned, which is a division of Ser. No. 436,809, Jan. 25, 1974, Pat. No. 3,879,485. This application Sept. 8, 1975, Ser. No. 611,319

Int. Cl.^{2} C07C *3/10*

U.S. Cl. 260—683.15 D **2 Claims**

1. A method of producing butene-**metaphenylenediamine,** comprising dimerizing ethylene in the presence of a complex organometallic catalyst consisting of titanium alcoholates of the formula $Ti(OR)_4$ and alkylaluminium of the formula $AlR_2''R'$, where R is an alkyl radical having from 2 to 4 carbon atoms, R′ is either the same as R or is H, R″ is the same as R′, with said catalyst being modified by an additive for decreasing formation of by-products selected from the group consisting of dicyclopentadienyltitanium dichloride, oxygen, methaphenylenediamine, and N-phenyl-β-naphthylamine, and in the medium of a hydrocarbon solvent selected from the group consisting of n-heptane; n-decane, and toluene.

3,969,430

PROCESSABILITY OF INTRACTABLE POLYMERS

Ilmar L. Kalnin, Millington, N.J., and Thaddeus E. Helminiak, Dayton, Ohio, assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,750

Int. Cl.^{2} C08L *79/06, 79/04, 79/00*

U.S. Cl. 260—823 **20 Claims**

1. An improved process for forming a three-dimensional shaped article from a normally intractable high temperature resistant polymer comprising:

a. physically admixing in substantially uniform admixture (1) a major quantity of a nitrogenous intractable high temperature resistant polymer which lacks a glass transition temperature below its decomposition temperature and (2) a minor quantity of a cross-linkable additive polymer exhibiting a glass transition temperature above 200°C. and below its decomposition temperature, or precursors capable of forming the same,

b. forming said substantially uniform admixture into a three-dimensional shaped article at a temperature which is below the decomposition temperature of said intractable high temperature resistant polymer, and below the decomposition temperature of said cross-linkable additive polymer, and

c. heating said resulting shaped article until said cross-linkable additive polymer is cross-linked and the thermal stability of said shaped article enhanced.

19. A high temperature resistant pressure molded three-dimensional shaped article having a flexural strength of at least 5,000 psi comprising in substantially uniform admixture (1) about 70 to 95 parts by weight of a nitrogenous intractable high temperature resistant polymer which lacks a glass transition temperature below its decomposition temperature and (2) about 5 to 30 parts by weight of a cross-linked additive polymer exhibiting a glass transition temperature above 200°C.

3,969,431

REINFORCEMENT OF VINYL CHLORIDE RESINS WITH SUSPENSION EMULSION INTERPOLYMERS

Ruth E. Gallagher, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 182,165, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 101,155, Dec. 23, 1970, abandoned. This application Nov. 13, 1973, Ser. No. 415,464

Int. Cl.^{2} C08L *51/06, 27/06, 31/02*

U.S. Cl. 260—876 R **9 Claims**

1. A composition comprising an intimate admixture of:

a. a rigid polymer of vinyl chloride; and

b. interpolymer particles which consist essentially of (i) an emulsion acrylate copolymer of 50 to 70% butyl acrylate and 50% to 30% 2-ethylhexyl acrylate which has been crosslinked by from about 0.2% to 10%, by weight of said acrylates, of a monomer containing at least two ethylenically unsaturated groups and (ii) a vinyl chloride polymer which has been suspension polymerized in the presence of said acrylate copolymer and which surrounds and/or is homogeneously dispersed within the mass of said crosslinked acrylate copolymer.

3,969,432

PREPARATION OF POLYMERIC MATERIALS DISINTEGRATABLE BY ULTRAVIOLET LIGHT

Shigenori Togami; Masaharu Okawa, both of Yokohama; Junji Hara, Kamakura, and Masami Tsuruta, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 291,294, Sept. 22, 1972, abandoned. This application June 27, 1974, Ser. No. 483,763

Claims priority, application Japan, Sept. 29, 1971, 46-76180; Jan. 14, 1972, 47-6351

Int. Cl.^{2} C08F *236/10*

U.S. Cl. 260—880 R **9 Claims**

1. A process which comprises copolymerizing a vinyl aromatic monomer with from 0.5 to 6.0% of a conjugated diene monomer based on the total weight of said monomers, initially copolymerizing said vinyl aromatic monomer by a free radical mechanism with from 15 to 70% by weight of the total quantity of said conjugated diene monomer for from ½ to 6 hours, and then adding the remainder of said conjugated diene to the copolymerization system and continuing the reaction to complete said copolymerization.

3,969,433

IRIDESCENT COMPOSITION AND THE PROCESS OF PREPARING THE SAME

Akira Kose, 11-9, Nukui-kitamachi-3, Koganei, and Tetsuko Kitayama, 40-15, Gohongi-1, Meguro, Tokyo, both of Japan

Filed May 8, 1974, Ser. No. 468,079

Claims priority, application Japan, May 11, 1973, 48-051596

Int. Cl.^{2} C08L *31/02, 25/14*

U.S. Cl. 260—885 **5 Claims**

1. A method of making a stabilized, light reflecting, iridescent polymeric material comprising

a. dispersing dry particles of a polymeric material selected from the group consisting of alkyl esters of methacrylic acid and divinyl benzene; alkyl esters of acrylic acid and divinyl benzene; styrene and divinyl benzene; styrene derivatives and divinyl benzene; alkyl esters of acrylic acid and ethylene glycol dimethacrylate; alkyl esters of methacrylic acid and ethylene glycol dimethacrylate; styrene and styrene derivatives and ethylene glycol dimethacrylate; alkyl esters of acrylic acid and allyl methacrylate; alkyl esters of methacrylic acid and allyl methacrylate; styrene and styrene derivatives and allyl methacrylate in a polymerizable suspending medium comprising an ethylenically unsaturated monomer having a refractive index different from that of the polymeric material and having no measurable solubilizing effect on the polymer particles to form a non-aqueous latex,

   1. said non-aqueous latex containing substantially uniform particles having an average particle diameter in the range from about 500 to about 10,000A, the uniformity of the individual particles being such that at least 80% of the mass of particles has a particle size within ± 10% of the average particle size of the entire mass, and

   2. said non-aqueous latex particles having an effective volume fraction of from about 0.25 to about 0.74;

b. permitting the non-aqueous latex to stand quietly for a time sufficient to form a three-dimensional, non-contiguous, regularly arranged structure of substantially uniform particles, the particles within the structure having a center to center distance of from about 1500 to about 15,000A, and

c. polymerizing the polymerizable suspending medium surrounding the particles to form a stabilized, light-reflecting, polymeric material exhibiting intense color caused by optical discontinuity.

3,969,434

PROCESS FOR PREPARING IONICALLY CROSSLINKED COPOLYMERS

Richard James Powell, and George Wyatt Prejean, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1973, Ser. No. 410,884

Int. Cl.^{2} C08L *23/08*

U.S. Cl. 260—897 B **10 Claims**

1. A process for ionically crosslinking at least one first copolymer formed by copolymerizing at least one alpha-olefin of the general formula $RCH{=}CH_2$ where R is a radical of the class consisting of hydrogen and hydrocarbyl radicals having 1 to 8 carbon atoms and at least one alpha,beta-ethylenically unsaturated carboxylic acid having 1 to 2 carboxylic acid groups and 3 to 8 carbon atoms, the alpha-olefin content of said first copolymer comprising at least 50 mole percent of said first copolymer, the alpha-beta-ethylenically unsaturated carboxylic acid content of said first copolymer comprising 0.2 to 25 mole percent of said first copolymer, which comprises mixing said first copolymer with a cation-supplying blend consisting essentially of 20 to 80 percent by weight of a substantially water-insoluble zinc compound selected from the class consisting of zinc oxide, hydroxide, carbonate and mixtures thereof, 0 to 10 percent by weight of a lubricant and a complemental amount of a second copolymer with a melt index of 50 to 2000 g./10 min. formed by copolymerizing at least one alpha-olefin of the general formula $RCH{=}CH_2$ where R is a radical of the class consisting of hydrogen and hydrocarbyl radicals having 1 to 8 carbon atoms and at least one alpha,beta-ethylenically unsaturated carboxylic acid, having 1 to 2 carboxylic acid groups and 3 to 8 carbon atoms, the alpha-olefin content of said second copolymer comprising at least 50 mole percent of said second copolymer, the alpha,-beta-ethyleincally unsaturated carboxylic acid content of said second copolymer comprising from 0.2 to 25 mole percent of said second copolymer, at a pressure of 100 to 10,000 p.s.i. and at a temperature above the melting point of both the first and second copolymers and between 100°C. and 330°C., with the amount of the cation-supplying blend present being that amount which has sufficient cations to neutralize at least 10 percent of the carboxylic acid groups in the first and second copolymers and neutralizing at least 10 percent of the carboxylic acid groups in the first and second copolymers, characterized in that there is present during the crosslinking reaction 0.5 to 8 percent by weight, based on the total weight of the cation-supplying blend, of at least one zinc salt of a volatile organic acid.

3,969,435

PROCESS FOR FINISHING TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMERS

Charles Eugene Bailey, and Miguel Jacinto Roura, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,901

Int. Cl.^{2} C08L *27/18, 27/20*

U.S. Cl. 260—900 **8 Claims**

1. A process for heat stabilizing copolymers of tetrafluoroethylene and hexafluoropropylene which comprises heating between about 340°C. and about 380°C. for a time sufficient to drive off substantially all volatiles in an atmosphere of air containing between about 3% and about 20% of water vapor, based on weight of atmosphere, a blend of melt-processible copolymers of tetrafluoroethylene and hexafluoropropylene having between about 6.75 and about 27 weight percent hexafluoropropylene, said blend containing:

A. 10–80% by weight of the blend of one or more of said copolymers having a melt viscosity that is:

   1. at least 50 percent greater than the melt viscosity desired in the treated blend;

2. no more than five times the melt viscosity desired in the treated blend;
3. at least 13 × 10^4 poise at 372°C.;

B. 10–80% by weight of the blend of one or more of said copolymers having a melt viscosity that is between 1 × 10^4 and 5 × 10^4 poise at 372°C., provided that the melt viscosity is no more than one-half the melt viscosity desired in the treated blend; and

C. 0–33% by weight of the blend of one or more of said copolymers having a melt viscosity of between 5 × 10^4 and 13 × 10^4 poise at 372°C.,

wherein the total percent by weight of the blend comprises 100%.

3,969,436
CARRIERS FOR BIOLOGICALLY ACTIVE COMPOUNDS AND METHODS FOR THE PRODUCTION THEREOF

Otto Wichterle, and Jiri Coupek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 387,313, Aug. 10, 1973, abandoned. This application May 15, 1974, Ser. No. 470,006

Claims priority, application Czechoslovakia, Aug. 18, 1972, 5743-72

Int. Cl.² C08L *33/04*

U.S. Cl. 260—901 **8 Claims**

1. A method for the production of carriers for biologically active compounds comprising the steps of admixing

a. a primary component comprising a three dimensional water insoluble acrylic or methacrylic ester having amino groups which have been diazotized and

b. a secondary component comprising a linear water soluble acrylic or methacrylic ester polymer having ligands selected from the group consisting of aromatic amino groups and aromatic amide groups, for a time sufficient to cause the ligands of the secondary component (b) to form covalent bonds with the primary component (a) by reaction with the diazotized amino groups of the primary component (a)

thereafter killing any unreacted diazotized amino groups remaining from the primary component and then

transforming the secondary component (b) ligands on the resulting coupled product of components (a) and (b) into diazonium groups or mercuric salts or isothiocyanate groups so as to obtain carriers operative to bind biologically active compounds.

3,969,437
CYCLIC PHOSPHORUS ESTERS

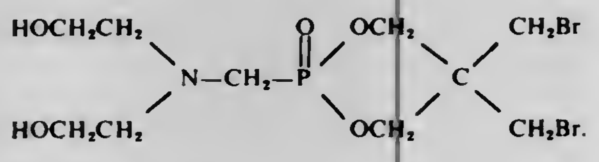
Kyung Sup Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 23, 1971, Ser. No. 118,164

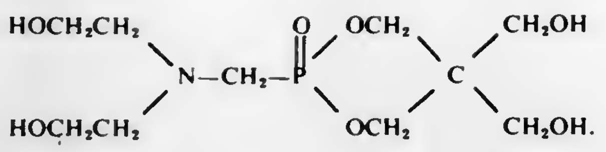
Int. Cl.² C07F *9/40;* **C08J** *9/00*

U.S. Cl. 260—937 **3 Claims**

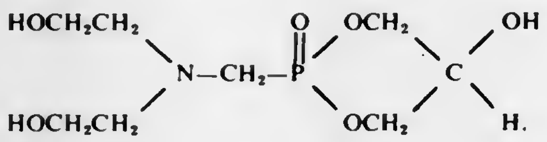
1. The compound:



2. The compound:



3. The compound:



3,969,438
O,S-DIALKYL-O-CYANOMETHYLPHENYLTHIO-PHOSPHATES AND -DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

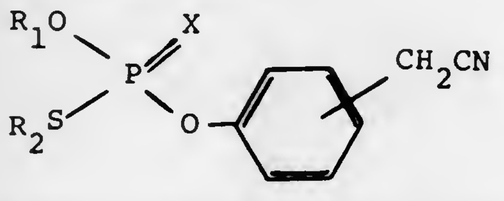
Division of Ser. No. 328,588, Feb. 1, 1973, Pat. No. 3,876,666. This application Mar. 12, 1975, Ser. No. 557,557

Claims priority, application Switzerland, Feb. 1, 1972, 1498/72; Dec. 29, 1972, 19075/72

Int. Cl.² C07F *9/18*

U.S. Cl. 260—940 **3 Claims**

1. A compound of the formula



wherein R_1 is methyl or ethly, R_2 is propyl or butyl, and X is oxygen or sulphur.

3,969,439
DITHIOPHOSPHORIC ESTERS

Hans Urbach, Lampertheim, and Heinrich Adolphi, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

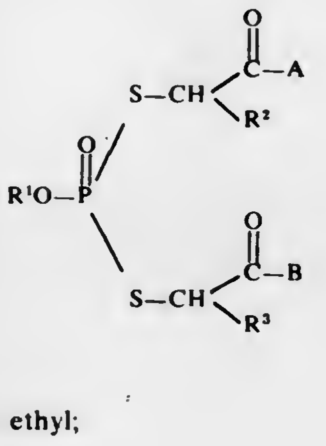
Filed May 1, 1970, Ser. No. 33,884

Claims priority, application Germany, May 7, 1969, 1923269

Int. Cl.² C07F *9/165;* **A01N** *9/36*

U.S. Cl. 260—942 **2 Claims**

1. A dithophosphoric ester having the formula



wherein:
R^1 is methyl or ethyl;
A is $NHCH_3$;
B is $NHCH_3$ or NH_2;
R^2 is hydrogen; and
R^3 is hydrogen or methyl.

3,969,440
PHOSPHORUS CONTAINING GRAFT COPOLYMERIZED ACRYLIC ESTERS AND AMIDES

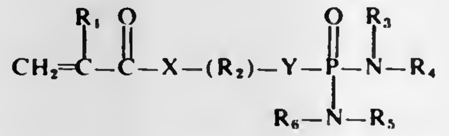
Nathan Allen Edelson, Cynwyd, and Robert W. Faessinger, Media, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 508,724, Sept. 23, 1974, Pat. No. 3,926,872, which is a continuation-in-part of Ser. No. 325,101, Jan. 19, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,413

Int. Cl.² C07F *9/02, 9/22*

U.S. Cl. 260—944 **6 Claims**

1. A compound having the general formula:



$$CH_2{=}\overset{R_1}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-X-(R_2)-Y-\underset{R_6-N-R_5}{\underset{|}{\overset{O}{\overset{\|}{P}}}}-\overset{R_3}{\overset{|}{N}}-R_4$$

wherein R_1 is hydrogen or methyl; R_2 is a substituted or unsubstituted lower alkylene group; R_3, R_4, R_5 and R_6 are independently selected from either methyl or ethyl; X is oxygen or —NH— and Y is oxygen or —NH—,

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3,969,441
THIOALKYL PHOSPHONATES

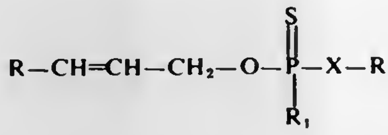
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, which is a division of Ser. No. 123,467, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,906

Int. Cl.² C07F *9/40, 9/44;* **A01N** *9/36*

U.S. Cl. 260—948 **3 Claims**

1. Compounds corresponding to the formula



$$R-CH{=}CH-CH_2-O-\underset{R_1}{\underset{|}{\overset{S}{\overset{\|}{P}}}}-X-R_2$$

wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is thioalkyl; X is oxygen, sulfur or amino.

3,969,442
O-(2-VINYLPHENYL)-THIOLPHOSPHATES

Manfred Böger, Haltingen, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

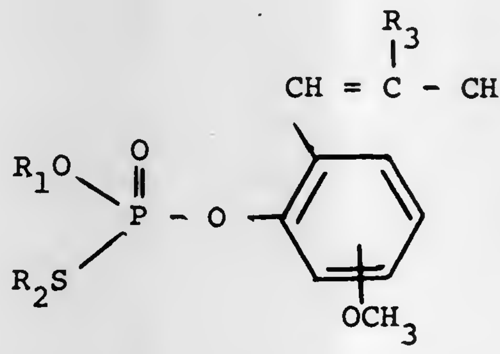
Division of Ser. No. 449,416, March 8, 1974, Pat. No. 3,898,306. This application May 27, 1975, Ser. No. 581,067

Claims priority, application Switzerland, Mar. 15, 1973, 3776/73; Jan. 30, 1974, 1261/74

Int. Cl.² C07F *9/16;* **A01N** *9/36*

U.S. Cl. 260—951 **2 Claims**

1. A compound of the formula



wherein R_1 represents methyl or ethyl; R_2 represents n-propyl, isopropyl, isobutyl, sec.butyl or n-amyl; and R_3 represents hydrogen or methyl.

3,969,443
O(S)(NH) TRIFLUOROMETHYL-ARYL PHOSPHONATES

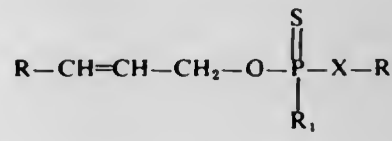
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, Division of Ser. No. 123,497, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,905

Int. Cl.² C07F *9/40, 9/44;* **A01N** *9/36*

U.S. Cl. 260—955 **5 Claims**

1. Compounds corresponding to the formula



$$R-CH{=}CH-CH_2-O-\underset{R_1}{\underset{|}{\overset{S}{\overset{\|}{P}}}}-X-R_2$$

wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is trifluoromethyl-substituted aryl; X is oxygen, sulfur or amino.

3,969,444
O,S-DIALKYL-O-ALLYLPHENYL-THIOPHOSPHATES AND -DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

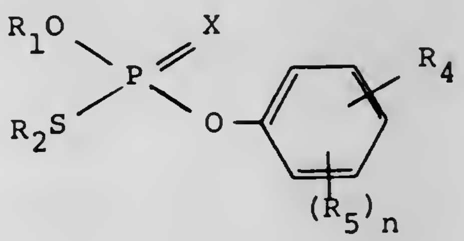
Division of Ser. No. 328,588, Feb. 1, 1973, Pat. No. 3,876,666. This application Mar. 12, 1975, Ser. No. 557,558

Claims priority, application Switzerland, Feb. 1, 1972, 1498/72; Dec. 29, 1972, 19075/72

Int. Cl.² A01N *9/36;* **C07F** *9/18*

U.S. Cl. 260—956 **7 Claims**

1. A compound of the formula



wherein R_1 is methyl or ethyl; R_2 is propyl or butyl; R_4 is allyl or methallyl; R_5 is hydrogen, halogen, alkyl of from 1 to 5 carbon atoms, nitro, cyano, methylthio or methoxycarbonyl; n is 1 or 2; and X is oxygen or sulphur.

3,969,445
CARBURETOR HAVING A CHOKE DEVICE

Gustav Vogelsang, Braunschweig, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 3, 1974, Ser. No. 529,111

Claims priority, application Germany, Dec. 6, 1973, 2360859

Int. Cl.² F02M *7/22*

U.S. Cl. 261—44 R **11 Claims**

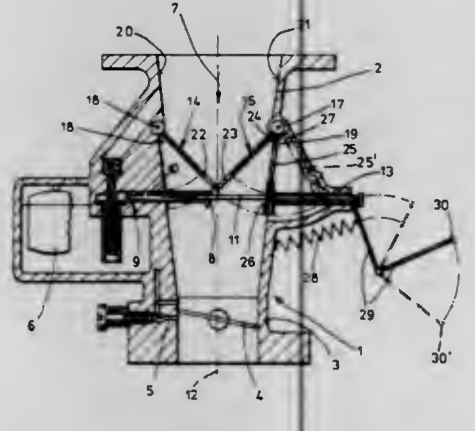
1. In a carburetor serving an internal combustion engine and including a fuel metering device which has means defining a fuel outlet opening disposed in the zone of the longitudinal axis of the flow passage of an intake manifold having walls defining the flow passage; an arbitrarily actuatable throttle flap situated in the flow passage downstream of the fuel outlet opening; a choke means situated in the flow passage upstream

of the fuel outlet opening for the pressure-dependent setting of the cross-sectional area of the flow passage, the improvement comprising

a. two planar, quadrangular choke flaps situated generally side-by-side in said flow passage transversely to the manifold axis; said choke flaps forming part of said choke means and each having
  1. a first edge zone extending along the manifold wall in close vicinity thereof; the first edge zones of the one and the other said choke flap being remote with respect to one another;
  2. a second edge zone extending generally parallel to said first edge zone; the second edge zones of the one and the other choke flap being adjacent one another and together defining a cross-sectional area of said flow passage;

b. means defining recesses in the manifold wall at opposite locations transversely to the manifold axis;

c. pivotal support means held in said recesses and connected to each said choke flap for providing pivotal motion of each choke flap about a pivotal axis extending in and along said first edge zone of each choke flap; the pivotal axes of the one and the other choke flap being parallel to one another;



d. a manifold wall portion defining a quadrangular cross section of the flow passage of said intake manifold in the zone of said choke flaps, said wall portion closely surrounding said choke flaps in any pivotal position thereof;

e. means for effecting a face-to-face engagment of each choke flap with said wall portion in a fully open position of said choke flaps;

f. spring means connected to one of said choke flaps for urging the latter in the direction of said fully open position; and

g. means for so arranging said choke flaps with respect to one another that in a closed position of said choke flaps the other of said choke flaps overlaps, with its said second edge zone, the second edge zone of said one choke flap for allowing pivotal motion of said one choke flap against the force of said spring means beyond said closed position in response to backlash pressures in said flow passage.

3,969,446
APPARATUS AND METHOD FOR AERATING LIQUIDS

Grover C. Franklin, Jr., 2250 Warmouth St., San Pedro, Calif. 90732

Filed June 3, 1974, Ser. No. 475,829

Int. Cl.² C02C *1/10, 1/12, 1/26, 5/04*

U.S. Cl. 261—87 **12 Claims**

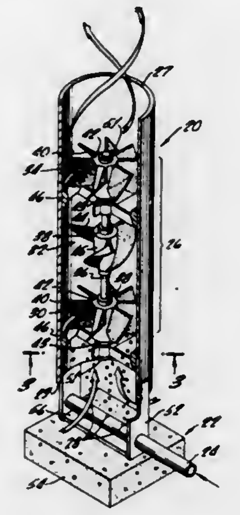
11. An aerator for dispersing a gas in a liquid, comprising:

a. a tube having open upper and lower openings, said tube being adapted for a flow of gas and liquid therethrough,

b. means for supporting said tube in a body of liquid with the longitudinal axis of said tube substantially vertical, said tube being submerged in said liquid,

c. a gas supply means connected for delivering a supply of gas bubbles to a lower region of said tube so as to cause an upward flow of gas bubbles and liquid through said tube,

d. rotatable mixing means for breaking said gas bubbles in said tube into a vast number of very small bubbles and for dispersing said very small bubbles in said liquid,
  said mixing means comprising plural turbines maintained in mutual spaced relationship within said tube, each of said turbines having an axis of rotation substantially parallel with said longitudinal axis of said tube, at least two of said turbines being constructed to rotate in opposite directions in response to said upward flow of gas and liquid through said tube, said means being mounted internally to said tube, said means being rotated solely by said upward flow of gas bubbles and liquid through said tube, and



e. venturi means comprising an annular ring mounted internally to said tube adjacent one of said turbines for increasing flow velocity of said gas bubbles and liquid.

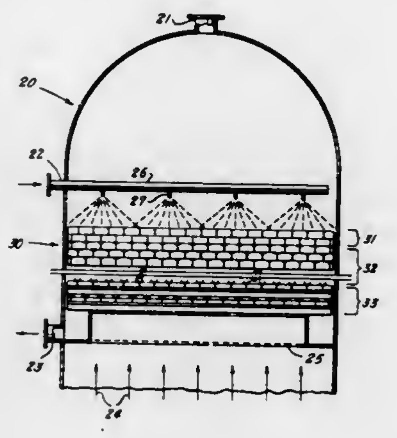
3,969,447
GRIDS FOR FLUID CONTACT APPARATUS

Michael C. Glitsch, Aubrey, and Bedford L. Kitterman, Lakewood Village, both of Tex., assignors to Fritz W. Glitsch & Sons, Inc., Dallas, Tex.

Filed Oct. 18, 1973, Ser. No. 407,585

Int. Cl.² B01F *3/04*

U.S. Cl. 261—111 **5 Claims**



1. A multi-functional grid system for use in a vapor-liquid contact vessel comprising:

a grid positionable in a vessel and mountable on supports located in said vessel;

said grid comprising a multiplicity of stacked layers of thin vertically oriented ribs with the upper layers being supported by the lower layers, each rib and layer being of relatively shallow height, said grid having at least three vertically superimposed zones;

the ribs in the uppermost of said zones being flange-free and spaced with respect to each other and with respect to a downcoming spray of liquid to distribute the liquid substantially uniformly across the horizontal extent of said grid and prevent lateral migration of descending liquid as it courses downwardly through said uppermost zone;

at least some ribs in the intermediate of said zones being provided with generally horizontally extending flanges for intercepting descending liquid and forming it into films on said flanges and ribs for contact with ascending vapor, for disentraining liquid being carried upwardly by ascending vapor, and for locally constricting the flow path of ascending vapor to create turbulence therein, the upper surfaces of said flanges being dammed at intervals by thin vertically oriented ribs to substantially prevent lateral migration of liquid therealong, said flanges being substantially coextensive in length with their associated ribs and extending transversely on both sides thereof;

and at least some ribs in the lowermost of said zones being provided with generally horizontally extending flanges having upstanding margins; said flanges and margins forming liquid collecting troughs constructed and arranged to collect descending liquid and convey it laterally of the vessel and along the troughs to liquid gathering means, said flanges and margins being substantially coextensive in length with their associated ribs and extending transversely on both sides thereof.

3,969,448
HEAT EXCHANGERS

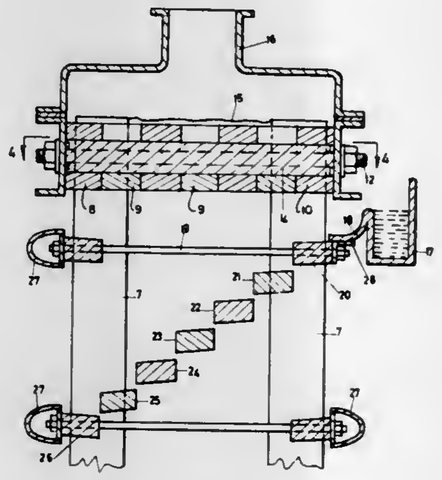
Gerald J. N. Limebeer, Johannesburg, South Africa, assignor to Basil Gilbert Alfred Lund, Johannesburg, South Africa, a part interest

Division of Ser. No. 334,215, Feb. 21, 1973, Pat. No. 3,885,936. This application Dec. 23, 1974, Ser. No. 535,342

Claims priority, application South Africa, Mar. 1, 1972, 72/1381

Int. Cl.² A23C *3/04;* **F28F** *1/02, 13/06*

U.S. Cl. 261—112 **10 Claims**



1. A liquid cooler comprising a multiplicity of tubes extending between tube sheets and means supplying a liquid at an elevated temperature to flow in the tubes and ambient air to flow past the tubes in a direction normal to an aperture plane, the tubes being in a plurality of rows parallel to the aperture plane and parallel to one another, having their longitudinal axes substantially vertical being formed with continuous exterior surfaces from end to end so that there are no heat transfer surfaces extending into the path of the air, and being formed as streamlined bodies facing the air stream, and means for flowing water on to the top of the exterior surfaces of the tubes for a continuous film of the water to form at least on the flanks of the tubes being traversed by the air.

3,969,449
VAPORIZING PROCESS

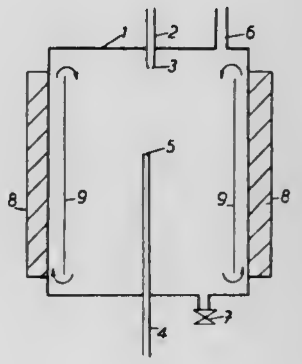
Michael John Shires, and Stephen Frederick Bush, both of Reading, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 26, 1973, Ser. No. 344,598

Claims priority, application United Kingdom, Mar. 29, 1972, 14765/72

Int. Cl.² B01F *3/04*

U.S. Cl. 261—153 **3 Claims**



1. A process for the vapourisation of a heat-sensitive liquid which comprises introducing into an enclosed space

a. the liquid in fine droplet form through an atomising means, and

b. a heated gas at a pressure greater than that in the enclosed space so that the gas circulates and recirculates in the enclosed space past heating means and is further heated, screening the said heating means from the said atomising means and vapourizing the liquid droplets in the part of the enclosed space screened from the heating means by the heated inlet gas and the further heated recirculating gas and removing the vapour from the enclosed space.

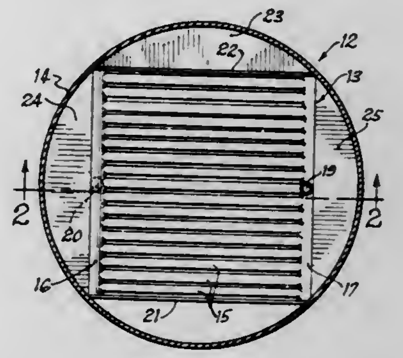
3,969,450
HEAT-EXCHANGER TRAYS AND SYSTEM USING SAME

Robert J. Hengstebeck, Valparaiso, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,524

Int. Cl.² B01D *3/14;* **B01F** *3/04*

U.S. Cl. 261—153 **29 Claims**



1. A heat-exchanger tray for a distillation column, said heat-exchanger tray being hollow and constructed:

to provide a pair of horizontal manifolds at opposite margins;

to provide within the portion of said tray between said manifolds a number of walls to form a number of spaced chambers communicating said pair of manifolds with each other; and

to have vertical openings in said tray between those of said walls that provide adjacent chambers of said chambers, said walls between adjacent chambers being spaced from each other so that said vertical openings between said spaced walls is such that when said tray is installed and used as a distillation tray in a distillation column a pool of down-flowing liquid is formed above the entire area of said portion of said tray between said pair of manifolds and that pool of liquid is supported on that portion of said tray primarily by said walls forming said chambers while up-flowing vapor can pass through said openings, and each of said manifolds having an opening for passage of fluid to or from said tray so that fluid can pass from one of said manifolds through said chambers in said portion of said tray between said pair of manifolds to the other of said manifolds with indirect heat exchange of the up-flowing vapor and pool of down-flowing liquid with the fluid flowing through these chambers.

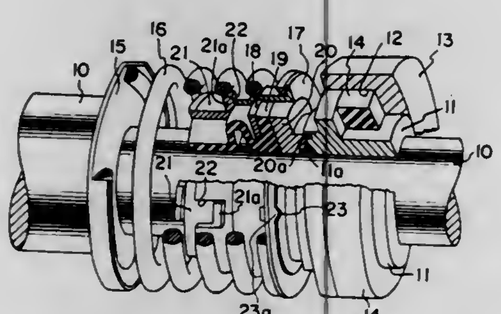
3,969,451

MECHANICAL SEALS

James R. Floyd; Paul N. Dalenberg, both of Saginaw, and Robert B. Slivensky, Bridgeport, all of Mich., assignors to The Wickes Corporation, San Diego, Calif.

Continuation of Ser. No. 143,789, May 17, 1971, abandoned.
This application Dec. 6, 1973, Ser. No. 422,186
Int. Cl.^{2} F16J *15/50*

U.S. Cl. 264—29 **19 Claims**



1. In a method of preparing a mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting sealing interfaces to seal off a fluid which wets the interface and wherein the seal comprises a graphitic matrix bonded by a binder; the steps of: homogeneously dispersing non-abrasive particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and particles, to form a seal having said particles in said seal interface; and matching the seal interface with a seat interface, the seat interface having a microhardness of at least about 200 kilograms per square millimeter; and the particles, being of a size and shape to be non-abrasively smooth to the seat interface and having a microhardness in the range of at least about 200 kilograms per square millimeter.

17. In a method of preparing a mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting sealing interfaces to seal off a fluid which wets the interface and wherein the seal comprises a graphitic matrix bonded by a binder; the steps of homogeneously dispersing carbide forming particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and to form dispersed carbide particles in situ in said matrix at said seal interface; and matching the seal interface with a seat interface, the seat interface having a microhardness of at least about 200 kilograms per square millimeter; and the particles being of a size and shape to be non-abrasively smooth to the seat interface and having a microhardness in the range of at least about 200 kilograms per square millimeter.

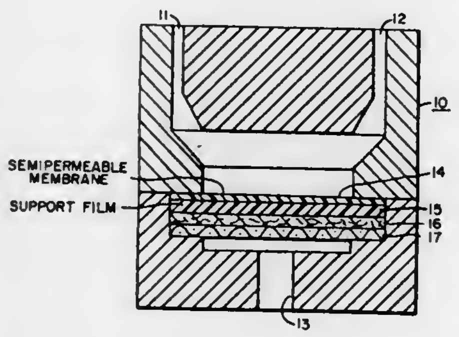
3,969,452

METHOD FOR CASTING AND HANDLING ULTRA-THIN REVERSE OSMOSIS MEMBRANES

David F. Ciliberti, and Luciano C. Scala, both of Murrysville, Pa., assignors to The United States of America as represented by the Secretary of the Department of the Interior, Washington, D.C.

Filed Aug. 8, 1974, Ser. No. 495,758
Int. Cl.^{2} B29D *27/04;* **B29C** *1/06;* **B01D** *13/00, 39/16*

U.S. Cl. 264—41 **19 Claims**



1. A method of casting ultra-thin semipermeable membranes on a water soluble film support comprising the steps of:

A. applying a coating of a solution of a film forming water soluble polymer which is not substantially degraded by organic polar solvents, onto a smooth casting surface, wherein the solution contains between about 5–50 wt% solids and about 1.5–5 wt% of a leachable pore producing agent having a water solubility of at least 50 gr/100 gr water,

B. drying the coating at between about 25°–125°C to form a water soluble, continuous support film of up to about 5% porosity about 0.5–10 mils thick on the casting surface,

C. applying a coating of an organic, polymeric, membrane casting solution onto the support film and drying the coating for between 15 seconds to 48 hours at between about 20° to about 200°C to form a semipermeable reverse osmosis membrane film about 0.01–1.0 mil thick on the continuous support film, and

D. applying a leaching liquid to the membrane-support films effective to leach pore producing agent from the support film and to cause formation of pores, between about 0.025–0.25 microns diameter, in the support film; to form a composite consisting of a 0.01–1.0 mil thick semipermeable membrane supported by a 0.5–10 mil thick water soluble film support of between about 5–50% porosity.

3,969,453

METHOD OF MOLDING FIREPROOF PRODUCTS CONTAINING MAGNESIUM OXYCHLORIDE CEMENT

Henry Clark Thompson, Saratoga, Calif., assignor to Thompson Chemicals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 194,557, Nov. 1, 1971, Pat. No. 3,778,304, which is a continuation-in-part of Ser. No. 811,616, March 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 589,808, Oct. 27, 1966, abandoned. This application Sept. 17, 1973, Ser. No. 397,834
Int. Cl.^{2} B29H *7/20*

U.S. Cl. 264—42 **5 Claims**

1. A method of preparing a fireproof material comprising the steps of forming a frothing, unset mixture of foamed magnesium oxychloride cement foamed by mixing aqueous magnesium chloride having a specific gravity of between 21.5° and 22.5° Baume with between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride and a metallic frothing agent chemically reactive with said mixture to produce bubbles, adding a heat-degradable component, and setting the mixture in a mold.

3,969,454

METHOD OF MAKING COLORED PARTICLEBOARD

William Thornber, and Brian Wrangham, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 10, 1971, Ser. No. 206,769
Int. Cl.^{2} D01F *1/04*

U.S. Cl. 264—78 **2 Claims**

1. A method of making decorative colored particleboard comprising:

a. coloring wood flakes, having a thickness of from 0.01 to 0.035 inches, with a water soluble dyestuff such that the individual flakes are colored non-uniformly with a relatively densely colored surface and relatively lightly colored core;

b. mixing the wood flakes with an adhesive binder and forming a mattress therewith;

c. hot-pressing the mattress to compact said mattress and to set the adhesive binder thereby forming particleboard; and

d. sanding a surface of the particleboard to provide a decorative marbled surface.

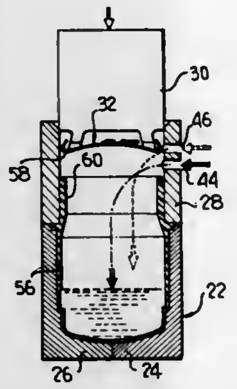
3,969,455

METHOD FOR FORMING, SEALING, CAPPING AND PASTEURIZATION OF BEVERAGE IN PLASTIC CONTAINER

Jens L. Moller, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 25, 1970, Ser. No. 40,302
Int. Cl.^{2} B29C *17/07*

U.S. Cl. 264—89 **15 Claims**



1. A method of forming a container comprising the steps of providing a mold cavity adapted to receive a heated plastic blank, enclosing an area outwardly of the mold cavity after the blank has been inserted therein, supporting a closure within the area prior to the formation of the blank into an open ended container, introducing fluid under pressure into the area thereby forming the blank to the configuration of the mold cavity to form an open ended container therein while the blank still retains sufficient heat to remain in a plastic state, and thereafter securing a peripheral edge of the closure to the container thereby closing the latter.

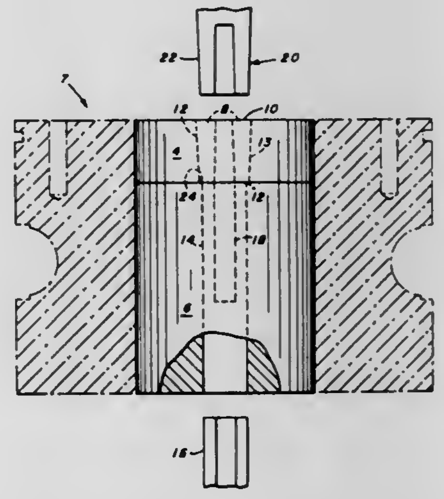
3,969,456

METHOD FOR MAKING C-SHAPED MAGNETIZABLE CORE

Richard B. Graf; Edward H. Chant, Jr., both of Marengo, and John F. Marco, Woodstock, all of Ill., assignors to Arnold Engineering Company, Marengo, Ill.

Division of Ser. No. 820,815, May 1, 1969, Pat. No. 3,566,323.
This application Feb. 22, 1971, Ser. No. 117,809
Int. Cl.^{2} B22F *5/00*

U.S. Cl. 264—111 **4 Claims**



1. The method for making a C-shaped core with a trapezoidal cross section of magnetizable powdered material and with high permeability comprising:

A. arranging a C-shaped mold having ends and a cavity and said trapezoidal cross section having two parallel sides with one parallel side larger and the other parallel side smaller, said mold having the ends corresponding to the parallel sides of the trapezoid open and having a ram movable into the mold cavity through the larger open end and an ejector movable into the mold cavity through the smaller open end, with the larger open end facing upward and the smaller open end closed by positioning the ejector in the smaller opening but not extending substantially into the mold cavity,

B. placing a predetermined amount of the magnetizable powdered material into the mold cavity,

C. inserting the ram into the mold cavity with sufficient force to compress the powdered material and to bond it into an integral structure of uniform density,

D. withdrawing the ram and inserting the ejector into the mold cavity with sufficient force to eject the resultant integral structure, whereby pressure on all portions of the nonparallel faces of the integral structure is released uniformly, and said integral structure expands uniformly in all directions.

3,969,457

CARBON BLACK PELLETING

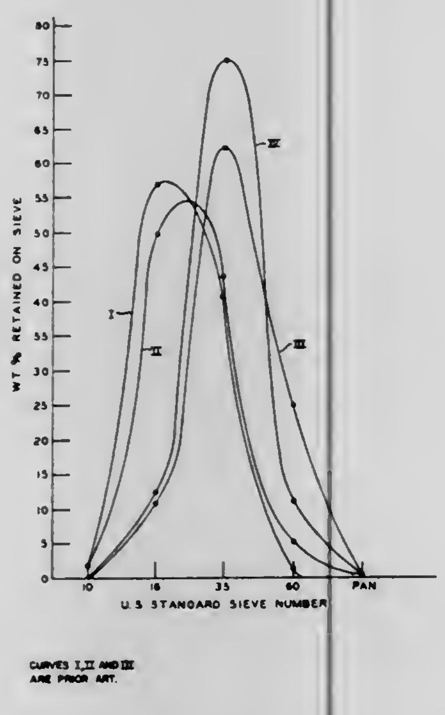
Bobby J. Paris, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1971, Ser. No. 204,019
Int. Cl.^{2} B01J *2/12*

U.S. Cl. 264—117 **3 Claims**

1. A method of pelleting carbon black which comprises introducing carbon black and an aqueous solution comprising

from about 1 to about 2 weight percent lignosulfonate and from about 4.5 to about 6.5 weight percent HNO_3 into a pelleter, and pelleting said carbon black in contact with said solution.



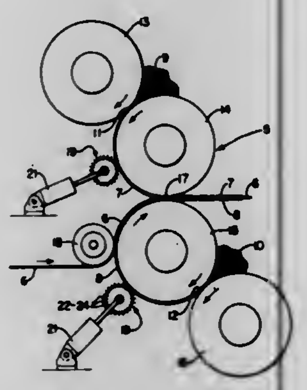
3,969,458
PRICKER ROLL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 354,575, April 26, 1973, Pat. No. 3,891,494. This application Feb. 3, 1975, Ser. No. 546,247

Int. Cl.² B29H *3/06, 9/02*

U.S. Cl. 264—154 **7 Claims**



1. In a method of calendering tire cords with unvulcanized rubber material which is formed into a sheet prior to contact with tire cords, the improvement comprising: (a) forming a plurality of spaced, transversely extending rows of slots in the sheet of unvulcanized rubber material prior to contact with the tire cords, each row of slots including a plurality of elongated slots spaced end-to-end, each of the slots having a longitudinal axis which is angularly disposed to a longitudinal axis of the sheet of unvulcanized rubber material; (b) staggering the slots of successive rows of slots; and (c) spanning the spaces between successive slots of each row of slots by slots of rows immediately succeeding each row of slots to enable entrapped air to escape from the sheet of unvulcanized rubber material.

3,969,459
FIBERBOARD MANUFACTURE

Henry A. Fremont, Wyoming, and Walter Phalti Lawrence, Hamilton, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed July 18, 1973, Ser. No. 380,334

Int. Cl.² B29J *5/02, 5/08*

U.S. Cl. 264—109 **1 Claim**

1. A process for the manufacture of thin fiberboard products wherein a thermosetting binder-impregnated fiber mat is continuously formed and treated until consolidation and binder cure are completed and the final fiberboard product formed, comprising:

a. passing said binder-impregnated wood fiber mat into a conditioning zone where the mat temperature is adjusted to about the glass transition temperature of the ligneous hemicellulosic matrix material of the wood, about 180° to 210°F., at a moisture content of the mat from about 6% to 12 % by weight;

b. prepressing the conditioned mat at said conditioning temperature and moisture content to reduce the bulk thereof and substantially eliminate entrained air therefrom; and

c. hot pressing the prepressed mat at a temperature and for a time measured in seconds and sufficient to initiate but not to complete cure of the binder, followed by immediately subjecting the mat to a temperature up to about 350°F. for a time, up to about 5 minutes, sufficient to complete binder cure and mat consolidation.

3,969,460
FIBER MAT CURING

Henry A. Fremont, Wyoming, and Walter Phalti Lawrence, Hamilton, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed July 18, 1973, Ser. No. 380,353

Int. Cl.² B29J *5/02, 5/08*

U.S. Cl. 264—109 **6 Claims**

1. The method of consolidating and curing a thermosetting binder-impregnated fibrous mat to form a consolidated fiberboard product comprising hot pressing the mat at a temperature of about 400°F. to 550°F. and for about 2 to 10 seconds and sufficient to initiate but not to complete cure of the binder, followed by immediately subjecting the mat to a temperature up to about 350°F. for a time, up to about 5 minutes, sufficient to complete binder cure and mat consolidation.

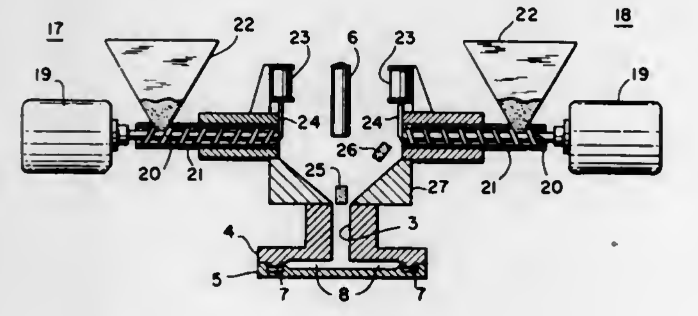
3,969,461
TRANSFER MOLDING THERMOSETTING POLYMERIC MATERIAL

Donald Edward Boesch, Trenton, and Yusuf Taher Koita, Lawrenceville, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 446,887, Feb. 28, 1974, Pat. No. 3,911,075. This application June 27, 1975, Ser. No. 590,890

Int. Cl.² B29G *3/00*

U.S. Cl. 264—163 **11 Claims**



1. Method of filling a die cavity with a thermosetting polymeric first material through a runner from a chamber to produce a molded article, said method comprising:

a. forming a slug adjacent to said chamber said slug consisting of a first body of said first material at one longitudinal end thereof, of a volume at least equal to the volume of the die cavity, and a second body of a second material at the opposite longitudinal end thereof, said first and second bodies having a transversely extending interface intermediate the two longitudinal ends of said slug, by extending said first material and said second material longitudinally toward each other and into engagement with each other at said transversely extending interface, so as to form a combined structure, and cutting off a length of said combined structure including said transversely extending interface;

b. heating said die cavity;

c. introducing said slug into said chamber oriented with respect thereto so that said first body of first material is adjacent to said runner; and

d. pressurizing and deforming said slug in said chamber sufficiently so that said second material forces said first material to flow from said chamber and through said runner so as to fill said die cavity, with at least a portion of said second material flowing from said chamber into said runner.

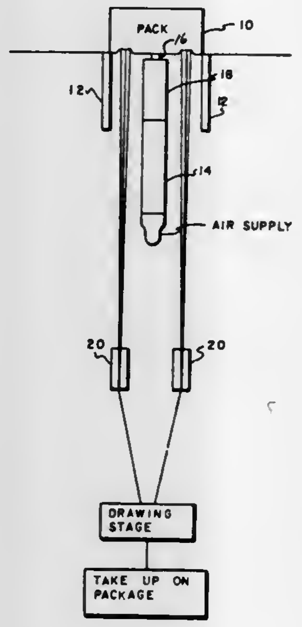
3,969,462
POLYESTER YARN PRODUCTION

Richard H. Stofan, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 160,019, July 6, 1971, Pat. No. 3,858,386. This application Nov. 7, 1974, Ser. No. 521,726

Int. Cl.² B29C *25/00*

U.S. Cl. 264—237 **10 Claims**



1. A method for producing an industrial polyester filament yarn of improved uniformity comprising melt spinning a plurality of filaments at an extrusion temperature above the polymer melting point into a heated zone maintained at a temperature of about 260° to 460°C., and maintaining said filaments in said heated zone for a filament travel distance of about 6 to 24 inches, and hence immediately passing said filaments about a gas quenching zone, directing quenching gas onto said filaments in a radial outflow direction, said quenching gas being maintained at a temperature of 15 to 80°C. in a gas volume of 20 to 130 standard cubic feet per minute being exhausted radially along a distance of about 8 to 20 inches of a peripheral diameter of 1.5 to 4 inches to provide a controlled cooling of said filaments and taking up said filaments as a yarn of improved Uster uniformity.

3,969,463
N-METHYLENE MALONATE OF TETRAHYDROQUINOLINE AND DERIVATIVES THEREOF

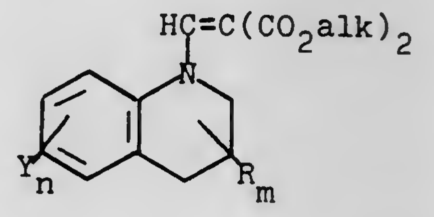
John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,037

Int. Cl.² C07D *215/06, 215/12, 215/14, 215/18*

U.S. Cl. 260—287 T **2 Claims**

1. Compounds of the formula



wherein alk is alkyl having 1 to 4 carbon atoms, Y is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, acetamido, trifluoroacetamido or N,N-lower dialkylamino having 2 to 8 carbon atoms, R is methyl, ethyl or trifluoromethyl, n is zero, one or two, and Y may also be methylenedioxy or ethylenedioxy bonded to adjacent ring positions, m is zero, one or two, and when R is trifluoromethyl, m is one; provided however that Y is located and comprised such that said compounds are capable of forming substituted benzo[ij]-quinolizine products.

3,969,464
POLYCYCLIC AROMATIC ESTERS OF PGA_1

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,600, Jan. 8, 1974. This application Dec. 12, 1974, Ser. No. 531,990

Int. Cl.² C07G *177/00*

U.S. Cl. 260—395 **3 Claims**

1. The ester of p-tritylphenol and PGA_1.

3,969,465
PROCESS FOR RECOVERY OF CARBOXYLIC ACIDS FROM THE WASTE SALT SOLUTIONS OF CYCLOHEXANONE MANUFACTURE

Josef Klemens Brunner, Scheuchzerstrasse 47, Zurich, Switzerland

Filed Nov. 18, 1974, Ser. No. 524,492

Claims priority, application Australia, Nov. 19, 1973, 9682/73

Int. Cl.² C07C *51/44, 51/48*

U.S. Cl. 260—527 R **4 Claims**

1. In a process for obtaining usefully esterifiable organic acids from the waste solution of salts of monocarboxylic acids having 1 to 6 carbon atoms, dicarboxylic acids and hydroxy carboxylic acids produced in the manufacture of cyclohexanone by the catalytic oxidation of cyclohexane, in which said waste salt solution is acidulated with sulfuric acid to produce an aqueous phase which is a concentrated sulfate salt solution and an organic phase which is a water-containing mixture of free carboxylic acids, said phases are separated and the organic phase is separated by distillation into a distillate containing water and monocarboxylic acids and a residue containing dicarboxylic and hydroxy acids, the improvement which consists in that:

in the acidulation step there is added to the said waste salt solution concentrated sulfuric acid and also an aqueous solution of monocarboxylic acids derived from a separated aqueous phase from the distillate produced in the distillation step, the acidulation step being performed so as to lower the pH of the salt solution to a value in the range between 1 and 2.5;

the water-containing mixture of carboxylic acids separated as an organic phase from the concentrated sulfate solution is subjected, prior to distillation, to a counter-current extraction with a saturated aqueous solution of monocarboxylic acids obtained as a distillate and retrocycled from the distillation step, the aqueous extract obtained by said counter-current extraction being then recycled to the acidulation step; and

the distillation step is performed on the water-containing carboxylic acid mixture obtained after said counter-current extraction by subjecting it to heat under vacuum in a thin film evaporator to vaporize out water and monocarboxylic acids and to produce a remainder liquid consisting mainly of dicarboxylic acids and one or more hydroxy acids, condensing the distillate vapors to form a condensate, and separating the condensate into an aqueous saturated solution of monocarboxylic acids for retrocycling as aforesaid and an organic phase comprising the monocarboxylic acid product of the process.

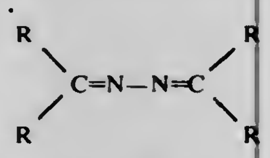
3,969,466

PREPARATION OF HYDRAZODICARBONAMIDE

Robert W. Brown, Middlebury; Byron A. Hunter, Woodbridge, and Franklin H. Barrows, Beacon Falls, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,015
Int. Cl.² C07C *133/02*
U.S. Cl. 260—554 **5 Claims**

1. A process for producing hydrazodicarbonamide by heating urea and water, and a ketazine of the formula



$$\begin{array}{ccc} R & & R \\ & C{=}N{-}N{=}C & \\ R & & R \end{array}$$

wherein the R groups are the same or different and are alkyl groups containing up to 8 carbon atoms or are joined together to form aliphatic rings of 5–6 carbon atoms, to a temperature of about 90° to 130°C. in the absence of an acid catalyst. wherein the urea is present in at least two moles per mole of ketazine.

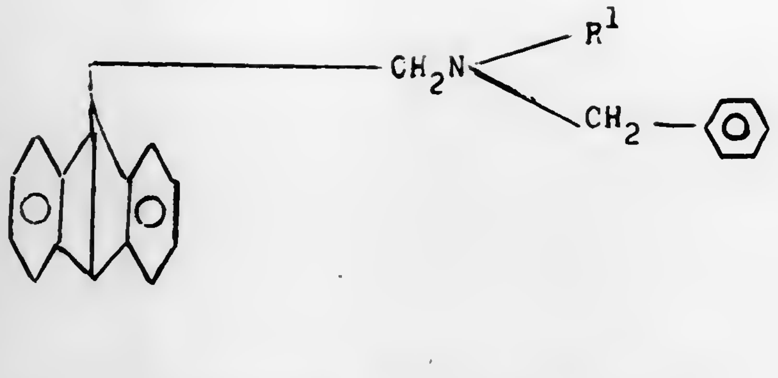
3,969,467

12-ANTI AND SYN-(N-BENZYL-N-ALKYLAMINOMETHYL)-10,11-DIHYDRO-5,10-METHANO-5H-DIBENZO[a,d]CYCLOHEPTENES AND THE SALTS THEREOF

Walton James Hammar, St. Paul, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed May 14, 1973, Ser. No. 360,105
Int. Cl.² C07C *87/29*
U.S. Cl. 260—570.9 **2 Claims**

1. A syn and/or anti compound of the formula



wherein R¹ is methyl or ethyl, and acid addition salts thereof.

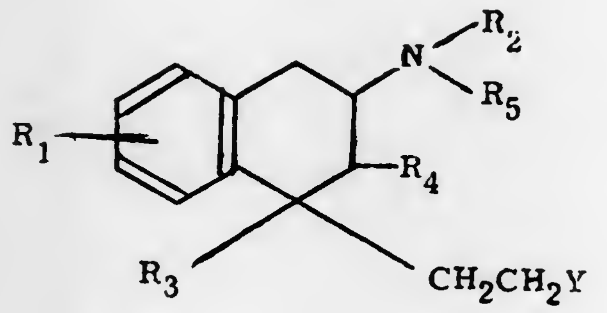
3,969,468

2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES

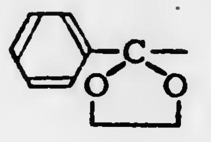
Kentaro Tamaki; Kyoichi Fujii; Seiichi Yada, all of Sakai, and Shiro Kudo, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Oct. 29, 1973, Ser. No. 410,443
Claims priority, application Japan, Oct. 31, 1972, 47-108408; Oct. 31, 1972, 47-108409; Oct. 31, 1972, 47-109054
Int. Cl.² C07C *93/14*
U.S. Cl. 260—574 **4 Claims**

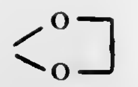
1. A compound represented by the formula:



wherein R_1 is a hydrogen atom, a hydroxy group, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a benzyloxy group or an alkanoyloxy group having 1 to 4 carbon atoms; R_2 is a hydrogen atom, an alkyl group having 1 to 8 carbon atoms which is either substituted or unsubstituted, the substituent being a phenyl group, a benzoyl group,



group, =O group or



group, a cycloalky group having 3 to 6 carbon atoms, a cycloalkylalkyl group having 4 to 8 carbon atoms or an alkyenyl group having 3 to 8 carbon atoms which is either substituted or unsubstituted, the substituent being a chlorine atom or a bromine atom; R_3 and R_4 are the same or different and are alkyl groups having 1 to 4 carbon atoms; R_5 is a hydrogen atom or a benzyl group; and Y is an alkoxy group having 1 to 4 carbon atoms, a phenoxy group or a benzyloxy group.

3,969,469

VINYL HALIDE RESIN COMPOSITIONS

Fred E. Love, Denver, Colo., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 362,311, May 21, 1973, Pat. No. 3,922,320. This application Jan. 6, 1975, Ser. No. 538,614
Int. Cl.² C08L *27/06, 33/20*
U.S. Cl. 260—891 **6 Claims**

1. An impact-resistant resinous composition consisting essentially of

a. 70 to 90 percent by weight of a vinyl halide resin selected from the group consisting of polyvinyl halides and copolymers that contain at least 70 percent of vinyl halide units and up to 30 percent of copolymer units;

b. 5 to 15 percent by weight of an elastomer that is a terpolymer that contains 10 to 40 percent of styrene units, 15 to 30 percent of alkyl methacrylate units, and 40 to 65 percent of butadiene units; and

c. 5 to 15 percent by weight of a thermoplastic resin selected from the group consisting of

 i. styrene-acrylonitrile copolymers that contain from 50 to 90 percent of styrene, methylstyrene, ethylstyrene, monochlorostyrene, or methoxystyrene units and 10 to 50 percent of acrylonitrile, methacrylonitrile, ethacrylonitrile, or chloroacrylonitrile units; and

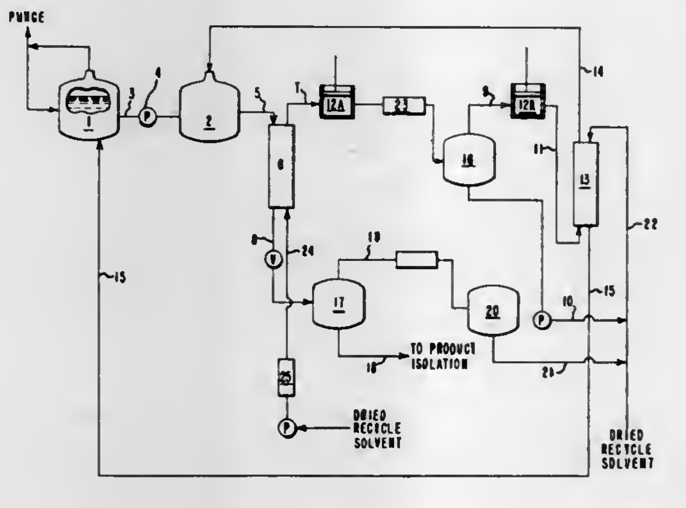
 ii. styrene-acrylonitrile-alkyl methacrylate terpolymers that contain from 50 to 90 percent of styrene, methylstyrene, ethylstyrene, monochlorostyrene, or methoxystyrene units; 10 to 50 percent of acrylonitrile, methacrylonitrile, ethacrylonitrile, or chloroacrylonitrile units; and 5 to 30 percent of lower alkyl methacrylate units.

3,969,470

PROCESS FOR RECYCLING HYDROGEN WHEN MAKING BLENDS OF OLEFIN COPOLYMERS

Phillip Poliner Spiegelman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1975, Ser. No. 570,260
Int. Cl.² C08L *23/08, 23/14, 23/16*
U.S. Cl. 260—897 A **13 Claims**



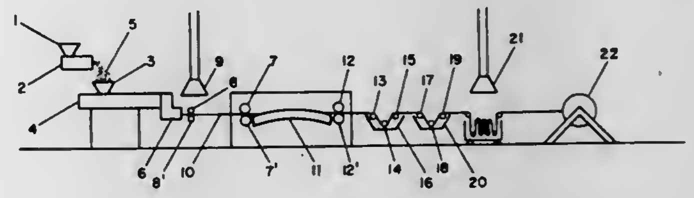
1. In a continuous process for making blends of high and low molecular weight copolymers and recycling the chain-transfer agent gaseous hydrogen for reuse in the process, said process comprising polymerizing ethylene and at least one higher olefin monomer in a solvent for the monomers in separate polymerization reactors in the presence of a coordination catalyst, at least one, but not all, of said reactors containing the chain-transfer agent hydrogen in an amount sufficient to produce low molecular weight copolymer, mixing the resulting solution of high and low molecular weight copolymers, flashing unreacted monomers and hydrogen from the mixture and isolating the blend of high and low molecular weight copolymers and solvent from the unflashed residue, the improvement which comprises circulating the flashed gaseous unreacted monomers and hydrogen together through a staged absorption column and simultaneously passing said solvent through said column to absorb monomer gas in the solvent and thus separate unabsorbable hydrogen gas from monomers and recycling hydrogen in the system to a polymerization reactor for making low molecular weight copolymer.

3,969,471

PROCESS OF MANUFACTURING CHROMIC ACID TREATED FOAM FIBRILLATED WEBS

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Jan. 2, 1973, Ser. No. 320,352
Int. Cl.² B29D *7/24, 27/00, 7/20*
U.S. Cl. 264—50 **1 Claim**



1. A process of producing a foam-fibrillated fibrous web comprising extruding a blend of a molten polyolefin resin selected from the group consisting of polyethylene, polypropylene, copolymers of ethylene and propylene or blends thereof, and a gaseous blowing agent from a die into a zone of reduced pressure to produce an extrudate, withdrawing said extrudate from said die by a first take-up means at a linear rate from 2 to 25 times the linear rate at which said blend of molten polyolefin resin and gaseous blowing agent reaches the die lips to form a foam fibrillated web, stretching said foam fibrillated web from two to 10 times in the machine direction, and surface treating the stretched foam fibrillated web in from 90 to 100% sulfuric acid containing from 1 to 20 wt. % chromic acid at from 25° to 100°C. for from 0.1 second to 3 minutes whereby the fibrous web has improved adhesion ability with itself.

3,969,472

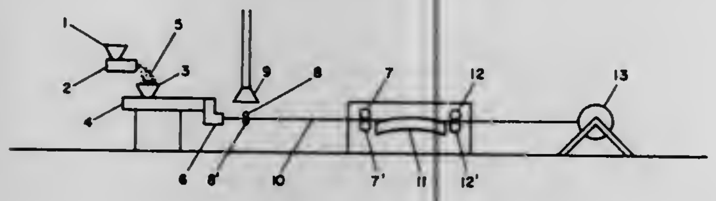
METHOD OF MANUFACTURING A FOAM FIBRILLATED FIBROUS WEB FROM AN ISOTACTIC POLYPROPYLENE, POLYSTYRENE AND α-METHYLSTRENE BLEND

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 320,356, Jan. 2, 1973, abandoned. This application Nov. 15, 1973, Ser. No. 416,152
Int. Cl.² B29D *7/24, 27/00*
U.S. Cl. 264—50 **2 Claims**

1. A process of producing a foam fibrillated fibrous web comprising heating a blend of from 50 to 98 weight percent as based on said blend of isotactic polypropylene and from 50 to 2 weight percent as based on said blend of polystyrene which may contain up to 10 weight percent α-methylstyrene, in an extruder to a temperature generally maintained in a range of from 175° to 260°C whereby a molten blend is formed, extruding said blend and from 0.1 to 20 percent by weight as based on said blend of a material which is gaseous under the extru-

sion conditions used mixed with said molten blend from a die which is generally maintained in the temperature range of from 220° to 260°C into a zone of reduced pressure to produce a foam fibrillated fibrous web extrudate, quenching said extrudate to a temperature below about 150°C while withdrawing said extrudate from said die by a first linear take-up means at a linear rate of from two to 25 times the linear rate at which said blend reaches the lips of said die whereby a foam-fibrillated web is formed, and stretching said foam fibrillated web from two to 10 times in the machine direction at a temperature of from about 90°C to about 150°C to increase the strength thereof.



3,969,473

METHOD OF CORRUGATING A WEB OF THIN THERMOPLASTIC MATERIAL IN A CONTINUOUS PRODUCTION

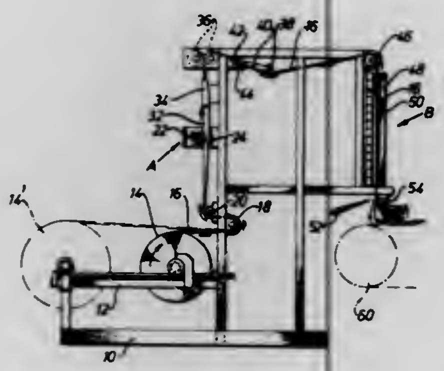
George W. Meek, Fort Myers, Fla., assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Mar. 12, 1974, Ser. No. 450,531

Claims priority, application Sweden, Mar. 13, 1973, 7303518

Int. Cl.^{2} B29C *24/00*

U.S. Cl. 264—90 **1 Claim**



1. Method of continuously forming a corrugated web from thermoplastic thin sheet material which is rendered relatively weak when heated, the corrugations extending at an oblique angle to the side edges of the web, said method comprising;

a. moving the web through a heating zone to soften the thermoplastic material into moldable condition;
b. folding over at least one of the lateral edge portions to produce a thickened edge to reinforce the softened web;
c. introducing the softened web in depending slack condition to a continuously moving longitudinal corrugating zone comprising a series of diagonal ridges and grooves for engaging and advancing the web in said zone;
d. forming the corrugations initially by mechanically depressing the softened advancing web without any substantial stretching thereof progressively into successive grooves while maintaining the introductory portion of the web in slack condition;
e. applying suction beneath the thus initially formed corrugations to draw them against the surfaces of the grooves and to harden and set the thus completed corrugations; and
f. forming a plurality of ribs in said corrugations by drawing the web against corresponding ridges in the corrugating zone in the suction applying step.

3,969,474

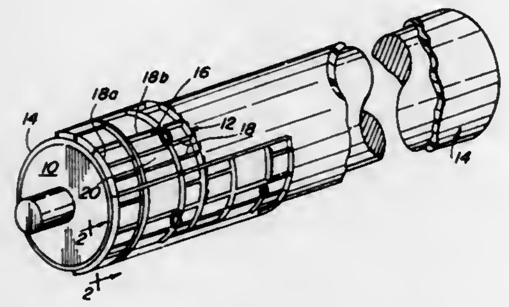
MOLDED STEEL RULE DIE FOR ROTARY DIE CUTTING

John R. Gaug, 9229 Ivanhoe St., Schiller Park, Ill. 60176

Continuation-in-part of Ser. No. 813,831, April 7, 1969, abandoned. This application Sept. 10, 1971, Ser. No. 179,404

Int. Cl.^{2} B29C *1/02, 5/00;* **B29D** *3/00*

U.S. Cl. 264—219 **7 Claims**



1. A method of making a die adapted for use in cutting blanks from sheet material comprising: positioning steel rules in a mold, said mold having a smooth, hard, unbroken and accurately formed surface, each of a plurality of said rules having a cutting edge abutting said surface, positioning at least one machined metal spacing member between said rules next to said surface and clamping said rules and spacing member in face to face position in said mold by pressure exerted laterally against said rules and spacing member, said spacing member being of less thickness than the height of said rules, casting and solidifying a resin composition against the portions of said rules extending above said spacing member, thereby forming a base having said rules attached thereto, and then separating said base and rules from said spacing member and said mold.

3,969,475

POWDER MOLDING PROCESS FOR PRODUCING THERMOPLASTIC ARTICLES

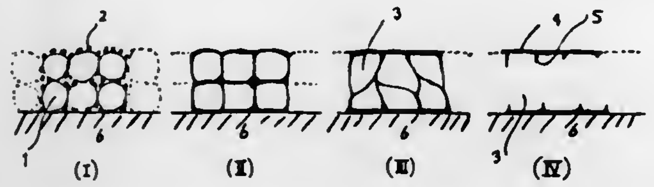
Yasuo Horiuchi, Yokohama, and Toraichi Katsube, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 501,675, Aug. 29, 1974, abandoned. This application Dec. 20, 1974, Ser. No. 534,894

Claims priority, application Japan, Aug. 31, 1973, 48-97904; Dec. 26, 1973, 49-143942; Dec. 26, 1973, 49-143943; Dec. 26, 1973, 49-143944; Dec. 26, 1973, 49-143945; Dec. 26, 1973, 49-143946; May 15, 1974, 49-53211

Int. Cl.^{2} B29C *5/04*

U.S. Cl. 264—310 **10 Claims**



1. A powder molding process for producing thermoplastic articles having improved surface properties which comprises dry blending a powdery thermoplastic polymer and a curable additive selected from reactive monomers and prepolymers thereof, said curable additive being a liquid at the melting or softening temperature of the thermoplastic polymer and being capable of bleeding to the surface of the thermoplastic polymer during molding, to form a moldable composition, and powder molding said composition by heating it in a mold to initiate melting or softening of the thermoplastic polymer, said heating being controlled at a heating rate of less than 25°C. per minute during the linear portion of the temperature-time curve after the initiation of melting or softening of the thermoplastic polymer, whereby said curable additive bleeds to the surface of the thermoplastic polymer during molding and cures at said surface so as to improve the surface characteristics thereof.

3,969,476

SOLVENT-IN-PULP EXTRACTION

Bernard H. Lucas, and Gordon M. Ritcey, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 19, 1974, Ser. No. 443,902

Claims priority, application United Kingdom, Feb. 23, 1973, 8978/73

Int. Cl.^{2} C01G *43/00*

U.S. Cl. 423—1 **5 Claims**

1. In a process for the solvent extraction of an aqueous leach slurry containing dissolved metal values, and gangue particles selected from the group consisting of the silica, sericite and sulphide types, with organic amine extractants, at least part of said metal values being extractable by said amine extractants, the improvement comprising pretreating the leach slurry with a fish glue material which is adsorbed onto the gangue solids, the pretreated gangue solids having decreased affinity for the amine extractant during the extraction.

3,969,477

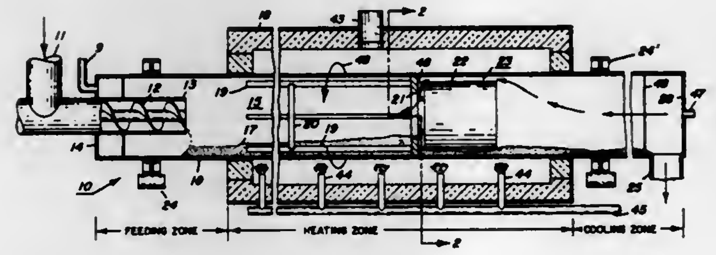
METHOD OF DEFLUORINATING URANIUM COMPOSITIONS IN A CALCINER

W. Gill Keith, San Jose, and F. Donald Ferris, San Martin, both of Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 299,356, Oct. 20, 1972, Pat. No. 3,871,829. This application Mar. 4, 1974, Ser. No. 448,005

Int. Cl.^{2} C01G *43/02*

U.S. Cl. 423—19 **9 Claims**



9. In a method of defluorinating and controlling the oxygen-to-metal ratio of a particulate uranium oxide containing composition containing fluoride impurities in a calciner having a heating zone, a cooling zone and an atmosphere capable of defluorinating the composition including the steps of passing the composition through the calciner, passing the atmosphere countercurrent to the passage of the composition through the calciner, heating the composition at a temperature in the range of about 400° to about 800°C under the atmosphere, the improvement comprising restricting the passage of the atmosphere to a zone of greater flow velocity with said zone of greater flow velocity starting at about the junction of the heating zone and the cooling zone of the calciner and extending into the cooling zone so that the diffusion of gaseous impurities from the heating zone to the cooling zone of the calciner is substantially eliminated.

3,969,478

PROCESS FOR SEPARATION OF TUNGSTEN AND MOLYBDENUM BY EXTRACTION

Abram Naumovich Zelikman, ulitsa D. Ulyanova, 4, korpus 2, kv. 251; Grigory Markovich Voldman, Petrozavodskaya ulitsa, 15, korpus 2, kv. 187, both of Moscow; Viktor Konstantinovich Rumyantsev, ulitsa Sportivnaya, 46, kv. 43, Chirchik Tashkentskoi oblasti; Georgy Nikolaevich Ziberov, sovkhoz Lenina otdelenie 3, ulitsa Lermontova, 9, Krasnodarsky krai, Anapa, and Valery Sergeevich Kagermanian, ulitsa Krasnogo Mayaka, 8, korpus 2, kv. 469, Moscow, all of U.S.S.R.

Filed Jan. 30, 1975, Ser. No. 545,708

Int. Cl.^{2} B01D *11/00;* **B01J** *1/04;* **C01G** *37/00, 39/00*

U.S. Cl. 423—54 **10 Claims**

1. A process for the separation of tungsten and molybdenum by extraction comprising the steps of: adding to an aqueous solution containing chemical compounds of tungsten and molybdenum a complexing agent which is hydrogen peroxide in an amount of from 1.5 to 2 mol per l g-atom of the total content of tungsten and molybdenum; adding to the resulting solution an acid selected from the group consisting of nitric, hydrochloric and sulfuric acids to obtain a pH of the solution from 0.5 to 1.8; and selectively extracting molybdenum from the resulting solution with an organic extracting agent selected from the group consisting of tri-n-butyl phosphate, tributyl phosphine oxide and trioctylamine with the volumetric ratio of the aqueous organic solutions of from 1:1 to 1.5.

9. A process for the separation of tungsten and molybdenum by extraction comprising the steps of: adding to an aqueous solution containing chemical compounds of tungsten and molybdenum a complexing agent which is hydrogen peroxide in an amount of from 1.5 to 2 mol per l g-atom of the total content of tungsten and molybdenum; adding to the resulting solution nitric acid to obtain a pH of from 2.5 to 2.8 or sulfuric acid to obtain a pH of 4.3; and selectively extracting molybdenum from the resulting solution with a salt of a quaternary ammonium base with the volumetric ratio of the aqueous to organic solutions of from 1:1 to 1.5.

3,969,479

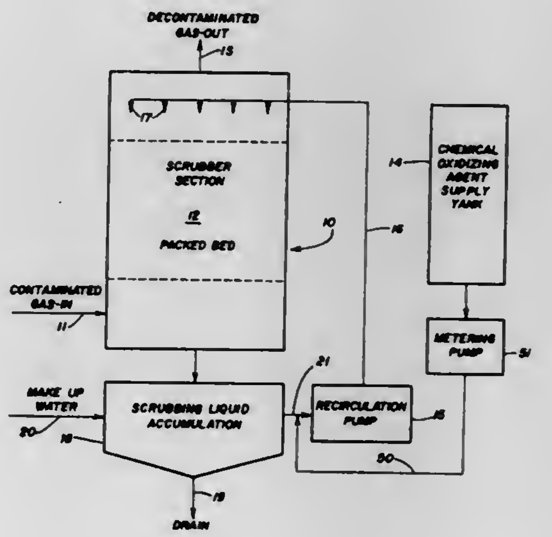
ODOR CONTROL METHOD

Perry B. Lonnes; Carl M. Peterson, both of St. Paul, Minn.; Dale A. Lundgren, Gainesville, Fla., and Laverne W. Rees, St. Paul, Minn., assignors to Environmental Research Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 167,925, Aug. 2, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,240

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—210 **8 Claims**



1. In a method for oxidizing constituents of a gaseous fluid with minimum consumption of chemical oxidizing agent which comprises:

passing the odorous gaseous fluid through a bed of packing material contained in a scrubber;

simultaneously passing an aqueous solution of a predetermined concentration of chemical oxidizing agent selected from the group consisting of $NaClO_2$, Cl_2, $KMnO_4$, $NaMnO_4$, O_3, and H_2O_2 through the packing material to thereby cause contact between the gaseous fluid and the aqueous solution, oxidation of the odorous constituents and precipitation of solid chemical reaction products; and

discharging the treated gaseous fluid from the scrubber;

the improvement comprising:

passing the aqueous solution containing the solid precipitates into a holding tank disposed at an elevation lower than the scrubber;

accumulating by gravity the solid precipitates at the bottom of the holding tank;

purging a quantity of the accumulated solid precipitates, the quantity comprising 1–5% by weight of the total amount of circulating aqueous solution, from the bottom of the holding tank;

introducing water to the holding tank above the level of the accumulated solid precipitates therein;

pumping the aqueous solution, with the added water, from the holding tank from a point above the level of the accumulated solid precipitates through a line terminating in the scrubber above the bed of packing material;

adding fresh oxidizing agent to the line at a point intermediate the holding tank and scrubber in a controlled amount, wherein the amount of fresh oxidizing agent added to the line and the amount of water added to the holding tank maintain the predetermined concentration of the aqueous solution.

3,969,480
NICKEL BASE NO_x REDUCING CATALYTIC STRUCTURE

Robert J. Fedor, Westlake, and Cameron S. Ogden, Hudson, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.
Continuation-in-part of Ser. No. 207,284, Dec. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 149,331, June 2, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,032
Int. Cl.² C01B *33/00*
U.S. Cl. 423—213.5 **19 Claims**

1. In the combination comprising an internal combustion engine and a catalyst for catalytically reducing nitrogen oxides in the exhaust gases of said engine, the improvement wherein said catalyst comprises a thin expanded metal foil structure comprising a corrosion resistant nickel base substrate having an effective amount of NO_x reducing catalyst metallurgically bonded on the surface thereof, said nickel base substrate before metallurgical bonding of said NO_x catalyst comprising:

from about 50 to about 85 weight percent of a mixture of nickel and a metal selected from the group consisting of iron, cobalt and mixtures thereof, with nickel always being present in an amount equal to at least about 17 weight percent of the substrate and the weight percent of iron and cobalt individually never exceeding about 40 percent and always being less then the weight percent of nickel, but at least one thereof being present in excess of a trace amount; and

from about 15 to about 50 weight percent of a metal selected from the group consisting of chromium, aluminum and mixtures thereof with at least about 5weight percent of chromium always present in the substrate and the amount of aluminum never exceeding about 10 weight percent;

the chemical composition of the catalytic layer being different than the chemical composition of said substrate.

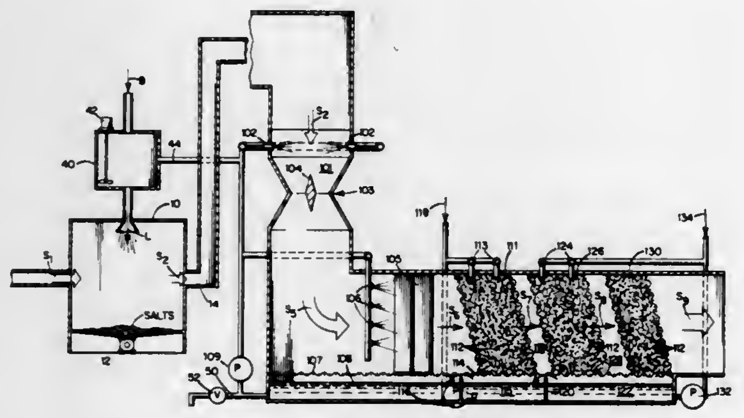
3,969,481
PROCESS FOR GENERATING ULTRA HIGH PURITY H_2 OR O_2

John N. Murray, Lutherville, Md., and Robert J. Hynek, Brookfield, Wis., assignors to Isotopes, Inc., Westwood, N.J.
Filed Nov. 3, 1972, Ser. No. 303,392
Int. Cl.² C01B *13/00*
U.S. Cl. 423—219 **20 Claims**

1. A process for purifying hydrogen gas containing a small amount of oxygen and a catalyst poison comprising placing a plurality of alternating contiguous layers of an adsorbent for said catalyst poison and a catalyst for catalysing the formation of water from hydrogen and oxygen in a single container, passing said hydrogen gas through said container, said layers being arranged in said container so that the first layer which the gas meets in the container and the last layer the gas meets in the container are adsorbent layers, and withdrawing a purified hydrogen gas from said container.

3,969,482
ABATEMENT OF HIGH CONCENTRATIONS OF ACID GAS EMISSIONS

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.
Filed Apr. 25, 1974, Ser. No. 463,651
Int. Cl.² B01D *53/34*
U.S. Cl. 423—235 **16 Claims**



1. A process for treating effluent gases having a temperature above about 350°F. and initially containing high concentrations of sulfur oxides, nitrogen oxides, hydrogen halides, silicon tetrafluoride and mixtures thereof to reduce the concentrations of these acid gases to environmentally required levels, comprising the following steps:

1. First treating the effluent gases to remove a predominant portion of the acid gases by the steps of:
   a. spraying into said effluent gases an aqueous solution or slurry of a basic material selected from the group consisting of: the oxides, hydroxides, carbonates and bicarbonates of the alkali metals, alkaline earth metals, zinc, nickel, copper and iron; nepheline syenite and phonolite; and mixtures thereof;
   b. adjusting the concentration of basic material in said solution or slurry and the rate of addition of solution or slurry such that 60–95% of the acid gases initially present react with said basic material for form a solid salt reaction product and the hot effluent gases rapidly evaporate substantially all of the liquid water thereby cooling the effluent gases to a temperature below about 250°F. and humidifying the gases to a relative humidity of about 20–50%; and,
   c. separating the larger solid salt particles from the effluent gases by gravity; and,
2. Thereafter further treating the effluent gases for the removal of residual acid gases and solid particles by the steps of:
   a. contacting the effluent gases with a particulate sorbent material selected from nepheline syenite, phonolite and mixtures thereof to sorb residual acid gases to environmentally acceptable levels; and,
   b. separating the mixture of effluent gases and particulate material by filter means.

3,969,483
REMOVAL OF CARBONACEOUS MATTER FROM AMMONIUM POLYPHOSPHATE LIQUIDS

John M. Stinson, Sheffield; Horace C. Mann, Jr., Florence, both of Ala., and Dale H. Johnson, Downers Grove, Ill., assignors to Tennessee Valley Authority, Muscle Shoals, Ala. and Akzona Incorporated, Ashville, N.C.
Continuation of Ser. No. 521,752, Nov. 7, 1974, Pat. No. T942,007. This application June 5, 1975, Ser. No. 583,873
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—305 **10 Claims**

1. An improved process for the removal of carbonaceous matter from ammoniated polyphosphate solutions wherein:

said solutions have a pH above about 4.5;

said solutions are prepared by the molecular dehydration and subsequent or concurrent ammoniation of wet-process phosphoric acid containing about 50 to 72 percent P_2O_5;

said carbonaceous matter results from organic impurities in said wet-process phosphoric acid;

said carbonaceous matter chars during the molecular dehydration of said wet-process orthophosphoric acid to superphosphoric acid, the improvement therein for removing substantially all of the black particualte carbonaceous matter therein by flocculation and subsequent flotation thereby eliminating any requirement for filtering means therein;

which improved process comprises the steps of adding to the solution from about 0.015 to about 0.075 percent by weight of a water-insoluble primary amine having a lower density than the ammoniated polyphosphate solution and immiscible therewith; adding to the solution from about 0.005 to about 0.075 percent by weight of a water-insoluble quaternary ammonium chloride having a lower density than the ammoniated polyphosphate solution and immiscible therewith; agitating the resulting mixture to bring said amine and said quaternary into intimate contact with said solution; holding the solution until the solids flocculate and float to the surface; and separating the resulting flocculated solids from the underflow.

6. An improved process for the removal of carbonaceous matter from ammoniated polyphosphate solutions wherein;

said solutions have a pH above about 4.5;

said solutions are prepared by the molecular dehydration and subsequent or concurrent ammoniation of wet-process phosphoric acid containing about 50 to 72 percent P_2O_5;

said carbonaceous matter results from organic impurities in said wetprocess phosphoric acid;

said carbonaceous matter chars during the molecular dehydration of said wet-process orthophosphoric acid to superphosphoric acid, the improvement therein for removing substantially all of the black particulate carbonaceous matter therein by flocculation and subsequent flotation thereby eliminating any requirement for filtering means therein;

which improved process comprises the steps of adding to the solution from about 0.015 to about 0.075 percent by weight of a water-insoluble acetic acid salt of a primary amine having a lower density that the ammoniated polyphosphate solution and immiscible therewith; adding to the solution from about 0.005 to about 0.075 percent by weight of a water-insoluble quaternary ammonium chloride having a lower density than the ammoniated polyphosphate solution and immiscible therewith; agitating the resulting mixture to bring said amine and said quaternary into intimate contact with said solution; holding the solution until the solids flocculate and float to the surface; and separating the resulting flocculated solids from the underflow.

3,969,484
PROCESS FOR RECOVERING TUNGSTEN FROM ALKALINE LEACHING SOLUTION OF TUNGSTEN ORES

Satoshi Onozaki, Mitaka; Shogo Nemoto, Iwaki, and Takeshi Hazeyama, Mitaka, all of Japan, assignors to Nittetsu Mining Company, Ltd., Tokyo, Japan
Filed Feb. 20, 1975, Ser. No. 551,240
Claims priority, application Japan, Mar. 22, 1974, 49-31446
Int. Cl.² C01G *39/00, 41/00*
U.S. Cl. 423—58 **5 Claims**

1. A process for recovering tungsten values from an alkaline solution employed in the leaching of tungsten ores containing molybdenum, which comprises:

adjusting the pH of said alkaline leaching solution containing tungsten and molybdenum values to a range of 7–8 with a mineral acid which does not form a precipitate with calcium ions, whereby the molybdenum values and tungsten values exist as molybdic acid and tungstic acid, respectively;

oxidizing said molydbic acid ions in solution; adding at least twice the stoichiometric amount with respect to said molybdic acid of at least one sulfide ion donor selected from the group consisting of hydrogen sulfide, alkali sulfides and alkali hydrosulfide to said molydbic acid containing solution at a temperature of 30°–80°C whereby molybdic acid ions are converted to complex thiomolybdate ions;

adjusting the pH of said sulfide ion treated solution to 2–3 with a mineral acid which does not form a precipitate with calcium ions;

separating the molybdenum sulfide compounds upon cooling which precipitate from pH adjusted solution;

oxidizing said tungstic acid in the molybdenum free solution;

adding at least one calcium ion donor selected from the group consisting of calcium chloride and calcium hydroxide to said tungstic acid containing solution at 30°–80°C which converts tungstic acid ions to calcium tungstate; and

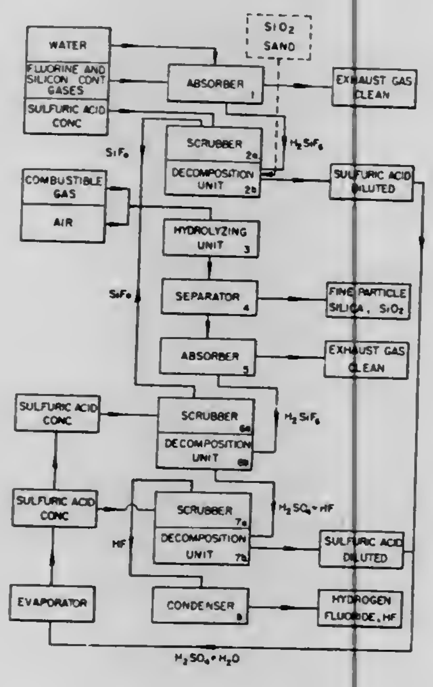
cooling said calcium tungstate containing solution to precipitate said calcium tungstate from solution which thereafter is separated from the solution.

3,969,485
PROCESS FOR CONVERTING SILICON-AND-FLUORINE-CONTAINING WASTE GASES INTO SILICON DIOXIDE AND HYDROGEN FLUORIDE

Gosta Lennart Flemmert, Hamngatan 22, Nynashamn, Sweden
Continuation-in-part of Ser. No. 193,467, Oct. 28, 1971, abandoned. This application Dec. 4, 1974, Ser. No. 529,315
Int. Cl.² C01B *33/18*
U.S. Cl. 423—337 **29 Claims**

1. A cyclic process for producing hydrogen fluoride and highly active silicon dioxide from silicon-and fluorine-containing waste gases, the silicon and fluorine being present at least as silicon tetrafluoride and hydrogen fluoride, and also silicon dioxide, if present, which comprises combining water and silicon-and fluorine-containing waste gases and absorbing silicon tetrafluoride and hydrogen fluoride in water thereby forming hydrofluosilicic acid; blending hydrofluosilicic acid with concentrated sulfuric acid to decompose hydrofluosilicic acid to form a gaseous effluent comprising tetrafluoride, hydrogen fluoride and water vapour; passing gaseous effluent into contact with sulfuric acid to absorb water and hydrogen fluoride therefrom: recovering silicon tetrafluoride from gaseous effluent and hydrolyzing silicon tetrafluoride by blending with combustible gas and with air, and burning to form silica and hydrogen fluoride; withdrawing residual sulfuric acid; separating silica formed in the hydrolysis; blending effluent gases from the combustion containing hydrogen fluoride, water vapour, unreacted silicon tetrafluoride and combustion products with a member selected from the group consisting of

water and aqueous hydrofluoric acid solution to form aqueous hydrofluosilicic acid solution and venting unabsorbed exhaust gases, now relatively free from fluorine-containing materials, to the atmosphere; combining and decomposing hydrofluosilicic acid with concentrated sulfuric acid; liberating and volatilizing hydrogen fluoride and water vapour; removing water vapour; recovering hydrogen fluoride and recovering sulfuric acid.



3,969,486
PROCESS FOR SYNTHESIS OF CHLORODIFLYROAMINE

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.
Filed Aug. 15, 1962, Ser. No. 218,479
Int. Cl.^{2} C01B *21/52, 7/00*
U.S. Cl. 423—351 **6 Claims**

1. The process for making chlorodifluoroamine which comprises introducing gaseous fluorine azide and at least a stoichrometric equivalent of gaseous chlorine into a reaction zone, maintaining temperature in the reaction zone substantially in the range of 20°–100° C., and discharging chlorodifluoroamine from the reaction zone.

3,969,487
PROCESS FOR SYNTHESIS OF CHLORODIFLUOROAMINE

Thomas E. Austin, Winston-Salem, N.C., and Robert W. Mason, Morris Plains, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.
Filed Apr. 26, 1963, Ser. No. 279,696
Int. Cl.^{2} C01B *21/52, 7/00*
U.S. Cl. 423—351 **10 Claims**

1. The process for making chlorodifluoroamine which comprises continuously introducing into a reaction zone — containing a comminuted alkali metal azide-alkali metal chloride mixture having an azide-chloride weight ratio of one to not less than 3 — an inert gas-elemental fluorine gas mixture having an inert gas-fluorine volume ratio of one to not more than 5, maintaining in the reaction zone reactive temperature not substantially above 50° C., and discharging from the reaction zone gaseous reaction products containing chlorodifluoroamine.

3,969,488
PROCESS FOR THE MANUFACTURE OF SODIUM CARBONATE

Alan C. Shaw, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold, Canada
Filed Aug. 25, 1975, Ser. No. 607,229
Int. Cl.^{2} C01D *7/00;* **C01F** *7/34*
U.S. Cl. 423—421 **14 Claims**

1. A process for the production of sodium carbonate, which comprises contacting subdivided solid sodium aluminate with a gas stream comprising water vapor and carbon dioxide at a temperature above the dew point of said atmosphere and below about 200°C to cause reaction between said sodium aluminate, carbon dioxide and water vapor in accordance with the equation:

$$2NaAlO_2 + 3H_2O + CO_2 \rightarrow Na_2CO_3 + 2Al\,(OH)_3$$

and recovering a solid mass containing sodium carbonate.

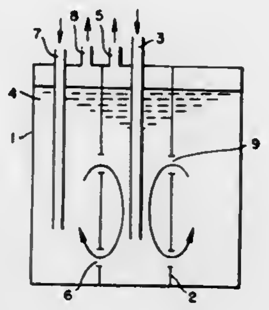
3,969,489
PROCESS FOR RECOVERING SYNTHETIC DIAMONDS FROM PRESSED RUNS

Mu-Sheng Wu, Worthington, Ohio, assignor to General Electric Company, Columbus, Ohio
Filed Sept. 24, 1975, Ser. No. 616,299
Int. Cl.^{2} C01B *31/06*
U.S. Cl. 423—446 **16 Claims**

1. A process for the recovery of synthetic diamond from a diamond synthesis run containing diamond crystals, a non-diamond carbonaceous material and a metallic catalyst which comprises: pretreating the run with liquid bromine to dissolve the non-diamond carbonaceous material; separating the bromine-carbon mixture from the remaining run material; chemically treating the remaining run material to remove the catalyst; and recovering the remaining diamond crystals.

3,969,490
PRODUCTION OF HYDROGEN CHLORIDE BY THERMAL DISSOCIATION OF ORGANIC SUBSTANCES CONTAINING CHLORINE

Gerard de Beuckelaer, Hoevenen, Belgium; Gerd Krome, Ludwigshafen, Germany; Jan Langens, Kapellen, Belgium; Ferdinand Lockefeer, Berchem, Belgium, and Paul Schaerlaekens, Ekren, Belgium, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Dec. 12, 1973, Ser. No. 423,924
Claims priority, application Germany, Dec. 16, 1972, 2261795
Int. Cl.^{2} C01B *7/08, 7/01*
U.S. Cl. 423—481 **4 Claims**



1. A process for the production of hydrogen chloride by thermal dissociation of an organic substance containing chlorine, wherein in a first stage, in which a temperature of from 400° to 1200°C. prevails, the substance containing chlorine is introduced into a salt melt of one or more alkali metal chlorides in the absence of oxygen, hydrogen chloride is discharged from reaction mixture and in a second stage, in which a temperature of from 650° to 1250°C. prevails, oxygen is supplied to the melt for the combustion of organic constituents remaining in it, and the combustion products are removed.

3,969,491
PURIFICATION OF ALKALI METAL CHLORIDES AND BROMIDES

Ricardo C. Pastor, Manhattan Beach, and Arthur J. Timper, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Continuation-in-part of Ser. No. 351,214, April 16, 1973. This application Aug. 18, 1975, Ser. No. 605,697
Int. Cl.^{2} C01D *3/14, 3/20, 3/04, 3/10*
U.S. Cl. 423—499 **5 Claims**

1. A method for the purification of alkali metal chlorides and bromides containing trace cationic and anionic impurities comprising the steps of exposing the reaction apparatus to a mascent sweep halogen gas for 10 hours to remove contaminants, forming a moving molten zone in said alkali metal halide placed in said apparatus while scrubbing said metal halide with a continuous stream of a gaseous nascent halogen corresponding to the halide of the alkali metal being scrubbed for 5 hours and allowing said halide to cool under a continuous stream of gaseous nascent halogen, thereby obtaining said alkali metal halides having a purity useful in laser technologies.

3,969,492
RECOVERY OF ELEMENTAL SULFUR FROM SULFUR DIOXIDE BEARING WASTE GASES

Michael Witte, Chatham, and Manankumar S. Mehta, Parsippany, both of N.J., assignors to U.S. Filter Corporation, New York, N.Y.
Filed Oct. 29, 1973, Ser. No. 410,540
Int. Cl.^{2} C01D *17/04*
U.S. Cl. 423—574 L **1 Claim**

1. In the removal of sulfur dioxide values from a sulfur dioxide bearing industrial gas stream,

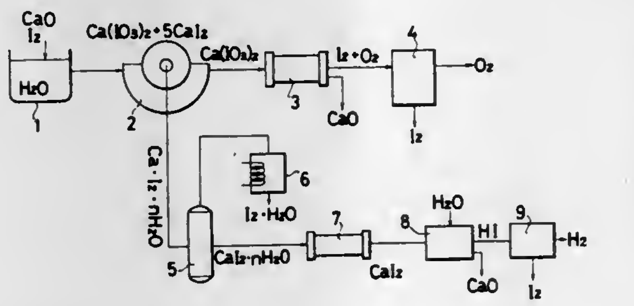
the steps of

introducing a sulfur dioxide bearing gas stream, into absorbent contact with an aqueous solution of mixed monoammonium phosphate and di-ammonium phosphate in which the weight proportion of mono- to di-ammonium phosphate is in the range of about **4** to **1** to about **10** to **1** to effect removal of sulfur dioxide values from said gas stream in said solution,

and reacting said absorbed sulfur dioxide values in said solution with hydrogen sulfide to reduce the sulfur therein to elemental sulfur.

3,969,493
THERMOCHEMICAL PROCESS FOR MANUFACTURE OF HYDROGEN AND OXYGEN FROM WATER

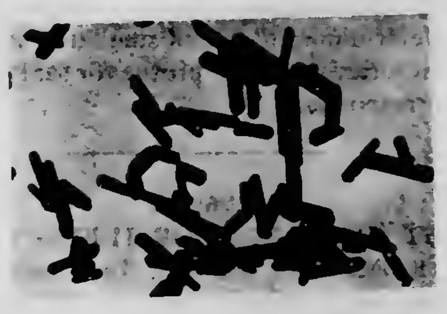
Kinjiro Fujii, Komae, and Wakichi Kondo, Kanagawa, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed June 20, 1975, Ser. No. 588,873
Claims priority, application Japan, June 21, 1974, 49-70917
Int. Cl.^{2} C01B *13/00*
U.S. Cl. 423—579 **6 Claims**



1. A process for the manufacture of hydrogen and oxygen from water, which process comprises the steps of allowing iodine and calcium hydroxide to react with each other in the presence of water at 20° to 100°C, separating calcium iodate and calcium iodide from the resultant reaction product, heating calcium iodate until it is converted into calcium oxide for thereby generating a mixed gas of iodine and oxygen, cooling the generated mixed gas thereby allowing the iodine component thereof to be educed in the form of crystals and simultaneously effecting liberation of oxygen gas therefrom, causing calcium iodide to react with steam at 400° to 750°C to give rise to hydrogen iodide and decomposing the generated hydrogen iodide into hydrogen and iodine.

3,969,494
METHOD FOR IMPROVEMENT OF PROPERTIES OF SYNTHETIC YELLOW IRON OXIDE

Soichiro Nobuoka, Nara; Takashi Asai, Minoo, and Kazuaki Ado, Sakai, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Feb. 21, 1975, Ser. No. 551,652
Claims priority, application Japan, Feb. 22, 1974, 49-21846
Int. Cl.^{2} C01G *49/02*
U.S. Cl. 423—633 **5 Claims**



1. A method for the improvement of properties of synthetic yellow iron oxide, which comprises dispersing said synthetic yellow iron oxide in an aqueous 0 – 10N alkali solution, subjecting the resultant slurry to a hydrothermal treatment at temperatures in the range of 100° – 250°C under saturated pressure of steam and recovering from the hydrothermally treated slurry the yellow iron oxide.

3,969,495
THERMOCHEMICAL PRODUCTION OF HYDROGEN

Robert M. Dreyfuss, Mount Vernon, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed June 26, 1975, Ser. No. 590,749
Int. Cl.^{2} C01B *1/03*
U.S. Cl. 423—648 **7 Claims**

1. A thermochemical process cycle for the production of hydrogen from water comprising the steps of:
   a. reacting a metal oxide with a metalloid from one of groups V and VI of the periodic system and with sulfur dioxide, thereby producing the corresponding metal sulfate and an intermetallic compound of the corresponding metal and the metalloid,
   b. hydrolyzing the intermetallic compound with sulfuric acid, thereby producing the corresponding metal sulfate and a compound of hydrogen and the metalloid,
   c. thermally decomposing the compound of hydrogen and the metalloid, thereby producing hydrogen and regenerating the metalloid.
   d. thermally decomposing the product metal sulfate, thereby producing oxygen and sulfur trioxide and regenerating the metal oxide and sulfur dioxide,
   e. reacting the product sulfur trioxide with water, thereby regenerating sulfuric acid,
   f. recycling the regenerated metalloid, regenerated metal oxide and regenerated sulfur dioxide to step (a), and
   g. recycling the regenerated sulfuric acid to step (b).

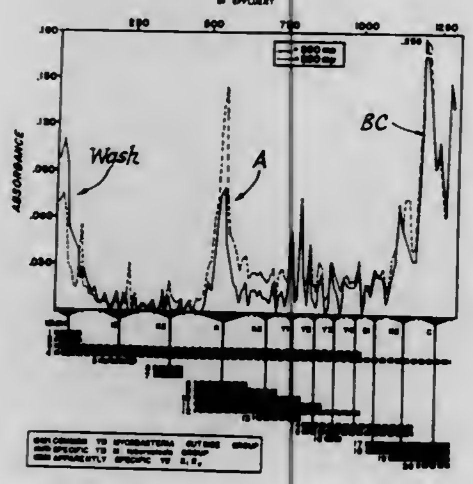
3,969,496
USE OF RADIOISOTOPES FOR RAPID IDENTIFICATION OF MICROORGANISMS

Joseph R. Schrot, Silver Spring, Md., assignor to Biospherics Incorporated, Rockville, Md.
Filed Dec. 28, 1973, Ser. No. 429,629
Int. Cl.² G01N *33/00;* **G01T** *1/16;* **G21H** *5/02;* **C12K** *1/06*
U.S. Cl. 424—1 **12 Claims**

1. A process for the rapid identification of a microorganism which comprises inoculating a number of different ^{14}C labeled substrates with an unknown microorganism, at least some of said ^{14}C labeled substrates being capable of being metabolized to $^{14}CO_2$ by certain specific microorganisms, incubating said substrates for a time sufficient to cause metabolic breakdown of at least some of said substrates resulting in the production of $^{14}CO_2$, analyzing for radioactivity in the CO_2 which is evolved from those substrates which are metabolized to determine which substrates are metabolized and to what extent by said unknown microorganisms, thereby obtaining a substrate radiorespirometric profile for said unknown microorganism, comparing said substrate radiorespirometric profile to standard radiorespirometric profiles for known microorganisms obtained by the same process by which the substrate radiorespirometric profile for said unknown microorganism was obtained and determining to which standard radiorespirometric profile the radiorespirometric profile for said unknown microorganism corresponds.

3,969,497
TEST SUBSTANCE FOR TUBERCULOSIS

William T. Kniker, San Antonio, Tex., assignor to Lincoln Laboratories, Inc., Decatur, Ill.
Filed May 5, 1971, Ser. No. 140,444
Int. Cl.² A61K *39/00*
U.S. Cl. 424—12 **8 Claims**



1. In a method for preparing a test substance having both high specificity and high sensitivity for detecting immunological sensitization to *M. tb.* in humans and animals which includes the steps of:

a. providing at least one *M. tb.* culture filtrate; and
b. fractionating said filtrate by means of ion-exchange chromatography so as to produce a plurality of chromatographic fractions;

the improvement which comprises:

c. subfractionating a plurality of said chromatographic fractions so as to produce a plurality of subfractins, each of which contains at least one *M. tb.* specific antigen and is substantially free of cross-reactive antigens; and
d. mixing a plurality of said *M. tb.* specific subfractions so as to produce a test substance which is substantially free of cross-reactive antigens and contains a plurality of *M. tb.* specific antigens.

3,969,498
DRESSING AND METHOD FOR TREATING A WOUND

Patrick N. Catania, and James C. King, both of Stockton, Calif., assignors to University of the Pacific, Stockton, Calif.
Filed Sept. 13, 1973, Ser. No. 397,203
Int. Cl.² A61K *9/70*
U.S. Cl. 424—28 **6 Claims**

1. In a wound dressing of the type having a water soluble solid, self-supporting flexible body consisting essentially of a film-forming polymer in integral non-discrete form in an amount sufficient to form an artificial eschar with the moist elements at the situs of the wound, the improvement in which said film-forming polymer is a plasma and water soluble dextran polymer having an average molecular weight of about 40,000 to about 100,000.

3,969,499
DENTAL ADHESIVE MATERIALS CONTAINING FLUORIDE COMPOUNDS

Henry L. Lee, Jr., San Marino, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.
Continuation of Ser. No. 146,466, May 24, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,048
Int. Cl.² A61K *7/18*
U.S. Cl. 424—52 **14 Claims**

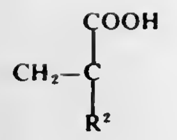
1. A composition of matter comprising a polymeric reaction product of a hydroxy terminated butadiene prepolymer having an average molecular weight of about 400 to 25,000 and containing 1 to 3 hydroxyl groups per molecule and a polyisocyanate reactant present in an amount to provide from 1.5 to 2.7 isocyanate groups for each hydroxyl group or active hydrogen site, and from 1 to 70% by weight of a fluoride ion containing compound capable of releasing fluoride ion.

3,969,500
SHAMPOO CONTAINING A WATER-SOLUBLE LINEAR CARBOXYLIC POLYMER

Malcolm George Kennerley, Edwalton, England, assignor to Lever Brothers Company, New York, N.Y.
Continuation of Ser. No. 336,093, Feb. 26, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,696
Claims priority, application United Kingdom, Mar. 3, 1972, 9969/72
Int. Cl.² A61K *7/06*
U.S. Cl. 424—10 **1 Claim**

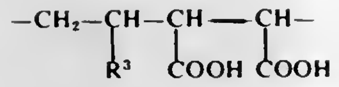
1. A shampoo which improves the lustre and ease of combing of the hair comprising an aqueous solution having a pH value of from about 3 to about 10 of

i. from about 5 to about 50% by weight of a non-soap synthetic anionic detergent selected from the group consisting of an alkyl sulphate, an alkyl ether sulphate, an alkyl sulphonate, an alkyl benzene sulphonate and a sulphosuccinate; and
ii. from 0.05 to 5% by weight of a water soluble carboxylic linear polymer having a molecular weight of about 1,000 to about 500,000 which contains repeating carboxylic acid units selected from the formulae consisting of:



$CH_2-\overset{COOH}{\underset{R^2}{C}}$

and



$-CH_2-\underset{R^3}{CH}-\underset{COOH}{CH}-\underset{COOH}{CH}-$

wherein R^2 is H or CH_3 and R^3 is H or OCH_3, or the water soluble salt thereof.

3,969,501
ANTIBIOTIC 342-14-I AND PRODUCTION THEREOF

Jun'ichi Shoji, Hirakata; Mikao Mayama, Ikeda; Shinzo Matsuura, Itami; Kouichi Matsumoto, Toyonaka, and Yoshiharu Wakisaka, Takarazuka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
Filed May 23, 1975, Ser. No. 580,341
Claims priority, application Japan, June 19, 1974, 49-70712
Int. Cl.² A61K *35/74*
U.S. Cl. 424—118 **3 Claims**

1. An antibiotic, 342-14-I, effective in inhibiting the growth of gram-positive microorganism, the said antibiotic being a colorless amphoteric powder which melts and decomposes at 190°–195°C; contains the elements carbon, hydrogen, nitrogen and oxygen in substantially the following proportions by weight:

Carbon	54.63 %
Hydrogen	7.12 %
Nitrogen	14.81 %
Oxygen	23.44 %(balance):

has a hydrochloric acid salt with an optical rotation of $[\alpha]_D^{22.0}$ $+6.1 \pm 0.5°$ (c=1.036 %, in methanol); has a molecular weight of about 1450 (estimated from amino acid analysis); shows the formation of aspartic acid, threonine, glycine, valine, isoleucine, phenylalanine, tryprophane, 2,4-diaminobutyric acid, ammonia and anteisononanoic acid by acid hydrolysis; has a hydrochloric acid salt with ultraviolet absorption (in methanol) at 274, 283 and 290.5 mμ; and has a hydrochloric acid salt with an infrared absorption spectrum as in the attached drawing, FIG. 1.

3,969,502
METHOD FOR CONTRACEPTION BY THE ADMINISTRATION OF SEQUENTIAL CONTRACEPTIVE PREPARATIONS

Ursula Lachnit-Fixson, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berin & Bergkamen, Germany
Continuation-in-part of Ser. No. 350,590, April 12, 1973, Pat. No. 3,939,264. This application July 9, 1974, Ser. No. 486,757
Claims priority, application Germany, Apr. 14, 1972, 2218831; Mar. 3, 1973, 2310963; July 9, 1973, 2335265
The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.
Int. Cl.² A61K *31/56*
U.S. Cl. 424—239 **9 Claims**

1. A method of contraception wherein a combination of an estrogen and a progestogen is administered orally to a female of child-bearing age for about 21 days and for the next 5–7 days, for a total of about 28 days, no estrogens and progestogens are administered, which comprises administering orally daily for the first 10–12 days either a combination of:

a. 0.030 mg. of 17α-ethinylestradiol and
   0.050 mg. of d-norgestrel,

or a combination of:

b. 0.030 mg. of 17α-ethinylestradiol and
   1 mg. of 17α-ethinyl-19-nortestosterone acetate;

and then administering orally daily for the next 11–9 days, when combination (a) is administered for the first 10–12 days, a combination of

c. 0.040 mg. of 17α-ethinylestradiol and
   0.125 mg. of d-norgestrel,

or when combination (b) is administered for the first 10–12 days, a combination either of:

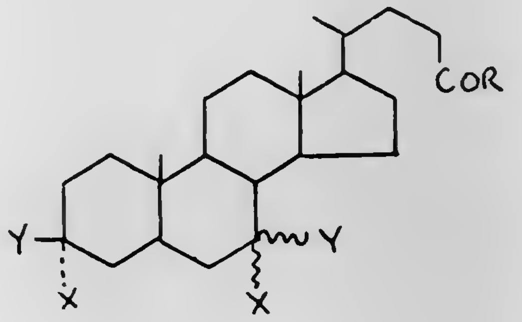
d. 0.050 mg. of 17α-ethinylestradiol and
   2 mg. of 17-ethinyl-19-nortestosterone acetate; or
e. 0.050 mg. of 17-ethinylestradiol and
   2 mg. of cyproterone acetate.

3,969,503
COMPOSITIONS AND METHODS USEFUL IN RENDERING LITHOGENIC MAMMALIAN BILE NON-LITHOGENIC

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.
Filed Oct. 2, 1975, Ser. No. 618,900
Int. Cl.² A61K *31/56*
U.S. Cl. 424—240 **6 Claims**

1. A composition for rendering lithogenic mammalian bile non-lithogenic which comprises, in combination:

a. a small but effective amount of a compound of the formula



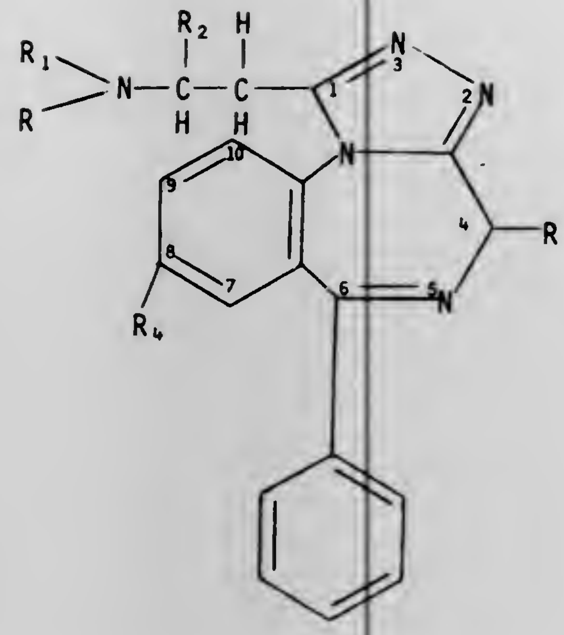
wherein each Y is hydrogen; each X is hydroxy or acyloxy; when taken together X and Y is oxo (O=); and R is hydroxy, acyloxy or alkoxy; and pharmaceutically acceptable salts thereof; and

b. a small but effective amount of a choloretic agent selected from the group consisting of dehydrocholic acid, glycocholic acid, florantyrone and tocamphyl.

3,969,504
6-PHENYL BENZODIAZEPINE ANTIDEPRESSANTS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Co., Kalamazoo, Mich.
Continuation-in-part of Ser. No. 550,120, Feb. 14, 1975, which is a continuation of Ser. No. 361,348, May 17, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,170
The portion of the term of this patent subsequent to June 17, 1993, has been disclaimed.
Int. Cl.² A61K *31/33*
U.S. Cl. 424—244 **9 Claims**

1. A process for treating depression comprising the administration to a human or animal subject an effective anti-depressant amount of a compound of the formula:



wherein R, R_1, R_2 and R_3 are hydrogen, methyl or ethyl, and R_4 is hydrogen, fluorine, chlorine, bromine, $-NO_2$, $-CF_3$, or methylthio, inclusive; or a pharmacologically acceptable acid addition salt thereof, in association with a pharmaceutical carrier.

3,969,505

8-N-METHYLPIPERAZINYL-N'-CARBONYLDIBENZOBICYCLOOCTADIENE AND SALTS THEREOF

Walton James Hammar, St. Paul, and Alvin C. Conway, North St. Paul, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 339,359, March 8, 1973, Pat. No. 3,904,630. This application July 11, 1975, Ser. No. 595,288

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **1 Claim**

1. The method for effecting sedative action upon the mammalian central nervous system which comprises administering an effective amount of a compound of the group consisting of

8-anti-(N-methylpiperazinyl-N'-carbonyl)dibenzobicyclo[3.2.1]octadiene and a pharmaceutically acceptable salt thereof to a mammalian subject.

3,969,506

PHARMACOLOGICALLY ACTIVE TRICYCLIC QUINAZOLINONES

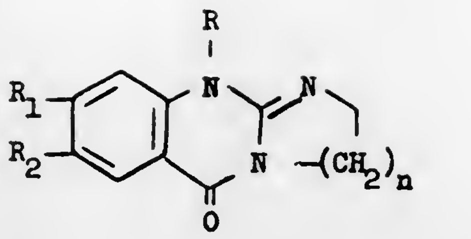
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 324,996, Jan. 19, 1973, Pat. No. 3,887,559, which is a continuation-in-part of Ser. No. 163,105, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 87,016, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 828,757, May 28, 1969, Pat. No. 3,598,823. This application Feb. 26, 1975, Ser. No. 553,143

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **14 Claims**

1. The method of effecting bronchodilation in an animal in need of said treatment comprising administering to said animal a bronchodilating effective amount of a compound of the formula:

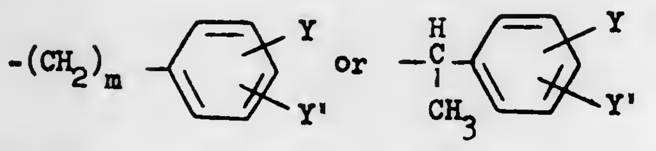


wherein

each of R_1 and R_2 is, independently, hydrogen, halo of atomic weight not greater than 36 or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both are alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, hydroxy or lower alkoxy of 1 to 2 carbon atoms,

n is 1 to 3,

R is alkyl of 1 to 5 carbon atoms,



m is 1 or 2,

each of Y and Y' is, independently, hydrogen, halo of atomic weight not greater than 36 or alkyl of 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y' are hydroxy, further provided that neither of R_1 and R_2 is hydroxy when either of Y and Y' is alkoxy and further provided that neither of Y and Y' is hydroxy when either of R_1 and R_2 is alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,969,507

METHOD OF PREVENTING AND TREATING THROMBOSIS

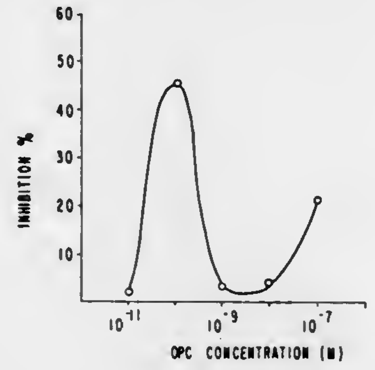
Hideaki Kohri, Tokushima, Japan, assignor to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,835

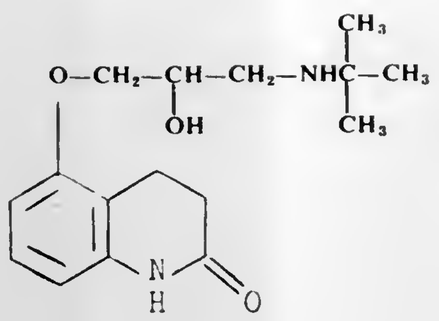
Claims priority, application Japan, Nov. 10, 1973, 48-125930

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **7 Claims**



1. A method for preventing blood platelet aggregation and minimizing blood platelet adhesion comprising applying in vitro to blood or in vivo to mammals afflicted with thrombosis an effective amount of 5-(hydroxy-3-t-butylamino)propoxy-3,4-dihydrocarbostyril having the formula



3,969,508

LOWERING THE CONCENTRATION OF PLASMA TRIGLYCERIDES

Nicholas W. DiTullio, Holmes, Pa.; Charles P. Lowman, Cherry Hill, N.J.; Alfred R. Maass, Swarthmore, and Harry L. Saunders, Willow Grove, both of Pa., assignors to Smith-Kline Corporation, Philadelphia, Pa.

Filed Nov. 27, 1974, Ser. No. 527,560

Int. Cl.² A61K *31/19, 31/38*

U.S. Cl. 424—275 **5 Claims**

1. A method of lowering the concentration of plasma triglycerides in a hyperlipidemic subject, which comprises administering internally to said subject a nontoxic amount, sufficient to lower said triglyceride concentration, of the compound 4-(2-thenoyl)-2,3-dichlorophenoxyacetic acid, an alkali metals salt of said acid or a pharmaceutically acceptable addition salt of said acid formed with a base.

3,969,509

ORTHO-CARBAMYLOXY-BENZAMIDE BACTERICIDES

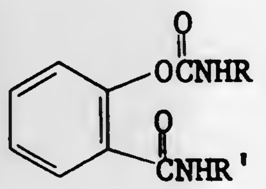
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 466,107, May 2, 1974, Pat. No. 3,888,906. This application Mar. 21, 1975, Ser. No. 560,841

Int. Cl.² A01N *9/20*

U.S. Cl. 424—300 **3 Claims**

1. A method of controlling bacteria comprising applying to the habitat thereof a bactericidally effective amount of a compound having the formula



wherein R is halogen substituted phenyl at least one of said halogen substituents being in the meta position and R' is selected from the group consisting of hydrogen and phenyl.

3,969,510

METHOD OF CONTROLLING FUNGI

Hans Osieka, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Hans Kiefer, Wachenheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

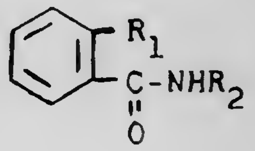
Continuation of Ser. No. 234,982, March 15, 1972, abandoned, which is a continuation of Ser. No. 53,307, July 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 722,549, April 19, 1968, abandoned. This application June 9, 1975, Ser. No. 584,859

Claims priority, application Germany, Apr. 28, 1967, 1642224

Int. Cl.² A01N *9/20*

U.S. Cl. 424—324 **9 Claims**

1. A method of controlling fungi of the class *Basidiomycetes* which comprises contacting fungi of the class *Basidiamycetes*-with a fungicidally effective amount of a compound having the formula



in which R_1 denotes methyl, chloro, bromo, iodo, trifluormethyl, amino or nitro and R_2 denotes phenyl or cycloalkyl of 6-8 carbon atoms.

3,969,511

INSECTICIDAL, MITICIDAL AND LEPIDOPTERICIDAL ACTIVE ISOTHIURONIUM COMPLEX ACIDS AND FREE BASES

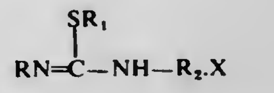
Llewellyn W. Fancher, Orinda, and Ashley H. Freiberg, Santa Clara, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 456,103, March 29, 1974, abandoned. This application Nov. 15, 1974, Ser. No. 524,094

Int. Cl.² A01N *9/20, 9/24*

U.S. Cl. 424—326 **87 Claims**

1. A method of controlling insects and mites consisting of applying to the insect or mite an insecticidal or miticidal amount of at least one compound having the formula



$$RN{=}\overset{\overset{\displaystyle SR_1}{|}}{C}{-}NH{-}R_2.X$$

wherein R is selected from the group consisting of benzyhydryl and lower alkyl having from 5 to 8 carbon atoms; R_1 is selected from the group consisting of alkenyl, cycloalkyl and lower alkyl each having from 1 to 6 carbon atoms, methylthiomethyl, phenyl, benzyl, and methylbenzyl; R_2 is selected from the group consisting of alkenyl aryl, aralkyl, cycloalkyl and lower alkyl each having from 5 to 10 carbon atoms; methylthiomethyl, propyl and butyl and X is either an inorganic acid or is non-existing.

3,969,512

N,N'BIS-(3-PHENOXY-2-HYDROXY-PROPYL)-ALKYLENEDIAMINES AND SALTS THEREOF

Herbert Köppe; Helmut Stahle; Werner Kummer; Gojko Muacevic, and Werner Traunecker, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

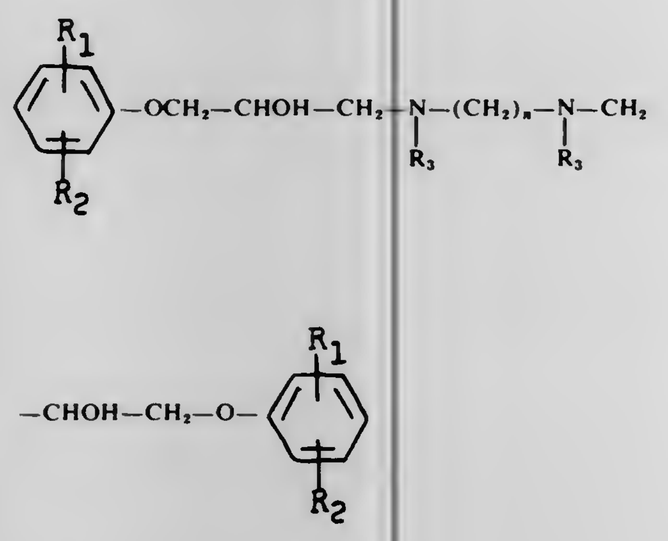
Division of Ser. No. 336,269, Feb. 27, 1973, Pat. No. 3,888,898. This application Feb. 10, 1975, Ser. No. 548,366

Claims priority, application Germany, Mar. 6, 1972, 2210620; Dec. 11, 1972, 2260444

Int. Cl.^{2} A61K *31/135*; **C07C** *93/06*

U.S. Cl. 424—330 **11 Claims**

1. A compound of the formula



wherein R_1 is allyl, allyloxy or chlorine,

R_2 is hydrogen or methyl,

R_3 is hydrogen, alkyl of 1 to 5 carbon atoms or benzyl, and

n is an integer from 2 to 6, inclusive,

provided, however, that when R_1 is allyl or allyloxy, R_2 is hydrogen; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

11. The method of blocking the β-adrenergic receptors and lowering the blood pressure of a warm-blooded animal in need of such treatment, which comprises perorally or parenterally administering to said animal an effective β-adrenergic receptor blocking and hypotensive amount of a compound of claim 1.

3,969,513

METHOD FOR CANDYING CHEWING-GUM SLABS

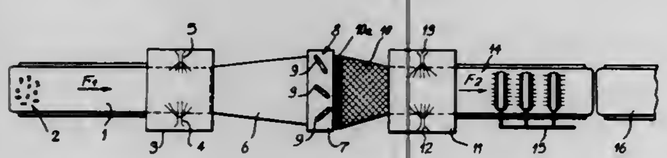
Jacques Edmond Marie Canonne, Geneva, Switzerland, assignor to Soreat S.A., Geneva, Switzerland

Filed Dec. 3, 1974, Ser. No. 529,116

Claims priority, application France, Oct. 22, 1974, 74.35454

Int. Cl.^{2} A23G *3/00, 3/30*

U.S. Cl. 426—5 **4 Claims**



1. A method for candying chewing-gum slabs comprising the steps of:

spraying the chewing gum slabs with eatable hot fluid;

coating the heated slabs with granulated confection sugar;

drying and cooling the coated slabs at a single drying tunnel; and

grouping the cooled coated slabs into packed units wherein individual slabs of gum are in direct contact with one another without sticking together.

3,969,514

COMBINATION FOOD PRODUCT HAVING DISCRETE PHASES OF NUT SPREAD AND OF A SECOND FOOD SPREAD

Peter J. Tiemstra, La Grange, Ill., assignor to Swift & Company, Chicago, Ill.

Filed July 17, 1974, Ser. No. 489,146

Int. Cl.^{2} A23L *1/06, 1/36, 1/38*

U.S. Cl. 426—90 **11 Claims**

1. A combination food product comprising a spreadable nut component phase, a second food spread phase of a marshmallow spread, a jelly, a jam, a preserve, or a marmalade, said second food spread phase having a normal water content between approximately 20 to 35 weight %, which corresponds to a water activity range of about 0.55 to 0.90, said spreadable nut component being an intimately mixed composition of minute particles of protein and carbohydrate suspended in an oil base, said spreadable nut component having water added thereto and thus a high water content of about 2% to 6% by weight thereof, which corresponds to a water activity range of about 0.40 to 0.70, a high oil content of about 55% to 65% by weight thereof, and a ground nuts content of about 60% to 90% by weight thereof, said high oil content and said high water content inhibiting the rate of moisture transfer from the second food spread phase into the spreadable nut component phase, said spreadable nut component phase being in contiguous contact with said second food spread phase and packaged as a combination food product wherein the spreadable nut component phase and the second food spread phase are discrete with respect to each other.

3,969,515

ANTIBIOTIC U-48,266

Alexander D. Argoudelis, and Fritz Reusser, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 10, 1975, Ser. No. 556,573

Int. Cl.^{2} A61K *35/74*

U.S. Cl. 424—118 **2 Claims**

1. Antibiotic U-48,266, which is active against *S. aureus*, *S. lutea* and *K. pneumoniae*, and which in its essentially pure form:

a. has the molecular formula $C_{17}H_{25}N_7O_5$

b. has the following elemental analysis: C, 50.16; H, 6.19; N, 24.09; O, 19.66;

c. has a specific rotation of $[\alpha]_D^{25} = -6.6°$ (c, 1, water);

d. is soluble in water and lower alcohols, for example, methanol and ethanol; is relatively insoluble in ketones, halogenated or saturated hydrocarbon solvents, ethyl acetate, or other ester-type solvents;

e. has a characteristic infrared adsorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings;

f. has a characteristic NMR spectrum as shown in FIG. 2 of the drawings;

g. has a typicla tlc pattern as shown in FIG. 3 of the drawings, or acid and base addition salts thereof.

3,969,516

COMPOSITION AND METHOD FOR TREATMENT OF ACNE

Richard B. Stoughton, Rancho Santa Fe, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation-in-part of Ser. No. 533,617, Dec. 19, 1974, abandoned. This application July 7, 1975, Ser. No. 593,641

Int. Cl.^{2} A61K *31/71*

U.S. Cl. 424—181 **9 Claims**

1. A method for temporarily alleviating the signs and symptoms of acne comprising topically administering to humans suffering from acne an effective amount of a composition comprising about 0.1 to about 10 percent percent by weight of an antibiotic of the lincomycin family.

3,969,517

ASYMMETRIC O,S-DIALKYL DITHIOPHOSPHORIC ACID ESTERS OF 1,2,3-BENZOTRIAZIN-4-ONES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

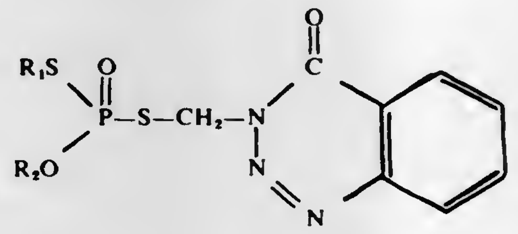
Division of Ser. No. 318,128, Dec. 26, 1972, Pat. No. 3,876,638. This application Jan. 29, 1975, Ser. No. 544,982

Claims priority, application Switzerland, Dec. 23, 1971, 18827/71; Nov. 22, 1972, 17011/72

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—200 **5 Claims**

1. An insecticidal and acaricidal composition comprising (1) an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 is N-propyl, isopropyl, n-butyl, isobutyl or sec-butyl, and R_2 is methyl or ethyl, and (2) a suitable carrier.

3,969,518

INHIBITING XANTHINE OXIDASE WITH 3-HALOALKYL SUBSTITUTED BENZOTHIADIAZINE-1,1-DIOXIDES

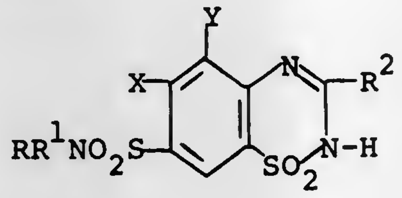
Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 24, 1972, Ser. No. 256,224

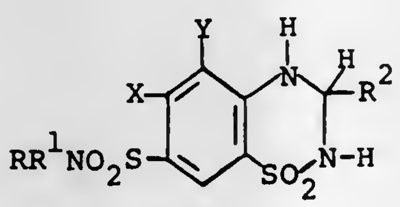
Int. Cl. A61k *19/02*

U.S. Cl. 424—246 **17 Claims**

1. A method for inhibiting the action of xanthine oxidase in a mammal having an elevated blood uric acid level by orally administering to said mammal a dose sufficient to lower the blood uric acid level to normal for that species of a xanthine oxidase inhibitor selected from the group consisting of structure I and structure II:



I



II

or sodium or potassium salt thereof wherein R represents hydrogen, C_{1-3} alkyl or allyl; R^1 represents hydrogen, C_{1-3} alkyl or allyl; X represents halogen or trifluoromethyl; Y represents hydrogen, chloro or bromo; and R^2 represents mono- or polyhalo C_{1-5} alkyl.

3,969,519

PHARMACEUTICAL COMPOSITION HAVING SYNERGISTIC ANALGESIC ACTIVITY AND CONTAINING AZIDOMORPHINE OR AZIDOCODEINE

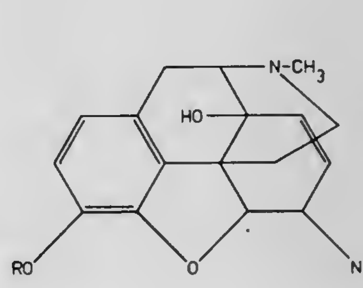
József Knoll; Zsuzsanna Fürst; Zoltan Mészaros; Gábor Nagy; Ágoston Dávid, all of Budapest; Rezsö Bognár; Sándor Makleit, both of Debrecen, and Gyula Valovics, Tiszavasvari, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti, Budapest, Hungary

Filed Dec. 26, 1974, Ser. No. 536,402

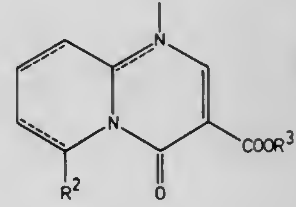
Claims priority, application Hungary, Dec. 29, 1973, CI 1432

Int. Cl.^{2} A61K *31/505, 31/485*

U.S. Cl. 424—251 **14 Claims**

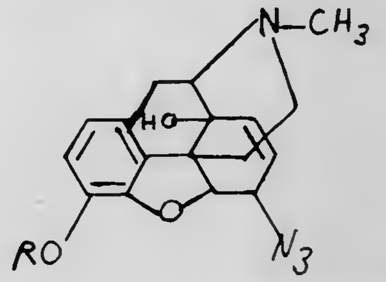


I

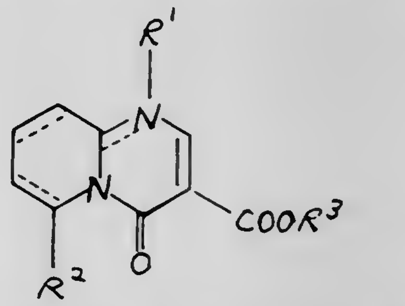


II

1. A pharmaceutical composition of synergistic analgesic effect which comprises in effective amounts at least one azido-compound of the formula



or its salt, wherein R is hydrogen or methyl and at least one homopyrimidazole compound of the formula:



wherein R^1 and R^2 are lower alkyl and R^3 is hydrogen or lower alkyl, and the dotted lines represent either double bonds or hydrogen atoms or a salt or pharmaceutically acceptable quaternary salt thereof in admixture with pharmacetically acceptable carriers or diluents.

3,969,520

2-AMINO-4[2-(1-LOWER ALKYL-5-NITRO-2-IMIDIAZOLYL)VINYL]PYRIMIDINES FOR TREATING PROTOZOAL AND BACTERIAL INFECTIONS

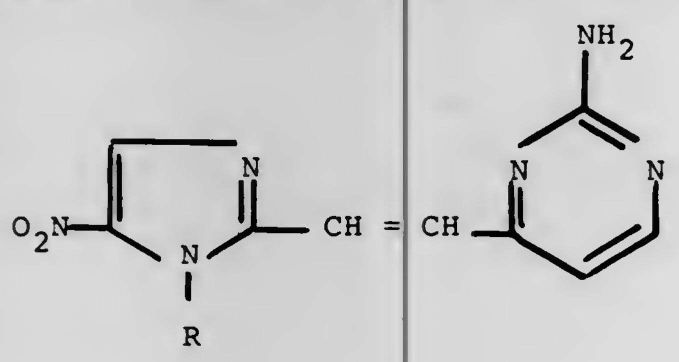
Aldo Garzia, Lodi (Milan), Italy, assignor to Istituto Chemioterapico Italiano S.p.A., Italy

Division of Ser. No. 364,025, May 25, 1973, Pat. No. 3,882,105, which is a continuation-in-part of Ser. No. 309,483, Nov. 24, 1972, abandoned. This application Nov. 6, 1974, Ser. No. 521,383

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **14 Claims**

1. A pharmaceutical composition for therapeutically treating a protozoal disease or bacterial infection in a living, warm-blooded animal body comprising an amount effective to combat the disease or infection of an active ingredient consisting essentially of a compound of the formula



wherein R is lower alkyl of 1 to about 6 carbon atoms and a pharmaceutically acceptable carrier.

3,969,521

PHARMACEUTICAL COMPOSITIONS CONTAINING TETRAHYDROALSTONINE AND METHOD FOR TREATING CIRCULATION DISORDERS

Jean-Claude Poignant, Bures-Sur-Yvette, France, assignor to Union et Cie, Societe Francasise de Recherche Medical, Suresnes, France

Filed Oct. 17, 1974, Ser. No. 515,785

Claims priority, application Germany, Aug. 18, 1975, 2439523

Int. Cl.^{2} A61K *31/475*

U.S. Cl. 424—262 **3 Claims**

1. A method for increasing the peripheral blood flow in capillary and venous circulation in humans or animals which comprises administering to said humans or animals in need of said method an effective amount, for increasing the peripheral blood flow in capillary and venous circulation, of a compound selected from the group consisting of tetrahydroalstonine and an acid addition salt thereof.

3,969,522

DIARYL-PYRIDYL-IMIDAZOLE METHANES FOR TREATING MYCOTIC INFECTIONS

Wilfried Draber; Manfred Plempel, and Karl Heinz Büchel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

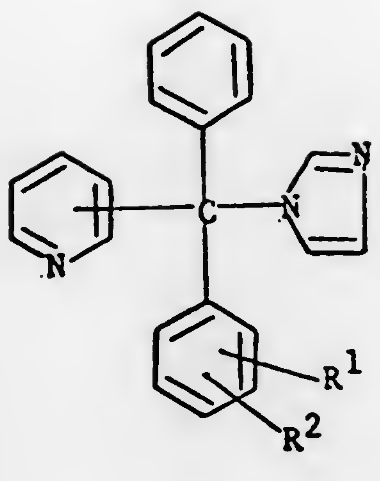
Division of Ser. No. 367,849, June 7, 1973, Pat. No. 3,910,936. This application Mar. 11, 1975, Ser. No. 557,354

Claims priority, application Germany, June 15, 1972, 2229128

Int. Cl.^{2} A61K *31/44*

U.S. Cl. 424—263 **50 Claims**

25. A method of treating mycotic infections in humans and animals which comprises administering to a human or animal an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable, non-toxic salt thereof wherein

R^1 and R^2 are the same or different alkyl of 1 to 4 carbon atoms.

3,969,523

ANTIPHLOGISTIC PHARMACEUTICAL COMPOSITIONS CONTAINING A 1-(NICOTINOYL OR ISONICOTINOYL)-3-BIPHENYLYL-ALKANONE-(2)

Josef Nickl; Helmut Teufel; Wolfhard Engel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

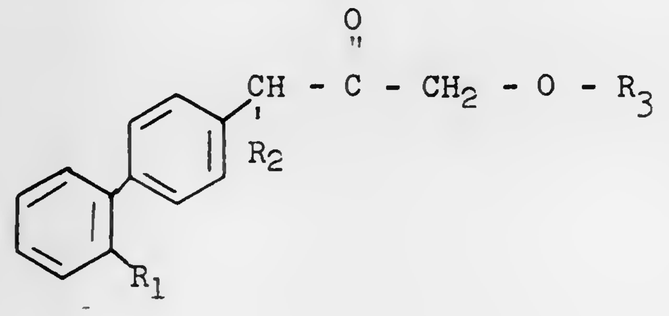
Division of Ser. No. 474,181, May 29, 1974, Pat. No. 3,920,668. This application Aug. 25, 1975, Ser. No. 607,667

Claims priority, application Germany, June 7, 1973, 2328973

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 **6 Claims**

1. An antiphlogistic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiphlogistic amount of a compound of the formula



wherein

R$_1$ is hydrogen fluoro or chloro,

R$_2$ is hydrogen or alkyl of 1 to 3 carbon atoms, and

R$_3$ is nicotinoyl or isonicotinoyl, or an optically active antipode thereof.

3,969,524

STABLE AMOXICILLIN DOSAGE FORM

Alexander S. Emodi, West Orange; Harold Leon Newmark, Maplewood, and Leonard Joseph Scialpi, Parsippany, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 13, 1974, Ser. No. 497,158

Int. Cl.^{2} H61K *31/43*

U.S. Cl. 424—271 **6 Claims**

1. An injectable solution for intramuscular or intravenous administration containing 1.0–2.0 moles of anhydrous sodium carbonate per mole of amoxicillin free acid, said amoxicillin being present in said solution in sufficient amount to provide from about 5% to 20% by weight of amoxicillin.

3,969,525

METHOD FOR REDUCING THE HEART BEAT FREQUENCY

Martin Wolf, Geisenheim, Johannisberg, Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Jan. 16, 1975, Ser. No. 541,381

Claims priority, application Germany, Feb. 1, 1974, 24047549

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 **1 Claim**

1. The method of slowing the heart rate in an adult human in need of such treatment, which comprises enterally or parenterally administering to said adult human 0.5 to 5 mgm of 2-(2′,6′-diethylphenyl-amino)-1,3-diazacyclopentene-(2) or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

3,969,526

ANTHELMINTIC 5-HETEROCYCLIOTHIO AND OXY-2-CARBALKOXYAMINOBENZIMIDAZLES

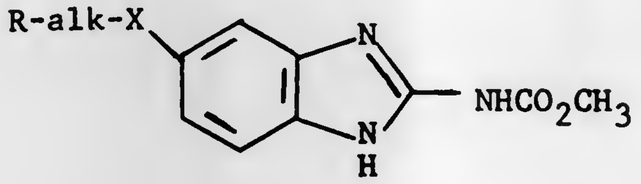
Robert J. Gyurik, West Brandywine, and William D. Kingsbury, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 364,841, May 29, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,781

Int. Cl.^{2} C07D *405/12, 409/12*

U.S. Cl. 424—273 **11 Claims**

1. A chemical compound of the structure:



in which R is furyl or thienyl; and X is thio or oxy, said furyl or thienyl being C-attached to X through alk which is an alkylene chain of from 1–4 members.

3,969,527

CNS ACTIVE COMPOUNDS

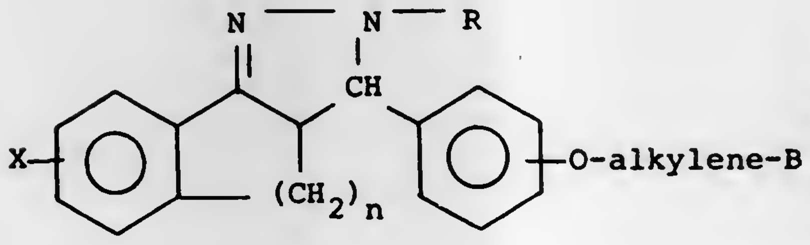
John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 28, 1975, Ser. No. 599,732

Int. Cl.^{2} A61K *31/415;* **C07D** *231/54, 231/56*

U.S. Cl. 424—273 **22 Claims**

1. A compound of the formula



wherein X is a member selected from the group consisting of H, halogen, alkyl of from 1 to 8 carbons, lower alkoxy or CF$_3$; R is a member selected from the group consisting of H, lower alkyl, lower alkanoyl, phenyl, phenyl lower alkyl or hydroxy lower alkyl; *n* is 1, 2 or 3; B is a member selected from the group consisting of lower alkylamino, dilower alkylamino and alkylene is a straight or branched saturated hydrocarbon chain group containing from 2 to about 5 carbons; and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

3,969,528

HEXAHYDROIMIDAZO[1,5-A]PYRIDINES

John Leheup Archibald; Alan Chapman White, both of Windsor, and Robin Michael Black, Porton, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

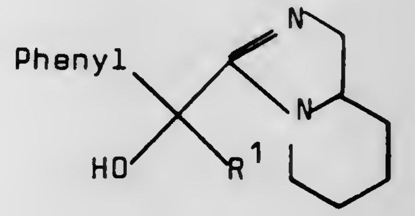
Filed Apr. 8, 1975, Ser. No. 566,632

Claims priority, application United Kingdom, Apr. 19, 1974, 17220/74

Int. Cl.^{2} C07D *471/00*

U.S. Cl. 424—267 **4 Claims**

1. A compound selected from the group consisting of bases having the formula (1)



(I)

and the acid addition salts of said bases with pharmaceutically acceptable acids, wherein R^1 represents phenyl or phenyl substituted by one or more hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl or halogen groups.

3,969,529

PHENOXYACETIC ACID DERIVATIVES AS DIURETIC AGENTS

Jean Jacques Godfroid, Noisy-le-Sec, and Jean Eugene Thuillier, Paris, both of France, assignors to C.E.R.P.H.A., Arcueil, France

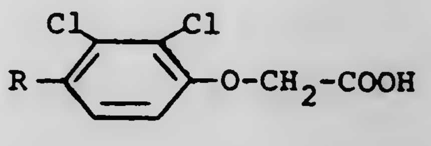
Continuation of Ser. No. 353,986, April 24, 1973, abandoned, which is a division of Ser. No. 78,976, Oct. 7, 1970, Pat. No. 3,758,506. This application Apr. 28, 1975, Ser. No. 572,311

Claims priority, application France, Oct. 10, 1969, 69.34760

Int. Cl.^{2} A61K *31/38*

U.S. Cl. 424—275 **8 Claims**

1. A therapeutic composition in dosage form, particularly for increasing diuresis, which contains as active principle at least one phenoxyacetic acid compound selected from the group consisting of a phenoxyacetic acid of the formula



wherein R is 2-furyl keto, 2-thienyl keto or 2(5-methyl thienyl) keto, an alkali metal salt of said acid, and an addition salt of said acid with a pharmaceutically acceptable base together with a pharmaceutically acceptable diluent, said active principle being present in an amount of 0.050 to 1 g.

3,969,530

4-HYDROXY-3,5-DI-ALKYL-PHENYL-PROPIONIC ACID COMPOSITION SUITABLE AS LIPID LOWERING AND ANTI-DIABETIC AGENTS

Otto Mauz, Liederbach, Taunus, and Ernold Granzer, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

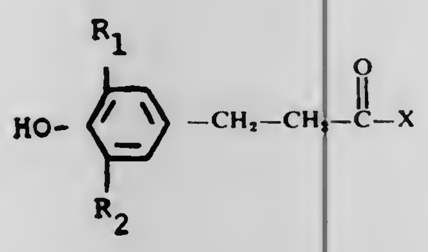
Filed Aug. 16, 1973, Ser. No. 389,004

Claims priority, application Germany, Aug. 18, 1972, 2240609

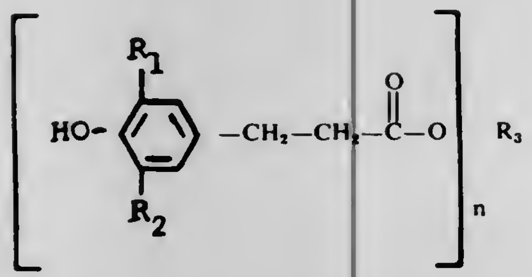
Int. Cl.² A61K *31/235*

U.S. Cl. 424—308 **16 Claims**

1\. A pharmaceutical composition for lowering the lipid or blood sugar level comprising an effective amount for lowering the lipid or blood sugar level, in a unit dosage of 0.2 to 4 grams, of a 4-hydroxy-3,5-dialkyl-phenylpropionic acid or derivative thereof corresponding to formula I or II



I



II

wherein:

R_1 and R_2, which may be identical or different, is alkyl of 1 to 8 carbon atoms, R_3 is alkylene of 2 to 12 carbon atoms, X is hydroxy, alkoxy of 1 to 18 carbon atoms, phenalkoxy of 1 to 4 alkyl carbon atoms or cycloalkoxy of 5 to 8 carbon atoms, and *n* is an integer from 2 to 4, and a pharmacologically acceptable carrier therefor.

10. A method of treatment for lowering the lipid or blood sugar level by oral administration which comprises administering to a patient a unit dosage of 0.2 to 4 grams of the active compound in a composition as defined in claim 1.

3,969,531

METHOD FOR DISPENSING A SEMI-FROZEN COMESTIBLE

Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company

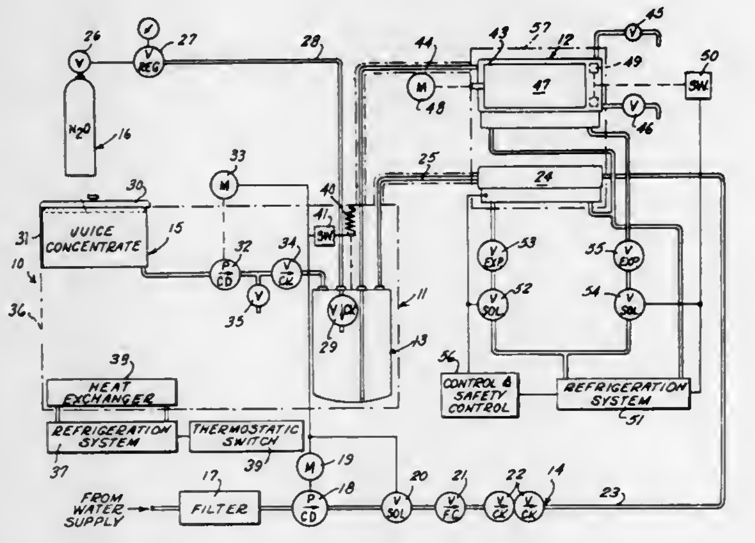
Continuation of Ser. No. 165,975, July 26, 1971, abandoned, which is a division of Ser. No. 866,861, Oct. 16, 1969, Pat. No. 3,642,174. This application Aug. 14, 1974, Ser. No. 497,298

Int. Cl.² A23G *9/20, 9/16, 9/28*

U.S. Cl. 426—319 **5 Claims**

1\. A process for producing and dispensing a semi-frozen comestible, comprising:

a. providing an unfrozen quantity of concentrated natural fruit juice;
b. storing said concentrated juice under refrigeration;
c. providing a quantity of pressurized nitrous oxide gas;
d. providing a quantity of water separate from said juice;
e. metering the concentrated juice while simultaneously separately regulating a flow of said water, and thereafter combining the metered juice and the flow-regulated water in an atmosphere charged with nitrous oxide gas under regulated pressure;
f. storing the resulting mixture under said regulated pressure of said gas under refrigerated non-freezing conditions;
g. transferring a portion of the stored mixture to a separate freezing chamber in response to the regulated pressure on the stored mixture;
h. lowering the temperature of said portion so as to freeze a predetermined proportion thereof under said regulated pressure as pure frozen water crystals dispersed in the unfrozen mixture; and
j. dispensing a serving of the comestible from said freezing chamber to atmospheric pressure to enable the dissolved nitrous oxide to break out of the liquid portion of the serving to render the serving fluffy.



3,969,532

1-ARYL-3-(2-HYDROXYETHYL) THIOUREAS FOR TREATING DEPRESSION

James R. McCarthy, Jr., Midland; Don V. Wysong, Farwell, and Bobbie J. Allen, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 438,927, Feb. 1, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,831

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **2 Claims**

1\. A composition for treating depression in a mammal comprising an effective anti-depressant amount of the compound 1-(2,4-dimethylbenzyl)-3-(2-hydroxyethyl)thiourea in combination with a suitable pharmaceutical carrier.

3,969,533

PROCESS FOR THE MANUFACTURE OF A SOLUBLE COFFEE PRODUCT

John G. Donnelly, Hasbrouck Heights, N.J., and George E. Livingston, Malverne, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 11, 1973, Ser. No. 423,862

Int. Cl.² A23F *1/08*

U.S. Cl. 426—432 **7 Claims**

1\. In the process of manufacturing soluble coffee powder wherein coffee extract obtained from the extraction of roasted and ground coffee is transported to a storage vessel and then passed to a drying operation, the improvement comprising agitating the coffee extract within said storage vessel by recirculating the coffee extract through an eductor submerged in the coffee extract at rates sufficient to prevent coalescing of the insoluble material contained in said extract.

3,969,534

SHELF-STABLE LOW-FAT BIOLOGICALLY FERMENTED DAIRY PRODUCT

Robert L. Pavey, Western Springs, and Patrick E. Mone, Oak Lawn, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,590

Int. Cl.² A23C *9/12*

U.S. Cl. 426—34 **12 Claims**

1\. A process for producing a shelf-stable cultured low-fat dairy product comprising: a first pasteurization step by heating a low-fat dairy base; biologically fermenting said dairy base; mixing in a starch stabilizer; heating the mixture to a syneresis temperature high enough to promote syneresis and low enough to avoid both pasteurization and setting of the mixture; maintaining the syneresis temperature until appreciable syneresis is accomplished, said syneresis temperature being within the approximate range of 100° to 150°F.; thereafter homogenizing the mixture to restructure same into a uniform, flowable, preset product; flowing the preset product in preparation for a canning step; accomplishing a second pasteurization step at a temperature of approximately 170° to 200°F., said secnd pasteurization step also serving to initiate setting of the present product; and permitting final setting of the flowable present product in a container to produce a cultured low-fat dairy product that has a room temperature shelf stability of at least 6 months.

3,969,535

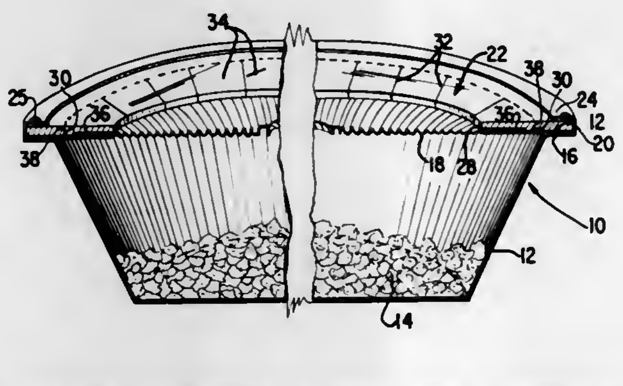
POPCORN PACKAGE

George B. Bourns, La Porte, Ind., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,866

Int. Cl.² A23L *1/18*

U.S. Cl. 426—111 **6 Claims**



1\. A package for storing and preparing an expansible food stuff comprising in combination:

A. A cooking pan;
B. A food stuff disposed in said pan;
C. An expansible cover closing the upper surface of said pan;
D. A gasket disposed adjacent to said cover;
  1. Said gasket further comprising an annulus, the outer surface of said annulus being substantially coextensive with the outer surface of said pan and said cover; the inner diameter of said annulus being substantially smaller than the outer diameter of said pan;
  2. An annular score formed in said gasket between said inner diameter and said outer diameter and extending partly through said gasket from the pan side;
  3. A plurality of straight scores extending from the inner diameter of said gasket to said annular score completely through said gasket material and defining a plurality of fingers which are adaptable to flex about a hinge defined by segments of said annular score;
  4. Each of said fingers being adhesively connected to the adjacent surface of the cover;
E. Said pan, gasket and cover being held together by crimping the edges of said cooking pan, whereby the integrity of said expansible cover is maintained, retaining steam generated during heating and improving the degree and extent of expansion of the expansible food stuff.

3,969,536

METHOD FOR PREPARING JELLY FOODS

Terukazu Ikeda, Tokyo; Shintaro Moritaka, Kobe; Satohiko Sugiura, and Tsutomu Umeki, both of Kawasaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Nichiro Gyogyo Kaisha, Ltd., Tokyo, both of, Japan

Filed Apr. 8, 1975, Ser. No. 566,518

Claims priority, application Japan, Apr. 9, 1974, 49-40565

Int. Cl.² A23L *1/04*

U.S. Cl. 426—103 **6 Claims**

1\. A method for preparing a jelly food, which comprises (1) separately preparing at least two mixtures each of which contains from 0.5 to 5 weight % of a thermally gelable polysaccharide predominantly composed of β-1,3-glycosidic groups, (2) separately maintaining each of the mixtures within the temperature range of from 55° to 80°C under stirring to disperse the polysaccharide in each of the mixtures, (3) assembling the resultant mixtures in a manner such that each mixture is independent from each of the other mixtures but in intimate contact with at least one of the other mixtures, (4) heating the resultant assembly to a temperature not less than 60°C, and (5) cooling the heated assembly.

3,969,537

METHOD FOR THE PROCESSING OF VINASSE

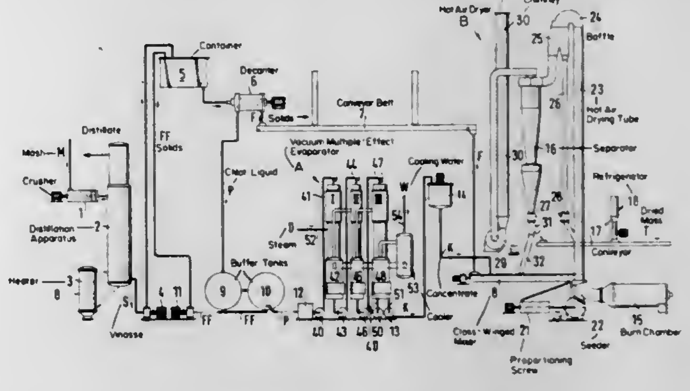
Hans-Martin Stoltenburg, Selk, Germany, assignor to Kartoffelverwertungsgesellschaft Cordes & Stoltenburg, Schleswig, Germany

Filed Apr. 9, 1974, Ser. No. 459,276

Claims priority, application Germany, Apr. 13, 1973, 2318751

Int. Cl.² A23B *4/04*

U.S. Cl. 426—464 **5 Claims**



1\. A method of processing potato vinasse comprising the steps of:

a. crushing a fermented potato mash whereby the dangers of heat crusting and clogging are reduced to a minimum;
b. distilling the crushed potato material by indirect heating to obtain a bottoms residue of potato vinasse;
c. fractionating the potato vinasse by decanting the same to simultaneously convert the vinasse into clear liquid with a very minimal content of undissolved solids, and solids with high degree of dehydration and removing the solids therefrom;
d. exiting the clear fractionated liquid from the decantation zone, and running the same free-fall into a lower buffer zone to separate sediment from the clear flow fractionated liquid and recycling the sediment to the decantation zone;
e. thereafter thickening the clean fractionated liquid from the buffer zone by multiple effect vacuum downfall vaporization to form a concentrate;

- f. cross-winged mixing the concentrate with the potato solids from the decantation zone;
- g. drying the mixture of step (f) by a two-stage hot-air drying system, whereby rapid drying is accomplished; and
- h. separating solids from step (g) and returning a portion thereof to step (f) for mixing therein.

3,969,538
RECOVERY OF ENZYMES WITH ION EXCHANGERS

Dieter Schwengers, Dormagen; Hans Georg Schneider, Euskirchen, and Ingrid Keller, Monchengladbach, all of Germany, assignors to Pfeiffer and Langen, Cologne, Germany

Filed Jan. 16, 1975, Ser. No. 541,670

Claims priority, application Germany, Jan. 17, 1974, 2402226; Aug. 21, 1974, 2439989

Int. Cl. C07g *7/02;* **A23c** *9/14*

U.S. Cl. 426—491 **18 Claims**

1. A process for separating enzymes from an aqueous solution in which they are mixed with smaller organic molecules, comprising passing the solution through an ion exchange resin, eluting the resin with water, and separating an enzyme-rich fraction before the appearance of a fraction of the eluate containing the samller organic molecules.

17. The process of claim 3, wherein the aqueous solution is milk and the eluate is successively divided into an enzyme-rich fraction and then a lactose-fraction.

3,969,539
PROCESS FOR PREPARING SYNTHETIC FOOD PRODUCTS

Arthur K. Sumner, Saskatoon; Linda M. Leinan, St. Jean, and Clarence G. Youngs, Saskatoon, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 31, 1973, Ser. No. 365,662

Claims priority, application Canada, June 2, 1972, 143692

Int. Cl.² A23J *3/00*

U.S. Cl. 426—641 **17 Claims**

1. A process for preparing a fragmented food product for admixing with meat products, comprising (a) forming an aqueous solution or dispersion containing pea protein concentrate with up to 40 percent edible oil by weight of the total solids plus oil, (b) drying the solution or dispersion rapidly in sheet form on a heated drying surface to form a sheeted dried product having a moisture content sufficient to permit fragmenting, (c) fragmenting said sheeted product prior to rehydration thereof and (d) thereafter rehydrating the fragmented product to a moisture content of at least about 50 percent to form said fragments suitable for admixing with meat products.

3,969,540
ENZYMATICALLY PREPARED METAL PROTEINATES

Ned L. Jensen, Layton, Utah, assignor to Albion Laboratories, Inc., Clearfield, Utah

Filed Sept. 11, 1975, Ser. No. 612,371

Int. Cl.² A23J *1/02*

U.S. Cl. 426—657 **4 Claims**

1. A composition of matter comprising naturally occurring proteinaceous tissues selected from the group consisting of muscle, heart, liver, thymus, brain, spleen, kidneys, duodenum, pancrease, and orchic a portion of which have been enzymatically hydrolyzed by a protease to produce polypeptides; said polypeptides being chelated with bivalent biologically essential metals to form metal proteinates.

3,969,541
DIFFUSION TRANSFER IMAGE RECEPTIVE MATERIALS

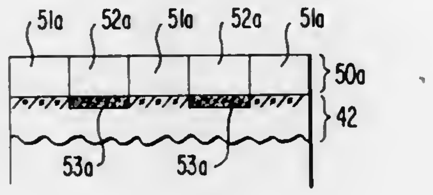
Yoshito Mukaida; Eiichi Mizuki; Tomoaki Ikeda; Masayoshi Tsuboi; Akio Ishizuka, and Fumiaki Shinozaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 27, 1972, Ser. No. 238,228

Claims priority, application Japan, Mar. 26, 1971, 46-18122

Int. Cl.² G03C *5/54*

U.S. Cl. 427—400 **15 Claims**



1. A process for producing a diffusion transfer image receptive sheet comprising an alkali impermeable polymer, which process comprises contacting a surface portion of said alkali impermeable polymer with a solution containing both diffusion transfer nuclei and at least one material which is capable of converting the alkali impermeable polymer into an alkali permeable state to simultaneously make said surface portion of said alkali impermeable polymer alkali permeable and incorporate therein diffusion transfer nuclei.

3,969,542
CATALYSTS AND METHODS OF MAKING

Tadayoshi Tomita, Yokohama; Mikio Noda; Yoshinobu Yamaguchi, both of Nagoya, and Kin-ichiro Uwano, Kariya, all of Japan, assignors to Toyo Engineering Corporation, Tokyo and Fujimi Kenmazai Kogyo Co., Ltd., both of, Japan

Filed July 12, 1974, Ser. No. 487,892

Int. Cl.² B01J *29/00, 23/08*

U.S. Cl. 252—457 **10 Claims**

1. The method of preparing a sintered catalyst article which comprises the steps of

- (I) kneading with water either (a) a refractory powder of calcium aluminate alone, or (b) a mixture of
  - 1. at least 25 wt. percent of said refractory powder and
  - 2. the balance is at least one member selected from the group consisting of aluminum oxide, calcium oxide, beryllium oxide, magnesium oxide, strontium oxide and a compound which is converted by heating to one of said oxides,

wherein (a) and (b) contain less than 0.2 wt. percent of silicon dioxide, less than 3.0 wt. percent of other metal oxides and the other ingredients are present in amounts effective to provide a sintered catalyst article having the composition set forth hereinbelow:

- II. molding the kneaded material into a shaped article;
- III. placing the shaped article in a vessel, closing the vessel and aging said shaped article in said closed vessel for at least one day while preventing evaporation of water to obtain a shaped article having a crushing strength of at least about 120 Kg/cm²;
- IV. drying the shaped article at a low temperature to remove uncombined water; and then
- V. sintering the shaped article at a temperature above 1150°C; the thus sintered catalyst article consisting of 10 to 60 wt. percent of calcium oxide, 30 to 90 wt. percent aluminum oxide 0 to 30 wt. percent of at least one oxide selected from the group consisting of beryllium oxide, magnesium oxide and strontium oxide, less than 0.2 wt. percent of silicon dioxide and less than 3.0 wt. percent of other metal oxides.

3,969,543
METHOD OF PROVIDING A PATTERNED LAYER OF SILICON-CONTAINING OXIDE ON A SUBSTRATE

Edward David Roberts, Purley, England, and Jan Frederik Steggerda, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,493

Claims priority, application United Kingdom, Oct. 1, 1973, 45771/73

Int. Cl.² B05D *3/06*

U.S. Cl. 427—54 **15 Claims**

1. A method of providing a patterned silicon containing oxide layer on a substrate, said method comprising applying a coating comprising a polymerizable cyclosiloxane containing methyl groups bonded to silicone and an ultra-violet sensitive sensitizer capable of being converted to a basic reacting form capable of promoting polymerization of the polymerizable cyclosiloxane to an insoluble state in a solvent for the polymerizable cyclosiloxane, exposing desired areas of said coated substrate to ultra-violet radiation to thereby cause polymerization of the polymerizable cyclosiloxane to an insoluble state, treating said surface with a solvent capable substantially only of dissolving unexposed polymerizable cyclosiloxane and then converting the polymerized cyclosiloxane to a silicon containing oxide.

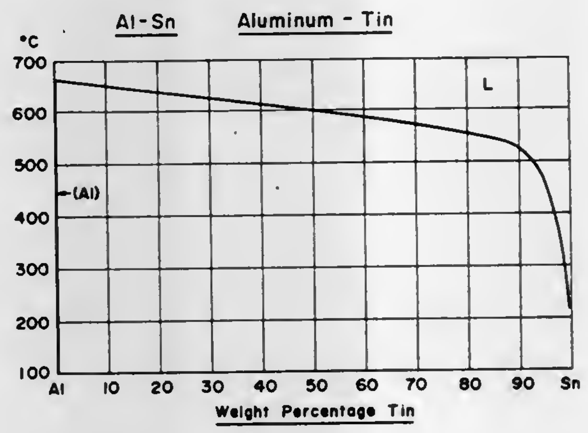
3,969,544
METHOD FOR PLATING METALLIC WORKPIECES, PARTICULARLY ALUMINUM

Edward G. Obeda, Brookfield, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Feb. 14, 1975, Ser. No. 549,894

Int. Cl.² B23K *35/12*

U.S. Cl. 427—57 **8 Claims**



1. A method of applying a tin plating upon an aluminum workpiece comprising the steps of:

- maintaining a pool of molten tin at a temperature of at least 300°C for causing an alloy to be formed between the aluminum workpiece and the tin;
- disposing the aluminum workpiece in said pool for a period of time sufficient for causing the surface of the workpiece to attain said temperature, and
- providing high frequency vibratory energy in the sonic or ultrasonic frequency range to said pool while said workpiece is disposed in said molten tin.

3,969,545
LIGHT POLARIZING MATERIAL METHOD AND APPARATUS

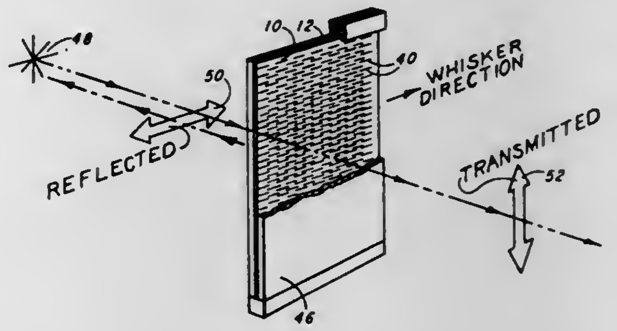
Robert E. Slocum, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 337,046, March 1, 1973, abandoned. This application Nov. 19, 1974, Ser. No. 525,232

Int. Cl.² C23C *13/02*

U.S. Cl. 427—163 **17 Claims**

1. The process of making light polarizers comprising directing in a vacuum a vaporized metallic material which is reflective at the wavelength to be polarized directly onto a microscopically smooth surface that whiskers formed of said material are grown on said surface with their long axis essentially parallel to the vaporized material direction and the projections of said long axis on said surface are essentially parallel.



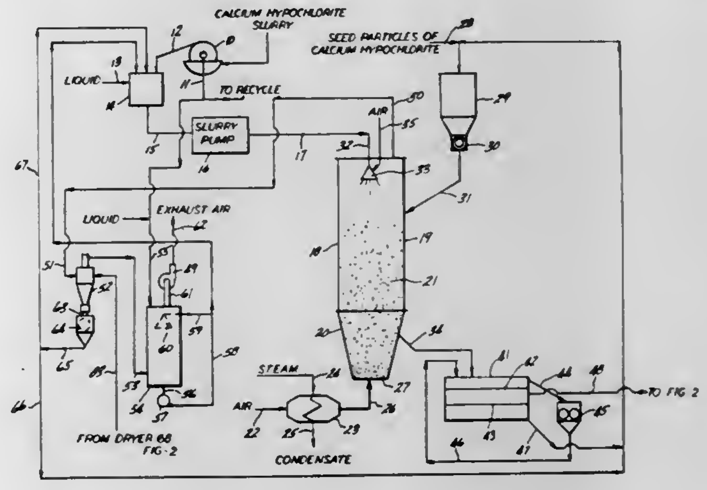
3,969,546
PROCESS FOR PREPARING GRANULAR CALCIUM HYPOCHLORITE IN A FLUIDIZED BED

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, July 31, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,931

Int. Cl.² C01B *11/06*

U.S. Cl. 427—213 **19 Claims**



1. A method for preparing particulate solid calcium hypochlorite having a smooth rounded surface from a pumpable and sprayable aqueous slurry of calcium hypochlorite which comprises:

- a. maintaining a moving bed of particulate solid calcium hypochlorite containing from about 5 to about 30 percent by weight of water in a fluidized bed having an upper part and a lower part,
- b. maintaining a temperature in said fluidized bed in the range from about 40° to about 70°C.,
- c. lifting a portion of said moving bed with a flowing stream of gas to said upper part and releasing said particles by gravity to separately fall through said fluidized bed to said lower part,
- d. spraying on said falling particles a pumpable and sprayable aqueous slurry of calcium hypochlorite containing from about 45 to about 90 percent by weight of water,
- e. simultaneously evaporating and removing water from said slurry on said falling particles whereby said particles are coated with a layer of solid calcium hypochlorite, and the water content is from about 5 to about 30 percent by weight, and
- f. removing at least a portion of the resulting coated smooth rounded calcium hypochlorite particles from said lower part of said fluidized bed.

3,969,547

PROCESS OF PREPARING POLYMER-COATED POWDER PARTICLES

Kazuo Isawa; Takayoshi Usuki, both of Tokyo, and Hideo Nagasaka, Hitachi, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,648

Claims priority, application Japan, Aug. 17, 1973, 48-92163

Int. Cl.² B05D *7/00, 3/00*

U.S. Cl. 427—214 **10 Claims**

1. A process for preparing inorganic powder particles which are individually coated with a polymer comprising the steps of:

a. dissolving a polymeric material in a water-immsicible organic solvent;
b. float-dispersing an inorganic powder particles in the resulting solution, the surface of the particles having been treated with an activator selected from the group consisting of hydrogen peroxide, phosphate, and chromate, or a surface treating agent selected from the group consisting of aliphatic acids, amine compounds, and alkoxy silanes or both to make the surface of the particles compatible with the polymeric material;
c. slowly adding to the resulting dispersion an aqueous solution of a hydrophilic protective colloid;
d. removing the water-immiscible organic solvent from the resulting emulsifying liquid; and
e. washing and drying the thus obtained individually coated particles.

3,969,548

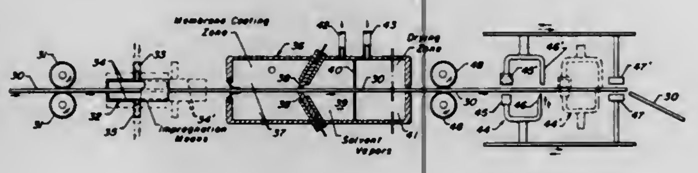
METHOD FOR FORMING A SEMI-PERMEABLE STRIP

Jack A. Hunter, Long Grove, Ill., and Kenneth E. Anderson, Rancho Bernardo, Calif., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 323,614, Jan. 15, 1973, Pat. No. 3,909,418. This application Nov. 21, 1974, Ser. No. 525,909

Int. Cl.² B05D *5/00*

U.S. Cl. 427—244 **6 Claims**



1. A continuous method for forming a member suitable for stacking and for separating the constituents of a fluid feed material which can be passed over the member, which comprises:

a. moving a thin, elongated strip of porous filler material through an impregnation zone and effecting penetration with a fluid seal material through spaced sections of said strip, whereby there can be no subsequent fluid flow therethrough;
b. continuing to draw said strip through a coating zone and into contact with a membrane forming coating solution to form a semi-permeable membrane on each side of said strip;
c. passing the thusly coated strip into a controlled temperature drying zone, thereby forming a resulting strip with spaced, sealed sections;
d. cutting at least one hole in said strip through the spaced and sealed sections; and
e. additionally, transversely cutting said elongated strip through the spaced and sealed sections at a spaced distance from any holes therein to provide resulting separate strips each of which has fluid sealing material through the porous filler for both end portions thereof and a fluid passageway hole through one end portion thereof.

3,969,549

METHOD OF DEACIDIFYING PAPER

John C. Williams, Alexandria, Va., and George B. Kelly, Jr., Gaithersburg, Md., assignors to The United States of America as represented by the Librarian of Congress, Washington, D.C.

Filed Dec. 24, 1974, Ser. No. 536,125

Int. Cl.² C23C *13/04*

U.S. Cl. 427—248 **9 Claims**

1. A method of deacidifying cellulosic paper by first impregnating said paper with the vapors of a volatile organo-metallic compound wherein said compound is volatile at temperatures up to about 150°C; does not discolor said paper; does not interact with inks used in books; and is readily reactive with acids; and subsequently hydrolyzing said compound to an alkaline material in situ by exposing said paper to a gaseous hydrolyzing environment.

3,969,550

CHROMIZING PROCESS USING COLUMBIUM AS STABILIZER

Carl Adolph Beiser, Coraopolis, assignor to National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 387,627, Aug. 13, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,177

Int. Cl.² C23C *11/00, 13/00*

U.S. Cl. 427—253 **21 Claims**

1. In a process for preparing chromized ferrous metal wherein a ferrous metal substrate is heat treated at an elevated chromizing temperature in a protective chromizing atmosphere in the presence of a source of chromium and a chromizing energizer until a corrosion resistant chromized coating is produced thereon, the improvement in combination therewith which comprises employing as the said ferrous metal substrate a plain low carbon columbium treated steel substrate initially having a total carbon content of at least 0.03% and containing about 0.03–0.15% of columbium, the carbon content of the steel being partially stabilized by the columbium whereby a portion of the carbon content is free to diffuse upon heating the steel substrate to the said elevated chromizing temperature, the steel substrate being heat treatable at the said elevated chromizing temperature in the protective chromizing atmosphere in the presence of the source of chromium and the chromizing energizer to produce a carbon-containing chromized coating thereon having a metallographically measured thickness of about 1–3 mils, the said chromized coating containing about 0.2–1% carbon from the steel substrate which is free to diffuse, and the said carbon content which is free to diffuse, the columbium content and the thickness of the steel substrate being correlated to satisfy the equation

$$A = Y \times Z,$$

where A is the percent carbon content of the said chromized coating and varies between 0.2 and 1%, Y is the percent carbon content of the steel substrate which is free to diffuse and is determined by the following equation

$$\begin{aligned}&\%\text{Diffusible Carbon} = \qquad \%\text{Total Carbon} - \\ &0.01\% \\ &\qquad\left[\frac{\%\text{Columbium Content}}{8} + \frac{0.0\%}{1}\right]\end{aligned}$$

and Z is a multiplication factor determined by the equation

$$\text{Multiplication Factor} = \frac{\text{The steel substrate thickness in mils}}{\text{The total chromized coating thickness of the steel substrate in mils}}$$

where the total chromized coating thickness of the steel substrate is equal to twice the metallographically measured diffusion layer of the said chromized coating plus one mil.

3,969,551

CHEMICALLY SCULPTURING FABRICS

Robert E. Ellsworth, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 5, 1974, Ser. No. 486,142

Int. Cl.² B05D *5/00*

U.S. Cl. 427—282 **12 Claims**

1. A process for manufacturing a sculptured decorative finish on a textile fabric which comprises:

i. applying a dispersion of an aqueous polyurethane latex composition having a viscosity of from 15,000 to 90,000 cps obtained by adding an isocyanate-terminated polyurethane prepolymer having pendant carboxyl groups to water containing a tertiary aliphatic amine and allowing chain extension with water to proceed until all of the isocyanate groups have been reacted to the fabric by gravure rolls, flat screens or rotary screens in a pattern and
ii. drying the fabric containing the latex composition at a temperature of 140° to 230°F. until internally tacky,
iii. passing the fabric through a system of heated nip rolls, and
iv. redrying the fabric at a temperature of 220° to 305°F. for 2 to 6 minutes.

3,969,552

PROCESS FOR IMPREGNATING POROUS ARTICLES

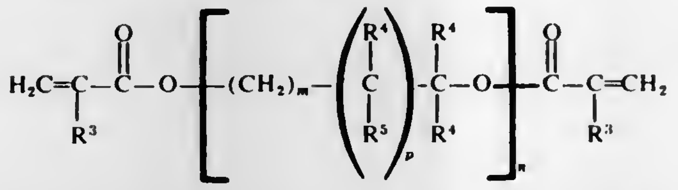
Bernard M. Malofsky, Bloomfield; Elliott Frauenglass, and Harold A. Fowler, both of Newington, all of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed May 8, 1974, Ser. No. 467,989

Int. Cl.² B08B *7/00;* **C23D** *17/00;* **B05D** *3/00*

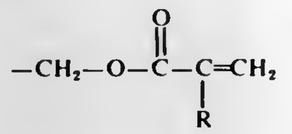
U.S. Cl. 427—295 **37 Claims**

6. An impregnation process comprising the steps of (a) impregnating a porous metal article with a polymerizable anaerobic sealant wherein at least a portion of the polymerizable anaerobic sealant has the formula



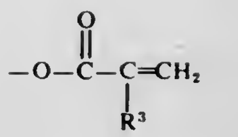
$$H_2C{=}\underset{R^3}{\underset{|}{C}}-\overset{O}{\overset{\|}{C}}-O-\left[(CH_2)_m-\left(\underset{R^5}{\underset{|}{\overset{R^4}{\overset{|}{C}}}}\right)_p-\underset{R^4}{\underset{|}{\overset{R^4}{\overset{|}{C}}}}-O\right]_n-\overset{O}{\overset{\|}{C}}-\underset{R^3}{\underset{|}{C}}{=}CH_2$$

wherein R⁴ represents a radical selected from the group consisting of hydrogen, lower alkyl of from 1 to about 4 carbon atoms, hydroxy alkyl of from 1 to about 4 carbon atoms, and



$$-CH_2-O-\overset{O}{\overset{\|}{C}}-\underset{R}{\underset{|}{C}}{=}CH_2$$

R_3 is a radical selected from the group consisting of hydrogen, halogen and lower alkyl of from 1 to about 4 carbon atoms; R^5 is a radical selected from the group consisting of hydrogen, hydroxyl and



$$-O-\overset{O}{\overset{\|}{C}}-\underset{R^3}{\underset{|}{C}}{=}CH_2$$

m is 0 to about 12, n is at least 1, and p is 0 or 1; in admixture with a peroxy initiator of the cure of the anaerobic sealant; (b) removing at least some of the polymerizable anaerobic sealant remaining on the surface of the metal article by treating said surface with an aqueous solution of a surfactant having the formula $X^1-O(C_2H_4O)_xX^2$ wherein X^1 is selected from the group consisting of A,R¹—A, and R², and carbonyl, wherein A is an aryl group of a halogen- and/or lower alkyl-substituted aryl group; R¹ is a branched alkyl group containing about 3–12 carbon atoms or a linear or cyclo akyl group containing about 1–20 carbon atoms; R² is a linear or cyclo alkyl group containing about 4–20 carbon atoms; X² is X¹ or H; and x is between five and about 100 when X² is H but between about seven and about 100 when X² is X¹; and (c) permitting the anaerobic sealant to cure.

3,969,553

METHOD OF MANUFACTURING A METAL-IMPREGNATED BODY

Katsumi Kondo; Fumiyoshi Noda, both of Toyota; Kunihiko Uchida, Okazaki, and Yoshihiro Tsuzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 11, 1974, Ser. No. 441,227

Claims priority, application Japan, Feb. 13, 1973, 48-17795

Int. Cl.² B22F *3/26*

U.S. Cl. 427—299 **8 Claims**

1. A method of manufacturing a nitride ceramic impregnated with a molten metal comprising the steps of treating a porous shaped or powdered nitride ceramic with a liquid or solution containing a compound having an OH radical, said solution or liquid selected from the group consisting of water or an aqueous solution of methanol, ethanol, butanol, acetone, acetic acid, or ammonium hydroxide, drying said ceramic to expose an active ceramic surface, molding said ceramic into a solid body before it is impregnated with a molten metal and impregnating said ceramic with a molten metal which remains in substantially uncombined form after impregnation.

3,969,554
PRECIOUS METAL SENSITIZING SOLUTIONS

Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Photocircuits Division of Kollmorgan Corporation, Glen Cove, N.Y.
Division of Ser. No. 278,429, Aug. 7, 1972, abandoned, and a continuation-in-part of Ser. No. 9,060, Feb. 5, 1970, Pat. No. 3,682,671, which is a continuation-in-part of Ser. No. 801,167, Feb. 20, 1969, Pat. No. 3,672,938, which is a continuation-in-part of Ser. No. 712,575, March 12, 1968, abandoned, which is a continuation of Ser. No. 551,249, May 19, 1966, abandoned, which is a continuation of Ser. No. 285,889, June 6, 1963, abandoned, which is a continuation of Ser. No. 53,352, Sept. 1, 1960, abandoned. This application Dec. 11, 1974, Ser. No. 531,725
Int. Cl.^{2} B05D *3/04, 3/10*
U.S. Cl. 427—305 **12 Claims**

1. A process for sensitizing a substrate to be plated with an adherent electroless metal which comprises cleaning said substrate and contacting the cleaned substrate with a sensitizing solution for the sensitization of conductive and non-conductive surfaces to the reception of adherent electroless metal which comprises from about 0.01 grams to about 5.0 grams per liter of precious metal ions; an excess of a stoichiometric amount of an ion of a Group IV metal which is capable of two valence states; and a stabilizing amount, at least sufficient to prevent separation from said solution of said precious metal as a metallic film or precipitate, of a Lewis Base selected from the group consisting of hydroxylamine, ammonia and aniline.

3,969,555
ALUMINUM PLATING CORROSION RESISTANCE

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Mar. 30, 1972, Ser. No. 239,959
Int. Cl.^{2} B05D *3/02*
U.S. Cl. 427—383 **6 Claims**

1. In a process for the plating of aluminum onto a substrate comprising sequentially contacting an aluminum hydride and a decomposition catalyst selected from the group consisting of a compound of titanium, zirconium, hafnium, vanadium, niobium and tantalum, in the presence of each other, with the substrate for a time sufficient to deposit metallic aluminum onto the substrate, the improvement consisting of subsequently heat treating at least the deposited metallic aluminum at a temperature of from about 50° to about 150°C. and for a time sufficient to improve the corrosion resistance of the deposited metallic aluminum.

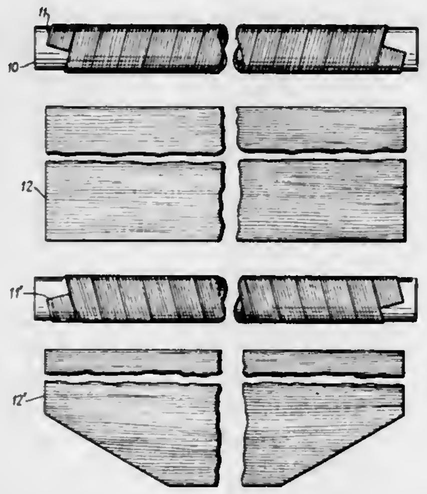
3,969,556
WHIPPED WAX BASE DISPLAY

Doris Sweeney, 512 A Taylor Ave., Warrington, Pa. 18476, and Mary Ellen Lee, 7951 Anita Drive, Philadelphia, Pa. 19111
Filed Jan. 2, 1975, Ser. No. 537,968
Int. Cl.^{2} B44C *3/04*
U.S. Cl. 428—13 **7 Claims**

1. A visual display comprising:
1. a transparent container in which is
2. a solid whipped wax mold shaped to the contours of said container, the surface of which has a whipped appearance and into which has been set
3. one or more objects for the purpose of creating a visually pleasing effect.

3,969,557
FIBERGLASS VAULTING POLE

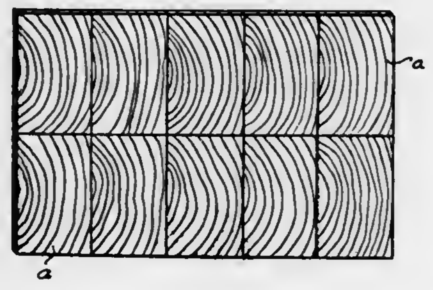
Herbert R. Jenks, Carson City, Nev., assignor to AMF Incorporated, White Plains, N.Y.
Filed Feb. 27, 1975, Ser. No. 553,604
Int. Cl.^{2} B32B *3/20;* **B65H** *81/00*
U.S. Cl. 428—36 **3 Claims**



1. An elongated and hollow vaulting pole having at least three layers of fiberglass which are bonded together, two of said layers comprising fiberglass tape extending the length of said pole in a succession of butt-jointed helical turns, said tape having the fibers thereof oriented primarily lengthwise of said tape, the turns of one of said two layers being oriented crosswise of the turns of the other of said two layers, and the third of said three layers being positioned between said two layers and comprising a plurality of turns of fiberglass cloth extending the length of said pole, said cloth having the fibers thereof oriented primarily lengthwise of said pole.

3,969,558
VENEER SHEET OF A PLURALITY OF THIN FLAT SECTIONS OF WOOD

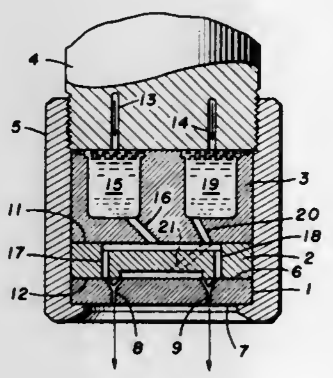
Takeshi Sadashige, Fuchu, Japan, assignor to Dantani Plywood Co., Ltd., Kitakyushu and Sadashige Fancy Plywood Industries Co., Ltd., Fuchu, both of, Japan
Division of Ser. No. 379,962, July 17, 1973, Pat. No. 3,878,016. This application Sept. 23, 1974, Ser. No. 508,366
Claims priority, application Japan, July 18, 1972, 47-72230
Int. Cl.^{2} B32B *3/14, 21/14, 31/18;* **B27D** *1/10*
U.S. Cl. 428—58 **6 Claims**



1. A sheet of veneer suitable to be affixed to a substrate comprising a plurality of thin flat sections of wood, each of said thin sections of wood comprising a portion of a flitch obtained from a log, said flat sections of wood having a substantially constant thickness of from about 0.1 mm to about 0.8 mm, said flat sections of wood having a flat front and a flat back bounded by lateral edges, said plurality of flat sections of wood being arranged in a flat coextensive array with said lateral edges abutting one another and adhesive means joining said abutting edges of said plurality of flat sections of wood to form said sheet of veneer.

3,969,559
MAN-MADE TEXTILE ANTISTATIC STRAND

Norman Wendell Boe, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.
Filed May 27, 1975, Ser. No. 581,397
Int. Cl.^{2} D02G *3/00;* **D03D** *27/00*
U.S. Cl. 428—87 **11 Claims**



1. A novel biconstituent filament useful for dissipating static electricity from normally static prone textile articles comprising a first constituent substantially adhered lengthwise to a second constituent, the first constituent being made of a nonconductive synthetic thermoplastic fiber-forming polymer, the second constituent being a normally non-conductive synthetic thermoplastic fiber-forming polymer rendered electrically conductive by having dispersed substantially uniformly throughout a sufficient quantity of electrically conductive carbon black to provide an electrical resistance of less than 1 × 10^{10} ohms per centimeter at a direct current potential of 0.1 volt, the cross-sectional area of the second constituent comprising from about 1 to 30 percent of the cross-sectional area of the filament, and the first constituent partially encapsulating the second constituent in an amount of at least 50 percent and forming a curvate interface therewith extending from one side to the other side of the filament.

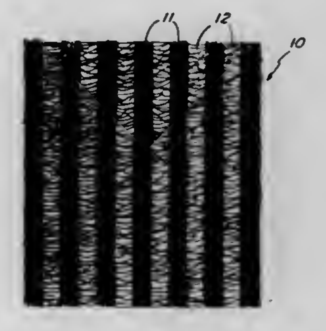
3,969,560
COPOLYMERS OF MONOUNSATURATED OR DIUNSATURATED POLYESTERS WITH VINYL MONOMERS

Sheldon N. Lewis, Willow Grove, and John J. Miller, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Continuation of Ser. No. 262,382, June 13, 1972, abandoned, which is a division of Ser. No. 18,290, March 13, 1972, Pat. No. 3,681,108. This application Nov. 29, 1974, Ser. No. 528,186
Int. Cl.^{2} C08F *218/14, 220/20*
U.S. Cl. 428—90 **10 Claims**

1. A substantially gel-free resinous copolymer of:
I. an ethylenically unsaturated addition-polymerizable polyester having an average of from one to two double bonds in each molecule, of
  1. an ethylenically unsaturated addition-polymerizable carboxylic acid,
  2. a saturated or aromatic polycarboxylic acid having no polymerizable double bonds, and
  3. a polyol and
II. at least one vinyl monomer, and comprising an alkyl ester of acrylic acid or methacrylic acid, the weight ratio of I:II being between 0.5:99.5 and 40:60.

3,969,561
BIAXIALLY ORIENTED NONWOVEN FABRICS AND METHOD OF MAKING SAME

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.
Filed Sept. 17, 1974, Ser. No. 506,843
Int. Cl.^{2} B32B *5/12*
U.S. Cl. 428—113 **8 Claims**



1. A biaxially oriented nonwoven fabric of textile-length fibers comprising:
an unlayered nonwoven web having adjacent areas of low fiber density and areas of high fiber density thereon, a majority of the fibers in said low fiber density areas having a particular configuration and being uniformly distributed therein and oriented in a direction substantially normal to the axis of said configuration and, a majority of the fibers in the high fiber density area that lies directly adjacent said low fiber density areas being uniformly distributed therein and oriented in a direction substantially parallel with the contours of said configuration of the low fiber density area.

3,969,562
POROUS POLYMER FILM

Takashi Suzuki, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 24, 1974, Ser. No. 536,116
Claims priority, application Japan, Dec. 28, 1973, 49-2853
Int. Cl.^{2} D06N *3/04*
U.S. Cl. 428—155 **6 Claims**

1. A plane-oriented, open porous film consisting of 100 parts by weight of crystalline high molecular material and 1 to 300 parts by weight of material having a lower melting point than that of said crystalline high molecular material, said film including a number of fine flat voids extending in the rectangular direction of the thickness in the film and fine arcshaped fiber structures on the surface thereof wherein said surface fiber has a mean diameter of 0.01 to 50 microns, the voids have a void mean diameter along the plane of 0.1 to 100 microns, and having a void content in the direction of the thickness of 10 to 10,000/mm.

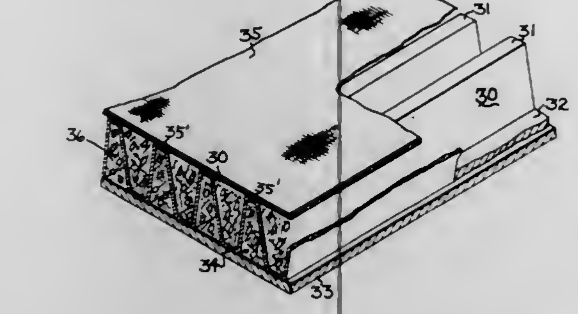
3,969,563
PROTECTIVE WALL STRUCTURE

Russell E. Hollis, Sr., 213 Fenwick Drive, New Carlisle, Ohio 45344

Continuation-in-part of Ser. No. 853,811, Aug. 28, 1969, Pat. No. 3,764,277, which is a continuation of Ser. No. 460,309, June 1, 1965, abandoned. This application Oct. 4, 1972, Ser. No. 294,903

Int. Cl.² B32B *3/12*; **F41H** *5/04*; **B32B** *3/28*

U.S. Cl. 428—175 **13 Claims**



1. A protective wall structure comprising spaced wall elements including an inner wall element and an outer wall element, said outer wall element being metallic and said inner wall element comprising a multi-layer cloth material, rigidifying means formed of a material selected from the group consisting of precipitation hardened stainless steel, mar-aging nickel steels, alloy steels and titanium alloys having a yield strength of at least about 200 ksi, said rigidifying means being positioned between and contacting said wall elements and forming therewith separated interior spaces, said rigidifying means having a truss-like, zig-zag form including angularly shaped segments which are inclined with respect to one another and to said wall elements, and organic polymerizable material occupying said separated interior spaces together with catalyst means enclosed in rupturable casing means, said casing means preventing contact between said polymerizable material and said catalyst means, the environment of said polymerizable material, including such portions of said catalyst means released on a break of a portion of said rupturable casing means by means producing one or more apertures in said wall elements, being pressurized and said polymerizable material and the portions of said catalyst means released from the casing having the property to co-act on contact to produce a sealant forming a pressurized plug of the one or more apertures in said wall elements.

3,969,564
METHOD OF SEAMING CARPETS AND TAPE USED THEREFOR

William E. Carder, Fairport, N.Y., assignor to Carder Industries, Inc., Rochester, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,634

Int. Cl.² B32B *3/00*; **D04H** *11/00*

U.S. Cl. 428—212 **6 Claims**

1. A method of seaming sections of carpet together with flexible seaming tape, comprising:

impregnating a permeable, flexible seaming tape with a liquid adhesive of the type which is tacky when moist, and non-tacky when dry,

allowing the impregnated tape to dry after it has penetrated into the tape so that the adhesive therein becomes non-tacky,

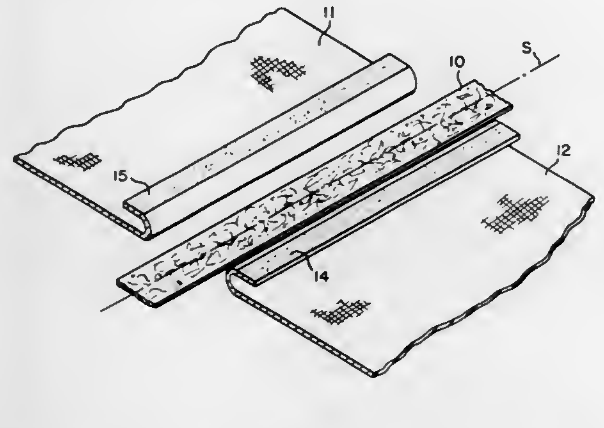
positioning a strip of the dry, impregnated tape on a surface that is to be covered by carpet,

applying to the undersides of two sections of carpet, adjacent the edges thereof that are to form a seam, a liquid adhesive containing a solvent for the first-named adhesive, and

while the adhesive on the undersides of said carpet sections is still moist, urging said undersides of the sections down onto said strip of tape, whereby the solvent in the moist adhesive on said carpet sections penetrates and remoistens the adhesive in said strip of tape, whereby the adhesive on said carpet sections and the remoistened adhesive in said strip of tape combine to form a cohesive bond between the carpet sections and said strip of tape, when the adhesive dries.

4. A method of utilizing both dry and liquid adhesives for adhesively seaming together two fabric sections, comprising:

coating a flexible, permeable tape with a liquid adhesive in such manner that the liquid adhesive penetrates and at least partially saturates said tape,



after the adhesive has penetrated and dried in the tape, placing a strip of the dry tape on a surface that is to be covered by fabric sections,

coating the undersides of two sections of fabric, adjacent the edges thereof that are to be seamed together, with a liquid adhesive similar to the first-named adhesive, and

urging the coated undersides of said fabric sections against said tape while the adhesive on said sections is still moist, whereby the adhesive in said tape is remoistened by the moist adhesive on said fabric sections and mixes therewith to form, upon drying, a cohesive bond between said tape and said sections.

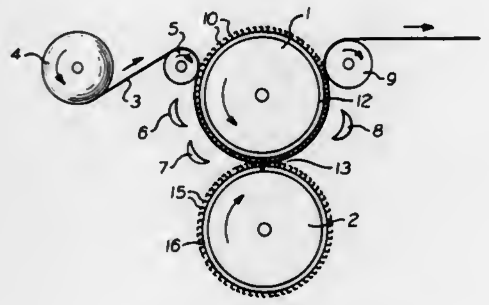
3,969,565
CARD CLOTHING METHOD FOR TREATING THERMOPLASTIC SHEET MATERIAL

Norman Forrest, 216 Byram Road, Byram, Conn. 10573

Filed Mar. 26, 1975, Ser. No. 562,386

Int. Cl.² B29D *7/14*

U.S. Cl. 264—284 **13 Claims**



1. A method of continuously reproducing a non-perforated patterned sheet of thermoplastic material which comprises the following sequential steps:

a. continuously feeding thermoplastic sheet material onto a rotating cylinder covered with card or metallic clothing having a surface of wires;
b. heating said thermoplastic sheet on said rotating cylinder to its heat softening temperature;
c. pressing said thermoplastic sheet against said cylinder by means of a cooperative rotating means covered with card clothing having a surface of wires without perforating said thermoplastic sheet;

d. cooling said pressed thermoplastic sheet on said cylinder to a temperature below its heat softening temperature; and
e. withdrawing said cooled thermoplastic sheet having a non-perforated patterned surface from said cylinder.

3,969,566
ARTICLES OF MANUFACTURING PREPARED FROM POLYMERS OF HYDRAZINE OR DIHYDRAZIDES AND TRICARBOXYLIC ACID ANHYDRIDES

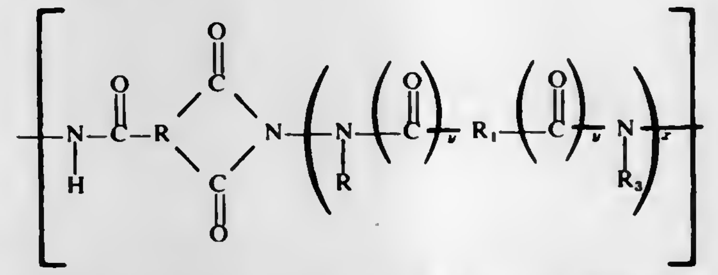
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 369,629, June 13, 1973, Pat. No. 3,882,086. This application Oct. 2, 1974, Ser. No. 511,337

Int. Cl.² C09D *3/70*

U.S. Cl. 428—290 **2 Claims**

1. An article of manufacture comprising: a polymer having the repeating structural formula:



deposited on a substrate selected from the group consisting of fibrous metallic and cellulosic substrates; and wherein R_1 is a divalent organic radical selected from the group consisting of alkylene, arylene and heterocyclic, R_2 and R_3 are monovalent alkyl, aryl, aralkyl, cycloalkyl or hydrogen radicals and x and y are either 1 or 0.

3,969,567
IMPROVEMENTS IN AND RELATING TO BOARD PRODUCTS

John E. Occleshaw, Wigan, and Terence D. Smith, Stockport, both of England, assignors to TAC Construction Materials Ltd., Manchester, England

Filed Mar. 8, 1974, Ser. No. 449,434

Claims priority, application United Kingdom, Mar. 13, 1973, 11953/73

Int. Cl.² C04B *29/02, 7/02*; **B22B** *13/02*

U.S. Cl. 428—297 **15 Claims**

1. An autoclaved fire-resistant board product consisting essentially of, in combination, a hydraulic cement binder, water, a mixture of long and short staple vitreous fibres, from 1 to 10% by weight of a cellulosic fibre, together with chemically reactive silica in an amount sufficient to react with the free lime remaining in the product after reaction between the cement and the water.

3,969,568
ARAMID FLOC REINFORCEMENT OF RUBBER USING PARTICULAR ADHESIVE

Richard Jon Sperley, Detroit, Mich., assignor to Uniroyal Inc., New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,648

Int. Cl.² B32B *5/02, 25/02, 25/12, 25/14*

U.S. Cl. 428—297 **18 Claims**

1. A reinforced rubber composition with increased compression modulus comprising (1) rubber, (2) 1-aza-3,7-dioxabicyclo[3.3.0]octane or derivatives thereof, (3) a material selected from the group consisting of resorcinol, m-aminophenol, m-phenylenediamine, resorcinol monoacetate, resorcinol diacetate, 1,5-naphthalene-diol, and partially reacted resorcinol-formaldehyde resins, and (4) discontinuous discrete fibers of aramid textiles of a length up to about 5 inches.

9. A solid vulcanizable rubber composition containing 1-aza-5-methyl-3,7-dioxabicyclo[3.3.0]octane, resorcinol monoacetate, and discontinuous discrete fibers of grey aramid textiles of a length up to about 5 inches.

10. The use of reinforced rubber composition of claim 1 in a tire.

11. A method of reinforcing rubber having incorporated therein 1-aza-3,7-dioxabicyclo[3.3.0]octane or derivative thereof and a material selected from the group consisting of resorcinol, m-aminophenol, m-phenylenediamine, resorcinol monoacetate, resorcinol diacetate, 1,5-naphthalene-diol, and partially reacted resorcinol-formaldehyde resins, comprising embedding therein prior to vulcanization discontinuous discrete fibers of grey aramid textiles of a length up to about five inches.

3,969,569
COATING COMPOSITION OF A STYRENE/ALLYL ALCOHOL POLYMER AND A POLYISOCYANATE

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1974, Ser. No. 519,354

Int. Cl.² C08L *75/08*; **B32B** *15/08*

U.S. Cl. 428—332 **12 Claims**

1. A coating composition comprising 10–90% by weight of film-forming constituents consist essentially of

1. about 10–90% by weight, based on the weight of the film-forming constituents, of a styrene/allyl alcohol polymer of 90–70% by weight styrene and 10–30% by weight allyl alcohol having a hydroxyl content of about 3–9% by weight and a specific viscosity of about 0.4–0.8 measured at 25°C. using 10 grams of copolymer in 100 milliliters of methylethyl ketone; and
2. about 90–10% by weight, based on the weight of the film-forming constituents, of a blocked organic polyisocyanate adduct in which the blocked organic polyisocyanate adduct is the reaction product of a polyether resin or a polyester resin and an aliphatic or cycloaliphatic organic diisocyanate and having the isocyanate groups blocked with an alkyl ketoxime.

3,969,570
COMPOSITION AND METHOD OF BONDING GOLD TO A CERAMIC SUBSTRATE AND A BONDED GOLD ARTICLE

Baynard R. Smith, 701 Lakeside Drive, North Palm Beach, Fla. 33408

Division of Ser. No. 232,943, March 8, 1972, Pat. No. 3,799,890. This application Mar. 22, 1974, Ser. No. 453,569

Int. Cl.² B05D *3/00*

U.S. Cl. 428—336 **32 Claims**

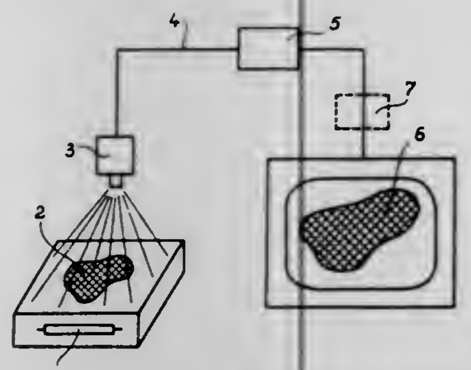
1. A method of bonding a gold layer to a ceramic substrate including the steps of:

a. mixing on a weight basis; (A) about 0.1% to 7.0% of at least one copper oxide powder from the group consisting of cuprous oxide and cupric oxide; (B) 93.0% to 99.9% of gold powder having a particle size approximately of 2–5 microns, said copper oxide powder and said gold powder defining in combination a solid composition mixture, said weight percentages of said copper oxide and said gold powder pertaining to said solid composition mixture; and (C) about 10.0% to 90.0% of an organic binder devoid of glass frits, said organic binder in combination with said copper oxide powder and said gold powder defining a total composition mixture, said weight percentage of said organic binder pertaining to said total composition mixture;
b. applying said total composition mixture to a ceramic substrate to form a coated ceramic substrate; and,
c. firing said coated ceramic substrate at a predetermined temperature within the approximating range of 900°C to 1063°C.

ELECTRICAL

3,969,571
SYSTEM FOR IMPROVING THE EVALUATION OF PICTURES COMPRISING DETAILS HARD TO RECOGNIZE, MAINLY OF FLUOROGRAPHS AND RADIOGRAPHS

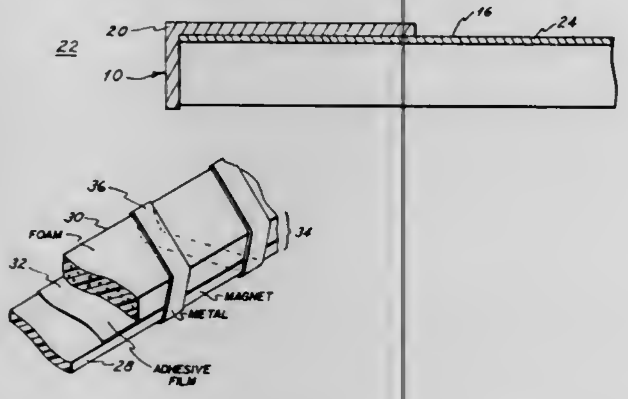
Martha Fenyö, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary
Filed Nov. 5, 1974, Ser. No. 521,156
Int. Cl.^{2} H04N *5/14*
U.S. Cl. 178—6 **4 Claims**



1. In a circuit arrangement for the transmission of picture details through a video chain for the emphasis of blurred contours, the arrangement being connected in series with a section serving for the transmission of video signals separated from synchronous signals of the video chain; the improvement in which the circuit contains delay means having a tapping point, an adder, a frequency-independent level control unit by which the input of the delay means is connected to a first input of the adder, the frequency-independent level control unit being connected between the tapping point and a second input of the adder, the output of the delay means being connected to a third input of the adder, the first and third inputs of the adder belonging to an operation having a common sign, opposite to that of the second input, the circuit input being formed by an input of the delay means, the circuit output being formed by the output of the adder.

3,969,572
ELECTROMAGNETIC INTERFERENCE SHIELDING GASKET FOR LIGHT-WEIGHT EQUIPMENT ENCLOSURES

Paul M. Rostek, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio
Filed Mar. 5, 1975, Ser. No. 555,519
Int. Cl.^{2} H05K *9/00*
U.S. Cl. 174—35 MS **4 Claims**

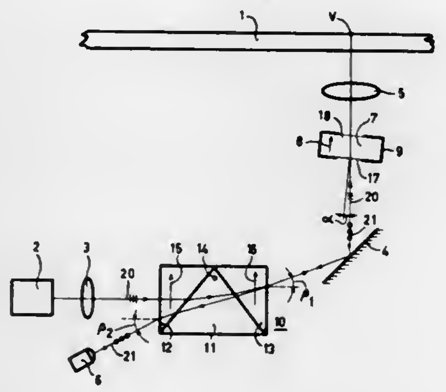


1. In an equipment enclosure including an opening therein, a separable door covering the opening and an electromagnetic interference shield coextensive with the enclosure, an improved gasket disposed about the opening at a junction of the door with the enclosure bridging discontinuities of the shielding at the junction when the door is in a closed position, said gasket being of the type having a magnetic element attractive to the enclosure, wherein the improved gasket comprises:

- A. a laminar strip including
  - 1. a plastic magnetic strip having first and second opposite faces, and
  - 2. a foam strip having first and second opposite faces and a width essentially equal to the width of said magnetic strip, the first face of said magnetic strip coextensively abutting the second face of said foam strip; and
- B. a pliable conductive strip wrapped spirally about said laminar strip and forming coils abutting the first face of said foam strip and the second face of said magnetic strip, said foam strip compressed between said magnetic strip and said coils partially with respect to the thickness of said foam strip and uniformly with respect to the length of said foam strip, adjacent ones of the coils of said spirally wrapped strip abutting the second face of said magnetic strip separated from each other leaving portions of said second face of said magnetic strip therebetween exposed for physical contact with the shielding, said conductive strip holding said foam strip to said magnetic strip.

3,969,573
APPARATUS FOR READING A RECORD CARRIER ON WHICH INFORMATION IS STORED IN AN OPTICALLY READABLE STRUCTURE

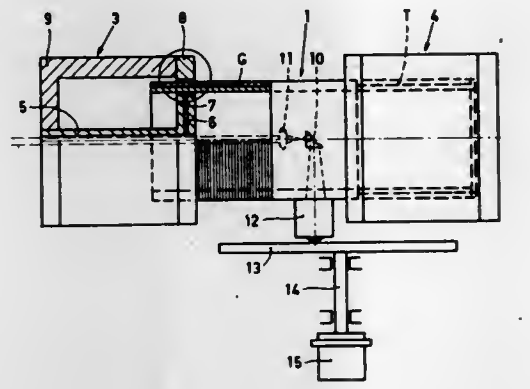
Gijsbertus Bouwhuis, and Carel Arthur Jan Simons, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 29, 1974, Ser. No. 464,789
Claims priority, application Netherlands, Feb. 15, 1974, 7402170
Int. Cl.^{2} G11B *7/00;* **G02F** *1/01*
U.S. Cl. 178—6.6 R **1 Claim**



1. An apparatus for reading a record carrier on which information is stored on an optically readable reflecting structure, which apparatus includes a radiation source which supplies a read beam, an objective system for focussing the read beam to a read spot on the information structure of the record carrier, and a radiation-sensitive detector for converting the read beam which is reflected and modulated by the information structure into an electrical signal, the radiation path between the radiation source and the objective system and between said objective system and the detector including a polarization-sensitive beam splitter and a $\lambda/4$ plate, wherein the beam splitter is positioned between the detector and the $\lambda/4$ plate, for separating the modulated and the unmodulated read beam, characterized in that the $\lambda/4$ plate is disposed in a holder in such a way that the normal to the entrance and exit faces for the read beam makes a small angle with said beam, and that the optic axis of the $\lambda/4$ plate is perpendicular to the entrance and exit faces so that the operation of the $\lambda/4$ plate is independent of its rotational position within the holder.

3,969,574
TUBULAR PLAYER ARM FOR AN OPTICAL RECORDING AND REPRODUCING DEVICE WITH DRIVE COIL AND TACHOGENERATOR COIL ON OTHER END

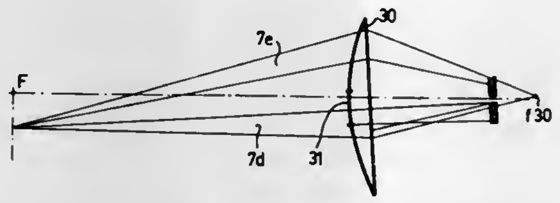
Peter Johannes Michiel Janssen, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 29, 1974, Ser. No. 464,852
Claims priority, application Netherlands, Feb. 28, 1974, 7402768
Int. Cl.^{2} H04N *5/76;* **G11B** *21/10, 7/12, 17/00*
U.S. Cl. 178—6.6 R **6 Claims**



1. A device for recording information on a rotating disk-shaped record carrier and/or for reading the recording from the carrier with a radiation beam, comprising a tubular member, a transducer on the tubular member in the path of the radiation beam, said radiation beam being projected through said tubular member in a direction substantially parallel to the longitudinal axis of said tubular member, means positioned within said tubular member for deflecting the radiation beam out of said tubular member through said transducer, a drive coil surrounding one end of said tubular member, a tacho-generator coil surrounding the other end of said tubular member and providing a tacho-generator signal in response to motion of the tubular member, a separate stationary magnetic system means magnetically coupled to each of said coils for providing a stationary magnetic field and an air gap surrounding each of said coils, a signal source for providing an energizing signal for said drive coil, and means for combining the tacho-generator signal with said energizing signal and for connecting said combined signal to said drive coil.

3,969,575
OPTO-ELECTRONIC FOCUS DETECTION SYSTEM

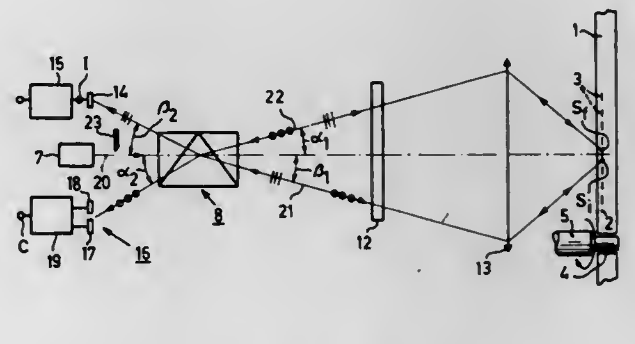
Gerrit Berend Gerritsen, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 6, 1974, Ser. No. 530,167
Claims priority, application Netherlands, Aug. 8, 1974, 7410642
Int. Cl.^{2} G11B *7/12;* **G01V** *1/04*
U.S. Cl. 178—6.6 R **6 Claims**



1. An opto-electronic focus-detection system for use in an apparatus for writing information in an information surface of a record carrier body as an optically readable radiation-reflecting structure with a writing beam, comprising an objective system for focussing said writing beam on said carrier body, a radiation source which emits a narrow focus detecting beam passing eccentrically through said objective of the write apparatus, two radiation-sensitive detection elements for intercepting the focus detecting beam which is reflected by the record carrier body and which passes the objective for a second time after said reflection, and a lens like element in the path of the reflected focus detecting beam to the radiation-sensitive detection elements, only the outer zone of said lens like element having a lens action, and the central part of said lens like element passing said focus detecting beam without affecting the direction of the focus detecting beam.

3,969,576
APPARATUS FOR READING A RECORD CARRIER WITH AN OPTICAL INFORMATION STRUCTURE

Lieuwe Boonstra, and Antonius Adrianus Marius van Alem, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 22, 1975, Ser. No. 543,111
Claims priority, application Netherlands, Nov. 13, 1974, 7414776
Int. Cl.^{2} H04N *5/76;* **G11B** *7/12, 17/00*
U.S. Cl. 178—6.6 R **3 Claims**



1. An apparatus for reading a record carrier which is provided with information, for example video and/or audio information, in an optically readable structure, which apparatus comprises a radiation source, an objective system for focussing the radiation supplied by the radiation source onto a plane of the information structure, optical means for deriving a read beam and a focus detection beam angularly diverging from said read beam from the radiation supplied by the radiation source, the apex of the angle of divergence of said focus detection beam and said read beam being located between the optical means and the objective system forming an imaginary radiation source, a radiation-sensitive signal detection system for converting the read beam which is modulated by the information structure into an electrical signal, and a radiation-sensitive focus detection system for converting the focus detection beam into an electrical signal, the optical means comprising a Wollaston prism disposed between the radiation source and the objective system, and a radiation absorbing element in the path of said focus detection beam between the imaginary radiation source for the focus detection beam for blocking a part of said focus detection beam and introducing spatial assymetry into said focus detection beam.

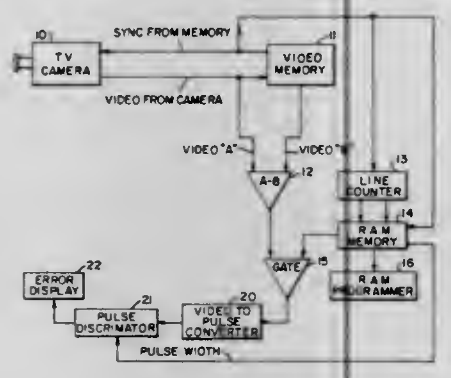
3,969,577
SYSTEM FOR EVALUATING SIMILAR OBJECTS

Raymond A. Lloyd, Laurel; Kenneth C. Ryan, Finksburg, both of Md., and William L. Hrybyk, deceased, late of Linthicum, Md. (by Catherine R. Hrybyk, executrix), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 15, 1974, Ser. No. 514,880
Int. Cl.^{2} H06N *7/18*
U.S. Cl. 178—6.8 **5 Claims**

1. A system for evaluating similar objects, comprising in combination:

- a. means for generating a first multiline signal having a predetermined relationship to the image of the model;
- b. means for generating a second multiline signal having a predetermined relationship to the image of the object to be evaluated;

c. a counter which contains a number which specifies which line of said first and second multiline signals is available for evaluation;



d. programmable means responsive to the number stored in said counter for selecting lines from said first and second multiline signals for evaluation to determine if said object to be evaluated meets predetermined specifications.

3,969,578
VISUAL DISPLAY OF ULTRASONIC RADIATION PATTERN

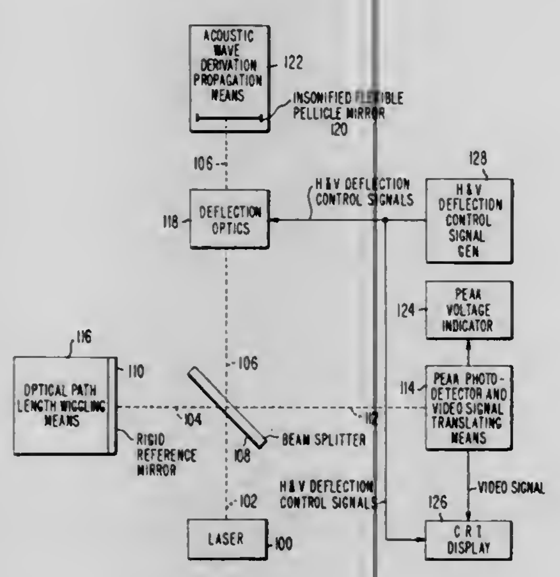
Reuben Saul Mezrich, Rocky Hill, N.J.; Karl-Friedrich Etzold, New York, N.Y., and David Herman Raphael Vilkomerson, South Brunswick, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,468

Claims priority, application United Kingdom, Apr. 23, 1974, 17708/74

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **15 Claims**



ACOUSTIC WAVE DERIVATION PROPAGATION MEANS
122
INSONIFIED FLEXIBLE PELLICLE MIRROR
120
106
118
DEFLECTION OPTICS
H & V DEFLECTION CONTROL SIGNALS
128
H & V DEFLECTION CONTROL SIGNAL GEN
124
PEAK VOLTAGE INDICATOR
116
110
OPTICAL PATH LENGTH WIGGLING MEANS
104
106
112
114
PEAK PHOTO-DETECTOR AND VIDEO SIGNAL TRANSLATING MEANS
RIGID REFERENCE MIRROR
108
BEAM SPLITTER
H & V DEFLECTION CONTROL SIGNALS
VIDEO SIGNAL
102
126
LASER
100
C R T DISPLAY

1. In a system responsive to the intensity of radiated ultrasonic wave energy having a first given frequency; the combination comprising:

a. first means including a detection means responsive to the illumination thereof with interfering first and second components of coherent light of predetermined wavelength λ for deriving an output signal substantially proportional to the peak phase change at said first given frequency in said first and second light components;

b. second means including an interferometer for illuminating said detection means with said first and second interfering light components, wherein said interferometer comprises a substantially rigid reference mirror illuminated by said first light component and a flexible pellicle mirror of given surface area having a selected spot thereof illuminated by said second light component; said selected spot on said flexible pellicle mirror, in response to being insonified by said ultrasonic wave energy, vibrating at said first given frequency through an acoustic displacement amplitude Δ determined by the intensity of said ultrasonic wave energy insonifying said selected spot, wherein Δ<<λ, and

c. third means for wiggling at a second given frequency the round-trip optical path length of said first light component reflected from said rigid reference mirror by an amount which is greater than λ/2, said second given frequency being significantly lower than said first given frequency,

d. whereby said output signal derived by said detection means is substantially proportional to the acoustic displacement amplitude Δ of said selected spot.

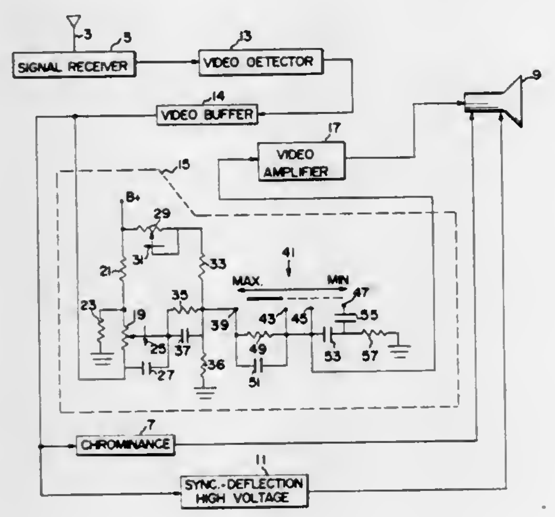
3,969,579
CONTRAST, BRIGHTNESS AND PEAKING CONTROL CIRCUIT

Robert Patrick Logan, Batavia, and Robert Charles Wheeler, Elba, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 455,122, March 27, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,197

Int. Cl.² H04N *5/14*

U.S. Cl. 178—7.3 R **3 Claims**



1. In a television receiver having a video signal channel, a secondary control circuit comprising:

a potential source;

first voltage divider means coupling said potential source to a potential reference level;

second potential divider means including an adjustable brightness control means coupling said potential source to a potential reference level;

adjustable contrast control means coupled to said first potential divider means and via parallel connected AC and DC coupling means to said second potential divider means;

adjustable peaking control means directly connected to said second potential divider means and said parallel connected AC and DC coupling means and to a potential reference level; and

a pair of connectors coupling said secondary control circuit to said video signal channel including a first connector coupling said video signal channel to said adjustable contrast control means and a second connector coupling said adjustable peaking means to said video signal channel.

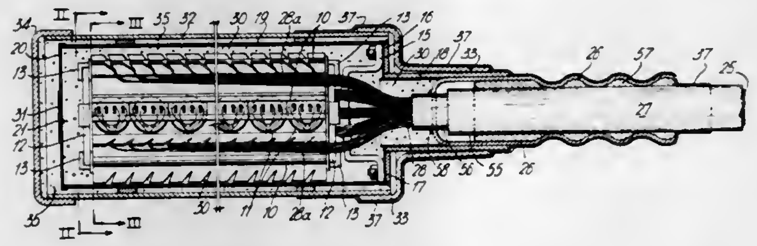
3,969,580
LOADING COIL ASSEMBLIES FOR COMMUNICATIONS CABLES

George Debortoli; Peter McGivery Chase, both of Ottawa, and Helmut H. Lukas, Carleton Place, all of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 22, 1975, Ser. No. 615,773

Int. Cl.² H01F *17/08*

U.S. Cl. 178—46 **15 Claims**



1. A loading coil assembly, comprising:

an inner casing including first and second end discs, a disc at each end of the casing;

a first support disc mounted on said first end disc and spaced axially therefrom in said casing;

a plurality of assembled loading coil magazines in said casing, said magazines extending axially and spaced circumferentially around the axis of said casing, mounting means at each end of each magazine, the mounting means at one end of each magazine engaging with the periphery of said first support disc;

a second support disc adjacent to said second end disc, said mounting means at the other end of each magazine engaging with the periphery of said second support disc;

cable entry and attachment means, attached to said first end disc;

a further casing enclosing said inner casing and spaced therefrom; and

expanded synthetic resin electrically insulative material filling spaces in said inner casing and between said inner casing and said further casing.

3,969,581
VERTICAL SYNCHRONIZING SIGNAL RECORDING APPARATUS

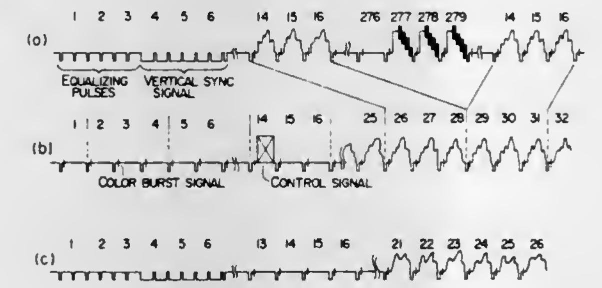
Yoshizumi Watatani, Machida, and Michio Masuda, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 19, 1975, Ser. No. 578,765

Claims priority, application Japan, May 22, 1974, 49-57640

Int. Cl.² H04N *7/00;* **H04L** *7/00;* **H04N** *5/78*

U.S. Cl. 178—5.6 **3 Claims**



1. In a recording apparatus receiving a time-division multiple signal comprising a first video signal, and a second video signal without any vertical synchronizing signal, said second video signal being divided for each horizontal scanning line and, in the predetermined number of the horizontal scanning lines, inserted in predetermined positions within the vertical fly-back period of said first video signal, said second video signal being extracted and recorded for the purpose of reproduction; the improvement comprising means for extracting from said multiple signal said second video signal inserted in said predetermined positions within the vertical fly-back period of said first video signal, means for recording said second video signal extracted by said extracting means, means for detecting the vertical synchronizing signal for said first video signal transmitted at substantially the position where a vertical synchronizing signal for said second video signal should be located, means for extracting said vertical synchronizing signal for said first video signal from said multiple signal when said position where said vertical synchronizing signal for said second video signal should be located is detected by said detecting means, and means for recording on the recording means for said second video signal the vertical synchronizing signal extracted by said extracting means.

3,969,582
SYSTEM FOR AUTOMATIC SYNCHRONIZATION OF BLOCKS TRANSMITTING A SERIES OF BITS

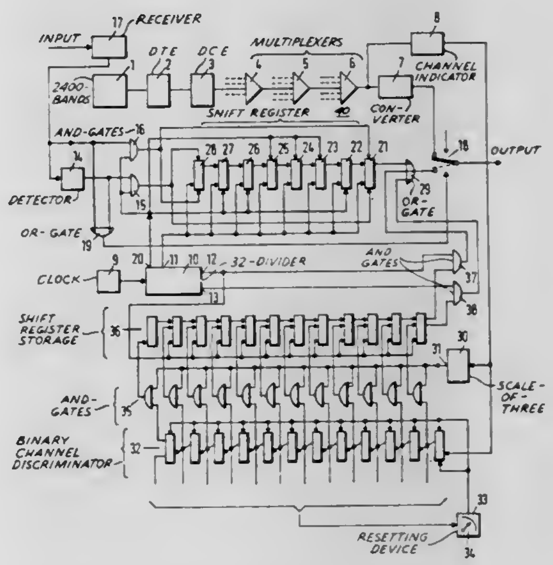
Hendrik Cornelis Anthony van Duuren, Wassenaar, and Herman da Silva, Voorburg, both of Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, Netherlands

Filed Dec. 20, 1974, Ser. No. 535,040

Claims priority, application Netherlands, Dec. 21, 1973, 7317591

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.5 R **12 Claims**



1. In a system for transmitting and receiving a continuous series of binary information bits of an indefinite length between two stations, wherein said series is divided into balanced blocks of a predetermined number of bits, the improvement comprising automatically maintaining synchronism of said blocks of signals communicated between said stations, comprising:

A. detecting an out-of-balance in the bits in said blocks received at one station,

B. generating and transmitting one special balanced framing block of bits at said one station in response to said out-of-balance detection, said special framing block having bits in specific locations therein for its identification and synchronization,

C. receiving and detecting at the other station said one special framing block signal,

D. generating and transmitting at said other station another special framing block of bits in response to the detection of said one special framing block,

E. receiving and detecting said other special framing block at said one station indicating the reestablishment of synchronism,

F. switching from transmission of one special framing block to information blocks at said one station on receipt of said other framing block, and

G. switching from transmission of said other framing blocks to information blocks at said other station when said information blocks from said one station are received at said other station.

3,969,583
METHOD OF STEREOPHONIC RECORDING

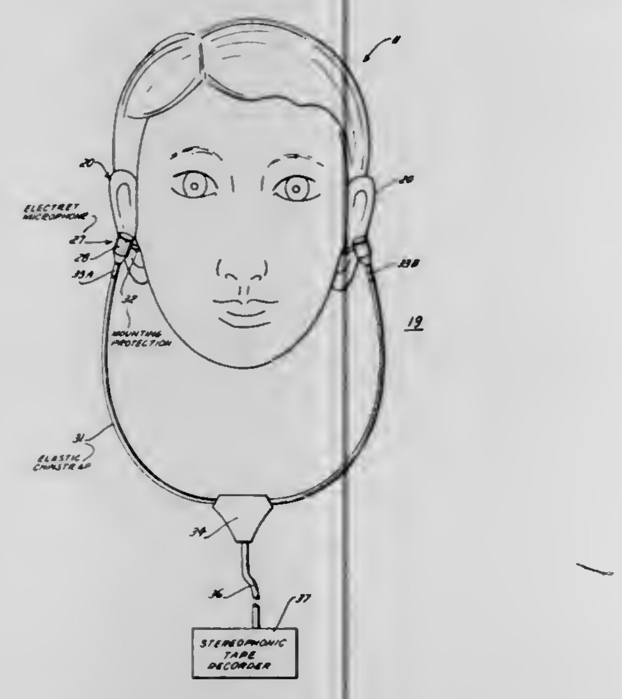
Hans-Joachim Griese, Isernhagen; Paul-Friedrich Warning, and Klaus-Hinrich Wichmann, both of Mellendorf, all of Germany, assignors to Sennheiser Electronic, Bissendorf, Hannover, Germany

Filed Apr. 16, 1974, Ser. No. 461,366

Claims priority, application Germany, Mar. 2, 1974, 2410146

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 G **6 Claims**



1. In a method of stereophonic recording wherein sound waves are detected by a pair of head-mounted stereophonic microphones individually disposed within a pair of actual or simulated human ears and wherein the detected sound waves are recorded, the improvement which comprises the step of locating the sound inlet of each microphone at prescribed reference points disposed in front of the entrance to the ear canal.

3,969,584
SYSTEM FOR RECORDING THE ACTUATION OF REMOTELY LOCATED LOCKING DEVICES

Cecil John Miller, 18134-8 Killion St., Tarzana, Calif. 91356, and Richard W. Foster, 1845 Niodrara Drive, Glendale, Calif. 91205

Filed Jan. 17, 1975, Ser. No. 541,707

Int. Cl.² H04M *11/00;* **H04G** *3/00*

U.S. Cl. 179—2 A **14 Claims**

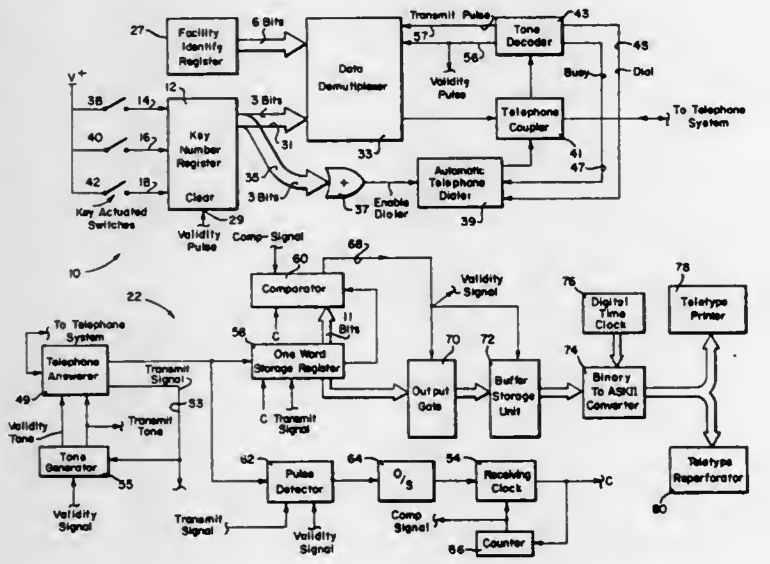
6. A system for providing a record at a central office of the actuation of at least one locking device disposed at least at one remote location, said system comprising:

lock monitoring means, located at the remote location for providing a key identifying signal upon each actuation of the associated locking device, said key identifying signal being indicative of the actuating key;

first means located at the remote location and responsive to the key identifying signal, for automatically transmitting the central office a facility identifying signal indicative of the facility at which the actuated locking device is located and for automatically transmitting the key identifying signal to the central office;

second means located at the central office for receiving said key and facility identifying signals and for providing a record of said signals and the time and date of their receipt; and wherein

said first means includes telephone dialing means responsive to said key identifying signal for automatically dialing the telephone number of the central office; and data transmission means for repetitively transmitting said key and facility identifying signals to the central office by means of the telephone system, said transmission commencing upon receipt of an authorizing signal from said second means and terminating upon receipt of a validity signal from said second means; and wherein said second means includes means for producing said authorization signal upon the completion of the telephone connection between said first and second means; and means for producing said validity signal after successive identical sets of said repetitively transmitted data which resulted from a given key actuation have been received.



3,969,585
FREQUENCY-DIVISION MULTIPLEXER FOR TELEPHONE TRANSMISSION PROVIDING FOR TRANSPOSITION OF CONVERSATION AND CALLING CHANNELS INTO A PRIMARY FREQUENCY GROUP

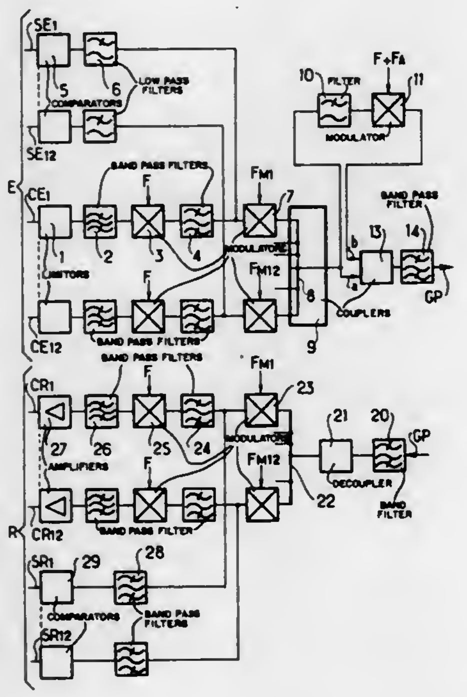
Claude Boulanger, Chevilly-Larue, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Aug. 16, 1974, Ser. No. 498,116

Claims priority, application France, Aug. 16, 1973, 73.29880; June 12, 1974, 74.20360

Int. Cl.² H04J *1/06*

U.S. Cl. 179—15 FD **6 Claims**



6. In a multi-channel transmission system for converting to a primary band group: voice signals in a voice band from a plurality of voice channels, and auxiliary signals, such as calling and supervisory signals, having a very low frequency from a plurality of auxiliary channels pertaining to the respective voice signals, a multiplexer comprising:

premodulation means for converting respective voice signals of respective voice channels into a plurality of premodulated voice channels having a same carrier frequency,

means for coupling respective auxiliary channels with respective ones of said premodulated voice channels,

modulation means for modulating the respective coupled channels into a plurality of modulator stages having respective carrier frequencies for converting each premodulated voice channel to the primary band group,

extra modulation means for modulating the whole spectrum of said plurality of modulator stages such that modulated auxiliary channels are positioned into said primary band group, and

band filtering means receiving said whole spectrum of said plurality of modulator stages from said modulation means and the modulated whole spectrum from said extra modulation means for supplying said voice signals and said auxiliary signals in said primary band group.

3,969,586
MULTIPLEX SIGNAL TRANSMISSION DEVICE

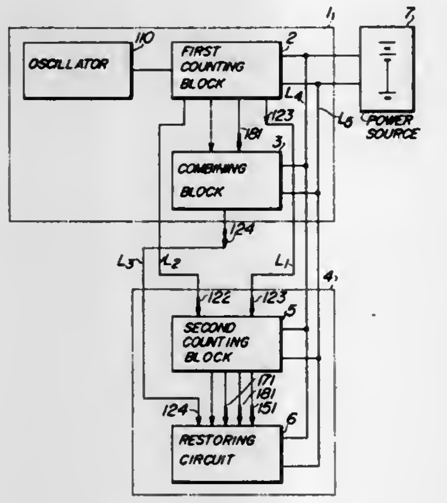
Hisato Wakamatsu, Kariya, Japan, assignor to Nippondenso Co., Ltd., Japan

Continuation of Ser. No. 246,482, April 21, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 465,359

Claims priority, application Japan, Apr. 22, 1971, 46-26376

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 A **9 Claims**



5. A time division multiplex signal transmission system for transmitting and receiving information signals from a plurality of channels in each of a succession of time frames, said system comprising in combination,

a transmitter, said transmitter including an oscillator for generating a pulse signal having a predetermined frequency; a first circuit means connected to said oscillator for generating a timing signal, a synchronous signal for synchronizing each frame of the transmitted signal, and an address signal for defining each of a plurality of time intervals within each of said frames, said first circuit means further including means for generating strobe pulses, one for each time interval within said frame, said strobe pulses having a duration which is less than the duration of said time intervals, and a combiner circuit connected to said first circuit means and to each of a plurality of channels containing information signals to be transmitted, said combiner circuit including means responsive to said address, information and strobe signals for generating a time division multiplex level signal having a duration in each of said time intervals equal to the time duration of said strobe pulses wherein said timing, synchronous and level signals are transmitted separately, and

a receiver, said receiver including a second circuit means responsive to said transmitted timing and synchronous signals for generating a second address signal for defining each of said plurality of time intervals within said frame of said transmitted level signal, said second circuit means including a means for generating a transverse signal during the last time interval of each of said frames, a restoring circuit connected to said second circuit means, said restoring circuit including means responsive to second address signal and said level signal for converting said level signal back to said plurality of information signals, and

means for storing each of said information signals, said means for storing said information signals comprising a first memory circuit for storing the converted information signal, said first memory circuit being reset in response to said transmitted synchronous signal, and a second memory circuit connected to said first memory circuit restoring the output information signal of said first memory circuit, wherein said output information signal is transferred from the first to the second memory circuit in response to the receipt of said generated transverse signal.

3,969,587
SELECTIVE TRANSMISSION OF PRERECORDED VOICE SIGNALS TO SUBSCRIBERS OF TIME-SHARING TELECOMMUNICATION SYSTEM

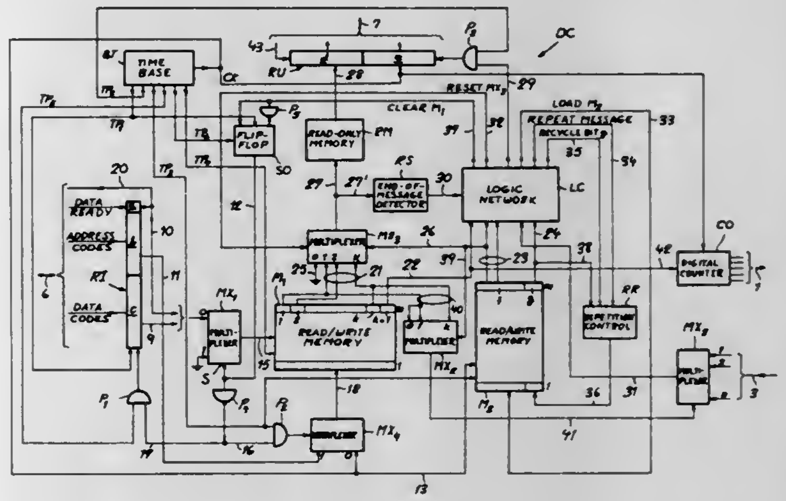
Piero Calcagno, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed July 14, 1975, Ser. No. 595,430

Claims priority, application Italy, July 12, 1974, 69218/74

Int. Cl.² H04J *6/00;* **H04M** *15/10*

U.S. Cl. 179—15 AT **10 Claims**



1. In a time-division-multiplex telecommunication system with *m* temporal voice channels extending between respective subscriber stations and a central office, timing means at said central office for sequentially scanning said channels in a recurrent cycle of *m* time slots, and a processor at said central office responsive to selection signals from any subscriber station for emitting relevant call information, the combination therewith of:

a dynamic memory provided with *n* endless signal tracks containing respective prerecorded audibly reproducible message words representing different types of call information available from said processor, each message word being prefaced on its track by a synchronizing signal, said dynamic memory having *n* first outputs emitting the message words and *n* second outputs emitting the synchronizing signals of respective tracks;

first storage means provide with *m* principal memory stages respectively allocated to said *m* channels;

asynchronously operative circuitry for loading a first memory stage, allocated to a channel serving an inquiring subscriber, with at least one data code received from said processor and identifying a signal track carrying relevant call information;

synchronously operative circuitry controlled by said timing means and selectively connectable to any of said second outputs in response to a registered data code for initiating, upon the occurrence of a corresponding synchronizing signal, a periodic readout in recurrent time slots, assigned to the channel serving the inquiring subscriber, of a data code loaded into a principal memory stage allocated to the same channel;

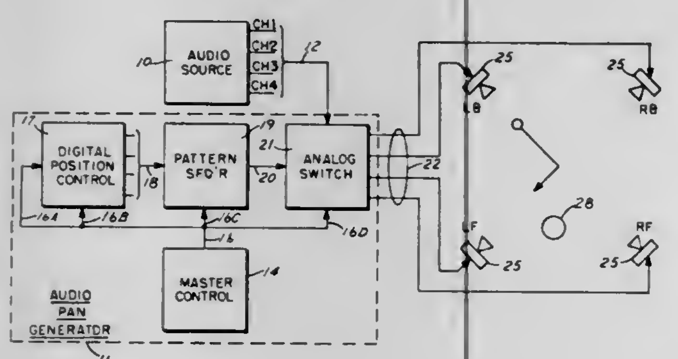
switch means responsive to said timing means for periodically connecting any one of said channels, during an assigned time slot, through a respective first output of said dynamic memory to a selected signal track thereof identified by a data code read out from a principal memory stage allocated to the respective channel, thereby transmitting the prerecorded message word of the selected signal track to the inquiring subscriber; and

second storage means in said synchronously operative circuitry provided with *m* ancillary memory stages for respectively monitoring the activities of said *m* principal memory stages and terminating the readout of a data code therefrom after a period sufficient to transmit the entire prerecorded message word of the selected signal track.

3,969,588
AUDIO PAN GENERATOR

Stephen M. Raydon, Boulder, and Ronald E. Hays, Northglenn, both of Colo., assignors to Video and Audio Artistry Corporation, Boulder, Colo.

Filed Nov. 29, 1974, Ser. No. 528,220
Int. Cl.² H04R ***5/00***
U.S. Cl. 179—1 G **28 Claims**



7. Apparatus for introducing audio signals from at least one source to a plurality of audio output transducers for creating sound patterns and effects comprising:

a source of clock pulses,

means responsiive to said clock pulses for generating cycles of pairs of increasing and decreasing signal levels,

a plurality of voltage controlled amplifiers having the outputs thereof connected to respective transducers and each having one of the inputs thereof connected for receiving the audio signals from at least one audio signal source,

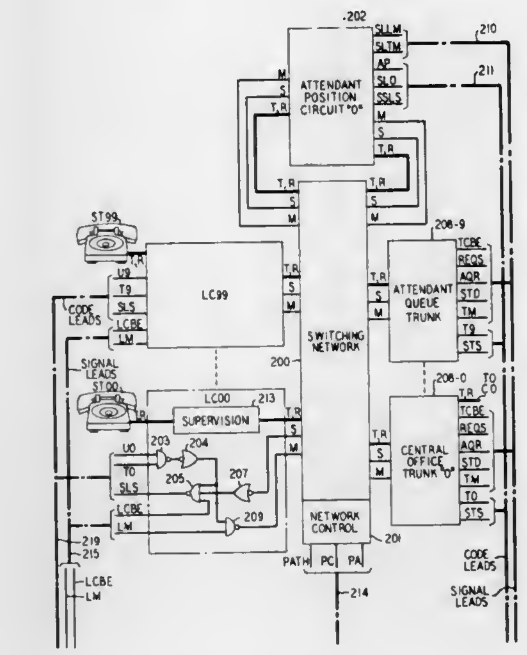
means for switching the pairs of signal levels from said generating means to said plurality of amplifiers, and

input means for providing control signals to said switching means for selectably establishing connection of the signal level pairs from said generating means to provide the respective other inputs to at least two of said amplifiers, whereby the sound from the source will appear to move relative to the audio transducers selected by the said input means control signals at a rate determined by the said generating means signal levels.

3,969,589
TELEPHONE SWITCHING SYSTEM HAVING ATTENDANT QUEUING FACILITIES

Henry August Meise, Jr., Boulder, and George William Taylor, Broomfield, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 22, 1975, Ser. No. 606,837
Int. Cl.² H04Q ***3/64***
U.S. Cl. 179—27 D **16 Claims**



1. In a telephone switching system, a first-in first-out attendant queue circuit, an attendant position circuit, a plurality of trunk circuits, an attendant queue arrangement comprising:

means for detecting requests by said trunk circuits for connection to said attendant position circuit;

means for determining the circuit identity of any said detected requesting trunk circuit;

means for storing any said determined circuit identity in said first-in first-out attendant queue circuit;

means for detecting when said attendant position circuit is idle;

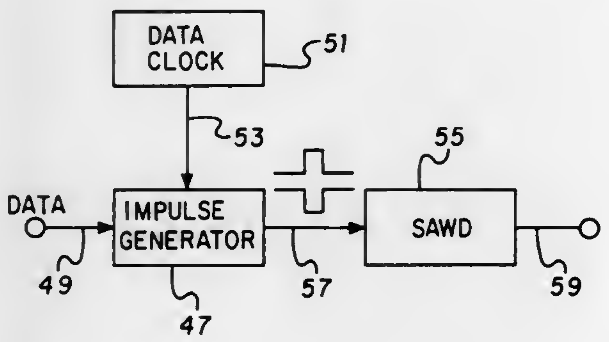
means controlled by said idle detection means for retrieving a next available circuit identity from said attendant queue circuit; and

means responsive to a retrieved circuit identity for connecting said trunk circuit associated with said retrieved circuit identity to said idle attendant position circuit.

3,969,590
SURFACE ACOUSTIC WAVE APPARATUS

Anant K. Jain, Richardson, and Robert K. Marston, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 4, 1975, Ser. No. 565,035
Int. Cl.² H04L ***27/12***
U.S. Cl. 178—66 R **5 Claims**



1. Minimum shift keyed modulating apparatus comprising, in combination:

piezoelectric substrate means;

input impulse signal supplying means for supplying unmodulated input impulses having a period T therebetween;

input transducer means mounted on said substrate means and connected to said input signal supplying means;

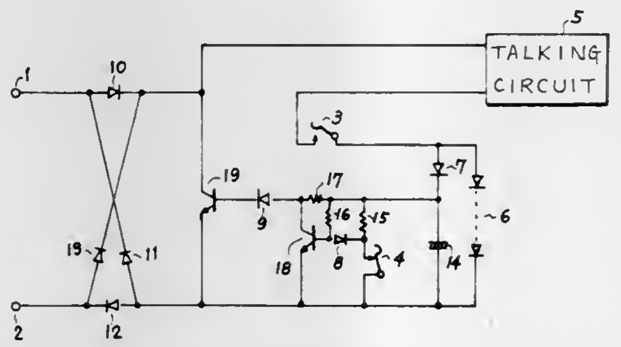
output transducer means, for providing an output constant frequency carrier signal having an amplitude weighted envelope in an oscillatory period having a duration greater than T for each inpulse applied to said input transducer means, mounted on said substrate means; and

output signal means electrically connected to said output transducer means for providing MSK output signals.

3,969,591
CIRCUIT FOR PREVENTING IMPULSE GENERATION BY OPERATING A HOOK SWITCH IN A TELEPHONE SET

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Dec. 18, 1974, Ser. No. 533,801
Claims priority, application Japan, Dec. 28, 1973, 48-1490
Int. Cl.² H04M ***1/74***
U.S. Cl. 179—84 R **3 Claims**



1. In a telephone set, a circuit for preventing impulse generation by the operation of a telephone hook switch, comprising:

the hook switch having a make contact and a break contact which are make-before-break contacts when going to the OFF-hook condition, and break-after-make contacts when going to the ON-hook condition;

a capacitor connected to said make contact to be charged through said make contact when said make contact is closed in the OFF-hook condition, and to be discharged through said break contact when said break contact is closed in the ON-hook condition; and

a transistor switching circuit connected to said break contact and said capacitor and turned ON by the charge on the capacitor to develop short-circuit between telephone line terminals of the telephone set when the break contact is closed.

3,969,592
PUSHBUTTON-CONTROLLED CALL-NUMBER SELECTOR FOR DIAL-EQUIPPED TELEPHONE

Roberto Pipitone, and Vittorio Montesi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 2, 1974, Ser. No. 429,909
Claims priority, application Italy, Jan. 3, 1973, 19009/73
Int. Cl.² H04M ***1/44***
U.S. Cl. 179—90 K **10 Claims**

1. A call-number selector for a subscriber station of a telecommunication system linked with an exchange through a two-conductor transmission line, comprising:

a normally open hook switch in a conductor of said line closable upon the initiation of an outgoing call to complete a signal loop to the exchange;

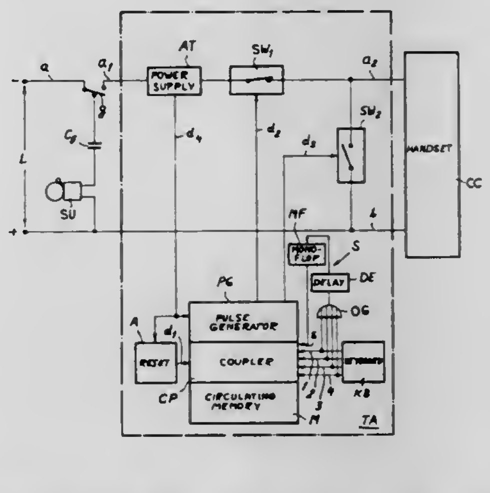
an energy-storing circuit in said signal loop including a capacitor connected in series with said conductor for charging from a d-c source in the exchange upon closure of said hook switch;

a set of manually operable switches for the selection of respective call-number digits;

coding means provided with a plurality of output leads selectively connectable across said capacitor for energization by the charge thereof upon the operation of any of said switches;

memory means connected to said output leads for storing a code combination of a selected digit, said memory means being normally nonreceptive to said code combination;

pulse-generating means energizable by the charge on said capacitor and responsive to the contents of said memory means for emitting a series of dial pulses corresponding to the value of the selected digit;



timing means energizable by the charge on said capacitor and connected to said output leads in parallel with said memory means for transmitting to said memory means an enabling pulse in response to energization of any of said output leads, thereby making said memory means responsive to said code combination;

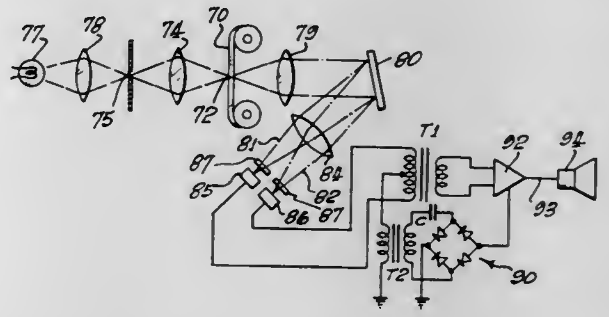
clearing means connected across said capacitor and responsive to the charging thereof for emitting a signal canceling the stored code from said memory means; and

pulse-repeating means in said transmission line connected to said pulse-generating means for actuation thereby with open-circuiting of said signal loop in response to each dial pulse for a period insufficient to discharge said capacitor.

3,969,593
SOUND RECORDING ON COLOR FILM BY HUE MODULATION

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers Inc., Hollywood, Calif.

Filed Nov. 8, 1974, Ser. No. 522,233
Int. Cl.² G11B ***7/00, 7/24, 23/18***
U.S. Cl. 179—100.3 B **34 Claims**



1. Optical sound record comprising

a film strip carrying at an elongated sound track area at least two light selective media which produce respective optical densities predominantly limited to distinct regions of the photographic spectrum,

each of said densities being essentially uniform transversely of the track area, and said densities of the respective two media being modulated longitudinally of the track area in mutually inverse phase relation in accordance with a common sound signal,

the corresponding inverse density variations of said two media being mutually superposed.

3,969,594

AUTOMATED TELEPHONY TESTING AND POLLING APPARATUS AND SYSTEM

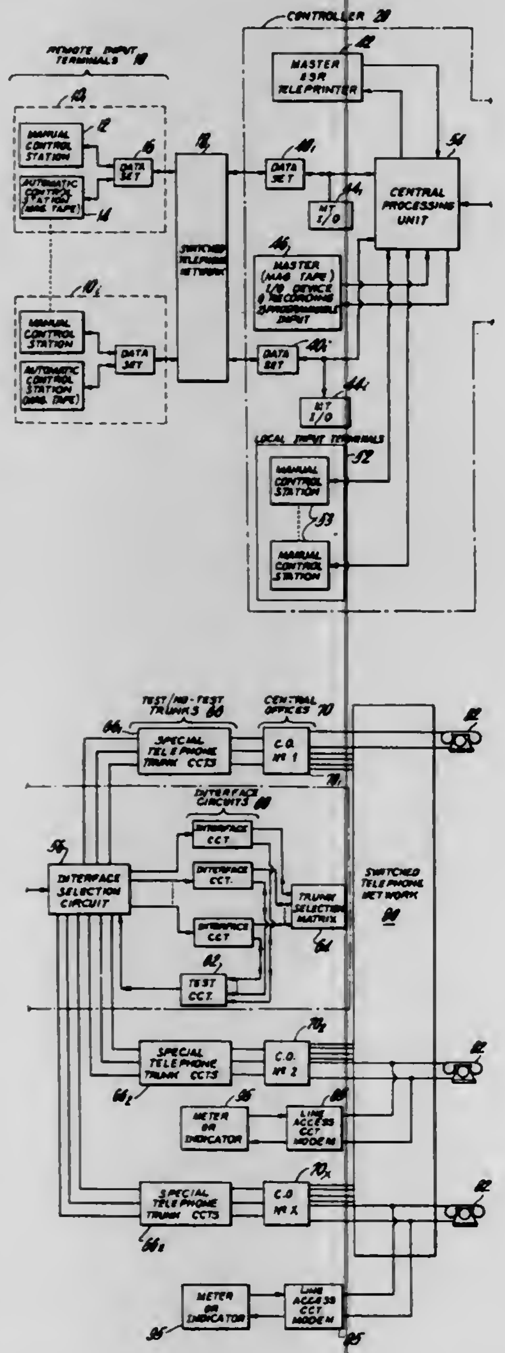
Paul V. DeLuca, Port Washington; John J. Gazzo, Jr., Commack; Vincent F. Santulli, Manhasset; Errol Siegel, New York, and Vito Mannino, Holbrook, all of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Continuation-in-part of Ser. No. 313,817, Dec. 11, 1972, Pat. No. 3,842,218, which is a continuation-in-part of Ser. No. 270,058, July 10, 1972, Pat. No. 3,752,940. This application Oct. 15, 1974, Ser. No. 515,011

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **10 Claims**


CONTROLLER 20
REMOTE INPUT TERMINALS 10
MASTER ASR TELEPRINTER
CENTRAL PROCESSING UNIT
DATA SET
MANUAL CONTROL STATION
INTERFACE SELECTION CIRCUIT
SWITCHED TELEPHONE NETWORK
SPECIAL TELEPHONE TRUNK CCTS
METER OR INDICATOR

1. In combination in telephone subscriber line energizing apparatus, a stored program controlled central processor, input/output means for supplying to said central processor subscriber information and for storing subscriber information supplied thereto from said central processor, control processing circuitry including stored program controlled microprocessor means for bilaterally communicating with said central processor, a matrix of trunks adapted to not cause ringing when a subscriber line is seized thereover, means responsive to said microprocessor means to select one of said trunks, and line energizing means responsive to said microprocessor means for energizing a subscriber line and for communicating the results of such energization to said microprocessor means for translation to said central processor.

3,969,595

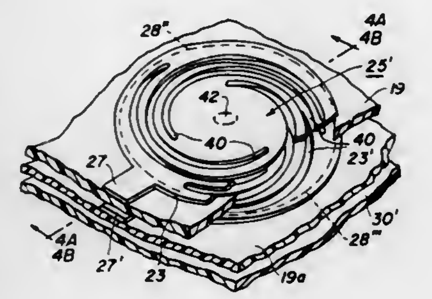
SEQUENTIAL SWITCHING ASSEMBLY HAVING PLURAL, SPACED FLEXIBLE CONTACT LAYERS

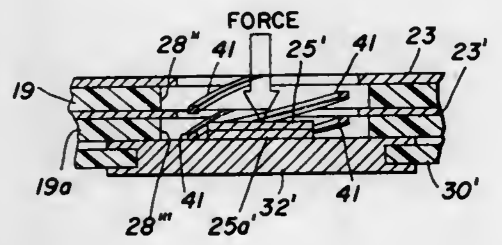
Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,477

Int. Cl.² H01H *13/70, 1/06*

U.S. Cl. 200—5 A **6 Claims**





1. A switching device comprising:

a first metallic contact member having a first focibly movable contact area portion defined therein by a plurality of curved slots and a support portion surrounding said first forcibly movable contact area portion,

a second metallic contact member having a second forcibly movable contact area portion defined therein by a plurality of curved slots and a support portion surrounding said second forcibly movable contact area portion,

a third metallic contact member,

first means for combining said metallic contact members into a unitary structure with said first and second metallic contact members adjacent each other and electrically isolated from each other, with said second and third metallic contact members adjacent each other and electrically isolated from each other, and with said first and second movable contact area portions in axial alignment with at least a portion of said third contact member, said first means permitting movement of said first and second contact area portions along said alignment axis,

second means for maintaining adjacent contact members at different potentials, and

switch actuating means in operative association with said contact members, said switch actuating means being capable of achieving (1) movement when a force is applied thereto of only said first contact area portion of said first metallic member without movement of said support portion surrounding said first forcible movable contact area portion and without changing the shape of said first contact area portion to achieve one switching function or (2) movement of both said first contact area portion of said first metallic member without movement of said support portion surrounding said first forcibly movable contact area portion and without changing the shape of said first contact area portion and said second contact area portion of said second metallic contact member without movement of said support portion surrounding said second forcibly movable contact area portion and without changing the shape of said second contact area portion to achieve two switching functions, with said first contact area portion being capable of movement independent of movement of said second contact area portion and with said second contact area portion being capable of movement only in conjunction with movement of said first contact area portion.

3,969,596

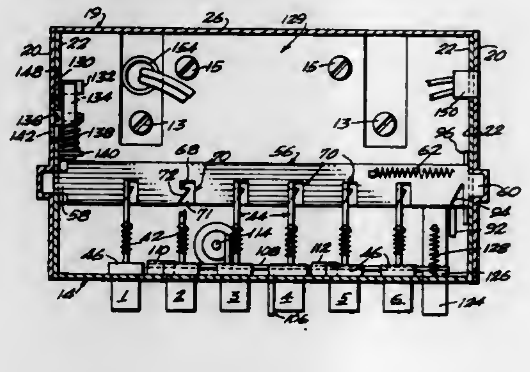
COMBINATION LOCK FOR THE IGNITION HOOD AND TRUNK OF AN AUTOMOTIVE VEHICLE

Frederick Siegel, 2228 Monroe, Hollywood, Fla. 33020

Filed Feb. 26, 1975, Ser. No. 553,175

Int. Cl.² H01H *27/10*

U.S. Cl. 200—43 **12 Claims**



1. A combination lock for an automotive vehicle ignition, hood and trunk lid comprising an ignition switch and hood and trunk lid switches, a main housing including a removable portion for access to an interior chamber, defined by said housing; a longitudinally extending control shaft, rotatably journaled in said chamber between opposed end walls of said housing; a plurality of lug means, fixed relative to said control shaft, providing abutment surfaces, spaced circumferentially outwardly of the outer surface of said control shaft in a predetermined, equally spaced apart relationship; a plurality of outwardly accessible push buttons, exceeding in number the number of said lug means; a plurality of inwardly extending arms connected to respective push buttons, corresponding in number to the number of lug means, and in respective alignment therewith, each of said arms including an inner abutment surface positioned to contact one of said lug abutment surfaces to rotate said control shaft through a predetermined number of degrees when the arm carrying push buttons are depressed in a proper sequential order; a lock bar, longitudinally slidable in said interior chamber in a parallel relationship with said control shaft and including tension spring means to normally maintain said lock bar in a first position; lock means associated with said lock bar and arms to first, move said lock bar to a second position as each arm carrying push button is sequentially actuated in proper order, and, second, to permit the lock bar to return to said first position to sequentially lock said arms and push buttons in their depressed positions; a first electric switch, located adjacent to one end of said control shaft; positioned to trip said first switch when all of said arm carrying push buttons have been depressed in a proper sequential order, to initially condition electric circuits to said ignition switch and to a pair of switches in respective circuits to hood and trunk lid solenoid actuated latches.

3,969,597

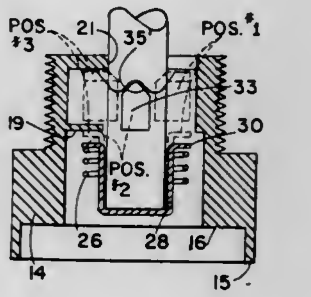
KEY OPERATED ELECTRIC GROUND SWITCH

Thomas F. Osika, Gary, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Jan. 2, 1975, Ser. No. 537,901

Int. Cl.² H01H *9/28*

U.S. Cl. 200—44 **9 Claims**



1. An electric ground circuit switch using the insertion of a key into the switch for changing the condition of an operating electric circuit in equipment which has a metal portion in which said switch is mounted for an electric connection through the switch and metal portion, said switch including in combination

a hollow conduction portion having a closure wall at one end with a key-opening therein and being open at the other end,

a hollow nonconductive portion which is open at one end and substantially closed at the other end,

terminal means on said hollow nonconductive portion,

means for electrically connecting said terminal means and said hollow conductive portion including a conductive compressible coiled spring positioned in said hollow nonconductive portion in conductive contact with said terminal means and also including a cup-shaped metal member positioned within said coiled spring and biased by said coiled spring into conductive contact with said hollow conductive portion at the key-opening end of the latter,

a key insertable through said key opening end for positioning in said cup-shaped metal member, said key being rotatable from a first position to a second position and acting when so rotated to move said cup-shaped metal member out of conductive contact with said hollow conductive portion against the bias of said coiled spring to change the condition fo a grounding electric circuit through said terminal means and said coiled spring and said cup-shaped metal member to said hollow conductive portion,

and means for maintaining said key in the rotated position with said cup-shaped member in the moved position, which latter position is out of electrical contact with said hollow conductive portion of said switch.

3,969,598

VACUUM-TYPE CIRCUIT INTERRUPTER WITH A PLURALITY OF SETS OF CONTACTS IN PARALLEL

Joseph C. Sofianek, Broomall, and Donald R. Kurtz, West Chester, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Feb. 3, 1975, Ser. No. 546,475

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **17 Claims**

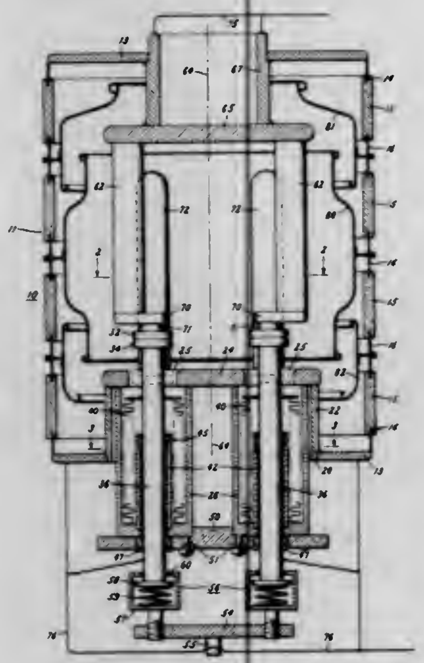
1. A vacuum-type circuit interrupter comprising:

a. an evacuated envelope,

b. a plurality of pairs of separable contacts located within said envelope, each pair including a movable contact having a surface that engages a surface of the other contact when the interrupter is fully closed,

c. a plurality of elongated conductive contact rods on which said movable contacts are respectively mounted, each movable contact being electrically connected to its associated contact rod, said contact rods being located in side-by-side physical relationship and being electrically connected in parallel with each other, said contact rods extending between the interior and exterior of said evacuated envelope and being axially movable to effect separation of the contacts of the associated pair of contacts,

d. a plurality of elongated tubes of highly conductive metal respectively surrounding said contact rods, each tube being radially spaced from its associated surrounded contact rod, the engaging surfaces of said pairs of contacts being located outside said tubes when said interrupter is fully closed,



e. means for mounting said tubes in fixed relationship with respect to said envelope and in adjacent side-by-side relationship with respect to each other so that said tubes define flux-controlling shields around said contact rods in which eddy currents are developed to substantially reduce the magnetic flux penetrating into the interior of each tube from any adjacent contact rod,

f. means for producing substantially simultaneous contact-separating motion of said contact rods,

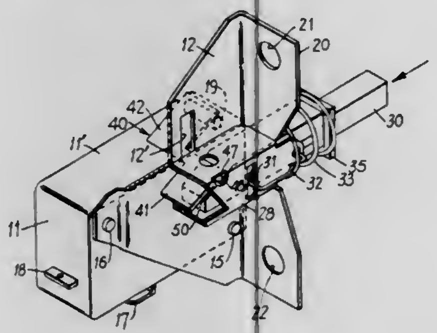
g. and means providing a seal about each of said contact rods that permits axial movement thereof without impairing the vacuum within said envelope.

3,969,599
OFFSET PADDLE ACTUATOR FOR PUSH-ROD SWITCH
Ronald Terry, Princeton, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,053

Int. Cl.² H01H *3/20*

U.S. Cl. 200—153 T **9 Claims**



7. A push rod mechanism for use in actuating a switch comprising

a push rod,

a flat mounting bracket,

a U-shaped channel member disposed with its open side on one face of said bracket thereby defining a slideway for receiving said push rod and for permitting axial movement of the rod between first and second positions,

an actuating lever having first and second oppositely extending paddles spaced by a narrow intermediate portion,

a slot in said mounting bracket located to intersect the open face of said channel member,

said actuating lever being disposed transversely of the mounting plate with its first paddle on one side thereof in said slideway and with its second paddle on the opposite side of the mounting plate.

the intermediate portion of the actuating lever being pivotally retained in said slot by said channel means,

the first paddle being pivoted by the push rod when the rod moves to its second position, whereby the second paddle also is pivoted in response to movement of the push rod,

a switch having actuator means mounted on the opposite face of said mounting bracket,

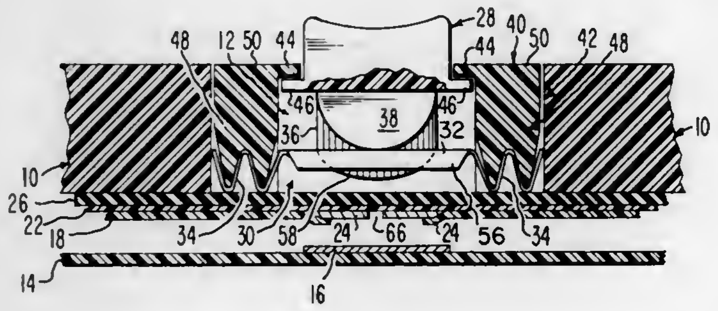
said switch actuator means being spring biased and located to pivot the second paddle when the push rod is in its first position, said second paddle operating to depress said switch actuator means when the push rod is in its second position.

3,969,600
TACTILE FEEDBACK KEYBOARD SWITCH ASSEMBLY AND ACTUATOR
Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 11, 1975, Ser. No. 586,039

Int. Cl.² H01H *13/14*, *3/17*

U.S. Cl. 200—159 B **22 Claims**



13. A switch assembly including, in combination:

a. relatively rigid means including a first of a pair of electrical contacts carried on a surface portion thereof;

b. flexible diaphragm means spaced from said rigid means and including a second of said pair of electrical contacts carried on a surface portion thereof, said diaphragm means being deflectable in the direction or the rigid means to effect closure of the pair of electrical contacts;

c. means mounted for movement along a path toward and away from the pair of contacts and disposed on the side of the flexible diaphragm means opposite to the rigid means, said movable means including a pair of depending members for applying pressure to the flexible diaphragm means and to thereby effectuate the closure of the pair of electrical contacts; and

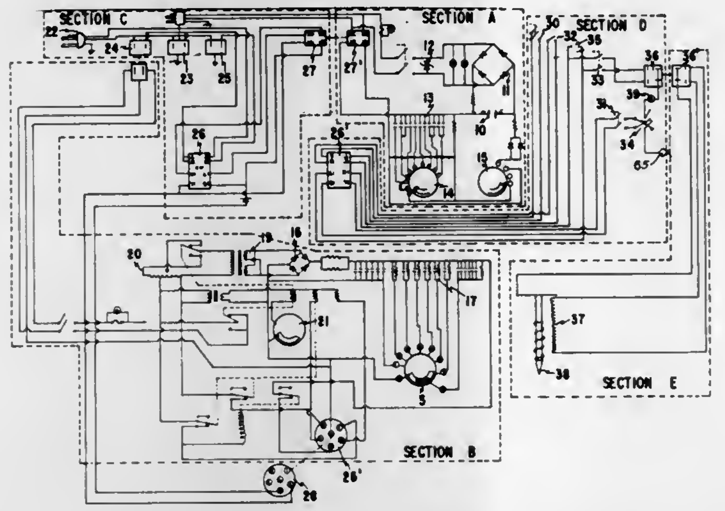
d. means for yieldably resisting movement of the movable means toward the rigid means, said yieldably resisting means including spring means disposed above the flexible diaphragm means and intermediate the pair of depending members, said spring means being comprised of leg means and interconnecting beam means that provides a first yieldable resistance to the movement of the movable means and that is qualified for buckling in response to a first predetermined pressure applied by said movable means, said beam means providing a second lesser yieldable resistance to the movement of said movable means following said buckling such that a lesser second predetermined pressure applied by said movable means will serve to continue the deflection of said diaphragm means in the closure of the pair of electrical contacts.

3,969,601
ELECTRONIC SPARK TREATING AND ERODING METALS
Isadore J. Rocklin, 3240 Douglas St., Sioux City, Iowa 51104

Continuation-in-part of Ser. No. 130,734, April 2, 1971, abandoned. This application Aug. 6, 1973, Ser. No. 386,189

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 G **14 Claims**



1. An electrical discharge machining apparatus for spark discharge treatment of a workpiece comprising:

a. a workpiece;

b. an electrode;

c. individual and separate units, electrically isolated from each other and including a main power supply unit, a first capacitor power pack generating unit, a second capacitor power pack generating unit, a control panel unit, an electrode positioning unit, and electrical cable connection means to selectively interconnect said units;

d. said first capacitor power pack generating unit comprising capacitor discharge power supply means connected between said electrode and said workpiece to provide said spark discharge and including at least one bank of a plurality of individual capacitors, switch means to selectively connect said bank of capacitors between said electrode and said workpiece, storage capacitor means to provide a sizable reservoir capacitive source to constantly charge said bank of capacitors;

e. said electrode a positioning unit including spark discharge sensing means to monitor the condition of said spark discharge between said electrode and said workpiece; and,

f. said electrode positioning unit further including means to move the electrode toward and away from the workpiece in response to said spark discharge sensing means.

3,969,602
STRUCTURE FOR AND METHOD OF ELECTROEROSION MACHINING
Victor E. Matulaitis, Franklin, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

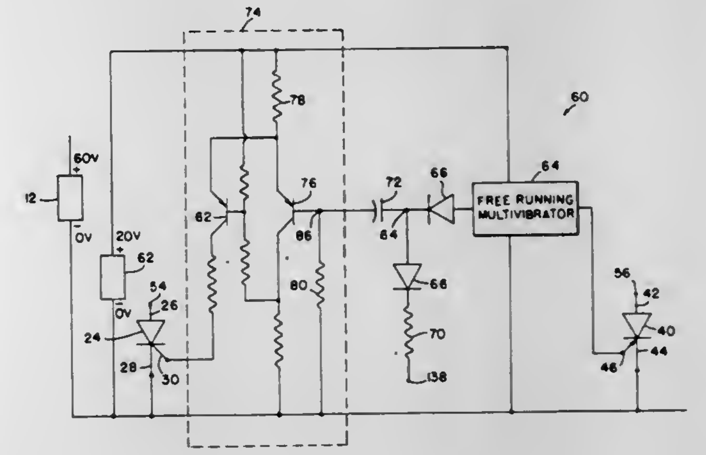
Filed Apr. 1, 1969, Ser. No. 811,719

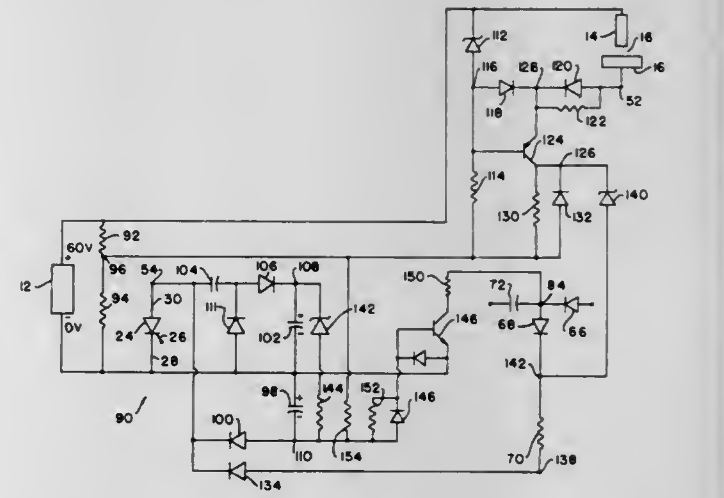
Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **5 Claims**

1. A circuit for electroerosion machining comprising a silicon controlled rectifier having anode, cathode and control electrodes, a source of electrical power and an electrode and workpiece in spaced apart relation to provide a machining gap connected in series with the anode and cathode of the rectifier and means connected to the control electrode of the rectifier for positively and rapidly turning the rectifier on and off including a free-running multi-vibrator and means indirectly connecting one side of the multi-vibrator to the control electrode of the rectifier including a Schmitt trigger circuit connected to the rectifier and means for providing a transient signal to actuate the Schmitt trigger circuit in response to a signal pulse from the one side of the multi-vibrator and means for inhibiting the transient signal provided to the Schmitt trigger circuit in response to a pulse from the one side of the multi-vibrator at controlled times.

3. The method of electroerosion machining comprising connecting a power supply, electrode, machining gap, workpiece and silicon controlled rectifier in series, rapidly turning the silicon controlled rectifier on and off, monitoring the machining gap during each machining cycle, preventing conducting of the rectifier in response to recognition of minimum voltage across the machining gap at the end of a machining cycle, testing the voltage across the machining gap at predetermined intervals after sensing a minimum voltage across the machining gap at the end of a machining cycle to determine if the minimum voltage has increased to a machining voltage and automatically varying the length of time between testing of the voltage across the machining gap in accordance with the length of time a minimum voltage has been present across the machining gap.





3,969,603
PLASMA-MIG ARC WELDING
Peter Boughton, Balsham, and David Bernard Swann Clarke, Horston, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 377,899, July 10, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,187

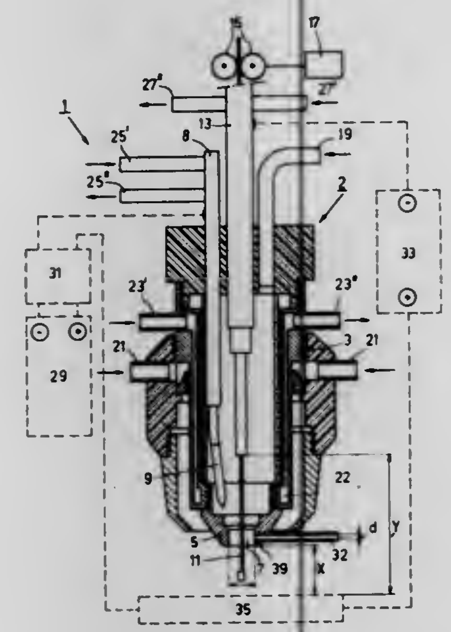
Claims priority, application United Kingdom, July 12, 1972, 32572/72

Int. Cl.² D23K *5/00*

U.S. Cl. 219—121 P **9 Claims**

1. In a method of plasma-MIG arc welding including connecting a first current source across a non-consumable electrode and the workpiece and thereby maintaining a plasma arc in a flow of inert gas between the end of said non-consumable electrode and said workpiece, guiding a consumable electrode coaxially into the plasma stream, connecting a second current source across a consumable electrode and the workpiece and thereby maintaining a MIG arc between the end of the con-

sumable electrode and the workpiece, the improvement in combination therewith comprising introducing an oxidizing



gas stream into the plasma stream in a region intermediate the respective ends of the consumable and non-consumable electrodes.

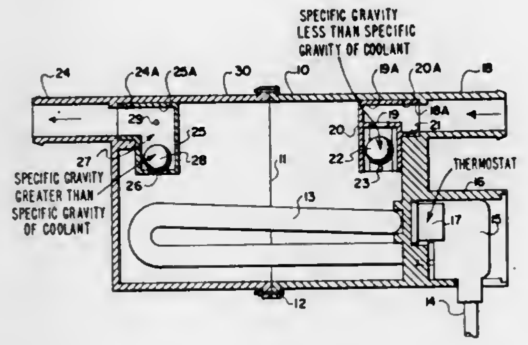
3,969,604
METHOD OF WELDING GALVANIZED STEEL

Edward Lund Baardsen, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 403,590, Oct. 4, 1973, Pat. No. 3,881,084. This application Oct. 4, 1974, Ser. No. 512,391
Int. Cl.² B23K *26/00*
U.S. Cl. 219—121 LM **1 Claim**

1. The product resulting from practicing the method of joining base steel articles, at least one of the articles is coated with a substance having a vapor pressure higher than the base steel article, the steel articles are first mated along at least one zone thereof, secondly a deposit of flux material is located adjacent at least one portion of said zone and is constituted so as to be effective to form a compound with said substance having a boiling and a melting temperature substantially the same or higher than the steel of said base articles and has a vapor pressure substantially the same or less than said base steel articles, and lastly, at least one portion of said zone is subjected to a high energy density beam effective to melt both of said base steel articles in the area of said beam and the flux whereby welding of said articles is obtained, said product is characterized by the absence of voids or porosity.

3,969,605
THERMAL PULSE TYPE HEATER FOR COOLANT SYSTEMS AND THE LIKE

Russell D. Danell, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada
Filed Jan. 23, 1975, Ser. No. 543,308
Claims priority, application United Kingdom, Jan. 29, 1974, 4036/74
Int. Cl.² F02N *17/06;* **H05B** *1/00;* **F24H** *1/10;* **F16K** *15/04*
U.S. Cl. 219—208 **8 Claims**


SPECIFIC GRAVITY LESS THAN SPECIFIC GRAVITY OF COOLANT
24
24A
25A
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THERMOSTAT
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SPECIFIC GRAVITY GREATER THAN SPECIFIC GRAVITY OF COOLANT

1. A heater for the coolant of liquid cooled automotive engines and the like comprising in combination a coolant reservoir, a heater element therein operatively connected to a source of electrical energy, an inlet connection and an outlet connection in said reservoir adjacent the upper side thereof, whereby said reservoir may be operatively connected to the coolant system of said engine, said inlet connection including a fluid level, one-way control valve assembly adapted to allow coolant to enter said reservoir, said outlet connection including a one-way valve assembly adapted to allow coolant to leave said reservoir, said inlet valve assembly including a valve seat, a ball valve element below said seat engageable with said seat when said inlet valve assembly is in the closed position, said ball valve element having a specific gravity less than the specific gravity of the coolant whereby said ball valve element floats in said coolant and moves away from said valve seat when the level of coolant drops within said reservoir and moves into engagement with said valve seat when the level of coolant rises within said reservoir, said one-way control valve assembly in said inlet connection including a horizontally situated cylindrical sleeve engageable within a bore forming the inner end of said inlet connection, and a substantially cylindrical shroud extending downwardly substantially at right angles to said sleeve, said valve seat being situated between said sleeve and said shroud and at the upper end of said shroud whereby said shroud communicates with said sleeve, said ball valve element moving freely vertically within said shroud, and means restraining the displacement of said ball valve element from the lower open end of said shroud.

3,969,606
ELECTRICALLY HEATED STYLUS FOR TRANSFERRING A PRINTING MEDIUM

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048
Filed Aug. 5, 1974, Ser. No. 494,473
Int. Cl.² H05B *3/00;* **B43K** *7/00;* **B23K** *3/02*
U.S. Cl. 219—237 **1 Claim**

1. In a device for transferring a printing medium, forming a coating on one face of a sheet of material, and subject to release therefrom upon movement of a heated stylus along the opposite face of the sheet in a desired path, while the medium is in contact with an article to be printed, the improvements, in combination, comprising;

a. a hollow handle adapted to be grasped in the hand of an operator for freehand movement in a path corresponding to the configuration of insignia to be printed,

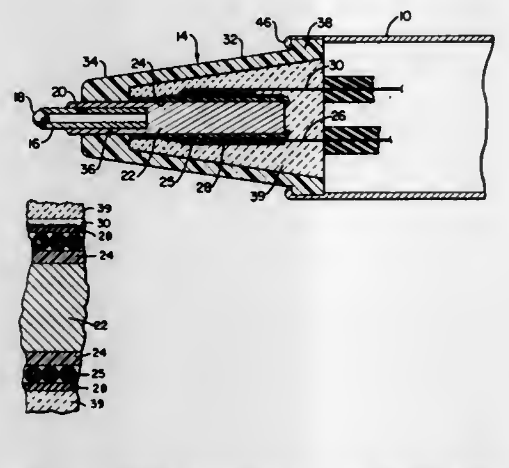
b. said handle having a stylus supporting member extending outwardly from an end thereof formed of electrically insulated material of relatively low heat conductivity,

c. a metallic mandrel carried by said member and having a portion disposed within said member in spaced relation thereto,

d. a layer of electrical insulation surrounding and electrically insulating the surface of said portion,

e. a continuous insulated wire of relatively high electrical resistance wound around said layer in a plurality of abutting coils, said coils forming a heating element for supplying heat to the mandrel through said layer,

f. a metallic stylus comprising the tip portion of a conventional ball point pen extending outwardly from the exposed end of the mandrel, said stylus comprising a metallic tube with a rotatable steel ball secured to the end thereof, said ball being adapted to roll along said opposite face, the exposed portion of said stylus having an uninsulated electrically conductive outer surface, the stylus being in electrically conductive engagement with said metallic mandrel, said stylus supporting member being hollow and surrounding the heating element in spaced relation thereto, said space being completely filled with a potting material comprising a liquid cement mixture subject to hardening after being delivered to said space,



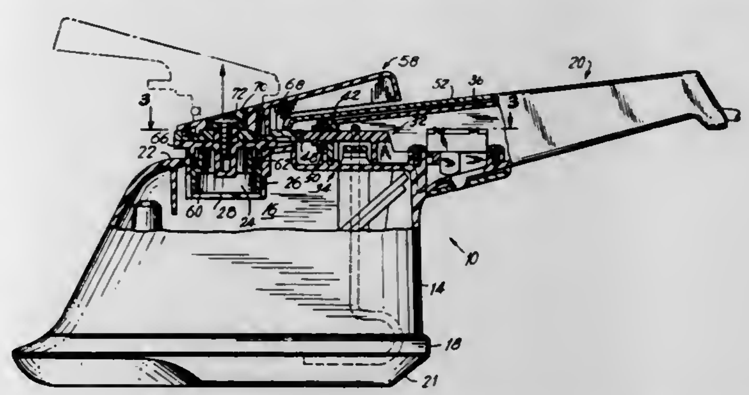
g. means extending through said handle and connected to the heating element for supplying power thereto, and

h. the construction and arrangement being such that said layer provides back-up insulation between the electrically heated heating element and the mandrel and prevents the introduction of a shocking voltage to the stylus through the mandrel in event of breakdown of the insulation on the heating element.

3,969,607
HAND STEAMING DEVICE WITH AUTOMATIC POWER INTERRUPTING MEANS

Leonard Osrow, Great Neck, and Jacques L. LeBaigue, Westbury, both of N.Y., assignors to Osrow Products Company Inc., Glen Cove, N.Y.
Filed June 18, 1974, Ser. No. 480,599
Int. Cl.² H05B *1/02, 3/60;* **D06F** *75/08*
U.S. Cl. 219—272 **8 Claims**

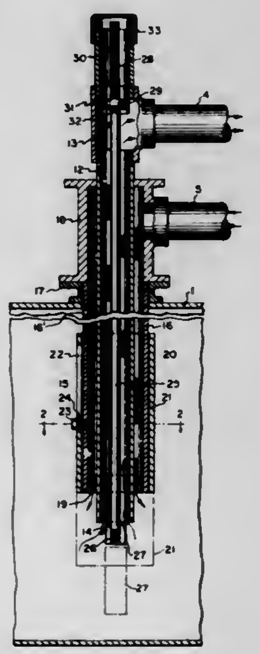
1. A hand steaming device comprising a housing, said housing including a reservoir, a pair of spaced apart electrodes located in said reservoir, a fill cap port through which a liquid can be directed to said reservoir, a fill cap for sealing said fill cap port and movable between a position wherein said fill cap seals said fill cap port to a position wherein said fill cap does not seal the fill cap port, said fill cap rotatable in said fill cap port while sealing said fill cap port, switch means connected to said electrodes, and means cooperatively associated with said switch means and said fill cap for selectively controlling the operation of said switch means in response to rotation of said fill cap in said fill cap port and so that when said fill cap is positioned so that it no longer seals said fill cap port said switch means is opened to prevent a source of electrical power which is connected to said switch means from being connected to said electrodes and so that when said fill cap seals said fill cap port said switch means can selectively be closed



to connect the source of electrical power to said electrodes and alternatively selectively be opened to prevent said source of electrical power from being connected to said electrodes.

3,969,608
VISCOUS LIQUID CONVEYING APPARATUS

Joseph M. Day, 4231 Elmonte St., Saginaw, Mich. 48603
Filed Oct. 15, 1974, Ser. No. 514,590
Int. Cl.² H05B *3/00;* **B05B** *1/24;* **F17D** *1/18;* **B67D** *5/62*
U.S. Cl. 219—300 **14 Claims**

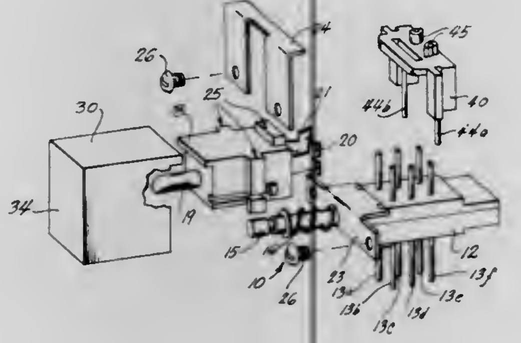


1. Viscous liquid conveying apparatus comprising a tank having a bottom for containing a supply of viscous liquid; a device for receiving liquid from said tank; a supply line extending into said tank toward said bottom and having one end terminating at a predetermined level from said bottom in an open mouth, said supply line having its other end connected to said device; a return line having one end extending into said tank in concentric relation with said supply line and having its other end connected to said device, said one end of said return line terminating in an open mouth adjacent the mouth of said supply line but at a different level from said bottom; means for delivering liquid from said tank to said device via said supply line and for returning liquid from said device to said tank via said return line; means for heating liquid returned to said tank via said return line; a tubular member snugly but slidably fitted on the higher level one of said lines adjacent its mouth for back and forth movements toward and away from the bottom of said tank to adjust the effective length of said higher level one of said lines and thereby the position of its mouth at a selected level above or below the level of the mouth of the other of said lines; and operating means connected to said tubular member for moving the latter.

3,969,609
ILLUMINATED PUSH BUTTON SWITCH

Vernon Walter Wanner, and William Karl Lueschen, both of Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Jan. 15, 1975, Ser. No. 541,328
Int. Cl.^{2} H01H *9/00*
U.S. Cl. 200—314 **9 Claims**



1. An illuminated electrical switch comprising:

a switch mechanism having a selector element extending from one end and two or more conductive switch terminals located in proximity to the other end of said switch mechanism;

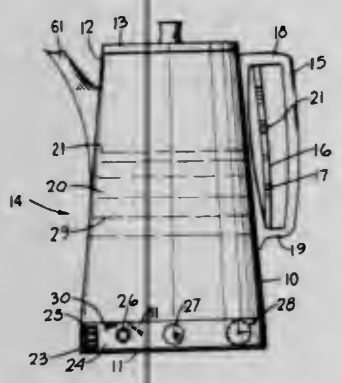
housing means coupled to said switch mechanism for containing a light source, said housing means including a socket for receiving said source located adjacent to said selector element and spaced conductive connector means engaging said light source, said connector means extending from said housing means and terminating in proximity to said switch terminals; and

nonconductive saddle means removably mounted on said switch mechanism adjacent said housing means, said saddle means including pair of spaced auxiliary terminals spanning the sides of said switch mechanism and spaced from said switch terminals, said connector means contacting said auxiliary terminals and being held out of contact with said switch terminals when said saddle means is in place and contacting at least one of said switch terminals when said saddle means is removed.

3,969,610
LIQUID HEATING DEVICE

Helen Ratti, and Charles Ratti, both of North Babylon, N.Y., assignor to Lawrence Peska Associates Inc., New York, N.Y., a part interest

Filed Jan. 20, 1975, Ser. No. 542,434
Int. Cl.^{2} F27D *11/02*
U.S. Cl. 219—441 **2 Claims**

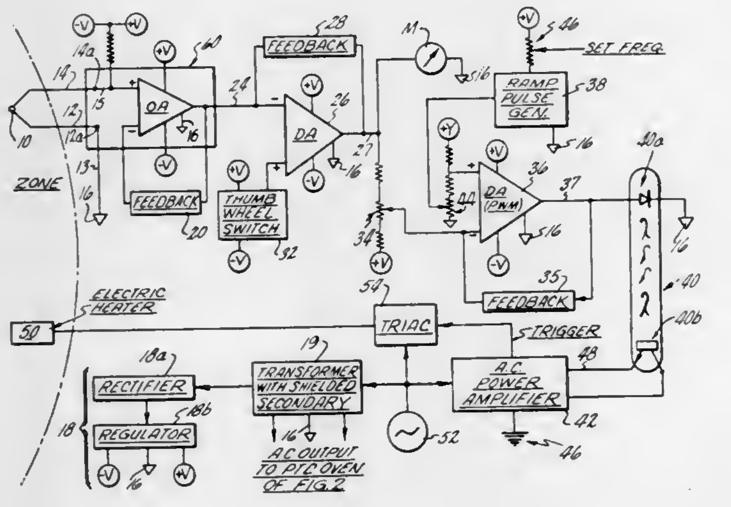


1. A liquid heating device, which comprises:
a. a cylindrically shaped container having a closed base, an upwardly extending cylindrically shaped sidewall, an interior chamber therein, wherein a pouring spout and a U-shaped handle communicate with said sidewall;
b. a removable top lid cover communicating with an open top end of said container; said container and said lid cover being of thermally and electrically insulating material;
c. a control panel contained on a bottom outside periphery of said sidewall;
d. an inlet receptacle, a two way switch assembly, a light unit and a timer assembly contained in said control panel; and
e. an interior electrical heating element within said interior chamber electrically communicating in an electric circuit, said electric circuit including a first series circuit of a power source, said two way switch, a first electrical juncture, a thermostatic unit in fluid contact with a liquid adapted to be received in said interior chamber, a second electrical juncture, said heating element, a third electrical juncture, and a fourth electrical juncture, a second series circuit of a fifth electrical juncture and said timer assembly joined between said switch assembly and said first electrical juncture, and a third series circuit of said light unit and a variable heat responsive switch, said heat responsive switch joined to said third and said fourth electricl junctures, said electric circuit being electricaly insulated.

3,969,611
THERMOCOUPLE CIRCUIT

Norman O. Fonteneau, Acushnet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,942
Int. Cl.^{2} H05B *1/02*
U.S. Cl. 219—502 **6 Claims**

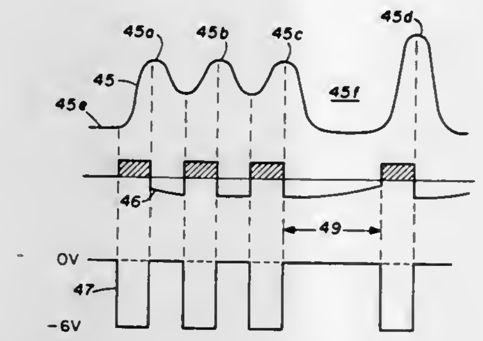


1. In a thermocouple circuit wherein two dissimilar conductors define a transducer for generating a thermal e.m.f. proportional to the temperature difference between said transducer and the electrically connected reference junction of said dissimilar conductors the improvement comprising:
a. A thermal stable environment means providing a reference temperature for forming a thermocouple reference junction,
b. A source of electrical energy for generating a voltage which is referenced to a stable common potential,
c. Amplifying means for said thermal e.m.f., said amplifying means driven from said electrical energy source, and said amplifying means having its output referenced to said stable common potential said amplifying means disposed in said thermal stable environment means, and
d. An optical coupling device for isolating the output of said amplifying means from ground potential.

3,969,612
BAR CODE READER ENHANCEMENT

Robert B. McJohnson, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed June 11, 1974, Ser. No. 478,238
Int. Cl.^{2} H03K *5/01, 6/06;* **G06K** *7/14*
U.S. Cl. 235—61.11 E **12 Claims**



1. Apparatus for processing a video signal derived from bar coded documents of varying reflectance, the video signals having noise components in addition to signal components, the combination comprising:

means for transforming the video signal into amplitude truncated pulses having transitions at points corresponding to a change in the sign of the slope of the video signal,

means for filtering the truncated pulses to produce a dump signal pulse train at a bit rate determined by transitions of the truncated pulses,

means for integrating the truncated pulses and responsive to the dump signal to provide at the output thereof a pulse train at the integration level of the truncated pulses and synchronized at the bit rate,

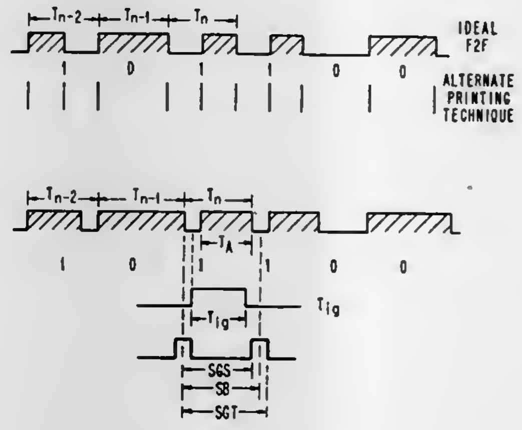
a threshold detector responsive to the output of said means for integrating to provide an output control signal when the integration level of the truncated pulses exceeds a preset level, and

a bistable output means responsive to the output control signal to provide an output at one of two levels.

3,969,613
TWO FREQUENCY CODED DATA INTERPRETING METHOD AND APPARATUS

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,572
Int. Cl.^{2} G06K *7/00*
U.S. Cl. 235—61.11 R **22 Claims**



1. A method of operating an F2F coded data decoder apparatus for interpreting F2F coded data received thereby to extract therefrom its correct digital content whenever each multibit data block received at said decoder is preceded by at least a first or preamble symbol having two double frequency time slots, or nominal half-symbol widths bounded by single frequency signals, by predicting from the end of said preamble symbol the time at which the next single frequency symbol boundary transition should occur, and controlling the duration of a period of searching by said decoding apparatus for any said single frequency symbol boundary transitions in accordance with said prediction, thereby isolating said boundary transitions for interpretation, comprising the steps performed by means in said apparatus of:
a. measuring the width of said first symbol and, after said measurement is completed, reinitiating step a) for the next succeeding symbol;
b. storing as a reference the polarity of the symbol boundary transition signal at the end of said first symbol width measurement;
c. predicting ideal times for the start and end of said symbol boundary search period according to the following algorithm:
a. $T_{sg} = T_{n-1} \ (1 \pm \alpha)$

where α is a variable coefficient arbitrarily chosen from the range 0 to ½ and being optimum at $\alpha = ¼$, T_{sg} is the predicted ideal dimensions for said symbol boundary search time, and T_{n-1} is the last and said symbol width measurement;
d. during said search period, sensing the next symbol boundary transition signal, storing the polarity of said signal in a temporary storage, comparing the polarity of said transition with said reference polarity and, if said polarities correspond, entering a one into a data register, terminating said reinitiated symbol width measurement, and reinitiating said symbol width measurement for the succeeding symbol, but if said polarities do not correspond, entering a "zero" into said data register; and terminating said reinitiated symbol width measurement, and reinitiating said symbol width measurement;
e. storing the polarity contents of said temporary storage as the next said reference polarity and continuing operation from step c).

3,969,614
METHOD AND APPARATUS FOR ENGINE CONTROL

David F. Moyer, Ann Arbor; Shaun S. Devlin, Birmingham, and Richard J. Genik, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1973, Ser. No. 423,968
Int. Cl.^{2} G05B *13/02, 15/02*
U.S. Cl. 235—150.21 **18 Claims**

1. A method for controlling a combustion engine used in a process of converting heat energy, released by the combustion of a fuel, into mechanical energy, said engine having an output shaft which rotates while it is in operation and including at least one means for controlling said energy conversion process, said method comprising the steps of:

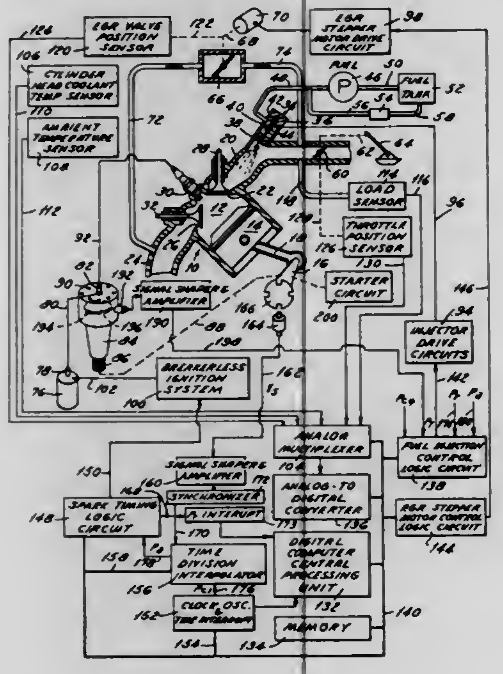
generating an electrical signal in the form of a binary number, said signal being indicative of a condition of said engine as of a selected instant in time during which said engine is operative in effecting said energy conversion process; then

arithmetically calculating a value corresponding to a setting of said means for controlling said energy conversion process, said calculating being performed using said binary number electrical signal, by a digital computer programmed to calculate said value from an algebraic function or functions describing a desired relationship between said engine condition and said means for controlling said energy conversion process; then

with an electrical circuit coupled between said digital computer and said means for controlling said energy conversion process, converting said calculated value into a setting of said means for controllng said energy conversion process; and thereafter

while said engine is in operation, continuously repeating the above sequence of steps at uniform angular intervals of rotation of said engine output shaft to effect changes in the settings of said means for controlling said energy conversion process in response to changes in said binary number electrical signal indicative of said engine condition.

11. A method for controlling a combustion engine used in a process of converting heat energy, released by the combustion of a fuel, into mechanical energy, said engine including at least first and second means for controlling said energy conversion process, said method comprising the steps of:
- generating an electrical signal in the form of a binary number, said signal being indicative of a condition of said engine as of a selected instant in time during which said engine is operative in effecting said energy conversion process; then
- arithmetically calculating a first value corresponding to a setting of said first means for controlling said energy conversion process, said calculating being performed, using said binary number electrical signal, by a digital computer programmed to calculate said first value from an algebraic function or functions describing a desired relationship between said engine condition and said first means for controlling said energy conversion process;
- arithmetically calculating a second value corresponding to a setting of said second means for controlling said energy conversion process, said calculating being performed, using said calculated value corresponding to a setting of said first means for controlling said energy conversion process, by said digital computer programmed to calculate said second value from an algebraic function or functions describing a desired relationship between settings of said first and second means for controlling said energy conversion process;
- with a first electrical circuit coupled between said digital computer and said first means for controlling said energy conversion process, converting said calculated first value into a setting of said first means for controlling said energy conversion process;
- with a second electrical circuit coupled between said digital computer and said second means for controlling said energy conversion process, converting said calculated second value into a setting of said second means for controlling said energy conversion process; and thereafter
- while said engine is in operation, continuously repeating the above sequence of steps to effect changes in the settings of said first and second means for controlling said energy conversion process in response, respectively, to changes in said binary number electrical signal indicative of said engine condition and in said calculated first value.


EGR VALVE POSITION SENSOR
CYLINDER HEAD COOLANT TEMP SENSOR
AMBIENT TEMPERATURE SENSOR
LOAD SENSOR
THROTTLE POSITION SENSOR
STARTER CIRCUIT
SIGNAL SHAPING AMPLIFIER
BREAKERLESS IGNITION SYSTEM
INJECTOR DRIVE CIRCUITS
ANALOG MULTIPLEXER
ANALOG-TO-DIGITAL CONVERTER
DIGITAL COMPUTER CENTRAL PROCESSING UNIT
MEMORY
SPARK TIMING LOGIC CIRCUIT
CLOCK OSC.
FUEL INJECTION CONTROL LOGIC CIRCUIT

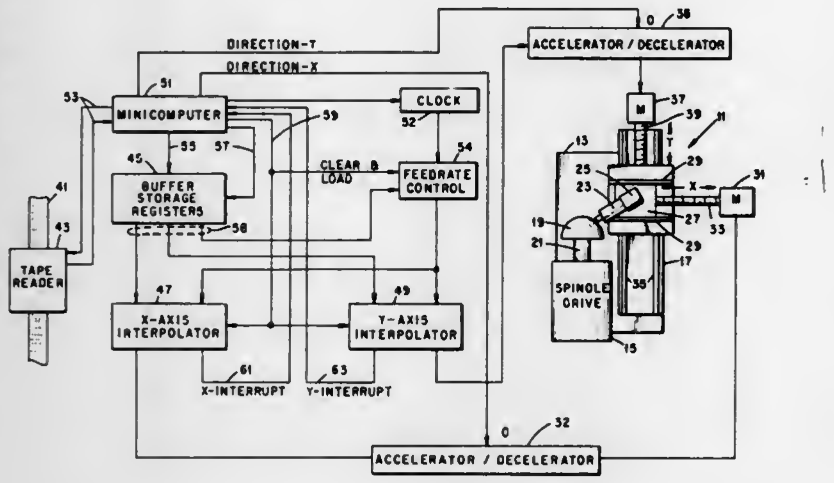
3,969,615
INTERPOLATOR FOR NUMERICALLY CONTROLLED MACHINE TOOLS

Gary L. Bowers, Clinton; Clyde M. Davenport, Oak Ridge, and Albert E. Stephens, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 534,937

Int. Cl.^{2} G06F *15/46;* **B23Q** *11/18*

U.S. Cl. 235—151.11 **6 Claims**



1. In combination with a positioning system for automatic positioning of at least one positionable member driven by a drive means along an axis at a rate responsive to the rate of command pulses applied to said drive means and including a computer having a data storage means for storing descriptive data in the form of a plurality of data blocks of binary values each relating to a particular motion to be achieved by said positionable member within a prescribed time frame, an interpolator for accepting said descriptive data one block at a time and generating said command pulses sepecified by a data block within the prescribed time frame, comprising:
- a first digital integrator means for receiving and storing a first binary integrand value from said computer of the particular one of said data blocks being executed and producing a first train of pulses according to the integral of said first binary integrand value with respect to said prescribed time frame;
- a second digital integrator means for receiving a second binary integrand value from said computer of said particular data block being executed and producing a second train of pulses according to the integral of said second binary integrand value with respect to said prescribed time frame, each of said integrators includes an integrand register having a predetermined fixed bit size and operative to store the corresponding binary integrand value, a parallel bit digital adder having first and second add inputs, a sum output, which is the sum of binary values applied to said first and second add inputs and an overflow output, said first add input connected to receive said integrand value stored in said integrand register, and a remainder storage register of a bit size identical to said integrand register and having an output connected to said second add input of said adder and an input connected to said sum output of said adder, said remainder storage register having a transfer trigger input connected to receive said control pulses from said control means, so that upon receiving a control pulse the remainder value stored in said remainder storage register is added to said integrand value and the sum is reloaded into said remainder storage register;
- means responsive to said first train of pulses for incrementing said second integrator integrand at a selected bit position so as to continually change the integrand value of said second integrator with respect to said prescribed time frame according to the integral value of said first integrator;

- control means for accepting a binary time value from said computer, the magnitude of which controls the rate of generation of said first and second train of pulses within said time frame for the particular data block being executed and generates control pulses to said first and second integrators to effect integration of said integrand values according to said time frame;
- output circuit means for applying said second train of pulses to the corresponding axis drive means; and
- an end-of-block interrupt signal generating means for sensing the pulses to said axis drive means and generating an end-of-block interrupt signal to said computer when a specified number of command pulses for the block being executed is applied to said axis drive means.

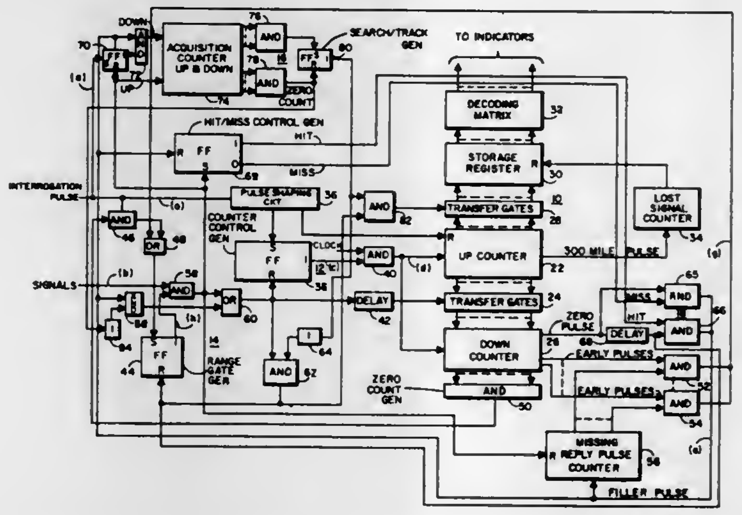
3,969,616
DIGITAL RANGE COMPUTER SYSTEMS FOR AIR NAVIGATION SYSTEMS SUCH AS TACAN

Frederick J. Mimken, Fairport, N.Y., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed June 29, 1965, Ser. No. 467,897

Int. Cl.^{2} G01S *9/18;* **H03K** *5/20*

U.S. Cl. 235—151.32 **15 Claims**



1. A computer system for calculating the range between two stations which are in radio communication with each other, said system comprising:
- a. calculation means for producing an output having a value corresponding to the elapsed time between the transmission of a signal from a first of said stations to a second of said stations and the reception of a signal transmitted from said second station to said first station in reply to said first station transmitted signal,
- b. control means for supplying information to said calculation means respecting time of the occurrence of said first station transmitted signal and the time of reception of said reply signal, and
- c. means operated by said calculation means when said calculation means output equals an expected value for operating said control means to supply information simulating the information respecting the reception of reply signals to said claculation means whereby to maintain the operation of said calculation means on a continuing basis notwithstanding that said reply signals are missing.

3,969,617
MULTICHANNEL DIGITAL MODULATOR

Sylvain Fontanes, Chatou, France, assignor to Compagnie Europeenne de Teletransmission (C.E.T.T.), Chatou, France

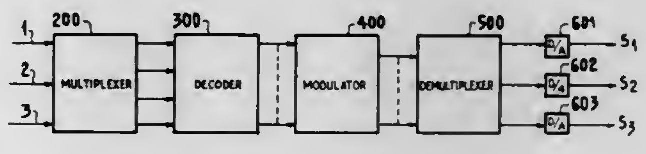
Filed Apr. 8, 1975, Ser. No. 566,512

Claims priority, application France, Apr. 12, 1974, 74.13068

Int. Cl.^{2} H03C *5/00*

U.S. Cl. 235—152 **7 Claims**

1. A digital modulator adapted for receiving *n* input binary digital signals S_i, $i = 1, 2 \ldots n$,*n* being an integer greater than one, said modulator comprising
- a memory in which coded binary words representative of samples of a sinusoidal signal are stored, said memory having an address input and an output;
- *n* channel circuits for respectively grouping the successive bits of each input signal S_i in groups of P_i bits, each P_i being a positive integer, said *n* channel circuits having respective outputs;
- a multiplexing circuit, having an output, and comprising means for sampling the output groups of said *n* channel circuits, a sample of a group being formed by sampling each bit of this group, and the sampling of the *n* channel output groups being performed cyclically, said multiplexing circuit thus delivering at its output a multiplexed signal comprising a plurality of samples of each of said groups, a group having given rise to a sample being termed the parent group of this sample;
- a coding arrangement having an input coupled to the output of said multiplexing circuit and an output coupled to said address input for delivering to said address input, for each sample included in said multiplexed signal, an address signal and means for successively reading the coded words respectively corresponding to the successive address signals.



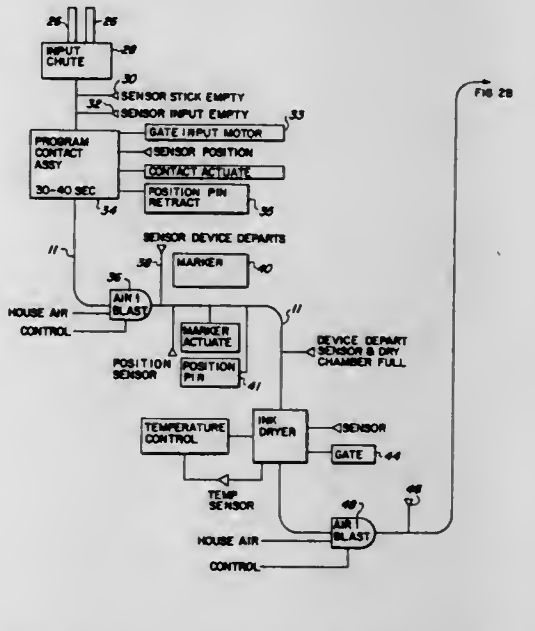
3,969,618
ON LINE PROM HANDLING SYSTEM

John Michael Strubel, Rancho Palos Verdes; Don Minoru Mizota, Panorama City; Michael Tung, Culver City; Alfred Watson Sanborn, North Hollywood; Richard Dale McNair, Rancho Palos Verdes; Jefferson Frank Forte, Whittier, and William Lawrence Scheding, Marvista, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1974, Ser. No. 528,241

Int. Cl.^{2} G11C *29/00;* **G06F** *11/04*

U.S. Cl. 235—153 AC **25 Claims**



1. Apparatus for automatically programming and testing a programmable read-only memory (PROM) device of the type having a fuse corresponding to every bit in memory, the selective blowing of said fuses by the application of electrical pulses constituting the programming of said PROM, comprising:
- means electrically coupled to said PROM for programming said PROM with a predetermined bit pattern by the selective blowing of said fuses,
- means electrically coupled to said PROM for testing the access time required for said PROM to output said bit

pattern contained within said PROM after completion of said programming, and

means for transporting said PROM to said means for programming and to said means for testing.

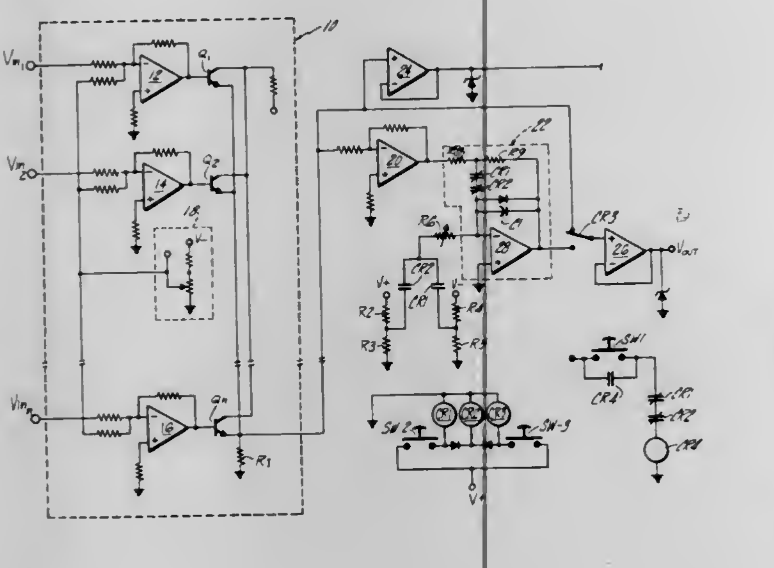
3,969,619
ANALOG SERVO MEMORY

Mohamed A. R. El-Ramly, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 13, 1975, Ser. No. 549,721

Int. Cl.^{2} G06G *7/18*

U.S. Cl. 235—183 **7 Claims**



1. An analog servo memory, said memory having an output terminal and receiving a plurality of input signals in the form of variable direct current potentials, said memory comprising:

- maximum value selector circuit means, said maximum value selector circuit means receiving said plurality of said input signals and providing an output signal commensurate with the magnitude of the input signal having the instantaneously highest magnitude;
- an analog integrator, said integrator having an input and an output;
- automatic-manual mode selector switch means;
- means coupling a first contact of said selector switch means to the memory output terminal;
- means connecting a second contact of said selector switch means to the output of said maximum value selector circuit means, said first and second contacts of said selector switch means being closed in the automatic mode position and being open in the manual mode position;
- means connecting a third contact of said selector switch means to the output of said integrator, said first and third contacts of said selector switch means being open in the automatic mode position and being closed in the manual mode position;
- means for selectively delivering the output signal provided by said maximum value selector circuit means to the input of said integrator, said selective delivering means isolating the integrator from the maximum value selector circuit means output signal when said selector switch means is in the manual mode position; and
- means for selectively varying the magnitude of the signal appearing at the output of said integrator independently of the value of input signals applied to said maximum value selector circuit means.

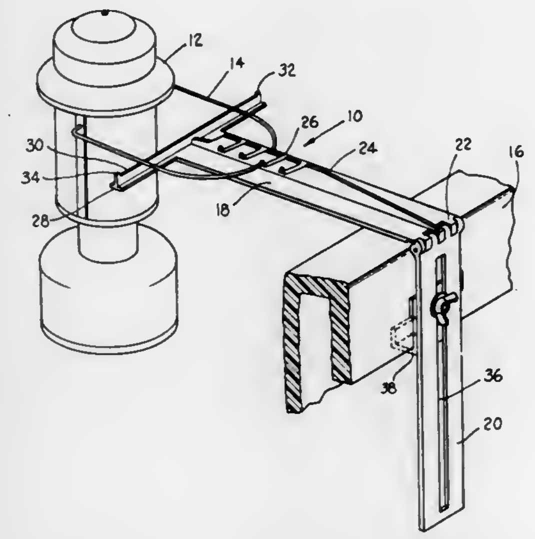
3,969,620
LANTERN SUPPORT APPARATUS

Charles R. Brooks, Rte. 1, White Horse Road, Greenville, S.C. 29611

Filed June 4, 1975, Ser. No. 583,762

Int. Cl.^{2} F21V *21/14*; **F16M** *11/00*

U.S. Cl. 240—7.5 **6 Claims**



6. A support apparatus for holding a lantern having a bail pivoted thereon about a horizontal axis comprising:

- a horizontal outwardly extending elongated member;
- at least one transverse notch formed in an upper surface of said horizontal member extending downwardly and outwardly therein;
- an elongated transverse member carried on an outer end of said elongated member for receiving the width of said bail thereagainst;
- attachment means carried by said elongated member for attaching said support apparatus to a supporting structure;

whereby said bail is received in said notch and overagainst said elongated transverse member to maintain said lantern in an upright position as it freely pivots about its bail while supported thereby.

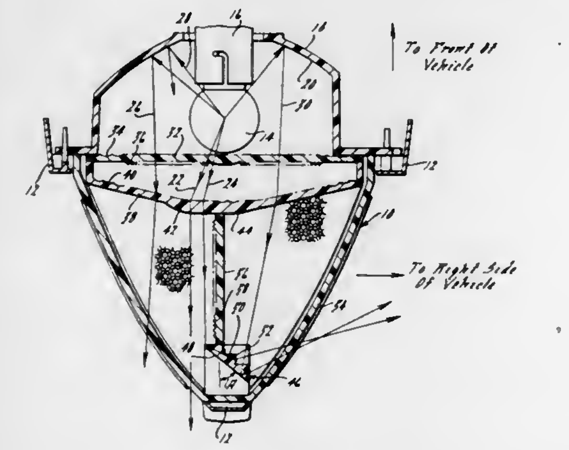
3,969,621
MOTOR VEHICLE LIGHT ASSEMBLY UTILIZING TOTAL INTERNAL REFLECTION

Richard M. Ferrell, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1974, Ser. No. 525,034

Int. Cl.^{2} F21V *7/00*

U.S. Cl. 240—41.35 C **6 Claims**



1. A light assembly for a motor vehicle, said light assembly being designed to project light both in the longitudinal direction of said motor vehicle and in a direction transverse to said motor vehicle, said light assembly comprising:

- a light source;
- a parabolic reflector, said light source being positioned at the focal point of said parabolic reflector and said parabolic reflector defining a general direction of light projection;
- a lens made from a transparent material, said lens having a plane surface and a surface having a plurality of optics, said lens surface having a plurality of optics including certain portions interspersed among said optics, said surface portions being flat and parallel to said plane surface of said lens, thereby, to permit light rays entering said lens at said surface portions to be transmitted through said lens, said optics being of a type capable of producing total internal reflection of light rays entering said lens from the direction of said parabolic reflector and said light source, and said optics projecting said totally internally reflected light rays in a direction substantially transverse to said general direction.

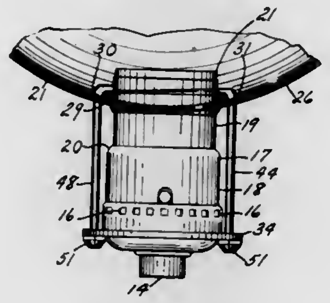
3,969,622
SOCKET LOCKING STRUCTURE

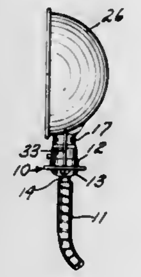
Neil W. Brandt, 55 Laron Drive, New Rochelle, N.Y. 10804

Filed June 19, 1975, Ser. No. 588,216

Int. Cl.^{2} F21V *7/00, 17/06*

U.S. Cl. 240—140 **1 Claim**





1. In a combination lamp socket and reflector assembly of a type in which a socket element includes a cup-like base and a cylindrical sleeve maintained in assembled relation with said base by resilient detent means, said reflector being carried by said sleeve, improved means for maintaining said assembly in integrated condition comprising: a planar ring-like base member having a generally centrally disposed opening of diameter less than that of said cup-like base of said socket element, said base member having a pair of openings therein bordering said centrally disposed opening; and a looped wirelike member having free ends thereof penetrating and secured within said pair of openings in said base member; said reflector having a pair of correspondingly spaced openings therein, said looped member passing through said openings in said reflector, whereby said reflector is retained upon said sleeve against rotational and longitudinal movement, and said sleeve is maintained in assembled condition within said socket, irrespective of the engagement of said resilient detent means.

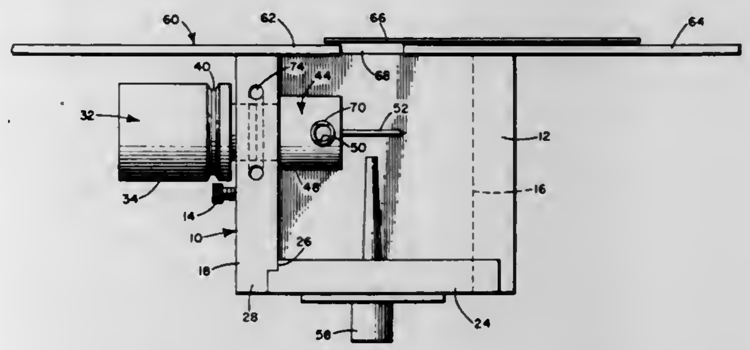
3,969,623
VARIABLE TEMPERATURE FLAT PLATE POWDER DIFFRACTION CAMERA

Theodore J. Klingen, Oxford, Miss., and John H. Kindsvater, Reno, Nev., assignors to The University of Mississippi, University, Miss.

Filed Jan. 10, 1975, Ser. No. 540,219

Int. Cl.^{2} G01N *23/20*

U.S. Cl. 250—275 **11 Claims**



1. A camera including a source of X-ray radiation for obtaining X-ray diffraction photographs of a powder specimen comprising:

- a support assembly having a first and second axis, said first axis being transverse to said second axis;
- first means mounted to said support assembly for forming a collimated beam of X-radiation, said collimated beam directed parallel to said first axis;
- second means mounted to said support assembly for mounting a powder specimen having a longitudinal axis thereof set parallel to said second axis, said second means maintaining the specimen in an area for impingement by said collimated beam of X-radiation for producing a plurality of diffracted X-rays;
- a flat-plate photographic film slidably supported in an attitude transverse said first axis and responsive to said diffracted X-rays for recording said diffracted X-rays; and
- a planar shield assembly secured to said support assembly for shielding said photographic film from a portion of said diffracted X-rays, said planar shield assembly permitting at least recording of said diffracted X-rays about the intersection of said first axis and said film.

3,969,624
ELECTROSTATIC IMAGING DEVICE AND PROCESS USING SAME

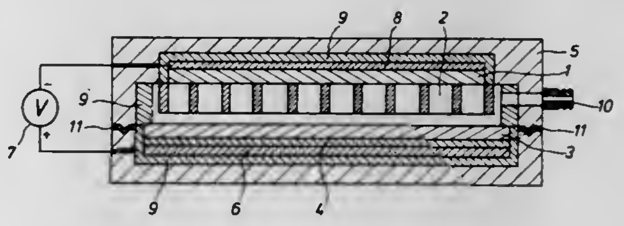
Jozef Antoon Van Biesen, Boechout, and Jan Van den Bogaert, Schilde, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 420,557, Nov. 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,575

Claims priority, application United Kingdom, May 21, 1973, 24169/73

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—315 R **8 Claims**



1. In a radiographic system for the operation with a source of X-rays which comprises:

- a. an imaging chamber;
- b. a pair of generally flat electrodes arranged in spaced substantially parallel relation in said chamber and defining a gap therebetween;

- c. means in said chamber for emitting a pattern of electrostatic charges when exposed to an X-ray image and including an ionizing gas medium filling at least said gap between said electrodes at a pressure of at least about 0.1 Torr;
- d. a removable sheet of dielectric material disposed in said gap adjacent one of said electrodes; and
- e. means for applying a high voltage electrical potential across said electrodes for biasing said pattern of electrostatic charges towards said dielectric sheet for deposit thereon;

the improvement comprising

in combination, means for intercepting electrons deviating significantly from a direction of movement between said electrodes perpendicular to the electrode faces comprising a mesh of charge-absorbing non-secondarily emissive material, said mesh defining a plurality of narrow passages and being interposed between said electrodes with the input ends of said passages in close proximity with said other electrode and the output passage ends being open and directed towards said dielectric sheet, the ratio of the cross-sectional diameter to the length of the individual narrow passages being at least 1:4.

3,969,625

X-RAY SPOT FILM DEVICE WITH MEANS FOR ORGANWISE-PROGRAMMED SETTING OF X-RAY EXPOSURE DATA

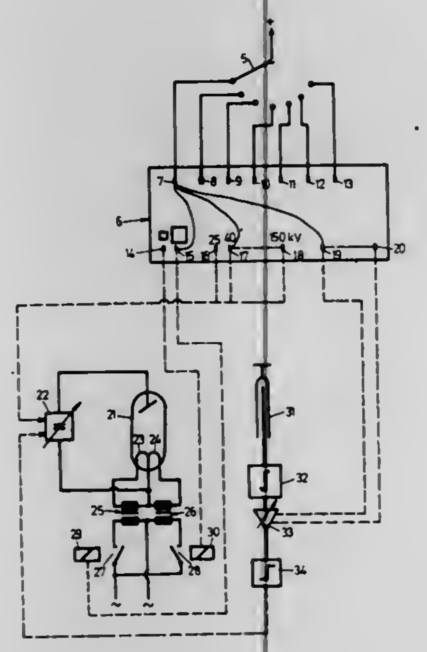
Johann Finkenzeller; Peter Grassmann, both of Erlangen, and Peter Skarke, Uttenreuth, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Feb. 20, 1974, Ser. No. 444,245

Claims priority, application Germany, Apr. 13, 1973, 2318781

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—322 **6 Claims**



1. In an X-ray spot film device, a command component, and switching means on said command component for effecting the concurrent organwise-programmed setting of a plurality of X-ray exposure data, the improvement comprising; said switching means comprising a multiple-position rotary step switch, each position of said rotary step switch being associated with a predetermined body organ of a patient whereby rotation of said switch to a respective position automatically concurrently selects a plurality of exposure data for X-raying said body organ.

3,969,626

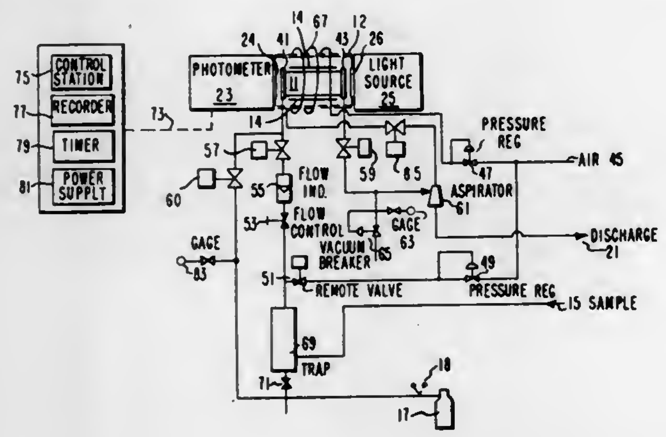
METHOD AND APPARATUS FOR DETECTING TOTAL REDUCED SULFUR

Robert S. Saltzman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1975, Ser. No. 550,852

Int. Cl.^{2} G01J *1/00*

U.S. Cl. 250—344 **13 Claims**



1. A method for determining the total reduced sulfur content of a gas comprising the steps of:

- a. introducing a sample of the gas into a sample cell;
- b. passing detecting radiation of a wavelength between about 250 to about 330 nm. through the gas sample in the cell, said detecting radiation being of a wavelength strongly absorbed by SO_2;
- c. measuring the intensity of the detecting radiation passing through the gas sample;
- d. sealing the gas sample in the cell;
- e. introducing an oxygen-containing gas into the cell to form a gas mixture containing oxygen and the gas sample, said gas mixture being retained in the cell;
- f. thereafter heating the gas mixture to a temperature above about 200°C. to oxidize the total reduced sulfur in the gas sample;
- g. passing the detecting radiation through the heated gas mixture in the cell; and
- h. measuring the intensity of the detecting radiation passing through the gas mixture; the difference between the intensity of the detecting radiation passing through the gas mixture and that passing through the gas sample alone being indicative of the total reduced sulfur content of the sample gas.

3,969,627

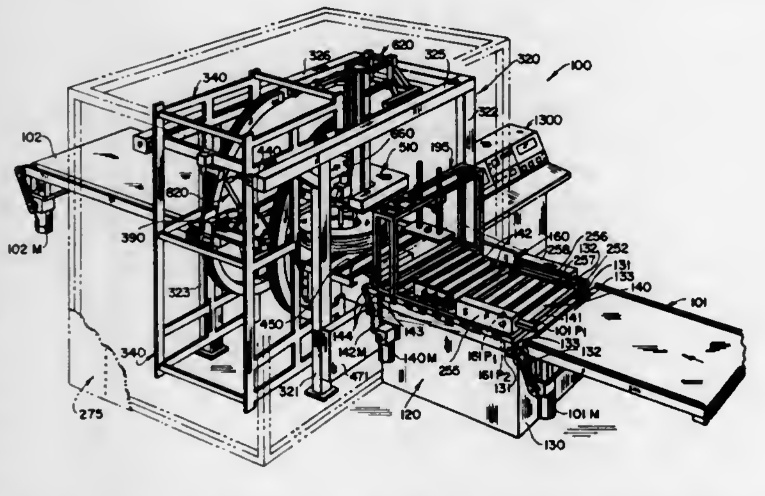
SYSTEM OF POSITIONING AND INSPECTING TIRES

Donald N. Heisner, Euclid, Ohio, and Phillip K. Loyer, Waynesville, N.C., assignors to Picker Corporation, Cleveland, Ohio

Filed Aug. 7, 1974, Ser. No. 495,448

Int. Cl.^{2} G01N *23/00*

U.S. Cl. 250—358 T **83 Claims**



1. A method of inspecting a plurality of tires, through the use of penetrative emanation where at least one of the tires differs in size from at least one other of the tires, comprising the steps of:

- a. feeding tires to be inspected along a feed path;
- b. sequentially positioning such tires one at a time in an inspection station with the central axis of each positioned tire substantially coincident with a predetermined line and with the central plane of each positioned tire substantially coincident with a predetermined plane;
- c. inspecting such positioned tire without substantially moving the central plane and the central axis of such tire, by passing penetrating emanation through portions of the positioned tire to form an image of such portions.

3,969,628

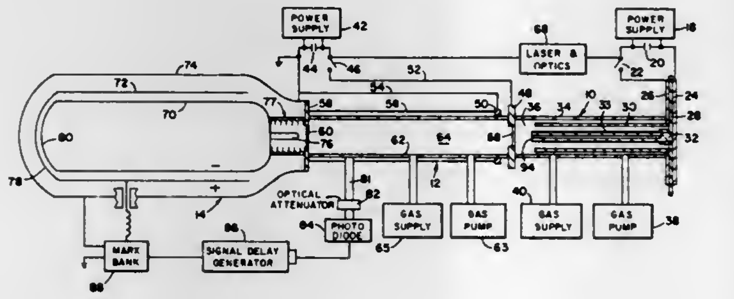
INTENSE, ENERGETIC ELECTRON BEAM ASSISTED X-RAY GENERATOR

Thomas G. Roberts; Romas A. Shatas; Harry C. Meyer, III, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,864

Int. Cl.^{2} H01J *35/00*

U.S. Cl. 250—402 **6 Claims**



1. An electron beam assisted x-ray generator comprising a plasma generator; a source of high energy electrons; and a sealed beam forming and guiding section interconnecting said source of high energy electrons and said plasma generator; and control means for the plasma generator, the sealed beam forming and guiding section, and the source of high energy electrons, said plasma generator having a chamber therein that is filled with a gas including hydrogen and said gas being subjected to high Z material in said plasma generator chamber to cause x-rays to be produced from the interaction of a hot plasma produced by the plasma generator and electrons from said source of high energy electrons, said beam forming and guiding section being a sealed linear pinch tube device and said control means for said beam forming and guiding section and said plasma generator including a chargeable capacitor bank for each of said beam forming and guiding section and said plasma generator, and control means for simultaneously firing each said capacitor bank to cause said plasma generator to produce a plasma and said sealed linear pinch tube device to produce a current sheath for guiding electrons from said source of high energy electrons to said hot plasma, said control means for said source of high energy electrons including means responsive to the current sheath produced in said sealed linear pinch tube device to cause said source of high energy electrons to be emitted in reponse to a predetermined current sheath condition being established, and said sealed linear pinch tube device being filled with a gas selected from argon and helium.

3,969,629

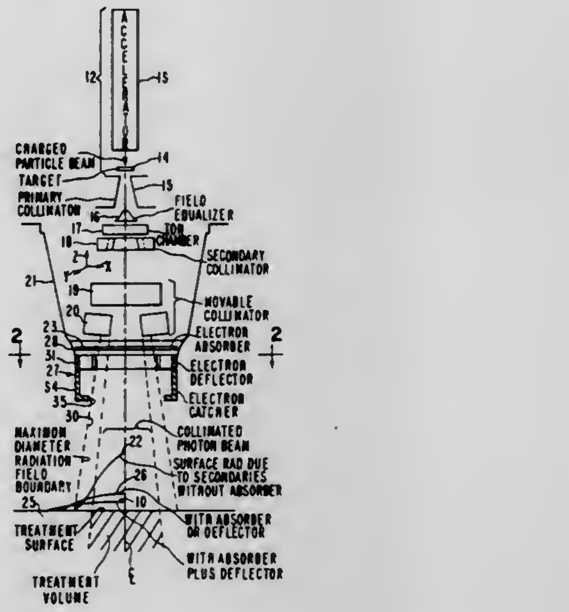
X-RAY TREATMENT MACHINE HAVING MEANS FOR REDUCING SECONDARY ELECTRON SKIN DOSE

Raymond D. McIntyre, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 14, 1975, Ser. No. 558,392

Int. Cl.^{2} G01J *1/00*

U.S. Cl. 250—503 **9 Claims**



1. In an x-ray treatment machine:

means for producing a field of x-ray radiation for application to a body for treatment thereof;

means for shaping the field of x-ray radiation as applied to the body, said field shaping means producing contamination of the radiation field of x-ray radiation with high energy secondary electrons which can substantially increase the undesirable electron portion of the total dosage of radiation delivered to the surface of the body being treated; and

electron deflection means for interposing in the electron contaminated field of x-ray radiation an electron deflecting flux for deflecting the contaminating electron trajectories and spreading the electron radiation dose rate out more uniformly over the treated surface, whereby the maximum central axis surface radiation dose rate due to the irradiation of the body with contaminating secondary electrons is reduced in use.

3,969,630

METHOD AND APPARATUS FOR DEFINING RADIATION-OPAQUE PATHWAYS WITHIN SHIELDING MATERIALS

Obie M. Langford, and Michael Bagnasco, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,340

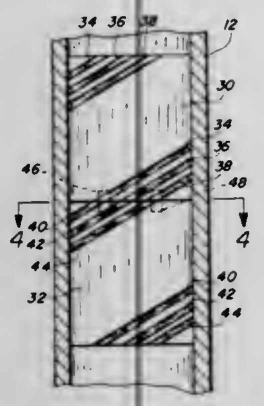
Int. Cl.^{2} G01V *5/00*

U.S. Cl. 250—515 **8 Claims**

1. A radiation shield, for use in well logging applications, comprising:

- a. a fluid tight tubular housing member or sonde sized and adapted for passage through a well borehole;
- b. a substantially cylindrical radiation shielding member having a length L and a radius R and closely fitted within said sonde;
- c. a first cavity within said sonde on one side of said substantially cylindrical shielding member;
- d. a second cavity within said sonde on the opposite side of said substantially cylindrical shielding member from said first cavity; and
- e. substantially helical groove means on the surface of said substantially cylindrical shielding member, having a pitch

approximately equal to L and a depth D which is small relative to R and extending longitudinally along the external surface of said substantially cylindrical shielding



member from said first cavity to said second cavity, and forming a non-linear pathway communicating said first cavity with said second cavity.

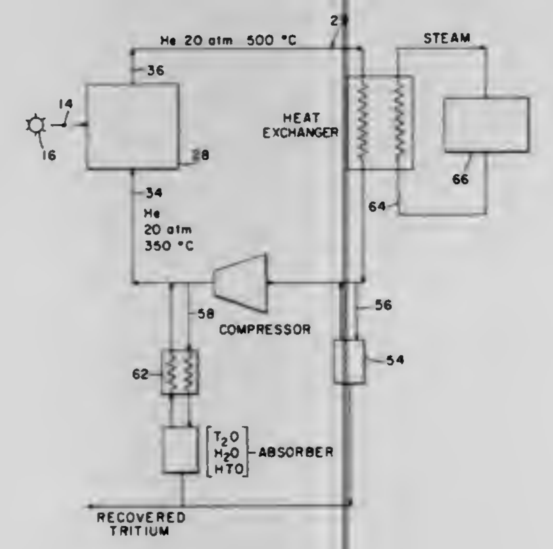
3,969,631
GAS PRODUCTION APPARATUS

Warren E. Winsche; Francis T. Miles, both of Bellport, and James R. Powell, Wading River, all of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,430

Int. Cl.² B01K *1/00*, **B01J** *1/10*

U.S. Cl. 250—527 **15 Claims**



1. Tritium gas producing apparatus for use with a source of neutrons comprising means consisting of:

a. solid lithium target means for receiving the neutrons so as to produce tritium that diffuses through the solid lithium means; and

b. sintered aluminum product cooling means interposed between the solid lithium target means and the source of neutrons for containing gas coolant that circulates under pressure through the cooling means in contact with the solid lithium target means to separate and remove the tritium that escapes from the solid lithium means by said diffusion.

3,969,632
LOGIC CIRCUITS-EMPLOYING JUNCTION-TYPE FIELD-EFFECT TRANSISTORS

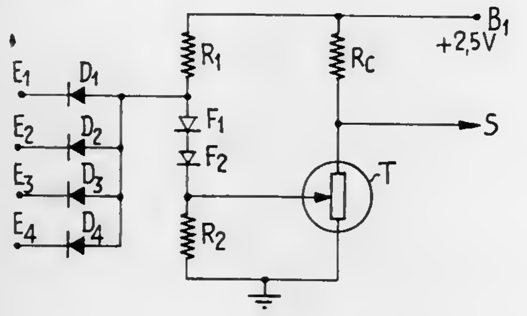
Albert Bobenrieth, Paris, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 267,213, June 28, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 510,985

Claims priority, application France, July 6, 1971, 71.24683

Int. Cl.² H03K *19/08*, *19/34*, *19/12*; **H01L** *29/80*

U.S. Cl. 307—205 **3 Claims**



1. A logic circuit integrated upon a semi-insulating substrate comprising a d.c. supply, a junction type field-effect transistor having ion implanted source drain and channel regions, having a predetermined type of conductivity and a metal gate forming with said channel a Schottky junction, said channel having a thickness equal to that of the depletion zone produced by a zero potential applied to said gate junction, said logic circuit comprising at least two inputs and one output, means for carrying selectively said inputs at two predetermined voltage values corresponding respectively to the digit 0 and the digit 1, first resistor means for connecting said drain to said d.c. supply, said output being connected to said drain, said source being grounded, second resistor means for connecting said gate to ground, for applying to said gate a voltage near zero; rectifying means for connecting selectively said inputs to said carrying means for establishing a first conduction path between at least one of said inputs and said supply where said at least one input is at the 0 level, means for establishing a second conductive path between said d.c. supply and the ground, where all the rectifying means are not conductive, and giving to said gate a voltage rendering said transistor conductive.

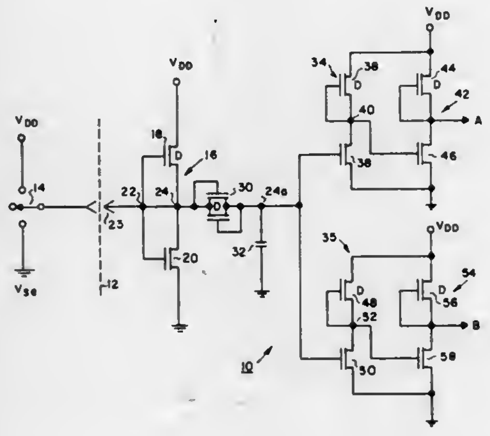
3,969,633
SELF-BIASED TRINARY INPUT CIRCUIT FOR MOSFET INTEGRATED CIRCUIT

Robert John Paluck, Carrollton, and Robert James Proebsting, Richardson, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Jan. 8, 1975, Ser. No. 539,392

Int. Cl.² H03K *19/08*, *19/40*, *17/18*

U.S. Cl. 307—205 **9 Claims**



1. In an integrated MOSFET circuit, a trinary to binary input circuit comprising:

a bias stage comprised of a first inverter stage having an input connected to receive a logic input to the integrated circuit and an output electrically common with the input;

a second inverter stage having a beta ratio greater than that of the first stage and having an input connected to the output of the first stage; and

a third inverter stage having a beta ratio less than that of the first stage and having an input connected to the output of the first stage;

whereby when the logic input is an open circuit, the logic output of the second inverter stage will be at one binary logic level and the output of the third inverter stage will be at another binary logic level, and when the logic input is at a logic 1 level the outputs of both the second and third inverter stages will be at one binary logic level and when the logic input is at a logic 0 level the outputs of both the second and third inverter stages will be at another binary logic level.

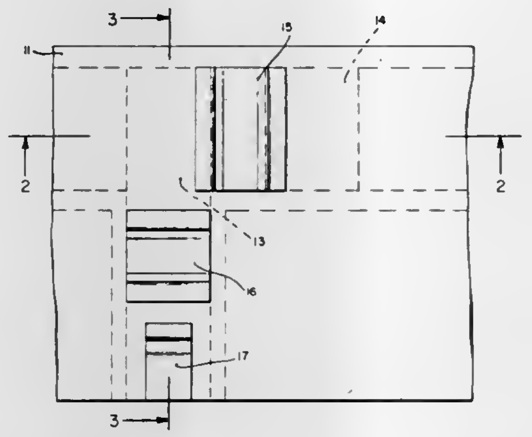
3,969,634
BUCKET BACKGROUND SUBTRACTION CIRCUIT FOR CHARGE-COUPLED DEVICES

Stephen C. Su, Huntington Beach, and Ronald M. Finnila, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 31, 1975, Ser. No. 601,124

Int. Cl.² G11C *19/28*; **H01L** *29/78*

U.S. Cl. 307—221 D **6 Claims**



1. A charge coupled device circuit for removing a predetermined quantum of charge from a packet of charge in a charge coupled device plural phase clock voltage driven shift register to reduce the DC offset component of a signal passing through said shift register, said circuit comprising:

a. a semiconductor substrate;

b. an insulation layer on said substrate;

c. a diffused junction charge drain means in said substrate;

d. first and second juxtaposed charge storage locations in said substrate respectively having first and second electrode means associated therewith, each said electrode means being spaced by said insulation from said substrate and being positioned to define a potential well in said substrate for charge storage;

e. means to supply input charge to a first side of said first charge storage location;

f. signal control means comprising a third electrode positioned for controlling the potential barrier between a second side of said first charge storage location and a first side of said second charge storage location for extracting the AC signal representing variable magnitude component of charge from said first charge storage location and transferring it to said second charge storage location; and,

g. channel switch means comprising a fourth electrode positioned for controlling the potential barrier between said diffused junction charge drain means and a third side of said first charge storage location which is juxtaposed to said diffused junction charge drain means for extracting the DC uniform background representing component of charge from said input charge in said first charge storage location by transfer through said diffused junction charge drain means.

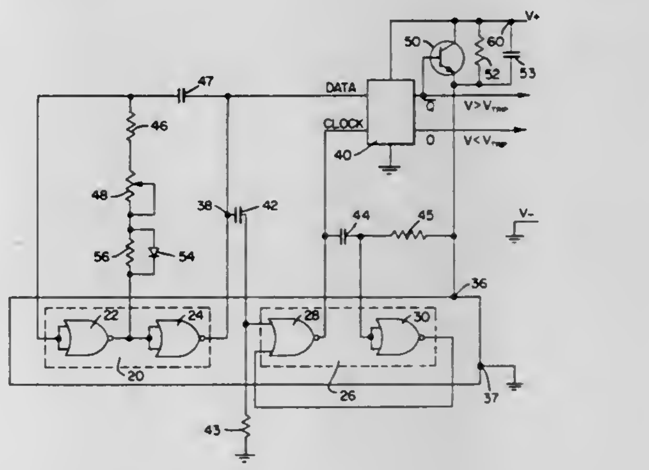
3,969,635
VOLTAGE CONDITION MONITOR

William G. Wilke, 641 E. Dayton St., Madison, Wis. 53703

Filed Feb. 25, 1974, Ser. No. 445,339

Int. Cl.² H02H *3/24*, *7/18*

U.S. Cl. 307—235 R **6 Claims**



1. A low power apparatus for monitoring a variable supply voltage comprising a first means for producing a digital signal in response to the voltage level of the variable supply voltage, a second means for producing a digital signal also in response to the voltage level of the variable supply voltage, the digital signal of one of the first and second means varying to a greater degree than the digital signal of the other of said means in response to the same voltage level variation, and a comparison means for comparing the two digital signals and thereby determining supply voltage level information.

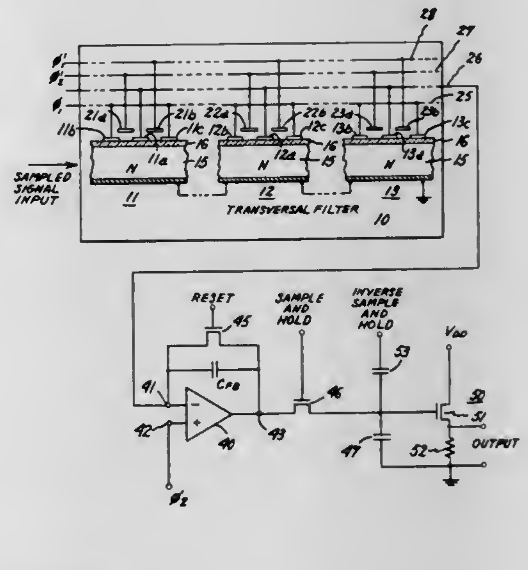
3,969,636
CHARGE SENSING CIRCUIT FOR CHARGE TRANSFER DEVICES

Richard D. Baertsch, Scotia; Jerome J. Tiemann, Schenectady, and William E. Engeler, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 30, 1975, Ser. No. 591,636

Int. Cl.² H03K *5/20*

U.S. Cl. 307—235 H **4 Claims**



1. In combination,

a substrate of one conductivity type semiconductor material.

an insulator overlying said substrate,

a conductor member overlying said insulator member,
means for applying a voltage between said conductor member and said substrate to deplete a portion of said substrate underlying said conductor member of majority carriers,
means for introducing charge in the form of minority carriers corresponding to a signal into said depleted portion of said substrate,
means for maintaining said voltage constant while sensing the charge flow into said conductor member including a high gain differential amplifier having a pair of input terminals and an output terminal the voltage at which is responsive to the difference in the voltages at said input terminals, one of said input terminals being an inverting input terminal and the other being a non-inverting terminal, said non-inverting input terminal connected to a source of said voltage, said inverting input terminal connected to said output terminal through a feedback capacitor and also connected to said conductor member,
whereby said conductor member is maintained substantially at said voltage and an output voltage at said output terminal is developed which is proportional to the charge induced on said conductor divided by said feedback capacitor.

3,969,637
TRANSISTOR CIRCUIT

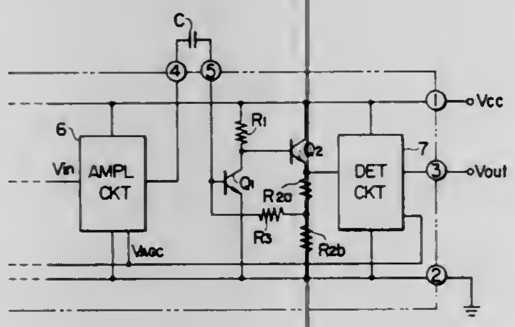
Norio Minami, Katsuta, and Mitsuya Sato, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 432,326, Jan. 10, 1974, abandoned. This application June 25, 1975, Ser. No. 590,377

Claims priority, application Japan, Jan. 10, 1973, 48-5244

Int. Cl.² H43K *17/00*

U.S. Cl. 307—237 **3 Claims**



1. A circuit comprising:
a first and a second conductor means each having substantially no resistance;
a grounding conductor means having a substantial parasitic resistance for connecting said first conductor means to ground;
a power supplying conductor means having a substantial parasitic resistance for connecting said second conductor means to a power source;
a first signal amplifier circuit means having an input terminal and an output terminal, coupled between said first and second conductor means, for amplifying a signal supplied to the input terminal and deriving the amplified signal from the output terminal; and
a succeeding circuit means, coupled to said output terminal of the first signal amplifier circuit means, for preventing a signal voltage due to said parasitic resistances and said amplified signal of the first signal amplifier circuit means from leaking to said input terminal of the first signal amplifier circuit means, said succeeding circuit means including
a second signal amplifier circuit means, connected between said first and second conductor means, for amplifying said amplified signal of the first signal amplifier circuit means into a signal current of a prescribed magnitude, and
a cancellation circuit means, connected between said first and second conductor means, and responsive to the output of said second signal amplifier circuit means, for supplying to said grounding and power supplying conductor means a cancellation current which is substantially equal in magnitude and opposite in phase to said signal current amplified by said second signal amplifier circuit means.

3,969,638
INTEGRATED CIRCUIT BREAKER

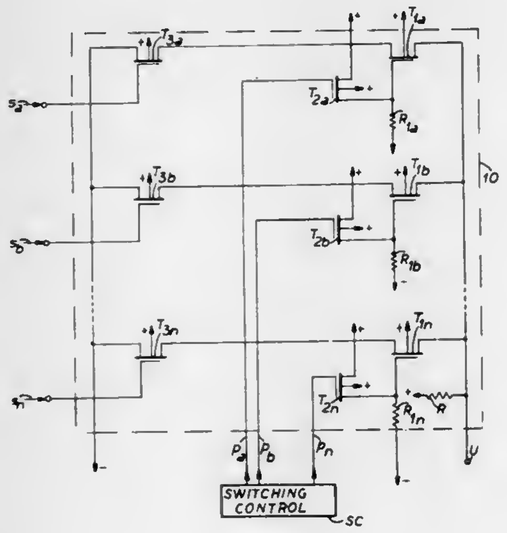
Gianfranco Marchetti, S.Fruttuoso, Milan, and Giovanpietro Bassani, Milan, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 2, 1975, Ser. No. 537,920

Claims priority, application Italy, Jan. 4, 1974, 19073/74

Int. Cl.² H03K *17/60, 17/16;* **H04J** *3/10*

U.S. Cl. 307—243 **8 Claims**



4. In a switching system for selectively energizing a load from a plurality of input terminals carrying different signals, in combination:
a plurality of signal paths, one for each input terminal, comprising each a first, a second and a third MOSFET each having a pair of principal electrodes at opposite ends of a channel and a gate capacitively coupled with said channel, the gate of each third MOSFET being connected to the respective input terminal;
a supply of direct current;
conductor means serially connecting the principal electrodes and the channels of the first and third MOSFETs of each signal path across said supply;
an output resistance common to said signal paths in series with the serially interconnected channels of said first and third MOSFETs;
a biasing resistor individual to each signal path connected to the gate of said first MOSFET thereof, the principal electrodes and the channel of said second MOSFET being connected across said supply in series with said biasing resistor; and
control means connected to the gate of said second MOSFET of each signal path for alternately turning the associated first MOSFET on and off through energization and de-energization, respectively, of said second MOSFET.

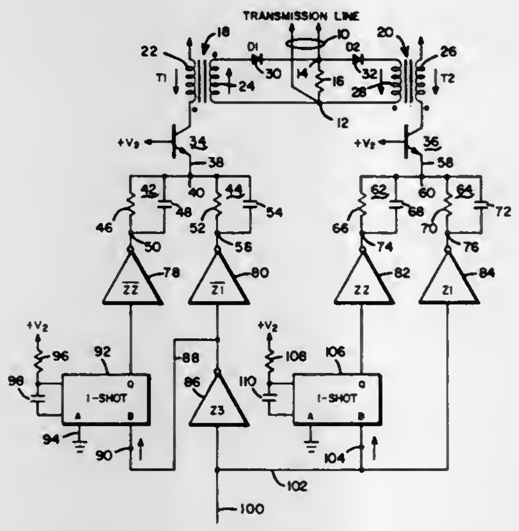
3,969,639
TRANSMISSION LINE DRIVER CIRCUIT

Mauritz L. Granberg, Richfield; Howard N. Hanson, Minneapolis; Robert L. Rajala, Blaine, and William G. Whipple, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,336

Int. Cl.² H03K *17/56*

U.S. Cl. 307—270 **5 Claims**



1. A transmission line driver circuit comprising in combination:
a. first and second transformers, each having a primary winding and a secondary winding, said secondary windings of said first and second transformers being connected through unidirectional current conducting means to first and second output terminals and in opposite winding senses with respect to their respective primary windings;
b. a load impedance connected between said first and second output terminals;
c. first and second waveshaping networks;
d. first and second semiconductor current switching means, said first semiconductor current switching means being individually connected between the primary winding of said first transformer and said first waveshaping network and said second semiconductor current switching means being connected between the primary winding of said second transformer and said second waveshaping network; and
e. digital logic circuit means adapted to be connected to a source of digital signals to be transmitted for simultaneously applying signals representative of the true and complementary values of said digital signals individually to said first and second waveshaping networks said digital logic circuit means being coupled to said first and second semiconductor current switching means for causing said first semiconductor current switching means to conduct when said digital signals are of a first binary significance and said second semiconductor current switching means to conduct when said digital signals are of a second binary significance.

3,969,640
MICRORESONATOR PACKAGING AND TUNING

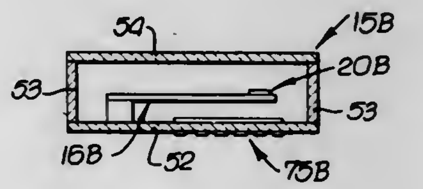
Juergen H. Staudte, Anaheim, Calif., assignor to Statek Corporation, Orange, Calif.

Division of Ser. No. 237,132, March 22, 1972, Pat. No. 3,766,616. This application Aug. 1, 1973, Ser. No. 384,402

Int. Cl.² H01R *41/04*

U.S. Cl. 310—9.1 **3 Claims**

1. A package containing a microresonator having a tuning fork configuration including a base portion and two tines extending therefrom, said tuning fork configuration having no dimension greater than 500 mils, each of said tines having metal weights thereon, each of said weights having a first region of one thickness and a second region of lesser thickness, at least a portion of said package being transparent to permit the beam from a laser external to said package to pass therethrough for selective removal of portions of said weights to alter the oscillation frequency of said microresonator, removal of material from said first or second regions, respectively, effecting coarse or fine tuning of said microresonator, said package also containing electronic microcircuitry inter-



connected to said microresonator, said microcircuitry comprising an oscillator using said microresonator as a frequency source, said package also containing an adjustable capacitor electrically interconnected to affect the frequency of said oscillator, said capacitor including spaced parallel plates, some of said plates being electrically connected within said package and others of said plates being outside of said package, said capacitor utilizing a wall portion of said package as the plate separating dielectric.

3,969,641
QUARTZ CRYSTAL VIBRATOR

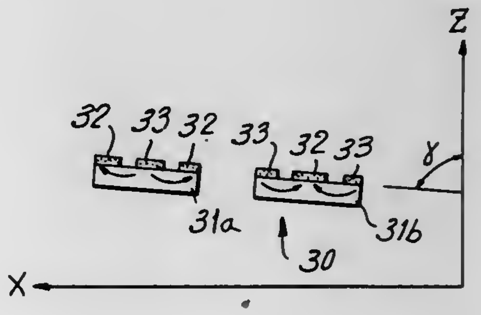
Kikuo Oguchi, Shimosuwa; Akio Shimoi, and Toshiaki Ogata, both of Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,462

Claims priority, application Japan, Apr. 16, 1973, 48-42927; May 7, 1973, 48-50440; May 30, 1973, 48-60493

Int. Cl.² H01L *41/18*

U.S. Cl. 310—9.5 **26 Claims**

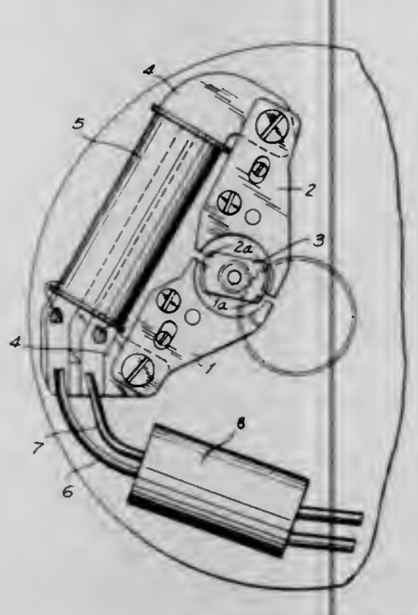


1. A flexural-mode quartz crystal vibrator comprising an X-cut quartz crystal plate having a vibratory portion defined by first and second opposed substantially planar surfaces, a plurality of electrodes disposed on at least one of said surfaces, circuit means coupled to said electrodes for applying signals to said vibrator electrodes to generate electric fields between said electrodes, said electrodes being disposed to direct the major component of said fields substantially parallel to said surfaces in said crystal plate and define a vibrational direction of said vibratory portion parallel with said opposed planar surfaces, said plate having a thickness between said opposed planar surfaces no greater than 0.5 mm, and said plate being formed by rotating an X-cut plate around the X-axis by 0° to 10° and further rotating the plate around the Y′-axis by 70° to 90° or −70° to −90°.

3,969,642

STEP MOTOR FOR ELECTRONIC TIMEPIECE

Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed July 17, 1974, Ser. No. 489,323
Claims priority, application Japan, July 17, 1973, 48-79835
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **1 Claim**

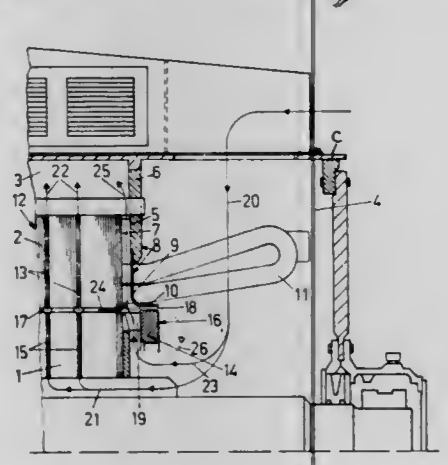


1. In an electronic timepiece, a step motor having a permanent magnet rotor adapted to be stepped through a specific angle, at least two stator poles having semi-circular recessed portions, said recessed portions substantially surrounding said rotor at the periphery thereof, and an electromagnetic core coupled to said stator pole pieces said core including a coil wrapped therearound, said electromagnetic core being adapted in response to each drive pulse applied to said coil to effect first and second magnetic orientations of said stator poles in order to step said rotor through said specific angle, the improvement comprising means coupled to said coil for applying drive pulses thereto to effect said orientations; said drive pulse application means including short circuiting means for terminating said driving pulses applied to said coil at a time not later than the completion of the stepping of the rotor through said specific angle by short circuiting said coil wrapped around said core at a time not later than the terminating of the pulse applied thereto.

3,969,643

GAS-COOLED DYNAMO-ELECTRIC MACHINE

Jorg Säpper, Windisch, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Feb. 19, 1975, Ser. No. 551,117
Claims priority, application Switzerland, Mar. 4, 1974, 2996/74
Int. Cl.² H02K *9/00*
U.S. Cl. 310—53 **7 Claims**

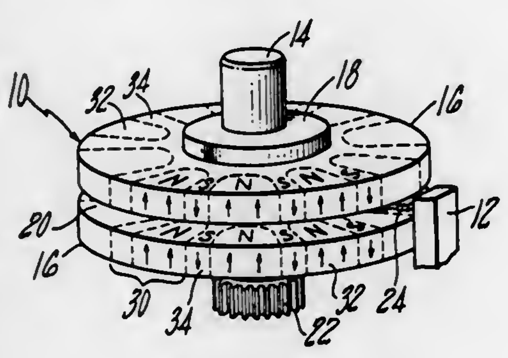


1. A gas-cooled dynamo-electric machine comrising a casing enclosing a rotor component mounted for rotation and which is surrounded by a laminated stator component having a stator winding thereon, means providing a cooling gas flow inlet space within each end portion of said casing between the end wall thereof and the corresponding ends of the rotor and stator components and in which inlet spaces the end turns at opposite ends of said stator winding are located, means for introducing fresh cooling gas into said gas inlet end spaces for flow in a radially inward direction over said end turn portions of said stator winding, means providing a gas flow outlet space between the periphery of said stator component and the surrounding wall portion of said casing, said rotor and stator components being provided with radially extending slots for flow of cooling gas therethrough from each said gas inlet flow space following its passage over said end turn portions of said stator into said gas flow outlet space, and annular gas flow dividing members located respectively in axially spaced relation to the opposite end faces of said stator and which form substantially gas-tight partitions between the end faces of said stator and said gas flow inlet spaces, said annular gas flow dividing members together with the end faces of said stator thus forming radially extending stator end flow channels for flow of cooling gas from said gas inlet flow space radially outward therethrough into said gas flow outlet space thereby to effect cooling of said end faces of said stator and removal of heat generated in the end portions of said stator laminations, the axial width of said radially extending stator end flow channels being small in relation to the axial width of said gas flow inlet spaces thereby to effect a relatively higher gas flow velocity in said radially extending stator end flow channels than exists in said gas flow inlet spaces.

3,969,644

PULSE GENERATOR WITH ASYMMETRICAL MULTI-POLE MAGNET

Walter J. Nowak, Vernon, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.
Division of Ser. No. 450,562, March 13, 1974, Pat. No. 3,893,059. This application Feb. 3, 1975, Ser. No. 546,259
Int. Cl.² H02K *21/00*
U.S. Cl. 310—152 **8 Claims**



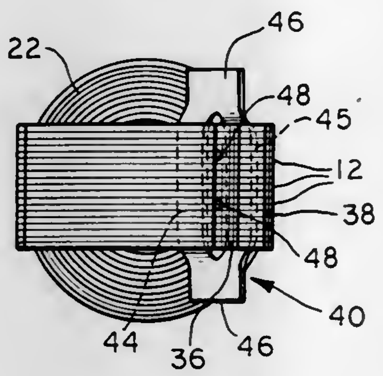
1. An asymmetrical magnet well suited for use in a rotary pulse generator comprising a multi-pole magnetic disc wherein the magnetic poles of the disc consist essentially of a plurality of pole pairs symmetrically spaced about the circumference of the disc with each pole pair including a predominant magnetic pole of one polarity and a subservient magnetic pole of the opposite polarity, the magnetic poles being oriented parallel to the axis of the disc.

3,969,645

SHADED POLE MOTOR

Willard Spotts, Boonville, and Clifford Brown, Madison, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.
Continuation of Ser. No. 494,048, Aug. 2, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,353
Int. Cl.² H02K *17/10*
U.S. Cl. 310—172 **11 Claims**

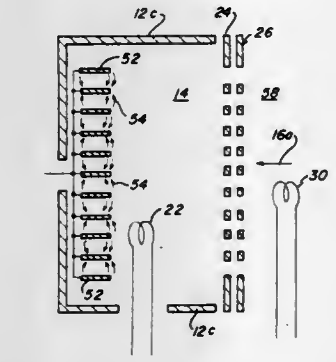
1. In a shaded pole motor having a stator stack formed of annular magnetic laminations defining circumferentially spaced pole projections with respective pole faces which outline a central rotor space, each pole projection having a narrow slot inclined upwardly from corresponding ends of the pole face and forming thereby a pole tip cantilevered toward the pole face, and an electrically conductive continuous loop shading band having an opening fitting over the pole tip,.the improved combination of having each pole tip tapered to the narrowest at the pole face and the shading band having spaced side legs and spaced end heads defining said band opening and the side legs being spaced apart across the opening a distance less than the thickness of the pole tip thereby necessitating a wedging interference fit thereof particularly along an exposed edge contact area crosswise to the stack against the pole tip upon complete positioning of the band on the pole tip and the end heads being spaced apart across the opening a distance significantly more than the thickness of the stack to leave a discernible air gap under the shading band at each endmost stack lamination even upon complete positioning of the band on the pole tip, and epoxy coating selectively on the pole projections and shading band and specifically bridging over said edge contact area and further specifically over each endmost lamination and under the shading band at each endmost stack lamination in the location of the air gap and thereby independently covering the shading band and stack at the air gap and effectively thereby electrically insulating the band and the stack, field coil means wound on each pole projection over the epoxy coating and, wherein the end heads project beyond the endmost stack laminations distances comparable to the breadth of the field coil means on the pole projection, serving thereby to mechanically hold the former in place.



3,969,646

ELECTRON-BOMBARDMENT ION SOURCE INCLUDING SEGMENTED ANODE OF ELECTRICALLY CONDUCTIVE, MAGNETIC MATERIAL

Paul D. Reader, and Harold R. Kaufman, both of Fort Collins, Colo., assignors to Ion Tech, Inc., Fort Collins, Colo.
Filed Feb. 10, 1975, Ser. No. 548,763
Int. Cl.² H01J *1/50;* **H05H** *1/00*
U.S. Cl. 313—359 **13 Claims**

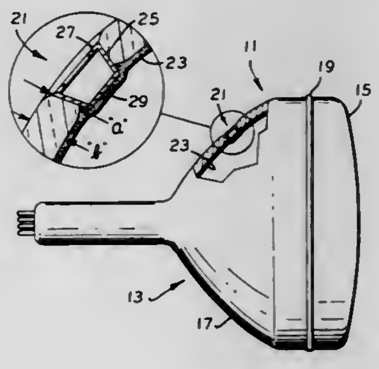


1. In an electron-bombardment ion source which includes:
means defining a chamber for containing an ionizable propellant;
means for introducing said propellant within said chamber;
an anode disposed within said chamber;
an electron-emissive cathode disposed within said chamber;
means for impressing a potential between said anode and said cathode to effect electron emission at a sufficient velocity to ionize said propellant;
means for accelerating ions out of said chamber;
and means for establishing a magnetic field within said chamber to increase the efficiency of ionization of said propellant by said electrons;
the improvement comprising:
a plurality of successively-spaced segments of electrically conductive magnetic material distributed within said chamber;
means for interconnecting said segments with said impressing means so that said segments collectively constitute said anode,
and individually adjacent ones of said segments respectively being oppositely polarized magnetically with said segments collectively establishing said magnetic field.

3,969,647

CATHODE RAY TUBE ELECTRICAL CONNECTIVE TRAVERSAL INCORPORATING INTERNAL SHIELDING AND CONTACT MEANS

Allan W. Keen, Waterloo, and Joseph B. Shinal, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Continuation of Ser. No. 419,768, Nov. 28, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,268
Int. Cl.² H01J *29/00, 31/00*
U.S. Cl. 313—477 HC **2 Claims**



1. In a cathode ray tube wherein an electrical conductive coating interiorly disposed on at least a portion of the wall of the encompassing envelope makes substantial contact with the planar bottom surface of an electrical connective traversal positioned in the wall of said envelope and exposed to the interior of said envelope, an improvement therein in the form of structural contact and shielding means disposed integral to the interiorly oriented planar bottom surface of said traversal to effect increased areal contact in a plurality of areas with said priorly disposed coating and to additionally provide regional radiation shielding of the traversal area, said improvement means comprising:
a resilient metallic member formed to have a configurated expanse related to the shaping of the internal contour of said envelope whereof at least two areal portions of said member make positive pressured contact with said coating, said member having a planar central area formed in a manner compatible with the planar bottom surface of said traversal, the expanse of said member being configurated to superjacently cover said traversal region; and
bonding attachment means to effect a contiguous planar seated jointure between said member and said traversal whereby the planar central portion of said member is securely affixed to a bare central area of the planar bottom surface of said traversal to provide positive seating contact with the coating thereat and peripherally spatially therefrom.

3,969,648

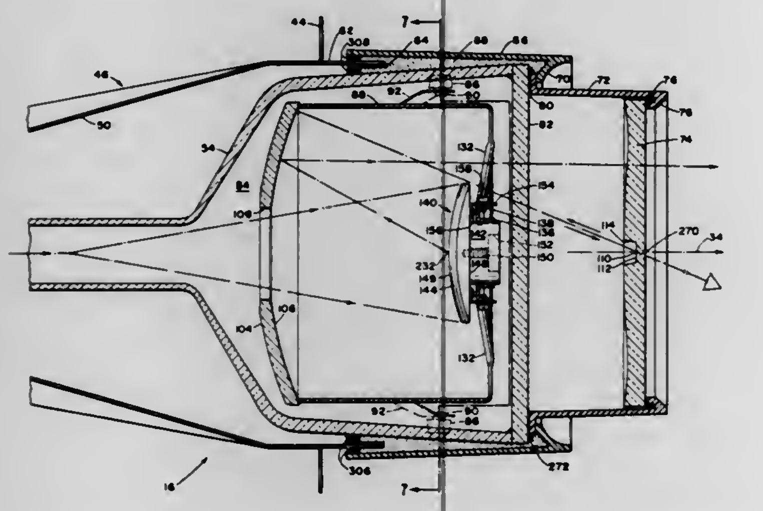
PROJECTION TELEVISION TUBE SYSTEM

George R. Hergenrother, Watertown, and Henry E. Kloss, Cambridge, both of Mass., assignors to Advent Corporation, Cambridge, Mass.
Filed Sept. 3, 1974, Ser. No. 502,768
Int. Cl.² H01J *31/00, 29/89*
U.S. Cl. 313—482 **8 Claims**

1. A projection television tube having, in combination,
an envelope with means to seal it to define an evacuated space,

a mounting barrel having supports engaging the envelope to secure the barrel fixedly against translation along and rotation about a barrel axis in said barrel and resiliently with respect to thermal expansion radially of said axis, said mounting barrel having a spider and a barrel portion with an accurately formed edge at one end thereof, said edge being circular with its center lying in said barrel axis,

means in the envelope to project an electron beam through the barrel portion,



phosphor coated target means in position for illumination by said beam and secured on the spider nonadjustably with respect to translation perpendicular to the barrel axis and adjustably with respect to translation along the barrel axis and rotation about any axis transverse thereto,

and a projection mirror having an aperture for passage of said beam to the target means and a segmental spherical reflecting surface, said formed edge contacting said reflecting surface at a circle located inwardly of its periphery.

3,969,649

CIRCUIT ARRANGEMENT FOR BICYCLE LIGHTING SYSTEMS

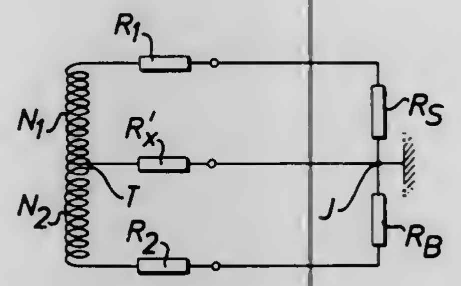
Walter Emil Wilhelm Jacob, Hagvretsstigen 7, 141 44 Huddinge, Sweden

Filed Oct. 15, 1974, Ser. No. 515,053

Claims priority, application Sweden, Oct. 15, 1973, 7313999

Int. Cl.² B60Q *1/00*

U.S. Cl. 315—78 **7 Claims**



1. A circuit arrangement for bicycle lighting systems and the like, comprising:

a dynamo having a winding provided with a tap dividing the winding into two parts;

a front lamp connected to a first of said winding parts;

a rear lamp connected to the second winding part, said lamps being interconnected by a junction point;

an impedance connected between the tap and the lamp junction point and of preselected value;

the number of turns and the resistance of said first winding part and the number of turns and resistance of said second winding part being such as to establish system equilibrium, wherein the potential of the tap is the same as the potential of the lamp junction point, during normal operation conditions with lamp resistances varying.

3,969,650

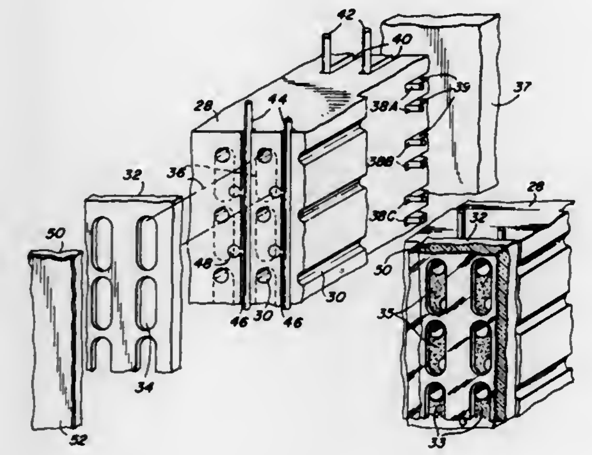
GAS DISCHARGE DISPLAY DEVICE AND A NOVEL HOLLOW CATHODE THEREFOR

Gerald Joseph Chodil, Highland Park; Michael C. DeJule, Chicago, both of Ill., and David Glaser, Greenbrook, N.J., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,569

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **29 Claims**



1. In a gas discharge panel having an array of rows and columns of gas discharge cells which emit light when a discharge is created in a gas atmosphere between a forwardly located anode; that is, an anode lying toward the front panel display and a rearwardly mounted cathode structure, the improvement wherein said cathode is a scannable hollow cathode structure made up of two electrically isolated parts comprising:

a set of row-wise extending, electrically conductive, rear cathode means, one for each row of cells, and with each row of the series communicating with every cell in its respective row of cells; and

a corresponding set of electrically conductive, row-wise extending forward cathode means, one for each rear cathode means, each forward cathode means being positioned adjacent and essentially parallel to its respective rear cathode means and situated between said rear cathode means and the anode such that all pairs of the rear and forward cathode means together operate as hollow cathodes which may be scanned row by row by the application of scanning signals thereto.

3,969,651

DISPLAY SYSTEM

James C. Greeson, Jr., Woodstock, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,818

Int. Cl.² H05B *41/00*

U.S. Cl. 315—169 TV **1 Claim**

1. A display of the type having

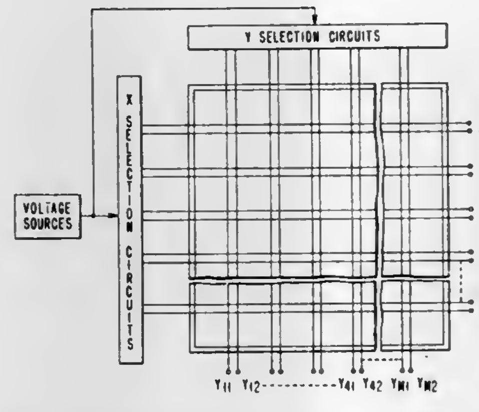
an envelope having two parallel flat walls and containing an ionizable medium therebetween, and

light emitting cells formed at crossover points of sets of X and Y coordinate lines parallel with said walls, wherein the improvement comprises,

pairs of conductors supported on said flat walls and extending positioned to define said coordinate lines, the two conductors of each pair being conductively isolated from each other,

means connecting said conductors to be energized for write and erase operations in a pattern in which both conductors of a selected coordinate line are energized and only one of the two conductors of an unselected line is energized,

said conductors of a pair being spaced apart on said walls to form a single cell at a point of crossover with conductors of the other coordinate set, said conductors of a pair being capacitively coupled such that the ionizable medium of a cell experiences the average voltage of the pair of conductors.



Y SELECTION CIRCUITS
X SELECTION CIRCUITS
VOLTAGE SOURCES
Y_{11} Y_{12} Y_{41} Y_{42} Y_{M1} Y_{M2}
T_{11} T_{12} T_{41} T_{42} T_{M1} T_{M2}

3,969,652

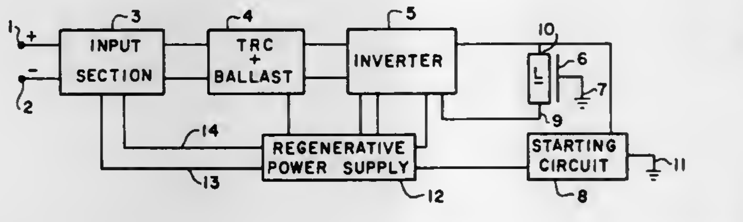
ELECTRONIC BALLAST FOR GASEOUS DISCHARGE LAMPS

Rollie R. Herzog, Burnt Hills, N.Y., assignor to General Electric Company, Carmel, Ind.

Continuation-in-part of Ser. No. 430,830, Jan. 4, 1974, abandoned. This application Apr. 15, 1975, Ser. No. 568,175

Int. Cl.² H05B *41/29*, *41/36*; **G05F** *1/30*

U.S. Cl. 315—224 **32 Claims**



1. A circuit for operating at least one gaseous discharge lamp comprising:

input means for connecting the circuit to a source of DC electrical power;

switch means connected to said input means, said switch means having a control electrode;

sensing means connected to said switch means for sensing the current through said switch means;

feedback regulation means connected to said sensing means and to said control electrode of said switch means for controlling the conduction of said switch means;

energy storage means connected in a circuit relationship with said switch means for providing lamp operating current for a predetermined time while said switch means is turned off;

said switch means and said energy storage means providing ballasting for the lamp;

an inverter circuit connected in a circuit relation with said switch means;

said inverter circuit being adapted to be connected to the lamp for providing operating voltage for the lamp.

3,969,653

DEFLECTION CIRCUIT FOR TELEVISION RECEIVER SET OR THE LIKE

Hirokazu Fukaya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,098

Claims priority, application Japan, Dec. 28, 1973, 49-494

Int. Cl.² H01J *29/70*, *29/76*

U.S. Cl. 315—403 **7 Claims**

1. A deflection circuit comprising;

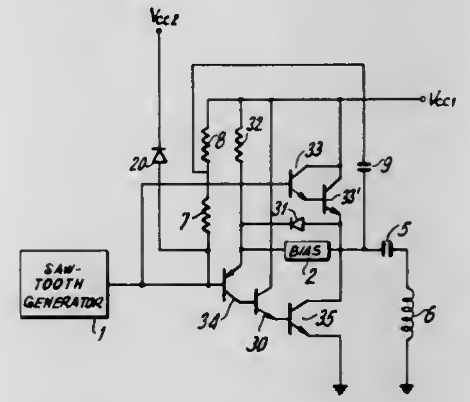
a power source for providing a first voltage;

a saw-tooth wave source means for generating a saw-tooth wave signal having a blanking signal at retrace periods;

a power amplifier including a transistor amplifier and a load therefor connected in series with said transistor amplifier, said power amplifier being connected to amplify said saw-tooth wave signal from said saw-tooth wave source;

means for turning off said transistor amplifier in response to said blanking signal;

a deflection coil connected to receive current supplied from said power amplifier,



means for producing a second voltage; and

switching means connected between the input terminal of said transistor amplifier and said means for producing a second voltage, said switching means causing said transistor amplifier to turn on in response to current from said deflection coil during said retrace period.

3,969,654

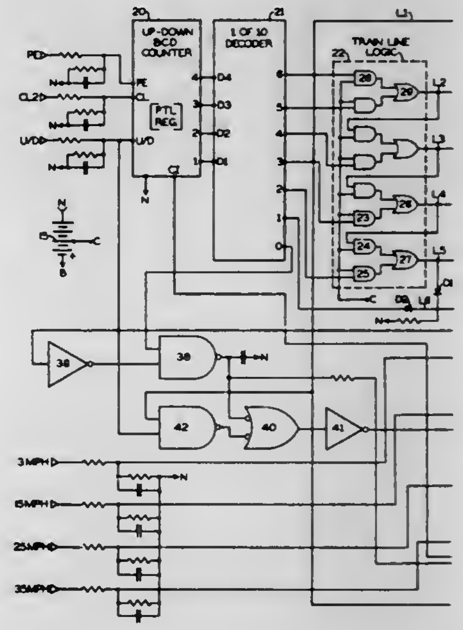
PROPULSION TRAIN LINE ENCODER FOR A TRAIN SPEED REGULATION SYSTEM

Reed H. Grundy, Murrysville, and Joseph J. Pierro, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,224

Int. Cl.² H02P *7/00*

U.S. Cl. 317—5 **5 Claims**

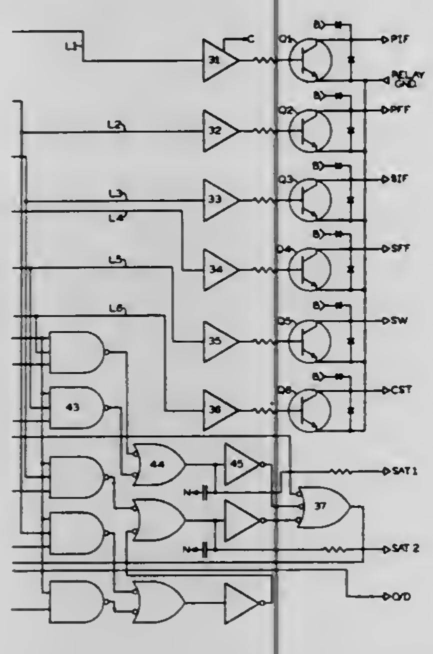


1. A propulsion train line encoder, for use in a speed regulation system for a train comprised of cars having individual propulsion apparatus operable to a plurality of levels of propulsion effort, said system including advance train line apparatus for varying the train propulsion effort in a car by car steps from any base level, comprising in combination,

a. a reversible binary counter means coupled for receiving a periodic clock pulse from the associated advance train line apparatus, when each cycle of car by car propulsion variation is completed, and a count direction signal from the speed regulation system having a first or a second condition in accordance with the direction of the existing error between actual and allowed train speeds,

1. said counter means operable for counting said clock pulses, adding or subtracting each pulse from the existing digital count as said direction signal has a first or second condition, respectively,

- b. propulsion train line driver means responsive to a selective input signal for actuating the propulsion apparatus on each car to a selected level to establish a base propulsion effort for that train,
- c. conversion logic means connected for receiving the digital output count from said counter means and coupled to said train line driver means for supplying a converted signal individually selecting the base propulsion level corresponding to the existing count in said counter means,



- d. an inhibit logic network coupled to said conversion logic means, to said counter means, and to receive said direction signal, and responsive to an output signal from said conversion means representing either the maximum or minimum count limit for generating a signal to inhibit further counting operation when said counter means counts to either limit and the direction signal has a corresponding condition.

3,969,655

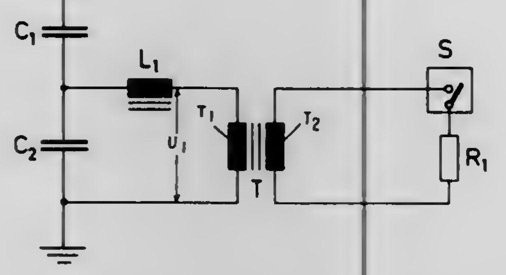
PROTECTIVE CIRCUIT ARRANGEMENT FOR CAPACITOR VOLTAGE TRANSFORMERS

Georges-Albert Gertsch, Zurich, Switzerland, assignor to Micafil A.G., Zurich, Switzerland

Continuation of Ser. No. 336,239, Feb. 27, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,425

Int. Cl.² H02H *7/16*

U.S. Cl. 317—12 A **19 Claims**



1. A capacitor voltage transformer system comprising a capacitor voltage divider constituted by a plurality of capacitor sections connected in series between a high voltage source and ground, an intermediate voltage transformer including a primary winding connected across a section of said capacitive voltage divider through a principal inductive reactance, a secondary winding, a damping load having a value which is a multiple of the rated burden of said transformer, normally open switching means for connecting said damping load to said secondary winding, and means constituted by an auxiliary inductive reactance connected in series with said capacitor voltage divider for closing said switching means when the voltage drop across said auxiliary inductive reactance reaches a predetermined value in the event of a breakdown of the voltage at the terminals of the primary winding of said transformer.

3,969,656

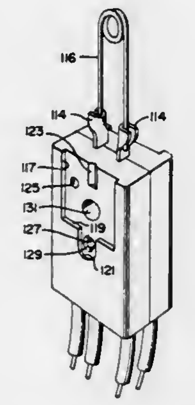
ELECTRIC IGNITER CONSTRUCTION

Richard K. Mitts, Fullerton; Wilbur F. Jackson, Rolling Hills, and James R. Willson, Garden Grove, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 318,791, Dec. 27, 1972, Pat. No. 3,823,345, which is a continuation of Ser. No. 107,767, Jan. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 807,509, March 17, 1969, Pat. No. 3,562,590. This application July 8, 1974, Ser. No. 486,294

Int. Cl.² F23Q *7/10*

U.S. Cl. 317—98 **2 Claims**



1. An igniter element for use in an electric igniter assembly for a gas burner comprising
  an electrically resistive wire made of molybdenum disilicide,
  said wire having an operating temperature less than 2500° F. and having a diameter less than 0.035 inches,
  said wire having terminal ends and an intermediate portion therebetween,
  electrical lead means connecting said terminal ends to a source of electrical power,
  said intermediate portion of said wire being coiled into substantially one and one-half loops, and
  overlapping portions of said loops being spaced from each other by a distance in the range of 0.018 inches to 0.035 inches.

3,969,657

MAGNETIZING AND DEMAGNETIZING ELECTRICAL CIRCUIT

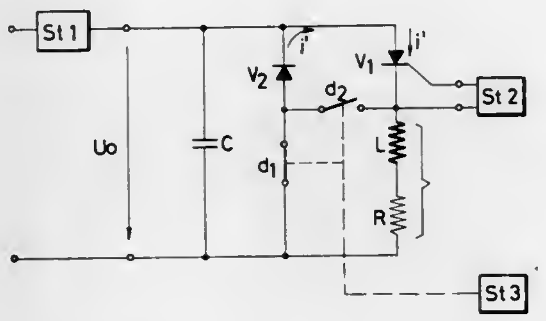
Dieter Oettinghaus, Hohenlimburg, Germany, assignor to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

Filed Feb. 6, 1975, Ser. No. 547,395

Claims priority, application Germany, Oct. 4, 1974, 2447363

Int. Cl.² H01F *13/00*

U.S. Cl. 317—157.5 PM **2 Claims**



1. A circuit arrangement for magnetizing and demagnetizing permanent magnets comprising:
  a condenser;
  means for charging the condenser;

  a magnetizing and demagnetizing coil;
  electronic switch means joined to the coil for selectively connecting said coil across the condenser;
  a diode;
  additional switch means selectively connected to one end of the coil for connecting said diode across the condenser and to the other end of the coil for connecting the coil and the diode across the condenser.

3,969,658

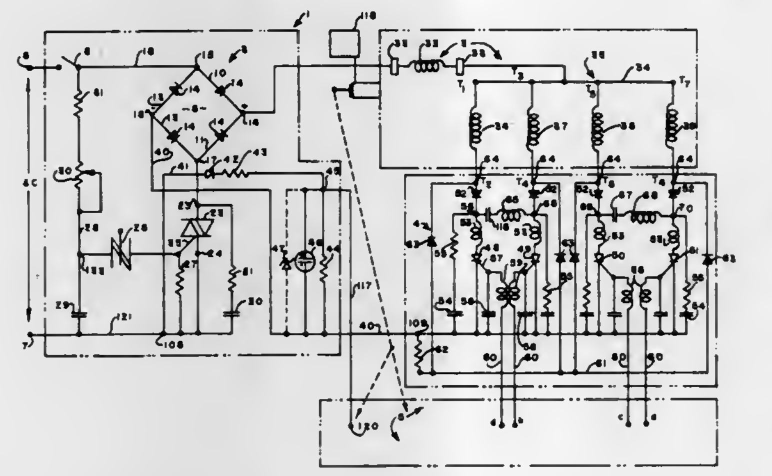
MOTOR AND CONTROL SYSTEM HAVING CYCLIC REVERSAL AND UNIDIRECTIONAL CAPABILITIES

John S. C. Htsui, Hazelwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 17, 1975, Ser. No. 541,798

Int. Cl.² H02P *1/40*

U.S. Cl. 318—202 **35 Claims**



1. In a device having a member driven in at least two operation modes, one of said modes being a constant cyclic reversal movement occuring at some predetermined interval of rotational movement of said member, and the other of said modes being a continuous rotation of said member in a preselected direction, the improvement which comprises dynamoelectric system means for driving said member in each of said operational modes, said dynamoelectric system means comprising a motor including a rotating member and a stationary member, means for supplying electrical energy to the said motor, said energy supplying means including a pair of input terminals, a rectifier bridge having a negative DC terminal, said rectifier bridge being electrically connected to said input terminal pair, said energy supply means providing a first output and a second output, said first output being variable to permit selective variation of motor speed, said second output being substantially constant, said negative terminal providing a common connection point for both said first output and said second output.

3,969,659

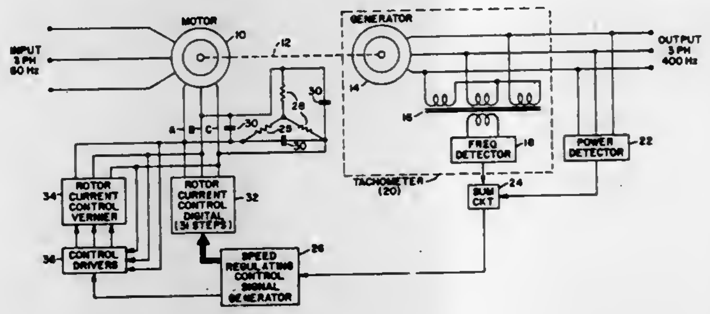
ALTERNATING CURRENT MOTOR SYSTEM

Herbert W. Thode, Oradell, N.J., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed Dec. 16, 1974, Ser. No. 533,044

Int. Cl.² H02P *7/62*

U.S. Cl. 318—237 **28 Claims**



1. A system for controlling the speed of an A.C. electric motor having a wound rotor comprising
- a. means responsive to the speed of said motor for providing an output signal which deviates from a certain value correspondingly with deviations in the speed of said motor from a given speed,
- b. control signal generator means responsive to said output signal for providing first and second control signals, corresponding to deviations of said output signal of larger value and of smaller value respectively, said second control signal also corresponding to output signal values for low motor speeds produced during starting and the like,
- c. means for controlling the rotor current in said motor in accordance with said first and second signals, and
- d. means included in said control signal generator means for converting said first signal into a multi-bit digital signal, said converting means including an analog to digital converter responsive to said first signal for converting said first signal into said digital signal, and
- e. means responsive to said first signal and a level representing the analog value of said digital signal for providing as said second signal a signal corresponding to the difference therebetween.

3,969,660

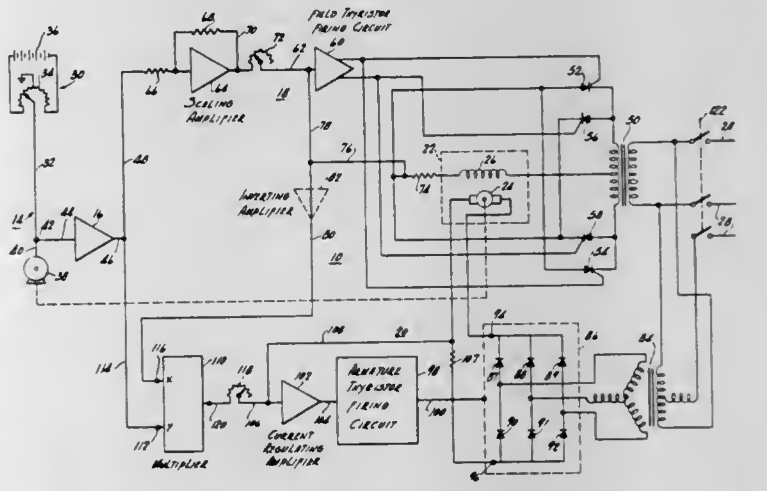
REGENERATIVE MOTOR CONTROL WITH IMPROVED CIRCUIT MEANS

Arnold Ruppert, Cambridge (Galt), Canada, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Aug. 2, 1974, Ser. No. 494,228

Int. Cl.² H02P *5/04*

U.S. Cl. 318—338 **17 Claims**


Field Thyristor Firing Circuit
Scaling Amplifier
Inverting Amplifier
Armature Thyristor Firing Circuit
Current Regulating Amplifier
Multiplier

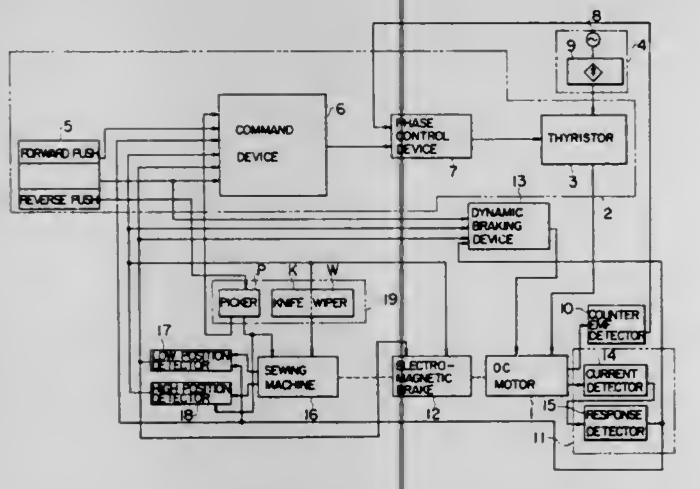
1. A regenerative motor control for regulating the operative condition of a direct current motor from a power source between the motoring and regenerative states in accordance with a bi-polarity operative condition error signal produced by a motor operative condition error signal source, said control comprising:
  a field circuit means having an input couplable to said error signal source and an output connectable to the field winding of the motor, said field circuit means being responsive to said error signal for providing current energization in either direction from the power source through the motor field winding and for reversing the current energization from a first direction through zero to a second direction during a transient period initiated by a reversal of the polarity of the error signal;
  signal means connected to said field circuit means for providing a signal proportional in magnitude to the magnitude of the motor field winding current energization and having a polarity indicative of the direction of said energization;
  an armature circuit means having an output connectable to the armature winding of the motor for energizing the armature winding from the power source responsive to the magnitude of a controlling signal of a preselected polarity applied to an input thereof, the energization of the armature winding providing motoring operation to the motor for one direction of field winding current ener-

gization and providing regenerative operation to the motor, for the motoring direction of motor rotation, for the other direction of field winding current energization; and

analog signal generating means mathematically combining the magnitude and polarity characteristics of input signals applied to at least a pair of inputs for determining the magnitude and polarity characteristics of a resultant output signal provided at an output of said means, one of said inputs being couplable to said error signal source, the other of said inputs being coupled to said signal means for receiving said field winding current energization signal, sid output being coupled to the input of said armature circuit means for providing a controlling signal to said armature circuit means having the preselected polarity during the motoring and regenerative states of the motor.

3,969,661
MOTOR CONTROL APPARATUS

Shigeki Morinaga; Kazuo Onishi, and Tadashi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 19, 1974, Ser. No. 498,663
Claims priority, application Japan, Aug. 20, 1973, 48-92511
Int. Cl.^{2} H02P *3/12*
U.S. Cl. 318—375 **4 Claims**

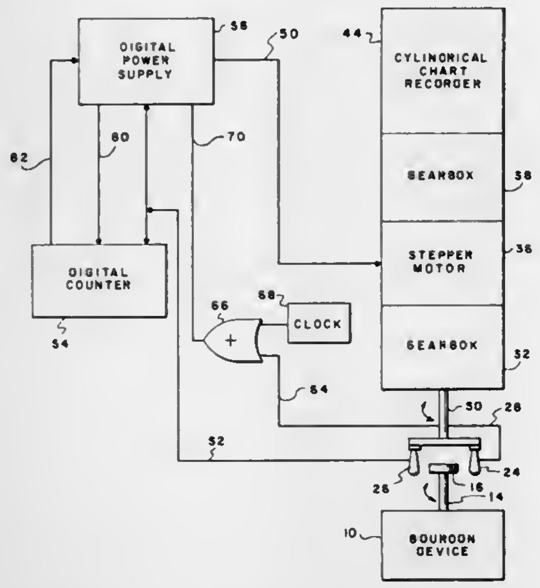


1. A motor control apparatus comprising a speed control device for running at a specified speed a DC motor connected to a DC power supply, a dynamic braking device for effecting the dynamic braking of said motor when a command for decelerating said motor is issued, a low speed detector for generating a detection signal when the magnitude of the braking current due to the dynamic braking of said motor is reduced below a predetermined set point, and means for maintaining a predetermined low speed level of said motor by controlling said speed control device, said means terminating said dynamic braking upon the actuation of said low speed detector, said low speed detector including a current detector which is transferred from a first output state to a second output state when the dynamic braking current of said DC motor detected by said low speed detector is increased beyond a first set point, said current detector being transferred from said second output state to said first output state when said dynamic braking current is reduced below the predetermined set point which is a second set point having a magnitude less than that of said first set point; and a response detector for generating an output signal when said current detector is transferred from said second output state to said first output state.

3,969,662
MEASURING THE ANGULAR POSITION OF A SHAFT

Leroy E. Weaver, Houston, Tex., assignor to Sperry-Sun, Inc., Sugar Land, Tex.
Filed Nov. 8, 1973, Ser. No. 414,061
Int. Cl.^{2} G05D *16/00*
U.S. Cl. 318—645 **22 Claims**

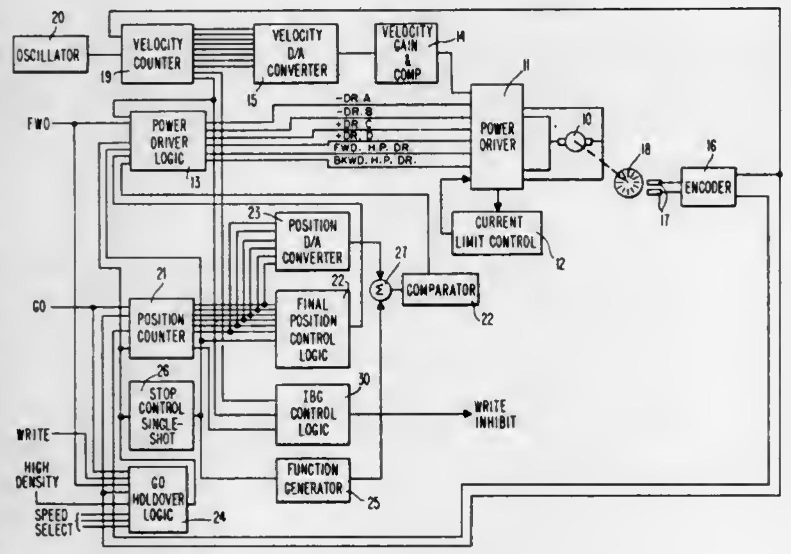
1. In a borehole-pressure recorder, apparatus for measuring the rotation of a shaft about its longitudinal axis, said rotation corresponding to borehole pressure levels, comprising: a centrally rotatable member spaced from the shaft; means for sensing relative rotation between the rotatable member and the shaft from a reference relationship position to limit relationship positions that are angularly spaced from the reference



relationship position; reversible means for rotating the rotatable member back toward the reference relationship position in incremental steps in response to the sensing means; and means for controlling the number of steps taken by the rotating means, whereby the rotatable member may cease to rotate when it reaches the reference relationship position.

3,969,663
CAPSTAN CONTROL FOR A TAPE DRIVE SYSTEM

William C. Arthur, and William W. Steger, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Oct. 17, 1974, Ser. No. 515,601
Int. Cl.^{2} H02P *1/04*
U.S. Cl. 318—561 **17 Claims**



1. In a system for controlling the transport of an element of indeterminate length and including drive means for frictionally engaging the element, and means for producing a deceleration signal, means for controlling the deceleration of the element comprising:

encoder means coupled to the drive means for producing a signal indicative of the distance traversed by the element subsequent to the deceleration signal;

decoder means for receiving the distance signal and outputting a position signal representative of the distance traveled by said element subsequent to the deceleration signal;

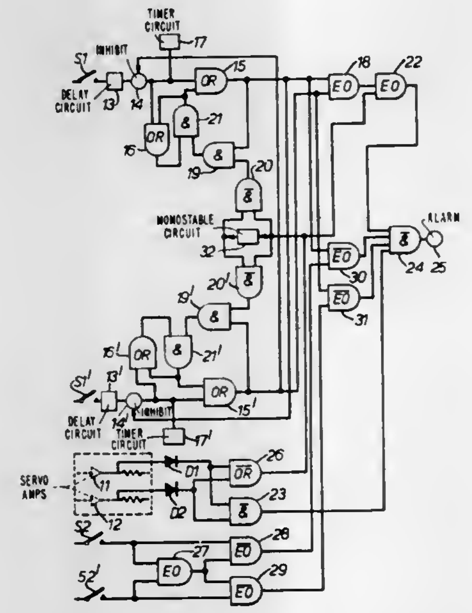
a function generator energizable in response to said deceleration signal for producing a reference signal representative of a desired position-versus-time characteristic;

signal combining means coupled to said decoder means and said function generator for receiving said position signal and said reference signal and outputting an error signal representative of difference therebetween; and

a power circuit coupled to said signal combining means for energizing the drive means in response to said error signal to cause a fixed length of the element to be transported subsequent to the occurrence of the deceleration signal.

3,969,664
MONITOR SYSTEMS

Michael Camilleri, Chatham; Michael Terence Usher, Bedford, and Mark Beresford Wilson, Houghton-le-Spring, all of England, assignors to The British Petroleum Company Limited, London, England
Filed Oct. 4, 1974, Ser. No. 512,170
Claims priority, application United Kingdom, Oct. 18, 1973, 48604/73
Int. Cl.^{2} G05B *23/02*
U.S. Cl. 318—565 **17 Claims**



1. A monitor apparatus arranged for monitoring the operation of remote control apparatus for actuators, which monitor apparatus is separate and electrically isolated from the remote control apparatus, comprising:

first means for providing respective inputs representative of directional input commands to the control apparatus;

first logic means electrically connected to and actuable by said first means for producing a signal;

second means for providing respective inputs representative of servo directional output control signals from the control apparatus;

second logic means for comparing the respective inputs from said second input providing means with the signal from said first logic means to provide an error signal upon the detection of an error between the respective inputs from said second input providing means and the signal from said first logic means;

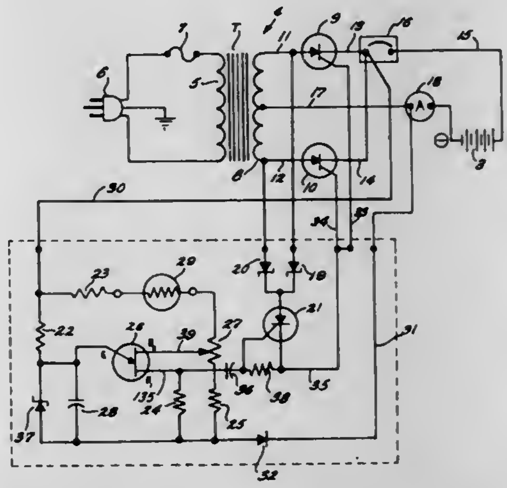
third means for providing respective inputs representative of actuator response;

third logic means for comparing the respective inputs from said third input providing means with the signal from said first logic means to provide an error signal upon the detection of an error in the respective inputs from said third input providing means and the signal from said first logic means; and

fourth logic means for receiving signals from said second and third logic means to provide an output signal if either of the signals from said second and third logic means is an error signal.

3,969,665
AUTOMATIC CONTROL CIRCUIT FOR BATTERY CHARGING SYSTEMS

Clifford A. Rowas, Cincinnati, Ohio, assignor to Schauer Manufacturing Corporation, Cincinnati, Ohio
Filed Dec. 23, 1974, Ser. No. 535,992
Int. Cl.^{2} H02J *7/04*
U.S. Cl. 320—35 **2 Claims**



1. A storage battery charging system comprising:

a transformer having a primary winding connected at its ends to a source of alternating current, and a secondary winding having output leads,

a first full wave rectifier means connected to the output leads of the secondary winding; said first full wave rectifier means having a pair of direct current output leads connected to the terminals of a storage battery, and which includes a pair of gate controlled rectifiers each interposed in an output lead of the secondary winding,

a unijunction relaxation oscillator circuit,

a pilot controlled rectifier,

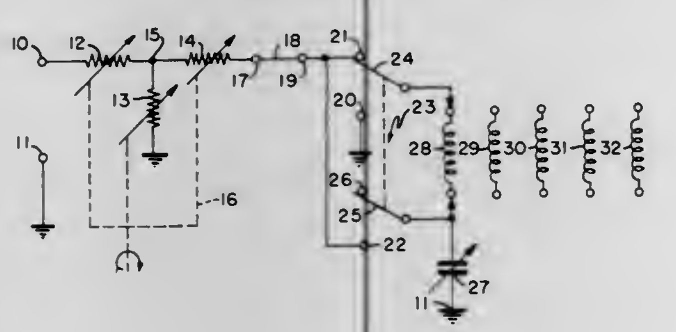
a second full wave rectified control circuit connected to the output leads of the secondary winding and consisting of a pair of diodes having their anodes connected to the output leads of the transformer secondary winding and their cathodes electrically connected together, the connected cathodes of said diodes being connected to the anode of the pilot gate controlled rectifier, and the cathode of said pilot gate controlled rectifier being connected to the gates of the pair of gate controlled rectifiers in the said first full wave rectifier means, said unijunction relaxation oscillator circuit being connected across the output terminals of the first full wave rectifier and having a voltage output conduction capacitance coupled to the gate of the pilot gate controlled rectifier, said oscillator circuit including a thermistor in series with a potentiometer and adapted to sense the battery voltage and trigger the pilot gate controlled rectifier when said voltage is or decays below a predetermined full charge, said gate controlled rectifier triggering the pair of gate controlled rectifiers to initiate and maintain the battery charging control of the system and also render the pilot gate controlled rectifier non-conductive to turn off the pair of gate controlled rectifiers when the battery has attained a predetermined charge.

3,969,666
UNIVERSAL IMPEDANCE TEST LOAD

Louis W. Simon, Fort Mitchell, Ky., assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio
Continuation-in-part of Ser. No. 166,712, July 28, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 317,945
Int. Cl.^{2} G01R *1/20*
U.S. Cl. 323—74 **5 Claims**

1. A universal test load apparatus having independently adjustable reflection coefficient magnitude and angle as seen from a pair of input terminals comprising:

1. a variable attenuator coupled to both of the input terminals and having a pair of output terminals, means for varying the attenuation of said attenuator while maintaining a substantially constant characteristic impedance between both said input and output terminals; and



2. variable reactance means connected across said attenuator output terminals, said variable reactance means comprising a variable capacitive reactance, an inductive reactance, and switch means for selectively connecting the capacitive reactance and the inductive reactance in series with each other or in parallel with each other, the series or parallel connections being selected dependent on said reflection coefficient angle.

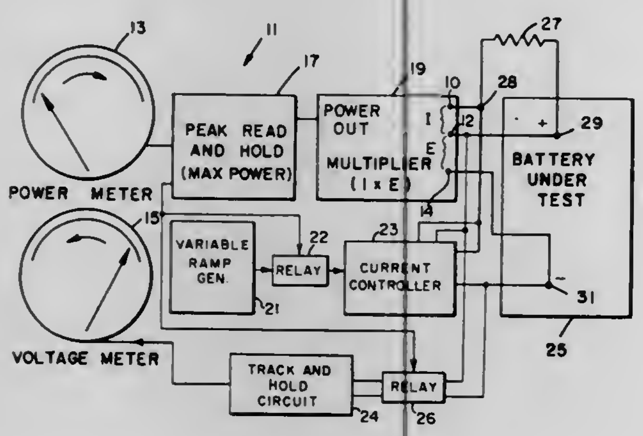
3,969,667
DEVICE FOR DETERMINING THE STATE OF CHARGE IN BATTERIES

Gerald E. McWilliams, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 283,141, Aug. 23, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,990

Int. Cl.^{2} G01N *27/42*

U.S. Cl. 324—29.5 **2 Claims**



1. A device for determining the state of charge in an electrochemical system said system comprising in combination:
a. power measuring means connected to said electrochemical system having an output voltage proportional to the power output of said electrochemical system,
b. peak read and hold circuit means connected to said power measuring means and providing a first output that is proportional to the output voltage of said power measuring means and a second output that is proportional to the error signal of said peak read and hold circuit,
c. power indicating means connected to the first output of said peak read and hold circuit means,
d. a current control means coupled to said electrochemical system for controlling the current flow from said electrochemical system to increase in a linear manner;
e. a means for generating a ramp function signal coupled to said current control means for controlling said current control means in a linear manner.
f. track and hold circuit means coupled to said electrochemical system for providing an output voltage proportional to the output voltage of said electrochemical system,
g. voltage indicating means connected to the output of said track and hold circuit means,
h. first control means coupled between said current control means and said ramp function signal generating means and having an input connected to said second output of said peak read and hold circuit means for disconnecting said ramp function signal generating means from said current control means in response to a predetermined value of said error signal,
i. second control means coupled between said track and hold circuit means and said electrochemical system and having an input connected to said second output of said peak read and hold circuit means for disconnecting said track and hold circuit means for said electrochemical system in response to said predetermined value of said error signal.

3,969,668
METHOD FOR CHECKING THE PLANARITY OF A COLD-ROLLED FERROMAGNETIC STRIP

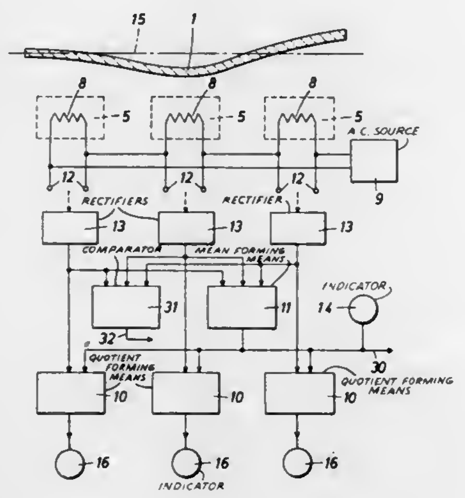
Hans Weinzinger; Bruno Hopf, and Gunter Rigler, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 23, 1974, Ser. No. 535,363

Claims priority, application Austria, Jan. 15, 1974, 289/74

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—34 R **6 Claims**



1. A method of checking the planarity of a cold-rolled ferromagnetic strip, which comprises pulling the strip in its longitudinal direction over two parallel supports which extend transversely to and are spaced apart in said longitudinal direction, subjecting said strip between said supports to magnetic forces which are approximately at right angles to the surface of said strip and are exerted by a plurality of solenoids distributed across and clear of the strip and which comprise exciter windings fed with a predetermined alternating current, whereby a local deflection is produced in the strip adjacent each of said solenoids, which deflections differ in a non-planar strip, in which the tensile stress differs across the strip, sensing the voltage across each of said exciter windings during an interval of time which is shorter than one-half of a period of said voltage and which includes a crossover of said alternating current, and deriving the values which are related to said local deflections from the voltages across the exciter windings of said solenoids.

3,969,669
METHOD AND APPARATUS FOR CONTINUOUSLY DETERMINING THE INTERNAL RESISTANCE OF AN ELECTROLYSIS CELL

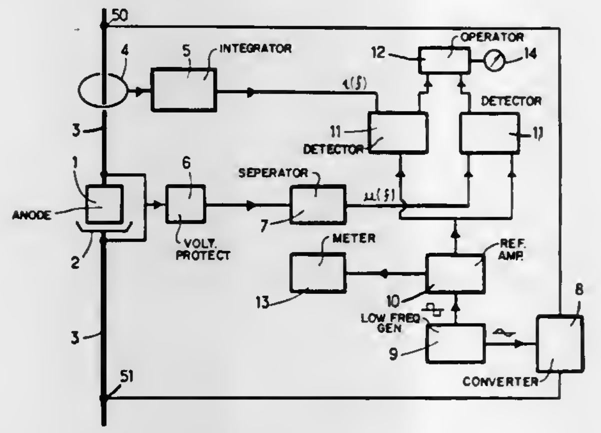
Thierry Brault, St.-Michel-de-Maurienne, and Jean-Claude Lacroix, Chambery, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed May 7, 1975, Ser. No. 575,479

Claims priority, application France, June 5, 1974, 74.19297

Int. Cl.^{2} G01R *27/02*

U.S. Cl. 324—65 R **12 Claims**



1. A method for continuously determining the internal resistance (R) of an electrolysis cell from the voltage (U) at the terminals of the cell and from the current (I) flowing through the cell, a weak alternating current (if) of frequency (f) being superimposed upon the direct current (I) used for electrolysis, wherein the active part (rf) of the impedance which the cell offers to this alternating current is determined, followed by extrapolation to zero frequency of the function giving the active part (rf) of the impedance as a function of the frequency (f), this active value (rf) thus inclining towards the internal resistance (R) of the cell.

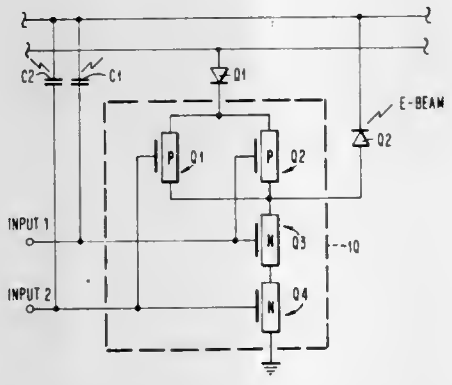
3,969,670
ELECTRON BEAM TESTING OF INTEGRATED CIRCUITS

Leon Li-Heng Wu, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,991

Int. Cl.^{2} G01R *15/12*

U.S. Cl. 324—73 PC **7 Claims**



1. In an integrated circuit structure including a plurality of functional circuits, each having at least one input and at least one output, the method of testing each said circuits comprising the steps of:
connecting one side of each one of a plurality of capacitive means to an input of each said circuit;
connecting the other side of said plurality of capacitive means to a desired logic potential level; and selectively applying an electron beam to desired ones of said capacitive means, thereby generating electron-hole pairs rendering said capacitive means resistively conductive.

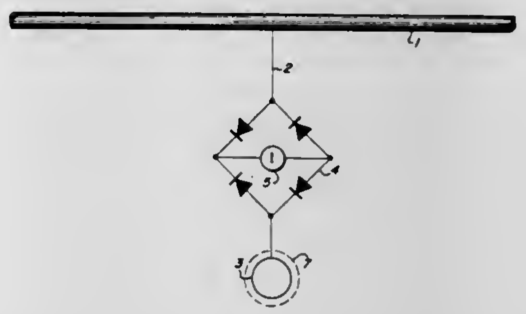
3,969,671
CHARGING CURRENT VOLTMETER

David A. Smith, Rte. 1, Box 707, Willcox, Ariz. 85643

Continuation-in-part of Ser. No. 271,909, July 14, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,646

Int. Cl.^{2} G01R *19/22, 1/20*

U.S. Cl. 324—119 **9 Claims**



1. A single probe voltmeter for providing an indication of the voltage potential of a high·tension transmission line, said voltmeter comprising:
a. a single probe electrically contactable to the line under test for conveying a flow of current from the line;
b. a spherical capacitance means electrically connected to the line through said single probe;
c. a rectifier network electrically disposed intermediate said single probe and said spherical capacitance means for rectifying the current flowing through said single probe to said spherical capacitance means; and
d. an ammeter electrically disposed across said rectifier network, said ammeter being responsive to the current flowing through said rectifier network to charge said spherical capacitance means;
e. said ammeter being effective to provide an indication of the charging current which is reflective of the voltage potential of the line;
f. said spherical capacitance means being effective to cause the voltmeter to be essentially immune to variations due to electrostatic fields in the vicinity of high tension transmission lines.

3,969,672
VOLTAGE LEVEL INDICATOR ESTABLISHED BY A SERIES OF PROGRESSIVELY ENERGIZED LIGHT EMITTING DIODES

Gunnar Wallander, Bandhagen, and Bernt Bostrom, Hagersten, both of Sweden, assignors to Audio Stockholm, Stockholm, Sweden

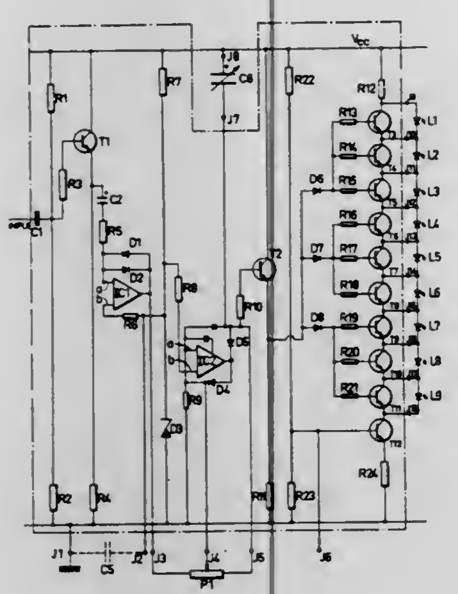
Filed Feb. 7, 1975, Ser. No. 548,017

Int. Cl.^{2} G01R *19/16*

U.S. Cl. 324—133 **4 Claims**

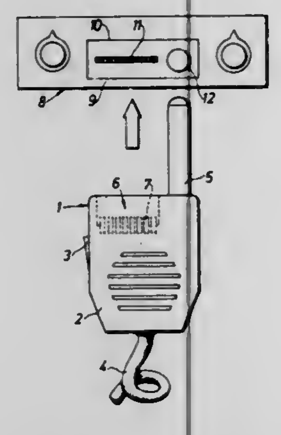
1. A voltage level detector comprising a plurality of light emitting means connected electrically in series, a constant current source coupled to said series-connected light emitting means, a voltage supply source connected to the series connection of said light emitting means and said constant current source, a plurality of voltage level controlled means correlated respectively with said light emitting means, each said voltage level controlled means having two main electrodes and one control electrode, the main electrodes of each of said voltage level controlled means being connected electrically in parallel with a corresponding one of said light emitting means and the control electrode thereof being connected to means for providing a control voltage common to all of said voltage level controlled means and which varies with the level of the voltage to be detected, each of said voltage level controlled means in the series being operable sequentially in accordance with a different level of the voltage to be detected to change over from a conducting to a non-conducting state and vice versa whereby each of said voltage level controlled means when in a conducting state functions as a by-pass for current flow around its corresponding light emitting means and when in a

non-conducting state functions to force current flow through its corresponding light emitting means, said voltage level controlled means being arranged electrically in groups in one to three means and wherein with respect to each said group individual resistors are connected respectively between a common connection point for the group and the control electrode of a corresponding voltage level controlled means of the group, and wherein diodes are respectively connected between the output of said control voltage providing means and the common connection point for a corresponding group, each of said diodes being forward biased when at least one of the voltage level controlled means of the corresponding group is conducting and back biased when none of the voltage level controlled means of that particular group is conducting.



3,969,673
PERSONAL RADIO STATION

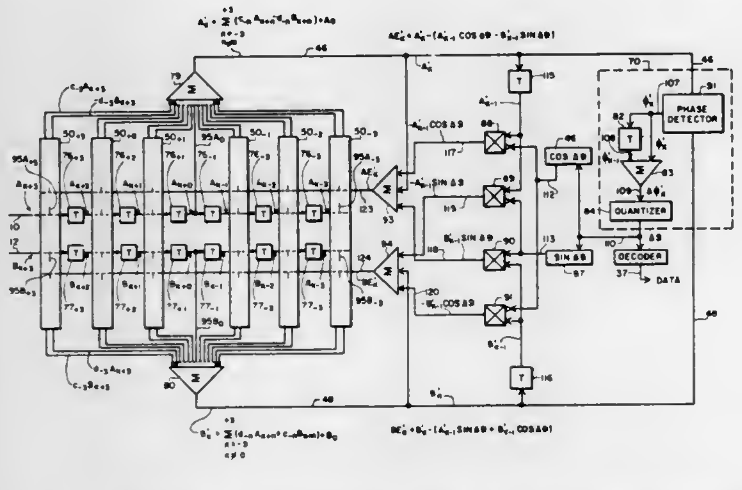
Karl Gustav Gösta Lennart Nordlöf, Skarholmen, Sweden, assignor to AB Teleplan, Solna, Sweden
Filed Oct. 19, 1973, Ser. No. 407,819
Int. Cl.² H01B *1/38*
U.S. Cl. 325—16 **8 Claims**



1. In a personal radio system having a portable set composed of first housing means containing a transmitting unit and a receiver unit, and a remote control unit for controlling a plurality of different functional operations of the system, the system also including an external auxiliary control unit arranged to be permanently mounted in a support structure, the improvement wherein said remote control unit comprises: a second housing means of a size so as to be capable of being hand held; a flexible cable extending between said first and second housing means to connect said remote control unit to said transmitting and receiver units; an aerial connected to said second housing means and projecting therefrom; and function control means for controlling the different functions of said system, said remote control unit includes contact means mounted within said second housing means and coupled to said function control means, and said auxiliary control unit includes mating contact means for selectively coupling the receiver and transmitter units to said external auxiliary control unit for enabling the different functions of the radio system to be controlled by said external auxiliary control unit, whereby said contact means and said aerial on said second housing means form a plug-in unit for coupling the portable set to said external auxiliary control unit.

3,969,674
METHOD AND APPARATUS FOR INCOHERENT ADAPTIVE MEAN-SQUARE EQUALIZATION OF DIFFERENTIALLY PHASE-MODULATED DATA SIGNALS

Robert J. Tracey, San Mateo, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Oct. 21, 1974, Ser. No. 516,842
Int. Cl.² H04B *1/10*
U.S. Cl. 325—42 **30 Claims**



1. An adaptive equalizer for a phase-modulated data transmission channel causing distorted signals, comprising:

delay line means receiving distorted signals and having pairs of output tap lines at synchronously equally spaced intervals that are determined by the transmission rate of data symbols traversing the channel, associated tap lines of each pair passing in-phase and quadrature-phase tap signals, one of said pair of tap lines being principal tap lines for passing principal tap signals;

first weighting means for weighting tap signals from each pair of tap lines, other than the principal tap lines, with associated pairs of in-phase and quadrature-phase tap gains that are updated at least periodically for producting a pair of in-phase and a pair of quadrature-phase weighted tap signals associated with each pair of tap lines other than the principal tap lines, wherein each pair of in-phase weighted tap signals is a measure of the associated in-phase tap signal weighted by the associated in-phase tap gain and the associated quadrature-phase tap signal weighted by the associated quadrature-phase tap gain, and wherein each pair of quadrature-phase weighted tap signals is a measure of the associated in-phase tap signal weighted by the associated quadrature-phase tap gain and the associated quadrature-phase tap signal weighted by the associated in-phase tap gain;

second weighting means for weighting the principal tap signals with constants;

first combining means combining all of the in-phase and quadrature-phase weighted tap signals, including the weighted principal tap signals, for producing an equalized signal;

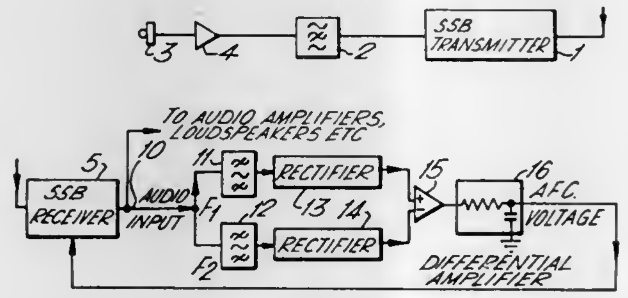
error signal producing means responsive to the output of said first combining means for producing, during at least some symbol intervals, common in-phase and quadrature-phase components of an error signal that is a measure of

the difference between the signal vector equalized during one symbol interval and a reference vector which is the signal vector equalized during the prior symbol interval after the latter equalized signal vector is rotated by a phase angle that is proportional to a quantized value of the difference between the phases of the signals equalized during the one and the prior symbol intervals; and

correlation means responsive to tap signals from pairs of tap lines other than the principal tap lines and to the in-phase and quadrature-phase error signals for producing updated values of the in-phase and quadrature-phase tap gains.

3,969,675
SINGLE SIDE-BAND RADIO

Harold William Gosling, Sketty, Swansea, Wales, assignor to National Research Development Corporation, London, England
Continuation of Ser. No. 371,469, June 19, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,329
Claims priority, application United Kingdom, June 20, 1972, 28783/72
Int. Cl.² H04B *1/68*
U.S. Cl. 325—50 **22 Claims**



3. Single side-band information-transmission apparatus including filter means for substantially attenuating signals extending over a predetermined portion of the frequency range of input signals to be transmitted, said portion not extending to either frequency extremes of said range, means for modulating a signal in accordance with the output signal from the filter means to provide a single side-band signal and for transmitting the said single side-band signal, a receiver having demodulation means for demodulating the received signal to provide output signals dependent on the received signals and on a control signal applied to the receiver, frequency-sensitive means for detecting any departure in frequency from a nominal position of a low amplitude portion in the band of signals from the demodulation means which corresponds to the said predetermined portion, the nominal position being the position in the frequency spectrum, of the said predetermined portion, and control means, coupled to the output of the frequency-sensitive means, for providing the said control signal in accordance with the output signal of the frequency-sensitive means and for applying the said control signal to the receiver, said control signal not depending on any signal present in said predetermined portion of said frequency range.

3,969,676
ELECTRON BEAM IONIZATION SIGNAL SAMPLER

Conrad Driussi, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Continuation-in-part of Ser. No. 406,059, Oct. 12, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 568,965
Int. Cl.² G11C *11/26*; **H03K** *5/00*
U.S. Cl. 328—121 **1 Claim**

1. An electronic signal sampler for fully sampling each pulse received by the sampler, comprising;

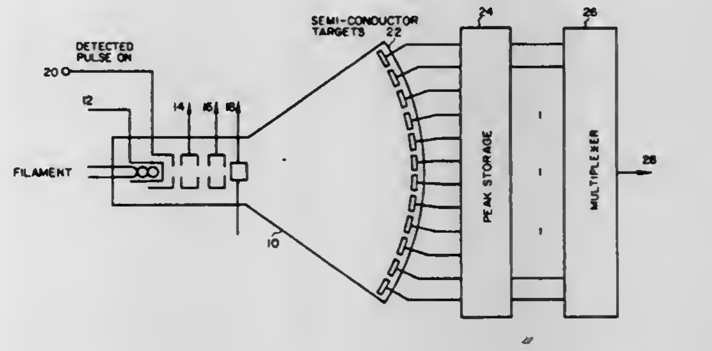
an input for receiving said pulses,

a cathode ray tube envelope having a face and an electron beam,

means coupled to said input for controlling the intensity of the electron beam in response to the electrical pulse received,

means for deflecting said beam such that the beam traces a scan on the face of the envelope,

a plurality of electron sensitive semi-conductors spaced along the inner surface of the face of the envelope, each



for detecting at least a part of the beam and providing an output responsive to the intensity of the part detected,

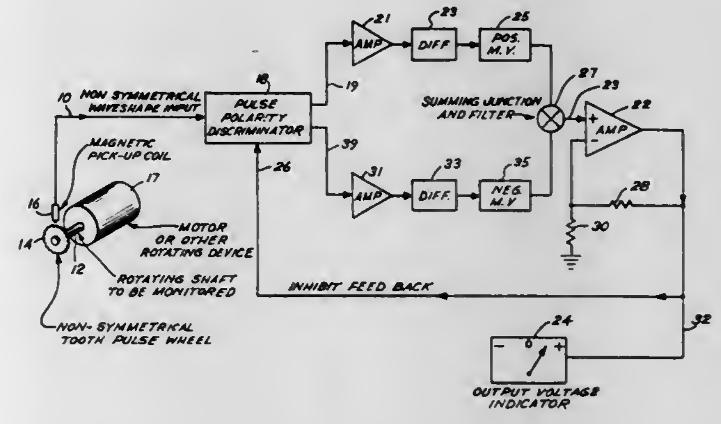
peak storage means coupled to said electron sensitive semi-conductors for separately storing the electrical charges corresponding to the amount of current generated by the respective semi-conductor for each pule, and

a multiplexer coupled to said peak storage means for systematically processing all of the charges stored for each pulse and providing the sampler output.

such that all parts of each pulse are sampled.

3,969,677
FREQUENCY RESPONSIVE POLARITY DISCRIMINATOR

Joseph T. Woyton, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.
Division of Ser. No. 438,232, Jan. 31, 1974, Pat. No. 3,916,326. This application May 21, 1975, Ser. No. 579,407
Int. Cl.² H03K *5/156, 9/06*
U.S. Cl. 328—140 **5 Claims**


10 NON SYMMETRICAL WAVESHAPE INPUT
18 PULSE POLARITY DISCRIMINATOR
21 AMP
23 DIFF
25 POS. M.V.
19
SUMMING JUNCTION AND FILTER
27
29 AMP
22
39
26
31 AMP
33 DIFF
35 NEG M.V.
28
30
MAGNETIC PICK-UP COIL
17
16
14
12
MOTOR OR OTHER ROTATING DEVICE
ROTATING SHAFT TO BE MONITORED
INHIBIT FEED BACK
NON-SYMMETRICAL TOOTH PULSE WHEEL
24
32
OUTPUT VOLTAGE INDICATOR

1. A sensing circuit comprising a means for producing a bi-polar, non-symmetrical waveshape signal, a polarity discriminator connected to said means, a signal processing circuit having a positive and negative responding channel means which includes an amplifier, a monostable multivibrator connected in series, and a summing junction connected to said channel means, said circuit being connected to said processing discriminator and controlled by the frequency of said signal, and a feedback means connecting said summing junctions output to said polarity discriminator for selecting one polarity component of said signal input, while rejecting the opposite polarity component.

3,969,678
BAND PASS FILTER CIRCUIT WITH AUTOMATIC BANDWIDTH ADJUST

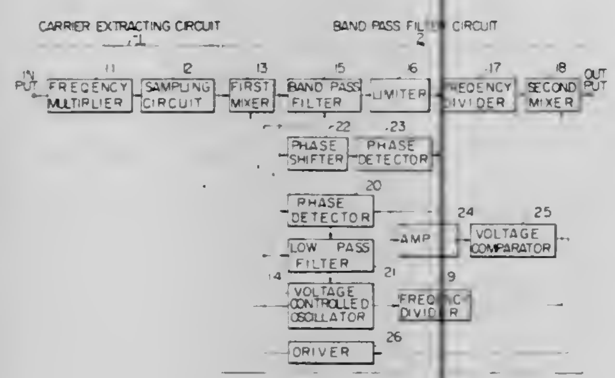
Masaru Asahara, Kawasaki; Noriyasu Toyonaga; Hiroaki Ohyama, both of Tokyo; Hiroshi Nakamura, Sagamihara, and Ryushiro Yoshizawa, Yokohama, all of Japan, assignors to Fujitsu Ltd., Japan

Filed July 3, 1975, Ser. No. 593,126

Claims priority, application Japan, July 8, 1974, 49-78059

Int. Cl.^{2} H03G *5/22*

U.S. Cl. 328—167 **5 Claims**



1. A band pass filter circuit including a band pass filter, a first phase detector which detects phase differences between an input and an output of said band pass filter, a low pass filter which receives an output of said first phase detector, a voltage controlled oscillator which is controlled by an output of said low pass filter, first and second mixers which are respectively connected to the input side and the output side of said band pass filter and receive an output of said voltage controlled oscillator, so that an input signal frequency of said band pass filter is pulled into the center frequency of said band pass filter, said band pass filter circuit comprising means for providing a first signal to change a bandwidth of said band pass filter from a wide bandwidth to a narrow bandwidth and a second signal occurring simultaneously to change a cutoff frequency of said low pass filter from a higher frequency to a lower frequency when said input signal frequency is pulled into said center frequency of said band pass filter.

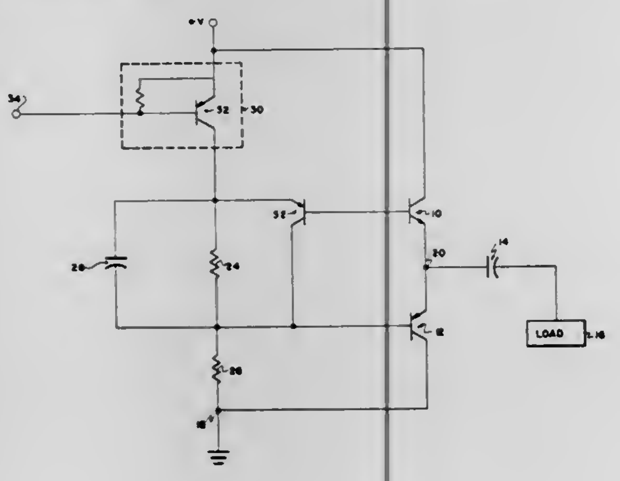
3,969,679
AUTOMATIC CROSSOVER DISTORTION CORRECTION CIRCUIT

Charles W. Sexton, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed July 26, 1974, Ser. No. 492,344

Int. Cl.^{2} H03F *3/04*

U.S. Cl. 330—22 **3 Claims**



1. In a television receiver vertical sweep output circuit, a complementary symmetry amplifier comprising:

first and second transistors interconnected in a complementary symmetry manner to create a common output for supplying load current in response to an input signal applied to said first and second transistors,

means for generating a bias voltage including filter means responsive to said input signal for eliminating crossover distortion effects from said load current, and

control means connected across said filter means and responsive to the bias current drawn by said first and second transistors to regulate said bias voltage as a function of said bias current.

3,969,680
AUTOMATIC DYNAMIC COMPANDER SYSTEM

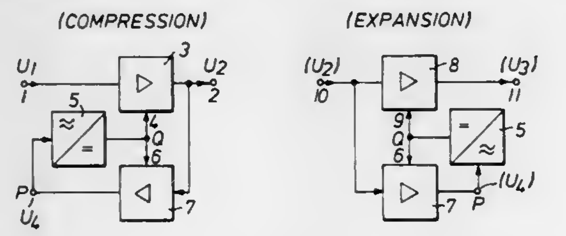
Jürgen Wermuth, Stederdorf, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 24, 1975, Ser. No. 543,931

Claims priority, application Germany, Jan. 26, 1974, 2403799; Feb. 9, 1974, 2406258

Int. Cl.^{2} H03G *7/00*

U.S. Cl. 330—29 **9 Claims**



1. In a circuit for the automatic dynamic compression or expansion of a signal between its input and its output, the circuit presenting a useful signal path connected between its input and its output and containing a first variable gain member which is electronically controllable for varying the transmission factor between the circuit input and output, the circuit also presenting a branch path connected at one point to the useful signal path and containing a control voltage generator for generating, from the signal at such point in the useful signal path, a control voltage and means applying the control voltage to the variable gain member, for causing the transmission factor of the useful signal path to have a value dependent on the value of the control voltage, the improvement comprising: a second variable gain member connected in said branch path and arranged to be electronically controllable for varying the transmission factor exhibited by said branch path; and means connecting the output of said control voltage generator to said second variable gain member for effecting a counterregulation of the transmission factor of said branch path, relative to the transmission factor variation imparted to said useful signal path.

3,969,681
FAST ELECTRONIC TUNING OF HIGH POWER CIRCUITS FOR VHF-UHF POWER AMPLIFIER AT HIGH-EFFICIENCY

George Fincke, W. Allenhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,788

Int. Cl.^{2} H03F *3/60*

U.S. Cl. 330—56 **1 Claim**

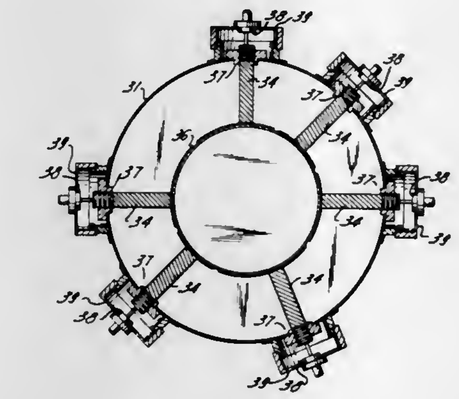
1. A selectively tunable output circuit for an ultra-high frequency power amplifying device comprising:

a tunable, coaxial, TEM mode cavity having cylindrical center and outer conductors;

a triode amplifying device located within said center conductor of said tunable coaxial cavity, said triode having its grid connected to said outer conductor and its anode connected to said center conductor;

at least six radially disposed, unequally spaced selectively positioned conductive tuning rods, capacitance coupled to said center conductor and insulated from and extending outward through said cylindrical outer conductor;

a PIN diode at the outer end of each of said radial conductive rods, each diode arranged to short said radial rod to said outer conductor when said diodes are biased into the conductive state; and



means to selectively bias said diodes to thereby change the tuning of said device.

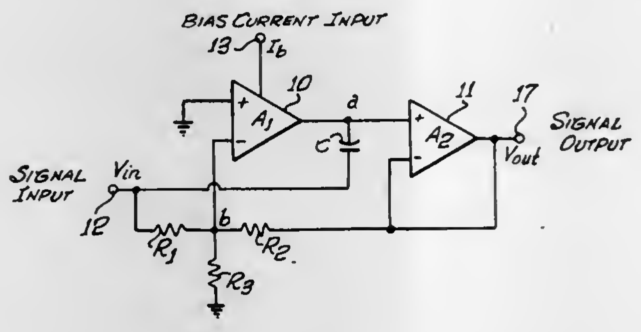
3,969,682
CIRCUIT FOR DYNAMIC CONTROL OF PHASE SHIFT

David Philip Rossum, Santa Clara, Calif., assignor to Oberheim Electronics Inc., Santa Monica, Calif.

Filed Oct. 21, 1974, Ser. No. 516,744

Int. Cl.^{2} H03F *1/34*

U.S. Cl. 330—85 **7 Claims**



5. A circuit for dynamic control of phase shift of a signal between input and output terminals thereof comprising a variable transconductance amplifier having a differential input stage with separate inverting and noninverting input terminals, and a current source output stage, said noninverting input terminal being connected to circuit ground, a capacitor connected in series between said circuit input terminal and the output of said transconductance amplifier, impedance matching means for coupling the output of said amplifier to said circuit output terminal comprised of a noninverting buffer amplifier having high input impedance, means for coupling negative feedback from the output of said transconductance amplifier to the input thereof comprised of a direct current path between said circuit output terminal and said inverting input terminal of said transconductance amplifier, and means for supplying a variable control bias current to said amplifier for a phase shift of said signal translated by said circuit from said input terminal to said output terminal.

3,969,683
AUTOMATIC LEVEL CONTROL CIRCUIT

Wayne Nixon Fabricius, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 21, 1975, Ser. No. 569,810

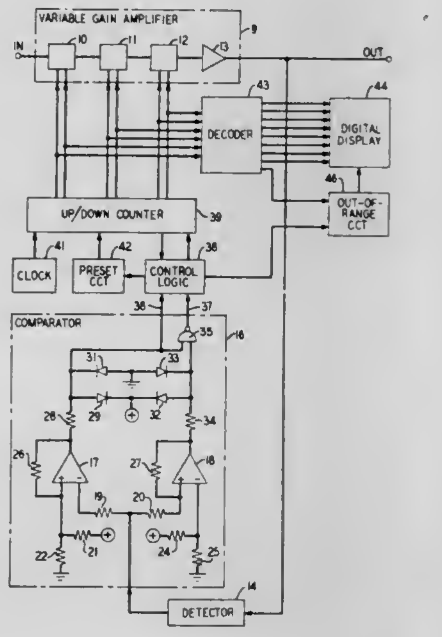
Int. Cl.^{2} H03G *3/20*

U.S. Cl. 330—144 **7 Claims**

1. An automatic signal level control circuit comprising:

amplifying means connected to receive an input signal and having variable gain that changes in precisely defined discrete increments to provide an output signal whose magnitude is variable independent of the level of the input signal,

comparing means having an upper predetermined limit and a lower predetermined limit for evaluating the amplitude of said output signal, said comparing means having feedback means to provide hysteresis in its transfer characteristic, and said comparing means producing an output signal indicative of the amplitude of said output signal relative to said limits as the hysteresis in the transfer characteristic therein provides substantial noise immunity in the indication of said output signal of said comparing means from the significant amount of noise that may be present on said output signal when it passes through one of said limits,



digital means for controlling the gain of said amplifying means comprising logic means and up/down counting means, said logic means responsive to the output of said comparing means, said counting means being enabled and inhibited by said logic means, and said counting means having counting states and associated outputs that control the gain of said amplifying means to maintain its output between said limits,

and decoding means responsive to the associated outputs of said counting means for providing a set of digital signals indicative of the level of the input signal being received by said amplifying means, said decoding means comprising read-only memory means, inverting means, gating means connected to the output of said counting means, and switching means for applying ground potential to said read-only memory means and said gating means to produce the set of digital signals.

3,969,684
METHOD FOR REDUCING THE WIDTH OF A LASER PULSE AND A CORRESPONDING DOUBLE-RESONATOR LASER

Olivier de Witte, Gif-sur-Yvette; Armand Eranian, Bois Colombes, and Pierre Dezauzier, Talence, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Jan. 7, 1974, Ser. No. 431,315

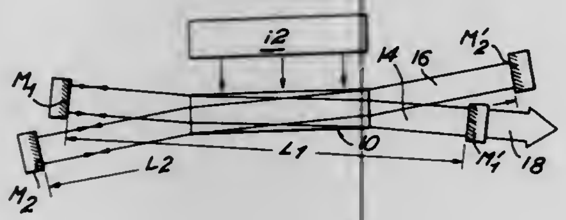
Claims priority, application France, Jan. 12, 1973, 73.01111

Int. Cl.^{2} H01S *3/08, 3/081, 3/10*

U.S. Cl. 331—94.5 C **21 Claims**

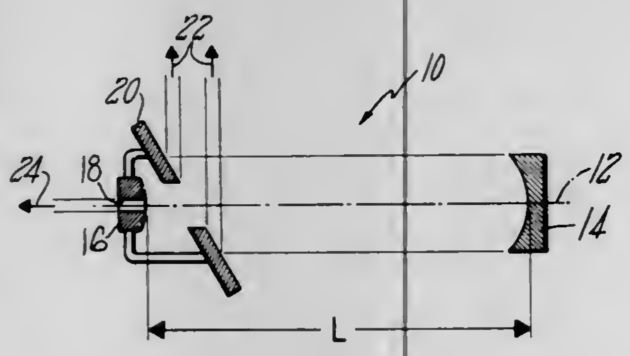
5. A laser which emits a light pulse of adjustable width, comprising:

an amplifying medium having a stimulable transition,
pulsed pumping means for exciting said medium,
a first resonator including two mirrors spaced at a distance of L_1, for containing said medium and for sustaining a first oscillation on said transition, said first resonator having a first quality factor,
a second resonator, including two mirrors spaced at a distance of L_2, for containing said medium and for sustaining a second oscillation on said transition, in competition with said first oscillation, said second resonator being continuously coupled to said first resonator and having a quality factor higher than said first quality factor,
means for extracting a fraction of said oscillation from said first resonator, said fraction forming said pulse of adjustable width, said width depending on the quality factor of said second resonator, and
means for adjusting the quality factor of said second resonator and said width.



3,969,685
ENHANCED RADIATION COUPLING FROM UNSTABLE LASER RESONATORS

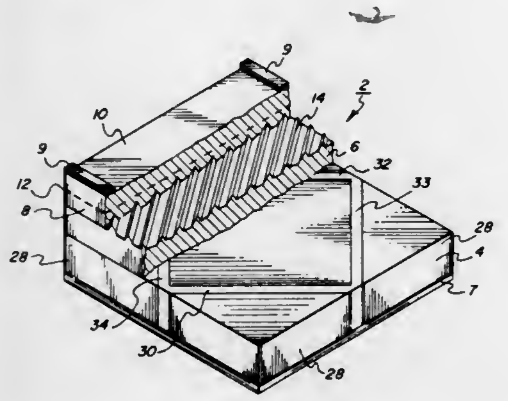
Peter P. Chenausky, West Hartford, and Robert J. Freiberg, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 6, 1974, Ser. No. 530,456
Int. Cl.^{2} H01S *3/081*
U.S. Cl. 331—94.5 C **11 Claims**



1. A method of coupling laser radiation from an unstable resonator having a centerline axis and operating in a low order mode pattern which is positioned about the axis including the steps of:
coupling out of the resonator as a principal output beam, all the laser radiation resonating in a region which extends along and includes the centerline axis; and
coupling laser radiation out of the resonator from a region not including the axis as a separate secondary output beam.

3,969,686
BEAM COLLIMATION USING MULTIPLE COUPLED ELEMENTS

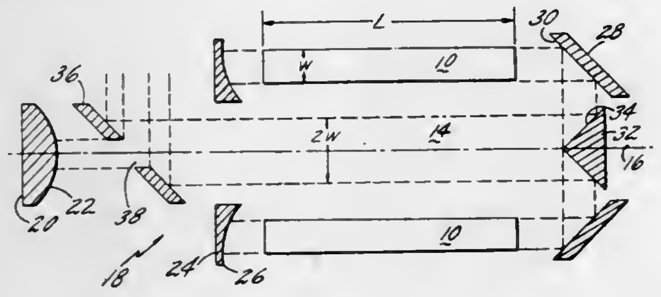
Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 26, 1975, Ser. No. 562,279
Int. Cl.^{2} H01S *3/19*
U.S. Cl. 331—94.5 H **9 Claims**



1. A heterojunction diode laser comprising:
a light waveguide layer of semiconductor material, said waveguide layer being sandwiched between first and second adjacent layers of semiconductor material with at least one of said adjacent layers being of a different material than the material of said waveguide layer, one of said adjacent layers being of a different conductivity type than the conductivity type of said waveguide layer such that a PN junction is formed therebetween,
means for electrically pumping at least two spaced parallel regions of said waveguide layers so that light photons are generated in and travel throughout said waveguide layer,
means for substantially totally internally reflecting said light photons so that at least a portion of said light photons follow a path within said waveguide layer which path has sections which are in alignment with said spaced parallel regions of said waveguide layer, and
a periodic structure within said diode laser, said periodic structure having a plurality of parallel teeth which are oriented such that their projections are perpendicular to said spaced parallel regions such that said portion of said light photons will be reinforced in a coherent manner thereby providing the feedback necessary to produce two parallel output light beams.

3,969,687
STANDING WAVE UNSTABLE RESONATORS FOR RADIAL FLOW LASERS

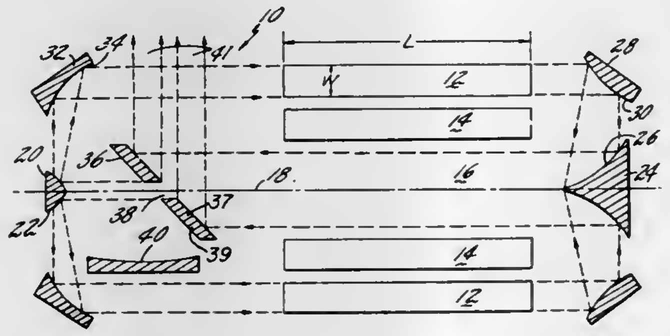
Robert J. Freiberg, South Windsor, and George H. McLafferty, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Apr. 14, 1975, Ser. No. 568,084
Int. Cl.^{2} H01S *3/081*
U.S. Cl. 331—94.5 C **11 Claims**



1. A radial flow laser system having an unstable resonator with a centerline axis and a standing wave optical path and including:
a first end mirror having a circular reflective surface which is positioned on and symmetrically about the centerline axis;
a first folding mirror having a conical reflective surface which is positioned on and symmetrically about the centerline axis with the reflective surfaces of the first end and first folding mirrors being optically communicative with each other;
a second folding mirror having a conical reflective surface which forms an annulus and is positioned symmetrically about the centerline axis with the conical reflective surfaces of the first and second folding mirrors being optically communicative with each other; and
an annular mirror having a curved reflective surface and positioned symmetrically about the centerline axis with the curved reflective surface optically communicative with the conical surface of the second folding mirror whereby the first end mirror, the first and second folding mirrors and the annular mirror form a standing wave unstable resonator.

3,969,688
TRAVELING WAVE UNSTABLE RESONATORS FOR RADIAL FLOW LASERS

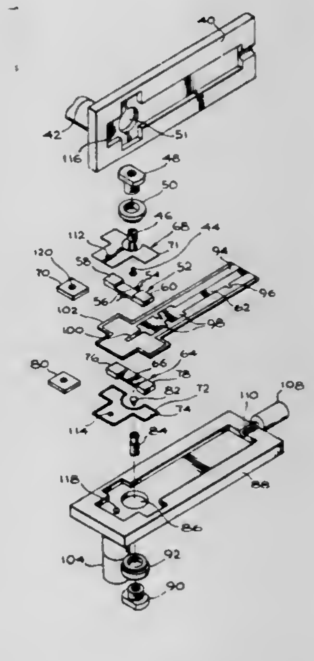
Robert J. Freiberg, South Windsor, and George H. McLafferty, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Apr. 14, 1975, Ser. No. 568,082
Int. Cl.^{2} H01S *3/081*
U.S. Cl. 331—94.5 C **7 Claims**



1. A radial flow laser system having an unstable ring resonator with a traveling wave optical path and including:
a first axial mirror having a conical reflective surface which is positioned on and symmetrical about an axis forming the centerline of the resonator;
a second axial mirror having a conical reflective surface which is positioned on and symmetrically about the centerline axis with the apex of the first axial mirror pointed toward the apex of the second axial mirror;
a first annular mirror having a conical reflective surface and positioned symmetrically about the centerline axis with the apex end of the first annular mirror disposed oppositely with respect to the apex of the second axial mirror and with the reflective surfaces of the second axial and first annular mirrors being optically communicative with each other; and
a second annular mirror having a conical reflective surface and positioned symmetrically about the centerline axis with the apex end of the second annular mirror disposed oppositely with respect to the apex of the first axial mirror and with the reflective surface of the second annular mirror being optically communicative with the reflective surfaces of both of the first axial and first annular mirrors whereby the first and second axial mirrors and the first and second annular mirrors form an unstable, traveling wave, ring resonator.

3,969,689
DUAL DIODE OSCILLATOR AND AIRSTRIP TRANSMISSION LINE APPARATUS

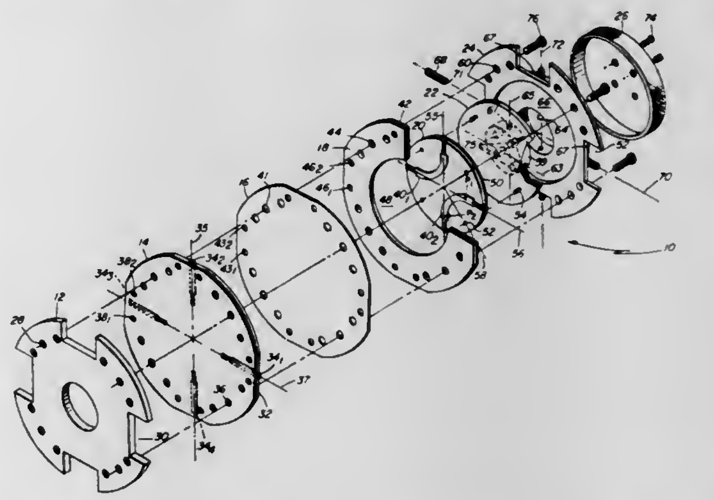
Bill E. Corrons, Montclair, and James F. Barker, Twenty Nine Palms, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.
Filed Apr. 7, 1975, Ser. No. 565,488
Int. Cl.^{2} H03B *7/14*
U.S. Cl. 331—107 R **10 Claims**



1. A multiple-diode microwave oscillator including, in combination:
a plurality of ground plane plates;
a plurality of airstrip transmission lines positioned between said ground plane plates;
a plurality of avalanche diodes each positioned in a strap cavity having unbiased conductive walls and coupled to a wall of the cavity and to a respective one of said plurality of transmission lines;
means for coupling operating signals to each of said plurality of avalanche diodes; and
means for combining the power from each of said diodes at the same desired frequency and phase.

3,969,690
RADIO FREQUENCY SWITCH

Russell W. Hansen, Stoughton, and Matthew Fassett, Billerica, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Mar. 3, 1975, Ser. No. 554,851
Int. Cl.^{2} H01P *1/10*
U.S. Cl. 333—7 R **1 Claim**



1. A radio frequency switch for coupling selected ones of a plurality of ports comprising:

a. an outer frame;

b. a first dielectric board, affixed to such outer frame, having a ground plane on one side thereof and a plurality of strip conductors formed on the other side thereof to extend radially inwardly of such board, one end of each one of the plurality of strip conductors being coupled to a corresponding one of the plurality of ports, such ports being disposed about the periphery of such dielectric board;

c. a dielectric sheet having a first surface disposed over the plurality of strip conductors;

d. a frame member, affixed to the outer frame, having an aperture formed through the center portion thereof and a conductive material disposed on one of the planar surfaces thereof, a second planar surface thereof being in contact with a second surface of the dielectric sheet;

e. a disk-shaped dielectric board, disposed within such aperture, having a conductive material disposed on one planar surface thereof, such surface being in a plane with the conductive material of the frame member to form a second ground plane, and at least one strip conductor formed on the other side thereof and in contact with the second surface of the dielectric sheet, such disk-shaped dielectric board being rotatable within the aperture and in a parallel relationship with respect to the first dielectric board, the strip conductors formed on the dielectric boards being separated by the dielectric sheet and being disposed between the ground planes, the strip conductors on both such boards being dimensioned to enable the at least one strip conductor to overlap pairs of the plurality of strip conductors by a length in the order of $\lambda/4$ where λ is the effective wavelength of the nominal operating frequency of the switch, thereby to effectuate a coupling between selected pairs of the plurality of strip conductors; and

f. detent means for indicating such coupling, such detent means including an engageable pair of elements, one of such pair of elements being affixed to the outer frame and the other one of such pair of elements being affixed to the disk-shaped dielectric board.

3,969,691

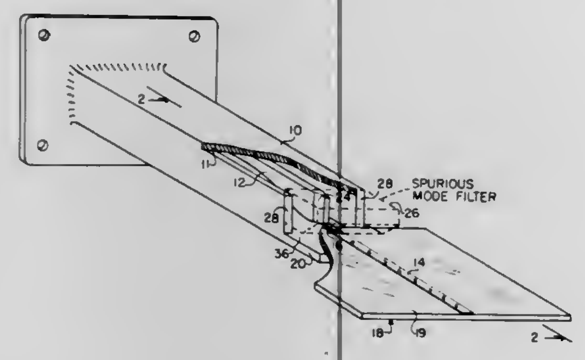
MILLIMETER WAVEGUIDE TO MICROSTRIP TRANSITION

David L. Saul, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 11, 1975, Ser. No. 586,113

Int. Cl.^{2} H01P *1/16*

U.S. Cl. 333—21 R **4 Claims**



1. A waveguide to microstrip transition apparatus comprising:

a waveguide;

a section of microstrip circuit coupled to said waveguide; and

mode filter means connected to said waveguide and extending over a portion of said section of microstrip circuit for preventing spurious modes of propagation beyond said waveguide, said mode filter means comprising a partially enclosed conductive cavity having an opening facing said portion of said section of microstrip circuit, said opening extending over said section of microstrip circuit.

3,969,692

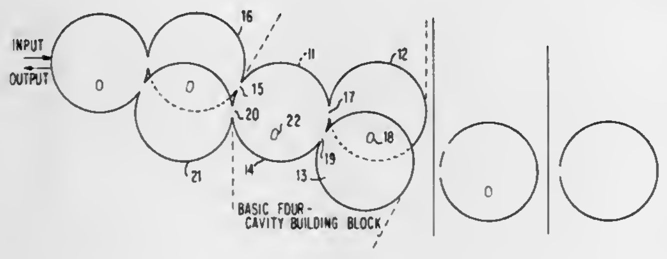
GENERALIZED WAVEGUIDE BANDPASS FILTERS

Albert Edward Williams, Bethesda, and Ali Ezzeldin Atia, Gaithersburg, both of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed Sept. 24, 1975, Ser. No. 616,479

Int. Cl.^{2} H01P *7/06, 1/20*

U.S. Cl. 333—73 W **6 Claims**



1. A generalized TE_{011} mode waveguide filter comprising:

at least first, second, third and fourth cylindrical cavities, each of said cavities being tuned to resonate in the TE_{011} mode at a common center frequency,

first coupling means connecting said first and second cavities through their side walls for coupling resonant energy between said first and second cavities,

second coupling means connecting said third and fourth cavities through their side walls for coupling resonant energy between said third and fourth cavities,

third coupling means connecting said second and third cavities through their end walls for coupling resonant energy between said second and third cavities, and

fourth coupling means connecting said first and fourth cavities through their end walls for coupling resonant energy between said first and fourth cavities.

3,969,693

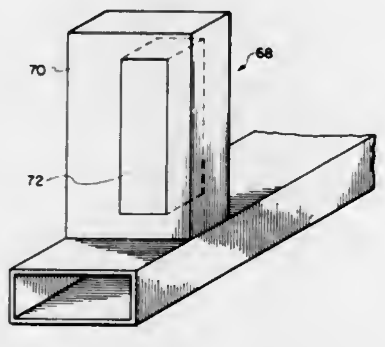
PASSIVE MICROWAVE POWER DISTRIBUTION SYSTEMS

John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 482,946, June 25, 1974, Pat. No. 3,953,853. This application Apr. 25, 1975, Ser. No. 571,670

Int. Cl.^{2} H01P *1/10, 1/18, 1/32, 5/12*

U.S. Cl. 333—98 S **1 Claim**



1. In combination with a waveguide, a lateral stub that is an odd number of quarter-wavelengths long for reflecting energy arriving from either direction in the waveguide, and a ferrite latching phase shifter mounted in said stub that is approximately transparent to microwave energy in one latched state and is operable to change the electrical length of the stub substantially by 90° in another latched state.

3,969,694

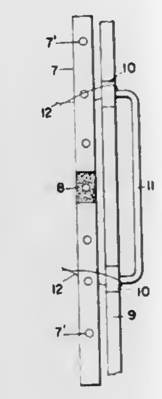
ELECTRIC FUSE FOR ELEVATED CIRCUIT VOLTAGES CAPABLE OF INTERRUPTING SMALL OVERLOAD CURRENTS

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed June 11, 1975, Ser. No. 585,961

Int. Cl.^{2} H01H *85/12*

U.S. Cl. 337—161 **4 Claims**



1. An electric fuse adapted to form multibreaks at the occurrence of small protracted overload currents including

a. a tubular casing of electric insulating material;

b. a pulverulent arc-quenching filler inside said casing;

c. a pair of metallic terminal elements closing the ends of said casing;

d. a first fusible element having a relatively small resistance and forming a plurality of serially related points of reduced cross-sectional area conductively interconnecting said pair of terminal elements, said first fusible element having means at a predetermined point thereof for causing formation of a break therein at the occurrence of small protracted overload currents;

e. a second fusible element having a relatively high resistance shunted across said predetermined point of said first fusible element and having ends immediately adjacent said first fusible element conductively connected to said first fusible element, said ends of said second fusible element being adapted to melt and to initiate arcing at points thereof located immediately adjacent said first fusible element at smaller current intensities than those required to cause formation of a break in the center region of said second fusible element; and

f. blocks of metal spaced from said first fusible element arranged in the zone of arcing established by fusion of said ends of said second fusible element to increase the contamination of said zone of arcing by products of arcing resulting from vaporization of said blocks of metal to accelerate formation of series breaks in said first fusible element.

3,969,695

ELECTRIC FUSE AND TERMINAL PLUG THEREFOR

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

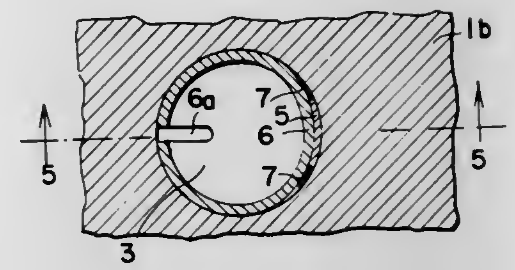
Filed Aug. 6, 1975, Ser. No. 602,319

Int. Cl.^{2} H01H *85/16*

U.S. Cl. 337—236 **8 Claims**

1. An electric fuse including a tubular casing of electric insulating material, a granular arc-quenching filler inside said casing, fusible element means inside said casing embedded in said filler, and a pair of plug terminals closing the ends of said casing and conductively interconnected by said fusible element means wherein the improvement comprises in that

a. the axially inner end surfaces of said pair of plug terminals are provided with blind bores engaged by the axially outer ends of said fusible element means and also engaged by spring means tending to clamp said axially outer ends of said fusible element means against the lateral walls of said blind bores; and in that



b. soft solder joints are formed inside said blind bores conductively connecting the axially outer ends of said fusible element means to said pair of plug terminals.

3,969,696

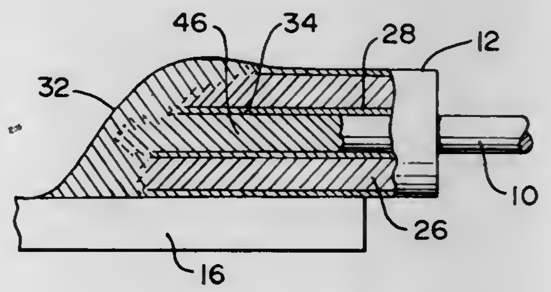
REFRACTORY RESISTOR WITH SUPPORTING TERMINAL

Denis G. Wolfe, Santa Ana; Richard K. Mitts, Fullerton, both of Calif.; Wilbur F. Jackson, deceased, late of Rolling Hills, Calif., and by Linda A. Benton, trust administrator, Long Beach, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 19, 1973, Ser. No. 398,889

Int. Cl. H01c *1/14*

U.S. Cl. 338—315 **21 Claims**



1. A resistance and terminal comprising

an elongated resistance element made from a conductive refractory material which is weakened where subjected to a substantial temperature gradient,

a metal supporting member extending along a segment of the element from one end of the element and at least partially surrounding the segment of the element,

a fused portion having constituents of the supporting member metal and the refractory material joining the one end of the resistance element to the supporting member, and

said supporting member having an unfused portion along a substantial portion of the segment providing mechanical support for the element where subject to weakening.

3,969,697

VOLTAGE DROP WARNING APPARATUS WITH NEGATIVE-RESISTANCE DEVICE

Hitoo Iwasa, Takatsuki, and Gota Kano, Nagaoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 30, 1974, Ser. No. 537,392

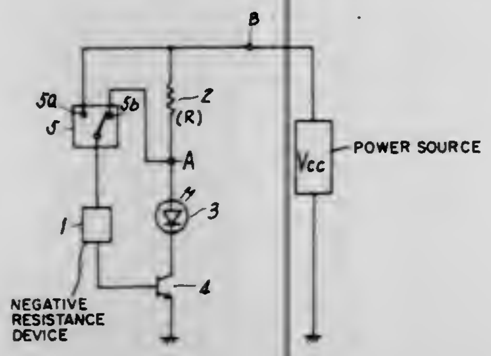
Int. Cl.^{2} G08B *21/00*

U.S. Cl. 340—248 B **4 Claims**

1. A voltage-drop warning apparatus comprising:

a series connection including a load, an indication means and a semiconductor switching element, both ends of the series connection being connected across positive and negative ends of a power source, and

a negative-resistance device comprising a complementary connection of an n-channel field-effect transistor and a p-channel field-effect transistor, one end of the negative-resistance device being connected to a junction point between said load and the switching element, and the other end of said device being connected to a control-signal input-terminal of the switching element.



3,969,698

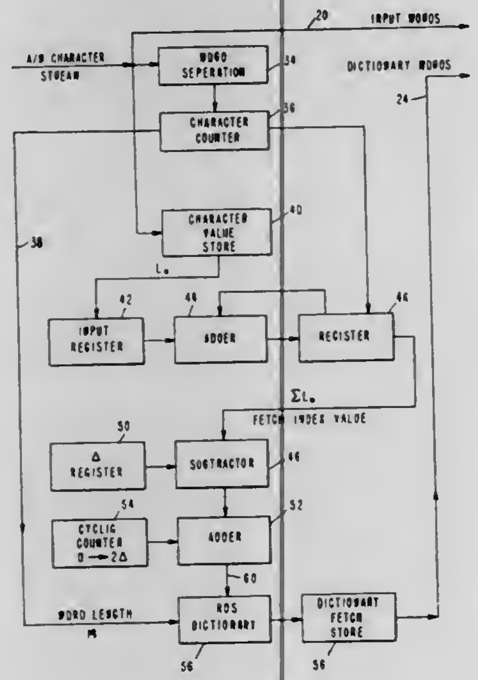
CLUSTER STORAGE APPARATUS FOR POST PROCESSING ERROR CORRECTION OF A CHARACTER RECOGNITION MACHINE

Ellen Willis Bollinger, Poughkeepsie, N.Y.; Anne Marie Chaires, Lanham, Md.; Jean Marie Ciconte, Rockville, Md.; Allen Harold Ett, Bethesda, Md.; John Joseph Hilliard, Potomac, Md.; Donald Francis Kocher, and Walter Steven Rosenbaum, both of Silver Spring, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,202

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 WD **10 Claims**



1. A cluster storage apparatus for outputting groups of valid alpha words as potential candidates for the correct form of an alpha word misrecognized by an OCR machine, comprising:

a two-dimenational array of alpha word read only storage locations, each location having a group of alpha words arranged such that adjacent locations contain alpha words having similar OCR misread propensities;

means for assigning numeric values to the characters of the input alpha word based upon the read reliability of the characters;

a first-dimensional accessing means for addressing said locations based upon the values assigned to the characters of which the input alpha word is composed;

a second-dimensional accessing means for accessing said locations based upon the number of characters in said input alpha word;

said first-dimensional accessing means calculating the first-dimensional address as a magnitude

$$Y = \sum_{N=1}^{M} L_N$$

where L_N is the numeric value assigned to each alpha character;

whereby an input alpha word which is potentially in error can be associated with that portion of the read only storage which contains potential candidates for the correct form of the input alpha word.

3,969,699

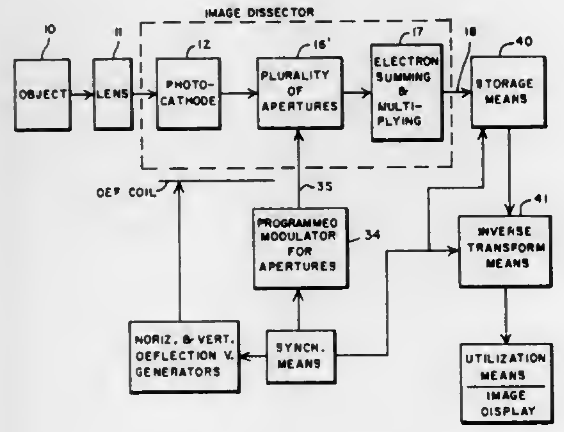
IMAGE DISSECTOR WITH MANY APERTURES FOR HADAMARD ENCODING

Laurence D. McGlaughlin, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 11, 9175, Ser. No. 567,154

Int. Cl.² H01J *39/12*

U.S. Cl. 340—146.3 F **3 Claims**



1. An improved image dissector camera tube system comprising:

photocathode means for generating an electron image;

a plurality of normally operative detector means at known adjacent positions of the electron image for producing signals indicative of the electron density at each of the known adjacent positions;

electron controlling means for causing one of a plurality of predetermined patterns of said plurality of detector means to be inoperative during each of a plurality of successive image sampling periods, said electron controlling means further comprising programmed modulator means connected in controlling relation to each of said detector means;

combining means for combining the signals from the operative detector means during each of the plurality of sampling periods to produce a combined signal for each of said plurality of periods, said programmed modulator means together with said combining means being so coded as to cause the electron image to be transformed to a Hadamard image; and

transform means for transforming the combined signals into a series of electrical signals indicative of the electron image.

3,969,700

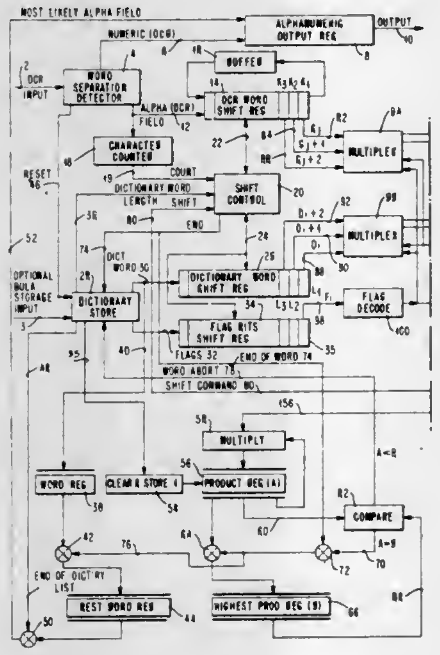
REGIONAL CONTEXT MAXIMUM LIKELIHOOD ERROR CORRECTION FOR OCR, KEYBOARD, AND THE LIKE

Ellen Willis Bollinger, Poughkeepsie, N.Y.; Anne Marie Chaires, Lanham, Md.; Jean Marie Ciconte, Rockville, Md.; Allen Harold Ett, Bethesda, Md.; John Joseph Hilliard, Potomac, Md., and Walter Steven Rosenbaum, Silver Spring, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 459,820, April 10, 1974, abandoned. This application July 30, 1975, Ser. No. 600,743

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 WD **38 Claims**



1. A data processing system for selecting the correct form of an input error word garbled by an OCR splitting error, the correct form of the error word being a member of a predetermined class of reference words, each comprising a plurality of characters, comprising:

a storage means for storing said predetermined class of reference words, selected characters composing the reference words having stored in said storage means an error propensity indicium for indicating the propensity of the character to being misread through a splitting error,

said storage means storing a first type conditional probability that a first character can be output by said OCR through character substitution, given that a second character was actually scanned, and a second type conditional probability that a pair of adjacent characters can be output by said OCR through character splitting, given that a third character was actually scanned;

a first register means connected to an input line for storing the characters of said error word arranged in the sequence of receipt from said OCR, with a first character at a given end of said error word defining a first position for an error word origin;

a second register means connected to said storage means for storing the characters of a first reference word from said predetermined class in said storage means, arranged in a sequence to correspond with said sequence of characters in said first register means, with a first character in said reference word corresponding to said first character in said error word, defining a first position for a reference word origin;

decoding means connected to said second register for decoding the error propensity indicium corresponding to the character located at said reference word origin in said reference word;

accessing means connected to said storage means for accessing from said storage means, when said decoded indicium indicates a character splitting propensity, a first one of said first type conditional probability that given the character located at said reference word origin in said reference word was scanned, that the OCR substituted the character located at said error word origin in said error word;

said accessing means accessing from said storage means when said decoded indicium indicates a error splitting propensity, a second one of said first type conditional probability that given the character next to the character at said reference word origin in said reference word was scanned, that the OCR substituted the character next to the character located at said error word origin in said error word;

multiplying means connected to said storage means for multiplying said first one and said second one of said first conditional probabilities, as a first product;

said accessing means accessing from said storage means when said decoded indicium indicates a character splitting propensity, a first one of said second type conditional probability that given the character located at said reference word origin in said reference word was scanned, that the OCR split it into the character located at said error word origin and the character next to the character located at said error word origin in said error word;

said accessing means accessing from said storage means when said decoded indicium indicates a character splitting propensity, a third one of said first type conditional probabilities that given the character next to the character located at said reference word origin in said reference word was scanned, that the OCR substituted the second next character to the character located at said error word origin in said error word;

said multiplying means multiplying said first one of said second type probability and said third one of said first type conditional probability as a second product;

comparison means connected to said multiplying means for comparing the relative magnitudes of said first and said second product;

a running product calculating means connected to said storage means for multiplying a running product times said first one of said first type conditional probabilities if said first product is greater than said second product or said first one of said second type conditional probabilities if said second product is greater than said first product;

a shifting means connected to said comparison means for shifting the location of both said error word origin and said reference word origin by one character position when said first probability product is greater than said second probability product;

said shifting means shifting said error word origin by two character positions and shifting said reference word origin by one character position when said second probability product is greater than said first probability product;

whereby the reference word stored in said storage means having the highest conditional probability of having been misread as the error word stored in said first register, can be determined.

3,969,701

FUNCTION BLOCK ORIENTED SPC SYSTEM

Göran Anders Henrik Hemdal, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 27, 1974, Ser. No. 455,294

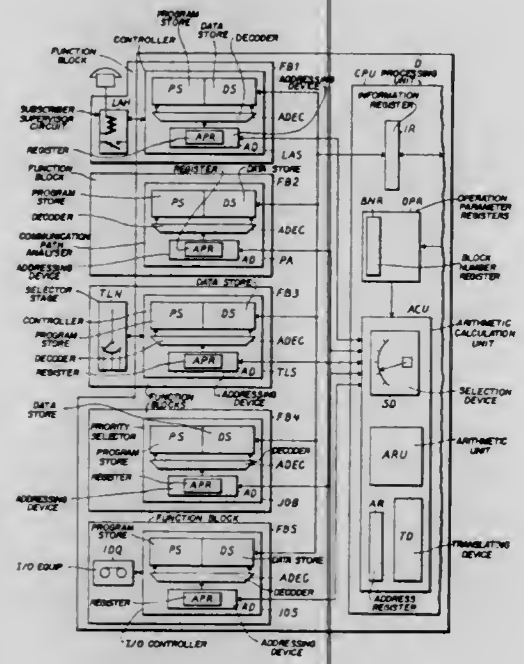
Claims priority, application Germany, Apr. 9, 1973, 2317772; Sweden, Apr. 9, 1973, 7304982

Int. Cl.² G05B *15/00;* **H04M** *3/00*

U.S. Cl. 340—172.5 **9 Claims**

1. In a stored program controlled system wherein devices for the execution of various device functions and computer functions are controlled by a computer having stores for the storage of system control information and having a central processor for the performance of the system control and for the writing and reading, via an information register, of the memory means, said system comprising:

- a plurality of function blocks of a first type for performing functions which are delimited from the functions of other blocks, each of said blocks of a first type including both executive devices for performing operating functions and control devices controlling the executive devices;
- a plurality of function blocks of a second type, each of said function blocks of a second type including control devices for performing control functions and no executive devices;
- each of said function blocks being assigned an associated function block number;
- the controlling devices of both types of function blocks being included in the computer, and each of said controlling devices comprising a program store and a data store having read/write terminals for the storage of the control information of its associated function block and addressing means for addressing only the stores of its associated function block;



- connecting means for connecting the central processor to the control devices of a number of said function blocks; and
- said central processor unit comprising a block number register for the registering of the respective function block numbers, a selection device which is connected to the block number register in order to be set by means of the registered block number, said connection means connecting the addressing means selected by the selection device to the central processor and connecting the write/read terminals of the stores in the control devices to the information register in the central processor for enabling the latter to control, with the aid of the addressing means, the writing and reading in the program stores and in the data stores.

3,969,702
ELECTRONIC COMPUTER WITH INDEPENDENT FUNCTIONAL NETWORKS FOR SIMULTANEOUSLY CARRYING OUT DIFFERENT OPERATIONS ON THE SAME DATA

Giancarlo Tessera, Milan, Italy, assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 2, 1974, Ser. No. 485,468

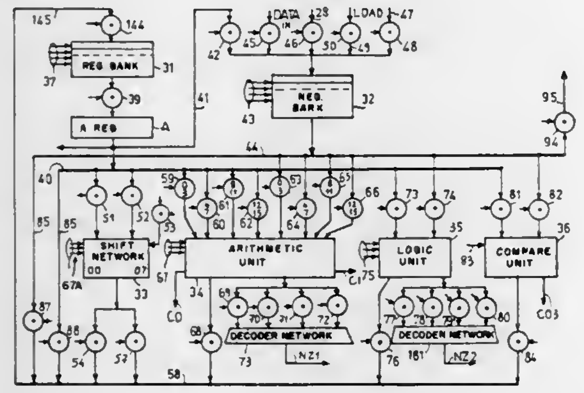
Claims priority, application Italy, July 10, 1973, 26397/73

Int. Cl.^{2} G06F *9/08, 9/20, 13/00*

U.S. Cl. 340—172.5 **16 Claims**

4. A data processing system comprising:

- control means;
- working storage means for storing units of information representative of instructions and data for at least one program;
- logic and arithmetic means coupled to said control means and to said storage means, said logic and arithmetic means including a plurality of independent functionally different processing network means, each being individually coupled to said control means and having input and output terminals;
- distribution circuit means coupled to said working storage means for receiving said information;



- a plurality of gating means coupled to said distribution circuit means and each coupled to the input terminals of a different predetermined one of said processing network means; and,
- said control means being coupled to each of said gating means, said control means being operative to process one of said program instructions said control means in response to said one of said program instructions generating a series of subcommand signals for enabling at least a pair of said gating means to apply the same units of data simultaneously to corresponding ones of said processing network means and for causing each of said corresponding ones of said processing network means for performing different types of operations upon the same units of data.

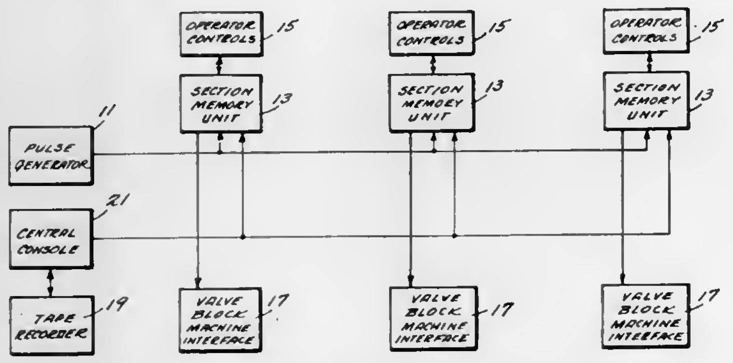
3,969,703
PROGRAMMABLE AUTOMATIC CONTROLLER

Jerome A. Kwiatkowski, and Charles L. Wood, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 19, 1973, Ser. No. 408,208

Int. Cl.^{2} G05B *1/08, 11/18;* **G06F** *3/05, 15/46*

U.S. Cl. 340—172.5 **22 Claims**



1. A programmable automatic controller for controlling at least one machine, said at least one machine including a plurality of cyclically movable components which are actuated in a timed relationship with respect to one another, said movable components each being actuated at respective relative times in each of a plurality of machine cycles, and said at least one machine including machine cycle position indicating means for cyclically moving in synchronism with the cyclic operation of said at least one machine, said controller comprising:

- timing means responsive to said machine cycle position indicating means for generating a digital signal in synchronism with the movement of said cycle position indicating means, said digital signal providing an instantaneous indication of the time elapsed in each cycle of operation of said machine,
- a storage means for storing the sequential relative times in a cycle of machine operation when each of the plurality of components is to be actuated,
- means coupled to said storage means for selectively varying the actuating times of selected components stored in said storage means while said machine is operating to thereby change the relative times in each machine cycle when said selected machine components are to be actuated,
- means for cyclically reading out the contents of said storage means,
- comparator means responsive to said timing means and said readout means for comparing the digital signal corresponding to the time elapsed in each cycle with the relative component actuating times stored in said storage means, said comparator providing an actuating signal when a favorable comparison results, and
- addressing means receiving said actuating signal from said comparator means for providing a component operating command to the component whose component actuating time compared with the cycle time elapsed.

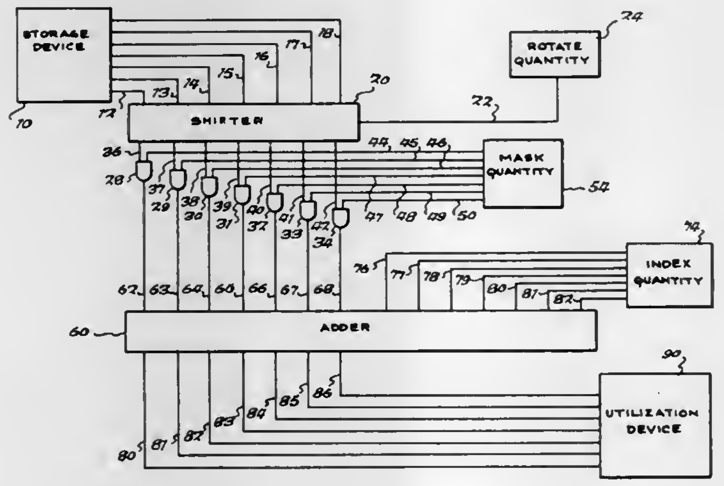
3,969,704
WORD TRANSFORMATION APPARATUS FOR DIGITAL INFORMATION PROCESSING

John T. Liebel, Jr., Williamsville, N.Y., assignor to Nanodata Corporation, Williamsville, N.Y.

Filed July 19, 1974, Ser. No. 490,113

Int. Cl.^{2} G06F *7/00*

U.S. Cl. 340—172.5 **10 Claims**



1. In a digital information processing system wherein coded information words are transmitted from a first location in the system through a path to a second location for utilization by said system, word transformation apparatus comprising:

- a. word position changing means having an input connected to said path to receive words from said first location and operative to change the relative positions of portions of a word received thereby in a predetermined manner so that a portion of the word which is of current interest is placed in a predetermined location in the word;
- b. selective gating means having an input connected to the output of said position changing means and an output connected to said path and operative to gate only said portion of said word placed in said predetermined location to said path for transmission to said second location; and
- c. means operatively connected to the output of said selective gating means for adding a quantity to the word portion before it is transmitted to said second system location.

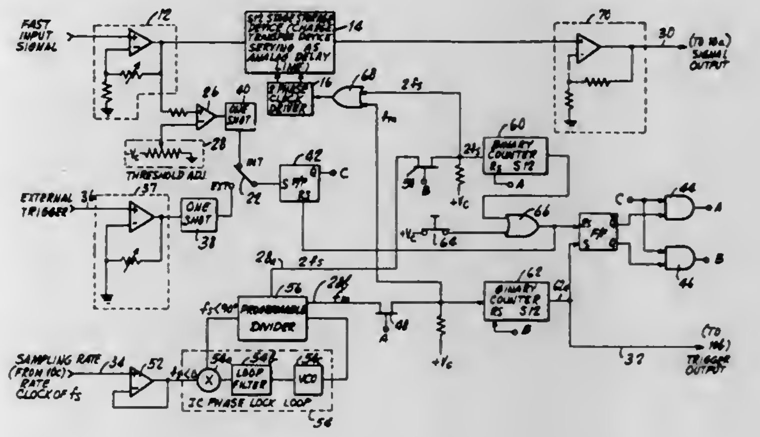
3,969,705
SPECTRUM ANALYZER HAVING MEANS FOR TRANSIENT SIGNAL ANALYSIS

William N. Waggener, Sarasota, Fla., assignor to Weston Instruments, Inc., Newark, N.J.

Filed June 10, 1974, Ser. No. 477,825

Int. Cl.^{2} G11C *21/00*

U.S. Cl. 340—173 RC **11 Claims**



1. A spectrum analyzer having a selected first sampling rate and comprising:

- means for receiving a fast analog signal whose duration of interest is short as compared with said first sampling rate of the spectrum analyzer;
- means for providing a second sampling rate which is substantially higher than said first sampling rate;
- means for sampling the fast analog signal at said second sampling rate to provide a succession of fast analog samples of said fast analog signal at said second sampling rate;
- analog signal storage means for storing in succession the fast analog samples provided by the sampling means, said storage means including an input for analog samples to be stored therein and an output for analog samples to be read therefrom and having means for shifting all fast analog samples stored therein toward the output for the storing of a new fast analog sample applied to the input;
- means for reading the fast analog samples from the storage means at a reading sampling rate which is the same as and synchronous with the first sampling rate to provide a succession of slow analog samples, said reading means including means for shifting all fast analog samples stored in the storage means toward the output for the reading out of a fast analog sample;
- means for analyzing analog samples occurring at said first sampling rate to derive signals indicative of the frequency content or power spectrum of the corresponding analog signal; and
- means for applying the slow analog samples read out of the storing means to said analyzing means at said first sampling rate.

3,969,706
DYNAMIC RANDOM ACCESS MEMORY MISFET INTEGRATED CIRCUIT

Robert James Proebsting, and Robert Sherman Green, both of Richardson, Tex., assignors to Mostek Corporation, Carrollton, Tex.

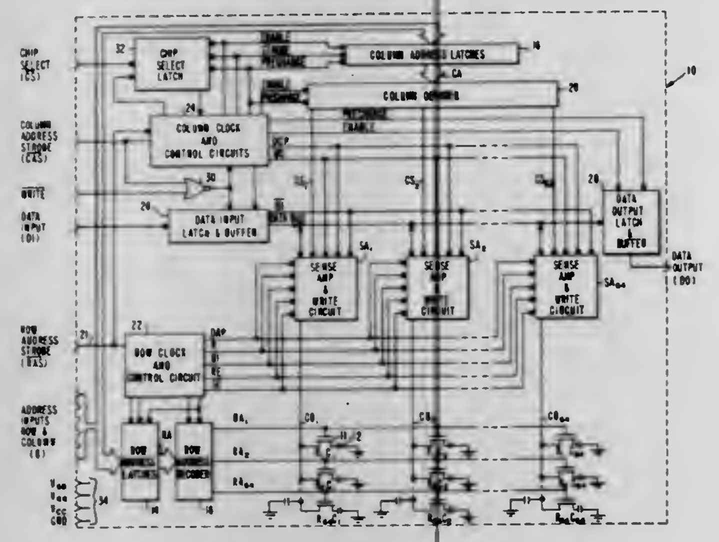
Filed Oct. 8, 1974, Ser. No. 513,091

Int. Cl.^{2} G11C *7/00, 7/06, 9/00*

U.S. Cl. 340—173 R **30 Claims**

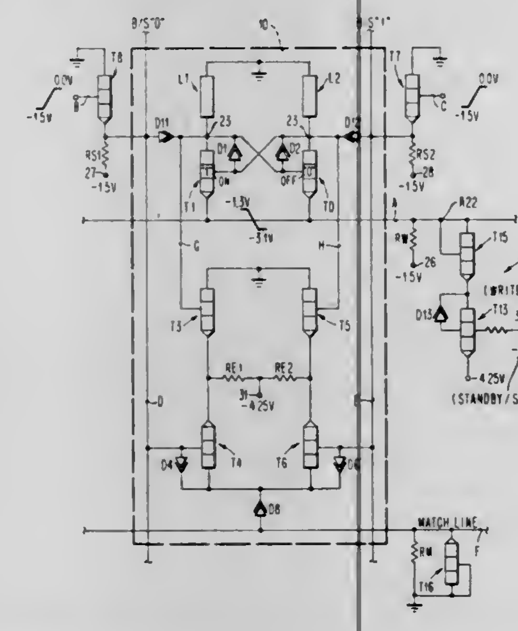
5. The method of addressing a desired memory cell of a memory formed on a monolithic semiconductor chip having a matrix of storage cells arrayed in rows and columns which comprises sequentially applying first and second sets of binary address signals to the same address inputs to the chip to identify the row and column of the desired memory cell.

6. In a random access memory formed on a monolithic semiconductor chip and having a series of precharge periods each followed by a data access period initiated by a strobe signal, the method for outputting data from the chip which comprises reading data from a selected memory cell during an access period and storing the data read from the cell in a data output latch during the remainder of the access period and at least a portion of the succeeding precharge period, and outputting the data from the data output latch to circuitry external of the chip during at least a portion of said succeeding precharge period.



3,969,707
CONTENT-ADDRESSABLE MEMORY CAPABLE OF A HIGH SPEED SEARCH

Ralph D. Lane, Wappingers Falls, and Richard A. Manning, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 27, 1975, Ser. No. 562,695
Int. Cl.² G11C *15/04, 11/40*
U.S. Cl. 340—173 AM **18 Claims**



1. A content-addressable memory comprising:

a bistable memory cell having flip-flop characteristics including first and second storage elements having input-/output terminals;

means for connecting first and second Search lines with said first and second input/output terminals, respectively;

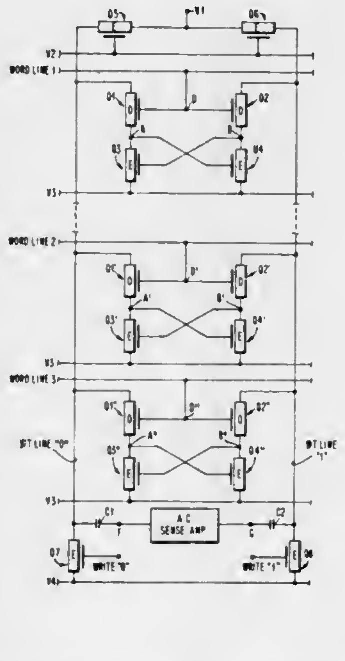
a Match line:

first and second current switch means associated with said first and second storage elements, respectively, each current switch including: first and second transistors, the emitters of which are connected in common, the base of said first transistor connected to said storage element input/output terminal, the base of said second transistor connected to said Search line, and the collector of said second transistor connected to said Match line;

whereby said Match line receives an indication of a match or mismatch when a search bit is compared with a data bit stored in said bistable cell.

3,969,708
STATIC FOUR DEVICE MEMORY CELL

George Sonoda, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1975, Ser. No. 592,148
Int. Cl.² G11C *7/00, 11/40*
U.S. Cl. 340—173 FF **7 Claims**



1. A semiconductor memory array having a plurality of field effect transistor memory cells, comprising:

first and second field effect transistors having two gated electrodes and a gating electrode, the first gated electrodes being connected together, the second gated electrode of the first field effect transistor being coupled to the gating electrode of the second field effect transistor, the second gated electrode of the second field effect transistor being coupled to the gating electrode of the first field effect transistor;

a third field effect transistor having two gated electrodes and a gating electrode, a first gated electrode being connected to the second gated electrode of said first field effect transistor, the second gated electrode of said third field effect transistor being connected to a first bit line, the gating electrode of said third field effect transistor being connected to a word line;

a fourth field effect transistor having two gated electrodes and a gating electrode, a first gated electrode being connected to the second gated electrode of said second field effect transistor, the second gated electrode of said fourth field effect transistor being connected to a second bit line, the gating electrode of said fourth field effect transistor being connected to said word line;

said first and second field effect transistors being enhancement mode field effect transistors; and

said third and fourth field effect transistors being depletion mode field effect transistors.

3,969,709
WIRELESS BURGLAR ALARM SYSTEM

Roger Isaacs, 953 E. 9th St., and Albert Stern, 929 E. 18th St., both of Brooklyn, N.Y. 11230
Filed June 26, 1969, Ser. No. 836,848
Int. Cl.² G08B *5/22*
U.S. Cl. 340—224 **49 Claims**

1. A wireless burglar alarm system comprising

a wireless transmitter, and

a receiver,

a first output circuit connected to said receiver and responsive to a first predetermined frequency,

a second output circuit connected to said receiver and responsive to a second predetermined frequency,

warning means connected to said second output circuit as a load thereof,

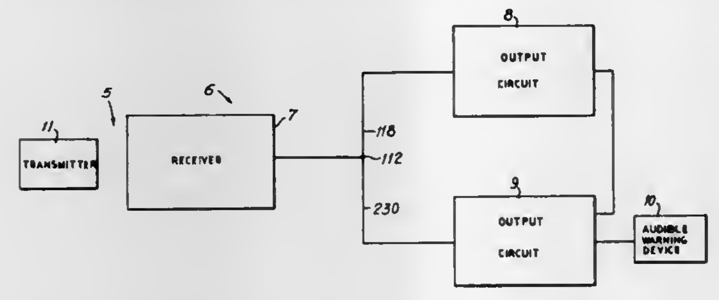
said first output circuit being connected to said second output circuit,

said transmitter being selectively operable to transmit signals having one of said first and second predetermined frequencies,

said receiver being operable upon the reception of an input signal from said transmitter to produce an output signal having one of said first and second predetermined frequencies,

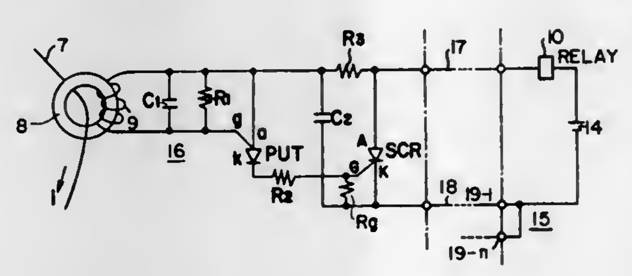
said second output circuit being selectively operable upon the application of said output signal from said receiver at said second predetermined frequency to activate said warning means, and

said first output circuit being operable upon the application of said output signal from said receiver at said first predetermined frequency to inhibit the operation of said second output circuit and said warning means.



3,969,710
APPARATUS FOR PICKING UP SIGNAL CURRENTS FLOWING THROUGH SIGNAL LINES

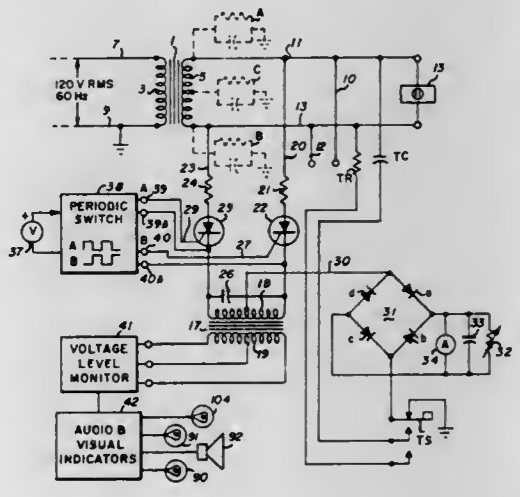
Takeo Arima, Tokyo, Japan, assignor to Hochiki Corporation, Japan
Filed May 22, 1974, Ser. No. 472,451
Claims priority, application Japan, May 25, 1973, 48-60735[U]; May 23, 1973, 48-60980[U]
Int. Cl.² G08B *21/00*
U.S. Cl. 340—253 R **4 Claims**



1. An apparatus for discriminating an operated sensor and attached to an alarm system in which a plurality of sensors are connected in parallel between signal lines led from a receiving panel of said alarm system for short-circuiting said signal lines so that a signal current passes through said signal lines when said sensor has detected an abnormal condition, said apparatus comprising an annular magnetic core wound with a pickup coil linked with one of said signal lines for picking up said signal current flowing through said signal lines, thyristor means connected to be turned ON by the voltage induced in said pickup coil, a programmable unijunction transistor connected to said pickup coil and said thyristor for increasing the load impedance of said pickup coil thereby positively turning ON said thyristor, the output of said pickup coil being connected to the gate input of said programmable unijunction transistor, the output of said programmable unijunction transistor being connected to the gate input of said thyristor means, a capacitor connected to be charged from a source of direct current, a discharge circuit connected to said capacitor for discharging said capacitor, said discharge circuit comprising the anode-cathode circuit path of said transistor and the gate-cathode circuit path of said thyristor connected to said anode-cathode circuit path, and to discharge through a discharge circuit including the anode-cathode circuit of said transistor and the gate-cathode circuit of said thyristor, said signal lines having signal and return conductors connected to said sensor, said conductors forming a loop, one of said conductors being magnetically coupled with said magnetic core corresponding to each of the sensors whereby when said respective sensor is operated, the currents flowing through the signal and return conductors being unequal and thereby inducing a voltage across said pickup coil.

3,969,711
LINE ISOLATION MONITOR AND ALARM

Herbert Ahntholz, Berwyn, Ill., assignor to Litton Systems, Inc., Bellwood, Ill.
Filed Apr. 25, 1975, Ser. No. 571,773
Int. Cl.² G08B *21/00*
U.S. Cl. 340—255 **13 Claims**



1. A line isolation monitor for monitoring the leakage condition of an isolated electrical system having leads carrying AC voltages of a frequency of F hertz comprising:

a core of magnetic material;

a first winding on said core;

a first end and a second end and a center tap on said winding;

first circuit means connected to one end of said winding and adapted for connection to one of said power lines, comprising resistance means and series connected semiconductor controlled rectifier means;

second circuit means connected between the other end of said winding and adapted for connection to a second of said power lines, said second circuit means including resistance means and series connected semiconductor controlled rectifier means;

periodic switch means coupled to each of said semiconductor controlled rectifier means for alternately and cyclically triggering said semiconductor controlled rectifier means into the current conducting condition;

said switch means having a periodic rate of less than said line frequency;

means connected between said center tap and electrical ground potential for providing a resistive path therebetween to ground and measuring means associated with said last named means for indicating the current level through said path.

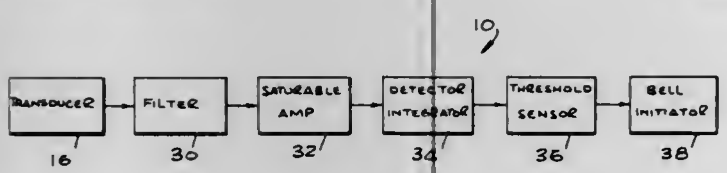
12. Condition responsive alarm means comprising:

first means for generating a DC voltage of a first polarity and of a level dependent upon the condition being monitored;

reference voltage source means for providing a predetermined DC voltage of a second polarity, said voltage source means including a potentiometer having a movable tap, diode means, and resistor means;
an output juncture; means electrically connecting said diode means and said resistor means in series circuit between said tap and said output juncture;
thermistor means, said thermistor means being connected in series circuit with said first voltage generating means and said output terminal, whereby said reference voltage and said condition dependent voltage are connected in subtractive relationship to provide a voltage at said output terminal equal to the difference therebetween;
first and second AC voltage sources for providing first and second AC voltages, the level of said second AC voltage source being greater than the level of said first AC source and approximately 180° out of phase therewith;
rectifier means adapted to conduct current only during alternate half cycles of AC and first resistor means connected electrically in series with said rectifier means across said first AC source;
semiconductor controlled rectifier means having an input and adapted to conduct current only during alternate half cycles of AC when said input has a predetermined voltage applied thereto; second resistor means; said second resistor means connected in series with said controlled rectifier means across said second source;
each of said diode and semiconductor controlled rectifier means being poled in circuit to conduct current only during the same AC half cycles and means for combining the voltages as appear across said first and second resistors in a voltage subtractive relationship;
means coupling said output juncture to said controlled rectifier input; and
means responsive to said combined voltage across said first and second resistors for providing a first indication when said voltage is of a first polarity and a second indication when said voltage is of the opposite polarity.

3,969,712
POOL ALARM

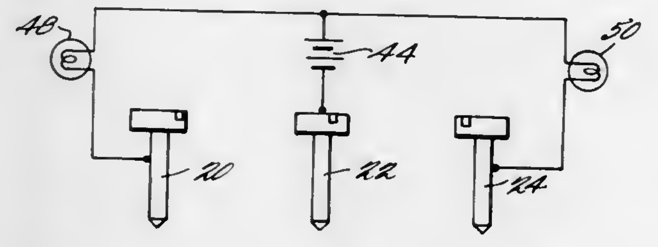
Jerry Butman, Palos Verdes Peninsula, and Thomas L. Grettenberg, Marina Del Rey, both of Calif., assignors to Applied Systems Laboratories, Palos Verdes Peninsula, Calif.
Filed May 25, 1973, Ser. No. 364,098
Int. Cl.^{2} G08B *13/16*
U.S. Cl. 340—261 **2 Claims**



1. Pool alarm apparatus comprising:
transducer and filter means including a transducer, said means being responsive to noise in water for generating electrical signals representing primarily predetermined frequency components of the noise;
integrator means coupled to said transducer and filter means for generating a signal which increases in amplitude when signals are received from the filter means over an extended period of time;
threshold responsive means coupled to said integrator means for initiating an alarm when the integrator output reaches a predetermined level;
a watertight housing containing said integrator means and threshold responsive means, said housing being buoyant in water and floating in a predetermined orientation, and said housing having a downwardly facing aperture containing said transducer; and
a tilt sensitive switch on said housing, which prevents alarm initiation unless the housing is substantially level.

3,969,713
BOLT STRESS DETECTOR

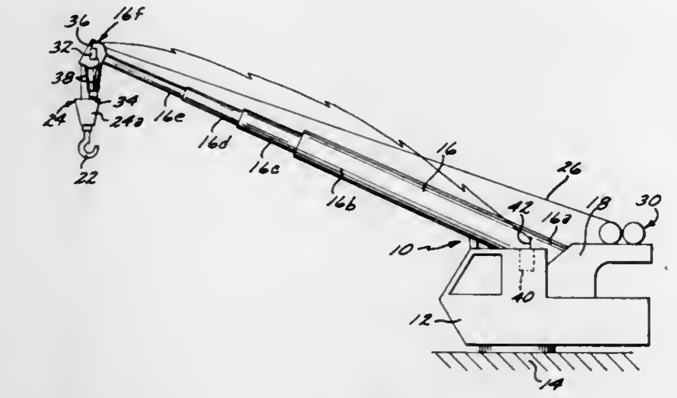
Robert Bossler, Jr., Bloomfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.
Filed Apr. 2, 1974, Ser. No. 457,346
Int. Cl.^{2} G01B *7/28*
U.S. Cl. 340—265 **4 Claims**



1. Apparatus for detecting the relative location of two electrically conductive bodies comprising:
a housing member,
first, second and third electrical contacts mounted on said housing member to extend outward therefrom and separated so that said first and third contacts are in electrical connection with said first body when said second contact is in electrical connection with said second body, each said contact comprising a screw movable inward and outward,
first and second indicator means for providing an indication when an electrical signal is applied, and
means for connecting said first, second and third contacts to a source of electrical energy so that said first indicator means provides said indication when said first contact is electrically connected to said second contact and said second indicator means provides said indication when said third contact is electrically connected to said second contact.

3,969,714
SAFETY SYSTEM FOR CRANES

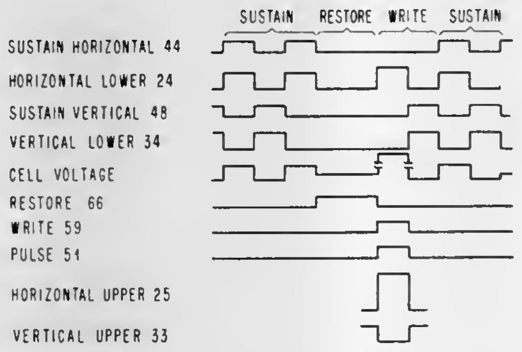
Gerald L. Greer, 1300 Westcliff Drive, Newport Beach, Calif. 92660
Filed Jan. 6, 1975, Ser. No. 538,554
Int. Cl.^{2} G08B *21/00*
U.S. Cl. 340—267 C **3 Claims**



1. A safety system for cranes having a boom, a load-carrying device thereon movable with respect to said boom to raise and lower a load as desired and an operator's cab, comprising in combination,
a radio signal transmitter mounted at one end of said boom and having its own portable source of electric power thereat,
an on-off control switch connected in circuit with said transmitter and said source of power having at least one pair of cooperating electrical contacts and biasing means associated therewith biasing said contacts to open circuit relation to effect energization of said transmitter by said source when moved to closed circuit relation against said biasing means, said switch being suspended a predetermined distance below said one end of said boom to be operated by upward movement of said load-carrying means before it contacts said one end of said boom,
and warning means including a radio signal receiver connected in circuit with the electrical energy source in the operator's cab of said crane normally used to power said crane and a warning device in said cab and in circuit with said receiver to be energized when, but only when, said receiver is receiving a signal from said transmitter.

3,969,715
GAS PANEL WITH IMPROVED WRITE CIRCUIT AND OPERATION

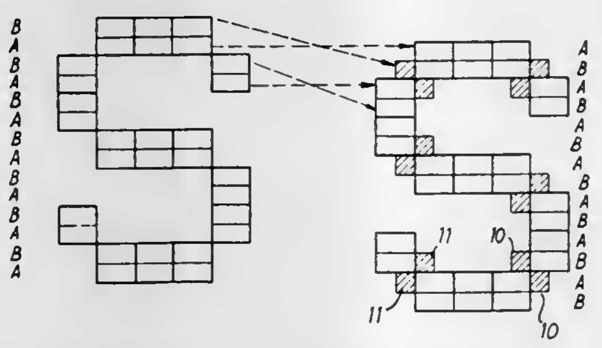
William R. Lamoureux, Kingston, N.Y., assignor to IBM Corporation, Armonk, N.Y.
Filed June 1, 1973, Ser. No. 365,922
Int. Cl.^{2} H01J *17/48*
U.S. Cl. 340—324 M **6 Claims**



1. A gas panel of the type having light emitting cells formed at crossover points of two sets of conductors, comprising,
means to apply between the conductors of said two sets a sustain waveform having positive and negative rectangular pulses,
means to apply between the conductors of a selected cell a waveform of a predetermined polarity and of an amplitude and width to produce a write operation, and
means for timing the occurrence of said write waveform with respect to said sustain waveform to produce a transition that is substantially continuous from said write waveform to a sustain voltage level in the opposite polarity over an interval that is short enough to prevent the cell from being erased as a result of the ionization associated with the transition.

3,969,716
GENERATION OF DOT MATRIX CHARACTERS ON A TELEVISION DISPLAY

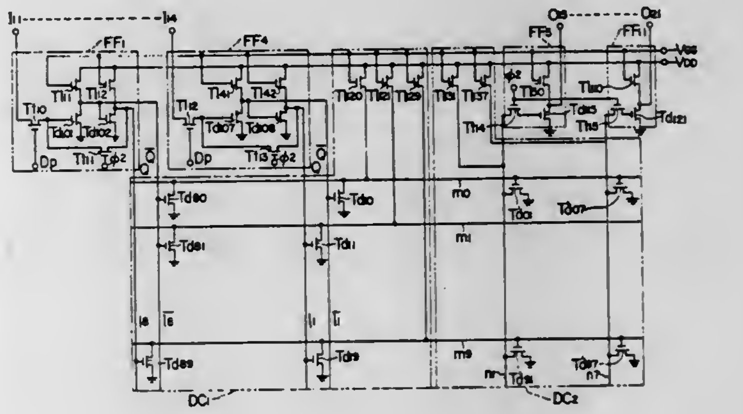
Alan Roberts, Sutton, England, assignor to British Broadcasting Corporation, London, England
Filed July 10, 1974, Ser. No. 487,124
Int. Cl.^{2} G06F *3/14*
U.S. Cl. 340—324 AD **3 Claims**



1. Interpolation apparatus responsive to a line-interlaced video signal having first fields alternating with second fields and representing a dot matrix character in a matrix of cells, each composed of segments of two lines adjacent each other in the interlaced picture, said apparatus comprising delay means operative to establish four signals, of which three are delayed by one dot period, by one line period, and by one line period plus one dot period respectively relative to the fourth signal, a logic circuit responsive to predetermined logical combinations of said four signals to detect diagonal portions of the character, and means controlled by the logic circuit to add half-dot period pulses in lines of the first fields and in lines of the second fields delayed by a line period, so as to fill in cornerwise opposed quarters of the cells to either side of a diagonal portion in the display of the character represented by the first fields and the line delayed second fields.

3,969,717
DIGITAL CIRCUIT TO ELIMINATE DISPLAY FLICKER

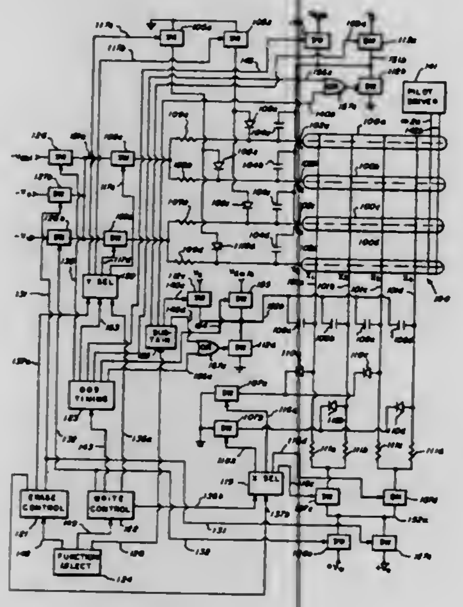
Yoshikazu Hatsukano, Kodaira; Kosei Nomiya, Tokyo, and Hiroto Kawagoe, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan
Division of Ser. No. 332,522, Feb. 14, 1973, Pat. No. 3,870,897. This application Nov. 20, 1974, Ser. No. 525,674
Claims priority, application Japan, Feb. 14, 1972, 47-14805
Int. Cl.^{2} G06F *3/14*
U.S. Cl. 340—324 M **4 Claims**



1. A circuit comprising:
a plurality of input terminals to which respective information signals are applied;
a logical circuit, coupled to receive said information signals and to effect a prescribed logical operation thereon;
an output circuit, coupled to said logical circuit, for providing an indication of the operation of said logical circuit on said information signals, including a display device for luminously displaying the result of the operation of said logical circuit on said information signals;
a plurality of first delay means, respectively connected between said plurality of input terminals and said logical circuit, for controlling the application of said information signals to said logical circuit in accordance with a first pulse signal;
a multiplicity of second delay means, respectively connected between said logical circuit and said output circuit, for receiving the result of the operation of said logical circuit and applying said result to said output circuit in accordance with a second pulse signal having a phase difference relative to said first pulse signal; and
an input shift register for supplying information signals at the outputs of respective stages thereof and for shifting the contents thereof in synchronism with said first and second pulse signals.

3,969,718
PLASMA PANEL PRE-WRITE CONDITIONING APPARATUS

Richard A. Strom, Eagan, Minn., assignor to Control Data Corporation, Minneapolis, Minn.
Filed Dec. 18, 1974, Ser. No. 534,037
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **13 Claims**



1. In a gas discharge display matrix of the type having at least one chamber containing ionizable gas and formed of a dielectric having at least one first electrode extending along a first side of the chamber and spaced apart from any other first electrodes and a plurality of spaced apart second electrodes on a second side of the chamber, said electrodes located so as to interpose an ionizable gas volume and a portion of the dielectric between each first electrode and each second electrode for which

- i. a write pulse between a first and a second electrode of voltage at least equal to a minimum firing value causes firing of the gas volume between these electrodes and creation of substantial wall charge adjacent thereto, if no adjacent wall charge is present,
- ii. a sustain pulse between a first and a second electrode of voltage in a range between preselected minimum and maximum sustain values causes firing of the gas volume between these electrodes and creation of a substantial wall charge adjacent thereto if substantial wall charge of polarity discharged by the sustain pulse is present, and insures not firing otherwise, and
- iii. an erase pulse between a first and a second electrode of voltage between preselected maximum and minimum erase voltages and of polarity discharging wall charge adjacent the gas volumes between these electrodes created by a previous sustain pulse, insures removal of substantially all of said wall charge, and

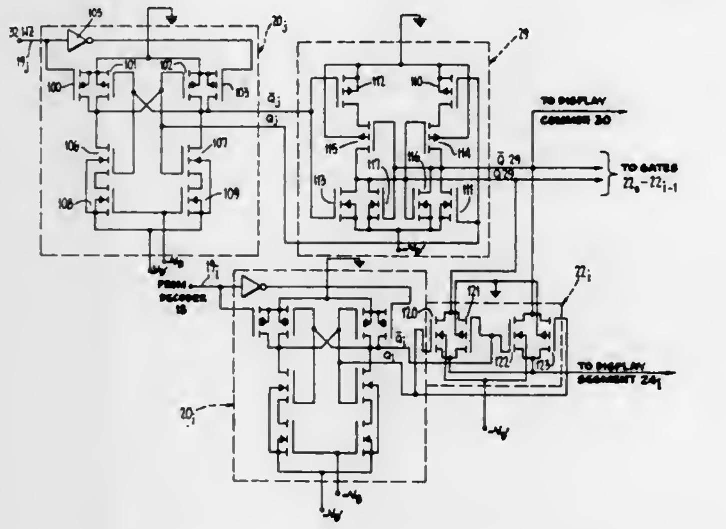
means for applying to the electrodes said write, sustain and erase pulses in the manner indicated;

improved apparatus for making free electrons available to selected gas volumes for increasing reliability in firing by a write pulse, and comprising:

- a. timing means for receiving a write select signal specifying at least one first electrode and for issuing responsive thereto at least one timing signal occuring prior to the associated write pulses, and following a selected sustain pulse having preselected first polarity; and
- b. means receiving each timing signal and write select signal for applying between the selected first electrode and the plurality of second electrodes first and second dual-on-state biasing pulses, and a dual-on-state firing pulse all superimposed on each other where overlapped;
  - i. each of said first biasing pulses starting responsive to the first timing signal and having a predetermined duration, reaching a predetermined magnitude appreciably different from zero and no greater than the maximum sustain voltage and having the same polarity, measured with respect to the electrodes involved, as was created by the selected sustain pulse;
  - ii. each of said second biasing pulses having polarity opposite that of the first biasing pulse, starting after the first biasing pulse and having a predetermined duration, and a predetermined magnitude substantially different from zero and no greater than the minimum sustain voltage; and
  - iii. each of said firing pulses having polarity opposite that of the first biasing pulse, having magnitude less than the minimum write voltage and sufficient to cause conduction, when superimposed on the first biasing pulse, by each gas volume between the plurality of second electrodes and the selected first electrode which did not conduct during the most recent sustain pulse, but insufficient to cause conduction by the gas volumes adjacent the selected first electrode which did conduct at that time, and starting and finishing during the first and second biasing pulses respectively.

3,969,719
ELECTRONIC WATCH

Richard L. Sirocka, and David F. Broxterman, both of Sunnyvale, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Division of Ser. No. 320,223, Jan. 2, 1973, Pat. No. 3,815,354. This application May 9, 1974, Ser. No. 468,344
Int. Cl.² H03K *17/60, 1/12*
U.S. Cl. 340—336 **9 Claims**

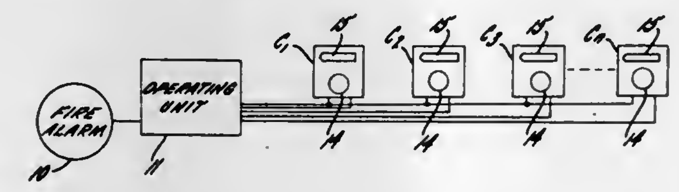


1. In an electronic time keeping system including a liquid crystal display having at least one pair of energizing electrodes for receiving a pair of relatively high voltages of the same frequency which are in phase or out of phase, a system for controlling the relative phase of said pair of relatively high voltage signals in response to a relatively low voltage control signal from a source, said system comprising:

- a source for providing a pair of periodic relatively high voltage signals of opposite phase;
- a level converter adapted to be coupled to said source of low voltage control signal for converting said low voltage control signal to a high voltage control signal;
- a transfer gate having a pair of transfer inputs each coupled to a different one of said pair of periodic relatively high voltage signals and a control portion coupled to said level converter for transmitting a first one of said pair of periodic relatively high voltage signals to the output of said transfer gate in the absence of said control signal and for transmitting the other one of said pair of periodic relatively high voltage signals to said output when said control signal is present; and
- means for applying one of said pair of relatively high voltage signals to one electrode of said display and for applying said output to the other of said electrodes of said display.

3,969,720
EMERGENCY ALARM AND EVACUATION SYSTEM

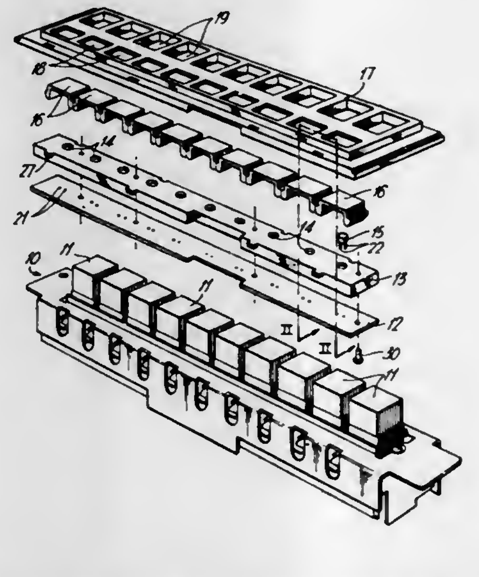
Shiro Nishino, No. 462, Nakakosaka, Higashiosaka, Osaka, Japan
Filed July 18, 1975, Ser. No. 597,208
Claims priority, application Japan, July 26, 1974, 49-86322
Int. Cl.² G08B *7/00*
U.S. Cl. 340—371 **9 Claims**



1. An emergency alarm and evacuation system for indicating the direction and location of an emergency exit comprising an alarm which when activated produces an electrical output signal, a plurality of indicator units arranged in a line toward said emergency exit, said indicator units each including electrically operated means for generating an audible and visual indication upon being energized, and an operating unit coupled to said alarm and being operable in response to an output signal from said alarm to successively energize said indicator units to produce a simultaneous visual and audible indication at each unit which if followed lead to said exit.

3,969,721
LIGHT EMITTING DIODE INDICATOR ASSEMBLY FOR A MULTIPLE PUSHBUTTON ARRAY

Donald Thornton Chadwick, Ottawa, and Gerd Kuhfus, London, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada
Filed Nov. 10, 1975, Ser. No. 630,159
Int. Cl.² G09F *3/14*; **H01H** *3/12*
U.S. Cl. 340—381 **5 Claims**

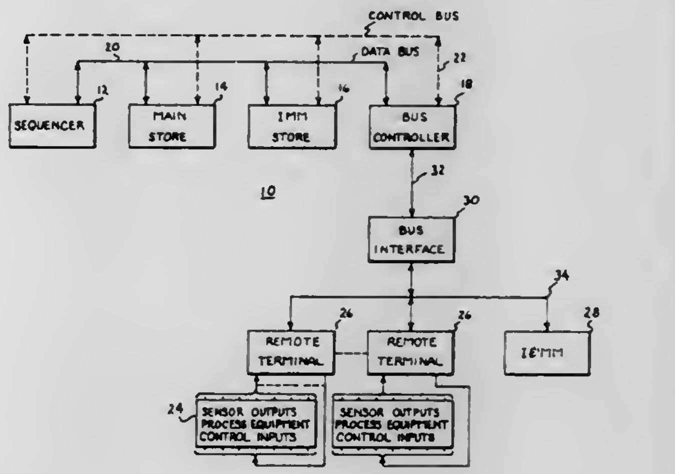


1. A light emitting diode indicator assembly for a multiple pushbutton array comprising:

- an elongate printed circuit board having a plurality of circuits thereon and a plurality of connection positions to said circuits spaced along said board;
- an elongate electrically insulating spacer attached to one surface of said printed circuit board, said spacer including a plurality of locations for a plurality of light emitting diodes, a diode at each location, said location each associated with a related connection position on said printed circuit board;
- a light emitting diode inserted at each of said locations, each diode including leads passing through said spacer and electrically connected to the related circuit at the related connection position;
- a plurality of lenses positioned over said light emitting diodes, a lens over each diode;
- a bezel having a plurality of first apertures extending in a line and a lens positioned in each of said first apertures, and a plurality of second apertures extending in a line alongside said first apertures, each second aperture in lateral alignment with a related first aperture, said second apertures for reception of a pushbutton key in each of said second apertures;
- said bezel including a longitudinally extending wall and a longitudinally extending web, said wall and web spaced apart to define a recess beneath said first apertures for the reception of said spacer;
- interengaging formations on said wall and web of said bezel and on side edges of said spacer, said formations arranges such that when the spacer is inserted in said recess and moved longitudinally, the formations interengage to retain said spacer in said recess.

3,969,722
METHOD AND APPARATUS FOR OPERATOR INTERROGATION OF SIMULATED CONTROL CIRCUITS

William J. Danco, and Arthur P. Given, both of Roanoke, Va., assignors to General Electric Company, Salem, Va.
Filed July 3, 1974, Ser. No. 485,765
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **19 Claims**

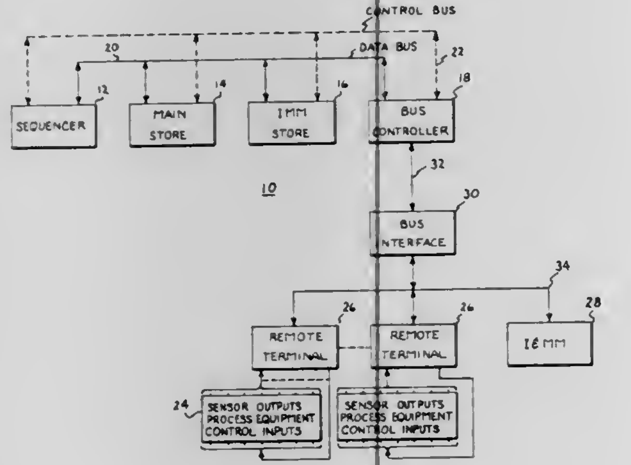


1. An operator console for communicating with a computer, said computer including a memory having an executive program stored therein for directing communication between said computer and said console and for simulating an equipment control circuit having a format comprised of a plurality of logic strings each including logic elements, at least one of which is a switch element having a logical condition and another of which is a continuity status means having a conducting condition controlled by the conditions of the switch elements of its associated logic string, said continuity status means serving to effect output control signals from said controller to equipment external thereto, said operator console comprising:

- a. means to specify a logic string and a logic element in said string;
- b. means to communicate to said computer the specified string and element whereby said computer can retrieve data relative thereto from said memory for communication to said console;
- c. display means responsive to said data for displaying indicia identifying the specified logic element and its condition; and

- d. means for communicating indexing signals to said computer to direct said computer to retrieve data relative to additional logic elements in the specified logic string from said memory for communication to said console for display by said display means.

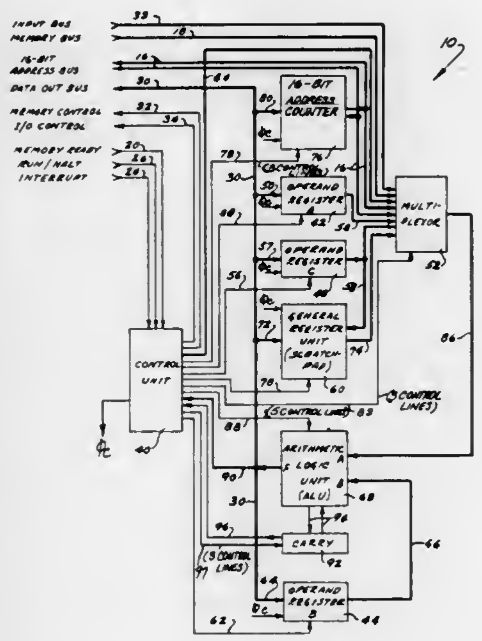
3,969,723
ON-LINE MODIFICATION OF COMPUTER PROGRAMS
Philip R. Kennicott, Scotia, N.Y., assignor to General Electric Company, Salem, Va.
Filed July 3, 1974, Ser. No. 485,766
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **15 Claims**



1. In a controlled equipment system of the type operable in response to signals resulting from logical operations based upon operating parameters of the controlled equipment, a control system comprising:

- a. a programmable controller including a store having stored therein an executive program serving to,
  - 1. direct on-line communication between said controller and equipment external thereto, and
  - 2. simulate an equipment control circuit having a format comprised of a plurality of logic strings, each logic string comprised of a conductor including at least one switch element disposed in a designated position and a continuity status means controlled by the condition of the switch elements of its associated logic string, said continuity status means serving to effect output signals from said controller to the equipment external thereto; and,
- b. a programming console in communication with said controller comprising:
  - 1. means for specifying to said controller a one of the simulated logic strings to be modified,
  - 2. means for directing said controller to copy the simulated specified logic string into a predetermined region in said store while retaining the specified logic string in the executive program,
  - 3. means for specifying to said controller a position in the conductor of the logic string copied,
  - 4. means for modifying the copied logic string by specifying to said controller a type of switch element,
  - 5. means for directing said controller to test the modified logic string on-line as a part of the executive program in place of the retained specified logic string, and
  - 6. means for directing said controller to replace the retained specified logic string with the modified logic string while maintaining the modified logic string online whereby the modified logic string becomes an integral part of the executive program to control the external equipment in accordance with the logic now defined by the modified logic string.

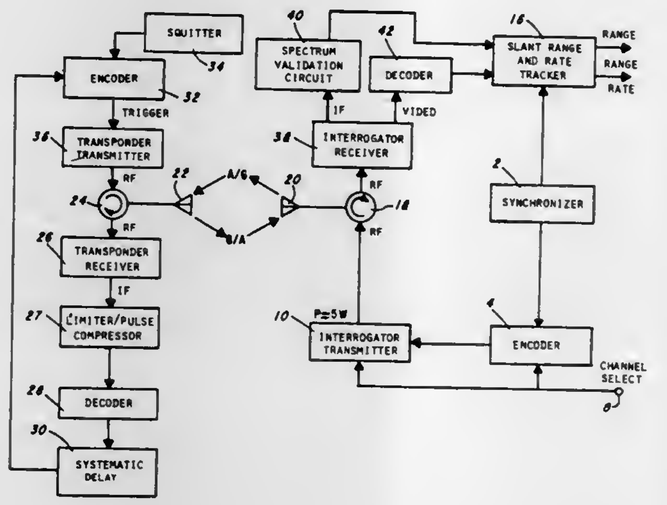
3,969,724
CENTRAL PROCESSING UNIT FOR USE IN A MICROPROCESSOR
Terry M. Anderson, Minnetonka, and Reinhard Schumann, St. Paul, both of Minn., assignors to The Warner & Swasey Company, Cleveland, Ohio
Filed Apr. 4, 1975, Ser. No. 565,239
Int. Cl.² G06F *9/14*, *9/18*
U.S. Cl. 340—172.5 **4 Claims**



1. In a microprocessor having a central processing unit, memories external to the central processing unit and operatively connected thereto, and input/output devices operatively connected to the central processing unit, said microprocessor operating in response to input macro instructions stored in one of the external memories, said central processing unit comprising:

- a. a first data bus to carry data through the central processing unit and to cary data to the external memories and input/output devices;
- b. an arithmetic logic unit which performs operations on the data, said unit having two inputs for receiving operand data, and said unit supplying resulting data to the first data bus;
- c. a carry register associated with the arithmetic logic unit;
- d. a multiplexor having a plurality of inputs and having an output connected to one of the inputs of the arithmetic logic unit, said multiplexor passing selected data from the plurality of inputs to the output;
- e. two operand registers connected to receive input data from the first data bus and each having an output connected to one of the inputs of the multiplexor;
- f. a scratchpad register connected to receive input data from the first data bus and connected to receive an address from the output of one of the two operand registers, and having an output connected to one of the inputs of the multiplexor;
- g. an address counter connected to receive input address data from the first data bus and having an output connected to at least one of the inputs of the multiplexor, and to the external memories and input/output devices;
- h. a second data bussing means for carrying data from the external memories and input/output devices to one of the inputs of the multiplexor;
- i. a third operand register connected to receive input data from the first data bus and having an output connected to the other input of the arithmetic logic unit; and
- j. a control unit including:
  - 1. a read only memory having a plurality of addressable word locations each storing an instruction of a present micro control program, and having a plurality of outputs for supplying data to one of the inputs of the multiplexor and for supplying control signals in dependence upon the micro instruction to each counter, register and unit in the central processing unit over a plurality of control lines;
  - 2. a source of clock pulses;
  - 3. means for addressing one of the word locations so as to output control signals therefrom,
    - said addressing means having a first operating mode for incrementally addressing the word locations in a predetermined sequence and a second actuatable operating mode for addressing a specific one of the word locations,
    - said addressing means including means for incrementing a multiple-bit binary address stored in the addressing means in response to each clock pulse while the addressing means is in the first mode, and
    - said addressing means including means for loading the specific address outputted from the arithmetic logic unit in response to each clock pulse while the addressing means is in the second mode,
    - whereby one instruction of the micro control program is executed for each clock pulse; and
  - 4. mode control means for actuating the addressing means from the first mode to the second mode in dependence upon the micro instruction represented by certain control signals supplied from the memory outputs, said mode control means including means for receiving a plurality of input status signals from the external memories and other units external to the central processing unit and from the carry register, each status signal having a first or second signal level and passing a selected one of the status signals in dependence upon the certain control signals, and means responsive to the selected status signals actuating the addressing means to its second mode when the selected status signal exhibits the second signal level.

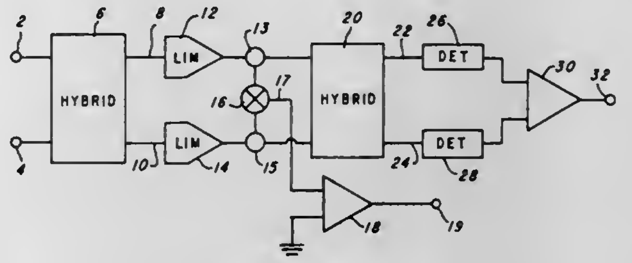
3,969,725
DISTANCE MEASURING EQUIPMENT
James Benedict Couvillon, Dallas; William Dorsey Daniels, Richardson; Ronald Lee Gassner, Richardson, and Robert Allen Maher, Richardson, all of Tex., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.
Filed June 12, 1974, Ser. No. 478,651
Int. Cl.² G01S *9/56*
U.S. Cl. 343—6.5 R **5 Claims**



1. Distance measuring equipment for measuring the distance from an airborne interrogator to a ground based transponder comprising;

- an interrogator encoder for providing a linear frequency modulated pulse modulated signal with selectable slope sign;
- interrogator transmitter means for mixing a preselected radio frequency signal with the interrogator encoder pulse and transmitting the resulting radio frequency pulse;
- transponder receiver means for receiving interrogator transmissions and providing an intermediate frequency output in response thereto;
- a matched pulse compression filter coupled to the transponder receiver for providing time compression and signal to noise gain for intermediate frequency signals having a preselected center frequency and linear frequency modulated frequency modulation with separate detection for both modulation slope signs;
- transponder decoder means coupled to the pulse compression filter for detecting the arrival of the leading edge of a received pulse and providing an output pulse indicating said arrival;
- transponder transmitter means coupled to said transponder decoder means for transmitting a pulse of radio frequency signals at a preselected frequency in response to the decoder output;
- interrogator receiver means for receiving transponder transmissions and providing an intermediate frequency output in response thereto;
- interrogator decoder means coupled to the interrogator receiver for detecting the arrival of a transponder pulse having a preselected center frequency and providing an output indicating said arrival; and
- range calculating means coupled to the interrogator encoder and the interrogator decoder for measuring the time between an interrogator transmission and reception of a transponder transmission and providing an output proportional to the distance from the interrogator to the transponder.

3,969,726
TWO CHANNEL MONOPULSE RECEIVER
S. Vincent Birleson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 27, 1975, Ser. No. 553,394
Int. Cl.² G01S *9/22*
U.S. Cl. 343—16 M **12 Claims**



1. A monopulse receiver for processing signals received from a target by a monopulse antenna comprising:

- a first signal processing means coupled to the output of the monopulse antenna for receiving sum and difference signals from said antenna and for generating equal amplitude outputs having a phase difference proportional to the amplitude difference of said sum and difference signals,
- amplifier means coupled to the output of said first signal processing means for generating signals having a preselected amplitude and the same phase difference as said first signal processing means outputs,
- second signal processing means having an input coupled to the output of said amplifier means for generating outputs having the same amplitude ratio as said sum and difference signals, and
- subtractor means coupled to the output of said second signal processing means for providing an output proportional to the amplitude difference of said second signal processing means outputs.

3,969,727

POSITION DETECTING DEVICE FOR OMEGA RECEIVING SYSTEM

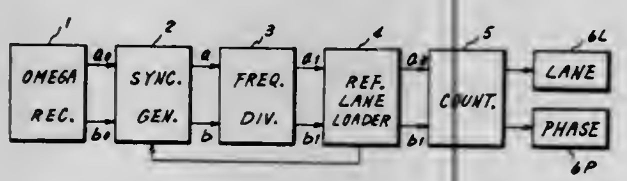
Hideki Tanaka, Takatsuki; Kazutaka Ishida, Suita; Minoru Handa, Ikoma, and Asao Kitabatake, Kakogawa, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Sept. 9, 1974, Ser. No. 504,133

Claims priority, application Japan, Oct. 29, 1973, 48-121498

Int. Cl.^{2} G01S *1/30*

U.S. Cl. 343—105 R **5 Claims**



1. A position detecting device for an omega receiving system, comprising means for receiving first and second omega signals from first and second omega transmitting stations and generating first and second synchronized signals of said first and second omega signals, means for frequency-dividing said first and second synchronized signals by a common divisor to produce first and second frequency-divided waves, means for dividing the phase difference between said first and second frequency-divided waves by the period of said omega signals and producing the resultant integral quotient as the lane number and the remainder as the phase difference between said first and second omega signals, and reference lane loading means for shifting in phase said first frequency-divided wave with respect to said second frequecy-divided wave until the phase difference therebetween becomes equal to said phase difference between said omega signals plus a specific length of time corresponding to the reference lane number.

3,969,728

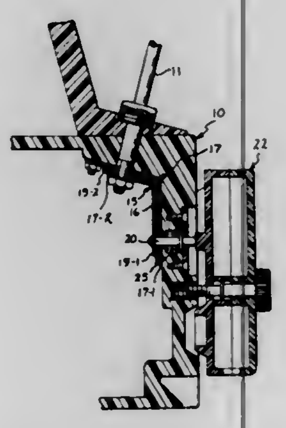
STRIPLINE ANTENNA SWITCH

Roy F. Hodsdon, and Jerry M. Barringer, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Sept. 24, 1975, Ser. No. 616,261

Int. Cl.^{2} H01Q *1/24*

U.S. Cl. 343—702 **3 Claims**



1. For use in a portable radio or the like housed in a cabinet having an antenna mounted thereon, an improved stripline switch for selectively connecting a circuit of said radio to said mounted antenna or to an external antenna, said switch comprising:

a. a wall adapted to be part of the radio housing, said wall having a first opening therethrough;

b. a first metallic plate having a first portion with a first opening therethrough and having a second portion with a second opening therethrough;

c. means mounting said first plate on an interior surface of said wall with said first opening of said first plate substantially coinciding with said first opening of said wall;

d. a pin terminal mounted on said interior surface of said wall and within said second opening of said first plate, said pin terminal being spaced from the edges of said second opening of said first plate and extending above said first plate in one direction and extending in the opposite direction through said wall to the outer surface thereof;

e. an electrical insulating plate having a first opening therethrough;

f. means mounting said electrical insulating plate on at least said first portion of said first plate with said first opening of said insulating plate substantially coinciding with said first opening of said first plate and with said first opening through said wall;

g. a second metallic plate;

h. means mounting said second metallic plate on said electrical insulating plate so that said second metallic plate is electrically insulated from said first metallic plate and is in movable contact with said pin terminal;

i. an insulated plunger connected to said second metallic plate and extending through said first opening of said insulating plate, said first opening of said first plate, and said first opening of said wall, said insulated plunger being mechanically urged from said second metallic plate toward said wall;

j. means for connecting said second metallic plate to an antenna mounted on said radio;

k. means for connecting said pin terminal to the circuit of said radio apparatus;

l. and an external plug adapted to be attached to said outer surface of said wall, said plug having at least one electrical contact positioned to engage said pin terminal and having an insulated boss adapted to engage said insulated plunger, whereby when said external plug is attached to said outer wall surface, electrical contact is made between said electrical contact of said plug and said pin terminal, and said second metallic plate is moved to break electrical contact between said pin terminal and said second metallic plate.

3,969,729

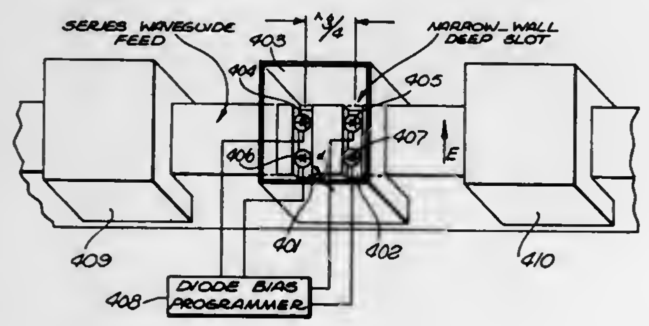
NETWORK-FED PHASED ARRAY ANTENNA SYSTEM WITH INTRINSIC RF PHASE SHIFT CAPABILITY

Jeffrey T. Nemit, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,705

Int. Cl.^{2} H01Q *3/26*

U.S. Cl. 343—756 **16 Claims**



1. An integral antenna element and RF phase shifter particularly for use as a controllable element in a phase scanned array fed from an RF transmission line of a type selected from a group including waveguide and stripline, said transmission line having longitudinal conductive outer walls through which RF energy may be coupled by means of slots, comprising:

means including a pair of slot patterns through one of said outer walls, the slots of said patterns being placed symmetrically about the longitudinal centerline of said one outer wall, each of said slot patterns thereby capable of providing coupling on both sides of said longitudinal centerline of said outer wall;

and means including at least four RF devices each of a type capable of providing a controlled RF admittance path for providing admittance ranging at least between discrete minimum and maximum values as a function of a corresponding control signal applied thereto, at least two of said RF devices being placed to control corresonding admittance paths within one of said slot patterns with one of said RF devices on each side of said longitudinal centerline of said outer wall.

3,969,730

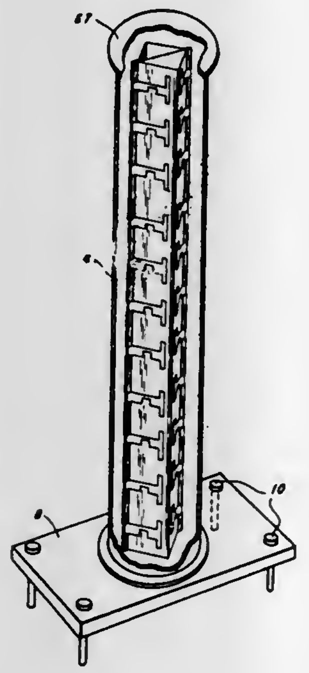
CROSS SLOT OMNIDIRECTIONAL ANTENNA

Troy D. Fuchser, Plano, Tex., assignor to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Feb. 12, 1975, Ser. No. 549,604

Int. Cl.^{2} H01Q *13/12*

U.S. Cl. 343—770 **7 Claims**



1. An antenna for radiating radio frequency energy at preselected frequency comprising:

a hollow member having thin conductive walls, said member being four way symmetric about a vertical axis and having a maximum horizontal dimension of less than one wavelength at said preselected frequency, said member having a plurality of horizontal slots having lengths less than two-thirds of a wavelength at said preselected frequency, said slots spaced vertically in two rows, each row centered on a point of maximum horizontal dimension, and said two rows spaced symmetrically about said vertical axis, forming vertically stacked pairs of cross slot radiating elements,

power divider means having an input for receiving RF energy at said preselected frequency and one output for each of said slot radiating elements and

means for coupling RF energy from said power divider means to said slots to be radiated,

whereby said RF energy is radiated in an omnidirectional pattern.

3,969,731

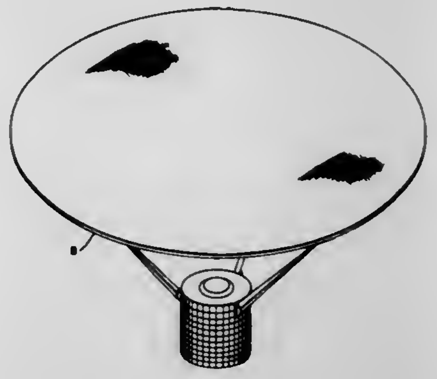
MESH ARTICLES PARTICULARLY FOR USE AS REFLECTORS OF RADIO WAVES

Robert K. Jenkins, Huntington Beach; Leon B. Keller, Palos Verdes Peninsula, and John H. Cover, Jr., Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 9,132, Feb. 11, 1970, abandoned, which is a continuation of Ser. No. 590,571, Oct. 31, 1966, abandoned. This application Feb. 19, 1974, Ser. No. 443,645

Int. Cl.^{2} H01Q *15/20*

U.S. Cl. 343—840 **10 Claims**



1. A folded antenna for radio waves comprising a peripheral ring support, a flexible non-woven preformed mesh member having dimensional stability secured to said support, said mesh member comprising criss-crossing flexible fibers of negligible extensibility having a modulus of elasticity and yield strength sufficient for providing the negligible extensibility, each of said fibers integrally bonded to said ring support.

3,969,732

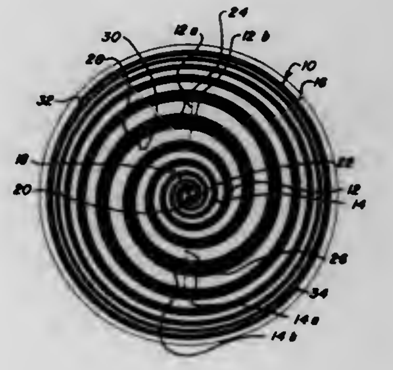
SPIRAL ANTENNA CIRCUIT

Albert L. Holloway, 941 Jackling Drive, Hillsborough, Calif. 94010

Filed Apr. 24, 1975, Ser. No. 571,423

Int. Cl.^{2} H01Q *1/36*

U.S. Cl. 343—895 **8 Claims**



1. A spiral antenna circuit comprising first and second antenna elements, each having at least one continuously scaled logarithmic spiral having a width continuously growing and at least one continuously scaled inverse logarithmic spiral having a termination with a termination point and having a width continuously diminishing to said termination point, wherein the inverse logarithmic spiral has an in continuum coupling to the logarithmic spiral; said continuously scaled logarithmic spiral being constructed from logarithmic equations and said continuously scaled inverse logarithmic spiral being constructed from inverse logarithmic equations.

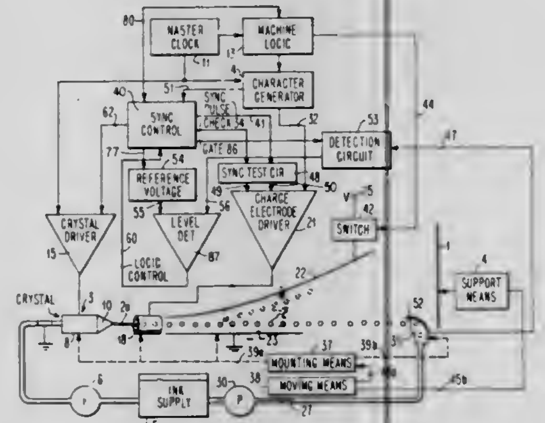
3,969,733
SUB-HARMONIC PHASE CONTROL FOR AN INK JET RECORDING SYSTEM

Richard A. DeMoss, and Howard T. Hilton, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,968

Int. Cl.² G01D *18/00*

U.S. Cl. 346—1 **10 Claims**



1. The method of synchronizing an ink recording system of the type wherein a stream of individual droplets generated by a perturbation of an ink jet filament at a predetermined rate are each selectively charged by a charging electrical field applied to the droplets in the region where said ink jet filament breaks into said stream of droplets for deflection by an electrostatic deflection field, the method comprising the steps of:

during a sync test cycle, modulating said drop charging field to provide a series of narrow charging pulse fields for a portion of the time a drop is in said region at a repetition rate which is a sub-harmonic of said predetermined rate;

induction sensing the charging of said charged drops to provide charge sense signals;

amplifying said charge sense signals in a narrow frequency band centered at said modulation charge repetition rate;

accumulating said amplified signals for a predetermined period;

comparing said accumulated signal to a predetermined signal to detect a deviation of said modulation from a desired phase; and

adjusting the relative phase of said perturbation and said modulation to correct any said detected deviation.

3,969,734
APPARATUS FOR RECORDING PNEUMATIC PRESSURES

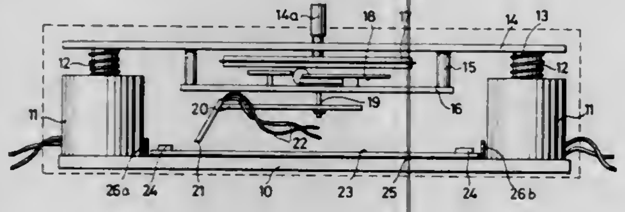
Johann Klein, Overbeckstr. 2-4, 5 Cologne 30, Germany

Filed Aug. 8, 1974, Ser. No. 495,791

Claims priority, application Germany, Aug. 11, 1973, 2340813

Int. Cl.² G01D *5/06;* **A61B** *5/02*

U.S. Cl. 346—33 ME **7 Claims**



1. In a recording device, support means for supporting a sheet material on which information is to be recorded, frame means carrying a marking means for marking information on sheet material carried by said support means, pneumatic pressure-responsive means carried by said frame means and operatively connected with said marking means for moving the latter in response to a change in the pressure of air received by said pneumatic pressure-responsive means, moving means for responding to a predetermined signal and being operatively connected to said frame means for moving the latter in response to said signal from a non-marking position where said marking means is spaced from a sheet material carried by said support means to a marking position where said marking means engages a sheet material carried by said support means, said moving means maintaining said frame means and said pressure-responsive means and marking means carried thereby in said marking position while said signal is received by said moving means, and signal-transmitting means for transmitting said signal to said moving means in response to a given change in the pressure of air received by said pneumatic pressure-responsive means, said signal-transmitting means acting through said moving means for maintaining said frame means in said marking position while said signal is transmitted to said moving means, so that in response to said signal said marking means engages the sheet material to record thereon said change in air pressure which occurs during transmission of said signal to said moving means, said frame means including a plate which carries said pressure-responsive means and marking means, and said moving means including an electromagnetic means operatively connected with said plate for moving the latter toward said support means from said non-marking to said marking position.

3,969,735
CAMERA WITH AUTOMATIC EXPOSURE-DETERMINING STRUCTURE

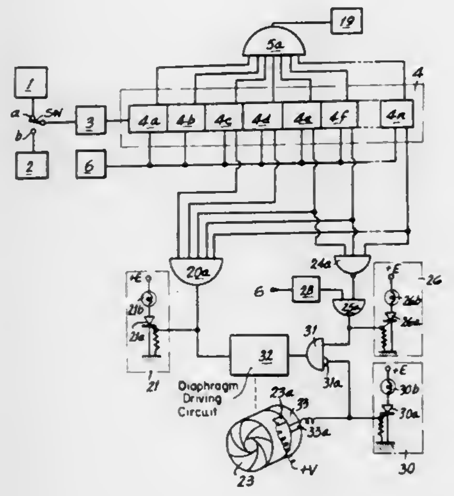
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 4, 1975, Ser. No. 555,298

Claims priority, application Japan, Mar. 11, 1974, 49-27921; Apr. 24, 1974, 49-46237

Int. Cl.² G03B *7/14*

U.S. Cl. 354—29 **11 Claims**



11. In a camera, light-responsive means for providing a signal corresponding to light brightness, exposure-time determining means for automatically determining exposure time, said exposure-time determining means being connected with said light-responsive means for determining exposure time when the signal provided by said light-responsive means corresponds to a given range of light brightness, detecting means connected with said exposure-time determining means for detecting when the signal provided by said light-responsive means is beyond at least one end of said range, means connected to said detecting means for preventing opening of a shutter of the camera when said detecting means detects that the singal provided by said light-responsive means is beyond said one end of said range, and diaphragm-adjusting means connected with said detecting means for automatically adjusting a diaphragm of the camera when said detecting means detects that said signal is beyond said one end of said range, so that immediately thereafter exposure operations can be carried out with the automatically adjusted diaphragm.

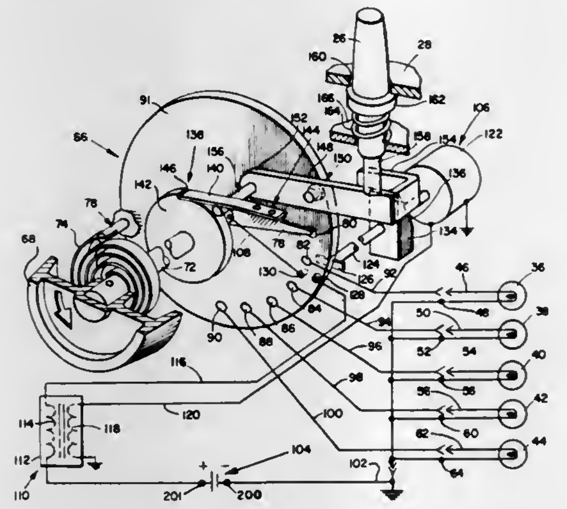
3,969,736
PHOTOGRAPHIC CAMERA AND FLASH LAMP SELECTION SYSTEM

Walter G. Lehmann, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,939

Int. Cl.² G03B *15/04*

U.S. Cl. 354—127 **8 Claims**



1. A photographic camera operable to produce an artificially illuminated photographic exposure in conjunction with an array of flashlamps of the kind having an individual terminal for each lamp in the array and a common terminal connected to all of the lamps in the array, said camera comprising, means for releasably receiving such an array and comprising a set of mutually insulated camera terminals for contacting the terminals of the array, said set including a first common camera terminal adapted to engage the common terminal of the array; means for initiating a photographic exposure cycle; first and second power supply terminals adapted to be connected to a source of electrical energy; a second common camera terminal; first switching means connected to said exposure cycle initiating means and operable thereby to sequentially connect all of said set of camera terminals except said first common terminal to said second common terminal during each exposure cycle; second switching means operable to open and close a circuit path connecting said first common terminal, said second common terminal, and said power supply terminals in series; and means for detecting the ignition of a lamp in an array received in said camera for operating said second switching means to open said path.

3,969,737
ELECTRONIC FLASH UNIT FOR CAMERAS ADAPTED TO RECEIVE FLASHBULBS

Edward Summers Kendrick, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,573

Int. Cl.² G03B *15/03*

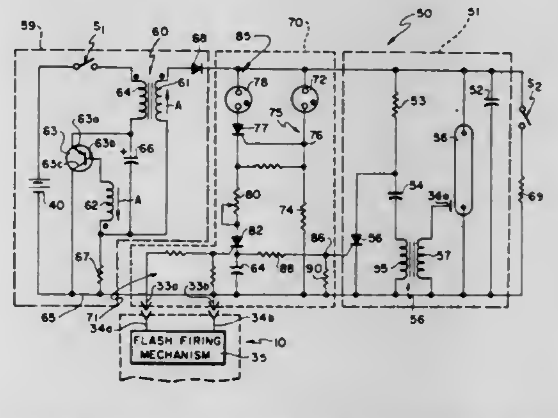
U.S. Cl. 354—141 **8 Claims**

5. In an improved electronic flash unit having a flashtube, a flashtube trigger circuit including a trigger capacitor for initiating a flash-triggering operation, a flash firing capacitor for producing a sustained flash following flash-firing energization, and means for connecting said trigger and firing capacitors to a source of electrical potential for controllably charging said trigger and firing capacitors, said electronic flash unit further including input means for coupling said flash unit to a camera having a shutter and a flash lamp firing mechanism of the type which produces a flash lamp energization signal in response to actuation of the camera in timed relation to operation of the camera shutter, the improvement comprising:

a. first electronic switching means having a gate electrode operatively associated with said flashtube trigger circuit for controlling triggering of said flashtube; and

b. circuit means interconnecting said input means and said first electronic switching means, said circuit means including:

  i. means having a resistor and timing capacitor for producing a control signal having a particular amplitude in a time interval following initiation of the flash lamp energization signal proportional to the product of the resistance and capacitance value;



  ii. first voltage-sensitive means for producing a signal to render said control signal producing means effective to produce said control signal once said firing capacitor is charged above a predetermined level;

  iii. second electronic switching means having a gate electrode electrically coupled to said input means for permitting said timing capacitor to charge following initiation of the flash lamp energization signal; and

  iiii. second voltage-sensitive means having a nonconductive state for rendering said circuit means non-conductive, said second voltagesensitive means assuming said non-conductive state during a flashtube-firing operation to effectively open circuit said resistor and capacitor combination.

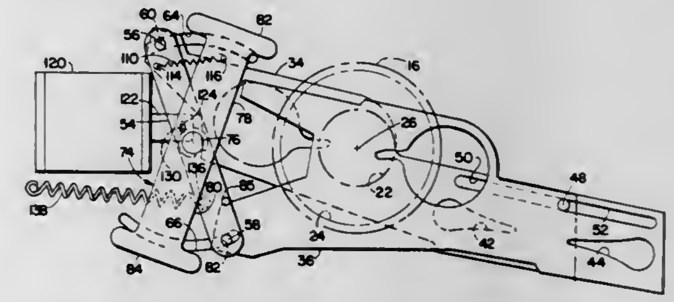
3,969,738
EXPOSURE CONTROL SYSTEM WITH INERTIAL CHARACTERISTIC

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 5, 1975, Ser. No. 574,695

Int. Cl.² G03B *9/08, 9/58*

U.S. Cl. 354—230 **9 Claims**



7. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising:

blade means including at least two blade elements;

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said moving means including a beam member pivotally connecting said blade elements at respective spaced apart points thereon together with means for pivotally connecting said beam member with respect to the housing at a pivot point on said member intermediate said spaced apart points of pivotal connection to said blade elements so that pivotal movement of said blade member about its point of pivotal connection with respect to the housing operates to drive said blade members in generally opposing directions to define a range of progressively increasing sized apertures as said blades move from said first arrangement to said second arrangement; and

means for presenting a relatively high inertial characteristic to said moving means as said moving means moves said blade means from its said first arrangement towards its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertial characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit an aperture closing movement of said blade means substantially uninhibited by said high inertial characteristic, said inertial characteristic presenting means including an inertia member having at least some portion thereof disposed in intercepting relation with respect to the path of pivotal movement of said beam member together with means for mounting said inertia member to accommodate displacement thereof in correspondence with said pivoting movement of said beam member from a select position with respect to the housing so that said beam member engages said inertia member at said select position as said beam member moves said blade means from its said first arrangement towards its said second arrangement and automatically withdraws from engagement with said inertia member as it moves said blade means away from its said second arrangement towards its said first arrangement, said inertial characteristic presenting means additionally including resilient means for automatically returning said inertia member to its said select position to accommodate the presentation of said relatively high inertial characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement.

3,969,739

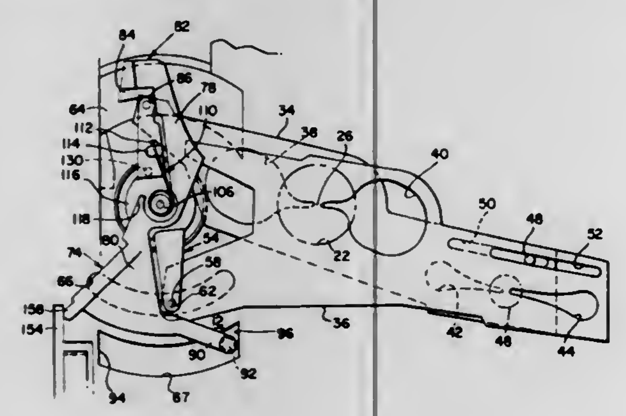
EXPOSURE CONTROL SYSTEM WITH SELECTIVELY PRESENTABLE INERTIA MEMBER

Bruce K. Johnson, Andover; Donald G. Josephson, Medford, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 27, 1975, Ser. No. 581,112

Int. Cl.^{2} G03B *9/00, 9/24*

U.S. Cl. 354—230 **19 Claims**



1. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising:

blade means;

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said blade means serving to define a range of progressively increasing sized apertures as it moves its said first arrangement to its said second arrangement;

means for presenting a relatively high inertia characteristic to said moving means as said moving means moves said blade means from its said first arrangement toward its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertia characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit aperture closing movement of said blade means substantially uninhibited by said high inertia characteristic, said inertia characteristic presenting means being operative to automatically present said relatively high inertia characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement, wherein said moving means includes a rotatably mounted member arranged to be rotated in a first direction as said moving means moves said blade means from its said first arrangement to its said second arrangement and to be rotated in the opposing direction as said moving means moves said blade means from its said second arrangement to its said first arrangement, and said inertia characteristic presenting means includes an inertia mass member mounted for rotation in correspondence with said moving means member; and

means for rotatably mounting said moving means member and said inertial member including concentric shaft portions extending respectively from said moving means member and said inertial member, said shaft portions being journalled for rotation with respect to each other, and additionally including support means for journalling only the outside concentric shaft portion for rotation about a select axis with respect to the camera housing.

19. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising;

blade means

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said blade means serving to define a range of progressively increasing sized apertures as it moves from its said first arrangement to its said second arrangement;

means for presenting a relatively high inertia characteristic to said moving means as said moving means moves said blade means from its said first arrangement toward its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertia characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit an aperture closing movement of said blade means substantially uninhibited by said high inertia characteristic, said inertia characteristic presenting means being operative to automatically present said relatively high inertia characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement wherein said moving means includes a displacably mounted member arranged to be displaced in a first direction as said moving means moves said blade means from its said first arrangement to its said second arrangement and to be displaced in a second direction as said moving means moves said blade means from its said second arrangement to its said first arrangement, and said inertia characteristic presenting means includes an inertial member mounted for displacement from an initial position in correspondence with said first displacably mounted member, and including a portion thereof engageable by said moving means member; and

latch means for selective engagement with said inertial member in order to prohibit substantial displacement of said inertial member from said initial position whereby said inertial member can engage said moving means member and retain said moving means member in its position corresponding to said first arrangement in this manner maintaining said blade elements in a position entirely precluding scene light from reaching the film plane regardless of the operative status of said moving means.

3,969,740

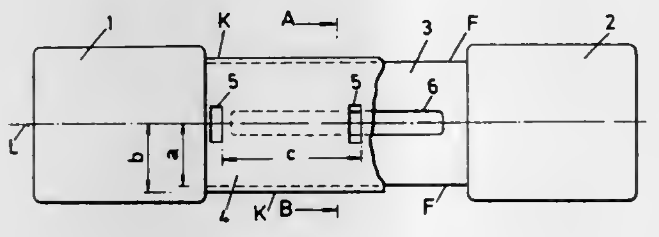
FILM CASSETTE

Werner Hahn; Walter Hennig, both of Dresden, and Bernhard Walther, Dessau, all of Germany, assignors to VEB Pentacon-Dresden, Dresden, Germany

Filed Dec. 23, 1974, Ser. No. 535,718

Int. Cl.^{2} G03B *1/22, 17/30*

U.S. Cl. 354—275 **4 Claims**



1. In a film cassette for roll film having transport perforations formed therein; said cassette being suitable for use with cameras having a housing adapted to receive said cassette and a film gate with a film engagement surface therein and film transport mechanism having a drive member engageable with said perforations in said film and performing driving strokes, said cassette comprising:

a. a storage chamber for housing said film:

b. a take-up chamber for receiving said film after exposure:

c. a crosspiece interconnecting said storage and take-up chambers and having a transport surface thereon for guiding said film from the storage chamber to said take-up chamber on the side of the crosspiece nearest the objective lens when the cassette is loaded in the camera; and

d. a transport slot provided in said crosspiece extending in the film transport direction; said slot passing through the crosspiece and having a length at least equal to the distance between successive transport holes in said film; whereby, when the cassette is located in the camera, said film gate presses said film against the transport surface of said crosspiece, and on transport of said film during a driving stroke of said transport mechanism the drive member extends through the slot and into a perforation.

3,969,741

APPARATUS FOR PRODUCING A DEVELOPER MEDIUM FOR DIAZOTYPE MATERIALS

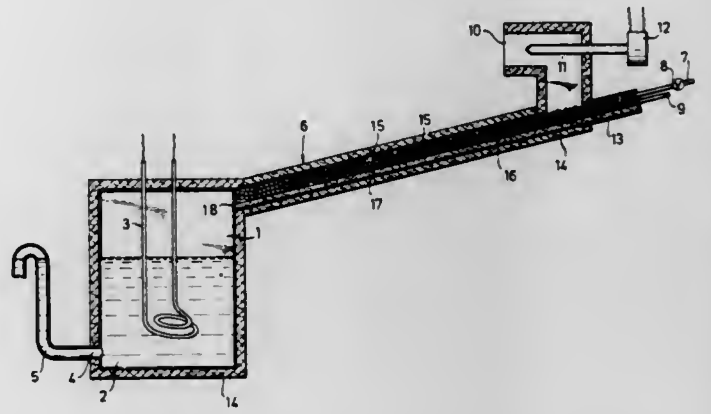
Hermann Frank, Sulzbach, and Karl-Heinz Degenhardt, Bad Schwalbach, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 7, 1973, Ser. No. 395,152

Claims priority, application Germany, Sept. 9, 1972, 2244384

Int. Cl.^{2} G03D *13/00, 7/00*

U.S. Cl. 354—299 **11 Claims**



1. An apparatus for producing a gaseous developer medium for diazotype materials from a developer solution, which comprises vapor-generating means,

distillation column means arranged above said vapor-generating means and connected thereto,

inlet means on said column means for developer solution to pass counter-currently to vapor from said vapor-generating means, means whereby depleted developer solution flows out of said column means into said vapor-generating means,

outlet means on said vapor-generating means for residual water, and

outlet means on said column means for said gaseous developer medium.

3,969,742

AUTOMATIC ENGAGEMENT AND METERING ADJUSTMENT CONTROLS FOR METERING BLADE DEVICE

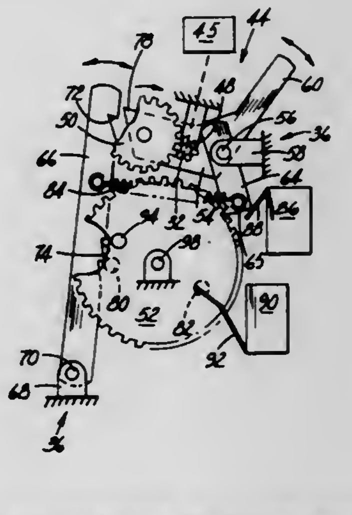
Peter McCabe, Godalming, England, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Apr. 25, 1974, Ser. No. 464,093

Claims priority, application Belgium, Apr. 24, 1974, 143519

Int. Cl.^{2} G03D *5/06*

U.S. Cl. 354—318 **19 Claims**



1. In a device for developing diazotype sensitized sheets by applying thereto a metered quantity of a developing liquid comprising:

a drive motor;

an applicator roller to be rotatably driven by said motor and having a surface adapted to retain thereon said metered quantity of developing liquid;

liquid supply means for supplying an excess amount of said liquid agent to said roller surface;

wiper blade means for removing excess developing liquid from the roller surface, said wiper blade means including means to movably position the blade between an operative position and an inoperative position relative to said surface;

pressure blade means for pressing said sheets against said applicator roller to transfer the metered amount of liquid from said roller to the sheets, said pressure blade means including means to movably position said blade between an operative and an inoperative position relative to said surface, wherein said pressure blade in the operative condition provides a developing zone defined by the contact area between the blade and the surface through which zone the sensitized sheet passes to be developed; the improvement therein comprising:

a sequence control means including a gear and a lever arm in cooperative association with said gear, said lever arm being operable between a first position and a second position, a gear assembly operably mounted on said lever arm and movable between an engaged first position and disengaged second position position relative to said gear forming a mechanical interconnection between said drive motor and said gear to move said blades into their respective positions latching means;

said latching means latching the sequence control means in said first position to said gear assembly and in said second position rendering said gear assembly free to rotate relative to said sequence control.

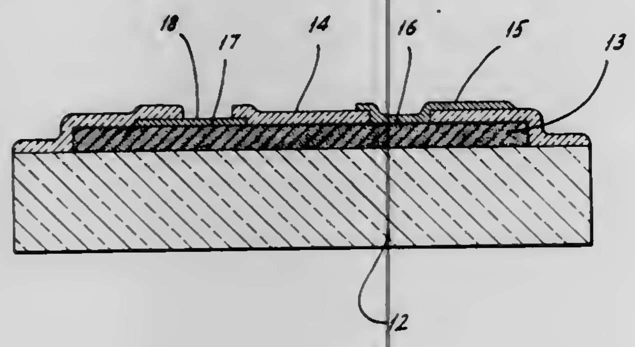
3,969,743
PROTECTIVE COATING FOR IV-VI COMPOUND SEMICONDUCTOR DEVICES

Daniel A. Gorski, Dearborn Heights, Mich., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 23, 1975, Ser. No. 570,632

Int. Cl.² H01L *29/12*

U.S. Cl. 357—4 **6 Claims**



1. A semiconductor device for use in a low temperature, moistureless ambient comprising:

a single crystal barium fluoride substrate,

a semiconductor deposited on said substrate, said semiconductor being selected from the group consisting of lead telluride, lead selenide, alloys of lead telluride and lead selenide, lead sulfide, alloys of lead sulfide and lead selenide, tin substituted lead telluride, tin substituted lead selenide, germanium substituted lead telluride, and cadmium substituted lead suffide,

means for making electrical contact to selected areas of said semiconductor, and

a protective coating covering said semiconductor, said coating being selected from the group consisting of barium fluoride and strontium fluoride.

3,969,744
SEMICONDUCTOR DEVICES

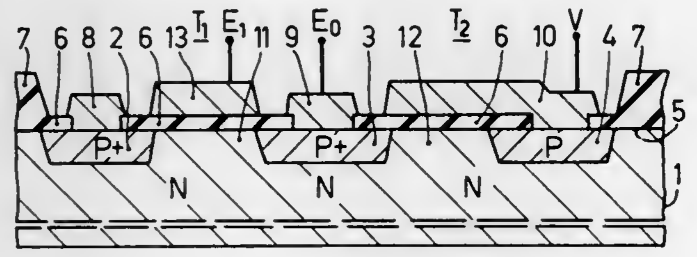
Keith Harlow Nicholas, Reigate, and Ronald Alfred Ford, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,138

Claims priority, application United Kingdom, July 27, 1971, 35122/71

Int. Cl.² H01L *29/80, 29/78, 7/00, 27/02*

U.S. Cl. 357—22 **12 Claims**



1. A semiconductor device comprising a common semiconductor wafer having a body portion of one type conductivity containing at least three spaced surface regions of the opposite type conductivity forming at least two field effect transistors each including a surface channel portion, and means for selectively reducing the gain of one of the field effect transistors, said gain reducing means comprising implanted neutral ions and associated semiconductor crystal lattice damage in the channel portion of said one transistor reducing the effective mobility of charge carriers therein in comparision with the mobility that would have existed in the absence of said implanted ions.

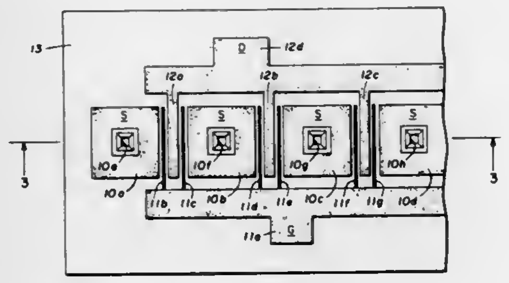
3,969,745
INTERCONNECTION IN MULTI ELEMENT PLANAR STRUCTURES

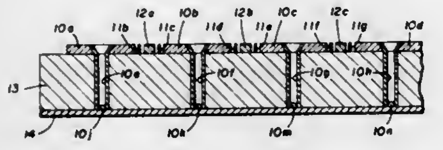
Truman G. Blocker, III, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 18, 1974, Ser. No. 507,021

Int. Cl.² H01L *29/80, 29/06, 23/48, 29/46*

U.S. Cl. 357—22 **15 Claims**





1. A field effect transistor comprising:

substrate means including a body of semiconductor material having an active region forming one surface thereof,

source, drain and gate electrodes disposed in spaced relationship to each other on said one surface of said semiconductor body with said gate electrode being interposed between said source and drain electrodes,

at least one of said source and drain electrodes being a multi-electrode array including a plurality of electrodes arranged in spaced relation to each other on said one surface of said semiconductor body,

said substrate means including a common conductor located in remote insulated relation to said one surface of said semiconductor body, and

conductive connections between each of said plurality of electrodes included in said array and said common conductor, said conductive connections extending through said active region and at least partially through the remainder of said semiconductor body to electrically connect each of said plurality of electrodes included in said array to said common conductor.

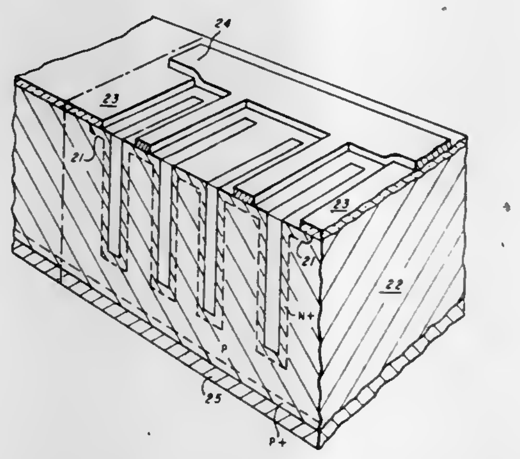
3,969,746
VERTICAL MULTIJUNCTION SOLAR CELL

Don Leslie Kendall, Richardson; Francois Antoine Padovani, Dallas; Kenneth Elwood Bean, and Walter Theodore Matzen, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,630

Int. Cl.² H01L *29/04, 31/06, 21/20, 21/308*

U.S. Cl. 357—30 **5 Claims**



1. A semiconductor device in a monocrystalline semiconductor body of one conductivity type;

a. a plurality of spaced parallel semiconductor columns of one conductivity type, each having a thickness about 10 microns, extending out from said body; and separated by grooves having a depth of about 100 microns;

b. a continuous semiconductor region of opposite conductivity type in said columns, adjacent the surfaces thereof and in said body between said columns to form a continuous PN junction; and

c. a pattern of metal contacts on the top surface of said columns and on the opposite surface of said body.

3,969,747
COMPLEMENTARY BIPOLAR TRANSISTORS WITH IIL TYPE COMMON BASE DRIVERS

Tadaharu Tsuyuki, Isehara; Hajime Yagi, Tokyo, and Toshiro Kobayashi, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

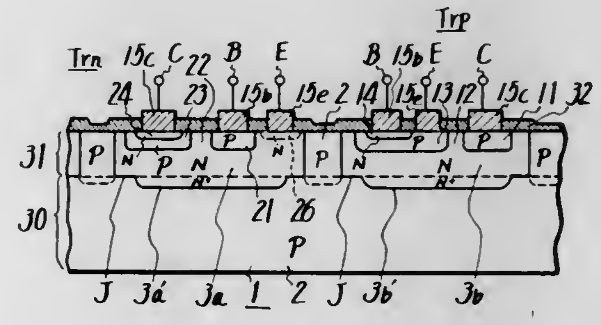
Filed June 10, 1974, Ser. No. 477,786

Claims priority, application Japan, June 13, 1973, 48-66488

Int. Cl.² H01L *27/04*

U.S. Cl. 357—44 **6 Claims**

1. A semiconductor device including a pair of complementary transistors comprising a planar substrate of a first conductivity type, first and second regions of opposite conductivity type formed in said substrate from a first surface and separated laterally from each other, third and fourth regions of said first conductivity type formed in said first region, fifth and sixth regions of said first conductivity type formed in said second region, a seventh region of opposite conductivity type formed in said third region, an eighth region of opposite conductivity type formed in said fifth region, a first collector electrode connected to said seventh region, a first base electrode connected to said fourth region, a first emitter electrode connected to said first region, a second base electrode connected to said eighth region, a second emitter electrode connected to said fifth region, a second collector electrode connected to said sixth region, and means for applying a bias potential to said second emitter electrode and to said second collector electrode of such polarity to forward bias the fifth region relative to said second region, and to reverse bias said second region relative to said sixth region, and means for applying a bias potential to said second base electrode and to said second collector of such polarity to forward bias said eighth region relative to said fifth region.



3,969,748
INTEGRATED MULTIPLE TRANSISTORS WITH DIFFERENT CURRENT GAINS

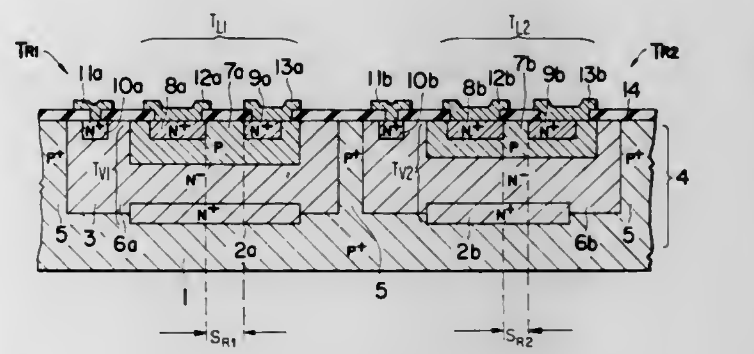
Noboru Horie, Kodaira, and Kazuo Hoya, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 31, 1974, Ser. No. 475,179

Claims priority, application Japan, June 1, 1973, 48-60880

Int. Cl.² H01L *27/02, 27/04, 29/72*

U.S. Cl. 357—46 **6 Claims**



1. An integrated circuit comprising:

a first multiple transistor and a second multiple transistor, which are formed in the same semiconductor body, each of which multiple transistors comprises:

a vertical transistor having a collector region of a first conductivity type, a base region of a second conductivity type formed in said collector region, and an emitter region of the first conductivity type formed in said base region; and

a lateral transistor having a base region of the second conductivity type, and an emitter region and a collector region of the first conductivity type laterally disposed in the surface of said base region, the base region of said lateral transistor being connected to the collector region of said lateral transistor and to the base region of said vertical transistor, the emitter region of said lateral transistor being connected to the emitter region of the vertical transistor; and wherein

the lateral transistors of said first and second multiple transistors have respectively different current amplification factors.

3,969,749

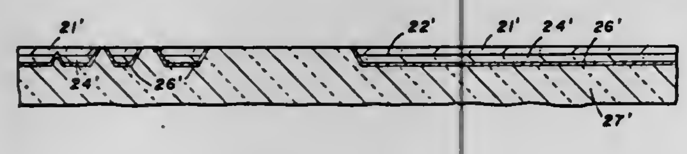
SUBSTRATE FOR DIELECTRIC ISOLATED INTEGRATED CIRCUIT WITH V-ETCHED DEPTH GROOVES FOR LAPPING GUIDE

Kenneth E. Bean, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 456,507, April 1, 1974, abandoned, which is a division of Ser. No. 788,167, Dec. 31, 1968, Pat. No. 3,844,858. This application May 19, 1975, Ser. No. 578,451

Int. Cl.² H01L *27/04, 27/12*

U.S. Cl. 357—49 **2 Claims**



1. A semiconductor substrate to be used in the fabrication of functional semiconductor devices comprising:

a single crystal slice of semiconductor material having a surface oriented in a crystallographic plane, and a plurality of sets of slots of precisely determined, different depths formed in said surface, said slots having at least two sides bounded by crystallographic planes, said slots being spaced apart from major slot-free areas of said surface reserved for the location of functional devices to be fabricated; said sets having locations distributed about the surface of said slice to form a pattern useful for thickness control when the back of the slice is lapped; and

a supporting layer covering said slotted surface, wherein each set of slots includes three slots of different depths, one of said three slots being located between the other two and having an intermediate depth with respect to the other two.

3,969,750

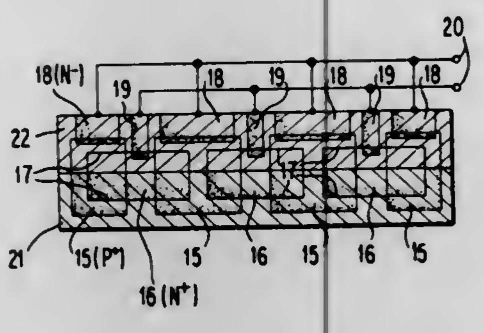
DIFFUSED JUNCTION CAPACITOR AND PROCESS FOR PRODUCING THE SAME

Vir A. Dhaka, and Walter F. Krolikowski, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 441,920, Feb. 12, 1974, abandoned, which is a continuation of Ser. No. 329,278, Feb. 2, 1973, abandoned, which is a division of Ser. No. 1,672, Jan. 9, 1970, Pat. No. 3,734,787. This application Dec. 3, 1975, Ser. No. 637,427

Int. Cl.² H01L *29/93, 27/04*

U.S. Cl. 357—14 **2 Claims**



1. A junction capacitor exhibiting a very high capacitance per unit area and a low series resistance comprising:

a monocrystalline silicon semiconductor substrate of a first conductivity type;

a monocrystalline silicon semiconductor layer of a second conductivity type disposed atop said substrate;

a set of parallel, spaced-apart, highly doped zones of said first conductivity type disposed in said substrate and said layer and remote from the surface of said layer;

a set of parallel, spaced-apart, highly doped zones of said second conductivity type disposed within said substrate and said layer and remote from the surface of said layer;

each one of second conductivity-type zones being disposed completely within adjacent ones of said first-conductivity-type zones but for a contact area between said adjacent zones;

a set of contacts of said second conductivity type from the surface of said layer to said contact areas;

a set of contacts of said first conductivity type from the surface of said layer to said first conductivity type zones; and

first and second means for respectively connecting said first conductivity type contacts and said second conductivity type contacts.

3,969,751

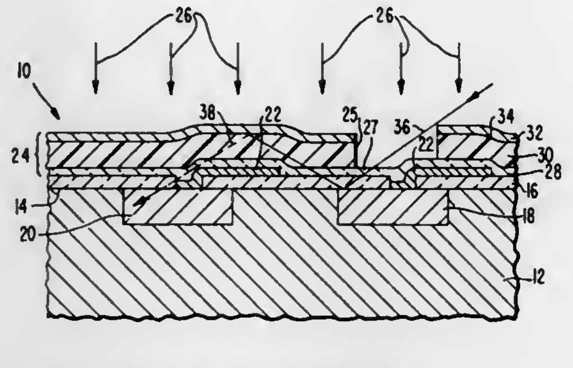
LIGHT SHIELD FOR A SEMICONDUCTOR DEVICE COMPRISING BLACKENED PHOTORESIST

Israel Drukaroff, Lakewood, and Wally Morren, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,995

Int. Cl.² H01L *27/14, 31/00*

U.S. Cl. 357—30 **4 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having first and second light-sensitive elements disposed therein, and

a light-shielding structure comprising a layer of opaque material, disposed above a surface of said substrate and having a window therein adjacent to said first lightsensitive element, said window exposing said first lightsensitive element to light incident upon said device and said light-shielding structure shielding said second lightsensitive element from said incident light, said opaque layer being blackened photoresist having the property of absorbing substantially all light striking a surface thereof.

3,969,752

HYBRID TRANSISTOR

John R. Martin, and Vahan Garboushian, both of Torrance, Calif., assignors to Power Hybrids, Inc., Torrance, Calif.

Continuation of Ser. No. 420,763, Dec. 3, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,624

Int. Cl.² H01L *27/02, 23/48, 39/02*

U.S. Cl. 357—51 **20 Claims**

1. A transistor package for providing in an output circuit a low reactance and a high resistance within a range of operating frequencies to enhance the power output from the transistor package in the range of operating frequencies, including:

a body member providing structural support for the transistor package;

an insulating member disposed on the body member;

at least a pair of thin metallic layers disposed on the body member in an electrically insulated relationship with the body member and in electrically insulated and spaced relationship with one another on the body member;

a transistor die disposed on the insulating member and including at least one transistor cell disposed on the body member in electrically isolated relationship with the metallic layers and defining a plurality of different electrodes in the cell;

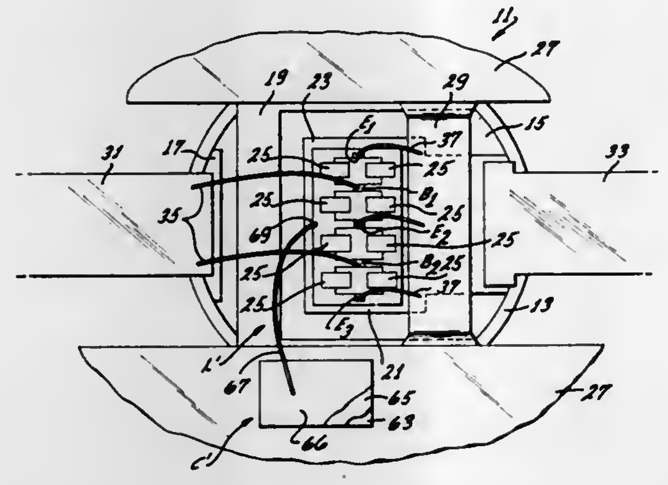
first means providing electrical connections between individual ones of the metallic layers and individual ones of the electrodes in the cell to provide for input connections to the transistor cell;

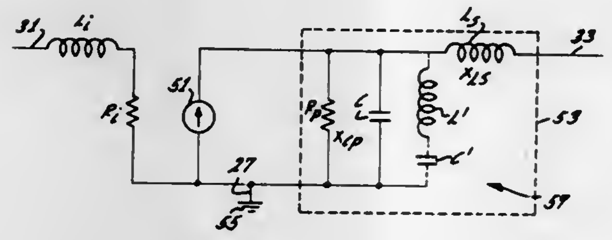
the transistor die and the metallic layers being constructed to provide in an equivalent output circuit of the transistor package characteristics including a shunt capacitance and a series inductance;

second means formed on the insulating member to define a capacitive reactance; and

third means supported on the insulating member to define an inductive reactance and connected electrically to the second means to provide a series circuit with the second means and a parallel relationship between the series circuit and the shunt capacitance and a series circuit between the parallel relationship and the series inductance,

the second and third means being provided with values to define an inductive reactance in their series relationship and the inductive reactance to provide a resonance with the shunt capacitance at a particular frequency within the operating range of frequencies to increase the output impedance of the transistor package and the effective range of operating frequencies.





3,969,753

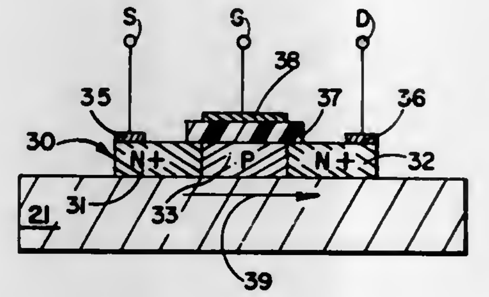
SILICON ON SAPPHIRE ORIENTED FOR MAXIMUM MOBILITY

Arthur C. Thorsen, Jr., Orange County, and Arlen J. Hughes, Tustin, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed June 30, 1972, Ser. No. 267,864

Int. Cl.² H01L *27/12*

U.S. Cl. 357—60 **1 Claim**



1. A semiconductor device comprising:

insulating substrate means having a prescribed crystallographic orientation in which an exposed surface displays an anisotropic thermal expansion,

a layer of piezoresistive semiconductive material epitaxially deposited on said exposed surface of said insulating substrate in a preferred crystallographic orientation so that said layer is maintained in an anisotropically stressed condition by said substrate means and exhibits a changed average mobility and a preferred direction of mobility of charge carriers therein, and

at least one region of semiconductor material of said device being located in said layer and oriented so that current passes therethrough in the preferred direction of mobility established in said layer,

wherein the substrate is sapphire and has its (1122) plane exposed and said semiconductor film has its (221) crystallographic face exposed.

3,969,754

SEMICONDUCTOR DEVICE HAVING SUPPORTING ELECTRODE COMPOSITE STRUCTURE OF METAL CONTAINING FIBERS

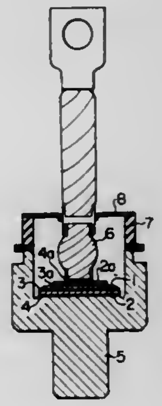
Keiichi Kuniya, Hitachi; Tomio Iizuka, Ibaraki; Masateru Suwa, Hitachi; Tomio Yasuda, Hitachi; Takeshi Sasaki, Hitachi; Sakae Kikuchi, Takasaki, and Hideo Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1974, Ser. No. 516,509

Claims priority, application Japan, Oct. 22, 1973, 48-119307

Int. Cl.² H01L *23/48, 29/40, 29/46, 29/62*

U.S. Cl. 357—65 **19 Claims**



1. A semiconductor device comprising a semiconductor substrate and a supporting electrode disposed in area contact on at least one surface of said semiconductor substrate, wherein said supporting electrode comprises a composite structure including a matrix of a metal and a plurality of fibers embedded in said metal matrix, said metal matrix having electric and heat conductivities higher than those of said fibers, said fibers having a coefficient of thermal expansion at most substantially equal to that of said semiconductor substrate.

3,969,755

EQUIPMENT FOR RECORDING AND REPRODUCING COLOR TELEVISION SIGNAL

Ichiro Arimura, Kyoto; Hiroshi Taniguchi, Hirakata, and Chojuro Yamamitsu, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 7, 1974, Ser. No. 512,206

Int. Cl.² H04N *5/76*

U.S. Cl. 358—4 **9 Claims**

1. An equipment for recording and reproducing color television signals comprising

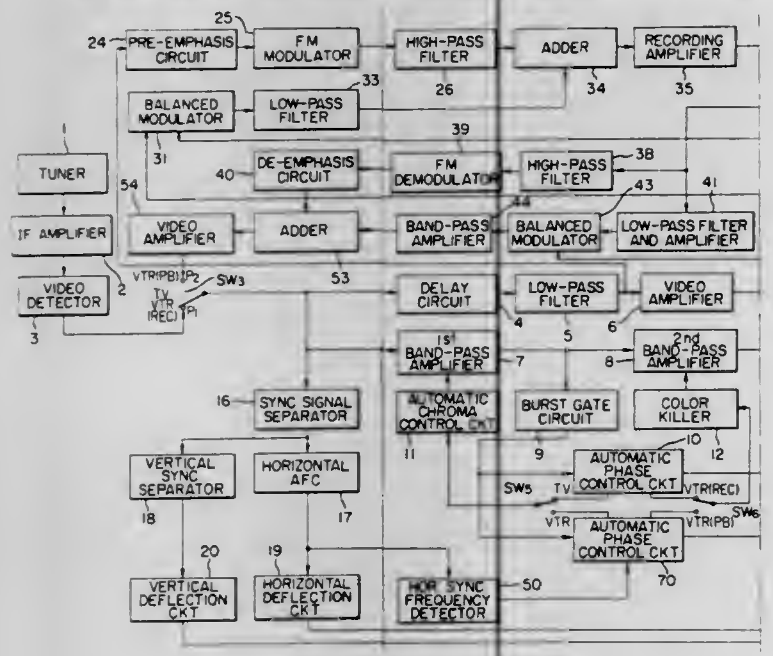
a. a tuner for selecting any receiving channel desired,

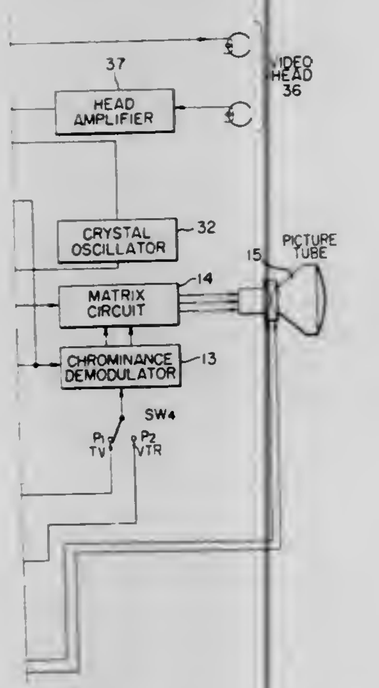
b. a first detector means for detecting the color television signal which has been converted into an intermediate frequency signal by said tuner,

c. luminance signal processing circuits for separating the luminance signal from the detected color video signal and for processing said separated luminance signal,

d. chrominance signal processing circuits for separating the carrier chrominance signal from said detected color video signal and processing said separated carrier chrominance signal;

- e. a continuous-wave signal generator circuit for producing a continuous wave signal in phase synchronizm with the burst signal in said carrier chrominance signal,
- f. a second detector means for phase detecting said carrier chrominance signal with said continuous wave signal;
- g. a matrix circuit to which is applied the output from said second detector means and the output from said luminance signal processing circuits,
- h. a picture tube for displaying the picture from the outputs from said matrix circuit,
- i. means for extracting the luminance signal from said luminance signal processing circuits and for frequency modulating said extracted luminance signal,
- j. a stable oscillator and a first modulator means for extracting the carrier chrominance signal from said carrier chrominance signal processing circuits and for heterodyning the extracted carrier chrominance signal with the output of a stable oscillator to convert the carrier chrominance signal into a low-frequency chrominance signal,





- k. means for recording and reproducing the color television signal by combining said frequency-modulated luminance signal with said low-frequency chrominance signal,
- l. separator means for separating said frequency modulated luminance signal and said low-frequency chrominance signal from the reproduced a signal output of said recording-reproducing means,
- m. a third detector means (39) for frequency demodulating said separated frequency modulated luminance signal,
- n. a second modulator means (51) for reconverting said separated low-frequency chrominance signal into the carrier chrominance signal with the initial frequency band, by the aid of the signal of a predetermined frequency,
- o. a first connecting means for connecting, in the recording mode, the output of said first detector means to said luminance signal processing circuit and in the reproduction mode, the output of said third detector means to said luminance signal processing circuits,
- p. a second connecting means for connecting, in the recording mode, the output of said first detector means to said carrier chrominance signal processing circuits and in the reproduction mode, the output of said second modulation means to said carrier chrominance signal processing circuits,
- q. a phase comparator means for detecting the phase difference between said burst signal and said continuous wave signal to produce an error signal, and
- r. a variable frequency oscillator means controlled by said error signal, for producing said signal of predetermined frequency.

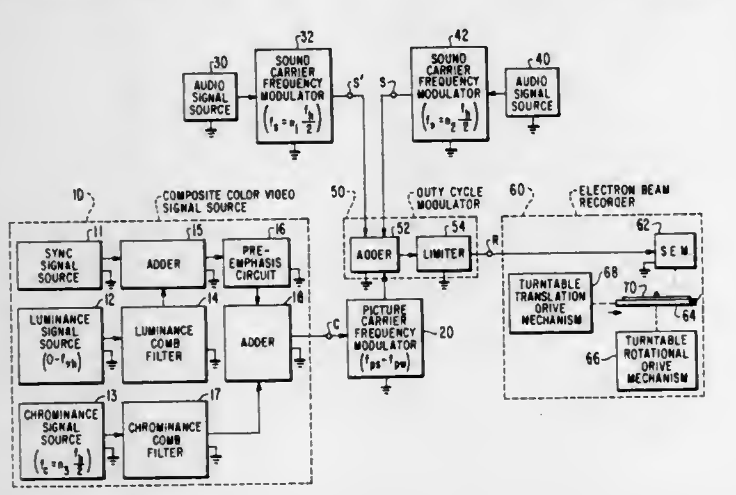
3,969,756
COLOR-PICTURE/MULTICHANNEL-SOUND RECORD AND RECORDING/PLAYBACK APPARATUS AND METHODS THEREFOR

Richard Claxton Palmer, Blawenburg, and Jon Kaufmann Clemens, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,811

Int. Cl.^{2} H04N *5/82*

U.S. Cl. 358—4 **19 Claims**


32
30
AUDIO SIGNAL SOURCE
SOUND CARRIER FREQUENCY MODULATOR
$(f_s = n_1 \frac{f_h}{2})$
S'
S
42
SOUND CARRIER FREQUENCY MODULATOR
$(f_s = n_2 \frac{f_h}{2})$
40
AUDIO SIGNAL SOURCE
10
COMPOSITE COLOR VIDEO SIGNAL SOURCE
50
DUTY CYCLE MODULATOR
60
ELECTRON BEAM RECORDER
11
SYNC SIGNAL SOURCE
15
ADDER
16
PRE-EMPHASIS CIRCUIT
52
ADDER
54
LIMITER
R
62
S.E.M.
12
LUMINANCE SIGNAL SOURCE
$(0-f_{yh})$
14
LUMINANCE COMB FILTER
18
ADDER
C
PICTURE CARRIER FREQUENCY MODULATOR
$(f_{ps}-f_{pw})$
20
68
TURNTABLE TRANSLATION DRIVE MECHANISM
70
64
66
TURNTABLE ROTATIONAL DRIVE MECHANISM
13
CHROMINANCE SIGNAL SOURCE
$(f_c = n_3 \frac{f_h}{2})$
17
CHROMINANCE COMB FILTER

1. A color-picture/multichannel sound record comprising:

a disc having a spiral groove in a surface thereof, said groove containing an information track comprising variations in the geometry of the groove bottom along a plurality of convolutions of said spiral groove;

said groove bottom geometry variations comprising alternations between a first cross-sectional shape for the groove in which the groove bottom and adjacent groove walls define a continuous smooth curve, and a second crosssectional shape in which the groove bottom is depressed relative to the groove bottom level associated with the first cross-sectional shape;

wherein the rate of recurrence of the groove bottom depressions varies along a groove convolution in accordance with the recorded picture information inclusive of luminance and chrominance components;

wherein the ratio of the groove length of a depressed groove bottom region to the groove length of the succeeding non-depressed groove bottom region varies along a groove convolution in accordance with the sum of first and second cyclical variations of respectively different rates; the rate of said first cyclical variations being subject to variation in accordance with the first aspect of the recorded second information, and the rate of said second cyclical variation being subject to variation in accordance with a second aspect of the recorded sound information; and

wherein the respective rates of said first and second cyclical variations lie below the lowest frequency of said chrominance component but above half said lowest chrominance component frequency.

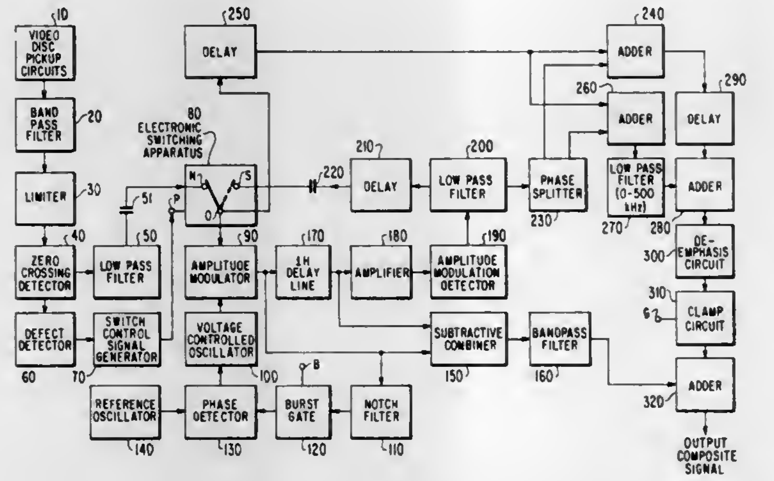
3,969,757
COLOR IMAGE SIGNAL PROCESSING CIRCUITS

John Gordon Amery, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,325

Int. Cl.^{2} H04N *5/76*, *9/535*

U.S. Cl. 358—4 **4 Claims**



1. In a color image signal translating system comprising a source of an input composite video signal including a luminance signal occupying a wide band of frequencies, and a chrominance signal occupying only an intermediate portion of said wide band, the combination comprising:

a voltage controlled oscillator having an output of a frequency determined by a control voltage input;

means for modulating the output of said oscillator with said input composite signal to develop a modulated carrier output having a sideband in which said chrominance signal occupies an intermediate portion;

a 1H delay line;

means for applying said modulated carrier output to the input of said delay line;

first comb filter means responsive to modulated carrier waves derived from both the input and the output of said delay line;

means for deriving a chrominance signal, to the substantial exclusion of luminance signal components, from the output of said first comb filter means;

an amplitude modulation detector coupled to the output of said delay line for developing a delayed composite video signal;

a second comb filter means, response to an input composite video signal from said source and to a delayed composite video signal from said detector, for passing luminance signal components, to the substantial exclusion of said chrominance signal; and

an adder for combining the outputs of said first and second comb filter means.

3,969,758
SYNCHRONIZING SYSTEM FOR VIDEO RECORDERS

Bernard J. Okey, Sunnyvale, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 4, 1974, Ser. No. 512,364

Int. Cl.^{2} H04N *5/76*, *9/44*; H04L *7/00*

U.S. Cl. 358—8 **12 Claims**

1. A synchronizing arrangement for use in a color video recorder system comprising:

apparatus for providing an incoming composite video signal,

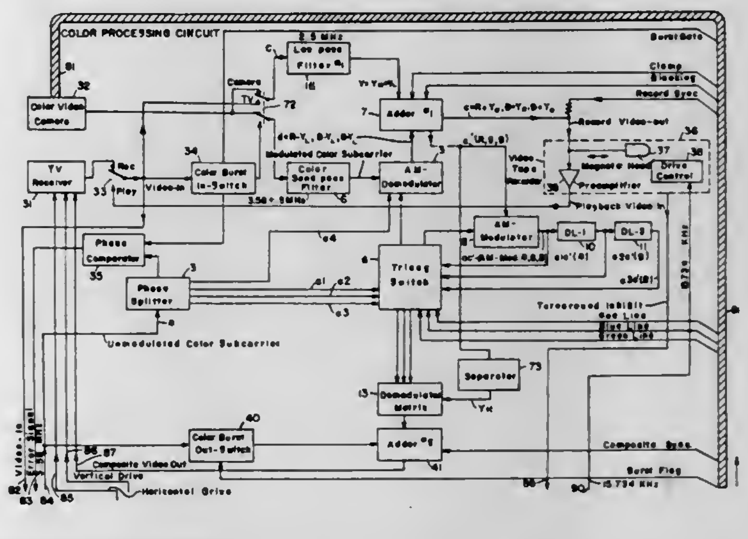
means for separating the color burst from said incoming video signal,

a first oscillator,

means for deriving from said first oscillator an unmodulated color subcarrier, ✓

a phase-locked loop for said first oscillator, said loop being effective in the recording mode and including means for comparing the phase of said unmodulated color subcarrier with the phase of said separator color burst,

means for deriving from said first oscillator a motor reference for said recorder, whereby said motor reference is locked to said color burst,



a second oscillator,

a sync generator driven by said second oscillator and developing a sync pattern comprising a plurality of different series of repetitive pulses,

means for separating the horizontal sync signal from said incoming video signal,

a phase-locked loop for said second oscillator, said loop including means for comparing the phase of one of said pulse series with the phase of said separated sync signal, and

apparatus for processing said video signal prior to recording, said apparatus including means controlled by others of said pulse series for impressing regenerated sync information on the video signal to be recorded.

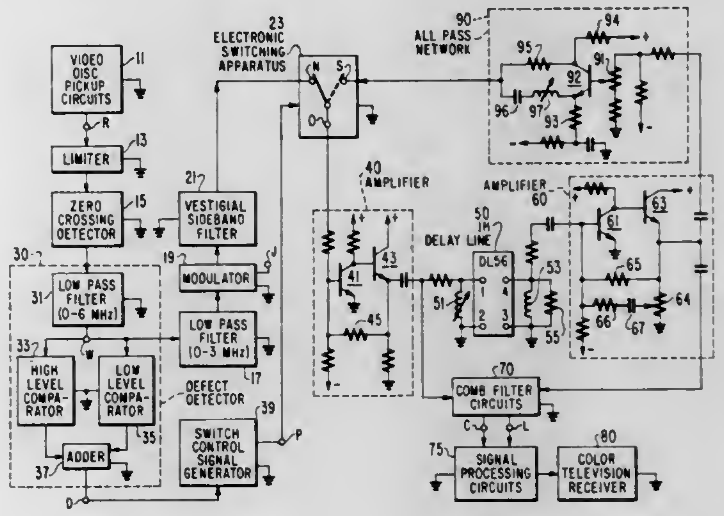
3,969,759
DEFECT COMPENSATION SYSTEMS

John Gordon Amery, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 476,839, June 6, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 568,313

Int. Cl.^{2} H04N *9/02*, *9/535*

U.S. Cl. 358—8 **16 Claims**



11. In a system for playback of a record of successive color images, said system including means for deriving during said record playback a color image representative composite video signal including a luminance signal, and a modulated color

subcarrier forming a chrominance signal having frequencies interleaved with the frequencies of a portion of said luminance signal; the combination comprising:

a 1H delay line having an input and an output;

means for supplying amplitude modulated carrier waves to the input of said delay line, said modulated carrier wave supplying means being normally responsive to an output of said signal deriving means;

means for utilizing said delay line to effect comb filter separation of said luminance and chrominance signals under normal conditions of operation of said composite signal deriving means; and

means responsive to abnormal conditions of operation of said composite signal deriving means for altering the mode of operation of said modulated carrier wave supplying means such that said modulated carrier wave supplying means is rendered responsive to the output of said delay line to the exclusion of said output of said composite signal deriving means.

3,969,760
SAMPLING PHASE IDENTIFICATION APPARATUS

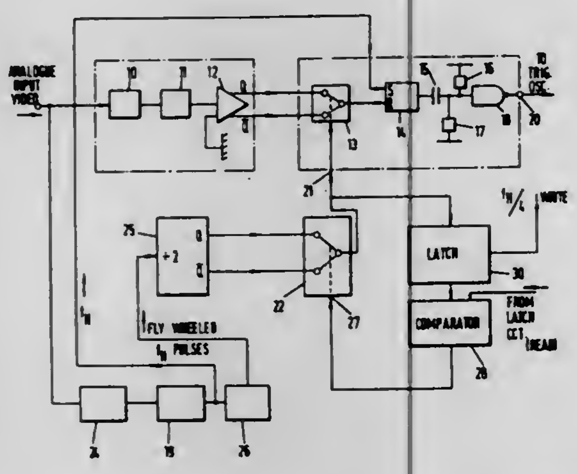
John Albert Coffey, Newbury, England, assignor to Quantel, Limited, England

Filed May 30, 1975, Ser. No. 582,514

Claims priority, application United Kingdom, June 3, 1974, 24421/74

Int. Cl.² H04N *9/44, 5/76*

U.S. Cl. 358—8 **7 Claims**



1. In a digital timebase corrector having a triggered oscillator for driving an analogue-to-digital converter for receiving and converting analogue video information to digital form, control means for writing digital information from said converter into storage means, and control means for reading said digital information from said storage means, said oscillator being triggered by means of signals received from a transition detector connected via delay means to a sync pulse separator, said transition detector also being connected to comparator means having an input connected to a band pass filter for receiving said analogue video information, said storage means including a plurality of stores for storing sequential line information; the provision of apparatus comprising:

- a. means for deriving in-phase and anti-phase Write clock phase identification signals from line frequency sync signals;
- b. selector means for selecting one of the in-phase or anti-phase signals;
- c. first latch means for receiving said selected one of said signals;
- d. means for simultaneously deriving a Read clock phase identification signal at a frequency which is half the line frequency from a sub-carrier reference signal;
- e. second latch means for receiving the Read clock phase identification signal;
- f. comparator means for comparing the output signals from the first and second latch means to produce a Write clock phase identification control pulse so as to select the other of the in-phase and anti-phase Write clock phase identification

signals in said selector means when the states of the signals applied to the comparator means are dissimilar.

3,969,761
TRANSMITTER AND RECEIVER CIRCUITS FOR THE SEQUENTIAL STORAGE COLOR TELEVISION SYSTEM

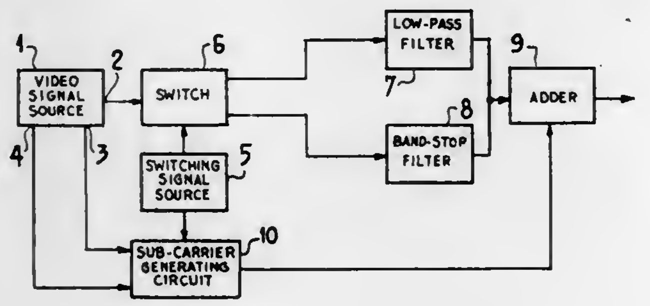
Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 22, 1975, Ser. No. 598,162

Claims priority, application France, July 26, 1974, 74.26060

Int. Cl.² H01L *9/40*

U.S. Cl. 358—14 **2 Claims**



1. A colour television transmitter circuit for deriving a colour television signal from a luminance signal and first and second colour signals, said circuit comprising:

switching and filtering means for alternately substantially eliminating from said luminance signal (i) the components thereof lying in a first channel (ii) the components thereof lying in a second channel, said first and second channels being adjacent channels occupying the upper portion of the frequency band allotted to said colour television signal, the alternation occurring at the line frequency;

subcarrier generating means for alternately delivering (i) a first subcarrier modulated by said first colour signal and (ii) a second subcarrier modulated by said second colour signal, at least a substantial portion of the frequency spectrum of said first subcarrier lying in said first channel, and a second subcarrier modulated by said second colour signal, at least a substantial portion of the frequency spectrum of said second subcarrier lying in said second channel, the alternation occurring at the line frequency so that said first or second subcarrier is delivered by said subcarrier generating circuit according to whether said switching and filtering means substantially eliminate those components of the luminance signal which lie in said first channel or in said second channel; and

adding means for adding the output luminance signal from said switching and filtering means to the output subcarrier from said subcarrier generating circuit.

3,969,762
SECAM COLOR TELEVISION RECEIVERS EMPLOYING TUNABLE NOTCH FILTER IN LUMINANCE CHANNEL

Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France

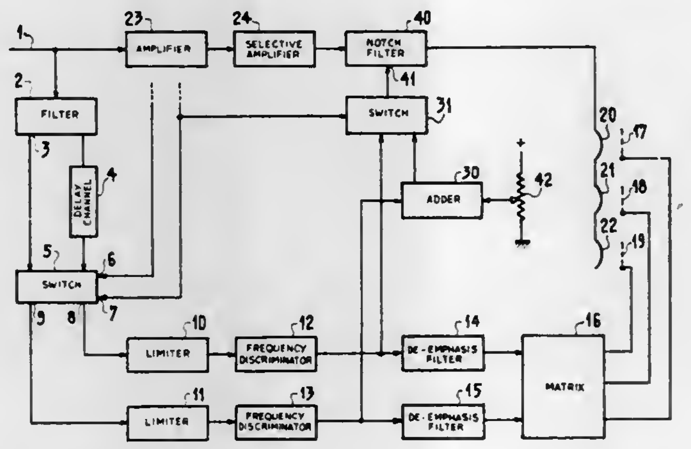
Filed July 22, 1975, Ser. No. 598,161

Claims priority, application France, July 26, 1974, 74.26059

Int. Cl.² H04N *9/40*

U.S. Cl. 358—38 **4 Claims**

1. A colour television receiver for operating in a system where the colour television signal comprises a luminance signal and a subcarrier which is alternately frequency modulated by first and second colour signals, the alternation occurring at the line frequency, said receiver comprising a luminance channel including a notch filter for attenuating the subcarrier, and a colour channel, including delay means, switching means and frequency demodulating means, for simultaneously delivering the colour signal derived from the color television signal being received and the colour signal derived from the colour television signal received at a time T earlier, where T is the line period, wherein said notch filter is a variable notch filter having a control input for receiving a signal determining the frequency at which said notch filter imparts maximum attenuation, and wherein said receiver comprises a circuit, coupled to said frequency demodulating means, for delivering to said control input a signal which is a function of the instantaneous frequency of said subcarrier.



3,969,763
COLOR TELEVISION CAMERA PROVIDED WITH A PICK-UP DEVICE AND A COLOR FILTER PLACED IN FRONT THEREOF

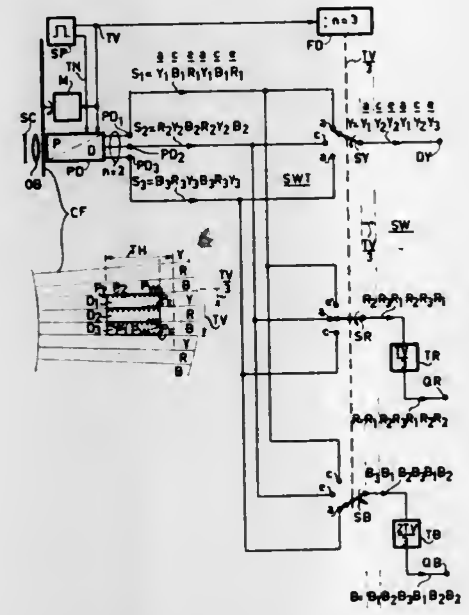
Sing Liong Tan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,940

Claims priority, application Netherlands, Jan. 24, 1973, 7300970

Int. Cl.² H04N *9/22*

U.S. Cl. 358—42 **11 Claims**



1. A color television camera comprising a color filter including a plurality of movable strip means having different chromatic transmission characteristics for separating incident light into different colors; a pickup device disposed behind said color filter having a plurality of read strips, a read means for simultaneously reading said read strips, and a plurality of output means for providing sequential output signal of successively different colors corresponding to said filter strips; switching and delay circuit converter means coupled to said pickup device outputs and having output means for providing simultaneous signals of different colors corresponding to the same read strip at any one instant of time; and a plurality of camera outputs coupled to said converter outputs respectively.

3,969,764
COLOR TELEVISION CAMERA

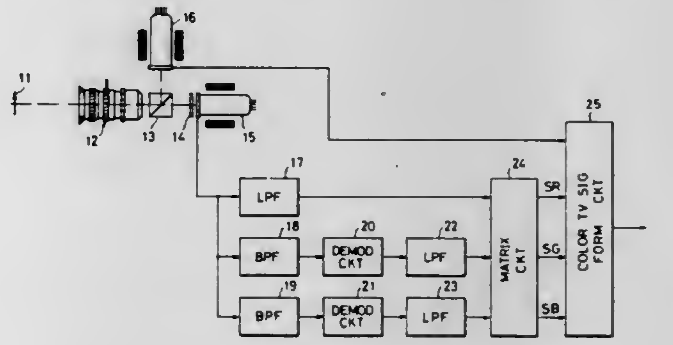
Hideshi Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 24, 1975, Ser. No. 543,929

Claims priority, application Japan, Jan. 28, 1974, 49-11616

Int. Cl.² H04N *9/07*

U.S. Cl. 358—47 **5 Claims**



1. A color television camera comprising:

a camera tube for chrominance signal;

a color-resolving striped filter disposed in the optical path of said camera tube, said color-resolving striped filter comprising a plurality of groups of filter stripes, each of said groups comprising a plurality of different kinds of said filter stripes which respectively extend in a specific direction, said stripes being arranged in a predetermined sequence along a line which is perpendicular to the specific direction, and at least two of said filter stripes transmitting two of said primary colors with different spatial frequencies in the specific direction;

means for causing an electron beam in said camera tube to scan simultaneously over the filter stripes in each group in parallel with the specific direction to produce chrominance signals in response to the light of an optical image passing through said striped filter;

low-pass filter means responsive to the chrominance signals for separating direct wave signals representing a sum of first, second and third primary color light signals of a specific ratio;

first band-pass filter means responsive to the chrominance signals for separating a first modulated color signal in which a carrier wave of a first frequency is amplitude-modulated with the second primary color light signal;

second band-pass filter means responsive to the chrominance signals for separating a second modulated color signal in which a carrier wave of a second frequency is amplitude-modulated with the third primary color light signal; and

means for demodulating the first and second modulated color signals and matrixing them with the direct wave signals to derive three primary color signals.

3,969,765
DEVICE FOR THE THERMOMAGNETIC RECORDING OF INFORMATION

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

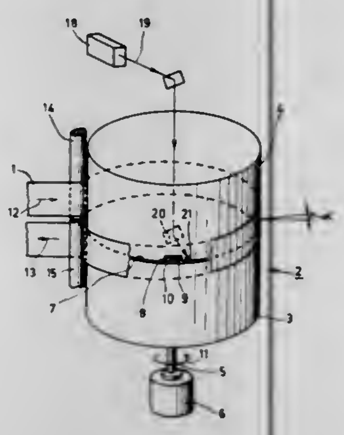
Filed May 20, 1974, Ser. No. 471,547

Int. Cl.² G11B *5/02;* **H04N** *1/28*

U.S. Cl. 360—59 **6 Claims**

1. A device for recording information on a magnetizable record medium having a temperature-dependent coercive force and being provided on an elongated carrier, comprising means for moving the carrier, at least one magnetic transducer cooperating with the recording medium for producing a mag-

netic field having a field strength at the area of the recording medium below the coercive force at room temperature thereof, and a heating source to locally heat the recording medium to a temperature above room temperature, the improvement comprising a rotatable cylindrical supporting member around which the record carrier is laid and on the circumference of which the transducer is mounted, the rotatable cylindrical supporting member constituting a means for moving the transducer in a direction which encloses an angle with the direction of movement of the record carrier, wherein the heating source is a source of radiation arranged independently of the supporting member and producing a concentrated energy beam, means mounted on the supporting member for directing the energy beam onto the record carrier and for focussing the energy beam in a location in front of the transducer viewed in the direction of rotation of the supporting member, whereby the energy beam is moved synchronously with the electro-magnetic transducer



3,969,766
TENSION CONTROL DEVICE FOR A VIDEO TAPE RECORDING AND/OR REPRODUCING APPARATUS

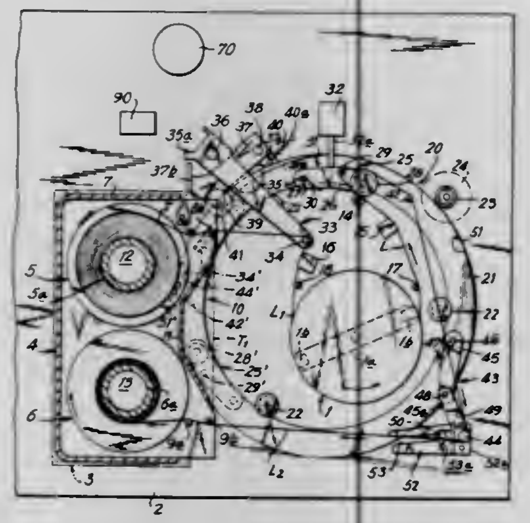
Katsuo Tanaka, Tokyo, and Akira Saito, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,279

Claims priority, application Japan, Nov. 16, 1973, 48-132484[U]

Int. Cl.² G11B *15/66, 15/43, 5/52, 23/04*

U.S. Cl. 360—85 **8 Claims**



1. A tension control device for controlling the tension in a tape as the latter is being advanced from a supply reel to a take-up reel, comprising a movable tension control arm engageable with a run of the tape between said supply and take-up reels, a tensioning spring connected with said arm for urging the latter against the tape so that the positioning of said arm is dependent on the force of said tensioning spring and the tension of said tape run, braking means controllable by said positioning of the tension control arm for resisting rotation of the supply reel with a braking force which maintains a substantially constant tension in said tape run, an anchor member connected with said tensioning spring and being movable for adjusting the force of said tensioning spring and thereby varying said substantially constant tension maintained in said tape run, an additional spring acting on said anchor member in opposition to said tensioning spring for substantially counterbalancing the force of said tensioning spring in respect to said anchor member, and manually actuable control means coupled with the counter-balanced anchor member for effecting movements of the latter.

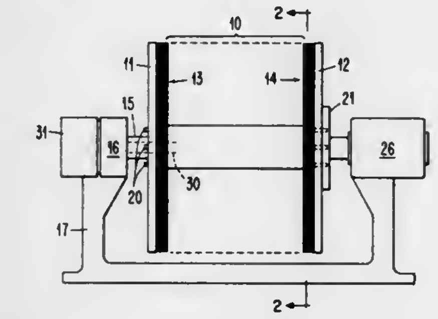
3,969,767
SPACER SUPPORTS FOR FLEXIBLE DISK STRUCTURES

Donald E. Griffiths, Longmont, Colo.; Joseph H. Koestner, Hopewell Junction, N.Y., and David G. Norton, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,406

Int. Cl.² G11B *5/016, 17/32, 5/64*

U.S. Cl. 360—99 **11 Claims**



1. A magnetic storage apparatus comprising:

a laminated tubular spindle consisting of a plurality of coaxially abutting spacer washers mounted for rotation as a unit and including radially extending air passageways, and each of said spacer washers having a radially inward portion of maximum axial extent for abutting engagement with both axially adjacent other ones of said spacer and radial outward portion of lesser axial extent, each washer having a central aperture aligned with apertures from other ones of said washers in said tubular spindle;

a like plurality of flexible record disks mounted to said spacer washers, respectively, in said radially outward portions;

means for rotating said tubular spindle; and

means for supplying fluid to said tubular spindle for fluid movement radially outwardly through said radially extending air passageways.

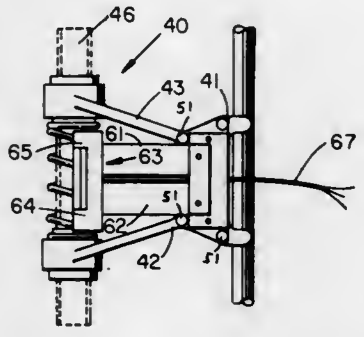
3,969,768
MAGNETIC DISK HEAD CARRIAGE

Peter F. M. Ebbing, Sunnyvale, Calif., assignor to Tri-Data, Mountain View, Calif.

Filed July 5, 1974, Ser. No. 486,193

Int. Cl.² G11B *5/55, 21/20, 25/04*

U.S. Cl. 360—107 **18 Claims**



1. For use in a magnetic disk recording apparatus having a magnetic disk member, a threaded lead screw, a motor for turning said lead screw for indexing a head carriage over the surface of said disk, and a guide rod for checking twisting of said head carriage about said lead screw, an improved magnetic disk head carriage assembly comprising:

a magnetic disk head assembly;

means forming a receiving platform for receiving said disk head assembly;

a first and a second beam-shaped member extending from said receiving platform, said beam-shaped members being symmetrically located with respect to a center line through said platform and being terminated by a lead screw receiving means for receiving said lead screw;

means extending from said platform for engaging said guide rod for checking rotation of said platform about said lead screw;

means for mounting said head assembly to said receiving platform symmetrically with respect to said platform center line; and

means for resiliently biasing said first and said second beam-shaped members against opposing threads of said lead screw for cancelling the effects of wear, thermal expansion and backlash between said lead screw and said platform.

3,969,769
MAGNETO-RESISTIVE HEAD

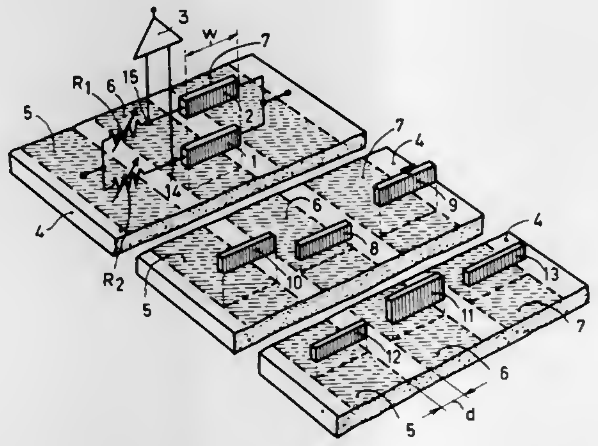
Frederik Willem Gorter, and Jan Antoon Ludolf Potgiesser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1975, Ser. No. 568,994

Claims priority, application Netherlands, Apr. 29, 1974, 05727

Int. Cl.² G11B *5/12*

U.S. Cl. 360—113 **5 Claims**



1. A magnetic head for detecting information-representing magnetic fields on an associated magnetic recording medium having a plurality of generally parallel data tracks disposed thereon which comprises:

at least first and second elongate magneto-resistive detection elements, each of said elements being oriented so that any magnetically recorded data in the tracks which causes one element to increase resistance also causes the other to increase resistance and any magnetically recorded data which causes one element to decrease the resistance thereof causes the other also to decrease the resistance thereof, one of said elements being disposed with the longitudinal axis thereof generally perpendicular to the data tracks, each of said elements being disposed with the longitudinal axis thereof parallel to the recording medium and in spaced relationship from each other element to prevent magneto static coupling therebetween;

means for generating an electric potential;

means for connecting said electric potential to each of said elements to generate a signal with each of said elements; and

means for generating an additional signal which is a function of the difference between at least two of said signals.

3,969,770
TWO-TRACK BIDIRECTIONAL CASSETTE HEAD FOR DATA HANDLING APPARATUS

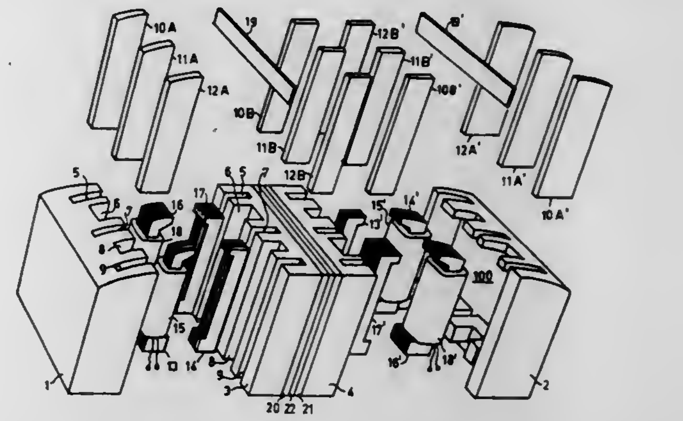
Pier Giuseppe Cavallari, Novara, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Feb. 23, 1973, Ser. No. 335,275

Claims priority, application Italy, Mar. 3, 1972, 21345/72

Int. Cl.² G11B *5/27, 5/10*

U.S. Cl. 360—121 **2 Claims**



1. A two track bidirectional magnetic head for writing, erasing and reading out information on a first track of a magnetic support in motion in a first direction with respect to said head, and on a second track parallel to said first track of said magnetic support in motion in a second opposite direction, comprising: a first write-erase transducer and a first read-out transducer for operating on said first track, respectively provided with a first write-erase gap and a first read-out gap, arranged in transverse relationship to said tracks, a second write-erase transducer and a second read-out transducer for operating on said second track, respectively provided with a second write-erase gap and a second read-out gap, arranged in transverse relation to said tracks, and magnetic shields to prevent interaction between said transducers, wherein the shields encompassing each reading transducer are spaced apart by a distance substantially equal to the width of the gap of the write-erase transducer operating on the same track, wherein the first write erase gap is aligned with the second read-out gap, said second write-erase gap is aligned with said first read-out gap, non-magnetic structural means for enclosing and supporting said transducers and said shields, including two mutually identical external supporting members, and two mutually identical internal supporting members arranged symmetrically with respect to a central plane for holding said transducers and said shields in a centrally symmetrical pattern around a central axis contained in said central plane.

3,969,771
MAGNETIC HEAD WITH SHIELD PLATES FOR RESPECTIVE HEAD ELEMENTS

Nobuo Suzuki, Yokosuka, and Takao Ketori, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,259

Claims priority, application Japan, Oct. 25, 1972, 47-122521[U]

Int. Cl. G11b *5/28, 5/10*

U.S. Cl. 360—121 **4 Claims**

1. A magnetic head assembly for recording on and reproducing from a magnetic tape comprising:

a head case;

a first and a second magnetic head element aligned with each other along the direction of the tape feed within said head case,

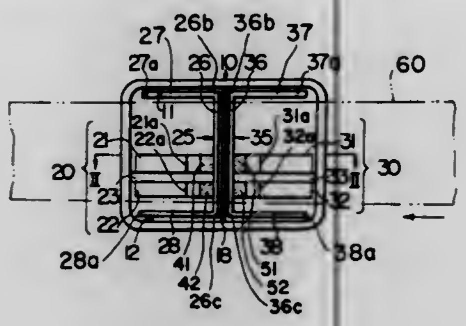
said first magnetic head element comprising at least one reproducing head core,

said second magnetic head element comprising at least one recording head core,

said reproducing and recording head cores having respective head gaps provided in parallel with each other and contacting the same track on the magnetic tape when it runs; and

a first and a second shield plate,

said first shield plate having at least a first plate portion perpendicular to the direction of the tape feed disposed between the head elements and a second and a third plate portion extending in parallel with the direction of the tape feed from both ends of the first plate portion, so as to enclose the first head element at least in three directions, said first, second and third plate portions of the first shield plate being integrally formed,



said second shield plate having at least a first plate portion perpendicular to the direction of the tape feed disposed between the head elements and a second and a third plate portion extending in parallel with the reverse direction of the tape feed from both ends of the first plate portion so as to enclose the second head element at least in three directions, said first, second and third plate portions of the second shield plate being integrally formed, and wherein

the first plate portions of said shield plates have respective end portions near the surface of the magnetic tape, said end portions extending approximately to the surface of the magnetic tape farther than the head gaps of the magnetic head cores, and a non-magnetic material having the same or substantially the same hardness and coefficient of thermal expansion as those of the magnetic head cores is filled in the space between said end portions and said magnetic head cores so as to form a smooth circular face for contact with the magnetic tape.

DESIGN PATENTS

GRANTED JULY 13, 1976

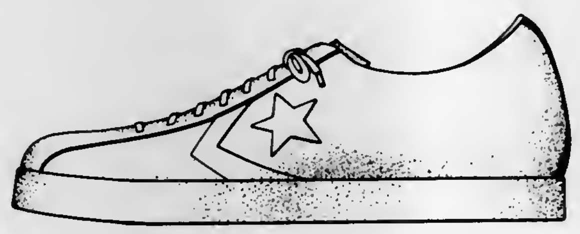
ERRATA

For CLASS	See PATENT NO.
025-056	240,520
025-022	240,521
025-035	240,522
016-030	240,554
016-032	240,555
010-081	240,556
016-032	240,557
086-010 F	240,561

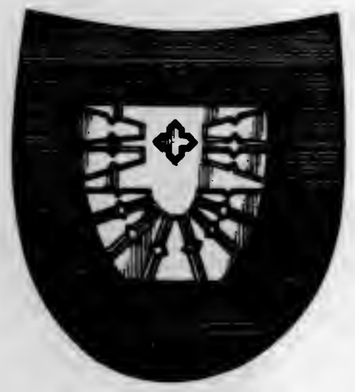
DESIGNS

JULY 13, 1976

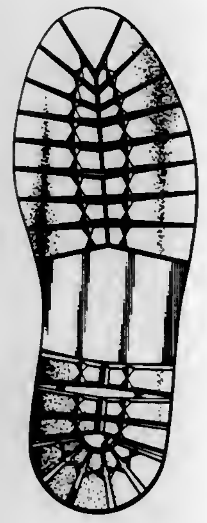
240,470
ATHLETIC SHOE
Gilbert Ford, Lynnfield, Mass., assignor to Eltra Corporation, Wilmington, Mass.
Filed Oct. 3, 1974, Ser. No. 511,576
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



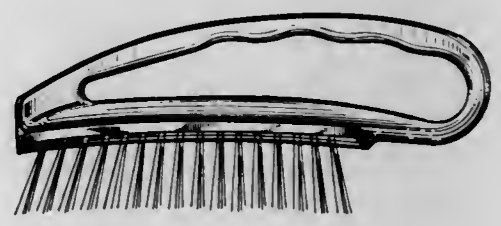
240,471
BOOT HEEL
Robert E. Russell, Holden, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Mar. 21, 1975, Ser. No. 560,808
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323



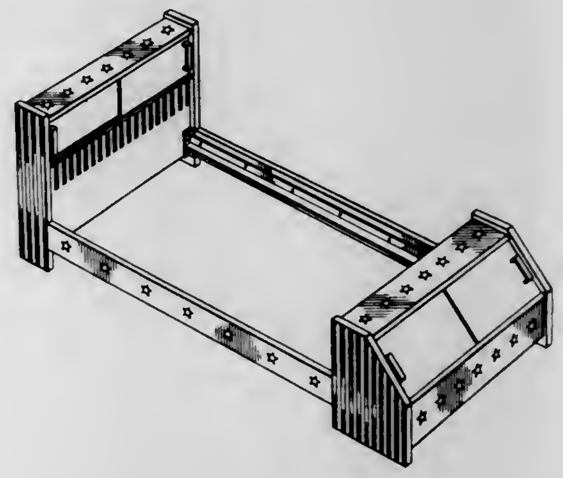
240,472
COMBINED BOOT SOLE AND HEEL
Giuseppe Sironi, Albizzate, Italy, assignor to Vibram S.p.A., Albizzate, Varese, Italy
Filed Apr. 9, 1975, Ser. No. 566,505
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



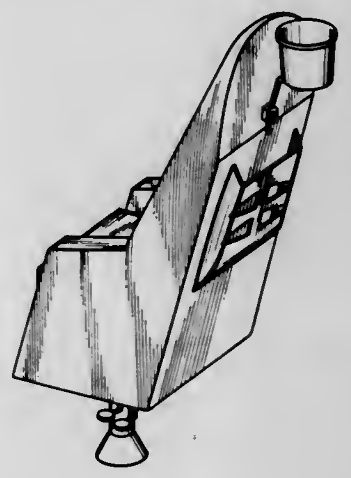
240,473
BRUSH
Russell H. R. Parker, Cleveland, Ohio, assignor to Superior Brush Company, Cleveland, Ohio
Filed Jan. 20, 1975, Ser. No. 542,599
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—29



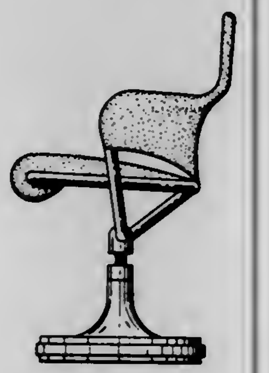
240,474
COMBINED BED AND TOY BOX
Michael E. Pawlak, General Delivery, Echo, La. 71330
Filed July 12, 1974, Ser. No. 488,240
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—6



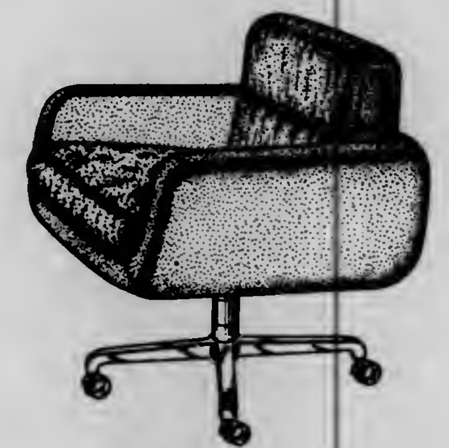
240,475
UTILITY CHAIR FOR A HAIRDRESSER
Jeanette Morgan, 5867 Lotus, St. Louis, Mo. 63112
Filed Sept. 30, 1974, Ser. No. 510,214
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



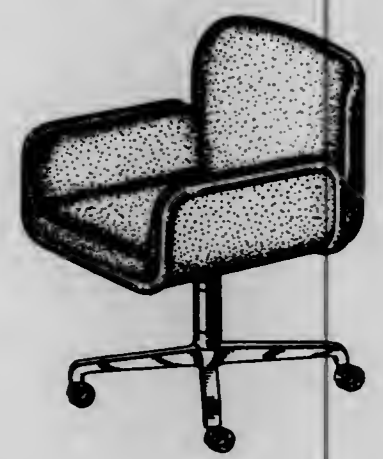
240,476
ARMCHAIR
Rodrigo Rodriquez, Carimate, Como, Italy, assignor to Marcatre S.p.A., Rovellasca, Como, Italy
Filed Jan. 23, 1975, Ser. No. 543,304
Claims priority, application Italy July 26, 1974
Term of patent 14 years
Int. Cl. D6—*31*
U.S. Cl. D6—26



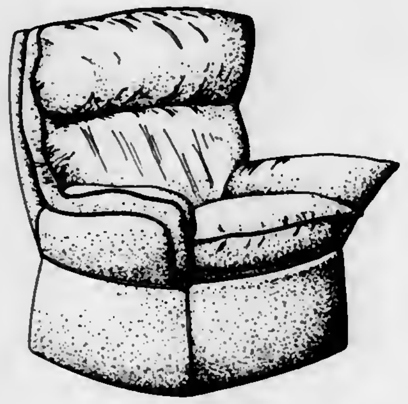
240,477
PEDESTAL LOUNGE CHAIR
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,305
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



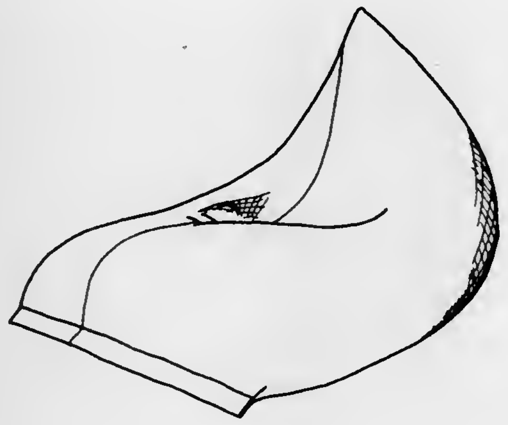
240,478
PEDESTAL ARM CHAIR
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,304
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



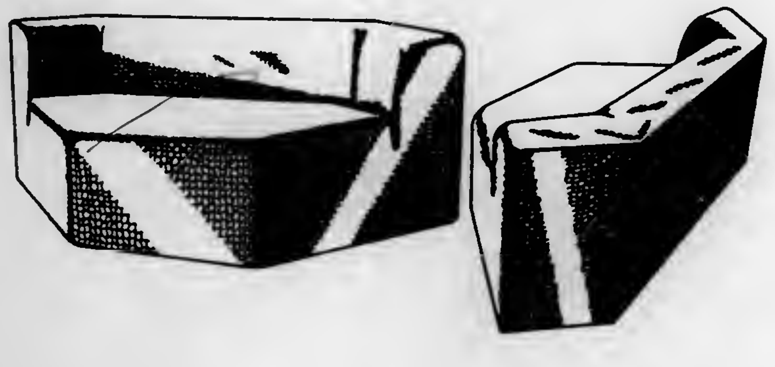
240,479
SEAT OR SIMILAR ARTICLE
Matti Halme, Helsinki, Finland, assignor to Burris Industries, Inc., Lincolnton, N.C.
Filed Feb. 13, 1975, Ser. No. 549,520
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



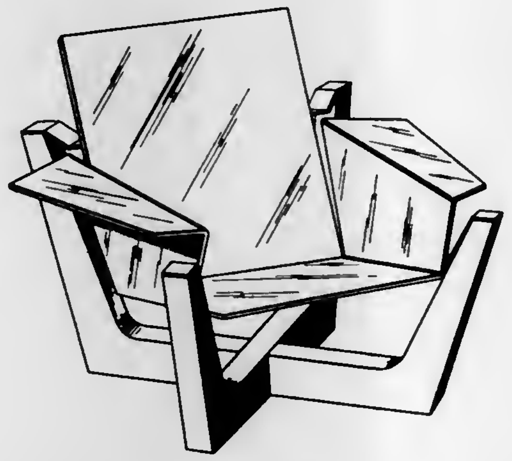
240,480
CHAIR
Robert J. Marks, 210 Johnson Ferry Road, Atlanta, Ga. 30328
Filed Mar. 4, 1975, Ser. No. 555,169
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



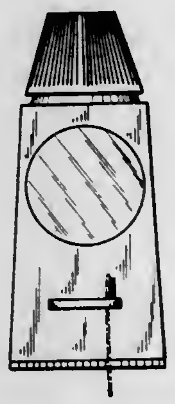
240,481
SOFA
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459
Filed Feb. 10, 1975, Ser. No. 548,233
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61



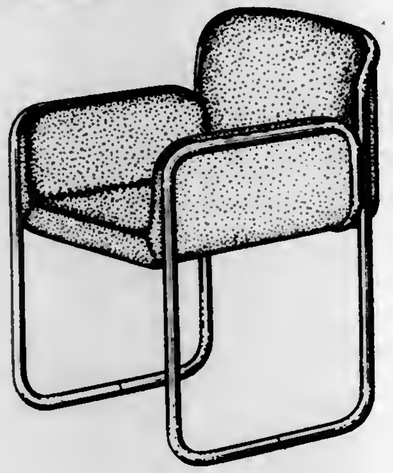
240,482
ARMCHAIR
Robert Francis Voorhees, Jr., 375 Church Lane, North Brunswick, N.J. 08902
Filed Jan. 31, 1975, Ser. No. 545,766
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



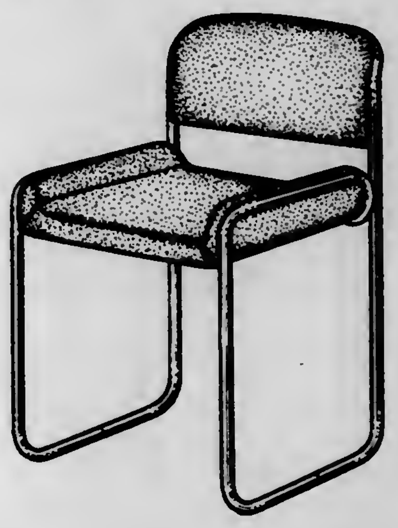
240,483
CHAIR OR SIMILAR ARTICLE
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,302
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



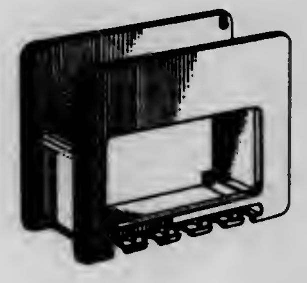
240,484
ARMCHAIR OR SIMILAR ARTICLE
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,303
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



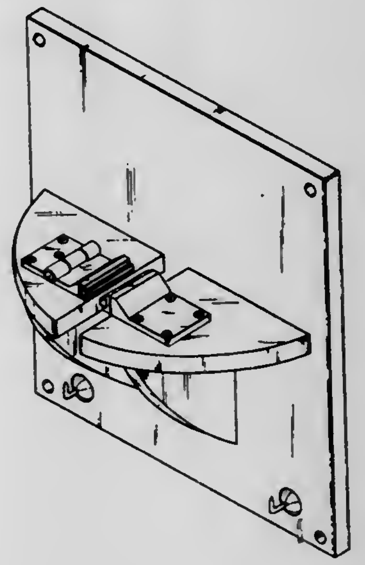
240,485
COMBINED MIRROR AND TOOTHBRUSH HOLDER
Stuart A. Farbman, 205 E. Mount Pleasant Ave., Livingston, N.J. 07039
Filed Apr. 17, 1975, Ser. No. 568,948
Term of patent 14 years
Int. Cl. D16— *06;* D23—*02*
U.S. Cl. D6—94



240,486
RACK FOR GARDEN IMPLEMENTS AND HOSES
Dieter Raffler and Franco Clivio, Ulm, Germany, assignors to Kupex AG, Glarus, Switzerland
Filed Mar. 1, 1973, Ser. No. 336,898
Claims priority, application Germany Oct. 14, 1972
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—112



240,487
RACK FOR SKIS AND SKI POLES OR THE LIKE
Ralph A. Blair, 228 N. Atlantic Place, Boise, Idaho 83704
Filed July 30, 1973, Ser. No. 383,630
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—125

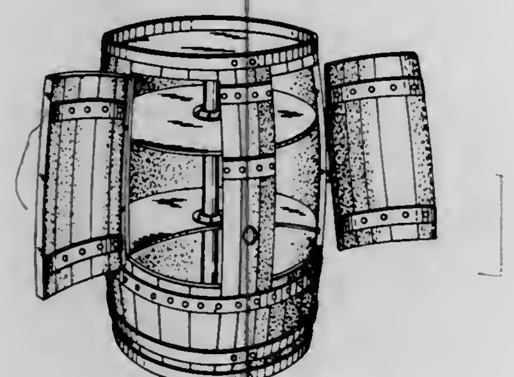


240,488

COMBINED BAR AND DISPLAY CABINET

Lawrence D. Taub, 7435 Boulevard East,
North Bergen, N.J. 07047
Filed Oct. 21, 1974, Ser. No. 516,785
Term of patent 14 years
Int. Cl. D6—*04*

U.S. Cl. D6—148

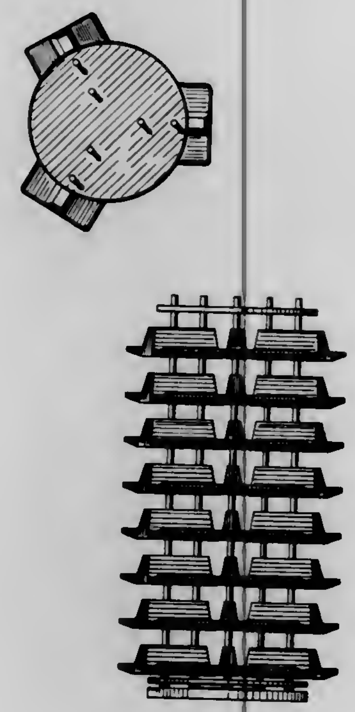


240,489

ROTATABLE DISPLAY STAND

Julian Kerwin, Westfield, Mass., assignor to Creative
Display Fixtures, Inc., East Hampton, Mass.
Filed Sept. 2, 1975, Ser. No. 609,407
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*

U.S. Cl. D6—188

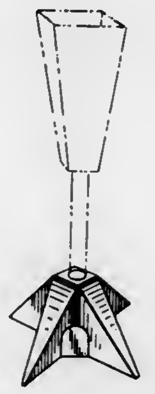


240,490

FLORAL HOLDER BASE

John Kevin Hunt, 10920 S. Rolmar,
Oak Lawn, Ill. 60453
Filed Feb. 24, 1975, Ser. No. 552,635
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—196

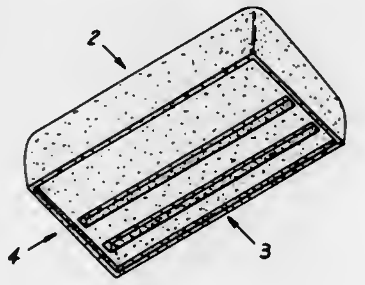


240,491

SEAT CUSHION

Milton H. Kramer, Wyncote, Pa., assignor to D S C
Industries, Inc., Philadelphia, Pa.
Filed Mar. 5, 1975, Ser. No. 555,685
Term of patent 14 years
Int. Cl. D6—*09*

U.S. Cl. D6—201

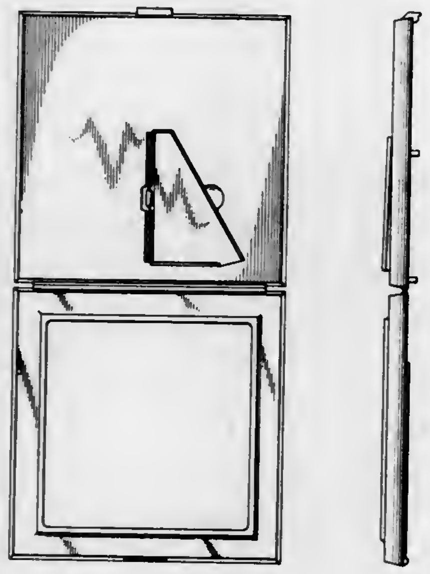


240,492

PHOTO FRAME

Ralph R. Burin, Glen Ellyn, Ill., assignor to
Intercraft Industries Corporation
Filed May 5, 1975, Ser. No. 574,540
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—236

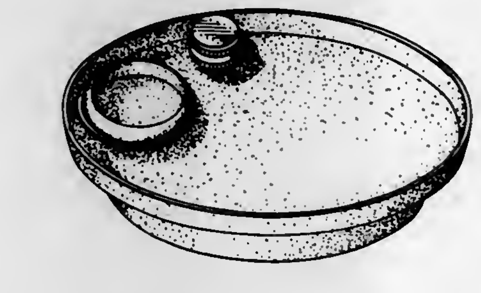


240,493

COMBINED SERVING TRAY AND TUMBLER

Clair O. Musser, 12997 Blairwood Drive,
Studio City, Calif. 91604
Filed Aug. 9, 1974, Ser. No. 496,044
Term of patent 7 years
Int. Cl. D7—*99*

U.S. Cl. D7—3

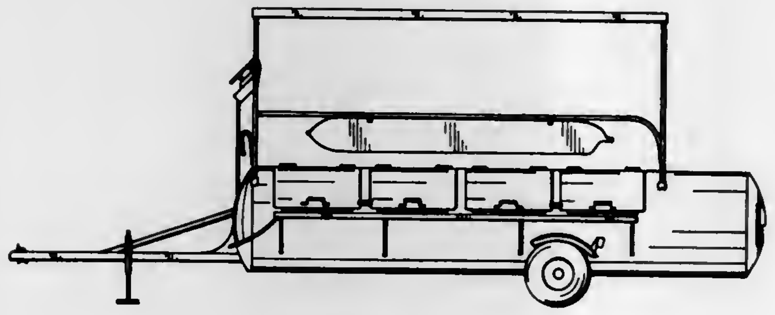


240,494

MOBILE COOKING TRAILER

Kenneth Beasley, 2141 NW. 33rd.,
Oklahoma City, Okla. 73112
Filed July 15, 1974, Ser. No. 488,675
Term of patent 14 years
Int. Cl. D7—*02*; D12—*10*

U.S. Cl. D7—108

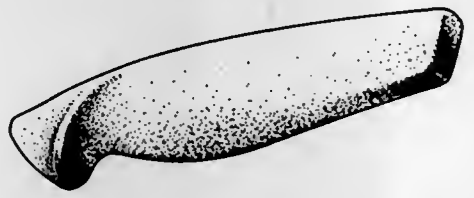


240,495

CUTLERY HANDLE

Rudolf Koppe, 27 Kenninghall Blvd.,
Streetsville, Ontario, Canada
Filed Oct. 22, 1974, Ser. No. 516,920
Term of patent 14 years
Int. Cl. D7—*03*

U.S. Cl. D7—152

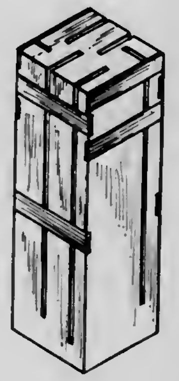


240,496

KNIFE HOLDER

Allan E. Schultz, 12049 Stony Creek, Milan, Mich.
48160, and Stewart Gordon, 1319 S. Forest, Ann Arbor,
Mich. 48104
Filed Nov. 4, 1974, Ser. No. 520,561
Term of patent 14 years
Int. Cl. D7—*06*

U.S. Cl. D7—74

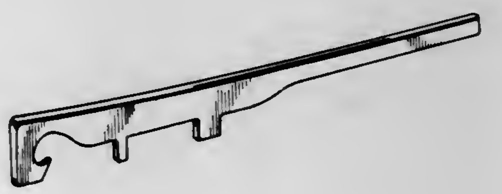


240,497

CAN OPENER PUNCH

Ferris E. Riba, 3722 E. Milton,
Tucson, Ariz. 85706
Filed Sept. 18, 1974, Ser. No. 507,233
Term of patent 14 years
Int. Cl. D7—*99*

U.S. Cl. D8—18

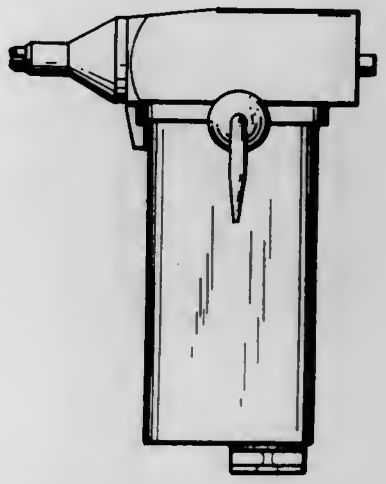


240,498

WIRE INSERTER

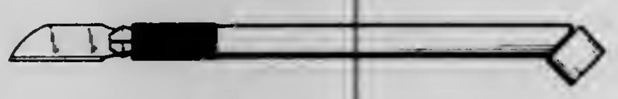
Carl L. Foltz, Briarhill Lane, Holiday, Fla. 33589;
Vernon H. Troutner, 4805 37th St., St. Petersburg,
Fla. 33711; and Arthur F. Trott, 3538 Grove St.,
Clearwater, Fla. 33515
Filed Oct. 29, 1975, Ser. No. 626,822
Term of patent 14 years
Int. Cl. D8—*05*

U.S. Cl. D8—68



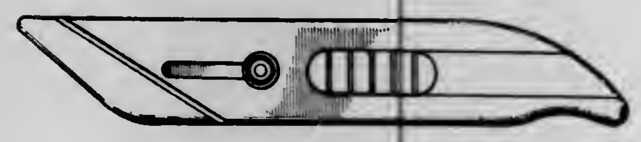
240,499
CUTTING AND ROLLING TOOL
**Morris L. Souders, R.R. 1, Box 251, Prairie Drive,
Bloomington, Ind. 47401
Filed Feb. 3, 1975, Ser. No. 546,267
Term of patent 14 years
Int. Cl. D8—*03***

U.S. Cl. D8—98



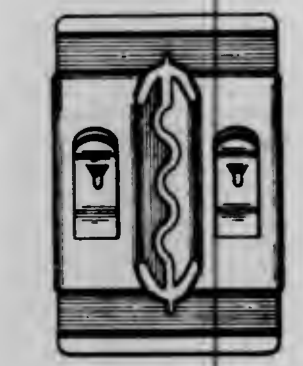
240,500
ADJUSTABLE BLADE KNIFE HANDLE
**James L. Richards, Rosemead, Calif., assignor to Pacific
Handy Cutter, Inc., Costa Mesa, Calif.
Filed July 2, 1975, Ser. No. 592,547
Term of patent 14 years
Int. Cl. D8—*03***

U.S. Cl. D8—99



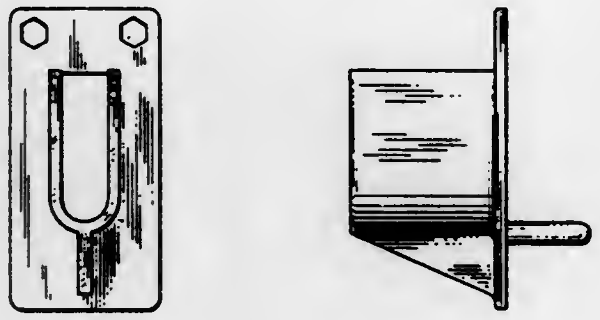
240,501
SIGN CLIP
**Richard A. Carroll, North Providence, R.I., assignor to
The Lorac Company, Inc.
Filed Apr. 7, 1975, Ser. No. 565,758
Term of patent 14 years
Int. Cl. D8—*08***

U.S. Cl. D8—245



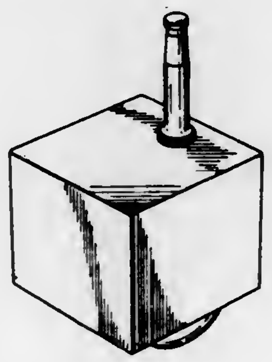
240,502
SHELF END MOUNTING BRACKET
**Charles R. Daniels, 256 Sudbury Drive,
Atlantis, Fla. 33406
Filed Apr. 21, 1975, Ser. No. 570,252
Term of patent 14 years
Int. Cl. D8—*08***

U.S. Cl. D8—255



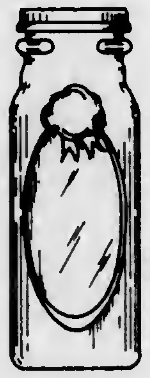
240,503
BLOCK CASTER
**Donald C. Crescenzi, Branford, and Eleanor S. Michaud,
Nichols, Conn., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed Dec. 9, 1974, Ser. No. 530,702
Term of patent 14 years
Int. Cl. D8—*09***

U.S. Cl. D8—226



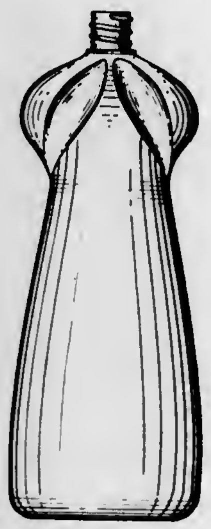
240,504
BOTTLE
**Charles S. Hayes, Chicago, Ill., assignor to
Charles S. Hayes, Chicago, Ill.
Filed Mar. 15, 1973, Ser. No. 341,507
Term of patent 3½ years
Int. Cl. D9—*01***

U.S. Cl. D9—83



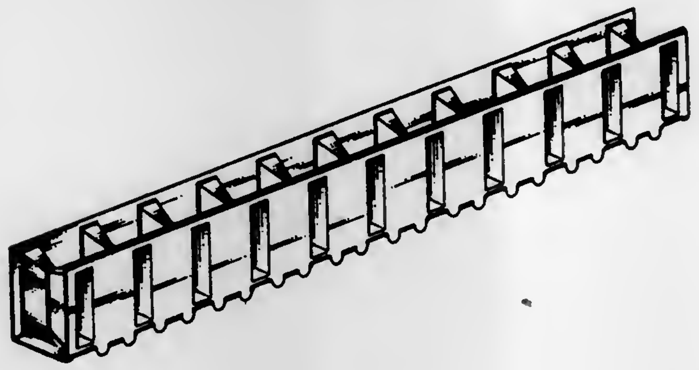
240,505
BOTTLE
**Victor Koenigsberg, Franklin Square, N.Y., assignor to
Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,971
Term of patent 14 years
Int. Cl. D9—*01***

U.S. Cl. D9—90



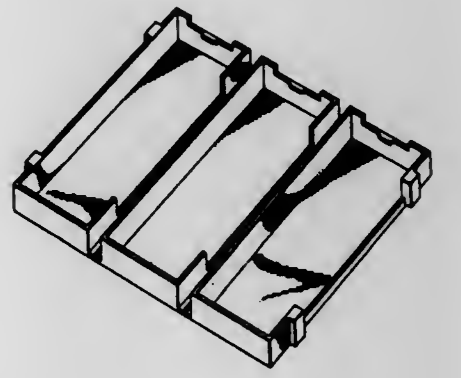
240,506
COMPARTMENTED PACKAGING CONTAINER
**Wayne L. Congleton, Whittier, Calif., assignor to
Dolco Packaging Corporation
Filed Dec. 26, 1974, Ser. No. 536,506
Term of patent 14 years
Int. Cl. D9—*03***

U.S. Cl. D9—184



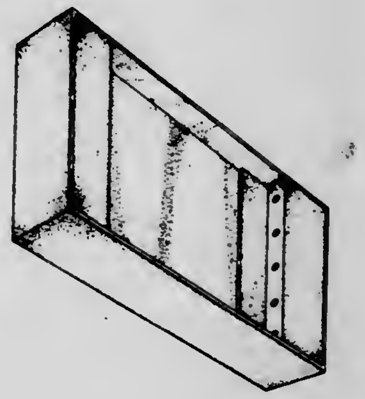
240,507
PACKAGING TRAY FOR CONTAINING AND DISPENSING RAZOR BLADE UNITS
**Christopher J. Hood, Tolworth, England, assignor to
Wilkinson Sword Limited
Filed May 20, 1974, Ser. No. 471,205
Claims priority, application Great Britain Nov. 29, 1973
Term of patent 14 years
Int. Cl. D9—*03***

U.S. Cl. D9—189



240,508
PACKAGING CONTAINER
**Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Company Limited, Sakae-machi, Kameyama, Mie, Japan
Filed Jan. 15, 1975, Ser. No. 541,323
Claims priority, application Japan Sept. 2, 1974
Term of patent 7 years
Int. Cl. D9—*03***

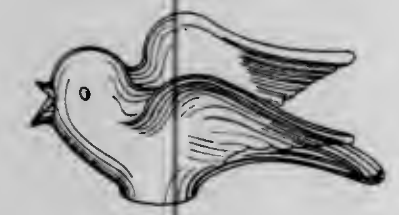
U.S. Cl. D9—224

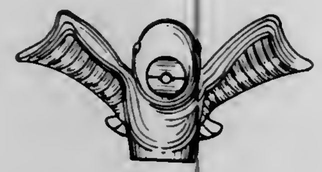


240,509
ACTUATOR CAP FOR A PRESSURIZED CONTAINER

Alvydas Velicka, Watertown, and Walter Makauskas, Prospect, Conn., assignors to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed May 13, 1974, Ser. No. 469,547
Term of patent 14 years
Int. Cl. D9—*07*

U.S. Cl. D9—258

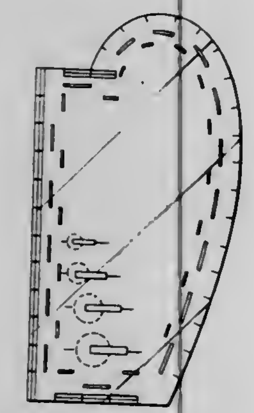




240,510
GARMENT DESIGNING STENCIL

Marie Irene Solange Brien, 45 Hermes Ave., Candiac, Quebec, Canada
Filed May 14, 1974, Ser. No. 469,824
Claims priority, application Canada Mar. 12, 1974
Term of patent 14 years
Int. Cl. D10—*04*

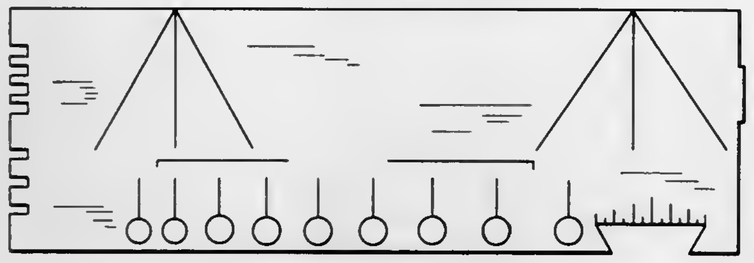
U.S. Cl. D10—64



240,511
CHAIN SAW GAUGE

Elof Granberg, 530 Canal St., San Rafael, Calif. 94901
Filed Jan. 13, 1975, Ser. No. 540,423
Term of patent 14 years
Int. Cl. D10—*04*

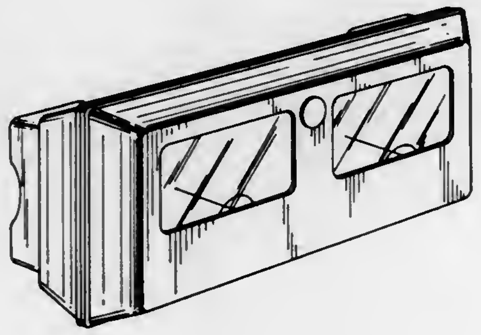
U.S. Cl. D10—64



240,512
ELECTRONIC BICYCLE SPEEDOMETER

David E. Erisman, 515 S. Maguire, Warrensburg, Mo. 64093
Filed Oct. 15, 1974, Ser. No. 514,469
Term of patent 14 years
Int. Cl. D10—*04*

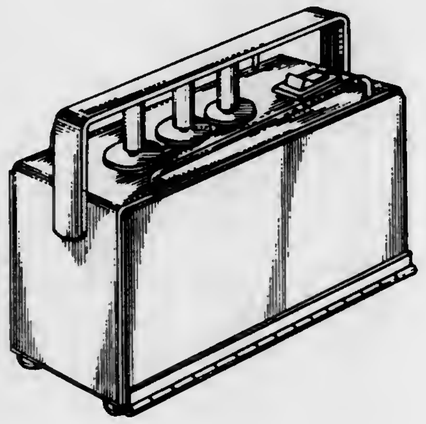
U.S. Cl. D10—98



240,513
BURGLAR ALARM

Maxey A. Hankins, Encino, Calif., assignor to Mole-Richardson Co.
Filed Nov. 25, 1974, Ser. No. 526,624
Term of patent 14 years
Int. Cl. D10—*06*

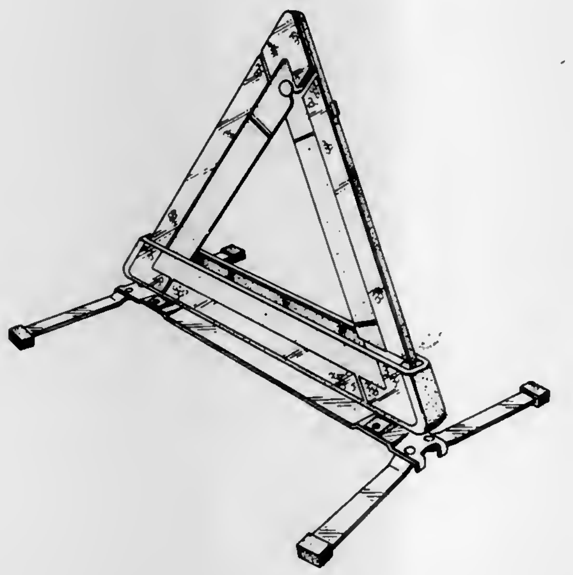
U.S. Cl. D10—106



240,514
FOLDABLE EMERGENCY WARNING SIGNAL

Peter E. Brudy, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 17, 1975, Ser. No. 541,847
Term of patent 14 years
Int. Cl. D10—*06*

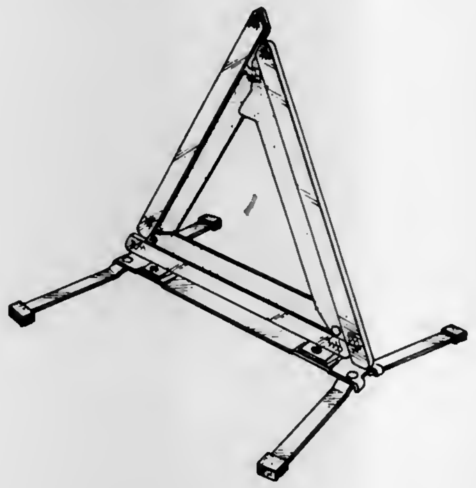
U.S. Cl. D10—111



240,515
FOLDABLE EMERGENCY WARNING SIGNAL

Kenneth J. Crompton, Willowdale, Ontario, and Theodore Hochstatter, Etobicoke, Ontario, Canada, assignors to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 17, 1975, Ser. No. 541,848
Term of patent 14 years
Int. Cl. D10—*06*

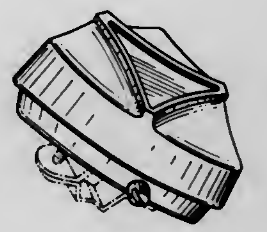
U.S. Cl. D10—111



240,516
BUZZER FOR BICYCLES AND THE LIKE

Hisashi Saitou, Kasugai, Japan, assignor to Kabushiki Kaisha Saikosha Seisakusho, Kasugai, Aichi, Japan
Filed Aug. 16, 1974, Ser. No. 498,007
Term of patent 14 years
Int. Cl. D10—*06*

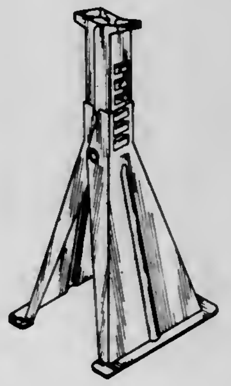
U.S. Cl. D10—116



240,517
AUTOMOTIVE JACK STAND

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Apr. 17, 1975, Ser. No. 569,063
Term of patent 14 years
Int. Cl. D12—*05*

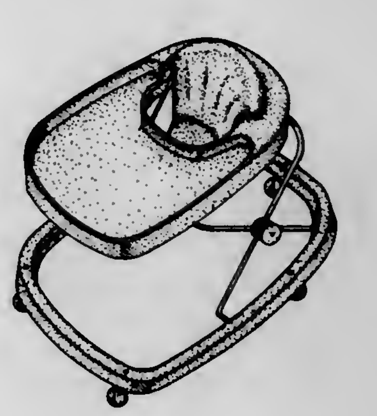
U.S. Cl. D12—55



240,518
BABY WALKER

Hajime Ishida, 9-10 Tateishi 7-chome, Katsushika-ku, Tokyo, Japan
Filed July 7, 1975, Ser. No. 593,239
Term of patent 14 years
Int. Cl. D12—*12*

U.S. Cl. D12—130



240,519

SET OF AUTOMOBILE LOUVRE ACCESSORIES

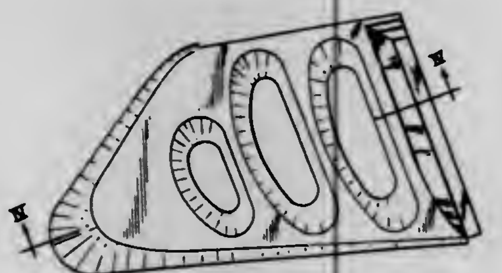
Hyman R. Richter and Robert I. Demaray, Hamilton, Ontario, Canada, assignors to Bay-King Motors (1968) Ltd., Hamilton, Ontario, Canada

Filed Aug. 24, 1973, Ser. No. 391,209

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—155



240,520

SILO DOME

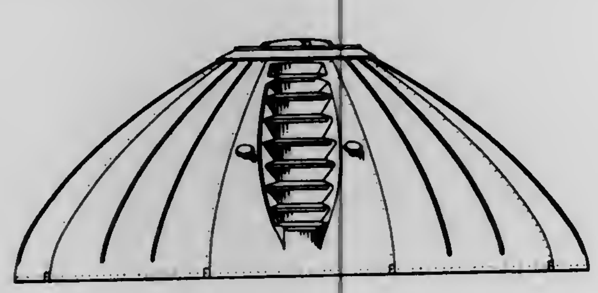
Marion E. Hutchison, 1241 Ackermant St., Waterloo, Iowa 50701; Vernon O. Thomas, R.R. 2, Charles City, Iowa 50616; and William D. Shafar, 405 W. Plum, West Union, Iowa 52175

Filed Feb. 25, 1974, Ser. No. 445,203

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—56



240,521

UTILITY BUILDING OR SIMILAR CONSTRUCTION

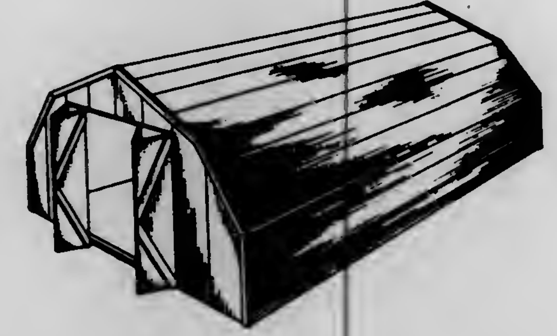
James T. Cribben, Mechanicsburg, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.

Filed May 21, 1973, Ser. No. 362,020

Term of patent 14 years

Int. Cl. D25—*03*

U.S. Cl. D25—22



240,522

STATION FOR ELEVATED RAILWAY

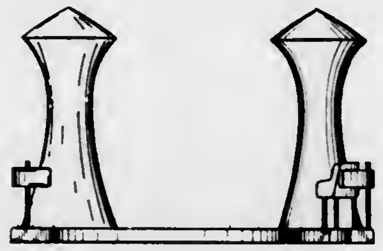
Lawrence K. Edwards, 565 Arastradero Road, Palo Alto, Calif. 94306

Filed Oct. 5, 1973, Ser. No. 403,925

Term of patent 14 years

Int. Cl. D25—*99*

U.S. Cl. D25—35



240,523

MENU COVER

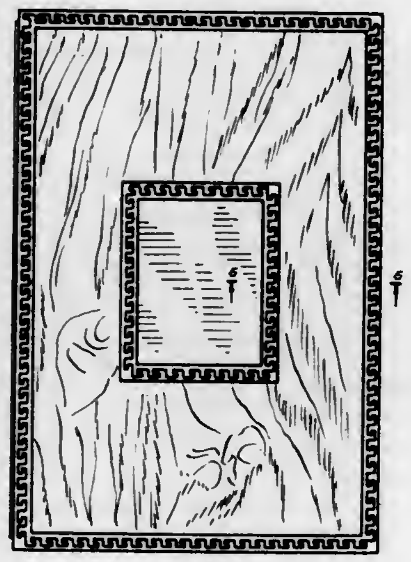
Theodor Box, 1108 Aileen Road, Brielle, N.J. 08730

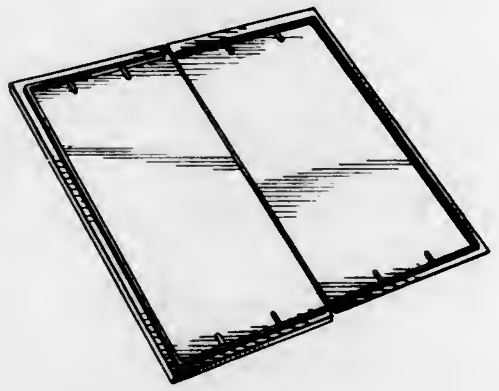
Filed Nov. 5, 1974, Ser. No. 521,078

Term of patent 14 years

Int. Cl. D19—*04*

U.S. Cl. D19—26





240,524

BALL-POINT PEN

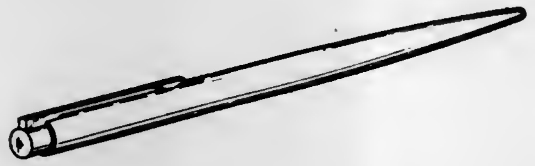
Alain Carre, Paris, France, assignor to Waterman, S.A., Paris, France

Filed June 19, 1974, Ser. No. 480,834

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—45



240,525

PEN

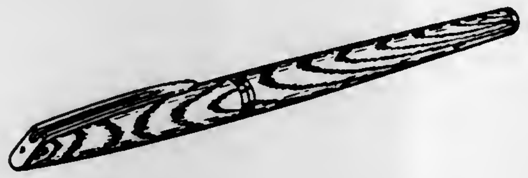
Eugene Defores, Nantes, France, assignor to Waterman, S.A., Paris, France

Filed June 19, 1974, Ser. No. 480,694

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—47



240,526

WRITING INSTRUMENT

Franco Verona, Turin, Italy, assignor to Aurora S.p.A., Turin, Italy

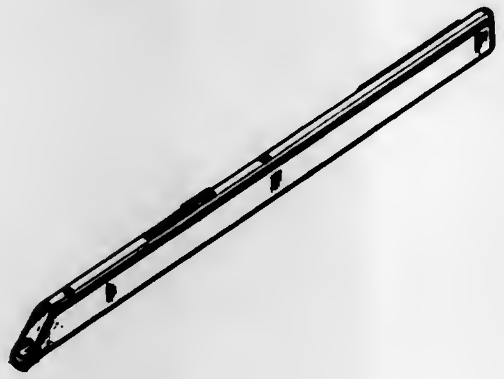
Filed Oct. 24, 1974, Ser. No. 517,719

Claims priority, application Italy May 6, 1974

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—51



240,527

SIGHT FOR AN ARCHERY BOW

Goro Nishikata, Kawasaki, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

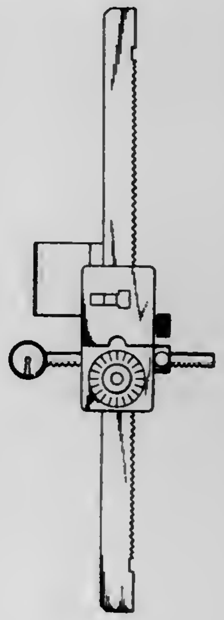
Filed Aug. 29, 1974, Ser. No. 502,041

Claims priority, application Japan Mar. 8, 1974

Term of patent 14 years

Int. Cl. D22—*05*

U.S. Cl. D22—5



240,528

ARTIFICIAL FISHING LURE

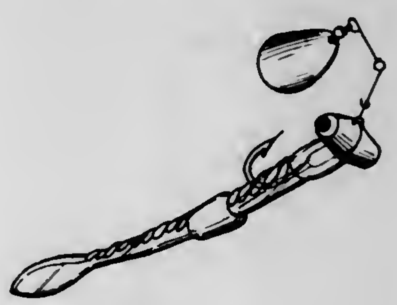
Robert K. Harris, Charlotte, N.C., assignor to Ringley & Crockett, Inc., Charlotte, N.C.

Filed June 24, 1974, Ser. No. 482,457

Term of patent 14 years

Int. Cl. D22—*05*

U.S. Cl. D22—27



240,529

TARGET MARKER

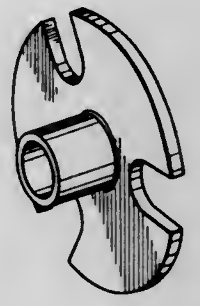
George Hinson-Rider, 300 Circle Drive, Santa Fe, N. Mex. 87501

Filed July 1, 1974, Ser. No. 484,625

Term of patent 7 years

Int. Cl. D22—*04*

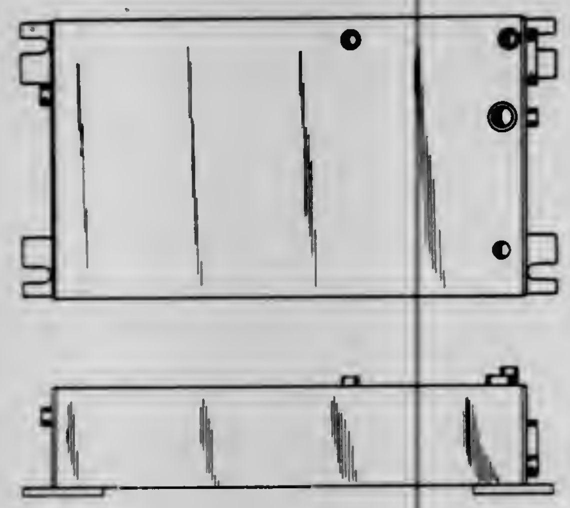
U.S. Cl. D22—99



240,530

FLUID RESERVOIR FOR PUMPS OR THE LIKE

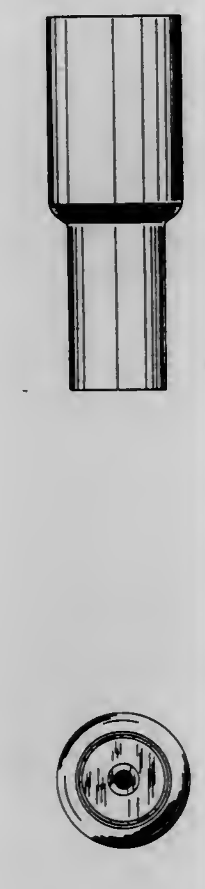
Philip A. Kubik, 6809 Spruce Drive,
Birmingham, Mich. 48010
Filed May 8, 1975, Ser. No. 575,586
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



240,531

PORTABLE WATER PURIFIER

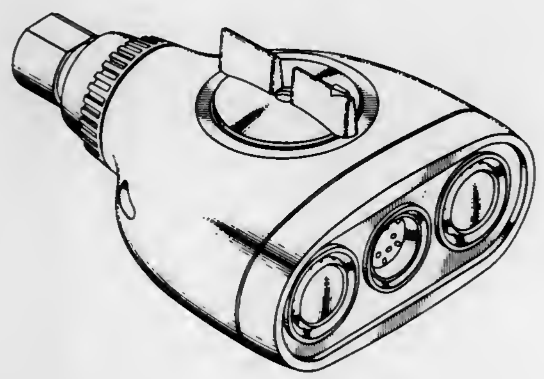
Kenneth W. Elkington, Coral Springs, Fla.
(6991 Ford Station Road, Germantown, Tenn. 38138)
Filed June 10, 1974, Ser. No. 478,177
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



240,532

SHOWER SPRAY HEAD

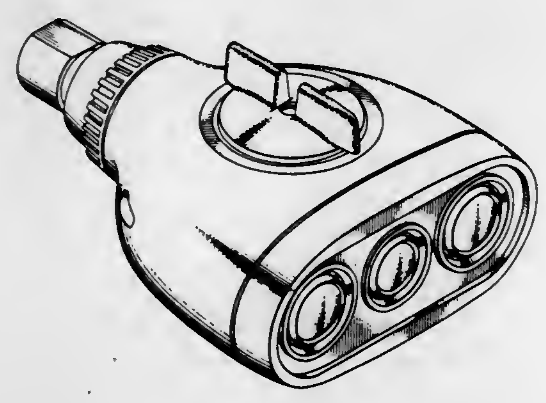
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed Apr. 9, 1975, Ser. No. 566,445
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



240,533

SHOWER SPRAY HEAD

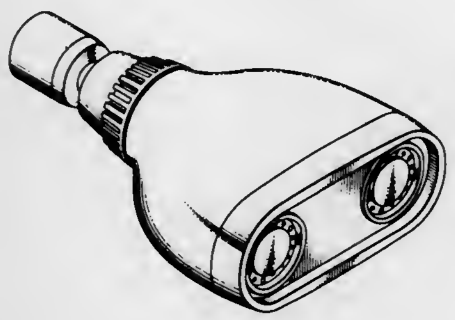
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed May 19, 1975, Ser. No. 578,497
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



240,534

SHOWER SPRAY HEAD

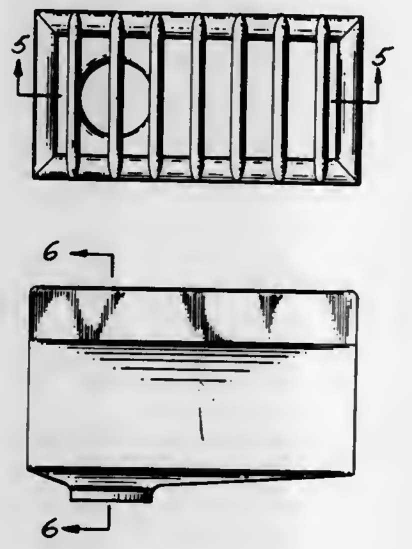
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed July 10, 1975, Ser. No. 589,861
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



240,535

FLOOR TOILET OR THE LIKE

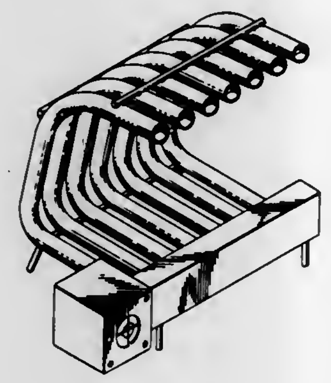
Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering, City of Industry, Calif.
Filed Mar. 10, 1975, Ser. No. 557,022
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67



240,536

COMBINED AIR CONVECTOR AND LOG SUPPORT FOR FIREPLACES

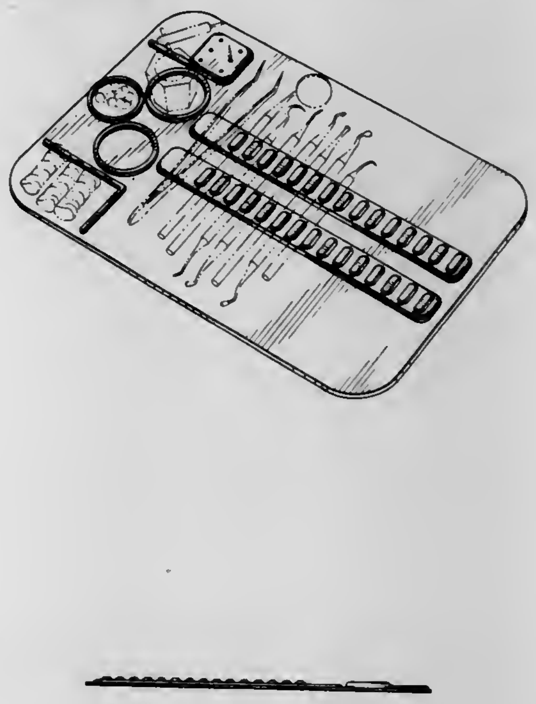
Reuben L. Christophel, Harrisonburg, Va., assignor to Shenandoah Manufacturing Company, Inc.
Filed June 5, 1975, Ser. No. 584,022
Term of patent 14 years
Int. Cl. D7—*08*; D23—*03*
U.S. Cl. D23—94



240,537

TRAY FOR HOLDING DENTAL EQUIPMENT AND SUPPLIES

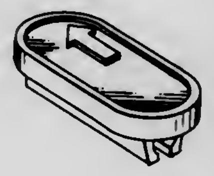
Robert M. Sronce, Lake Isabella, Calif., assignor to Johnson Pet-Dor, Inc., d.b.a. J & S Products
Filed Mar. 21, 1975, Ser. No. 560,673
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 R



240,538

IGNITION INDUCTION COUPLER FOR INTERNAL COMBUSTION ENGINE OR THE LIKE

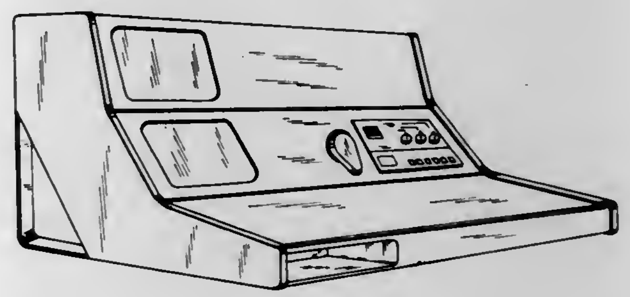
Delbert N. Wall, Box 848, Burlington, Colo. 80807
Filed Feb. 21, 1974, Ser. No. 444,471
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



240,539

AUDIO VISUAL CONTROL

Erle B. Savage, Jr., 2406 Woodwinds Lane,
Wayzata, Minn. 55391
Filed Nov. 18, 1974, Ser. No. 524,983
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

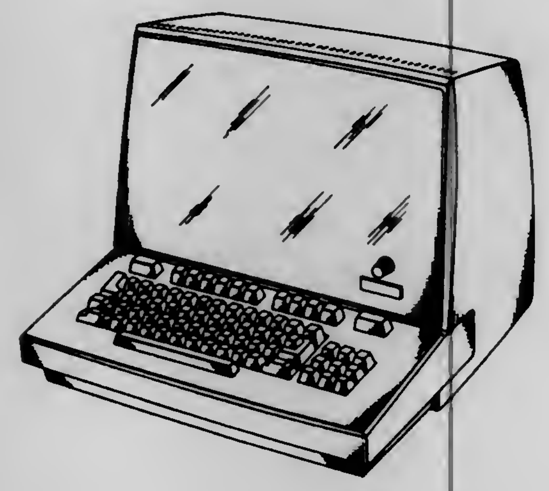


240,540

COMPUTER TERMINAL

Ronald E. Loosen, Malibu, Calif., assignor to
Xerox Corporation, Stamford, Conn.
Filed Dec. 11, 1974, Ser. No. 531,847
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D26—5 C



240,541

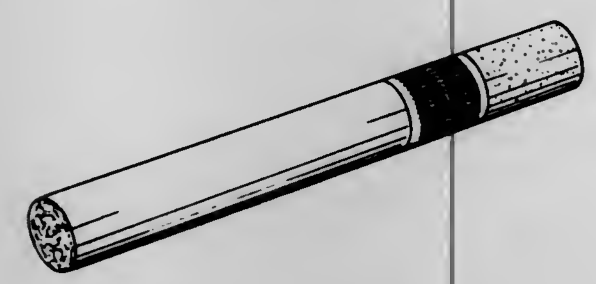
CIGARETTE

John P. Rupert, Stellenbosch, Cape Province, Republic of South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland

Continuation of design application Ser. No. 252,958, May 12, 1972. This application Mar. 5, 1974, Ser. No. 448,232

Claims priority, application Republic of South Africa
Mar. 14, 1972
Term of patent 14 years
Int. Cl. D27—*01*

U.S. Cl. D27—1

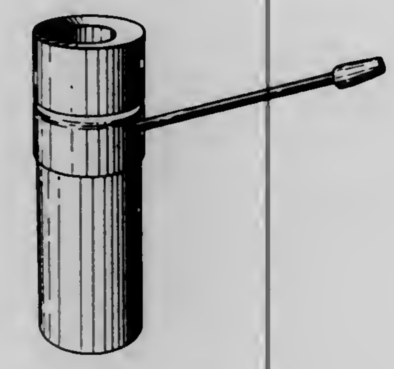


240,542

SMOKING PIPE

Joseph E. Murray, Jr., 27 Alpine St.,
Malden, Mass. 02148
Filed Jan. 15, 1975, Ser. No. 541,289
Term of patent 14 years
Int. Cl. D27—*02*

U.S. Cl. D27—3

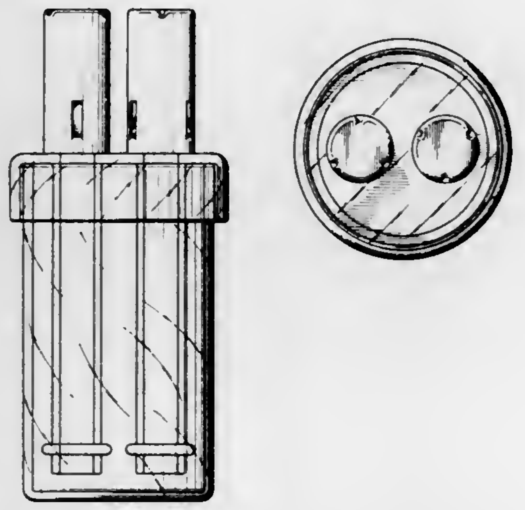


240,543

CELL CULTURE VESSEL OR THE LIKE

Robert Dragotta, Vineland, N.J., assignor to
Bio-Research Glass, Inc., Vineland, N.J.
Filed Oct. 2, 1974, Ser. No. 511,188
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D32—1 R

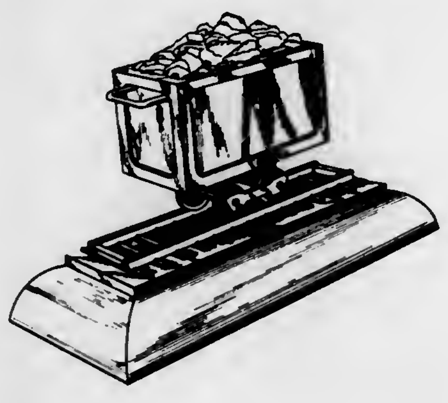


240,544

MINIATURE TRAMWAY CAR AND PLATFORM THEREFOR

Harold J. Howard, P.O. Box 914, Dillon, Colo. 80435
Filed June 24, 1974, Ser. No. 482,758
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 MM

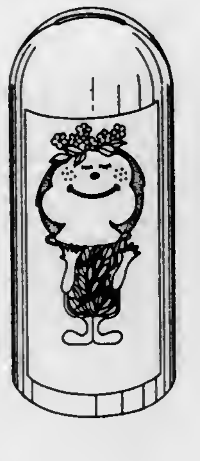


240,545

BANK

Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku,
Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,864
Term of patent 14 years
Int. Cl. D31—*00*

U.S. Cl. D34—11 R

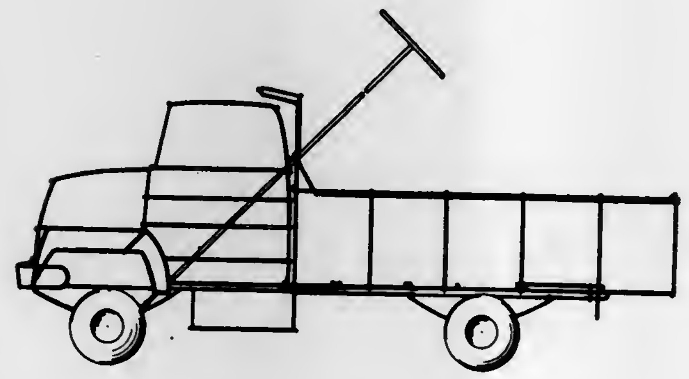


240,546

TOY AUTOMOTIVE VEHICLE

Marouf Nashagh, 335 Hawthorne Ave.,
Hawthorne, N.J. 07506
Filed Feb. 22, 1974, Ser. No. 444,755
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 AJ

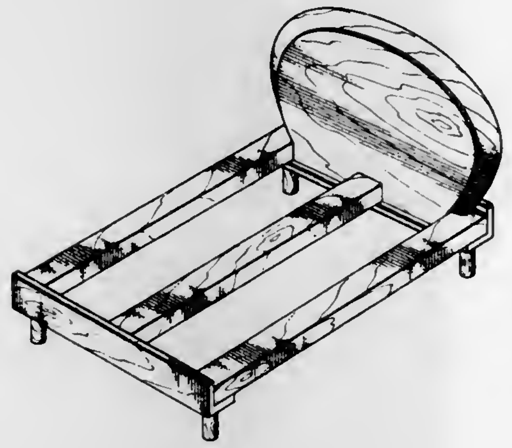


240,547

TOY BED

Bliss W. Stanley and Edmee M. Stanley, both of 1137 N.
Overlook Ridge Road, Diamond Bar, Calif. 91765
Filed Dec. 9, 1974, Ser. No. 530,524
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 AC

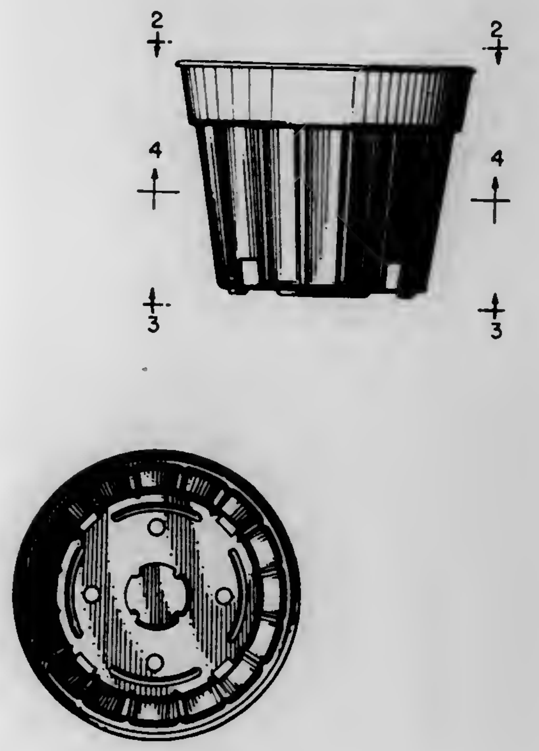


240,548

PLANT CONTAINER

Darrell E. Messick, Sunnyvale, Calif., assignor to
Geo. J. Ball, Inc., West Chicago, Ill.
Filed Apr. 17, 1975, Ser. No. 569,281
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D35—3 R

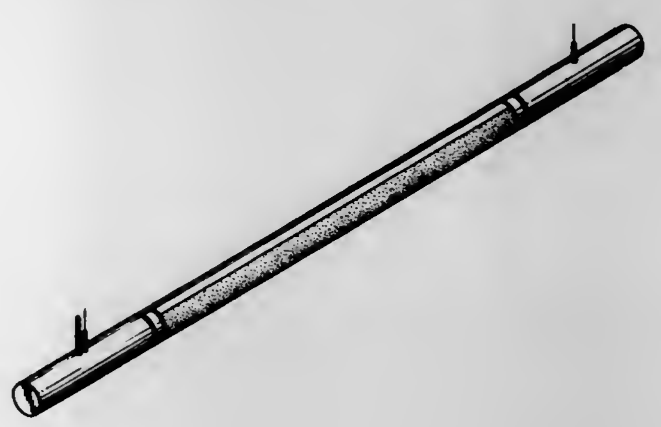


240,549

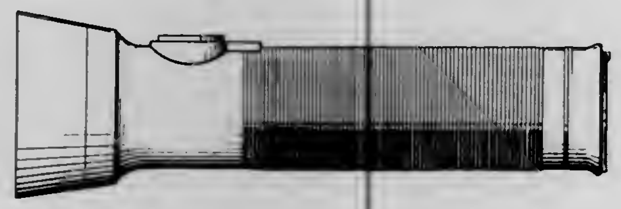
LIGHTING FIXTURE

Zia Eftekhar, Glendale, Calif., assignor to
Lightolier Incorporated, Jersey City, N.J.
Filed June 20, 1975, Ser. No. 588,803
Term of patent 14 years
Int. Cl. D26—*05*

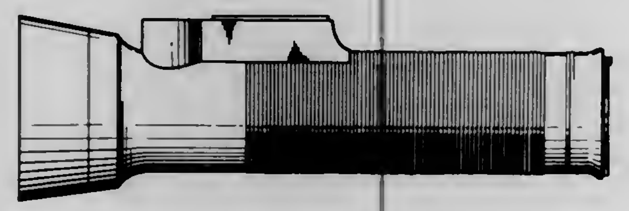
U.S. Cl. D48—23 R



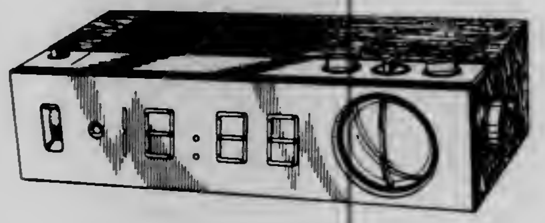
240,550
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,705
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



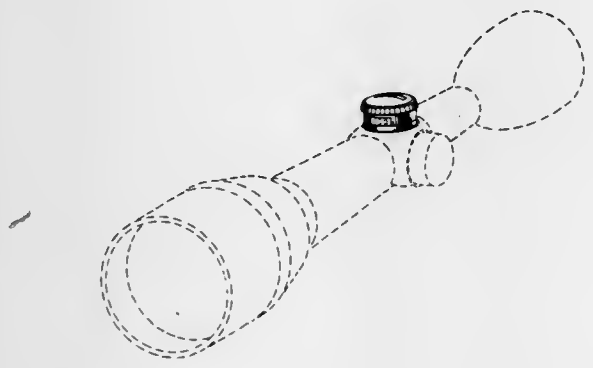
240,551
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,706
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



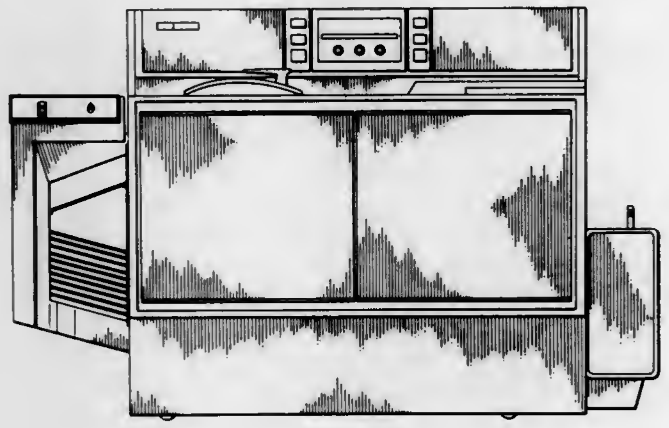
240,552
DIGITAL CLOCK RADIO
Masanori Hamada, Moriguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,730
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



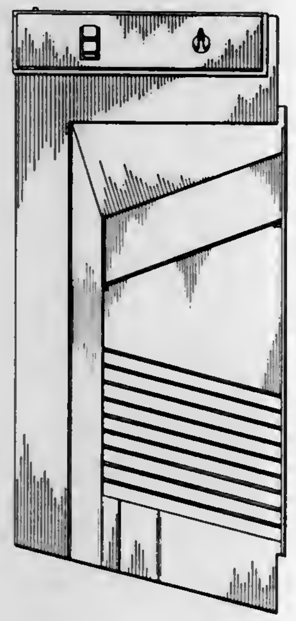
240,553
RIFLESCOPE ELEVATION ADJUSTMENT ASSEMBLY
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Jan. 2, 1975, Ser. No. 538,086
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



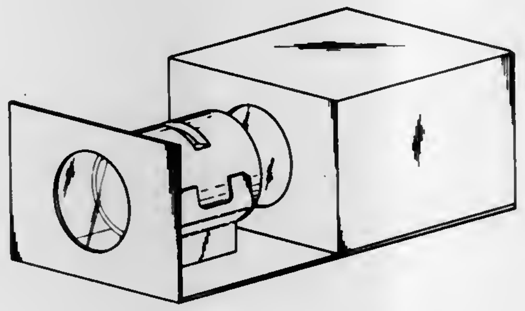
240,554
DUPLICATING MACHINE WITH SORTER
Thomas R. Cross, Rochester, Clifford L. George, Macedon, and Jacob W. Patla, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 22, 1974, Ser. No. 526,286
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



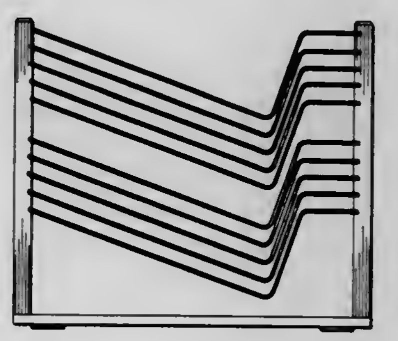
240,555
SORTER
Thomas R. Cross, Rochester, Clifford L. George, Macedon, and Jacob W. Patla, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 22, 1974, Ser. No. 526,287
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D16—32

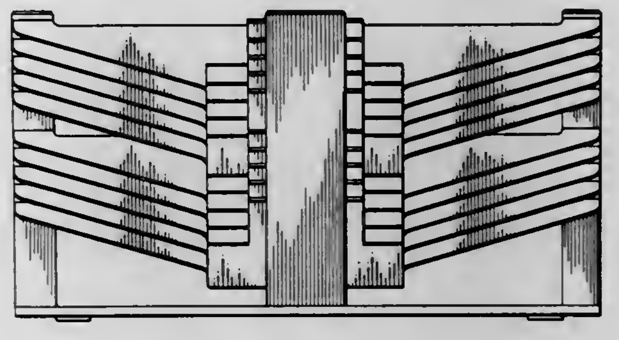


240,556
LENS VIEWER
Stanley Kirk, 3619 Lynn Lane, Wantagh, N.Y. 11793
Filed Dec. 23, 1974, Ser. No. 535,204
Term of patent 3½ years
Int. Cl. D10—*04;* D16—*05*
U.S. Cl. D10—81

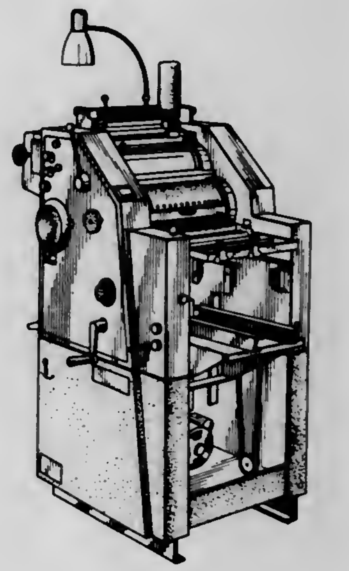


240,557
TRAY RACK
Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Continuation-in-part of design application Ser. No. 319,834, Dec. 29, 1972, now Patent No. 236,030. This application Sept. 16, 1974, Ser. No. 506,383
Term of patent 14 years
Int. Cl. D16—*05;* D18—*99*
U.S. Cl. D16—32

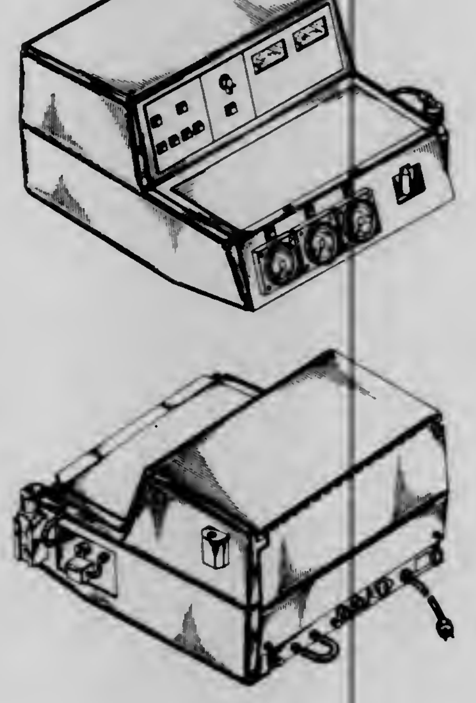




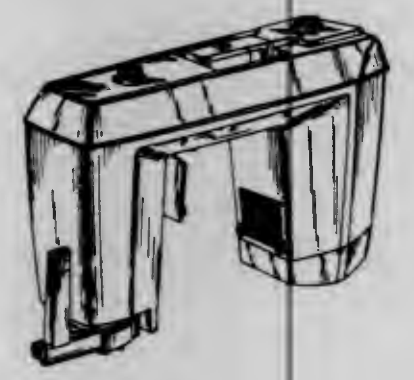
240,558
OFFSET PRINTING MACHINE
Takeshi Shohoji, Fukuyama, and Etsuo Hiraishi, Hiroshima-ken, Japan, assignors to Ryobi, Ltd., Fuchu, Hiroshima, Japan
Filed Nov. 27, 1974, Ser. No. 527,778
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



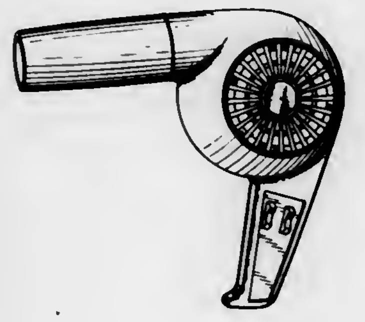
240,559
PERITONEAL DIALYSIS UNIT OR THE LIKE
Harold H. Kawaguchi, Seattle, Wash., assignor to Physio-Control Corporation
Filed July 11, 1974, Ser. No. 487,469
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



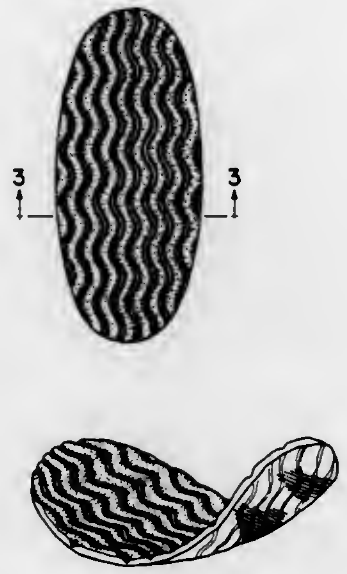
240,560
HYDROTHERAPY UNIT FOR BATH TUBS
Henry J. Talge, Leawood, and James M. Gerdom, Overland Park, Kans., assignors to Whirl-O-Matic Corporation, Kansas City, Mo.
Filed Sept. 5, 1975, Ser. No. 610,618
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 C



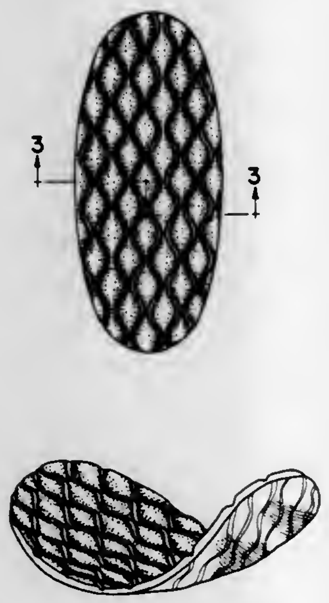
240,561
HAIR DRYER
Raymond W. Dybala, Chicago, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 14, 1974, Ser. No. 433,334
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



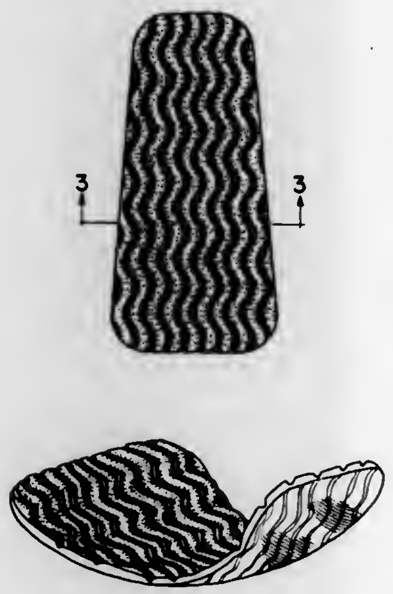
240,562
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,725
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A



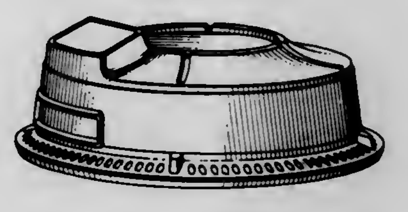
240,563
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,726
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A



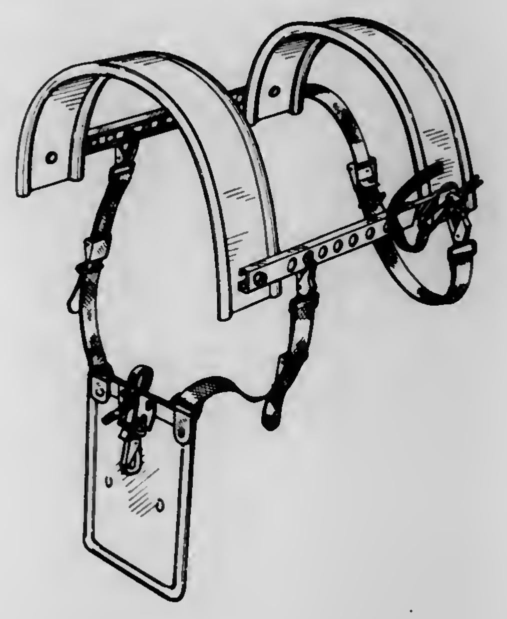
240,564
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,727
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A



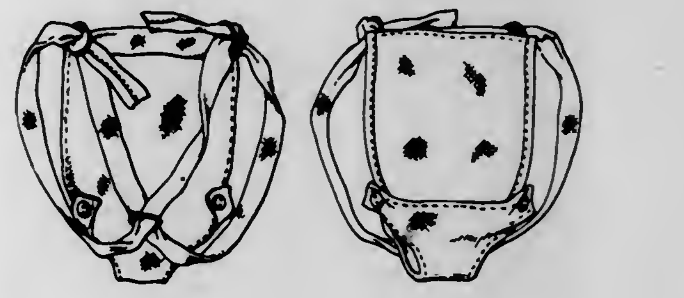
240,565
HAIR DRYER BASE
Douglas Long, Lombard, and Bernard B. Bluestein, Des Plaines, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 10, 1975, Ser. No. 540,019
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



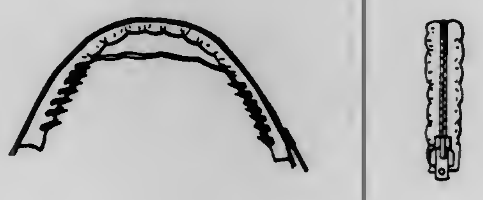
240,566
CARRYING HARNESS
Ingvar Westerberg, Vretvagen 39, S-352 47 Vaxjo, Sweden
Filed Oct. 9, 1974, Ser. No. 513,496
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



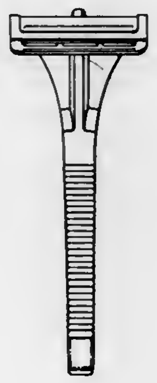
240,567
DOLL CARRIER
Susan Tatum, 34 E. 3rd St., New York, N.Y. 10003
Filed Nov. 6, 1974, Ser. No. 521,257
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 A



240,568
PURSE GUARD
Robert Grant Ammons, Sr., 1533 Northwick Road,
Baltimore, Md. 21218
Filed Oct. 8, 1974, Ser. No. 513,122
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—2 R



240,569
SAFETY RAZOR
Tatsuya Saito, Seki, Japan, assignor to Sanwa
Cutlery Co., Ltd., Tokyo, Japan
Filed Oct. 25, 1974, Ser. No. 518,176
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: *See—*
  - Redd, James B., 3,969,183.
- A-T-O Inc.: *See—*
  - Sievenpiper, Ward, 3,968,976.
- AB Bofors: *See—*
  - Malm, Karl Olof Bertil, 3,968,749.
- AB Teleplan: *See—*
  - Nordlof, Karl Gustav Gosta Lennart, 3,969,673.
- AB Volvo: *See—*
  - Karlsson, Sven Torgny, 3,968,559.
- Abbott Laboratories: *See—*
  - Criswell, Larry Grant, 3,969,336.
- Abe, Masao: *See—*
  - Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, 3,969,211.
- Abe, Nobuhiro: *See—*
  - Miyano, Seiji; and Abe, Nobuhiro, 3,969,409.
- Abt, Ed: *See—*
  - Burford, Milton K.; Mattis, Joseph F.; Gratton, Peter D.; Donahue, William J.; Halling, Michael A.; Pinkerton, Ken; Cammack, Thomas A.; Bernardin, Rodney A.; Johnson, Lee; Lohmann, Art; and Abt, Ed, 3,968,748.
- ABU Aktiebolag: *See—*
  - Murvall, Ake Eugen, 3,968,943.
- ACF Industries, Incorporated: *See—*
  - Thausing, Heinrich E.; and Wallis, Roger G., 3,969,041.
- Achenbach, Dieter: *See—*
  - Kolb, Walter; and Achenbach, Dieter, 3,968,820.
- Ackermann, Jacob; and Radici, Pierino, to Societa' Italiana Resine S.p.A. Method of purifying polymerizable organic substances. 3,969,344, Cl. 260-239.30A.
- Acuncius, Dennis S.; and Matthews, Steven J., to Cabot Corporation. Alloy compositions. 3,969,111, Cl. 75-171.000.
- Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., to Boots Company Limited, The. Phenylalkanoic acids. 3,969,402, Cl. 260-520.00R.
- Addison, Harry J., Jr.: *See—*
  - Kowalick, James F.; Hare, George F.; and Addison, Harry J., Jr., 3,968,724.
- Addressograph Multigraph Corporation: *See—*
  - McCabe, Peter, 3,969,742.
- Ado, Kazuaki: *See—*
  - Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, 3,969,494.
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  - Urbach, Hans; and Adolphi, Heinrich, 3,969,439.
- Advent Corporation: *See—*
  - Hergenrother, George R.; and Kloss, Henry E., 3,969,648.
- Aeronutronic Ford Corporation: *See—*
  - Gorski, Daniel A., 3,969,743.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
  - de Witte, Olivier; Eranian, Armand; and Dezauzier, Pierre, 3,969,684.
  - Poty, Bernard; Leroy, Jacques; and Jachimowicz, Leon, 3,969,013.
- Agency of Industrial Science & Technology: *See—*
  - Fujii, Kinjiro; and Kondo, Wakichi, 3,969,493.
  - Ishikawa, Toshio; Hayakawa, Takashi; Nishimura, Tsutomu; Araki, Michio; and Takehira, Katsuomi, 3,969,428.
  - Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, 3,969,494.
- AGFA-Gevaert, A.G.: *See—*
  - Winkler, Alfred; Eggering, Albert; Stenzenberger, Volkmar; and Wilsch, Herbert, 3,968,878.
- AGFA-GEVAERT N.V.: *See—*
  - Smolderen, Albert Emiel; and Cappuyns, Joseph Marie, 3,968,926.
  - Timmerman, Daniel Maurice; and De Winter, Walter Frans, 3,969,283.
  - Van Biesen, Jozef Antoon; and Van den Bogaert, Jan, 3,969,624.
- Ahntholz, Herbert, to Litton Systems, Inc. Line isolation monitor and alarm. 3,969,711, Cl. 340-255.000.
- Aisan Kogyo Kabushiki Kaisha: *See—*
  - Sakai, Toshimitsu; Saito, Tadashi; and Suzuki, Isamu, 3,969,045.
- Aishima, Itsuho; Takashi, Yukichi; Katayama, Yoshihiko; Arimoto, Kenji; and Matsumoto, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic composite compositions. 3,969,313, Cl. 260-40.00R.
- Ajinomoto Co., Inc.: *See—*
  - Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Hirose, Yoshio, 3,969,188.
- Ajinomoto Co., Ltd.: *See—*
  - Saito, Tadaomi; Matsuzawa, Yoshimasa; Ninagawa, Sadayoshi; Honna, Masao; Takesada, Masahiko; and Takehara, Masahiro, 3,969,087.
- Aksenov, Yakov Dmitrievich; Gumansky, Georgy Alexandrovich; Drako, Valery Mikhailovich; and Fedoseenko, Nikolai Konstantinovich. Metalloceramic current-conducting material and a method for preparing same. 3,969,278, Cl. 252-513.000.
- Aktiebolaget Carl Munters: *See—*
  - Meek, George W., 3,969,473.
- Aktiebolaget Svenska Flaktfabriken: *See—*
  - Strindehag, Ove; and Holmberg, Roy, 3,968,833.
- Aktiebolaget Tudor: *See—*
  - Eriksson, Tore, 3,969,141.
- Aktiengesellschaft Fr. Mettler's Sohne Maschinenfabrik: *See—*
  - Mettler, Hermann; and Aschwanden, Paul, 3,968,547.
- Akzo N.V.: *See—*
  - Hutton, Ronald Eric; Oakes, Vincent; and Iles, Brian Rodney, 3,969,319.
- Akzona Incorporated: *See—*
  - Roskott, Lodewijk; and Groenendaal, Arnoldus Adrianus Maria, 3,969,206.
  - Stinson, John M.; Mann, Horace C., Jr.; and Johnson, Dale H., 3,969,483.
  - van Andel, Eleonoor; Hilferink, Garrit J.; and Lendering, Theodorus P. J., 3,968,637.
- Alais, Michel: *See—*
  - Thomas, Pierre; and Alais, Michel, 3,969,149.
- Albany Novelty Mfg. Co.: *See—*
  - Dantowitz, Edward, 3,969,063.
- Albers, Bernd G.: *See—*
  - Fisher, Howard M.; and Albers, Bernd G., 3,969,061.
- Albert Singleton Corporation, The: *See—*
  - Singleton, Albert; and Neffenger, Carel H., 3,969,212.
- Albion Laboratories, Inc.: *See—*
  - Jensen, Ned L., 3,969,540.
- Albrethsen, Adrian E.; Hollander, Max L.; and Wetherill, William H., to Asarco Incorporated. Process for the recovery of antimony values from ores containing sulfo-antimony compounds of copper, and arsenic. 3,969,202, Cl. 204-105.00R.
- Alexander, Fred C., to Universal-Rundle Corporation. Actuating means for water closet flush tank. 3,968,525, Cl. 4-67.00R.
- All American Industries, Inc.: *See—*
  - Schlegel, William R.; and Hennessey, John J., 3,968,947.
- All-Steel Inc.: *See—*
  - Pergler, Charles C., 3,969,008.
- Allam, George A. Numeric display for Arabic speaking people. 3,968,583, Cl. 40-125.00E.
- Allen, Bobbie J.: *See—*
  - McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., 3,969,532.
- Allen-Bradley Company: *See—*
  - Ruppert, Arnold, 3,969,660.
- Allied Chemical Corporation: *See—*
  - Austin, Thomas E.; and Mason, Robert W., 3,969,487.
  - Gordon, Joseph; and Sukornick, Bernard, 3,969,486.
- Allied Tool Products, Inc.: *See—*
  - Carpenter, Edwin A., 3,968,549.
- Allis-Chalmers Corporation: *See—*
  - Ehrhardt, Benonie C., 3,968,859.
- Allmendinger, Jackson G., to Unistrut Corporation. Connector fixture. 3,968,624, Cl. 52-758.00F.
- Allori, Aldo: *See—*
  - Gaul, Edward M.; Allori, Aldo; and Hillstrom, Thomas, 3,969,034.
- Alontsev, Viktor Stepanovich: *See—*
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- Alphamedics Mfg. Corporation: *See—*
  - Catarious, Joseph; Bethke, Lyman; and Berman, Richard, 3,969,079.
- Altemare, Kenneth. Hair clip. 3,968,806, Cl. 132-48.00R.
- Altenschopfer, Theodor: *See—*
  - Batka, Heimold; and Altenschopfer, Theodor, 3,969,134.
- Aluma-Form Inc.: *See—*
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- Amann, Klaus; and Dienemann, Wolfgang, to Bosch-Siemens Hausgerate GmbH. Cooling arrangement for a no-frost refrigerator. 3,968,660, Cl. 62-275.000.
- Amano, Haruyuki: *See—*
  - Ohta, Yoshimoto; Hayashida, Yoshihiro; and Amano, Haruyuki, 3,969,000.
- Amano, Hitoshi; and Tsuchiya, Yoshifumi, to Takayuki Nomura. Overload safety device. 3,968,705, Cl. 74-424.80R.
- Amberg, Ralph G.: *See—*
  - Amberg, Stephen W.; and Amberg, Ralph G., 3,969,173.
- Amberg, Stephen W.; and Amberg, Ralph G., to Owens-Illinois, Inc. Method and apparatus for fabricating thermoplastic containers. 3,969,173, Cl. 156-218.000.
- Amchem Products, Inc.: *See—*
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- American Cyanamid Company: *See—*
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  - Brandt, Neill M.; and Deeg, Emil W., 3,969,023.
  - Shoulders, Kenneth R., 3,969,039.
- Amery, John Gordon, to RCA Corporation. Color image signal processing circuits. 3,969,757, Cl. 358-4.000.
- Amery, John Gordon, to RCA Corporation. Defect compensation systems. 3,969,759, Cl. 358-8.000.
- Ames, Ira R., Jr.: *See—*
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- AMF Incorporated: *See—*
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  - Neville, Richard Ernest Gartside, 3,968,904.
  - Terry, Ronald, 3,969,599.
- AMP Incorporated: *See—*
  - Clark, Donald George; and Brown, Ivan Godfrey Oliver, 3,968,548.
- Amselem, Armand, to Parcor. Process for the preparation of thieno [3,2-c] pyridine and thieno [2,3-c] pyridine. 3,969,358, Cl. 260-294.80C.
- Anderson, Arlynn Wesley, to Caterpillar Tractor Co. Vertical curing mold for tube-tires. 3,969,050, Cl. 425-40.000.
- Anderson Corporation: *See—*
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- Anderson Development Company: *See—*
  - Meyer, Jeffrey G., 3,969,272.
- Anderson Engineers, Inc.: *See—*
  - Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., 3,969,132.
- Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., to Anderson Engineers, Inc. Self-cleaning water table system. 3,969,132, Cl. 134-18.000.
- Anderson, John Dale; Lutz, Bruce Leo; and Garrison, Harold Keith, to Hesston Corporation. Stack-forming machine having uniform loading control. 3,968,634, Cl. 56-344.000.
- Anderson, Joseph C.; and Davitt, H. James, to Great Canadian Oil Sands Limited; and Sun Oil Company of Pennsylvania. Aerating tar sands-water mixture prior to settling in a gravity settling zone. 3,969,220, Cl. 208-11.0LE.
- Anderson, Kenneth E.: *See—*
  - Hunter, Jack A.; and Anderson, Kenneth E., 3,969,548.
- Anderson, Norman C., to Varian Associates. Brazing mixture for forming a corrosion-resistant vacuum-tight seal between a ceramic body and a refractory metal. 3,969,126, Cl. 106-290.000.
- Anderson, Terry M.; and Schumann, Reinhard, to Warner & Swasey Company, The. Central processing unit for use in a microprocessor. 3,969,724, Cl. 340-172.500.
- Ando, Yoshio: *See—*
  - Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, 3,969,211.
- Andress, Harry J., Jr., to Mobil Oil Corporation. Lubricant compositions containing benzotriazole derivatives as copper passivators. 3,969,237, Cl. 252-49.900.
- Andrew Corporation: *See—*
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- Archibald, John Leheup; White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother Limited. Hexahydroimidazo[1,5-A]pyridines. 3,969,528, Cl. 424-267.000.
- Arentzen, Einar M., to Dresser Industries, Inc. Continuous mining machine with a chain drive for the cutting head. 3,968,995, Cl. 299-76.000.
- Argoudelis, Alexander D.; and Reusser, Fritz, to Upjohn Company, The. Antibiotic U-48,266. 3,969,515, Cl. 424-118.000.
- Arima, Takeo, to Hochiki Corporation. Apparatus for picking up signal currents flowing through signal lines. 3,969,710, Cl. 340-253.00R.
- Arimoto, Kenji: *See—*
  - Aishima, Itsuho; Takashi, Yukichi; Katayama, Yoshihiko; Arimoto, Kenji; and Matsumoto, Koichi, 3,969,313.
- Arimura, Ichiro; Taniguchi, Hiroshi; and Yamamitsu, Chojuro, to Matsushita Electric Industrial Co., Ltd. Equipment for recording and reproducing color television signal. 3,969,755, Cl. 358-4.000.
- Arioli, Amedea; and Arioli, Lorenza. Apparatus for final immersion washing of fabrics. 3,968,664, Cl. 68-22.00R.
- Arioli, Lorenza: *See—*
  - Arioli, Amedea; and Arioli, Lorenza, 3,968,664.
- Arion, Nicolae Mihail, to Institutul de Proiectari Tehnologice Pentru Industria Chimica-Iprochim. Moving bed ion-exchange apparatus and operating method thereof. 3,969,243, Cl. 210-25.000.
- Armco Steel Corporation: *See—*
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- Armitage, Bernard J.: *See—*
  - Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 3,969,402.
- Armstrong, Arthur A., to Monsanto Company. Method of making an acrylic spinning solution. 3,969,305, Cl. 260-32.60N.
- Arnold Engineering Company: *See—*
  - Graf, Richard B.; Chant, Edward H., Jr.; and Marco, John F., 3,969,456.
- Arthur, William C.; and Steger, William W., to Storage Technology Corporation. Capstan control for a tape drive system. 3,969,663, Cl. 318-561.000.
- Asahara, Masaru; Toyonaga, Noriyasu; Ohyama, Hiroaki; Nakamura, Hiroshi; and Yoshizawa, Ryushiro, to Fujitsu Ltd. Band pass filter circuit with automatic bandwidth adjust. 3,969,678, Cl. 328-167.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
  - Aishima, Itsuho; Takashi, Yukichi; Katayama, Yoshihiko; Arimoto, Kenji; and Matsumoto, Koichi, 3,969,313.
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- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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- Asai, Osamu: *See—*
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- Asai, Takashi: *See—*
  - Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, 3,969,494.
- Asai, Takeji; and Yamazumi, Kaishu, to Kabushiki Kaisha Fujikoshi. Gas carburizing furnace. 3,968,957, Cl. 266-257.000.
- Asarco Incorporated: *See—*
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- Atia, Ali Ezzeldin: *See—*
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- Atkins, Jimmy G.: *See—*
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- Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle. Child's Teeter Totter. 3,968,962, Cl. 272-55.000.
- Atkins, Vonniebelle: *See—*
  - Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle, 3,968,962.
- Atkinson, Alan W., to TBA Industrial Products Limited. Glass compositions and fibers made therefrom. 3,969,121, Cl. 106-50.000.
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- Auge, Wolfgang: *See—*
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- Auracher, Franz, to Siemens Aktiengesellschaft. Photoresist layer waveguide coupling device. 3,969,014, Cl. 350-96.00C.
- Auriemma, Robert Sinbad. Underground drain pipe coupling. 3,968,654, Cl. 61-11.000.
- Austin-Gordon Design, Inc.: *See—*
  - Peva, Stanley W., Jr., 3,968,901.
- Austin, Thomas E.; and Mason, Robert W., to Allied Chemical Corporation. Process for synthesis of chlorodifluoroamine. 3,969,487, Cl. 423-351.000.
- Automatech Industries Inc.: *See—*
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- Automatisation - Sogemo: *See—*
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- Baardsen, Edward Lund, to Ford Motor Company. Method of welding galvanized steel. 3,969,604, Cl. 219-121.0LM.
- Baba, Shigeji: *See—*
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- Babcock-Hitachi Kabushiki Kaisha: *See—*
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- Bachler, Werner, to Leybold-Heraeus GmbH & Co. KG. Turbomolecular vacuum pump having a gas bearing-supported rotor. 3,969,042, Cl. 417-354.000.
- Bachmann, Mario E. Tablet dispenser. 3,968,902, Cl. 221-263.000.
- Bachofer, Henry L., to Sun Oil Company of Pennsylvania. Drum filling device. 3,968,819, Cl. 141-155.000.
- Baconnier, Emile Felix; and Delicheres, Francois. Device for distributing dyestuffs or other additional materials in extruders or the like. 3,969,053, Cl. 425-132.000.
- Bacquie, Serge B.; and Dagnaux, Jean G., to Societe Anonyme: Poclain. Fluid feed device comprising a constant cylinder capacity pump and at least one variable cylinder capacity pump. 3,968,650, Cl. 60-428.000.
- Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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  - Urbach, Hans; and Adolphi, Heinrich, 3,969,439.
- Baertsch, Richard D.; Tiemann, Jerome J.; and Engeler, William E., to General Electric Company. Charge sensing circuit for charge transfer devices. 3,969,636, Cl. 307-235.00H.
- Bagnasco, Michael: *See—*
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- Bailey, Alfred, to Kar-Ta-Craft Corporation. Knock down boat construction. 3,968,532, Cl. 9-2.00C.
- Bailey, Charles Eugene; and Roura, Miguel Jacinto, to Du Pont de Nemours, E. I., and Company. Process for finishing tetrafluoroethylene-hexafluoropropylene copolymers. 3,969,435, Cl. 260-900.000.
- Baker, Ronald L., to Lutes, Thomas G., a part interest. Dental syringe. 3,968,796, Cl. 128-173.100.
- Balkanli, Hayati, to Lynes, Inc. Environmental condition sensing apparatus. 3,968,691, Cl. 73-345.000.
- Ball Corporation: *See—*
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- Ball, Kenneth, to Intertek Technical Services Limited. Method of working underwater. 3,968,656, Cl. 61-69R.
- Ballard, Denis George Harold; Parkins, Adrian Walter; Robinson, Peter Anthony; Ibekwe, Samuel Dimewere; Lappert, Michael Franz; and Pearce, Ronald, to Imperial Chemical Industries Limited. Organo-metallic compounds. 3,969,386, Cl. 260-429.00R.
- Ballentine, Earle W. Protection of gas burners. 3,969,064, Cl. 431-90.000.
- Ballinger, Dale O., to Honeywell Inc. Capstan and motor assembly. 3,968,920, Cl. 226-188.000.
- Ballis, Joseph A., to Medtronic, Inc. Cautery protection circuit for a heart pacemaker. 3,968,802, Cl. 128-419.0PG.
- Banyas, John D.; and Ross, Edward A., to Owens-Illinois, Inc. Spin cycle mechanism for glass article forming machine. 3,968,870, Cl. 198-240.000.
- Baran, Robert J. Apparatus for reducing window breakage by wind pressure. 3,968,607, Cl. 52-173.00R.
- Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich. Granules of magnesium and its alloys. 3,969,104, Cl. 75-.50B.
- Barient Company: *See—*
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- Barker, James F.: *See—*
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- Barnes, Richard R., Jr.; MacArthur, Douglas E.; Wodell, William Roy; and Bernard, Irving Herbert, to Barnes, Richard R., Jr.; and MacArthur, Douglas E. Air cargo shipping container. 3,968,895, Cl. 220-1.500.
- Barrett, Doreen Veronica. Flotation separation. 3,969,216, Cl. 204-286.000.
- Barringer, Jerry M.: *See—*
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- Barrows, Franklin H.: *See—*
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- BASF Aktiengesellschaft: *See—*
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  - Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, 3,969,335.
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  - Urbach, Hans; and Mueller, Albrecht, 3,969,389.
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- Basham, Monte C., to Raymond Lee Organization, Inc., The, a part interest. Preloaded disposable button bait device. 3,968,589, Cl. 43-81.000.
- Bashlow, Joy Anne. Combined head and neck wear. 3,968,521, Cl. 2-203.000.
- Basiulis, Algerd, to Hughes Aircraft Company. Controlled vapor chamber cooking device. 3,968,787, Cl. 126-390.000.
- Bassani, Giovanpietro: *See—*
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- Bassett, Howard D.; Schrage, Franklin E.; and Kirkpatrick, George F., to Union Carbide Corporation. Method for heat sealing polyester film. 3,969,176, Cl. 156-251.000.
- Batka, Heimold; and Altenschopfer, Theodor, to Henkel & Cie G.m.b.H. Process for using clear rinsing agents in mechanical dishwashing. 3,969,134, Cl. 134-26.000.
- Batz, Friedrich: *See—*
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- Bauer, Anton Ernst, to Bunker Ramo Corporation. Stamped contact tip. 3,969,012, Cl. 339-252.00P.
- Bauer, James J., to Clark Equipment Company. Two-speed motor control for dual hydrostatic transmissions. 3,968,706, Cl. 74-471.00R.
- Baugh, Benton F., to Vetco Offshore Industries, Inc. Underwater connection apparatus. 3,968,838, Cl. 166-.600.
- Bayer Aktiengesellschaft: *See—*
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- Bean, Kenneth E., to Texas Instruments Incorporated. Substrate for dielectric isolated integrated circuit with V-etched depth grooves for lapping guide. 3,969,749, Cl. 357-49.000.
- Bean, Kenneth Elwood: *See—*
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- Beaudoin, Guy; and Vincent, Marcel, to Skiroule Ltee. Centrifugally controlled expansible pulley with manually engaged negative torque responsive means. 3,968,702, Cl. 74-230.17E.
- Beavers, Allan E., to T. A. Pelsue Company. Van tent for open-ended vans. 3,968,809, Cl. 135-4.00A.
- Becher, Heinz Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for preparation of 2-methoxy-3,6-dichloro-benzoic acid. 3,969,403, Cl. 260-521.00H.
- Becher, Heinz Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for preparation of 2-methoxy-3,6-dichloro-benzoic acid. 3,969,404, Cl. 260-521.00H.
- Becker, Carl: *See—*
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- Beckman Instruments, Inc.: *See—*
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- Beer, Andrew E. Magnetostrictive closure member. 3,968,898, Cl. 220-260.000.
- Beijen, James H., to Fabsco Corporation. Method of forging a solid head on a hollow steel tube. 3,968,919, Cl. 228-153.000.
- Beil, Valentin E.; and Ihlenfeld, Francis J., to McDonald Products Corporation. Multiple stacking letter tray. 3,968,881, Cl. 211-128.000.
- Beiser, Carl Adolph, to National Steel Corporation. Chromizing process using columbium as stabilizer. 3,969,550, Cl. 427-253.000.

- Belcher, Richard A., to Chase-Shawmut Company, The. Electric fuse and terminal plug therefor. 3,969,695, Cl. 337-236.000.
- Belicic, Martin, to Siemens Aktiengesellschaft. Coaxial metallurgical connection. 3,968,982, Cl. 285-287.000.
- Belkin, Gennady Ivanovich: *See—*
  - Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.
- Bell, Richard L.; and Walter, Richard T., to Container Corporation of America. Hollow wall carton corner arrangement. 3,968,923, Cl. 229-34.0HW.
- Bell Telephone Laboratories, Incorporated: *See—*
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  - Fabricius, Wayne Nixon, 3,969,683.
  - Kaiser, Peter; and Marcatili, Enrique Alfredo Jose, 3,969,016.
  - Meise, Henry August, Jr.; and Taylor, George William, 3,969,589.
- Bell, Weldon K.; and Chang, Clarence D., to Mobil Oil Corporation. Conversion of alcohols and/or ethers to hydrocarbons. 3,969,427, Cl. 260-676.00R.
- Bellmann, Bernard R., to Dayco Corporation. Endless power transmission belt. 3,968,703, Cl. 74-231.00C.
- Belosludtsev, Valery Sergeevich: *See—*
  - Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.
- Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and by Chirkov, Mikhail Nikolaevich, administrator. Method of producing butene-1. 3,969,429, Cl. 260-683.15D.
- Benkoe, Erwin: *See—*
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- Bense, William Malcolm, to Leesona Corporation. Traverse cam lubrication. 3,968,939, Cl. 242-43.00R.
- Benton, Linda A., trust administrator: *See—*
  - Wolfe, Denis G.; Mitts, Richard K.; Jackson, Wilbur F., deceased; and Benton, Linda A., trust administrator, 3,969,696.
- Berdan, Betty L.; and Luce, Betty M., to Gould Inc. Coating aluminum with a strippable copper deposit. 3,969,199, Cl. 204-33.000.
- Berets, Donald Joseph; Castellion, George Augustus; and Haacke, Gottfried, to American Cyanamid Company. Electrochromic information displays. 3,968,639, Cl. 58-23.00R.
- Berger Maschinenfabriken G.m.b.H. & Co.: *See—*
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- Bergson, Gustav. Apparatus for water determination. 3,969,210, Cl. 204-195.00W.
- Berkau, Eugene E.; and Capps, Cecil W., to Monsanto Company. Continuous process for drying, crystallizing and solid state polymerizing polyesters. 3,969,324, Cl. 260-75.00T.
- Berkley & Company, Inc.: *See—*
  - Holzhauer, Henry J., 3,968,725.
- Berkowitz, Sidney, to FMC Corporation. Crude cyanuric acid purification. 3,969,352, Cl. 260-248.00A.
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- Beschastny, Andrei Stepanovich: *See—*
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- Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., to United States of America, Army. Noise controllable nozzle closure. 3,968,646, Cl. 60-271.000.
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- BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft: *See—*
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- Black, Hugh. Fasteners. 3,968,720, Cl. 85-11.000..
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- Blanchard, Clarence E., to Outboard Marine Corporation. Marine propulsion device adapted for a sailboat. 3,968,767, Cl. 115-.50E.
- Blattler, Ernst; and Roner, Werner, to Elektrowatt AG. Thermostatic expansible material-working element. 3,968,692, Cl. 73-363.000.
- Blocker, Truman G., III, to Texas Instruments Incorporated. Interconnection in multi element planar structures. 3,969,745, Cl. 357-22.000.
- Blouin, Michel; and Mercier, Leo. Combined infant pacifier and thermometer. 3,968,690, Cl. 73-343.00R.
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- Bode, Kurt, to Rollei-Werke Franke & Heidecke. Motion picture camera with sound recording means. 3,969,021, Cl. 352-27.000.
- Boe, Norman Wendell, to Monsanto Company. Man-made textile antistatic strand. 3,969,559, Cl. 428-87.000.
- Boeckenhoff, Hermann Josef; Thoms, Gunter; and Pueschner, Erich, to Arbed-Felten & Guilleaume Drahtwerke GmbH. Wire and method for making steel wool. 3,969,085, Cl. 29-193.000.
- Boehringer Ingelheim GmbH: *See—*
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- Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. O-(2-Vinylphenyl)-thiolphosphates. 3,969,442, Cl. 260-951.000.
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- Boiko, Jury Nikolaevich: *See—*
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- Boisde, Gilbert; Cogez, Paul; Lachenal, Jean-Michel; and Lamare, Michel, to Commissariat a l'Energie Atomique. Control device for a fluidic-control jack. 3,968,735, Cl. 92-13.800.
- Bokros, Jack C., to General Atomic Company. Carbon-coated articles and method of making same. 3,969,130, Cl. 117-332.000.
- Bolen, Gerhard N.; Dunbar, Sidney G.; and Smock, George E., to Owens-Corning Fiberglas Corporation. Fibrous bodies and method and apparatus for producing same. 3,969,171, Cl. 156-167.000.
- Bollenbach, Gunther, to Dr. C. Otto & Comp. G.m.b.H. Control for regenerators of a horizontal coke oven. 3,969,191, Cl. 202-141.000.
- Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; Kocher, Donald Francis; and Rosenbaum, Walter Steven, to International Business Machines Corporation. Cluster storage apparatus for post processing error correction of a character recognition machine. 3,969,698, Cl. 340-146.3WD.
- Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, to International Business Machines Corporation. Regional context maximum likelihood error correction for OCR, keyboard, and the like. 3,969,700, Cl. 340-146.3WD.
- Bolt Beranek and Newman, Inc.: *See—*
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- Bommaraju, Tilak V.; and Stephens, Donald E., to Hooker Chemicals & Plastics Corporation. Electrolytic anode. 3,969,217, Cl. 204-290.00F.
- Boonstra, Lieuwe; and van Alem, Antonius Adrianus Marius, to U.S. Philips Corporation. Apparatus for reading a record carrier with an optical information structure. 3,969,576, Cl. 178-6.60R.
- Boots Company Limited, The: *See—*
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  - Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.
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- Boughton, Peter; and Clarke, David Bernard Swann, to U.S. Philips Corporation. Plasma-MIG arc welding. 3,969,603, Cl. 219-121.00P.
- Boulanger, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Frequency-division multiplexer for telephone transmission providing for transposition of conversation and calling channels into a primary frequency group. 3,969,585, Cl. 179-15.0FD.
- Bourns, George B., to American Home Products Corporation. Popcorn package. 3,969,535, Cl. 426-111.000.
- Bouwhuis, Gijsbertus; and Simons, Carel Arthur Jan, to U.S. Philips Corporation. Apparatus for reading a record carrier on which information is stored in an optically readable structure. 3,969,573, Cl. 178-6.60R.
- Bowers, Gary L.; Davenport, Clyde M.; and Stephens, Albert E., to United States of America, Energy Research and Development Administration. Interpolator for numerically controlled machine tools. 3,969,615, Cl. 235-151.110.
- Bowman, Harold M., to National Utility Products Company. Adjustable manhole cover support structure. 3,968,600, Cl. 52-19.000.
- BP Chemicals International Limited: *See—*
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- Breitling, Ulrich, to Krauss-Maffei Aktiengesellschaft. Circuit arrangement for magnetic suspension vehicle systems. 3,968,753, Cl. 104-148.0MS.
- Brenner, Gordon M., to M.G.B., Inc. Auger wiper. 3,968,846, Cl. 175-84.000.
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- Brown, Richard N., to General Electric Company. Coffeemaker. 3,968,740, Cl. 99-289.00R.
- Brown, Robert W.; Hunter, Byron A.; and Barrows, Franklin H., to Uniroyal Inc. Preparation of hydrazodicarbonamide. 3,969,466, Cl. 260-554.000.
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Carter, John L.; and McGowan, Joseph, to United States of America, Army. Passive microwave power distribution systems. 3,969,693, Cl. 333-98.00S.
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Caunt, Anthony David, to Imperial Chemical Industries Limited. Olefine polymerization catalyst incorporating an organo-phosphorus compound. 3,969,269, Cl. 252-429.00B.
Cavallari, Pier Giuseppe, to Honeywell Information Systems Italia. Two-track bidirectional cassette head for data handling apparatus. 3,969,770, Cl. 360-121.000.
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de Beuckelaer, Gerard; Krome, Gerd; Langens, Jan; Lockefeer, Ferdinand; and Schaerlaekens, Paul, to BASF Aktiengesellschaft. Production of hydrogen chloride by thermal dissociation of organic substances containing chlorine. 3,969,490, Cl. 423-481.000.

Debortoli, George; Chase, Peter McGivery; and Lukas, Helmut H., to Northern Electric Company Limited. Loading coil assemblies for communications cables. 3,969,580, Cl. 178-46.000.
Deeg, Emil W.: *See—*
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Deelen, Antonius Maria, to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V. Projectile-case connection. 3,968,750, Cl. 102-41.000.
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Deichsel, Klaus; Flessner, Hinrich; and Tromp, Henricus Theodorus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Disc brake, especially for crane drives. 3,968,864, Cl. 188-71.900.
DeJule, Michael C.: *See—*
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DeMoss, Richard A.; and Hilton, Howard T., to International Business Machines Corporation. Sub-harmonic phase control for an ink jet recording system. 3,969,733, Cl. 346-1.000.
de Munck, Eduard Herman Louis, to International B. F. Goodrich-Europe B.V. Dilation joint strip. 3,968,611, Cl. 52-396.000.
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Deutsche Edelstahlwerke Aktiengesellschaft: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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de Witte, Olivier; Eranian, Armand; and Dezauzier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method for reducing the width of a laser pulse and a corresponding double-resonator laser. 3,969,684, Cl. 331-94.50C.
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Diamond, Julius; and Santora, Norman J., to William H. Rorer, Inc. D-aminophenylacetic acid compounds and derivatives. 3,969,401, Cl. 260-518.00A.
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DiTullio, Nicholas W.; Lowman, Charles P.; Maass, Alfred R.; and Saunders, Harry L., to SmithKline Corporation. Lowering the concentration of plasma triglycerides. 3,969,508, Cl. 424-275.000.
Dobler, Helmut; Nadolny, Kurt; Zeilinger, Karl; Lamm, Heinz; and Piry, Horst, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine of trochoidal construction. 3,969,048, Cl. 418-83.000.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
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d'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky; and Camerman, Philippe Jean Andre, to Labofina S.A. Process for producing ethylphenols. 3,969,421, Cl. 260-621.00C.
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Doyel, John S. Rug-tufting device suitable for home use by hobyists. 3,968,757, Cl. 112-80.000.
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Driscoll, Gary L., to Sun Ventures, Inc. Method of manufacturing a foam fibrillated fibrous web from an isotactic polypropylene, polystyrene and α-methylstrene blend. 3,969,472, Cl. 264-50.000.
Driussi, Conrad, to United States of America, Navy. Electron beam ionization signal sampler. 3,969,676, Cl. 328-121.000.
Drukaroff, Israel; and Morren, Wally, to RCA Corporation. Light shield for a semiconductor device comprising blackened photoresist. 3,969,751, Cl. 357-30.000.
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Dunson, James B., Jr.; and Lucas, Robert L., to Du Pont de Nemours, E. I., and Company. Flue gas scrubber. 3,969,094, Cl. 55-242.000.
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- Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,969,429.

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Ebbing, Peter F. M., to Tri-Data. Magnetic disk head carriage. 3,969,768, Cl. 360-107.000.

Edelson, Nathan Allen; and Faessinger, Robert W., to Scott Paper Company. Phosphorus containing acrylic esters and amides. 3,969,440, Cl. 260-944.000.

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Ehrhardt, Benonie C., to Allis-Chalmers Corporation. Multiple hose guide arrangement for a lift truck. 3,968,859, Cl. 187-9.00E.

Eitel, Heinz-Joachim. Casting powder. 3,969,159, Cl. 148-26.000.

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Emodi, Alexander S.; Newmark, Harold Leon; and Scialpi, Leonard Joseph, to Hoffmann-La Roche Inc. Stable amoxicillin dosage form. 3,969,524, Cl. 424-271.000.

Endo, Shiro; Yoshida, Minoru; and Yaotani, Kouichi, to Nissan Motor Co., Ltd. Motor vehicle window. 3,968,612, Cl. 52-400.000.

Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method of producing guanosine by fermentation. 3,969,188, Cl. 195-28.00N.

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- Vopilkin, Alexeli Kharitonovich; Ermolov, Igor Nikolaevich; Ryzhov-Nikonov, Vladimir Ivanovich; Ivanov, Valery Ivanovich; Ryk, Vladimir Izidorovich; Rakhmanov, Viktor Vasilievich; Korolev, Vladimir Dmitrievich; and Krasinsky, Petr Yakovlevich, 3,968,[illegible]80.

Eross, Bela, to Instrumentation Industries, Inc. Apparatus for removal of condensed moisture from respiratory tubes. 3,968,812, Cl. 137-188.000.

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Faletti, Franco; Giordano, Nicola; Marinozzi, Paolo; Bart, Joannes; and Castellan, Arsenio, to Montedison S.p.A. Catalytic process for preparing unsaturated nitriles from olefins, ammonia and oxygen. 3,969,390, Cl. 260-465.300.

Fancher, Llewellyn W., to Stauffer Chemical Company. Ortho-carbamyloxy-benzamide bactericides. 3,969,509, Cl. 424-300.000.

Fancher, Llewellyn W.; and Freiberg, Ashley H., to Stauffer Chemical Company. Insecticidal, miticidal and lepidoptericidal active isothiuronium complex acids and free bases. 3,969,511, Cl. 424-326.000.

Faris, Gordon J. Clearance monitoring probe for rotary regenerative heat exchanger. 3,968,569, Cl. 33-169.00R.

Farmer, Marion R., to Aluma-Form Inc. Collapsible junction support bracket. 3,968,883, Cl. 211-201.000.

Farr, Andrew F. Apparatus for preparing liquid samples for analysis in automatic analyzers. 3,969,250, Cl. 210-359.000.

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- Hansen, Russell W.; and Fassett, Matthew, 3,969,690.

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Fauser, Ernest E., to Goodyear Tire & Rubber Company, The. Hydrocarbon polymer. 3,969,331, Cl. 536-66.000.

Favreau, Michel; to Thomson-CSF. Transmitter and receiver circuits for the sequential storage color television system. 3,969,761, Cl. 358-14.000.

Favreau, Michel, to Thomson-CSF. Secam color television receivers employing tunable notch filter in luminance channel. 3,969,762, Cl. 358-38.000.

Feder, Charles: *See*—
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Fedor, John; and Vetrone, James V., to International Business Machines Corporation. Sheet inverting and stacking apparatus. 3,968,960, Cl. 271-187.000.

Fedor, Robert J.; and Ogden, Cameron S., to Gould Inc. Nickel base nox reducing catalytic structure. 3,969,480, Cl. 423-213.500.

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- Aksenov, Yakov Dmitrievich; Gumansky, Georgy Alexandrovich; Drako, Valery Mikhailovich; and Fedoseenko, Nikolai Konstantinovich, 3,969,278.

Fehler, Adolf, to Motoren- und Turbinen-Union Munchen GmbH. Fuel admitting and conditioning means on combustion chambers for gas turbine engines. 3,968,644, Cl. 60-39.650.

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- King, Peter F.; and Fekete, Douglas D., 3,969,135.

Felton, George F., Jr.; and Royer, Robert E., to Sun Oil Company of Pennsylvania. Continuous evaluation of thermal stability of quenching oils. 3,968,677, Cl. 73-15.00R.

Feltz, Edward J.; and Cunningham, Ross, to Cunningham, John. Chromium removal and recovery process. 3,969,246, Cl. 210-45.000.

Fenyo, Martha, to Medicor Muvek. System for improving the evaluation of pictures comprising details hard to recognize, mainly of fluorographs and radiographs. 3,969,571, Cl. 178-6.000.

Ferrell, Richard M., to Ford Motor Company. Motor vehicle light assembly utilizing total internal reflection. 3,969,621, Cl. 240-41.35C.

Ferris, F. Donald: *See*—
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Fiber Industries, Inc.: *See*—
- Stofan, Richard H., 3,969,462.

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Fillion, Pierre C., to Societe Anonyme: Poclain. Pressurized fluid control circuit. 3,968,811, Cl. 137-114.000.

Fincke, George, to United States of America, Army. Fast electronic tuning of high power circuits for VHF-UHF power amplifier at high-efficiency. 3,969,681, Cl. 330-56.000.

Findler, Ludwig: *See*—
- Mayer, Ehrhard; Findler, Ludwig; Mathes, Wolfgang; and Steigenberger, Michael, 3,968,969.

Finkenzeller, Johann; Grassmann, Peter; and Skarke, Peter, to Siemens Aktiengesellschaft. X-ray spot film device with means for organwise-programmed setting of X-ray exposure data. 3,969,625, Cl. 250-322.000.

Finnila, Ronald M.: *See*—
- Su, Stephen C.; and Finnila, Ronald M., 3,969,634.

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Fischer, Hanspeter, to Ciba-Geigy Corporation. Agent for controlling plant growth. 3,969,101, Cl. 71-92.000.

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Fishburne, Francis B. Method and apparatus for producing enclosed bales of compressible material. 3,968,619, Cl. 53-24.000.

Fisher, Howard M.; and Albers, Bernd G., to Pennsylvania Engineering Corporation. Concrete press with mold clamping means. 3,969,061, Cl. 425-423.000.

Fitzgerald, William Maurice Bard. Hydraulic power transmission system. 3,968,732, Cl. 91-414.000.

Flaterman, Charles W.; Menz, Fred; Silver, Wallace E.; and Wiggins, Pearsie S., to United States of America, Navy. Method for reclaiming and recycling plastic bonded energetic material. 3,968,723, Cl. 86-1.00A.

Flemmert, Gosta Lennart. Process for converting silicon-and-fluorine-containing waste gases into silicon dioxide and hydrogen fluoride. 3,969,485, Cl. 423-337.000.

Flessner, Hinrich: *See*—
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- Miller, Karl A.; and Fogelberg, Clement V., 3,969,122.

Fogelberg, Mark J., to Borg-Warner Corporation. Power transfer mechanism. 3,968,704, Cl. 74-376.000.

Fontanes, Sylvain, to Compagnie Europeenne de Teletransmission (C.E.T.T.). Multichannel digital modulator. 3,969,617, Cl. 235-152.000.

Fonteneau, Norman O., to Texas Instruments Incorporated. Thermocouple circuit. 3,969,611, Cl. 219-502.000.

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Ford, Ronald Alfred: *See*—
- Nicholas, Keith Harlow; and Ford, Ronald Alfred, 3,969,744.

Forrest, Norman. Card clothing method for treating thermoplastic sheet material. 3,969,565, Cl. 264-284.000.

Forsberg, John Wesley, to Lubrizol Corporation, The. Orthopedic bandage comprising diacetone acrylamide, and cast prepared therefrom. 3,968,791, Cl. 128-90.000.

Forschirm, Alex S., to Celanese Corporation. Dyeing halogenated aromatic polyester fibrous materials with acetophenone. 3,969,075, Cl. 8-172.00R.

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- Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See—*
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  - Malofsky, Bernard M.; Frauenglass, Elliott; and Fowler, Harold A., 3,969,552.
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- Freiberg, Ashley H.: *See—*
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- Freiberg, Robert J.; and McLafferty, George H., to United Technologies Corporation. Standing wave unstable resonators for radial flow lasers. 3,969,687, Cl. 331-94.50C.
- Freiberg, Robert J.; and McLafferty, George H., to United Technologies Corporation. Traveling wave unstable resonators for radial flow lasers. 3,969,688, Cl. 331-94.50C.
- Freiberg, Robert J.: *See—*
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- Fremont, Henry A.; and Lawrence, Walter Phalti, to Champion International Corporation. Fiber mat curing. 3,969,460, Cl. 264-109.000.
- Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Naphthylmethyl sulfonium compounds. 3,969,414, Cl. 260-607.00B.
- Frenkel, Richard E.; and Schwartz, Allan E. Game racket. 3,968,965, Cl. 273-73.00J.
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- Fritz W. Glitsch & Sons, Inc.: *See—*
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  - Shiba, Keisuke; and Kubodera, Seiiti, 3,969,116.
- Fujii, Kinjiro; and Kondo, Wakichi, to Agency of Industrial Science & Technology. Thermochemical process for manufacture of hydrogen and oxygen from water. 3,969,493, Cl. 423-579.000.
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- Fukada, Eiichi; Takamatsu, Toshiaki; and Yasuda, Iwao, to Rikagaku Kenkyusho. Electret method of promoting callus formation in regeneration of bones. 3,968,790, Cl. 128-82.100.
- Fukaya, Hirokazu, to Nippon Electric Company, Ltd. Deflection circuit for television receiver set or the like. 3,969,653, Cl. 315-403.000.
- Fukuba, Kozo; and Ogushi, Yasutomo, to Sumitomo Chemical Company, Limited. Intumescent fire-retardant coating compositions containing amide-polyphosphates. 3,969,291, Cl. 260-17.300.
- Fukuda, Takashi; Ishizaki, Nobuo; Iwahori, Shoichi; and Shimada, Masayoshi, to Toyobo Co., Ltd. Process for preparing active carbon fibers. 3,969,268, Cl. 252-423.000.
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- Furst, Zsuzsanna: *See—*
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- Gaeddert, Melvin Victor; and McWhirt, Bobby Dwayne, to Hesston Corporation. Machine for forming round bales. 3,968,632, Cl. 56-341.000.
- Gaeddert, Melvin Victor; and McWhirt, Bobby Dwayne, to Hesston Corporation. Round bale forming machine for light crop materials. 3,968,633, Cl. 56-341.000.
- Gaillochet, Jean R., to Marinoni. Automatic device for the remote adjustment of the inking blade of a printing machine. 3,968,746, Cl. 101-365.000.
- Galantay, Eugene E., to Sandoz, Inc. 1-(2-Naphthyl)-2,3-butadien-1-ols. 3,969,415, Cl. 260-613.00D.
- Gallagher, Ruth E., to Stauffer Chemical Company. Reinforcement of vinyl chloride resins with suspension emulsion interpolymers. 3,969,431, Cl. 260-876.00R.
- Gallo, George T. Combination support and guard for a toothbrush. 3,968,950, Cl. 248-359.000.
- Gambill, Charles C., to General Motors Corporation. Electronic internal combustion engine ignition spark vacuum and speed advance system with ignition dwell time directly proportional to engine speed. 3,968,778, Cl. 123-117.00R.
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- Garzia, Aldo, to Istituto Chemioterapico Italiano S.p.A. 2-Amino-4[2-(1-lower alkyl-5-nitro-2-imidiazolyl)vinyl]pyrimidines for treating protozoal and bacterial infections. 3,969,520, Cl. 424-251.000.
- Gaskill, Charles David Sinclair, to International Electronics Limited. Electromagnet weighing balance. 3,968,850, Cl. 177-210.000.
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- Gerritsen, Gerrit Berend; and van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Opto-electronic focus detection system. 3,969,575, Cl. 178-6.60R.
- Gerster, John F., to Riker Laboratories, Inc. N-methylene malonate of tetrahydroquinoline and derivatives thereof. 3,969,463, Cl. 260-287.00T.
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- Godfroid, Jean Jacques; and Thuillier, Jean Eugene, to C.E.R.P.H.A. Phenoxyacetic acid derivatives as diuretic agents. 3,969,529, Cl. 424-275.000.
- Golda, Inc.: *See—*
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- Gordon, Douglas; and Seilenbinder, Richard W., to Briggs & Stratton Corporation. Low noise level muffler for small engines. 3,968,854, Cl. 181-40.000.
- Gordon, Joseph; and Sukornick, Bernard, to Allied Chemical Corporation. Process for synthesis of chlorodiflyuoroamine. 3,969,486, Cl. 423-351.000.
- Gorges, Franz A.; and Robertson, James E., to Menasco Manufacturing Company. Kinetic energy absorbing value assembly. 3,968,862, Cl. 188-1.00C.
- Gorski, Daniel A., to Aeronutronic Ford Corporation. Protective coating for IV-VI compound semiconductor devices. 3,969,743, Cl. 357-4.000.
- Gorter, Frederik Willem; and Potgiesser, Jan Antoon Ludolf, to U.S. Philips Corporation. Magneto-resistive head. 3,969,769, Cl. 360-113.000.
- Gosling, Harold William, to National Research Development Corporation. Single side-band radio. 3,969,675, Cl. 325-50.000.
- Gostling, Peter Eric, to C. Evans & Sons Limited. Decking beam assembly. 3,968,616, Cl. 52-645.000.
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- Graf, Richard B.; Chant, Edward H., Jr.; and Marco, John F., to Arnold Engineering Company. Method for making C-shaped magnetizable core. 3,969,456, Cl. 264-111.000.
- Granberg, Mauritz L.; Hanson, Howard N.; Rajala, Robert L.; and Whipple, William G., to Sperry Rand Corporation. Transmission line driver circuit. 3,969,639, Cl. 307-270.000.
- Granzer, Ernold: *See—*
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- Grassmann, Peter: *See—*
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- Greatbatch, Wilson; Mead, Ralph T.; Rudolph, Frank W.; and Frenz, Norbert W., to Wilson Greatbatch Ltd. Lithium iodine battery. 3,969,142, Cl. 136-83.00R.
- Greek, John Charlie, Jr.; Petterson, Eric Sigfried; Tanner, Howard Carl; and Terry, David Wesley, to International Business Machines Corporation. Format control system for positioning final copy printed text. 3,968,868, Cl. 197-19.000.
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- Greeson, James C., Jr., to International Business Machines Corporation. Display system. 3,969,651, Cl. 315-169.0TV.
- Greiller, Jack F., to Eastman Kodak Company. Curtain coating apparatus. 3,968,772, Cl. 118-325.000.
- Grettenberg, Thomas L.: *See—*
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- Griese, Hans-Joachim; Warning, Paul-Friedrich; and Wichmann, Klaus-Hinrich, to Sennheiser Electronic. Method of stereophonic recording. 3,969,583, Cl. 179-1.00G.
- Griffin Wellpoint Corporation: *See—*
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- Griffiths, Donald E.; Koestner, Joseph H.; and Norton, David G., to International Business Machines Corporation. Spacer supports for flexible disk structures. 3,969,767, Cl. 360-99.000.
- Grigull, Hans, to Leybold-Heraeus GmbH & Co. KG. Production of plastic-filler mixtures. 3,969,314, Cl. 260-42.000.
- Grimm, Oskar; Vorgrimler, Ludwig; and Bernhard, Peter, to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft. Cartridge receiving drum construction for gas-tight closure between the drum and the adjacent gun barrel. 3,968,726, Cl. 89-26.000.
- Groenendaal, Arnoldus Adrianus Maria: *See—*
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- Gros, Chajim. Apparatus and method for manufacturing resilient bands. 3,968,710, Cl. 83-18.000.
- Grosser, Richard W.; and Long, Virgil L., to AMF Incorporated. Vaulting board. 3,968,964, Cl. 272-65.000.
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- Grunberg, Emanuel: *See—*
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- Guth, Lauren W., to General Electric Company. Door latch. 3,968,984, Cl. 292-229.000.
- Gutman, Arnold D., to Stauffer Chemical Company. Thioalkyl phosphonates. 3,969,441, Cl. 260-948.000.
- Gutman, Arnold D., to Stauffer Chemical Company. O(S)(NH) Trifluoromethyl-aryl phosphonates. 3,969,443, Cl. 260-955.000.
- Gyurik, Robert J.; and Kingsbury, William D., to SmithKline Corporation. Anthelmintic 5-heterocycliothio and oxy-2-carbalkoxyaminobenzimidazles. 3,969,526, Cl. 424-273.000.
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- Hadley, Harry A.; and Spector, George. Soap saver. 3,969,256, Cl. 252-92.000.
- Hafner, Raoul Maria Johann Ottokar Karl. Apparatus and method for determining optimum direction of process of sailing vessels. 3,968,684, Cl. 73-178.00R.
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- Haines, Delmar C. Fruit picking device. 3,968,631, Cl. 56-328.00R.
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- Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 3,968,745, Cl. 101-111.000.
- Hamlin, Arthur Houser, to Du Pont de Nemours, E. I., and Company. Precision registration system for leads. 3,968,563, Cl. 29-591.000.
- Hamm, Falko; and Kratz, Gunter, to G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken. Pump, especially circulating pump. 3,969,040, Cl. 417-292.000.
- Hammar, Walton James, to Riker Laboratories, Inc. 12-Anti and syn-(N-benzyl-N-alkylaminomethyl)-10,11-dihydro-5,10-methano-5H-dibenzo[a,d]cycloheptenes and the salts thereof. 3,969,467, Cl. 260-570.900.
- Hammar, Walton James; and Conway, Alvin C., to Riker Laboratories, Inc. 8-N-methylpiperazinyl-N'-carbonyldibenzobicyclooctadiene and salts thereof. 3,969,505, Cl. 424-250.000.
- Hammer, Heiner I., to Schlegel Engineering GmbH. Method and apparatus for introducing water-proof sheeting into the ground in a vertical position. 3,968,658, Cl. 61-72.100.
- Hammermill Paper Company: *See—*
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- Hansen, Kenneth P.; and Crombie, Dean H., to United Technologies Corporation. Fluid-operated apparatus exhibiting hysteresis effect. 3,968,729, Cl. 91-32.000.
- Hansen, Russell W.; and Fassett, Matthew, to Raytheon Company. Radio frequency switch. 3,969,690, Cl. 333-7.00R.
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- Hashizume, Akihide; Kohno, Hideki; and Yamamoto, Shinji, to Hitachi, Ltd. Signal separation system used for an automated classification of white blood cells. 3,969,024, Cl. 356-39.000.
- Hassan, Javathu K.; Mack, Alfred; and Wojtaszek, Michael R., to International Business Machines Corporation. Method and apparatus for handling workpieces. 3,968,885, Cl. 214-1.0BC.
- Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, to Hitachi, Ltd. Digital circuit to eliminate display flicker. 3,969,717, Cl. 340-324.00M.
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- Hayes, John C., to Universal Oil Products Company. Hydrogenation and hydrodesulfurization of hydrocarbon distillate with a catalytic composite. 3,969,222, Cl. 208-210.000.

- Hayes, John C., to Universal Oil Products Company. Saturated hydrocarbon isomerization process. 3,969,425, Cl. 260-666.00R.
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- Heisner, Donald N.; and Loyer, Phillip K., to Picker Corporation. System of positioning and inspecting tires. 3,969,627, Cl. 250-358.00T.
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- Hemdal, Goran Anders Henrik, to Telefonaktiebolaget L M Ericsson. Function block oriented SPC system. 3,969,701, Cl. 340-172.500.
- Hemperly, Vernon C., to United States of America, Energy Research and Development Administration. High-strength ductile uranium alloy. 3,969,160, Cl. 148-32.500.
- Henderson, William B., to TRW Inc. Simplified method of transistor manufacture. 3,969,165, Cl. 148-187.000.
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- Henrick, Clive A., to Zoecon Corporation. Ethyl 10-methoxy-3,7,11-trimethyldodeca-2,4-dienoate. 3,969,385, Cl. 260-410.90R.
- Hepp, Gunter, to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung. Conveyor for transporting workpieces. 3,968,889, Cl. 214-18.00R.
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- Herber, John F.; Street, Robert W.; and Richard, William R., Jr., to Monsanto Company. Chemical compounds. 3,969,254, Cl. 252-78.000.
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- Hermes, Walter L.; and Davis, Robert C., to Curtiss-Wright Corporation. Rotary engine rotor and oil seal configuration. 3,969,049, Cl. 418-91.000.
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  - Gaeddert, Melvin Victor; and McWhirt, Bobby Dwayne, 3,968,633.
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- Heubeck, Erich, to Siemens Aktiengesellschaft. Dental patient's chair including padded backrest. 3,968,990, Cl. 297-452.000.
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- Hill, Eugene F.; and Walls, Jack L., to Varian Associates. Treatment of stainless steel and similar alloys to reduce hydrogen outgassing. 3,969,151, Cl. 148-6.300.
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  - Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,969,700.
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- Hitachi, Ltd.: *See—*
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- Hoch, Rene Gerard; and Julliand, Michel Henri, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Notch attenuation device. 3,968,853, Cl. 181-33.00C.
- Hochiki Corporation: *See—*
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- Holbert, Albert S., to Youngstown Sheet and Tube Company. Process for treating 9% nickel steel. 3,969,158, Cl. 148-16.500.
- Holcombe, Cressie E., Jr.; and Morrow, Margaret K., to United States of America, Energy Research and Development Administration. Refractory ceramic compositions and method for preparing same. 3,969,123, Cl. 106-55.000.
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- Holloway, Albert L. Spiral antenna circuit. 3,969,732, Cl. 343-895.000.
- Holmberg, Roy: *See—*
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- Holt, Harley Raymond, to Bunker Ramo Corporation. Electrically operated programmable insertion tool with conductor guide and movable strain relief insertion mechanisms. 3,968,555, Cl. 29-203.0MW.
- Holzhauer, Henry J., to Berkley & Company, Inc. High strength, low stretch braided rope. 3,968,725, Cl. 87-6.000.
- Holzwarth, Henry A.: *See—*
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- Hopkins, John Paxton. Sphygomanometer band and method of self-application thereof. 3,968,788, Cl. 128-2.05C.
- Horie, Noboru; and Hoya, Kazuo, to Hitachi, Ltd. Integrated multiple transistors with different current gains. 3,969,748, Cl. 357-46.000.
- Horiuchi, Yasuo; and Katsube, Toraichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Powder molding process for producing thermoplastic articles. 3,969,475, Cl. 264-310.000.
- Horner, James W., to GTI Corporation. Component handler with automatic sorter. 3,969,229, Cl. 209-74.00R.
- Horowitz, Arnold S., to Kunik, I. Jordan, a part interest. Differential separation of particulates by combined electro-static and radio frequency means. 3,969,225, Cl. 209-127.00A.
- Hortlik, Frantisek: *See—*
  - Junek, Jan; Vobornik, Vaclav; Jaros, Frantisek; Ripka, Josef; Lihtarova, Ludmila; Ohlidal, Vladimir; and Hortlik, Frantisek, 3,968,636.
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- Horwitz, Norton. Ball and racket carrier. 3,968,912, Cl. 224-36.000.
- Hosaka, Hirokazu: *See—*
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- Hotton, Joseph G., to Neumann Engraving Co. Method and apparatus for forming joints in thermoplastic strip. 3,969,172, Cl. 156-211.000.
- Hougen, Everett D. Magnetic drill. 3,969,036, Cl. 408-76.000.
- Hough, William D. Perimeter overflow system for swimming pools. 3,968,527, Cl. 4-172.170.
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- Htsui, John S. C., to Emerson Electric Co. Motor and control system having cyclic reversal and unidirectional capabilities. 3,969,658, Cl. 318-202.000.
- Huchette, Paul V.; and Hall, Homer H., Jr., to Edgewater Corporation. Composite material springs and manufacture. 3,968,958, Cl. 267-47.000.
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- Hugelin, Bernard, to Sublistatic Holding S.A. Carriers and their use in printing and dyeing. 3,969,071, Cl. 8-2.50R.
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- Hunter, Jack A.; and Anderson, Kenneth E., to Universal Oil Products Company. Method for forming a semi-permeable strip. 3,969,548, Cl. 427-244.000.
- Hunter, John J. Method and apparatus for forming plastic lined junction in lined pipe. 3,968,552, Cl. 29-157.00R.
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- Hutton, Ronald Eric; Oakes, Vincent; and Iles, Brian Rodney, to Akzo N.V. Stabilization of halogen-containing polymers. 3,969,319, Cl. 260-45.75S.
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- Ikeda, Terukazu; Moritaka, Shintaro; Sugiura, Satohiko; and Umeki, Tsutomu, to Takeda Chemical Industries, Ltd.; and Nichiro Gyogyo Kaisha, Ltd. Method for preparing jelly foods. 3,969,536, Cl. 426-103.000.
- Ikeda, Tomoaki: *See—*
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- Jackson, Lynn Wolstenholme. Method and construction of footwear incorporating a customized, form fitted casting unit. 3,968,577, Cl. 36-43.000.
- Jackson, Ronnie D., to Lion Oil Company. Two-phase contact reactor. 3,969,081, Cl. 23-284.000.
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- Jeanson, Richard L., to Menasha Corporation. Apparatus for making a sheet molding compound. 3,969,178, Cl. 156-361.000.
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- Jenkins, Robert K.; Keller, Leon B.; and Cover, John H., Jr., to Hughes Aircraft Company. Mesh articles particularly for use as reflectors of radio waves. 3,969,731, Cl. 343-840.000.

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Jones, Bernard B. Gaming token and process for fabricating same. 3,968,582, Cl. 40-27.500.

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Kataoka, Hiroshi. Roll packaging apparatus. 3,968,622, Cl. 53-59.00R.

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Kuhn, Gregory L., to Motorola, Inc. Method for filling grooves and moats used on semiconductor devices. 3,969,168, Cl. 156-17.000.

Kulig, Stanislaw, to Osrodek Badawczo-Rozwojewy Przemyslu Budowy Urzadzen Chemicznych "Cebea". Disjoinable assembly designed for connecting of piston with piston rod in engines and machines, particularly suitable for use in compressors. 3,968,737, Cl. 92-258.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
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Kuna, Kenneth J.; and Sowman, James P., to Ford Motor Company. Method of pelletizing glass batch materials. 3,969,100, Cl. 65-27.000.

Kunak, Anthony F.; Jarvis, Wayne C.; Kidd, Rollie B.; and Williams, Bobby L., to M. Lowenstein & Sons, Inc. Method of feeding fibers to a pile fabric circular knitting machine. 3,968,662, Cl. 66-9.00B.

Kunik, I. Jordan: *See—*
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Kuniya, Keiichi; Iizuka, Tomio; Suwa, Masateru; Yasuda, Tomio; Sasaki, Takeshi; Kikuchi, Sakae; and Suzuki, Hideo, to Hitachi, Ltd. Semiconductor device having supporting electrode composite structure of metal containing fibers. 3,969,754, Cl. 357-65.000.

Kupchan, S. Morris; and Britton, Ronald W., to Research Corporation. Bruceantin. 3,969,369, Cl. 260-343.20R.

Kurahashi, Shigeru. Air filter apparatus. 3,969,095, Cl. 55-350.000.

Kurechi, Taisuke: *See—*
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Kurz, Dieter; and Sabel, Alex, to Wacker Chemie GmbH. Copolymers of vinyl chloride and 2-hydroxypropyl-alkyl maleate. 3,969,328, Cl. 526-320.000.

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Kuthan, Josef; Palecek, Jaroslav; and Sramek, Miroslav, to Vysoka skola chemicko-technologicka. Method of preparing N-substituted 3,5-dicyan-1,4-dihydropyridines. 3,969,359, Cl. 260-294.900.

Kuzmin, Vladimir Evgenievich: *See—*
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Kvamsdal, Rolf; and Tobiassen, Roar, to Moss Rosenberg Verft A/S. Ships for transport of liquefied gases. 3,968,764, Cl. 114-74.00A.

Kwiatkowski, Jerome A.; and Wood, Charles L., to Ball Corporation. Programmable automatic controller. 3,969,703, Cl. 340-172.500.

Kyomori, Hiroyuki; Sasaki, Kazuhiro; and Takahashi, Mitsuhiro, to Kobayashi Perfumery Co., Ltd. 2-Alkyl-5-oximinocyclopentanone and the method of preparing the same. 3,969,408, Cl. 260-566.00A.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
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Lachnit-Fixson, Ursula, to Schering Aktiengesellschaft. Method for contraception by the administration of sequential contraceptive preparations. 3,969,502, Cl. 424-239.000.

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Lages, Robert E., to Lever Brothers Company. Transparent soap bar. 3,969,259, Cl. 252-107.000.

Lai, San-Cheng, to Rockwell International Corporation. Lithium electrode and an electrical energy storage device containing the same. 3,969,139, Cl. 136-6.0LN.

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Lamoureux, William R., to International Business Machines Corporation. Gas panel with improved write circuit and operation. 3,969,715, Cl. 340-324.00M.

Lanahan, John H., to Monarch Marking Systems, Inc. Record feeding apparatus and method. 3,968,917, Cl. 226-2.000.

Landgraf, Helmut, to Mannesmann Aktiengesellschaft. Method for making a thermoplastic sleeve to be used as coupler fitting for tubes. 3,969,170, Cl. 156-158.000.

Lane, Ralph D.; and Manning, Richard A., to International Business Machines Corporation. Content-Addressable Memory capable of a high speed search. 3,969,707, Cl. 340-173.0AM.

Lanfermann, Willy; Kaisler, Paul; and Lauterbach, Dieter, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Chain drive arrangement for a mining machine. 3,968,754, Cl. 104-172.00R.

Lang, Armin; Kurz, Falk; and Walter, Wolfgang, to Zahnradfabrik Friedrichshafen AG. Hydraulic power-steering system for automotive vehicles. 3,968,733, Cl. 91-451.000.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Wrap-around carton forming machine. 3,968,623, Cl. 53-195.000.

Langens, Jan: *See—*
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Langford, Obie M.; and Bagnasco, Michael, to Texaco Inc. Method and apparatus for defining radiation-opaque pathways within shielding materials. 3,969,630, Cl. 250-515.000.

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Lapham, Sidney D., to Lapham Engineering Co., Inc. Material handling vehicle with H-shaped walk area. 3,968,893, Cl. 214-700.000.

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Larsen, Rasmus Andreas; and Nielsen, Axel, to Larsen & Nielsen Enterprise A/S. Machine for surface treatment of concrete panels or sections. 3,969,056, Cl. 425-218.000.

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Lauer, Karl; Stoeck, Georg; and Batz, Friedrich, to Boehringer Mannheim G.m.b.H. Chromatographic fractionation of whey. 3,969,337, Cl. 260-112.00R.

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Lehmann, Walter G., to Polaroid Corporation. Photographic camera and flash lamp selection system. 3,969,736, Cl. 354-127.000.

Leichliter, Wayne K.; Detty, Rodney H.; and Hill, John B., to Eaton Corporation. Fluid coupling. 3,968,866, Cl. 192-58.00B.

Leighton, Harold; and Gullis, William John, to Leighton, Harold. Hairbrush. 3,968,536, Cl. 15-187.000.

Leimgruber, Willy: *See—*
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Le Noane, Georges E. Cable connector for optical fiber transmission. 3,969,015, Cl. 350-96.00C.

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Lester, George R., to Universal Oil Products Company. Method of catalyst manufacture. 3,969,270, Cl. 252-430.000.

Lester, George R., to Universal Oil Products Company. Method of manufacturing a catalytic composite useful for the treatment of gaseous waste products. 3,969,271, Cl. 252-430.000.

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Lin, Shi-Tron. Variable-inertia flywheel. 3,968,593, Cl. 46-209.000.
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Lindenmaier, Walter E. G.; and Sukopp, Hans. Apparatus for the treatment of refuse or the like with a foam material. 3,968,625, Cl. 53-124.00D.
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Magerlein, Barney J., to Upjohn Company, The. 16-Fluoro prostaglandin E_1 analogs. 3,969,377, Cl. 260-408.000.
Magerlein, Barney J., to Upjohn Company, The. 16-Fluoro prostaglandin A_2 analogs. 3,969,378, Cl. 260-408.000.
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Mancusi, Joseph J., Jr. Merry-go-round. 3,968,961, Cl. 272-44.000.
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Mangus, Ervin E.; Kizer, Richard W.; and Young, D. Craig, to Caterpillar Tractor Co. Heat exchanger mounting for a turbine engine. 3,968,834, Cl. 165-82.000.
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- Mayer, Ehrhard; Findler, Ludwig; Mathes, Wolfgang; and Steigenberger, Michael. Sealing arrangement. 3,968,969, Cl. 277-15.000.
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- McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., to Dow Chemical Company, The. 1-Aryl-3-(2-hydroxyethyl) thioureas for treating depression. 3,969,532, Cl. 424-322.000.
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- Meiller, Francois, to Rhone-Progil. Porous substances having ion exchange properties. 3,969,261, Cl. 252-179.000.
- Meise, Henry August, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Telephone switching system having attendant queuing facilities. 3,969,589, Cl. 179-27.00D.
- Mello, Fabio, to Commerciale Sacea, S.a.s. Complete set of elements fitting in unit-composed supporting systems. 3,968,882, Cl. 211-189.000.
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- Mezrich, Reuben Saul; Etzold, Karl-Friedrich; and Vilkomerson, David Herman Raphael, to RCA Corporation. Visual display of ultrasonic radiation pattern. 3,969,578, Cl. 178-6.800.
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- Miller, Karl A.; and Fogelberg, Clement V., to Tusco Engineering Co., Inc. Formulation for producing soda-lime glass including coal ash. 3,969,122, Cl. 106-52.000.
- Miller, Larry E., to Ohio Art Company, The. Spring type projectile projecting device. 3,968,784, Cl. 124-27.000.
- Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; and Minegishi, Isao, to Nippon Kokan Kabushiki Kaisha. Cr-Ni system austenitic heat-resisting steel. 3,969,161, Cl. 148-38.000.
- Mimken, Frederick J., to General Dynamics Corporation. Digital range computer systems for air navigation systems such as tacan. 3,969,616, Cl. 235-151.320.
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- Mitchell, Howard Lee, III; and Hays, James Richard, to Exxon Research and Engineering Company. Iridium-containing catalysts. 3,969,221, Cl. 208-139.000.
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- Miyashita, Kakunosuke, to Hitachi Metals, Ltd. Adamite roll containing cobalt. 3,968,551, Cl. 29-132.000.
- Miyatuka, Hajime, to Rank Xerox Ltd. Photosensitive binder layer for xerography containing titanium oxide and a cadmium pigment. 3,969,113, Cl. 96-1.0LY.
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- Moelders, Johann, to Berger Maschinenfabriken G.m.b.H. & Co. Horizontal drum-type magnetic separator for granular feeds. 3,969,226, Cl. 209-39.000.
- Moller, Jens L., to Continental Can Company, Inc. Method for forming, sealing, capping and pasteurization of beverage in plastic container. 3,969,455, Cl. 264-89.000.
- Mollere, John C., to Hercules Incorporated. Seismic marine gun assembly. 3,968,855, Cl. 181-118.000.
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  - D'Amico, John J.; and Mullins, Darrell D., 3,969,350.
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  - Packer, Gilbert; Boucher, Roger W.; Moore, James M.; Wark, John D.; and Holzwarth, Henry A., 3,968,797.
- Morgan, Samuel A., to Sycor, Inc. Self centering hub for flexible recording discs and the like. 3,968,972, Cl. 279-2.00R.
- Morganson, Neal E., to Olin Corporation. Continuous preparation of 2,4,4,4-tetrachlorobutanol. 3,969,423, Cl. 260-633.000.
- Mori, Eiji: *See*—
  - Isshiki, Setsuya; Shiromizu, Tetsuo; Oshima, Hiroto; Okada, Kozo; Kazunaga, Kiyoshi; and Mori, Eiji, 3,969,208.
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  - Yoshimoto, Takeo; Igarashi, Keiichi; Harayama, Takeo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Morikawa, Osamu; Takasawa, Yoshio; and Kurechi, Taisuke, 3,969,102.
- Morinaga, Shigeki; Onishi, Kazuo; and Takahashi, Tadashi, to Hitachi, Ltd. Motor control apparatus. 3,969,661, Cl. 318-375.000.
- Moritaka, Shintaro: *See*—
  - Ikeda, Terukazu; Moritaka, Shintaro; Sugiura, Satohiko; and Umeki, Tsutomu, 3,969,536.
- Morozowich, Walter, to Upjohn Company, The. Polycyclic aromatic esters of PGA_1. 3,969,464, Cl. 260-395.000.
- Morr, Charles W., to Essex International, Inc. Wedge feeding mechanism for short stroke dynamoelectric machine coil and wedge inserting apparatus. 3,968,556, Cl. 29-205.00D.
- Morren, Wally: *See*—
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- Morrison, Charles R., to Owens-Corning Fiberglas Corporation. Textile coating apparatus and method. 3,968,635, Cl. 57-35.000.
- Morrow, Margaret K.: *See*—
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- Morse, Lynn H.: *See*—
  - Nielsen, Anker J., Jr.; and Morse, Lynn H., 3,968,985.
- Morse, Walter H.; and Ames, Ira R., Jr., to Jacobs Manufacturing Company Limited, The. Anti-skid control device and system. 3,969,003, Cl. 303-21.00F.
- Mortensen, Peder S. Rotary fluid device with pivoted wedge-shaped radial vanes. 3,969,047, Cl. 418-18.000.
- Morton-Norwich Products, Inc.: *See*—
  - Schwan, Thomas J., 3,969,355.
- Mosburger, Hans, to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft. Machine for cross-cutting a web of material. 3,968,713, Cl. 83-347.000.
- Moses, Dudley K.; and Brodmann, George L., to PPG Industries, Inc. Perphthalic acid after-treatment of phosphonate flameproofed fabrics. 3,969,072, Cl. 8-111.000.
- Moss, Gerald; and Craig, John William Thomas, to Exxon Research and Engineering Company. Manufacture of combustible gases. 3,969,089, Cl. 48-197.00R.
- Moss Rosenberg Verft A/S: *See*—
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- Mostek Corporation: *See*—
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Moyer, David F.; Devlin, Shaun S.; and Genik, Richard J., to Ford Motor Company. Method and apparatus for engine control. 3,969,614, Cl. 235-150.210.
Moyer, Norman E., to Hughes Aircraft Company. Digital watch with oscillator/divider power selection circuitry. 3,968,641, Cl. 58-50.00R.
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Mueller, Theodore R., to United States of America, Energy Research and Development Administration. Automatic electrochemical ambient air monitor for chloride and chlorine. 3,969,209, Cl. 204-195.00R.
Mukaida, Yoshito; Mizuki, Eiichi; Ikeda, Tomoaki; Tsuboi, Masayoshi; Ishizuka, Akio; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Diffusion transfer image receptive materials. 3,969,541, Cl. 427-400.000.
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Murray, John N.; and Hynek, Robert J., to Isotopes, Inc. Process for generating ultra high purity H_2 or O_2. 3,969,481, Cl. 423-219.000.
Murray, Leo Thomas, to Colgate-Palmolive Company. Washing and bleaching composition containing bleach, activator and a nitrilotricarboxylic acid compound. 3,969,257, Cl. 252-102.000.
Murvall, Ake Eugen, to ABU Aktiebolag. Sliding clutch fishing reel. 3,968,943, Cl. 242-212.000.
Mutziger, John Stefan, to Deere & Company. Sound level meter. 3,968,697, Cl. 73-557.000.
Muzyczko, Thaddeus M.; and Jones, Thomas H., to Richardson Company, The. Photoreactive compositions comprising polymers containing alkoxyaromaticglyoxy groups. 3,969,119, Cl. 96-115.00R.
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Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Water-soluble coating materials. 3,969,300, Cl. 260-29.4UA.
Nagata, Toshio, to Kohan Sendan Kikai Kabushikikaisha. Electromagnetic lifting device. 3,968,986, Cl. 294-65.500.
Nagayama, Masuzo: *See—*
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Nailor, William Kirby, III; and Thompson, David Clyde, to Du Pont de Nemours, E. I., and Company. Substrate with improved contact terminals. 3,969,010, Cl. 339-17.00C.
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Nakamura, Hiroyuki; Kawaguchi, Hiroshi; and Hayashi, Hideyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control mechanism for automotive vehicle hydraulic braking system. 3,969,001, Cl. 303-21.00F.
Nakao, Yukimichi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,969,420.
Nakata, Kunii; and Kubo, Yoshimasa, to Kabushiki Kaisha Akita. Molding apparatus with shielding mold member. 3,968,829, Cl. 164-160.000.
Nally, Phillip L. Symmetrically arranged, hemispherical ball rebounding elements. 3,968,967, Cl. 273-95.00A.
Nanodata Corporation: *See—*
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Narayanan, Venkatachala L.; Jacobs, Glenn Anthony; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Morpholine containing isothiocyanobenzoxazoles. 3,969,351, Cl. 260-247.10H.
Narayanan, Venkatachala L., to E. R. Squibb & Sons, Inc. Tetrahydrocyclopropa[B]naphthalenes. 3,969,392, Cl. 260-473.00F.
National Distillers and Chemical Corporation: *See—*
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Negreiros, Salvio Correia Lima. Drawing and writing brush-pen with round and flat hair and adjustable flow of permanent liquid ink. 3,969,028, Cl. 401-279.000.
Neimann, Hans-Joachim; Schuster, Eberhard; and Kersting, Arno, to Kraftwerk Union Aktiengesellschaft. Method for separating gaseous mixtures of isotopes. 3,969,204, Cl. 204-157.10R.
Nelbock-Hochstetter, Michael: *See—*
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Nelson, Francis D.; and Presson, Willard M., to Inland Steel Company. Device for preventing ladle nozzle leaks. 3,968,908, Cl. 222-563.000.
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Nemit, Jeffrey T., to International Telephone and Telegraph Corporation. Network-fed phased array antenna system with intrinsic RF phase shift capability. 3,969,729, Cl. 343-756.000.
Nemoto, Shogo: *See—*
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Neuzil, Richard W.; and Rosback, Donald H., to Universal Oil Products Company. Process for the separation of cresol isomers. 3,969,422, Cl. 260-621.00B.
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Neville, Richard Ernest Gartside, to AMF Incorporated. Continuous measurement of the bulk density of particulate material. 3,968,904, Cl. 222-25.000.
Nevins, Alan J. Endodontic composition and method. 3,968,567, Cl. 32-15.000.
Newall, Christopher Earle: *See—*
Phillipps, Gordon Hanley; and Newall, Christopher Earle, 3,969,345.
Newell, E. Strohm. Assembly for pulling a line. 3,968,952, Cl. 254-134.30R.
Newman, Sydney. Method for producing a zipper closable garment pocket and a pocket provided thereby. 3,968,523, Cl. 2-252.000.
Newmark, Harold Leon: *See—*
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Nicholas, Keith Harlow; and Ford, Ronald Alfred, to U.S. Philips Corporation. Semiconductor devices. 3,969,744, Cl. 357-22.000.

Nichols, Dennis R.: *See—*
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Nichols, Harry S., Jr. Cleaning implement including a sponge, squeegee, scraper and brush. 3,968,535, Cl. 15-105.000.
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Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of copolymers of 4-methylpentene-1. 3,969,333, Cl. 526-154.000.
Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of homopolymers of 4-methylpentene-1. 3,969,335, Cl. 526-154.000.
Nickl, Josef; Teufel, Helmut; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. Antiphlogistic pharmaceutical compositions containing a 1-(nicotinoyl or isonicotinoyl)-3-biphenylyl-alkanone-(2). 3,969,523, Cl. 424-266.000.
Nielsen, Anker J., Jr.; and Morse, Lynn H. Locks for electric meter boxes. 3,968,985, Cl. 292-340.000.
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Nishino, Shiro. Emergency alarm and evacuation system. 3,969,720, Cl. 340-371.000.
Nissan Motor Co., Ltd.: *See—*
Endo, Shiro; Yoshida, Minoru; and Yaotani, Kouichi, 3,968,612.
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Nix, Maria, nee Saxler, to Nix, Norbert. Dispenser for dispensing metered quantities of liquid from a container. 3,968,907, Cl. 222-416.000.
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Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, to Agency of Industrial Science & Technology. Method for improvement of properties of synthetic yellow iron oxide. 3,969,494, Cl. 423-633.000.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with automatic exposure-determining structure. 3,969,735, Cl. 354-29.000.
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Noguchi, Masaaki; Sumiyoshi, Masaharu; and Mizusawa, Shinichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for internal combustion engine. 3,968,645, Cl. 60-288.000.
Noguchi, Masaaki; and Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torch ignition type internal combustion engine with a restricted orifice. 3,968,782, Cl. 123-191.00S.
Nohda, Masao, to Nippon Kogaku K.K. Curvature measuring optical system in ophthalmometer. 3,969,019, Cl. 351-13.000.
Nohe, Heinz; Jaeger, Peter; and BASF Aktiengesellschaft, to BASF Aktiengesellschaft. Manufacture of propiolic acid. 3,969,200, Cl. 204-79.000.
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Nonnenmacher, Gerhard; Bosch, Paul; and Fricke, Hans-Jurgen, to Robert Bosch G.m.b.H. Pressure regulator for an adjustable pump. 3,969,038, Cl. 417-218.000.
Noranda Mines Limited: *See—*
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Novello, Frederick C., to Merck & Co., Inc. Inhibiting xanthine oxidase with 3-haloalkyl substituted benzothiadiazine-1,1-dioxides. 3,969,518, Cl. 424-246.000.
Nowak, Walter J., to Veeder Industries, Inc. Pulse generator with asymmetrical multi-pole magnet. 3,969,644, Cl. 310-152.000.
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O. G. Hoyer A/S: *See—*
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Oakes, Thomas Francis; and Bridgewater, Martin. Method of fabricating hollow, foam-filled, metal structural members. 3,968,561, Cl. 29-460.000.
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Oettinghaus, Dieter, to Deutsche Edelstahlwerke Aktiengesellschaft. Magnetizing and demagnetizing electrical circuit. 3,969,657, Cl. 317-157.5PM.
Offermanns, Heribert: *See—*
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Ogawa, Haruo, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Workpiece lapping device. 3,968,598, Cl. 51-55.000.
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Oguchi, Kikuo; Shimoi, Akio; and Ogata, Toshiaki, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal vibrator. 3,969,641, Cl. 310-9.500.
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Ohbu, Kazuo: *See—*
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Ohta, Yoshimoto; Hayashida, Yoshihiro; and Amano, Haruyuki, to Tokico Ltd. Brake hydraulic pressure control valve. 3,969,000, Cl. 303-6.00C.
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Okey, Bernard J., to BASF Aktiengesellschaft. Synchronizing system for video recorders. 3,969,758, Cl. 358-8.000.
Okumura, Osamu; Sakatani, Takenobu; Ohbu, Kazuo; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Method of manufacturing salt of α-sulfofatty acid ester. 3,969,375, Cl. 260-400.000.
Olesen, Henry Frederik, to Titan Separator A/S. Centrifuge. 3,968,929, Cl. 233-21.000.

- Olin Corporation: *See—*
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  - Saeman, Walter C., 3,969,546.
- Olmsted, Peter B., to Olmsted Products Company. Flow shut off valve. 3,968,813, Cl. 137-493.000.
- Olmsted Products Company: *See—*
  - Olmsted, Peter B., 3,968,813.
- Oloman, Colin William; and Watkinson, Alan Paul, to Canadian Patents and Development Limited. Electrolytic production of alkaline peroxide solutions. 3,969,201, Cl. 204-83.000.
- Omark Industries, Inc.: *See—*
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- O'Neal, Allen, to Libby, McNeil & Libby. Flow indicator. 3,968,686, Cl. 73-207.000.
- O'Neill, Wilbur J., to Westinghouse Electric Corporation. Underwater breathing apparatus. 3,968,794, Cl. 128-142.300.
- O'Neill, Wilbur J.; and Colston, John R., to Westinghouse Electric Corporation. Underwater breathing apparatus. 3,968,795, Cl. 128-142.300.
- Onishi, Kazuo: *See—*
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- Onozaki, Satoshi; Nemoto, Shogo; and Hazeyama, Takeshi, to Nittetsu Mining Company, Ltd. Process for recovering tungsten from alkaline leaching solution of tungsten ores. 3,969,484, Cl. 423-58.000.
- Ontario Paper Company Limited, The: *See—*
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- Ormond, Alfred Neuman. Electrical equalization of load element sensitivity. 3,968,683, Cl. 73-141.00A.
- Ormond, Alfred Newman. Mechanical equalization of strain gauge sensitivity. 3,968,676, Cl. 73-1.00B.
- Osborn, Charles W., to Phillips Petroleum Company. Molding of poly-(arylene sulfide) resins. 3,969,307, Cl. 260-37.00R.
- Oschatz, Christian; and Somm, Franz, to Sandoz Ltd. Drying process. 3,968,571, Cl. 34-14.000.
- Oshima, Hiroto: *See—*
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- Osieka, Hans; Pommer, Ernst-Heinrich; and Kiefer, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method of controlling fungi. 3,969,510, Cl. 424-324.000.
- Osika, Thomas F., to McGill Manufacturing Company, Inc. Key operated electric ground switch. 3,969,597, Cl. 200-44.000.
- Osrodek Badawczo-Rozwojewy Przemyslu Budowy Urzadzen Chemicznych "Cebea": *See—*
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- Osrow, Leonard; and LeBaigue, Jacques L., to Osrow Products Company Inc. Hand steaming device with automatic power interrupting means. 3,969,607, Cl. 219-272.000.
- Osrow Products Company Inc.: *See—*
  - Osrow, Leonard; and LeBaigue, Jacques L., 3,969,607.
- Ostrowsky, Efrem M., to VCA Corporation. Plastic container. 3,968,880, Cl. 206-540.000.
- Oswald, Alexis A.; and Valint, Paul L., Jr., to Ciba-Geigy AG. O,S-dialkyl-O-cyanomethylphenylthio-phosphates and -dithiophosphates. 3,969,438, Cl. 260-940.000.
- Oswald, Alexis A.; and Valint, Paul L., Jr., to Ciba-Geigy AG. O,S-dialkyl-O-allylphenyl-thiophosphates and -dithiophosphates. 3,969,444, Cl. 260-956.000.
- Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy AG. Asymmetric O,S-dialkyl dithiophosphoric acid esters of 1,2,3-benzotriazin-4-ones. 3,969,517, Cl. 424-200.000.
- Otsuka Pharmaceutical Company Limited: *See—*
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- Ott, Jack J., to Dow Chemical Company, The. Treating agent for high melting temperature metals. 3,969,105, Cl. 75-53.000.
- Otterbeck, Claes Emil Lennart: *See—*
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- Ottosson, Per Axel Rune; and Otterbeck, Claes Emil Lennart, to Kahrs Maskiner Aktiebolag. Method and installation for sawing timber. 3,968,822, Cl. 144-312.000.
- Outboard Marine Corporation: *See—*
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- Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Conversion of methanol to products comprising gasoline boiling components. 3,969,426, Cl. 260-668.00R.
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- Palifka, Robert G., to United States of America, Navy. (Flex'ator) arming spring device. 3,968,751, Cl. 102-76.00R.
- Palmer, Richard Claxton; and Clemens, Jon Kaufmann, to RCA Corporation. Color-picture/multichannel-sound record and recording/-playback apparatus and methods therefor. 3,969,756, Cl. 358-4.000.
- Paluck, Robert John; and Proebsting, Robert James, to Mostek Corporation. Self-biased trinary input circuit for MOSFET integrated circuit. 3,969,633, Cl. 307-205.000.
- Papouchado, Lucien Marc, to Du Pont de Nemours, E. I., and Company. Segmented copolyester adhesives stabilized by alkaline earth oxides and carboxylic compounds. 3,969,294, Cl. 260-26.000.
- Pappo, Raphael; and Jung, Christopher, to G. D. Searle & Co. Preparation of prostaglandin precursors. 3,969,391, Cl. 260-468.00K.
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- Passal, Frank, to M & T Chemicals Inc. Electroplating processes and compositions. 3,969,399, Cl. 260-513.00R.
- Pastor, Ricardo C.; and Timper, Arthur J., to Hughes Aircraft Company. Purification of alkali metal chlorides and bromides. 3,969,491, Cl. 423-499.000.
- Pavey, Robert L.; and Mone, Patrick E., to Swift & Company. Shelf-stable low-fat biologically fermented dairy product. 3,969,534, Cl. 426-34.000.
- Peabody Coal Company: *See—*
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  - Ballard, Denis George Harold; Parkins, Adrian Walter; Robinson, Peter Anthony; Ibekwe, Samuel Dimewere; Lappert, Michael Franz; and Pearce, Ronald, 3,969,386.
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- Pecorari, Felice. Radial fluid-pressure apparatus. 3,968,736, Cl. 92-165.00R.
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- Pelton, Peter G., to Continental Can Company, Inc. Time release aerosol dispenser. 3,968,905, Cl. 222-70.000.
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- Pergler, Charles C., to All-Steel Inc. Safety latch and drawer movement sequencing control arrangement for file cabinets. 3,969,008, Cl. 312-221.000.
- Perkins, William V., to Maxon Industries, Inc. Unitized two stage compactor apparatus for refuse collecting trucks or the like. 3,968,891, Cl. 214-83.300.
- Perl, Richard L., to Tappan Company, The. Blue flame gas smooth top range. 3,968,785, Cl. 126-39.00J.
- Permalite Chemicals Ltd.: *See—*
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- Peterson, Roy L., Sr. Fish clamping apparatus. 3,968,588, Cl. 43-53.500.
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- Phillips Petroleum Company: *See—*
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- Poklacki, Erwin S., to Borg-Warner Corporation. Method for lowering the minimum pour temperature of fatty acids. 3,969,253, Cl. 252-77.000.
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- Ralbovsky, Frank Stephen, to General Electric Company. Pneumatic thickness sensor head. 3,968,679, Cl. 73-37.700.
- Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. 3,5-Dialkyl-4-hydroxyphenylalkyl substituted piperazine diones and polymeric compositions stabilized thereby. 3,969,316, Cl. 260-45.80N.
- Ramirez, Ernest R., to Swift & Company. Waste water treatment. 3,969,203, Cl. 204-149.000.
- Ramirez, Ernest R., to Swift & Company. Electrocoagulation system for removing pollutants from wastewater. 3,969,245, Cl. 210-44.000.
- Randar, George Andrew; and Young, Harris William, to Gillette Company, The. Writing instrument. 3,969,027, Cl. 401-199.000.
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- Reader, Arthur M., to Celanese Corporation. Polyurethanes. 3,969,394, Cl. 260-471.00C.
- Reader, Paul D.; and Kaufman, Harold R., to Ion Tech, Inc. Electron-bombardment ion source including segmented anode of electrically conductive, magnetic material. 3,969,646, Cl. 313-359.000.
- Ready Metal Manufacturing Co.: *See—*
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- Recker, Florian B. Torque transmitting coupling. 3,969,033, Cl. 403-322.000.
- Recognition Equipment Incorporated: *See—*
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- Redd, James B., to A. E. Staley Manufacturing Company. Vacuum dehydration of heat sensitive materials. 3,969,183, Cl. 159-49.000.
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- Regenass, Willy, to Ciba-Geigy Corporation. Apparatus for controlling the temperature of a heat exchange liquid. 3,968,832, Cl. 165-58.000.
- Reich, Rudolf. Automatic yarn changer. 3,968,759, Cl. 112-83.000.
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- Reinsch, Herbert; and Korner, Peter, to Robert Bosch G.m.b.H. Objective system with zoom lens for photographic apparatus. 3,969,018, Cl. 350-187.000.
- Reliance Electric Company: *See—*
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- Richard, William R., Jr.: *See—*
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- Riess, Karl. Golf ball pocket and improved golf garment. 3,968,522, Cl. 2-250.000.
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- Robert Bosch G.m.b.H.: *See—*
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  - Nonnenmacher, Gerhard; Bosch, Paul; and Fricke, Hans-Jurgen, 3,969,038.
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- Roberts, Charles B., to Dow Chemical Company, The. Aluminum plating corrosion resistance. 3,969,555, Cl. 427-383.000.
- Roberts, Edward David; and Steggerda, Jan Frederik, to U.S. Philips Corporation. Method of providing a patterned layer of silicon-containing oxide on a substrate. 3,969,543, Cl. 427-54.000.
- Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., to United States of America, Army. Intense, energetic electron beam assisted X-ray generator. 3,969,628, Cl. 250-402.000.
- Robertshaw Controls Company: *See—*
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- Robson, Robert, to John Ratcliff (Tail Lifts) Limited. Vehicle load lifting and lowering units. 3,968,890, Cl. 214-75.00T.
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- Rosback, Donald H.; and Neuzil, Richard W., to Universal Oil Products Company. Olefin separation process. 3,969,223, Cl. 208-310.00Z.
- Rosback, Donald H., to UOP Inc. Method of manufacturing a zeolitic adsorbent. 3,969,276, Cl. 252-455.00Z.
- Rosback, Donald H.: *See—*
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  - Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,969,700.
- Rosenblum, Frank, to Noranda Mines Limited. Device for taking samples of slurries or of any suspension of particulate material in liquid and for measuring desired chemical or physical properties of such samples. 3,968,696, Cl. 73-425.40R.
- Rosenkranz, Otto; Seifert, Karl-Heinrich; and Horwege, Claus, to Heidenreich & Harbeck Zweingniederlassung der Gildemeister AG. Apparatus for deforming a tubular slug of thermoplastic material. 3,969,060, Cl. 425-387.00B.
- Rosentreter, William O.; Justice, Richard M.; and Wade, Timothy E., to Otto H. Rosentreter Co. Dust wetting apparatus. 3,968,903, Cl. 222-1.000.
- Roskott, Lodewijk; and Groenendaal, Arnoldus Adrianus Maria, to Akzona Incorporated. Process for stabilization of ultraviolet light curable unsaturated polyester resin mixture. 3,969,206, Cl. 204-159.150.
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- Rossfelder, Andre M. Apparatus for sediment dredging and ocean mineral gathering. 3,968,579, Cl. 37-69.000.
- Rossum, David Philip, to Oberheim Electronics Inc. Circuit for dynamic control of phase shift. 3,969,682, Cl. 330-85.000.
- Rostek, Paul M., to NCR Corporation. Electromagnetic interference shielding gasket for light-weight equipment enclosures. 3,969,572, Cl. 174-35.0MS.
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- Saeman, Walter C., to Olin Corporation. Process for preparing granular calcium hypochlorite in a fluidized bed. 3,969,546, Cl. 427-213.000.
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- Saint-Remy Pellissier, Charles Marc Marie, to Societe Anonyme Fondasol-Technique. Penetrometers. 3,968,682, Cl. 73-84.000.
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- Saito, Tadaomi; Matsuzawa, Yoshimasa; Ninagawa, Sadayoshi; Honna, Masao; Takesada, Masahiko; and Takehara, Masahiro, to Ajinomoto Co., Ltd. Gels of nonpolar liquids with N-acyl amino acids and derivatives thereof as gelling agents. 3,969,087, Cl. 44-7.00C.
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- Saltzman, Robert S., to Du Pont de Nemours, E. I., and Company. Method and apparatus for detecting total reduced sulfur. 3,969,626, Cl. 250-344.000.
- Saltzman, William H., to Intellectual Property Development Corporation. Compositions and methods useful in rendering lithogenic mammalian bile non-lithogenic. 3,969,503, Cl. 424-240.000.
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- Sayles, David C., to United States of America, Army. Anti-erosive, solid rocket propellant compositions. 3,969,166, Cl. 149-19.400.
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- Schippers, Ronald. Enclosure structure. 3,968,989, Cl. 296-29.000.
- Schlegel Engineering GmbH: *See—*
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- Schlegel, William R.; and Hennessey, John J., to All American Industries, Inc. Launching apparatus for flying device. 3,968,947, Cl. 244-63.000.
- Schleicher, Ernst E. Tape dispenser. 3,968,915, Cl. 225-65.000.
- Schliemann, Gerd, to Computervision Corporation, The. Air bearing piston assembly for semiconductor mask-to-wafer aligner. 3,969,004, Cl. 308-9.000.
- Schmidt, Erwin; Clauss, Karl; Pietsch, Hartmut; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of the potassium salt of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide. 3,969,347, Cl. 260-243.00R.
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- Scholtholt, Josef: *See—*
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- Schrot, Joseph R., to Biospherics Incorporated. Use of radioisotopes for rapid identification of microorganisms. 3,969,496, Cl. 424-1.000.
- Schubert, Rudolf, to Licentia Patent-Verwaltungs-G.m.b.H. Method of forming a deflection yoke system. 3,968,566, Cl. 29-605.000.
- Schuelke, Larry Ray: *See—*
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- Schumann, Reinhard: *See—*
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- Schwan, Thomas J., to Morton-Norwich Products, Inc. 5-Aminoethyl-2,4-diphenylpyrimidine dihydrobromide. 3,969,355, Cl. 260-256.40R.
- Schwartz, Allan E.: *See—*
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- Schwarze, Werner; and Wolff, Siegfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Triazinesulfenimides of dicarboxylic acids. 3,969,353, Cl. 260-249.500.
- Schwengers, Dieter; Schneider, Hans Georg; and Keller, Ingrid, to Pfeiffer and Langen. Recovery of enzymes with ion exchangers. 3,969,538, Cl. 426-491.000.
- Scialpi, Leonard Joseph: *See—*
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- Science Union et Cie, Societe Francaise de Recherche Medical: *See—*
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- Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Beam collimation using multiple coupled elements. 3,969,686, Cl. 331-94.50H.
- SCM Corporation: *See—*
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- Scott, Charles D., to United States of America, Energy Research and Development Administration. Elution electrophoresis. 3,969,218, Cl. 204-299.00R.
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- Scott Paper Company: *See—*
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- Seabold, Thomas W., to Minnesota Mining and Manufacturing Company. Transfer adhesive dispensing device. 3,969,181, Cl. 156-577.000.
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- Sekine, Yoshitada; and Fujikawa, Tsuneo, to Nissan Motor Co., Ltd. Apparatus for and method of automatically assembling an automobile body structure. 3,968,558, Cl. 29-429.000.
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- Seragnoli, Enzo, to G. D. Societa per Azioni. Twist finger device for a candy wrapping machine. 3,968,627, Cl. 53-370.000.
- Seragnoli, Enzo, to G. D. Societa per Azioni. Twist finger apparatus for wrapping candies and the like. 3,968,628, Cl. 53-370.000.
- Sergeev, Jury Alexandrovich: *See—*
  - Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.
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- Shaw, Peter Sylvester. Preparation of ketals. 3,969,416, Cl. 260-615.00A.
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- Shell Oil Company: *See—*
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Stalker, Neil J., to F. Jos. Lamb Company. Pallet locating and clamping arrangement. 3,968,869, Cl. 198-19.000.
Stambuk, Berigoj K. Timed medicant dispensing device. 3,968,900, Cl. 221-3.000.
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- Sugiura, Junsuke; Takahashi, Junetsu; Shibasaki, Takeyoshi; and Yoneda, Motoaki, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Lancing apparatus with means for ready replacement or renewal of lances for top blown metallurgical furnaces. 3,968,956, Cl. 266-226.000.
- Sugiura, Satohiko: *See—*
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- Sullivan, Leo S., to General Motors Corporation. Ball joint with composite compression spring. 3,969,030, Cl. 403-132.000.
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- Sung, Rodney L.; Chafetz, Harry; Zoleski, Benjamin H.; and Foucher, Walter D., Jr., to Texaco Inc. Sulfurized calcium alkylphenolate compositions. 3,969,235, Cl. 252-42.700.
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- Suzuki, Nobuo; and Ketori, Takao, to Hitachi, Ltd. Magnetic head with shield plates for respective head elements. 3,969,771, Cl. 360-121.000.
- Suzuki, Takashi, to Matsushita Electric Industrial Co., Ltd. Porous polymer film. 3,969,562, Cl. 428-155.000.
- Swango, Billy J. Curtain wall panel support. 3,968,608, Cl. 52-235.000.
- Swanson, Kenneth B.; and Jensen, Kenneth D., to Midland-Ross Corporation. Hydraulic booster brake pressure regulator. 3,968,814, Cl. 137-505.180.
- Sweeney, Doris; and Lee, Mary Ellen. Whipped wax base display. 3,969,556, Cl. 428-13.000.
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- Tamborini, Ariberto; and Tamborini, Giancarlo. Process of the making of extruded thermoplastic bodies and device for the carrying out of the said process. 3,969,052, Cl. 425-113.000.
- Tamborini, Giancarlo: *See—*
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- Tan, Sing Liong, to U.S. Philips Corporation. Color television camera provided with a pick-up device and a color filter placed in front thereof. 3,969,763, Cl. 358-42.000.
- Tanaka, Hideki; Ishida, Kazutaka; Handa, Minoru; and Kitabatake, Asao, to Furuno Electric Company, Limited. Position detecting device for omega receiving system. 3,969,727, Cl. 343-105.00R.
- Tanaka, Hideshi, to Victor Company of Japan, Limited. Color television camera. 3,969,764, Cl. 358-47.000.
- Tanaka, Katsuo; and Saito, Akira, to Sony Corporation. Tension control device for a video tape recording and/or reproducing apparatus. 3,969,766, Cl. 360-85.000.
- Tanaka, Kunihiko: *See—*
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- Tegge, Bruce R.; and Rosenbaum, Barry M., to Exxon Research and Engineering Company. Process for desiccant drier regeneration. 3,969,091, Cl. 55-33.000.
- Telefonaktiebolaget L M Ericsson: *See—*
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- Telephonax, Inc.: *See—*
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- Terry, Ronald, to AMF Incorporated. Offset paddle actuator for pushrod switch. 3,969,599, Cl. 200-153.00T.
- Tessera, Giancarlo, to Honeywell Information Systems, Inc. Electronic computer with independent functional networks for simultaneously carrying out different operations on the same data. 3,969,702, Cl. 340-172.500.
- Tessler, Martin M.; and Jarowenko, Wadym, to National Starch and Chemical Corporation. Retort starches prepared from blends of starch and high amylose starch components. 3,969,340, Cl. 260-233.30R.
- Tessler, Martin M., to National Starch and Chemical Corporation. Method for the preparation of starch products and the compounds utilized therefor and the product thereof. 3,969,341, Cl. 260-233.500.
- Teufel, Helmut; Engel, Wolfhard; and Seeger, Ernst, to Boehringer Ingelheim GmbH. (4-Biphenylyl)-butenols. 3,969,418, Cl. 260-618.00R.
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- Thausing, Heinrich E.; and Wallis, Roger G., to ACF Industries, Incorporated. Shut-off valve for automotive fuel flow. 3,969,041, Cl. 417-295.000.
- Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Mobile track working machine. 3,968,752, Cl. 104-7.00B.
- Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for preparing amino-anthraquinones. 3,969,374, Cl. 260-382.000.
- Thode, Herbert W., to General Dynamics Corporation. Alternating current motor system. 3,969,659, Cl. 318-237.000.
- Thoma, Otto: *See—*
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- Thomas, Morton I. Convertible walker. 3,968,810, Cl. 135-45.00A.
- Thomas, Pierre; and Alais, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Thermoelectric microgenerator. 3,969,149, Cl. 136-225.000.
- Thompson Chemicals, Inc.: *See—*
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- Thompson, Henry Clark, to Thompson Chemicals, Inc. Method of molding fireproof products containing magnesium oxychloride cement. 3,969,453, Cl. 264-42.000.
- Thompson, John R.; and Rowland, Trevor C., to General Electric Company. Nuclear fuel element. 3,969,186, Cl. 176-68.000.
- Thompson, Richard D., to McGraw-Edison Company. Clothes dryer with heat reclaimer. 3,969,070, Cl. 432-105.000.
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- Thornber, William; and Wrangham, Brian, to Canadian Patents and Development Limited. Method of making colored particleboard. 3,969,454, Cl. 264-78.000.
- Thorsen, Arthur C., Jr.; and Hughes, Arlen J., to Rockwell International Corporation. Silicon on sapphire oriented for maximum mobility. 3,969,753, Cl. 357-60.000.
- Thuillier, Jean Eugene: *See—*
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- Thurn, Robert Dean, to Du Pont de Nemours, E. I., and Company. Polytetramethyleneether polyurethane adhesive composition. 3,969,301, Cl. 260-30.40N.
- Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., to Shell Oil Company. 2-(Nitromethylene)-hexahydropyrimidines. 3,969,354, Cl. 260-251.00R.
- Tiemann, Jerome J.: *See—*
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- Tiemstra, Peter J., to Swift & Company. Combination food product having discrete phases of nut spread and of a second food spread. 3,969,514, Cl. 426-90.000.
- Tietze, Werner, to Varta Batterie Aktiengesellschaft. Gas-tight sealed galvanic cell. 3,969,146, Cl. 136-133.000.
- Timmerman, Daniel Maurice; and De Winter, Walter Frans, to AGFA-GEVAERT N.V. Recording material. 3,969,283, Cl. 260-2.0EN.
- Timper, Arthur J.: *See—*
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- Toeniskoetter, Richard H.; and Spiwak, John J., to Ashland Oil, Inc. Method of casting non-ferrous alloys. 3,968,828, Cl. 164-41.000.
- Togami, Shigenori; Okawa, Masaharu; Hara, Junji; and Tsuruta, Masami, to Mitsui Toatsu Chemicals, Incorporated. Preparation of polymeric materials disintegratable by ultraviolet light. 3,969,432, Cl. 260-880.00R.
- Tokico Ltd.: *See—*
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- Tolar, Neal Jay; Hooper, Robert Curlee; Ghate, Prabhakar Bhimrao; and Fuller, Clyde Rhea, to Texas Instruments Incorporated. Method for fabricating a thin film capacitor. 3,969,197, Cl. 204-15.000.
- Tomita, Tadayoshi; Noda, Mikio; Yamaguchi, Yoshinobu; and Uwano, Kin-ichiro, to Toyo Engineering Corporation; and Fujimi Kenmazai Kogyo Co., Ltd. Catalysts and methods of making. 3,969,542, Cl. 252-457.000.
- Toyama, Nobuo: *See—*
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- Tracey, Robert J., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus for incoherent adaptive mean-square equalization of differentially phase-modulated data signals. 3,969,674, Cl. 325-42.000.
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- Tsuneda, Terukuni, to Canon Kabushiki Kaisha. Liquid developer for electrophotography and process for developing latent images. 3,969,238, Cl. 252-62.10L.
- Tsunoda, Fukuyuki. Steam presser. 3,968,581, Cl. 38-15.000.
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- Turner, John F., to Birdsboro Corporation. Cooling bed method. 3,968,671, Cl. 72-14.000.
- Turner, Peter H., to Sargent Industries, Inc. Bearing and bearing liner wear resistant compliant layer. 3,969,232, Cl. 252-12.600.
- Tusco Engineering Co., Inc.: *See—*
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- Umbach, Wilfried; and Stein, Werner, to Henkel & Cie G.m.b.H. Process for the alkoxylation of compounds containing alcoholic hydroxyl groups. 3,969,417, Cl. 260-615.00B.
- Ume, Yoshitaka: *See—*
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- Umeki, Tsutomu: *See—*
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- Urbach, Hans; and Mueller, Albrecht, to BASF Aktiengesellschaft. Manufacture of alkylisocyanates. 3,969,388, Cl. 260-453.00P.
- Urbach, Hans; and Mueller, Albrecht, to BASF Aktiengesellschaft. Manufacture of aliphatic isocyanates. 3,969,389, Cl. 260-453.00P.
- Urbach, Hans; and Adolphi, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Dithiophosphoric esters. 3,969,439, Cl. 260-942.000.
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- van Beukering, Henricus Cornelis Johannes, to U.S. Philips Corporation. Drive system. 3,968,699, Cl. 74-60.000.
- Van Biesen, Jozef Antoon; and Van den Bogaert, Jan, to AGFA-GEVAERT N.V. Electrostatic imaging device and process using same. 3,969,624, Cl. 250-315.00R.
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- Van Lierop, Joseph Gijsbertus, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 3,968,562, Cl. 29-571.000.
- van Rosmalen, Gerard Eduard: *See—*
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- Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Coating composition of a styrene/allyl alcohol polymer and a polyisocyanate. 3,969,569, Cl. 428-332.000.
- Vavrik, Ernest: *See—*
  - Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, 3,969,241.
- VCA Corporation: *See—*
  - Ostrowsky, Efrem M., 3,968,880.
- Veach, Carlos W. Electrically heated stylus for transferring a printing medium. 3,969,606, Cl. 219-237.000.
- VEB Pentacon-Dresden: *See—*
  - Hahn, Werner; Hennig, Walter; and Walther, Bernhard, 3,969,740.
- Veeder Industries, Inc.: *See—*
  - Nowak, Walter J., 3,969,644.
- Venuto, Paul B.: *See—*
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- Vereinigte Edelstahlwerke AG: *See—*
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- Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
  - Weinzinger, Hans; Hopf, Bruno; and Rigler, Gunter, 3,969,668.
- Vetco Offshore Industries, Inc.: *See—*
  - Baugh, Benton F., 3,968,838.
- Vetrone, James V.: *See—*
  - Fedor, John; and Vetrone, James V., 3,968,960.
- Vial, Garye R., to FMC Corporation. Pallet assembling system. 3,968,560, Cl. 29-430.000.
- Victor Company of Japan, Limited: *See—*
  - Tanaka, Hideshi, 3,969,764.
- Video and Audio Artistry Corporation: *See—*
  - Raydon, Stephen M.; and Hays, Ronald E., 3,969,588.
- Vilasi, Joseph A. Device for insertion into a body opening. 3,968,800, Cl. 128-343.000.

Vilkomerson, David Herman Raphael: *See—*
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Vinal, Albert Watson, to International Business Machines Corporation. Two frequency coded data interpreting method and apparatus. 3,969,613, Cl. 235-61.11R.

Vincent, Marcel: *See—*
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Vlahos, Petro, to Association of Motion Picture and Television Producers Inc., The. Sound recording on color film by hue modulation. 3,969,593, Cl. 179-100.30B.

Vobornik, Vaclav: *See—*
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Vogeli, Ernst, to Sulzer Brothers Limited. Stuffing box. 3,968,970, Cl. 277-106.000.

Vogelsang, Gustav, to Volkswagenwerk Aktiengesellschaft. Carburetor having a choke device. 3,969,445, Cl. 261-44.00R.

Vogt, B. Richard: *See—*
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von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 2-Benzoyl-3-aminopyridines. 3,969,361, Cl. 260-295.0AM.

von Eickstedt, Klaus-Wolf: *See—*
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Vorgrimler, Ludwig: *See—*
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Voronova, Natalya Alexandrovna: *See—*
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Wacker Chemie GmbH: *See—*
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Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Triazolo[4,3-D][1,4]benzodiazepine-3,6-diones. 3,969,343, Cl. 260-239.30T.

Wade, Peter C.; and Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 3[Substituted-2-(methylamino)phenyl]4-[2-oxo-2-(heterocyclic)ethyl]-5-substituted-1,2,4-triazoles. 3,969,366, Cl. 260-308.00R.

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Wagenhofer, John Joseph, to Lawrence Peska Associates, Inc., a part interest. Wiping blade device for truck rear view mirrors. 3,968,537, Cl. 15-250.290.

Waggener, William N., to Weston Instruments, Inc. Spectrum analyzer having means for transient signal analysis. 3,969,705, Cl. 340-173.0RC.

Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, to Bayer Aktiengesellschaft. Process for the production of synthetic plastics comprising urethane groups and biuret groups. 3,969,262, Cl. 252-182.000.

Wakamatsu, Hisato, to Nippondenso Co., Ltd. Multiplex signal transmission device. 3,969,586, Cl. 179-15.00A.

Wakefield, Gene Felix, to Texas Instruments Incorporated. Vapor deposition method of forming low cost semiconductor solar cells including reconstitution of the reacted gases. 3,969,163, Cl. 148-174.000.

Wakisaka, Yoshiharu: *See—*
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Waldrum, John E., to Amchem Products, Inc. Apparatus for hydraulic planting. 3,968,933, Cl. 239-171.000.

Waldstein, David A. Compositions containing monoalkanolamide borates. 3,969,236, Cl. 252-49.500.

Walgenbach, David D.; and Stocker, Kenneth E., to Chevron Research Company. Process and apparatus for applying pesticides to granular materials. 3,968,771, Cl. 118-303.000.

Wallace, David Nelson: *See—*
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Wallace, James, to Ideal Casements (Reading) Limited. Framing. 3,968,614, Cl. 52-403.000.

Wallander, Gunnar; and Bostrom, Bernt, to Audio Stockholm. Voltage level indicator established by a series of progressively energized light emitting diodes. 3,969,672, Cl. 324-133.000.

Wallbaum, Hans-Joachim, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method of making dispersion strengthened products. 3,969,156, Cl. 148-11.50R.

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Walther, Bernhard: *See—*
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Walther, Herbert C., Jr.; and Myers, George M., to Continental Oil Company. Determining the extent of entry of fluids into a borehole during drilling. 3,968,844, Cl. 175-48.000.

Walton, John E., to United States of America, Army. Shaped mini charge round. 3,968,945, Cl. 244-3.280.

Walworth, Ralph Franklin. Trans-clutch torque converter. 3,968,651, Cl. 60-487.000.

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Wang, Lawrence K., to Calspan Corporation. Method for the analysis of ionic surfactants. 3,969,076, Cl. 23-230.00R.

Wanner, Vernon Walter; and Lueschen, William Karl, to Globe-Union Inc. Illuminated push button switch. 3,969,609, Cl. 200-314.000.

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Wark, William John, to Zeo-Mag Research Limited. Selective hydrometallurgical separation of lead from complex lead-zinc-copper sulfide ores or derived concentrates. 3,969,106, Cl. 75-101.00R.

Warner & Swasey Company, The: *See—*
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Wassenburg, Teunis C.; and Van Westrenen, William J., to Shell Oil Company. Vinyl ester copolymer latices and their preparation. 3,969,296, Cl. 260-29.6TA.

Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, to Pilot Man-Nen-Hitsu Kabushiki Kaisha; and Toyo Giken Kogyo Kabushiki Kaisha. Continuous apparatus for electrolytic treatment on a long structure of aluminum or its alloys. 3,969,211, Cl. 204-211.000.

Watanabe, Sakae; and Ohigawa, Heihachiro, to Nissan Motor Co., Ltd.; and Nippon Dia Clevite Company, Limited. Copper-base bearing material containing corrosion-resistant lead alloy. 3,969,084, Cl. 29-182.100.

Watatani, Yoshizumi; and Masuda, Michio, to Hitachi, Ltd. Vertical synchronizing signal recording apparatus. 3,969,581, Cl. 178-5.600.

Watkinson, Alan Paul: *See—*
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Weaver, Leroy E., to Sperry-Sun, Inc. Measuring the angular position of a shaft. 3,969,662, Cl. 318-645.000.

Weber, Heinz P.; and Langlois, Gordon E., to Chevron Research Company. Method for impregnating a water-sensitive solid with a water-soluble material using an aqueous impregnating solution. 3,969,275, Cl. 252-455.00R.

Weed, Terrance O.; and Mougel, Daniel. Protective cover for automobile mounted bicycle carrier. 3,968,913, Cl. 224-42.03B.

Wegmann, Jacques; Becker, Carl; Zwahlen, Guenther; and Kuster, Werner, to Ciba-Geigy AG. Process for the dyeing of colored shaped articles of high polymer, synthetic resins and preparations for such process. 3,969,302, Cl. 260-30.40R.

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Weiler, Ernest D., to Rohm and Haas Company. 3-Pyridylmethyl phenyl urea metal salt complexes. 3,969,357, Cl. 260-270.0PY.

Weinzinger, Hans; Hopf, Bruno; and Rigler, Gunter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method for checking the planarity of a cold-rolled ferromagnetic strip. 3,969,668, Cl. 324-34.00R.

Weiss, Hansjakob; Cremer, Dieter; and Kranz, Eginhard, to Interatom Internationale Atomreaktorbau GmbH. Device for taking samples of molten metals flowing in pipes. 3,968,695, Cl. 73-422.00R.

Werblin, David A., to Griffin Wellpoint Corporation. Wellpoint jetting head. 3,968,847, Cl. 175-402.000.

Wermuth, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Automatic dynamic compander system. 3,969,680, Cl. 330-29.000.

Werth, John; and Sklarchuk, Jack C., to ESB Incorporated. Sodium-aluminum halide, sulfur battery. 3,969,138, Cl. 136-6.0FS.

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White, Charles Arthur John, to Chloride Alcad Limited. Electric cells. 3,969,140, Cl. 136-14.000.

White, Deloy J. System for producing a colored motion picture film from black-and-white medium. 3,969,022, Cl. 352-38.000.

White, Edward Louis; Robertson, William Ernest; and Yu, William Heng-Sen, to NL Industries, Inc. Basic zinc phosphites. 3,969,293, Cl. 260-22.0CB.

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Wickes Corporation, The: *See—*
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Wilbur-Ellis Company: *See—*
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Wilcox, Raymond J. Vehicle wheel. 3,968,996, Cl. 301-37.00R.

Wilfert, Karl, to Daimler-Benz Aktiengesellschaft. Tiltable indicia constructed as radiator emblem. 3,968,977, Cl. 280-727.000.

Wilke, William G. Voltage condition monitor. 3,969,635, Cl. 307-235.00R.

William H. Rorer, Inc.: *See—*
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Williams, Albert Edward; and Atia, Ali Ezzeldin, to Communications Satellite Corporation (Comsat). Generalized waveguide bandpass filters. 3,969,692, Cl. 333-73.00W.

Williams, Bobby L.: *See—*
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Williams, Francis E., to Carl-Art, Inc. Jewelry having rotatable indicia-bearing disc and indicating means. 3,968,661, Cl. 63-31.000.

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Windt, Robert James. Automatic lift system for air cushion vehicles. 3,968,851, Cl. 180-117.000.

Winkler, Alfred; Eggering, Albert; Stenzenberger, Volkmar; and Wilsch, Herbert, to AGFA-Gevaert, A.G. Circular magazine for photographic transparencies. 3,968,878, Cl. 206-455.000.

Winsche, Warren E.; Miles, Francis T.; and Powell, James R., to United States of America, Energy Research and Development Administration. Gas production apparatus. 3,969,631, Cl. 250-527.000.

Wismer, Marco: *See—*
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Witte, Michael; and Mehta, Manankumar S., to U.S. Filter Corporation. Recovery of elemental sulfur from sulfur dioxide bearing waste gases. 3,969,492, Cl. 423-574.00L.

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Wolf, Johann, to Johann Wolf Gesellschaft m.b.H. KG, Firma. Top unloader for silos. 3,968,998, Cl. 302-56.000.

Wolf, Martin, to Boehringer Ingelheim GmbH. Method for reducing the heart beat frequency. 3,969,525, Cl. 424-273.000.

Wolfe, [illegible]nis G.; Mitts, Richard K.; Jackson, Wilbur F., deceased; and by Benton, Linda A., trust administrator. Refractory resistor with supporting terminal. 3,969,696, Cl. 338-315.000.

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Wrobel, Gunter; and Papst, Georg, to Papst-Motoren KG. Magnetic tape recording and/or reproducing apparatus. 3,968,942, Cl. 242-204.000.

Wu, Leon Li-Heng, to International Business Machines Corporation. Electron beam testing of integrated circuits. 3,969,670, Cl. 324-73.0PC.

Wu, Mu-Sheng, to General Electric Company. Process for recovering synthetic diamonds from pressed runs. 3,969,489, Cl. 423-446.000.

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Yamada, Shinji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Attachment assembly for preventing improper positional mounting. 3,969,011, Cl. 339-125.00R.

Yamada, Shintaro, to Chugairo Kogyo Kaisha Ltd. Method for incineration of a sludge containing chromium substance and apparatus therefor. 3,968,756, Cl. 110-12.000

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Yankee, Ernest W., to Upjohn Company, The. 8β, 11β, 12α-PGE$_2$ compounds. 3,969,396, Cl. 260-468.00D.

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Yoshino, Masahito, to Kabushiki Kaisha Suwa Seikosha. Step motor for electronic timepiece. 3,969,642, Cl. 310-49.00R.

Yoshizawa, Ryushiro: *See—*
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Young, D. Craig: *See—*
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Zabransky, Robert F., to Universal Oil Products Company. HF Alkylation reaction temperature control system. 3,969,078, Cl. 23-253.00A.

Zahnradfabrik Friedrichshafen AG: *See—*
Dach, Hansjorg, 3,968,707.
Lang, Armin; Kurz, Falk; and Walter, Wolfgang, 3,968,733.

Zaromb, Solomon. Electrochemical power generation. 3,969,144, Cl. 136-86.00A.

Zeblisky, Rudolph J., to Photocircuits Division of Kollmorgan Corporation. Precious metal sensitizing solutions. 3,969,554, Cl. 427-305.000.

Zeigler, Theodore R. Collapsible self-supporting structure. 3,968,808, Cl. 135-4.00R.

Zeile, Karl: *See—*
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 3,969,410.

Zeilinger, Karl: *See—*
Dobler, Helmut; Nadolny, Kurt; Zeilinger, Karl; Lamm, Heinz; and Piry, Horst, 3,969,048.

Zelikman, Abram Naumovich; Voldman, Grigory Markovich; Rumyantsev, Viktor Konstantinovich; Ziberov, Georgy Nikolaevich; and Kagermanian, Valery Sergeevich. Process for separation of tungsten and molybdenum by extraction. 3,969,478, Cl. 423-54.000.

Zeman, Jack R. Method and apparatus for molding an elastomeric fishing lure body. 3,968,951, Cl. 249-55.000.

Zenith Radio Corporation: *See—*
Chodil, Gerald Joseph; DeJule, Michael C.; and Glaser, David, 3,969,650.

Zentman, Leo, Bathtub safety gripping rail. 3,968,524, Cl. 4–185H.

Zeo-Mag Research Limited: *See—*
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Zern, Leo: *See—*
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Zetye, Walter C.: *See—*
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Zeugner, Horst: *See—*
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Zelikman, Abram Naumovich; Voldman, Grigory Markovich; Rumyantsev, Viktor Konstantinovich; Ziberov, Georgy Nikolaevich; and Kagermanian, Valery Sergeevich, 3,969,478.

Zievers, James F., to Industrial Filter & Pump Mfg. Co. Process and apparatus for removing metallic ions from an electrolytic solution. 3,969,215, Cl. 204-276.000.

Zilver, Edwin, to Silverflex International N.W. Mounting bracket for a blind. 3,968,826, Cl. 160-323.00R.

Zimmer, Friedhelm; and Zimmer Herbert, to Dornier GmbH. Aircraft with shrouded propeller drive. 3,968,944, Cl. 244-1.00N.

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Zoecon Corporation: *See—*
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Zoleski, Benjamin H.: *See—*
Sung, Rodney L.; Chafetz, Harry; Zoleski, Benjamin H.; and Foucher, Walter D., Jr., 3,969,235.

Zosel, Kurt, to Studiengesellschaft Kohle m.b.H. Process for the separation of mixtures of substances. 3,969,196, Cl. 203-49.000.

Zosel, Kurt, to Studiengesellschaft Kohle m.b.H. Process for the simultaneous hydrogenation and deodorisation of fats and/or oils. 3,969,382, Cl. 260-409.000.

Zwahlen, Guenther: *See—*
Wegmann, Jacques; Becker, Carl; Zwahlen, Guenther; and Kuster, Werner, 3,969,302.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aneja, Rajindra; and Chadha, Jaswinder Singh, to Lever Brothers Company. Phosphatide separation. Re. 28,903, Cl. 260-403.000.

B. F. Goodrich Company, The: *See—*
Kim, Heung T., Re. 28,901.

Bell Telephone Laboratories, Incorporated: *See—*
Hodges, David Albert, Re. 28,905.

Byers, John E.; and Claussen, Wells H. Drill bit device. Re. 28,900, Cl. 408-201.000.

Chadha, Jaswinder Singh: *See—*
Aneja, Rajindra; and Chadha, Jaswinder Singh, Re. 28,903.

Claussen, Wells H.: *See—*
Byers, John E.; and Claussen, Wells H., Re. 28,900.

Concrete Pipe Machinery Company: *See—*
Trautner, Ferdinand A.; and Kent, LeRoy E., Re. 28,902.

Gleason, Patrick J., to Lumco Manufacturing Company. Cutting tool assembly. Re. 28,896, Cl. 29-97.000.

Gower, Roger L. Self-aligning traction assembly for vehicles. Re. 28,898, Cl. 152-239.000.

Himmelstein, Sydney; and Tveter, Richard S., to S. Himmelstein and Company. Torque control apparatus. Re. 28,899, Cl. 173-12.000.

Hodges, David Albert, to Bell Telephone Laboratories, Incorporated. Field effect transistor memory cell. Re. 28,905, Cl. 340-173.00R.

Kabushiki Kaisha Suwa Seikosha: *See—*
Natori, Machito, Re. 28,897.

Kent, LeRoy E.: *See—*
Trautner, Ferdinand A.; and Kent, LeRoy E., Re. 28,902.

Kim, Heung T., to B. F. Goodrich Company, The. Apparatus for refining polymeric material. Re. 28,901, Cl. 425-208.000.

Lever Brothers Company: *See—*
Aneja, Rajindra; and Chadha, Jaswinder Singh, Re. 28,903.

Lumco Manufacturing Company: *See—*
Gleason, Patrick J., Re. 28,896.

Maisonville, Richard C., to Scans Associates, Inc. Method and apparatus for testing internal combustion engines. Re. 28,904, Cl. 324-16.00R.

Natori, Machito, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Motion transforming mechanism. Re. 28,897, Cl. 74-112.000.

Noiles, Douglas G., to United States Surgical Corporation. Artificial hip joint. Re. 28,895, Cl. 3-1.912.

S. Himmelstein and Company: *See—*
Himmelstein, Sydney; and Tveter, Richard S., Re. 28,899.

Scans Associates, Inc.: *See—*
Maisonville, Richard C., Re. 28,904.

Shinshu Seiki Kabushiki Kaisha: *See—*
Natori, Machito, Re. 28,897.

Trautner, Ferdinand A.; and Kent, LeRoy E., to Concrete Pipe Machinery Company. Vibratory core for concrete pipe making machine. Re. 28,902, Cl. 425-262.000.

Tveter, Richard S.: *See—*
Himmelstein, Sydney; and Tveter, Richard S., Re. 28,899.

United States Surgical Corporation: *See—*
Noiles, Douglas G., Re. 28,895.

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Acorn Engineering: *See—*
Morris, Earl L. 240,535.

Ammons, Robert G., Sr. Purse guard. 240,568, 7–13–76, Cl. D87—2.

Aurora S.p.A.: *See—*
Verona, Franco. 240,526.

Ball, Geo. J., Inc.: *See—*
Messick, Darrell E. 240,548.

Bausch & Lomb Inc.: *See—*
Huckenbeck, Claus O. 240,553.

Bay-King Motors (1968) Ltd.: *See—*
Richter, Hyman R., and Demaray. 240,519.

Beasley, Kenneth. Mobile cooking trailer. 240,494, 7–13–76, Cl. D7—108.

Bio-Research Glass, Inc.: *See—*
Dragotta, Robert. 240,543.

Blair, Ralph A. Rack for skis and ski poles or the like. 240,487, 7–13–76, Cl. D6—125.

Bluestein, Bernard B.: *See—*
Long, Douglas, and Bluestein. 240,565.

Box, Theodor. Menu cover. 240,523, 7–13–76, Cl. D19—26.

Braun, Ralph V.: *See—*
Whitehead, Howard A., and Braun. 240 562–4.

Brien, Marie I. Garment designing device. 240,510, 7–13–76, Cl. D10—64.

Brindley, Robert E., to Union Carbide Corp. Flashlight. 240,550, 7–13–76, Cl. D48—24.

Brindley, Robert E., to Union Carbide Corp. Flashlight. 240,551, 7–13–76, Cl. D48—24.

Brudy, Peter E., to Dominion Auto Accessories Ltd. Foldable emergency warning signal. 240.514, 7–13–76, Cl. D10—111.

Burin, Ralph R., to Intercraft Industries Corp. Photo frame. 240,492, 7–13–76, Cl. D6—236.

Burris Industries, Inc.: *See—*
Halme, Matti. 240,479.

Capitol Products Corp.: *See—*
Cribben, James T. 240,521.

Carre, Alain, to Waterman, S.A. Ball-point pen. 240,524, 7–13–76, Cl. D19—45.

Carroll, Richard A., to The Lorac Co., Inc. Sign clip (A). 240,501, 7–13–76. Cl. D8—245.

Chicago Specialty Mfg. Co.: *See—*
Halsted, Milton, and Uyeda. 240,532–4.

Christophel, Reuben L., to Shenandoah Mfg. Co., Inc. Combined air convector and log support for fireplaces. 240,536, 7–13–76, Cl. D23—94.

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Crompton, Kenneth J., and T. Hochstatter, to Dominion Auto Accessories Ltd. Foldable emergency warning signal. 240,515, 7–13–76, Cl. D10—111.

Cross, Thomas R., C. L. George, and J. W. Patla, to Xerox Corp. Duplicating machine with sorter. 240,554, 7–13–76. Cl. D16—30.

Cross, Thomas R., C. L. George, and J. W. Patla, to Xerox Corp. Sorter. 240,555, 7–13–76, Cl. D16—32.

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Daniels, Charles R. Shelf end mounting bracket. 240,502, 7–13–76. Cl. D8—255.

Defores, Eugene, to Waterman, S.A. Pen. 240,525, 7–13–76, Cl. D19—47.

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Dolco Packaging Corp.: *See—*
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Dominion Auto Accessories Ltd.: *See—*
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Dragotta, Robert, to Bio-Research Glass, Inc. Cell culture vessel or the like. 240,543, 7–13–76. Cl. D32—1.

Dybala, Raymond W., to Sunbeam Corp. Hair dryer. 240,561, 7–13–76. Cl. D86—10.

Edwards, Lawrence K. Station for elevated railway. 240,522, 7–13–76. Cl. D25—35.

Eftekhar, Zia, to Lightolier Inc. Lighting fixture. 240,549, 7–13–76, Cl. D48—23.

Elkington, Kenneth W. Portable water purifier. 240,531, 7–13–76. Cl. D23—3.

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Erisman, David E. Electronic bicycle speedometer. 240,512, 7–13–76 Cl. D10—98.

Farbman, Stuart A. Combined mirror and toothbrush holder. 240,485, 7–13–76. Cl. D6—94.

Fister, Lee H., Jr. Sofa. 240,481, 7–13–76. Cl. D6—61.

Foltz, Carl L., V. H. Troutner, and A. F. Trott. Wire inserter. 240,498, 7–13–76, Cl. D8—68.

Ford, Gilbert, to Eltra Corp. Athletic shoe. 240,470, 7–13–76, Cl. D2—309.

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Gordon, Stewart: *See—*
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Halsted, Milton, and T. M. Uyeda, to Chicago Specialty Mfg. Co. Shower spray head. 240,533, 7–13–76, Cl. D23—35.

Halsted, Milton, and T. M. Uyeda, to Chicago Specialty Mfg. Co. Shower spray head. 240,534, 7–13–76, Cl. D23—35.

- Hamada, Masanori, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 240,552, 7–13–76, Cl. D56—4.
- Hankins, Maxey A., to Mole-Richardson Co. Burglar alarm. 240,513, 7–13–76, Cl. D10—106.
- Harris, Robert K., to Ringley & Crockett, Inc. Artificial fishing lure. 240,528, 7–13–76, Cl. D22—27.
- Hayes, Charles S. Bottle. 240,504, 7–13–76, Cl. D9—83.
- Hinson-Rider, George. Target marker. 240,529, 7–13–76, Cl. D22—99.
- Hiraishi, Etsuo : *See*—
  - Shohoji, Takeshi, and Hiraishi. 240,558.
- Hochstatter, Theodore : *See*—
  - Crompton, Kenneth J., and Hochstatter. 240,515.
- Hood, Christopher J., to Wilkinson Sword Ltd. Packaging tray for containing and dispensing razor blade units. 240,507, 7–13–76, Cl. D9—189.
- Howard, Harold J. Miniature tramway car and platform therefor. 240,544, 7–13–76, Cl. D34—15.
- Huckenbeck, Claus O., to Bausch & Lomb Inc. Riflescope elevation adjustment assembly. 240,553, 7–13–76, Cl. D57—1.
- Hunt, John K. Floral holder base. 240,490, 7–13–76, Cl. D6—196.
- Hutchison, Marion E., V. O. Thomas, and W. D. Shafar. Silo dome. 240,520, 7–13–76, Cl. D25—56.
- Intercraft Industries Corp. : *See*—
  - Burin, Ralph R. 240,492.
- Ishida, Hajime. Baby walker. 240,518, 7–13–76, Cl. D12—130.
- Johnson Pet-Dor, Inc., d.b.a. J & S Products : *See*—
  - Sronce, Robert M. 240,537.
- Kabushiki Kaisha Mitutoyo Seisakusho : *See*—
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- Kabushiki Kaisha Saikosha Seisakusho : *See*—
  - Saitou, Hisashi. 240,516.
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  - Tanikawa, Masashi. 240,508.
- Kawaguchi, Harold H., to Physio-Control Corp. Peritoneal dialysis unit or the like. 240,559, 7–13–76, Cl. D83—1.
- Kerwin, Julian, to Creative Display Fixtures, Inc. Rotatable display stand. 240,489, 7–13–76, Cl. D6—188.
- Kimberly-Clark Corp. : *See*—
  - Whitehead, Howard A., and Braun. 240,562–4.
- Kirk, Stanley. Lens viewer. 240,556, 7–13–76, Cl. D10—81.
- Koenigsberg, Victor, to Colgate-Palmolive Co. Bottle. 240,505, 7–13–76, Cl. D9—90.
- Koppe, Rudolf. Cutlery handle. 240,495, 7–13–76, Cl. D7—152.
- Kramer, Milton H., to DSC Industries, Inc. Seat cushion. 240,491, 7–13–76, Cl. D6—201.
- Kubik, Philip A. Fluid reservoir for pumps or the like. 240,530, 7–13–76, Cl. D23—2.
- Kupex AG : *See*—
  - Raffler, Dieter, and Clivio. 240,486.
- Lightolier Inc. : *See*—
  - Eftekhar, Zia. 240,549.
- Long, Douglas, and B. B. Bluestein, to Sunbeam Corp. Hair dryer base. 240,565, 7–13–76, Cl. D86—10.
- Loosen, Ronald E., to Xerox Corp. Computer terminal. 240,540, 7–13–76, Cl. D26—5.
- Lorac Co., Inc., The : *See*—
  - Carroll, Richard A. 240,501.
- Makauskas, Walter : *See*—
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- Marcatre S.p.A. : *See*—
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- Marks, Robert J. Chair. 240,480, 7–13–76, Cl. D6—37.
- Matsushita Electric Industrial Co., Ltd. : *See*—
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- Messick, Darrell E., to Geo. J. Ball, Inc. Plant container. 240,548, 7–13–76, Cl. D35—3.
- Michaud, Eleanor S. : *See*—
  - Crescenzi, Donald C., and Michaud. 240,503.
- Miller, Jack V. Automotive jack stand. 240,517, 7–13–76, Cl. D12—55.
- Miyazaki, Sadayasu. Toy bank. 240,545, 7–13–76, Cl. D34—11.
- Mole-Richardson Co. : *See*—
  - Hankins, Maxey A. 240,513.
- Morgan, Jeanette. Utility chair for a hairdresser. 240,475, 7–13–76, Cl. D6—22.
- Morris, Earl L., to Acorn Engineering. Floor toilet or the like. 240,535, 7–13–76, Cl. D23—67.
- Murray, Joseph E., Jr. Smoking apparatus. 240,542, 7–13–76, Cl. D27—3.
- Musser, Clair O. Combined serving tray and tumbler. 240,493, 7–13–76, Cl. D7—3.
- Nashagh, Marouf. Toy automative vehicle. 240,546, 7–13–76, Cl. D34—15.
- Nishikata, Goro, to Kabushiki Kaisha Mitutoyo Seisakusho. Sight for an archery bow. 240,527, 7–13–76, Cl. D22—5.
- Pacific Handy Cutter, Inc. : *See*—
  - Richards, James L. 240,500.
- Parker, Russell H. R., to Superior Brush Co. Brush. 240,473, 7–13–76, Cl. D4—29.
- Patla, Jacob W. : *See*—
  - Cross, Thomas R., George, and Patla. 240,554–55.
- Pawlak, Michael E. Combined bed and toy box. 240,474, 7–13–76, Cl. D6—6.
- Physio-Control Corp. : *See*—
  - Kawaguchi, Harold H. 240,559.
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  - Russell, Robert E. 240,471.
- Raffler, Dieter, and F. Clivio, to Kupex AG. Rack for garden implements and hoses. 240,486, 7–13–76, Cl. D6—112.
- Riba, Ferris E. Can opener punch. 240,497, 7–13–76, Cl. D8—18.
- Richards, James L., to Pacific Handy Cutter, Inc. Adjustable blade knife handle. 240,500, 7–13–76, Cl. D8—99.
- Richter, Hyman R., and R. I. Demaray, to Bay-King Motors (1968) Ltd. Set of automobile louvre accessories. 240,519, 7–13–76, Cl. D12—155.
- Ringley & Crockett, Inc. : *See*—
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- Risdon Mfg. Co., The : *See*—
  - Velicka, Alvydas, and Makauskas. 240,509.
- Rodriquez, Rodrigo, to Marcatre S.p.A. Armchair. 240,476, 7–13–76, Cl. D6—26.
- Rupert, John, to Tobacco Research and Development Institute Ltd. Cigarette. 240,541, 7–13–76, Cl. D27—1.
- Russell, Robert E., to Quabaug Rubber Co. Boot heel. 240,471, 7–13–76, Cl. D2—323.
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  - Shohoji, Takeshi, and Hiraishi. 240,558.
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- Saitou, Hisashi, to Kabushiki Kaisha Saikosha Seisakusho. Buzzer for bicycles and the like. 240,516, 7–13–76, Cl. D10—116.
- Sanwa Cutlery Co., Ltd. : *See*—
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- Schultz, Allan E., and S. Gordon. Knife holder. 240,496, 7–13–76, Cl. D7—74.
- Shafar, William D. : *See*—
  - Hutchinson, Marion E., Thomas, and Shafar. 240,520.
- Shenandoah Mfg. Co., Inc. : *See*—
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- Shohoji, Takeshi, and E. Hiraishi, to Ryobi, Ltd. Offset printing machine. 240,558, 7–13–76, Cl. D64—11.
- Sironi, Giuseppe, to Vibram S.p.A. Combined boot sole and heel. 240,472, 7–13–76, Cl. D2—320,
- Sklaroff, William to John Stuart International Inc. Pedestal lounge chair. 240,477, 7–13–76, Cl. D6—31.
- Sklaroff, William to John Stuart International Inc. Pedestal arm chair. 240,478, 7–13–76, Cl. D6—31.
- Sklaroff, William, to John Stuart International Inc. Chair or similar article. 240,483, 7–13–76, Cl. D6—69.
- Sklaroff, William, to John Stuart International Inc. Armchair or similar article. 240,484, 7–13–76, Cl. D6—69.
- Souders, Morris L. Cutting and rolling tool. 240,499, 7–13–76, Cl. D8—98.
- Sronce, Robert M., to Johnson Pet-Dor, Inc., d.b.a. J & S Products. Tray for holding dental equipment and supplies. 240,537, 7–13–76, Cl. D24—000.
- Stanley, Bliss W., and E. M. Toy bed. 240,547, 7–13–76, Cl. D34—15.
- Stanley, Edmee M. : *See*—
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- Stemmle, Denis J., to Xerox Corp. Tray rack. 240,557, 7–13–76, Cl. D16—32.
- Stewart-Warner Corp. : *See*—
  - Crescenzi, Donald C., and Michaud. 240,503.
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- Talge, Henry J., and J. M. Gerdom, to Whirl-O-Matic Corp. Hydrotherapy unit for bath tubs. 240,560, 7–13–76, Cl. D83—1.
- Tanikawa, Masashi, to Kameyama Candle Co. Ltd. Packaging container. 240,508, 7–13–76, Cl. D9—224.
- Tatum, Susan. Doll carrier. 240,567, 7–13–76, Cl. D87—1.
- Taub, Lawrence D. Combined bar and display cabinet. 240,488, 7–13–76, Cl. D6—148.
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  - Hutchinson, Marion E., Thomas, and Shafar. 240,520.
- Tobacco Research and Development Institute Ltd. : *See*—
  - Rupert, John. 240,541.
- Trott, Arthur F. : *See*—
  - Foltz, Carl L., Troutner, and Trott. 240,498.
- Troutner, Vernon H. : *See*—
  - Foltz, Carl L., Troutner, and Trott. 240,498.
- Union Carbide Corp. : *See*—
  - Brindley, Robert E. 240,550–1.
- Uyeda, Tim M. : *See*—
  - Halsted, Milton, and Uyeda. 240,532–4.
- Velicka, Alvydas, and W. Makauskas, to The Risdon Mfg. Co. Actuator cap for a pressurized container. 240,509, 7–13–76, Cl. D9—258.
- Verona, Franco, to Aurora S.p.A. Writing instrument. 240,526, 7–13–76, Cl. D19—51.
- Vibram S.p.A. : *See*—
  - Sironi, Giuseppe. 240,472.
- Voorhees, Robert F., Jr. Armchair. 240,482, 7–13–76, Cl. D6—69.
- Wall, Delbert N. Ignition induction coupler for internal combustion engine or the like. 240,538, 7–13–76, Cl. D26—1.
- Waterman, S.A. : *See*—
  - Carre, Alain. 240,524.
  - Defores, Eugene. 240,525.
- Westerberg, Ingvar. Carrying harness. 240,566, 7–13–76, Cl. D87—1.
- Whirl-O-Matic Corp. : *See*—
  - Talge, Henry J., and Gerdom. 240,560.
- Whitehead, Howard A., and R. V. Braun, to Kimberly-Clark Corp. Thin absorbent pad for a sanitary napkin or the like. 240,562, 7–13–76, Cl. D83—1.
- Whitehead, Howard A., and R. V. Braun, to Kimberly-Clark Corp. Thin absorbent pad for a sanitary napkin or the like. 240,563, 7–13–76, Cl. D83—1.
- Whitehead, Howard A., and R. V. Braun, to Kimberly-Clark Corp. Thin absorbent pad for a sanitary napkin or the like. 240,564, 7–13–76, Cl. D83—1.
- Wilkinson Sword Ltd. : *See*—
  - Hood, Christopher J. 240,507.
- Xerox Corp. : *See*—
  - Cross, Thomas R., George, and Patla. 240,554–555.
  - Loosen, Ronald E. 240,540.
  - Stemmle, Denis J. 240,557.

CLASSIFICATION OF PATENTS

ISSUED JULY 13, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
203	3,968,521
250	3,968,522
252	3,968,523
CLASS 3	
1.912	Re.28,895
CLASS 4	
1	3,968,524
67R	3,968,525
79	3,968,526
172.17	3,968,527
CLASS 5	
211	3,968,528
338	3,968,529
	3,968,530
CLASS 6	
1	3,968,531
CLASS 8	
2.5R	3,969,071
111	3,969,072
142	3,969,073
155.2	3,969,074
172R	3,969,075
CLASS 9	
2C	3,968,532
CLASS 10	
2	3,968,533
CLASS 12	
127	3,968,534
CLASS 15	
105	3,968,535
187	3,968,536
250.29	3,968,537
409	3,968,538
CLASS 16	
115	3,968,539
163	3,968,540
CLASS 19	
66R	3,968,541
97	3,968,542
293	3,968,543
CLASS 23	
230L	3,969,077
230R	3,969,076
253A	3,969,078
253R	3,969,079
259	3,969,080
284	3,969,081
288FB	3,969,083
288FC	3,969,082
CLASS 24	
49CF	3,968,544
67.9	3,968,546
205.15R	3,968,545
CLASS 28	
63	3,968,547
CLASS 29	
33M	3,968,548
95R	3,968,549
	3,968,550
97	Re.28,896
132	3,968,551
157R	3,968,552
157.1R	3,968,553
157.3AH	3,968,554
182.1	3,969,084
193	3,969,085
195	3,969,086
203MW	3,968,555
205D	3,968,556
271	3,968,557
429	3,968,558
430	3,968,559
	3,968,560
460	3,968,561
571	3,968,562
580	3,968,564
591	3,968,563
603	3,968,565
605	3,968,566
CLASS 32	
15	3,968,567
CLASS 33	
141G	3,968,568
169R	3,968,569
267	3,968,570
CLASS 34	
14	3,968,571
134	3,968,572
CLASS 35	
7R	3,968,573
	3,968,574
9A	3,968,575
35B	3,968,576
CLASS 36	
43	3,968,577
121	3,968,578
CLASS 37	
69	3,968,579
189	3,968,580
CLASS 38	
15	3,968,581
CLASS 40	
27.5	3,968,582
125E	3,968,583
130K	3,968,584
CLASS 43	
4	3,968,585
4.5	3,968,586
27.4	3,968,587
53.5	3,968,588
81	3,968,589
114	3,968,590
CLASS 44	
7C	3,969,087
10C	3,969,088
CLASS 46	
1R	3,968,591
178	3,968,592
209	3,968,593
CLASS 47	
57.5	3,968,594
CLASS 48	
197R	3,969,089
CLASS 49	
43	3,968,595
49	3,968,596
477	3,968,597
CLASS 51	
55	3,968,598
216LP	3,968,599
400	3,969,090
CLASS 52	
19	3,968,600
21	3,968,601
40	3,968,602
86	3,968,603
	3,968,604
126	3,968,605
127	3,968,606
173R	3,968,607
235	3,968,608
245	3,968,609
314	3,968,610
396	3,968,611
400	3,968,612
	3,968,613
403	3,968,614
439	3,968,615
645	3,968,616
720	3,968,617
745	3,968,618
758F	3,968,624
CLASS 53	
24	3,968,619
	3,968,620
52	3,968,621
59R	3,968,622
124D	3,968,625
195	3,968,623
267	3,968,626
370	3,968,627
	3,968,628
373	3,968,629
CLASS 55	
33	3,969,091
160	3,969,092
229	3,969,093
242	3,969,094
350	3,969,095
455	3,969,096
CLASS 56	
7	3,968,630
328R	3,968,631
341	3,968,632
	3,968,633
344	3,968,634
CLASS 57	
35	3,968,635
58.95	3,968,636
81	3,968,637
140R	3,968,638
CLASS 58	
23R	3,968,639
50R	3,968,640
	3,968,641
59	3,968,642
88R	3,968,643
CLASS 60	
39.65	3,968,644
262	3,968,647
271	3,968,646
282	3,968,648
288	3,968,645
297	3,968,649
428	3,968,650
487	3,968,651
641	3,968,652
644	3,968,653
CLASS 61	
11	3,968,654
42	3,968,655
46	3,968,656
53.5	3,968,657
72.1	3,968,658
CLASS 62	
5	3,968,659
137	3,969,097
275	3,968,660
CLASS 63	
31	3,968,661
CLASS 65	
1	3,969,098
2	3,969,099
27	3,969,100
CLASS 66	
9B	3,968,662
212	3,968,663
CLASS 68	
22R	3,968,664
CLASS 70	
234	3,968,665
243	3,968,666
303A	3,968,667
364A	3,968,668
456R	3,968,669
	3,968,670
CLASS 71	
92	3,969,101
124	3,969,102
CLASS 72	
14	3,968,671
225	3,968,672
331	3,968,673
334	3,968,674
CLASS 73	
1B	3,968,676
1G	3,968,675
15R	3,968,677
19	3,968,678
37.7	3,968,679
67.5R	3,968,681
67.8R	3,968,680
84	3,968,682
141A	3,968,683
178R	3,968,684
204	3,968,685
207	3,968,686
291	3,968,687
328	3,968,688
341	3,968,689
343R	3,968,690
345	3,968,691
363	3,968,692
398C	3,968,694
398R	3,968,693
422R	3,968,695
425.4R	3,968,696
557	3,968,697
CLASS 74	
3.5	3,968,698
60	3,968,699
84S	3,968,700
112	Re.28,897
229	3,968,701
230.17E	3,968,702
231C	3,968,703
376	3,968,704
424.8R	3,968,705
471R	3,968,706
869	3,968,707
CLASS 75	
.5B	3,969,104
3	3,969,103
53	3,969,105
101R	3,969,106
	3,969,107
	3,969,108
128N	3,969,109
166C	3,969,110
171	3,969,111
206	3,969,112
CLASS 81	
157	3,968,708
CLASS 83	
1	3,968,709
18	3,968,710
171	3,968,711
347	3,968,713
477.2	3,968,712
582	3,968,714
820	3,968,715
CLASS 84	
1.01	3,968,716
1.19	3,968,717
422R	3,968,718
454	3,968,719
473	3,968,722
CLASS 85	
11	3,968,720
64	3,968,721
CLASS 86	
1A	3,968,723
20R	3,968,724
CLASS 87	
6	3,968,725
CLASS 89	
26	3,968,726
191A	3,968,727
CLASS 90	
11C	3,968,728
CLASS 91	
32	3,968,729
171	3,968,730
407	3,968,731
414	3,968,732
451	3,968,733
491	3,968,734
CLASS 92	
13.8	3,968,735
165R	3,968,736
258	3,968,737
CLASS 96	
1LY	3,969,113
1.4	3,969,114
14	3,969,115
27E	3,969,116
66R	3,969,117
91D	3,969,118
115R	3,969,119
118	3,969,120
CLASS 98	
108	3,968,738
CLASS 99	
276	3,968,739
289R	3,968,740
330	3,968,741
CLASS 100	
37	3,968,742
52	3,968,743
CLASS 101	
93.02	3,968,744
111	3,968,745
365	3,968,746
376	3,968,747
CLASS 102	
7.2	3,968,748
8	3,968,749
41	3,968,750
76R	3,968,751
CLASS 104	
7B	3,968,752
148MS	3,968,753
172R	3,968,754
CLASS 106	
50	3,969,121
52	3,969,122
55	3,969,123
56	3,969,124
73.2	3,969,125
290	3,969,126
291	3,969,128
292	3,969,127
309	3,969,129
CLASS 108	
150	3,968,755
CLASS 110	
12	3,968,756
CLASS 112	
80	3,968,757
	3,968,758
83	3,968,759
219R	3,968,760
225	3,968,761
CLASS 114	
66.5H	3,968,762
67A	3,968,763
74A	3,968,764
102	3,968,765
CLASS 115	
.5E	3,968,767
1R	3,968,766
18R	3,968,768
CLASS 117	
332	3,969,130
CLASS 118	
8	3,968,769
227	3,968,770
303	3,968,771
325	3,968,772
637	3,968,773
CLASS 119	
14.14	3,968,774
CLASS 123	
25B	3,968,775
43C	3,968,776
44R	3,968,777
117R	3,968,778
140FG	3,968,779
141	3,968,780
	3,968,781
191S	3,968,782
CLASS 124	
25	3,968,783
27	3,968,784
CLASS 126	
39J	3,968,785
270	3,968,786
390	3,968,787
CLASS 128	
2.05C	3,968,788
49	3,968,789
82.1	3,968,790
90	3,968,791
132D	3,968,792
141R	3,968,793
142.3	3,968,794
	3,968,795
173.1	3,968,796
232	3,968,797
284	3,968,798
287	3,968,799
343	3,968,800
352	3,968,801
419PG	3,968,802
482	3,968,803
CLASS 131	
140C	3,968,804
CLASS 132	
9	3,968,805
48R	3,968,806
53	3,968,807
CLASS 134	
18	3,969,132
21	3,969,133
26	3,969,134
41	3,969,135
48	3,969,136
176	3,969,137
CLASS 135	
4A	3,968,809
4R	3,968,808
45A	3,968,810
CLASS 136	
6FS	3,969,138
6LN	3,969,139
14	3,969,140
26	3,969,141
83R	3,969,142
	3,969,143
86A	3,969,144
86R	3,969,145
133	3,969,146
157	3,969,147
173	3,969,148
225	3,969,149
CLASS 137	
114	3,968,811
188	3,968,812
493	3,968,813
505.18	3,968,814
602	3,968,815
606	3,968,816
CLASS 139	
436	3,968,817
CLASS 141	
78	3,968,818
155	3,968,819
330	3,968,820
CLASS 144	
34R	3,968,821
312	3,968,822
CLASS 148	
1.5	3,969,150
6.15Z	3,969,152
6.3	3,969,151
6.35	3,969,153
9R	3,969,154
11.5F	3,969,155
11.5R	3,969,156
14	3,969,157
16.5	3,969,158
26	3,969,159
32.5	3,969,160
38	3,969,161
111	3,969,162
174	3,969,163
175	3,969,164
187	3,969,165
CLASS 149	
19.4	3,969,166
38	3,969,167
CLASS 150	
.5	3,968,823
52R	3,968,824
CLASS 152	
158	3,968,825
239	Re.28,898
CLASS 156	
17	3,969,168
56	3,969,169
158	3,969,170
167	3,969,171
211	3,969,172
218	3,969,173
219	3,969,174

221	3,969,175
251	3,969,176
288	3,969,177
361	3,969,178
394	3,969,179
523	3,969,180
577	3,969,181
621	3,969,182
CLASS 159	
49	3,969,183
CLASS 160	
323R	3,968,826
CLASS 162	
19	3,969,184
CLASS 164	
23	3,968,827
41	3,968,828
160	3,968,829
196	3,968,830
CLASS 165	
1	3,968,831
58	3,968,832
66	3,968,833
82	3,968,834
108	3,968,835
111	3,968,836
135	3,968,837
CLASS 166	
.6	3,968,838
250	3,968,839
280	3,968,840
CLASS 169	
48	3,968,841
CLASS 171	
11	3,968,842
CLASS 173	
12	Re.28,899
139	3,968,843
CLASS 174	
35MS	3,969,572
CLASS 175	
48	3,968,844
60	3,968,845
84	3,968,846
402	3,968,847
CLASS 176	
68	3,969,185
	3,969,186
79	3,969,187
CLASS 177	
123	3,968,848
127	3,968,849
210	3,968,850
CLASS 178	
5.6	3,969,581
6	3,969,571
6.6R	3,969,573
	3,969,574
	3,969,575
	3,969,576
6.8	3,969,577
	3,969,578
7.3R	3,969,579
46	3,969,580
66R	3,969,590
69.5R	3,969,582
CLASS 179	
1G	3,969,583
	3,969,588
2A	3,969,584
15AT	3,969,587
15FD	3,969,585
15A	3,969,586
27D	3,969,589
84R	3,969,591
90K	3,969,592
100.3B	3,969,593
175.3R	3,969,594
CLASS 180	
117	3,968,851
118	3,968,852
CLASS 181	
33C	3,968,853
40	3,968,854
118	3,968,855
CLASS 182	
48	3,968,856
106	3,968,857
135	3,968,858
CLASS 187	
9E	3,968,859
17	3,968,860
	3,968,861
CLASS 188	
1C	3,968,862
	3,968,863
71.9	3,968,864
188	3,968,865
CLASS 192	
58B	3,968,866
CLASS 195	
28N	3,969,188
62	3,969,189
142	3,969,190
CLASS 197	
1R	3,968,867
19	3,968,868
CLASS 198	
	3,968,869
240	3,968,870
CLASS 200	
5A	3,969,595
43	3,969,596
44	3,969,597
144B	3,969,598
153T	3,969,599
159B	3,969,600
314	3,969,609
CLASS 202	
141	3,969,191
230	3,969,192
CLASS 203	
7	3,969,193
40	3,969,194
49	3,969,196
CLASS 204	
14N	3,969,195
15	3,969,197
33	3,969,199
43T	3,969,198
50Y	3,969,219
79	3,969,200
83	3,969,201
105R	3,969,202
149	3,969,203
157.1R	3,969,204
158HA	3,969,205
159.15	3,969,206
180P	3,969,207
193	3,969,208
195R	3,969,209
195W	3,969,210
211	3,969,211
213	3,969,212
244	3,969,213
275	3,969,214
276	3,969,215
286	3,969,216
290F	3,969,217
299R	3,969,218
CLASS 206	
1.5	3,968,871
222	3,968,872
223	3,968,873
248	3,968,874
315B	3,968,875
365	3,968,876
388	3,968,877
455	3,968,878
509	3,968,879
540	3,968,880
CLASS 208	
11LE	3,969,220
139	3,969,221
210	3,969,222
310Z	3,969,223
CLASS 209	
12	3,969,224
39	3,969,226
73	3,969,227
	3,969,228
74R	3,969,229
127A	3,969,225
CLASS 210	
22A	3,969,240
23H	3,969,241
25	3,969,242
	3,969,243
38B	3,969,244
44	3,969,245
45	3,969,246
54	3,969,239
68	3,969,247
126	3,969,248
170	3,969,249
359	3,969,250
CLASS 211	
128	3,968,881
189	3,968,882
201	3,968,883
CLASS 212	
55	3,968,884
CLASS 214	
1BC	3,968,885
6M	3,968,886
8.5D	3,968,887
16.4A	3,968,888
18R	3,968,889
75T	3,968,890
83.3	3,968,891
505	3,968,892
700	3,968,893
CLASS 215	
220	3,968,894
CLASS 219	
69C	3,969,602
69G	3,969,601
121LM	3,969,604
121P	3,969,603
208	3,969,605
237	3,969,606
272	3,969,607
300	3,969,608
441	3,969,610
502	3,969,611
CLASS 220	
1.5	3,968,895
63R	3,968,896
204	3,968,897
260	3,968,898
266	3,968,899
CLASS 221	
3	3,968,900
93	3,968,901
263	3,968,902
CLASS 222	
1	3,968,903
25	3,968,904
70	3,968,905
243	3,968,906
416	3,968,907
563	3,968,908
600	3,968,909
CLASS 224	
6	3,968,910
	3,968,911
36	3,968,912
42.03B	3,968,913
45AA	3,968,914
CLASS 225	
65	3,968,915
100	3,968,916
CLASS 226	
2	3,968,917
188	3,968,920
CLASS 228	
148	3,968,918
153	3,968,919
CLASS 229	
2.5R	3,968,921
33	3,968,922
34HW	3,968,923
39B	3,968,924
62.5	3,968,925
66	3,968,926
70	3,968,927
CLASS 232	
35	3,968,928
CLASS 233	
21	3,968,929
CLASS 235	
61.11E	3,969,612
61.11R	3,969,613
150.21	3,969,614
151.11	3,969,615
151.32	3,969,616
152	3,969,617
153AC	3,969,618
183	3,969,619
CLASS 239	
107	3,968,930
125	3,968,931
142	3,968,932
171	3,968,933
230	3,968,934
289	3,968,935
550	3,968,936
CLASS 240	
7.5	3,969,620
41.35C	3,969,621
140	3,969,622
CLASS 241	
5	3,968,937
101.1	3,968,938
CLASS 242	
43R	3,968,939
86.5R	3,968,940
193	3,968,941
204	3,968,942
212	3,968,943
CLASS 244	
1N	3,968,944
3.28	3,968,945
42D	3,968,946
63	3,968,947
155R	3,968,948
CLASS 248	
11	3,968,949
359	3,968,950
CLASS 249	
55	3,968,951
CLASS 250	
275	3,969,623
315R	3,969,624
322	3,969,625
344	3,969,626
358T	3,969,627
402	3,969,628
503	3,969,629
515	3,969,630
527	3,969,631
CLASS 252	
8.1	3,969,230
8.8	3,969,231
12.6	3,969,232
22	3,969,233
33	3,969,234
42.7	3,969,235
49.5	3,969,236
49.9	3,969,237
62.1L	3,969,238
62.1P	3,969,251
63.2	3,969,252
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78	3,969,254
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147	3,969,260
179	3,969,261
182	3,969,262
186	3,969,263
299	3,969,264
309	3,969,265
313S	3,969,266
415	3,969,267
423	3,969,268
429B	3,969,269
430	3,969,270
	3,969,271
431P	3,969,272
435	3,969,273
455R	3,969,275
455Z	3,969,276
	3,969,277
456	3,969,274
457	3,969,542
513	3,969,278
521	3,969,279
522	3,969,280
542	3,969,281
559	3,969,282
CLASS 254	
134.3R	3,968,952
150R	3,968,953
186R	3,968,954
CLASS 259	
192	3,968,955
CLASS 260	
2EN	3,969,283
2.1E	3,969,284
2.2R	3,969,285
2.5BF	3,969,288
2.5EP	3,969,286
2.5L	3,969,289
2.5N	3,969,290
8	3,969,287
17.3	3,969,291
18EP	3,969,292
22CB	3,969,293
26	3,969,294
29.4UA	3,969,300
29.6HN	3,969,298
	3,969,299
29.6TA	3,969,296
29.6XA	3,969,297
29.6S	3,969,295
30.4N	3,969,301
30.4R	3,969,302
31.8C	3,969,303
32.6PQ	3,969,304
32.6N	3,969,305
33.6R	3,969,306
37SB	3,969,308
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37R	3,969,307
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40R	3,969,311
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45.75B	3,969,318
45.75N	3,969,317
45.75S	3,969,319
45.8NW	3,969,315
45.8N	3,969,316
47ET	3,969,320
59R	3,969,321
63N	3,969,322
73R	3,969,323
75T	3,969,324
78.41	3,969,325
79.3M	3,969,329
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112R	3,969,336
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123.5	3,969,338
159	3,969,339
233.3R	3,969,340
233.5	3,969,341
239.1	3,969,342
239.3A	3,969,344
239.3T	3,969,343
239.55R	3,969,345
240E	3,969,346
243R	3,969,347
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247.1H	3,969,350
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247.1M	3,969,349
248A	3,969,352
249.5	3,969,353
251R	3,969,354
256.4R	3,969,355
268R	3,969,356
270PY	3,969,357
287T	3,969,463
294.8C	3,969,358
294.9	3,969,359
295AM	3,969,361
295CA	3,969,362
295R	3,969,360
296AE	3,969,363
298	3,969,364
307G	3,969,365
308R	3,969,366
326.12R	3,969,367
340.5	3,969,368
343.2R	3,969,369
343.6	3,969,370
346.1R	3,969,371
346.2R	3,969,372
347.3	3,969,373
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395	3,969,464
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465.3	3,969,390
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471C	3,969,394
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577	3,969,411
586E	3,969,412
604HF	3,969,413
607B	3,969,414
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615B	3,969,417
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956	3,969,444
CLASS 261	
44R	3,969,445
87	3,969,446
111	3,969,447
112	3,969,448
153	3,969,449
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CLASS 264	
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42	3,969,453
50	3,969,471
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89	3,969,455
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154	3,969,458
163	3,969,461
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237	3,969,462
284	3,969,565
310	3,969,475
CLASS 266	
226	3,968,956
257	3,968,957
CLASS 267	
47	3,968,958
CLASS 271	
137	3,968,959
187	3,968,960
CLASS 272	
44	3,968,961
55	3,968,962
65	3,968,964
134	3,968,963
CLASS 273	
73D	3,968,966
73J	3,968,965
95A	3,968,967
95H	3,968,968
CLASS 277	
15	3,968,969
106	3,968,970
177	3,968,971
CLASS 279	
2R	3,968,972
CLASS 280	
11.2	3,968,973
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731	3,968,979
734	3,968,980
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287	3,968,982
CLASS 292	
201	3,968,983
229	3,968,984
340	3,968,985
CLASS 294	
65.5	3,968,986
78R	3,968,987
82R	3,968,988
CLASS 296	
29	3,968,989
CLASS 297	
45	3,968,991
162	3,968,992
355	3,968,993
390	3,968,994
452	3,968,990
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76	3,968,995
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37R	3,968,996
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37	3,968,997
56	3,968,998
66	3,968,999

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CLASS 308	
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CLASS 310	
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CLASS 312	
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221	3,969,008
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320	3,969,009
CLASS 313	
359	3,969,646
477HC	3,969,647
482	3,969,648
CLASS 315	
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169TV	3,969,650
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224	3,969,652
403	3,969,653
CLASS 317	
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98	3,969,656
157.5PM	3,969,657
CLASS 318	
202	3,969,658
237	3,969,659
338	3,969,660
375	3,969,661
561	3,969,663
565	3,969,664
645	3,969,662
CLASS 320	
35	3,969,665
CLASS 323	
74	3,969,666
CLASS 324	
16R	Re.28,904
29.5	3,969,667
34R	3,969,668
65R	3,969,669
73PC	3,969,670
119	3,969,671
133	3,969,672
CLASS 325	
16	3,969,673
42	3,969,674
50	3,969,675
CLASS 328	
121	3,969,676
140	3,969,677
167	3,969,678
CLASS 330	
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29	3,969,680
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CLASS 331	
94.5C	3,969,684
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94.5H	3,969,686
107R	3,969,689
CLASS 333	
7R	3,969,690
21R	3,969,691
73W	3,969,692
98S	3,969,693
CLASS 337	
161	3,969,694
236	3,969,695
CLASS 338	
315	3,969,696
CLASS 339	
17C	3,969,010
125R	3,969,011
252P	3,969,012
CLASS 340	
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324M	3,969,715
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336	3,969,719
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381	3,969,721
CLASS 343	
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16M	3,969,726
105R	3,969,727
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756	3,969,729
770	3,969,730
840	3,969,731
895	3,969,732
CLASS 346	
1	3,969,733
33ME	3,969,734
CLASS 350	
87	3,969,013
96WG	3,969,016
96C	3,969,014
	3,969,015
162SF	3,969,017
187	3,969,018
CLASS 351	
13	3,969,019
17	3,969,020
CLASS 352	
27	3,969,021
38	3,969,022
CLASS 354	
29	3,969,735
127	3,969,736
141	3,969,737
230	3,969,738
	3,969,739
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299	3,969,741
318	3,969,742
CLASS 356	
33	3,969,023
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CLASS 357	
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65	3,969,754
CLASS 358	
4	3,969,755
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14	3,969,761
38	3,969,762
42	3,969,763
47	3,969,764
CLASS 360	
59	3,969,765
85	3,969,766
99	3,969,767
107	3,969,768
113	3,969,769
121	3,969,770
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CLASS 401	
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37	3,969,026
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279	3,969,028
CLASS 403	
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322	3,969,033
357	3,969,034
CLASS 404	
98	3,969,035
CLASS 408	
76	3,969,036
201	Re.28,900
CLASS 416	
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CLASS 417	
218	3,969,038
244	3,969,039
292	3,969,040
295	3,969,041
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366	3,969,043
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517	3,969,046
CLASS 418	
18	3,969,047
83	3,969,048
91	3,969,049
CLASS 423	
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421	3,969,488
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574L	3,969,492
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633	3,969,494
648	3,969,495
CLASS 424	
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10	3,969,500
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CLASS 425	
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262	Re.28,902
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CLASS 426	
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432	3,969,533
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491	3,969,538
641	3,969,539
657	3,969,540
CLASS 427	
54	3,969,543
57	3,969,544
163	3,969,545
213	3,969,546
214	3,969,547
244	3,969,548
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253	3,969,550
282	3,969,551
295	3,969,552
299	3,969,553
305	3,969,554
383	3,969,555
400	3,969,541
CLASS 428	
13	3,969,556
36	3,969,557
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175	3,969,563
212	3,969,564
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297	3,969,567
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316	3,969,131
332	3,969,569
336	3,969,570
CLASS 431	
90	3,969,064
95A	3,969,065
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95R	3,969,067
CLASS 432	
13	3,969,068
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CLASS 526	
1	3,969,327
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320	3,969,328

Classification of Designs

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	323	240,471
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D6—	6	240,474
	22	240,475
	26	240,476
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	188	240,489
	196	240,490
	201	240,491
	236	240,492
D7—	3	240,493
	74	240,496
	108	240,494
	152	240,495
D8—	18	240,497
	68	240,498
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	226	240,503
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	255	240,502
D9—	83	240,504
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D10—	64	240,510
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D12—	55	240,517
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D16—	30	240,554
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D19—	26	240,523
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D23—	2	240,530
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D26—	1R	240,538
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D35—	3R	240,548
D48—	23	240,549
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D56—	4B	240,552
D57—	1E	240,553
D64—	11R	240,558
D83—	1A	240,562
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	C	240,560
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D86—	10	240,561
		240,565
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	R	240,566
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PATENTS

1 : 3,968,646
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2 : 3,968,892
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4 : 3,968,590
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July 20, 1976

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PATENT AND TRADEMARK OFFICE NOTICES

Certificate of Mailing of Correspondence

[37 CFR Parts 1, 3 and 4]

Delays in Mail Delivery

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Public Law 92–132, 85 Stat. 364), and in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by adding §§ 1.8, 3.55 and 4.23.

These rule changes are intended to solve, in part, the problems caused by delays in the delivery of papers by mail to the Patent and Trademark Office within the time periods set for response by applicants. A procedure similar to this proposal, dated December 23, 1975 was published in the OFFICIAL GAZETTE on January 20, 1976 at 942 O.G. 1073 for comment. Comments received in response to this proposal have been considered in the preparation of this proposed rule change and will be given further consideration before the promulgation of any rule. A number of changes have been made in the earlier proposal as a result of these comments.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes in writing to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before August 20, 1976. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

Comments previously submitted relating to the notice of December 23, 1975 need not be resubmitted since they will again be evaluated along with any comments received directed to these proposed rules.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

The promulgation of the proposed rule change is within the authority granted the Commissioner under 35 U.S.C. 6 since it is "not inconsistent with law" and since it is "for the conduct of proceedings in the Patent and Trademark Office."

Under the proposed rules, generally, where a time is set for taking action in any pending patent or trademark application or in most patent or trademark proceedings pending before the Patent and Trademark Office, correspondence or fees will be considered as being timely filed if (1) deposited with the United States Postal Service within the time set for response, and (2) accompanied by a certificate indicating when the correspondence or fee was so deposited. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated.

The proposed procedure would relate to all actions taken before the Patent and Trademark Office except:

(1) The filing of patent and trademark applications;

(2) The filing of agreements between parties to an interference under 35 U.S.C. 135(c); and

(3) The following requirements of the Trademark Act applying to the registration of a mark;

(i) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c);

(ii) The filing of an application for renewal of a registration under Section 9;

(iii) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b); and

(iv) The filing of an affidavit under Section 15, subsection (3).

The date of deposit in the mails will be considered only to determine the timeliness of the response. The actual date of receipt of the correspondence or fee will continue to be used for all other purposes, such as for example, determining when an appeal brief is due (two months after the receipt of the Notice of Appeal, 37 CFR 1.192).

The proposed addition of a new section 1.8(a) would establish the Certificate of Mailing procedure. Proposed new § 1.8(b) would establish a procedure for situations where correspondence is deposited under § 1.8(a) but is not delivered.

Proposed form § 3.55 is designed for use in patent cases and proposed form § 4,23 is designed for use in trademark cases when making a certificate under § 1.8(a).

It is therefore proposed to amend 37 CFR, Chapter 1, as follows:

PART 1.—RULES OF PRACTICE IN PATENT CASES

1. By adding a new § 1.8 which reads as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms §§ 3.55 and 4.23). The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of original or reissue patent applications;

(ii) The filing of trademark application;

(iii) The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

(iv) The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under Section 8(a) or (b) or Section 12(c) of the Trademark Act;

(v) The filing of an application for renewal of a mark registration under Section 9 of the Trademark Act;

(vi) The filing of a petition to cancel a registration of a mark under Section 14(a) or (b) of the Trademark Act; and

(vii) The filing of an affidavit under Section 15, subsection (3) of the Trademark Act.

(b) In the event that correspondence or fees are timely mailed in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence or fee will be considered timely if the party who forwarded such correspondence or fee (1) informs the Office of the previous mailing of the correspondence or fee promptly after becoming aware of the Office action, (2) supplies an additional copy of the previously mailed correspondence or fee and certificate, and (3) includes a declaration under 37 CFR 1.68 or 2.20 which attests to the previous timely mailing.

PART 3—FORMS IN PATENT CASES

2. By adding a new § 3.55 which reads as follows.

§ 3.55 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

- -
Date

- -
Name of applicant, assignee, or Registered Representative

- -
Signature

- -
Date

PART 4—FORMS IN TRADEMARK CASES

3. By adding a new § 4.23 which reads as follows.

§ 4.23 *A suggested format for the certificate under 37 CFR 1.8(a) to be included with the correspondence.*

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

- -
Date

- -
Name of applicant, assignee, or applicant's attorney

- -
Signature

- -
Date

Dated: June 3, 1976.

C. MARSHALL DANN,
Commissioner of
Patents and Trademarks.

Approved: June 10, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for
Science and Technology.

[FR Doc.76–17963; Filed 6–18–76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,990,094, R. F. Reifers, MOLDED PULP EGG CARTON, **filed** May 26, 1969, D.C. Md. (Baltimore), Doc. 20809–W, *Diamond International Corporation* v. *Maryland Fresh Eggs Inc.* The U.S. Court of Appeals, 4th Circuit, Richmond, Va., reversed the judgment entered July 26, 1974, finding patent valid and infringed. The U.S. Supreme Court denied petition for Writ of Certiorari on 3–1–76. Case is now closed, Mar. 15, 1976. **Same, filed** July 8, 1974, D.C. Del. (Wilmington), Doc. C.A. 74–137, *Diamond International Corporation* v. *Dolco Packaging Corporation, The Dow Chemical Company and Olson Farms, Inc.* Stipulation and order dismissing this action with prejudice, Mar. 5, 1976.

3,076,623, D. G. Lyon, VARIABLE, SHAPED AIRFOIL; **3,127,130,** same, **filed** Feb. 15, 1973, D.C., W.D. Wash. (Seattle), Doc. 119–73c2, *Donald G. Lyon* v. *Boeing Company.* Defendant's motion for summary judgment granted. Defendants' devices do not infringe upon claim of plaintiff's patent, Mar. 10, 1976.

3,127,130. (See 3,076,623.)

3,275,461, Davies and Havranek, REFRACTORY, **filed** Aug. 8, 1969, D.C., N.D. Ohio (Toledo), Doc. C69–613, *Dresser Industries, Incorporated* v. *Eltra Corporation.* Claims 10 and 15 invalid and void. Patent procured by fraud upon Patent Office and as such patent unenforceable, June 11, 1975.

3,503,760, W. M. Allen, METHOD OF SMOKING A COMESTIBLE PRODUCT, **filed** June 6, 1974 D.C., N.D. Ill. (Chicago), Doc. 74c1538, *Beatrice Foods Co.* v. *Bluebird Inc. et al.* Order entered May 20, 1975 by agreement of parties, dismissing cause with prejudice, May 21, 1975.

3,542,214, J. Helms, STACKING AND TRANSMISSION DEVICE FOR PACKAGES, **filed** Aug. 24, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–2022–AAH, *Harry Feick Co., Inc.* v. *Entron Controls, Inc. and W. E. Starr and Company.* Stipulation and order re transfer and dismissal. Complaint transferred to the Northern District of Illinois, Eastern Division. Stipulated that cause of action against defendant be dismissed with prejudice and without prejudice to the plaintiff, Dec. 14, 1973. Consent decree attached from D.C., N.D. Ill. (Chicago), Doc. 73c3220 consenting to jurisdiction over litigation, Oct. 23, 1974.

3,563,286, Strobel and Heiser, SAW, **filed** Jan. 20, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76–114A, *Weyerhaeuser Company* v. *North American Products Corp. et al.*

3,583,888, F. G. Shanklin, PACKAGING APPARATUS AND METHOD, **filed** Feb. 10, 1975, United States Court of Appeals, First Circuit, Mass. (Boston), Doc. 75–1061, *Shanklin Corporation* v. *Springfield Photo Mount Company.* The judgment of the District Court is affirmed Aug. 20, 1975.

3,611,910, J. S. Hughes, CORN POPPER, **filed** Jan. 24, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c205, *Ropat Corp.* v. *McGraw Edison Co.* Memorandum opinion and order granting motion of the defendant for summary judgment, May 5, 1975. **Same, filed** Nov. 29, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3459, *Ropat Corp.* v. *Marshall Field and Co.* Memorandum opinion and order granting motion of the defendant for summary judgment, May 5, 1975.

3,614,757, R. P. Burr, DISPLACING APPARATUS, **filed** May 20, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–1714–F, *Kollmorgan Corporation* v. *Wangco Inc.*

3,645,463, F. R. Helm, WEB-SPLICING APPARATUS **filed** Oct. 1, 1974, D.C.N.J. (Newark), Doc. C–74–1511, *Champion-Edison, Inc.* v. *Compensating Tension Controls, Inc.* Order of dismissal of action, Mar. 15, 1976.

3,654,382, P. L. Rubright, GROMMET CONSTRUCTION, **filed** Feb. 3, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–70211, *Arco Industries Corp.* v. *Chemcast Corp., C. J. Edwards and Phillip L. Rubright.*

3,658,515, G. A. Saltzman, HARD WEAR-RESISTANT FERROUS ALLOY, **filed** Apr. 25, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72–C–232, *International Rectifier Corp. and Xaloy Incorporated* v. *Donald P. Lomax.* Plaintiffs' complaint against defendant dismissed without prejudice, Oct. 8, 1974.

3,664,915, W. L. Gore, SEALING MATERIAL, **filed** July 3, 1975, D.C. Del. (Wilmington), Doc. 75–180, *W. L. Gore & Associates, Inc.* v. *Dodge Industries, Inc.*

3,666,854, A. M. Eisentraut, TEST FOR THYROID HORMONE, **filed** Aug. 3, 1973. D.C., S.D. Tex. (Houston), Doc. CA–73–H–1090, *Nuclear Medical Laboratories, Inc.* v. *United Medical Laboratories, Inc.* Consent judgment, plaintiff and defendant have compromised and settled this action without trial and the action is dismissed without award to either party, entered Apr. 16, 1975.

3,671,006, I. L. Berkowitz and Ahrendt, REFRIGERATOR WALL PANELS WITH PANEL FASTENERS AND APPARATUS FOR MAKING SAID PANELS, **filed** Oct. 28, 1975, D.C., N.D. Ill. (Freeport), Doc. 75–0053, *Kason Hardware Corp.* v. *National Lock Hardware Co. and Keystone Consolidated Industries.*

3,676,966, D. Ragland, DOOR-FRAME ASSEMBLY, **filed** Sept. 4, 1974, D.C., S.D. Tex. (Houston), Doc. CA–74–1199, *Ragland Mfg. & Construction Co.* v. *Flexible Walls, Inc.* Stipulated judgment dismissing case with prejudice, Jan. 6, 1975.

3,687,302, M. A. Castro, MACHINE FOR FORMING TIED STACKS OF BALES, **filed** Apr. 22, 1975, D.C., E.D. Calif. (Sacramento), Doc. S–75–293, *Manuel A. Castro* v. *Sperry Rand Corporation.*

3,699,721, G. A. Beasley, GRINDING PAD, **filed** July 23, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–2494–FW, *Itek Corporation* v. *Optical Specialties, Inc.*

3,702,076, H. W. Georgi, ELECTRONIC THERMOMETER, **filed** May 30, 1975, D.C., S.D. Calif. (San Diego), Doc. 75–0292–T, *Ivac Corporation* v. *Diatek, Inc.*

3,706,914, G. F. Van Buren, LIGHTING CONTROL SYSTEM, **filed** June 5, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–1146–SC, *Van Buren Industries, Inc.* v. *Holzmueller Corporation.*

3,713,368, McDowell and Czernik, ROAD JOINT SEAL AND END DAM CONSTRUCTION, **filed** Sept. 15, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3063, *Watson-Bowman Associates, Inc.* v. *Felt Products Mfg. Co. et al.*

3,720,264, S. O. Hutchison, HIGH PRESSURE JET WELL CLEANING, **filed** Mar. 12, 1976, D.C., C.D. Calif. (Los Angeles), Doc. 76–810–AAH, *Edwin G. Bemis* v. *Chevron Research Co. and Standard Oil Co. of California.*

PATENT NOTICES

Certificates of Correction for the Week of July 20, 1976

Re. 28,776
Re. 28,790
D. 233,904
D. 239,130
3,288,612
3,431,687
3,550,902
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3,958,037

Disclaimer and Dedication

3,891,682.—*Robert Ernst,* Los Angeles, and *Eugene J. Miller,* Huntington Beach, Calif. ACYLAMIDOETHOXYETHYL SULFOSUCCINATE SALTS, METHODS OF PRODUCING THE SAME AND FROTH-FORMING COMPOSITIONS CONTAINING THE SAME. Patent dated June 24, 1975. Disclaimer and dedication filed May 11, 1976, by the assignee, *Henkel Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Disclaimers

3,506,828.—*David L. Hansen,* Palatine, and *Elizabeth T. Bush,* Chicago, Ill. QUATERNARY AMMONIUM BASES AND LIQUID SCINTILLATION COUNTING SOLVENT. Patent dated Apr. 14, 1970. Disclaimer filed Dec. 23, 1974, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to claims 1 through 12 of said patent.

3,874,613.—*Otto Zollinger,* Spartanburg, S.C. YARN TENSIONING DEVICE. Patent dated Apr. 1, 1975. Disclaimer filed Apr. 5, 1976, by the assignee, *Otto Zollinger, Inc.*

The term of this patent subsequent to Aug. 21, 1990, has been disclaimed.

3,892,371.—*Otto Zollinger,* Spartanburg, S.C. YARN TENSIONING DEVICE. Patent dated July 1, 1975. Disclaimer filed Apr. 5, 1976, by the assignee. *Otto Zollinger, Inc.*

The term of this patent subsequent to Aug. 21, 1990, has been disclaimed.

3,896,577.—*Norman J. Hayes,* Cody, Wyo. ONE PIECE ANIMAL IDENTIFICATION TAG. Patent dated July 29 1975. Disclaimer filed Apr. 26, 1976, by the assignee, *Y-Tex Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,914,165.—*Joseph E. Gaske,* Mount Prospect, Ill. RADIATION CURABLE NON-GELLED MICHAEL ADDITION REACTION PRODUCTS. Patent dated Oct. 21, 1975. Disclaimer filed May 18, 1976, by the assignee, *DeSoto, Inc.*

Hereby enters this disclaimer to claims 1–6, 8 and 9 of said patent.

3,925,349.—*Joseph E. Gaske,* Mount Prospect, Ill. RADIATION CURABLE NON-GELLED MICHAEL ADDITION REACTION PRODUCTS. Patent dated Dec. 9, 1975. Disclaimer filed May 18, 1976, by the assignee, *DeSoto, Inc.*

Hereby enters this disclaimer to claims 1–4, 6 and 7 of said patent.

3,955,042.—*Mazin Kellow,* Longueil, *James Vansant,* Chambly, and *Jacques Bonneville,* St-Bruno, Quebec, Canada. COOLING OF POWER CABLES BY A CLOSED - CYCLE EVAPORATION - CONDENSATION PROCESS. Patent dated May 4, 1976. Disclaimer filed May 17, 1976, by the assignee, *Institut de Recherche de l'Hydro-Quebec (IREQ.)*

The term of this patent subsequent to Mar. 23, 1976, has been disclaimed.

3,958,455.—*John D. Russell,* Malibu, Calif. FORCE TRANSDUCER FOR STRAIN GAGE. Patent dated May 25, 1976. Disclaimer filed Apr. 7, 1976, by the inventor.

The term of this patent subsequent to Apr. 13, 1993, has been disclaimed.

Errata

All reference to Patent No. 3,935,342 to Drahoslav Lim for HYDROPHILIZATION OF NON-POLAR SURFACES, appearing in the OFFICIAL GAZETTE of Jan. 27, 1976, should be deleted since no patent should have been granted.

All reference to Patent No. 3,956,286 to William H. W. Lunn of Indiana for PROCESS FOR PRODUCING 7-ACYLAMIDO-7-ALKOXYCEPHALOSPORINS appearing in the OFFICIAL GAZETTE of May 11, 1976, should be deleted since no patent was granted.

All reference to Patent No. 3,942,213 to Ralph H. Hoener, Jr. for WINDOW WALL WASHING DEVICE FOR HIGH RISE BUILDINGS appearing in the OFFICIAL GAZETTE of Mar. 9, 1976, should be deteled since no patent should have been granted.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 19, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-8-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-22-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-16-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-4-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-19-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-22-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-16-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	3-31-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists: Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-9-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,893,005 to 2,897,499 inclusive
Plant Patents	Numbers 1,850 to 1,855 inclusive

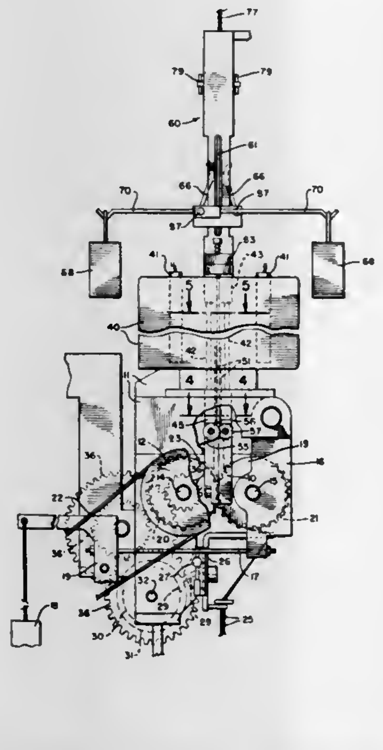
REISSUES

JULY 20, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,906
CRIMPING APPARATUS WITH HEATING AND COOLING CAGE

Donald W. McKinney, Wilmington, Del., and Henry A. Sinski, Aldan, Pa., assignors to Indian Head Inc., New York, N.Y.
Original No. 3,587,145, dated June 28, 1971, Ser. No. 834,792, June 19, 1969. Application for reissue June 6, 1975, Ser. No. 584,288
Int. Cl.^{2} D02G *1/12*
U.S. Cl. 28—1.7 **28 Claims**



1. Yarn crimping apparatus comprising walls forming a confined crimping chamber, feed rolls disposed to feed yarn for crimping into one end of said chamber, a housing forming a heating and setting chamber registering with said crimping chamber, a cage having a set of spaced parallel rods disposed around the periphery of said heating chamber with their inner surfaces forming a continuation of the walls of said crimping chamber and extending throughout the length of said heating chamber for confining and guiding the core of crimped yarn therethrough, means securing said rods as a unit to form said cage.

Re. 28,907
SELF-TAPPING THREADED BUSHINGS

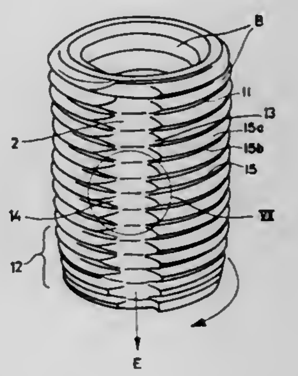
Carl B. H. Eibes, deceased, late of Schnalttenback, Germany; by Ursula Eibes, nee Waschau and Christian Eibes, both of Dr. Carl-Eibes-Str. 11, Schnaittenback, Germany; Carl-Herwig Eibes, Grunewaldstra. 30, Berlin-Schoneberg, Germany, and Maria-Theresia Wagner, nee Eibes, Hans Klopferweb Nr. 1, Amberg, Germany, all legal heirs
Original No. 3,866,510, dated Feb. 18, 1975, Ser. No. 329,952, Feb. 5, 1973. Continuation of Ser. No. 125,260, March 17, 1971, abandoned, which is a division of Ser. No. 733,562, May 13, 1968, Pat. No. 3,597,781. Application for reissue July 3, 1975, Ser. No. 593,404
Claims priority, application Germany, June 5, 1967, 62476
Int. Cl.^{2} F16B *25/00*
U.S. Cl. 85—47 **3 Claims**

1. A threaded self-tapping bushing adapted to be secured to a work piece and comprising,

an elongate member having helical male threads extending over at least a portion of its axial length, said threads having crests, roots between said crests, and flanks extending from said crests to said roots on either side of said crests;

said member having at least one axially extending bevel intersecting a plurality of successive threads,

the crests and flanks of each said male thread at their intersection with said bevel defining frontal areas on either side of said bevel which are concave both along the circumferential direction of each said male thread and transversely thereto along the axial direction of the bushing,

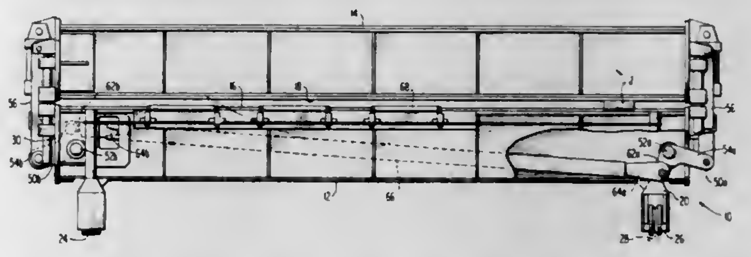


each said bevel being approximately as deep as the roots between the crests to ensure that the roots between successive crests are essentially discontinuous at each beveled portion, each said frontal area providing cutting edges along at least a part of its periphery as defined by said crest, flanks, and bevel,

one of the two said frontal areas formed at the junction of each said male thread with said bevel having a greater curvature than the other.

Re. 28,908
FLUID ACTUATED PRESS

John Calvin Jureit, Coral Gables, Fla., assignor to Automated Building Components, Inc., Miami, Fla.
Original No. 3,750,562, dated Aug. 7, 1973, Ser. No. 190,724, Oct. 20, 1971. Application for reissue Mar. 28, 1975, Ser. No. 563,059
Int. Cl.^{2} B30B *1/32*
U.S. Cl. 100—100 **10 Claims**



1. A press comprising: a base structure including a press platen, a head including a press platen in opposition to said first mentioned press platen, means connecting said head and said base structure for reciprocating movement of said head relative to said base structure including a fluid actuated cylinder connected between said head and said base structure at each of the opposite ends of said press, and means coupled between opposite ends of said press for transferring a portion of the force applied by the cylinder to said head at one end of said press to the head at the opposite end of said press, said coupling means including a bellcrank at opposite ends of said press, said bellcranks being pivotally carried by said base structure, a transfer bar interconnecting said bellcranks, a rod coupled between said bellcrank and said head at opposite ends of the press, said rods, bellcranks, and transfer bar being arranged such that rotation of one of said bellcranks in re-

sponse to movement of said head toward said base rotates the other bellcrank in an opposite direction, the rod at one press end being subject to compressive forces and the rod at the other press end being subject to tensile forces in response to asymmetrical press loadings.

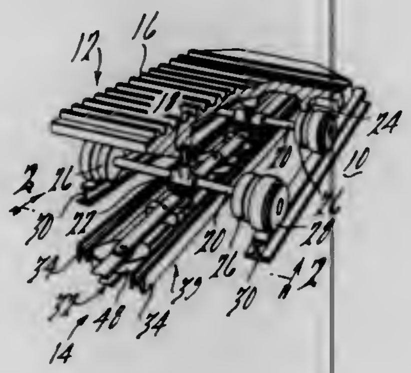
Re. 28,909
CONVEYOR

Dimitry Holbert, Birmingham, Mich., assignor to Standard Alliance Industries, Inc., Chicago, Ill.

Original No. 3,678,861, dated July 25, 1972, Ser. No. 63,392, Aug. 13, 1970. Application for reissue July 18, 1974, Ser. No. 489,798

Int. Cl.^{2} B61B *13/00*

U.S. Cl. 104—172 B **12 Claims**



6. In a conveyor chain assembly, a chain comprising connected pairs of spaced links; curved guide rails on opposite sides of said chain; a plurality of rollers carried by pins connecting said pairs of links and engageable with said guide rails as said chain passes therebetween, whereby intermediate portions of said links between said rollers approach relatively closely to said guide rails; and means for driving said chain comprising a plurality of blocks spaced along the length of said chain, each block being disposed between and attached to the links of a pair of said chain links and having planar surfaces extending laterally outwardly in opposite directions from said links, said rollers following and being disposed adjacent to but spaced from respective of said blocks, the lateral extent of said surfaces being less than that which will cause engagement of said blocks with said guide rails during operation of said chain assembly, and a driving apparatus having pairs of forked driving dogs movable into position on opposite sides of said chain, said dogs having lateral planar surfaces engageable with the lateral surfaces of said blocks.

Re. 28,910
PUSH-IN EASY-OPENING CLOSURES

Alan George Dalli, Warrandyte; Michael Debenham, Frankston, and Ralph Edward Schackleford, Emerald, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Original No. 3,759,206, dated Sept. 18, 1973, Ser. No. 180,785, Sept. 15, 1971. Application for reissue Apr. 4, 1975, Ser. No. 565,078

Claims priority, application Australia, Sept. 16, 1970, 2556/70

Int. Cl.^{2} B21D *51/00*

U.S. Cl. 113—121 C **20 Claims**

1. A method of forming an easy-opening, *push-in* closure in a sheet metal container member, said method comprising:

forming a bulge in an area of the sheet metal container member,

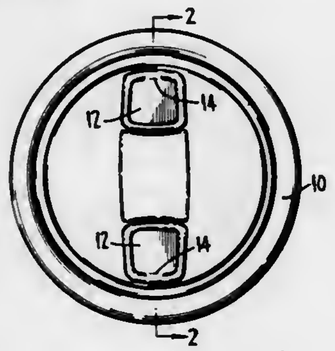
at least partially severing a portion of the sheet metal in said area to provide a free edge,

wherein at least a portion of said bulge lies substantially outside of said portion,

the free edge of the sheet metal from which said portion is at least partially severed defining an opening, and said severed portion defining a closure member for said opening,

wherein said bulge includes an approximately flat area of sheet metal that is generally parallel to the plane of the sheet metal surrounding said bulge, said severing being carried out substantially within said flat area,

thereafter reducing the size of said opening by at least partly flattening said bulge,



to place [at least a part of the free edge portion of said closure member and] the free edge defining said opening or the interior surface of the sheet metal adjacent said opening in overlapping contact or in overlapping close proximity *over at least a part of the free edge portion of said closure member,*

whereby said container member having said easy-opening closure is suitable for use in forming a container for liquids.

Re. 28,911
DISPENSER FOR FLEXIBLE SHEET MATERIAL AND A PERFORATING MECHANISM ADAPTED TO BE USED THEREIN

Paul W. Jespersen, Stamford, Conn., and Edward L. Bump, Oak Park, Ill., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Original No. 3,739,965, dated June 19, 1973, Ser. No. 104,415, Jan. 6, 1971. Division of Ser. No. 793,808, Jan. 24, 1969, Pat. No. 3,575,328. Application for reissue Sept. 30, 1974, Ser. No. 510,780

Int. Cl.^{2} B26F *3/02*

U.S. Cl. 225—96 **11 Claims**

10. In a dispenser for flexible sheet material including, a chassis adapted to be attached to a wall, means operatively connected to said chassis for rotatably supporting a roll of flexible sheet material, means operatively connected to said chassis for guiding a web of flexible sheet material from said roll to a position to be grasped by a user so that the user may pull the web out of the dispenser, a perforating mechanism operatively connected to said chassis for perforating said web at intervals therealong to divide the web into individual sheets, said perforating mechanism including a rotatably mounted knife-receiving roller, a rotatably mounted knife positioned adjacent said knife-receiving roller and having a radially outward portion defining a cutting edge for perforating the web as the web passes between the knife-receiving roller and the knife, said knife-receiving roller being operatively connected to said knife for synchronous rotation therewith and having a slot therein for receiving said radially outward knife portion as the knife rotates past the roller, and a stop mechanism associated with said perforating mechanism for stopping the rotation of said knife and said roller and thus arresting the movement of the web after a predetermined length of the web has been withdrawn from the dispenser; the improvement wherein said guiding means comprises a rotatably mounted upper pinch roll positioned adjacent said knife-receiving roller and spaced from said knife in the direction opposite to the normal direction of movement of the web through the dispenser, a rotatably mounted lower pinch roll positioned adjacent said knife-receiving roller and spaced from said knife in the direction of the normal direction of movement of the web through the dispenser, said lower pinch roll also being movable toward and away from said knife-receiving roller, and biasing means for urging said lower pinch roll toward said knife-receiving roller, whereby the lower pinch roll moves away from said knife-receiving roller against the urging of the biasing means when a user initially pulls on the web so that the web is pulled tautly against the knife-receiving roller, and the upper and lower pinch rolls cooperate with the knife-receiving roller when the knife and knife-receiving roller are rotated to insure that the web is held tautly about the knife-receiving roller.

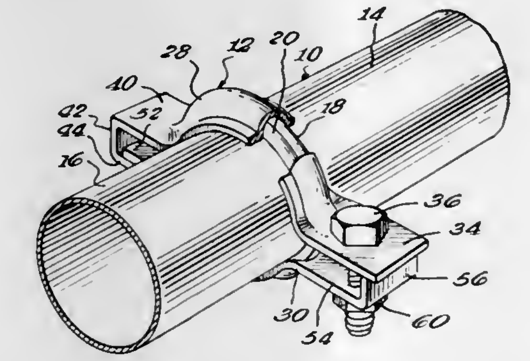
Re. 28,912
EMISSION-FREE EXHAUST PIPE JOINT AND CLAMP THEREFOR

Bertil Stade, Wood Dale, and Edward Hoglund, Park Ridge, both of Ill., assignors to Mercury Metal Products, Inc., Schaumburg, Ill.

Original No. 3,788,677, dated Jan. 29, 1974, Ser. No. 236,364, Mar. 20, 1972. Continuation-in-part of Ser. No. 142,977, May 13, 1971, abandoned. Application for reissue Sept. 13, 1974, Ser. No. 505,750

Int. Cl.^{2} F16L *17/00*

U.S. Cl. 285—367 **17 Claims**



1. A clamped joint for use in internal combustion engine exhaust systems which comprises:

A. a joint formed of a pair of pipes, each pipe having a bead formation at an end thereof, the bead formations including respective axially facing flange surfaces and the flange surfaces being substantially abutted face to face,

B. a pipe clamp engaged over the bead formations and constricted thereon, the clamp having radially inwardly facing groove means along its inner surface with opposite [surfaces] *areas of said inner surface* of the groove means engaging the bead formations and applying wedging forces on said bead means causing the flange surfaces to be forced axially together,

C. the clamp being formed of two generally semi-circular halves, each half having a substantially radially outwardly extending tongue on one end thereof with the tongues spaced apart and having cooperating fastening means for bringing the tongues together in securing the clamp to the joint, each half having a medial section provided with said groove means, and the second end of each half having cooperating formations providing a separable hinge connection thereat,

D. said cooperating formations comprising an open bight on one of said second ends and a tab on the other of said second ends, the tab lying in the bight engaged against one side of said bight in surface engagement, [only] ,

E. said bight being generally rectangular in configuration and having a pair of planar portions spaced apart, one planar portion extending substantially radially outwardly of the clamp and the other being parallel thereto, a bridge connecting the planar portions, said other planar portion having a free end, the said tab extending substantially radially outwardly of the clamp and being disposed in facing engagement with the inside of said other planar portion,

F. said tongues having aligned perforations and said fastening means comprising a bolt extending through said perforations generally tangential to said clamp, one of said tongues having a right angle bent flange adapted to limit movement of the tongues toward one another.

Re. 28,913
MILDNESS ADDITIVE

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Original No. 3,630,934, dated Dec. 28, 1971, Ser. No. 696,509, Jan. 9, 1968. Continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. Application for reissue Sept. 17, 1974, Ser. No. 506,723

Int. Cl.^{2} C11D *1/62, 1/66, 3/20*

U.S. Cl. 252—547 **12 Claims**

1. A detergent composition consisting essentially of a skin irritating detergent selected from the group consisting of [anionic,] cationic, non-ionic, and amphoteric organic detergents and .005 to 10 parts by weight based on said skin irritating detergent of a mildness additive comprising

(I) the substituted polymerized product of 2 to 4 molecules of a monomeric C_{12} to C_{26} fatty acid, wherein said product contains a cyclohexene moiety and instead of 2 to 4 carboxyl groups from said fatty acid, hydroxy or hydroxy methyl groups; or

(II) the substituted saturated polymerized product defined in (I);

said detergent composition exhibiting reduced skin irritation compared to the same composition absent the mildness additive; the mildness additive and detergent composition being stable and compatible in aqueous media.

Re. 28,914
TREATMENT OF A CELLULOSIC-CONTAINING TEXTILE WITH A FLUOROCARBON, AN AMINOPLAST, AND A SYNTHETIC ACID COPOLYMER, AND TEXTILE OBTAINED THEREFROM

Francis W. Marco, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Original No. 3,597,145, dated Aug. 3, 1971, Ser. No. 622,086, Mar. 10, 1967. Application for reissue July 11, 1972, Ser. No. 270,784

The portion of the term of the patent subsequent to Apr. 9, 1985, has been disclaimed.

Int. Cl.^{2} D06M *15/58; 15/54*

U.S. Cl. 428—272 **22 Claims**

1. A process for imparting oil and water repellency, soil release and durable press characteristics to a cellulosic-containing textile material which comprises applying thereto an aminoplast textile resin; a textile resin catalyst, a fluorocarbon oil and water repellent material, and a synthetic acid soil release copolymer derived from an ethylenically unsaturated carboxylic acid, said acid polymer comprising at least about 20 weight percent acid calculated as acrylic acid; and subjecting said textile material to textile resin curing conditions at a temperature between about 100° and 200° C., whereby the textile resin is crosslinked to the textile material, the proportion of said fluorocarbon oil and water repellent material on said textile material being between about 0.01% and 5% by weight based on the dry weight of the textile material and the proportion of said acid polymer on said textile material being between about 0.25% and 5% by weight based on the dry weight of the textile material.

17. In a process for improving the soil release properties of a textile material wherein the textile material is impregnated with a composition including a durable press textile reactant selected from water-soluble precondensates of formaldehyde with amino compounds and a water-insoluble acrylic hydrophilic polymer which absorbs about seven times its weight of water when immersed in an aqueous detergent solution for 2 minutes at 140° F., said polymer being an addition polymer of at least one ethylenically unsaturated monomer having one or more acid groups, and then drying and curing, the improvement which comprises applying said durable press reactant and hydrophilic polymer to said textile in a stable aqueous mixture with an oil and water repellent fluoro-acrylic polymer characterized by (CF_2) *groups and a terminal* CF_3 *group, the amount of fluoro-acrylic polymer* *being in the range of 4-100 based on the weight of said hydrophilic polymer, the proportion of said fluoro-acrylic polymer on said textile material being between about 0.01 and 5 by weight based on the dry weight of the textile material and the proportion of said acrylic hydrophilic polymer on said textile material being between about 0.25 and 5 by weight based on the dry weight of the textile material.*

22. A durable press textile having improved soil release properties, said textile being finished with a cured durable press and soil release finish consisting essentially of a mixture of durable press reactant selected from water-soluble precondensates of formaldehyde with amino compounds and a water-insoluble acrylic hydrophilic polymer which absorbs about seven times its weight of water when immersed in an aqueous detergent solution for 2 minutes at 140° F., said polymer being an addition polymer of at least one ethylenically unsaturated monomer having one or more acid groups, and oil and water repellent fluoro-acrylic polymer characterized by (CF_2) *groups and a terminal* CF_3 *group, the amount of fluoro-acrylic polymer being in the range of 4–100 based on the weight of hydrophilic polymer, the proportion of said fluoro-acrylic polymer on said textile material being between about 0.01 and 5 by weight based on the dry weight of the textile material and the proportion of said acrylic hydrophilic polymer on said textile material being between about 0.25 and 5 by weight based on the dry weight of the textile material.*

Re. 28,915
DETECTION OF PRODUCTS OF COMBUSTION

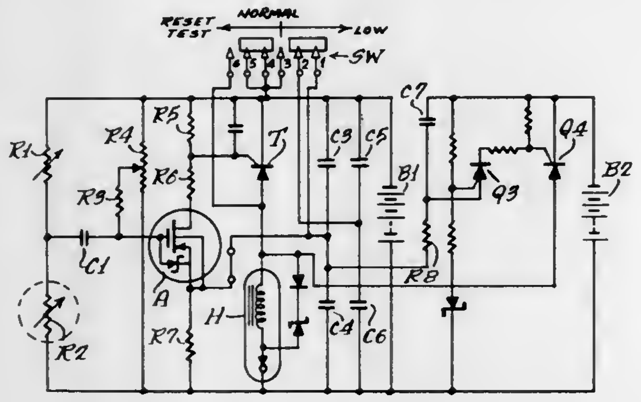
Wilbur L. Ogden, Aurora, and Clarence Glenn Henderson, Ottawa, both of Ill., assignors to BRK Shareholders' Committee

Original No. 3,594,751, dated July 20, 1971, Ser. No. 709,415, Feb. 29, 1968. Application for reissue July 13, 1973, Ser. No. 378,997

Int. Cl.^{2} G08B *17/10*

U.S. Cl. 340—237 S **40 Claims**

1. In a warning device having a primary power source, an alarm unit connected to said source and a load unit connected to said source; a supervisory circuit comprising a secondary power source, a capacitor in series with said secondary source, means coupling said capacitor to one side and said secondary source to the other side of said load unit to sense the voltage drop thereacross, trigger means responsive upon charging of said capacitor for connecting said alarm unit with said secondary source, said capacitor being charged by said second source when the voltage drop across said load unit falls below a predetermined value and when charged triggering said trigger means, said trigger means during discharge of said capacitor causing said secondary source to energize said alarm unit [whereby the alarm unit,] whereby the alarm unit emits periodic alarms of short duration when the output of the primary source falls below a predetermined value.



PLANT PATENTS

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

GRANTED JULY 20, 1976

3,937
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Apr. 30, 1975, Ser. No. 573,060

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—29 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous growth, dark red, pointed buds, Currant Red open flowers, with a white base, apple shaped receptacle, and long oval pointed leaflets.

PATENTS

GRANTED JULY 20, 1976

ERRATA

For CLASS	See PATENT NO.
051–141	3,969,848
051–268	3,969,856
073–139	3,970,155
062–028	3,970,441
426–237	3,970,530
526–012	3,970,603
526–260	3,970,606
526–335	3,970,607
526–019	3,970,608
526–089	3,970,609
526–062	3,970,610
526–065	3,970,611
526–086	3,970,612
526–104	3,970,613
536–017	3,970,641
536–017	3,970,642
536–017	3,970,643
340–147 TF	3,971,037
340–147 TF	3,971,038
335–284	3,971,054

PATENTS

GRANTED JULY 20, 1976

GENERAL AND MECHANICAL

3,969,772

JUMPING GARMENT FOR A PARACHUTIST

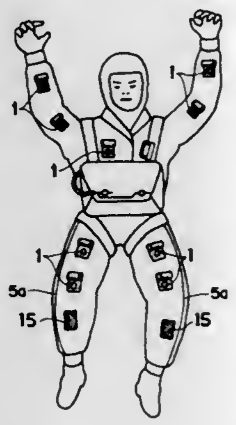
Marcel Pravaz, Clichy, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed Dec. 11, 1974, Ser. No. 531,668

Claims priority, application France, Dec. 19, 1973, 73.45483

Int. Cl.^{2} A41D *13/02*

U.S. Cl. 2—79 **15 Claims**



1. In a sky diving garment having sleeves and legs for a parachutist and defining a flexible wall exposed to the air about at least a part of the body including the arms and legs of the parachutist; the improvement comprising means for inflating the garment and thereby increasing the drag during the diving, said means comprising air entry openings which are in regions of the garment wall including a region of each sleeve and a region of each leg of the garment and defined by the wall of the garment and facing away from the parachutist/-transversely of the parachutist to permit entry of air directly into a space defined about the body of the parachutist by the wall of the garment so as to inflate the garment as the parachutist falls through the air in a substantially horizontal orientation.

3,969,773

PROSTHETIC KNEE JOINT FOR ATTACHMENT TO A NATURAL OR PROSTHETIC LEG

Alfred Menschik, Donaueschingenstrasse 13,, A 1200 Vienna, Austria

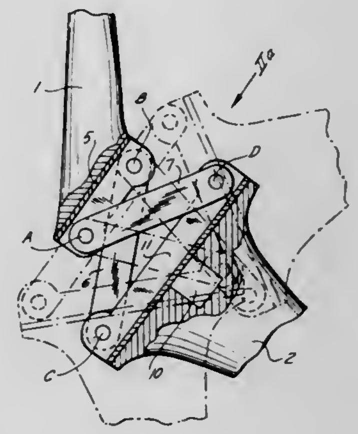
Filed Aug. 22, 1974, Ser. No. 499,565

Claims priority, application Austria, Aug. 24, 1973, 7405/73; Germany, July 8, 1974, 2432766

Int. Cl.^{2} A61F *1/24, 1/04, 1/08*

U.S. Cl. 3—1.911 **14 Claims**

1. A prosthetic knee joint comprising:
a femur-engaging upper base;
a tibia-engaging lower base; and
an inextensible and incompressible coupling including at least two rigid members positively interconnecting said bases, said coupling facilitating a swinging of said lower base relative to said upper base in a vertical plane between a front limiting position and a rear limiting position, the respective distances of a more forwardly located first point A and a more rearwardly located second point B on said upper base from a more rearwardly located third point D and from a more forwardly located fourth point C on said lower base being substantially constant throughout the swing range; the distance A–B of said first and second points, the distance C–D of said third and fourth points, the distance A–D of said first and third points, and the distance B–C of said second and fourth points being interrelated in a ratio of substantially 2:5:4:5.



3,969,774

FLUSHING AND REFILLING APPARATUS

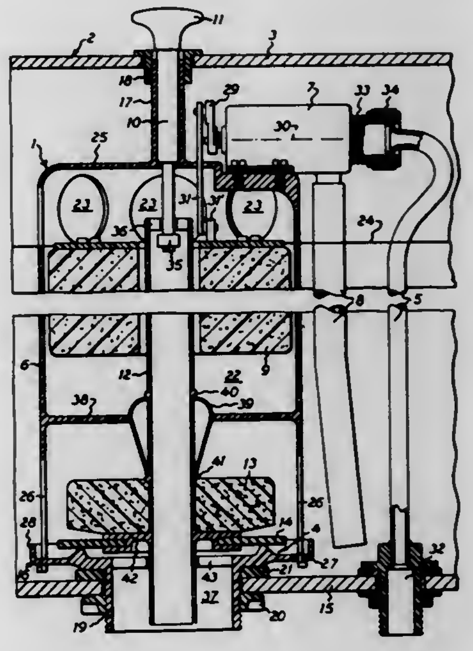
Frans Harry Karlsson, Lund, Sweden, assignor to Hykon-Patent Aktiebolag, Sweden

Filed Dec. 12, 1974, Ser. No. 532,148

Claims priority, application Sweden, Dec. 12, 1973, 7316759

Int. Cl.^{2} E03D *1/30*

U.S. Cl. 4—41 **12 Claims**

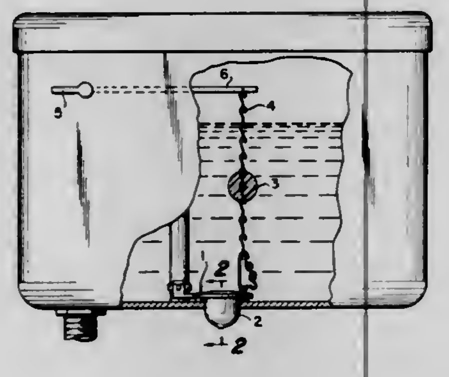


1. A cistern flush and refill system comprising a cistern provided with an upper wall and a discharge opening in its bottom wall and an inlet connected to a source of liquid under pressure, said system further comprising,
a flushing valve seat forming a passage between a lower part of the cistern and said discharge opening,
an assembly comprising as assembled parts a common support, a refilling valve, a flushing valve and an overflow pipe,
manually-operable coupling means for connecting said common support to said cistern and for permitting easily detachable connection of said common support to said cistern,

said refilling valve mounted on said common support and having means for detachably connecting said refilling valve to said inlet,
said flushing valve being movable between an open position and a closed position where it closes said flushing valve seat,
seat overflow pipe communicating between said flushing valve seat and an upper level of said cistern, said overflow pipe being connected to said flushing valve for movement therewith and being movably supported on said common support to permit movement of the flushing valve between its open and closed positions,
valve opening means connected to said flushing and refilling valves for opening said valves to start a flushing and refilling cycle, and
valve closing means for closing said refilling valve, said closing means being connected to said refilling valve.

3,969,775
WATER CLOSET FLUSHING DEVICE

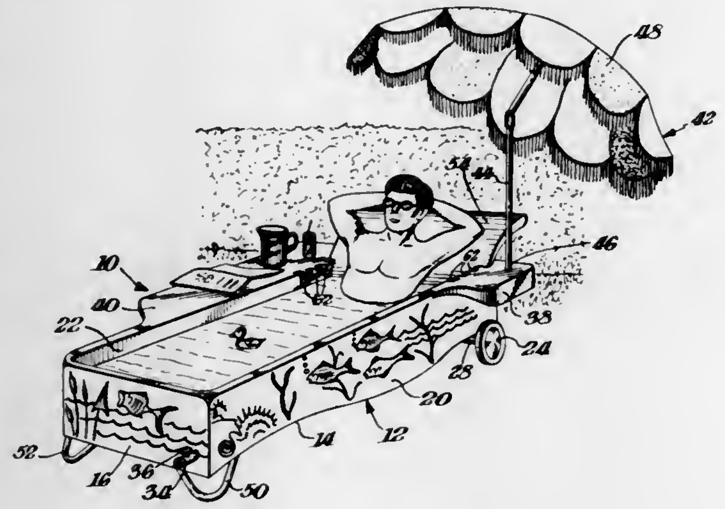
Frederick R. Haselton, 1205 Fallsmead Way, Rockville, Md. 20850
Continuation of Ser. No. 421,599, Dec. 4, 1973. This application Jan. 6, 1975, Ser. No. 538,617
Int. Cl.^{2} E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—67 A **2 Claims**



1. A flush control mechanism for a water closet of the type having a flushing fluid storage reservoir whose contents are transferred selectively either in part or substantially entirely to a bowl to flush the bowl comprising:
valve means in said reservoir selectively operable between open and closed positions and having a negative buoyancy characteristic at least when said valve means is open, said valve means normally assuming the closed position but when operated to its open position permitting the flow of flushing fluid to said bowl,
said valve means comprising an enclosed chamber having a vent aperture at its bottom which is isolated from the fluid in said reservoir when said valve means is closed to thereby permit emptying of said chamber during closure of said valve means,
said valve means further including an additional fluid entry aperture in said chamber upwardly of said vent aperture for permitting entry of fluid into said chamber only when said valve means is opened,
whereby said chamber has positive buoyancy when said valve means is closed but quickly becomes flooded and acquires negative buoyancy upon opening of said valve means,
a manually operated means operable between a first normal position and a second flushing position,
and means responsive to a momentary actuation of said manually operated means to its second position for opening said valve means only until a predetermined portion of the fluid in said reservoir which is less than the full quantity thereof has been transferred to said bowl,
said last-named means being responsive to a continued actuation of said manually operated means to its second position to maintain said valve means in its open position as long as said manually operated means remains in its said second position to permit transfer of substantially all of the fluid in said reservoir to said bowl.

3,969,776
WATER LOUNGE

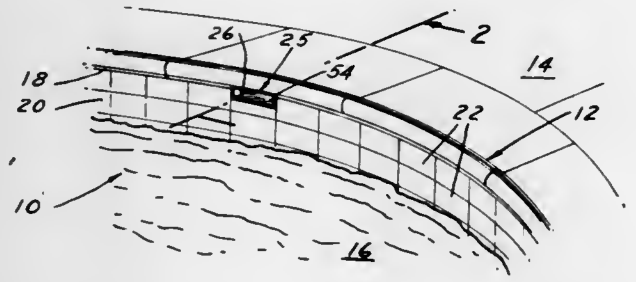
Robert Gildea, 2213 Ogletown Road, Newark, Del. 19711
Filed July 31, 1975, Ser. No. 600,631
Int. Cl.^{2} E04H *3/16, 3/18;* **F16L** *21/02*
U.S. Cl. 4—172 **10 Claims**



1. A water lounge comprising a generally rectangular shaped impervious body portion including a bottom wall with front, back and side walls extending upwardly therefrom adapted to hold water, a pair of spaced apart wheels rotatably secured to the body portion near the back wall thereof, an adjustable backrest within the body portion also near the back wall thereof, a drain in the bottom wall of the body portion, and at least one prop externally thereof and extending downwardly from the body portion near the front wall thereof for maintaining the body portion generally level.

3,969,777
OVERFLOW-SIPHONING DEVICE FOR SWIMMING POOLS AND THE LIKE

Sidney J. Beller, 20500 Miranda Place, Woodland Hills, Calif. 91364
Filed Feb. 24, 1975, Ser. No. 552,272
Int. Cl.^{2} E04H *3/20*
U.S. Cl. 4—172.17 **2 Claims**

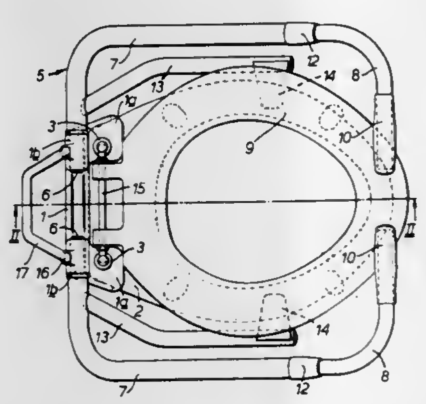


1. An overflow-siphoning device for controlling the water level of a swimming pool or the like body of water, the device being adapted for installation beneath the coping thereof to provide a continuous discharge of excess water from the pool separate from the pool recirculating system, wherein the device comprises:
a tubular conduit being disposed between said coping and said peripheral edge of said pool, wherein said peripheral edge of said pool is provided with a channel transversely disposed thereto in which said tubular conduit is fixedly received, said conduit having:

a substantially-flat, elongated mouth defining the inlet thereof;
a throat portion having a substantially-flat, upper wall, a pair of converging side walls, and a lower wall inclined dowมwardly and rearwardly of said mouth inlet;
a circumferential duct portion defining the outlet thereof; said mouth inlet is further defined as including: an elongated, leading edge of said upper, flat wall; an elongated, leading edge of said lower inclined wall; and a pair of oppositely-arranged, vertical, leading edges of said side walls, and wherein all of said walls are integrally formed and converge rearwardly to form said circular duct, thereby allowing the water in said pool to be discharged therethrough;
and said transverse channel includes a bottom wall being inclined downwardly and rearwardly, conforming to said lower inclined wall of said throat portion, and wherein said duct portion extends outwardly therefrom, said duct being disposed below said deck.

3,969,778
TOILET AIDS

Derek John Richards, Longhope, England, assignor to Mecanaids Limited, Great Britain
Filed May 8, 1975, Ser. No. 575,695
Claims priority, application United Kingdom, May 18, 1974, 22286/74
Int. Cl.^{2} E03D *11/00*
U.S. Cl. 4—254 **11 Claims**

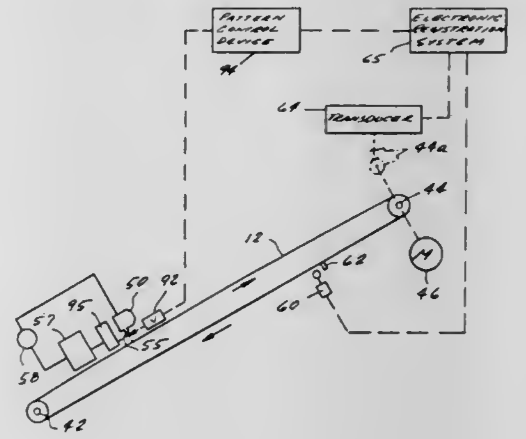


1. A toilet aid constructed for attachment to a W.C. pan, using the normal seat-attachment bolt holes provided in the pan, with support arms which extend forwardly on each side of a user when seated and which have inturned end portions connected thereto to provide front support for the user, at least the end portions of the arms being movable to the side to a front entry position which permits free entry and exit between the arms with main side portions of the arms positioned to assist the user when manoeuvring into and out of the seated position.

3,969,779
DYEING AND PRINTING OF MATERIALS

William H. Stewart, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed July 30, 1974, Ser. No. 493,187
Int. Cl.^{2} D06B *1/02*
U.S. Cl. 8—149 **15 Claims**

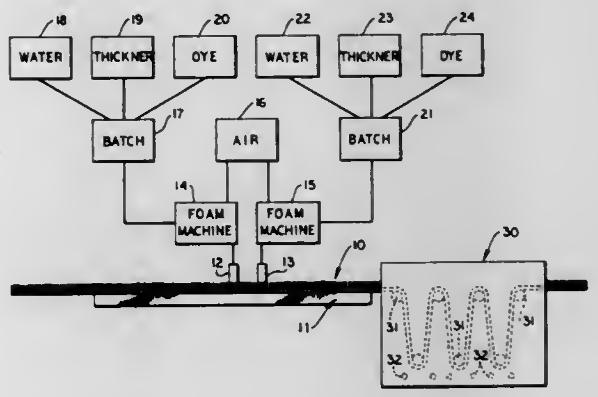
1. A method of dyeing a porous textile material, in particular pile fabrics and carpets, to obtain a desired pattern thereon with apparatus including conveying means for transporting the textile material past at least one row of jet orifices extending across the path of the textile material, deflecting means associated with said jet orifices, pattern control means to supply pattern data to control the operation of said deflecting means, and said pattern control means including timing means; said method comprising the steps of
1. transmitting pattern data from said pattern control means to said deflecting means in a multiplicity of repeating cycles (E-E) so that continuous dye streams from the jet orifices are directed onto or away from the textile material as required to form a single pattern,
2. initiating each of said cycles in response to movement of the textile material through a predetermined, preselected incremental distance,



3. directing one or more of the dye streams onto the textile material during one or more time controlled segments (C) of preselected duration within a fixed time period (T) in selected cycles in accordance with said pattern data and the operation of said timing means, and
4. maintaining within each cycle a quiescent time (Q) during which all of said dye streams in the row are directed away from the textile material.

3,969,780
CONTINUOUS CARPET DYEING PROCESS

James M. Henderson, P.O. Box 773, Dalton, Ga. 30720
Filed May 4, 1972, Ser. No. 250,298
The portion of the term of this patent subsequent to July 20, 1991, has been disclaimed.
Int. Cl.^{2} D06B *1/02*
U.S. Cl. 8—149.1 **19 Claims**



1. A process for use in dyeing material, such as carpet, including:
a. advancing a length of material to be dyed along a predetermined path;
b. applying a foam mixture containing dye material to one side of the length of material moving along said predetermined path;
c. applying a vacuum to the side of the length of material opposite to the side thereof to which the foam mixture is applied; and
d. fixing said dye material to said length of material.

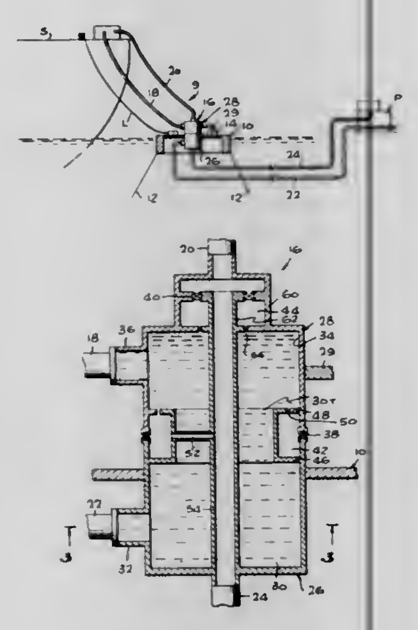
3,969,781
MOORING AND CARGO TRANSFER SYSTEM FOR DIFFICULT HANDLING CARGO

William R. Reid, Jr., Northridge, Calif., assignor to Imodco, Inc., Los Angeles, Calif.

Filed Aug. 27, 1973, Ser. No. 392,037

Int. Cl.² B63B *21/52*; B65B *3/04*

U.S. Cl. 9—8 P **5 Claims**



1. In a mooring and cargo handling system which includes a mooring station to which ships can be moored that are free to drift about the station, a first cargo conduit leading to a shorebased or other primary installation, and a second cargo conduit leading to the ship, the improvement comprising:

- a swivel unit attached to the mooring station and having first and second swivel sections with passages therein, said swivel sections rotatably joined about a primarily vertical axis and with their passages coupled to each other, the passages of said first and second sections respectively coupled to the first and second cargo conduits that lead to the primary installation and to the ship;
- said swivel unit having a pair of rotatable seal means between the swivel sections, and having walls defining an auxiliary chamber sealed from the environment by a first of the seal means and sealed from the passages by a second of the seal means, so that material which can leak through the second seal means is collected in the auxiliary chamber before it leaks into the environment; and
- pressure reducing means coupled to said auxiliary chamber for removing material therefrom, to maintain a lower pressure of material in said auxiliary chamber than the pressure which would build up in said auxiliary chamber in the absence of any removal of material therefrom, said pressure reducing means including means for resisting the escape of removed material into the environment, and said auxiliary chamber being sealed against the inflow of material therein to prevent material inflow except for any material which leaks through the seal means about the chamber.

3,969,782
TWO BRUSH VEHICLE COORDINATED AUTOMATIC WASHER

Robert D. Williams, 4338 Oakwood, La Canada, Calif. 91011

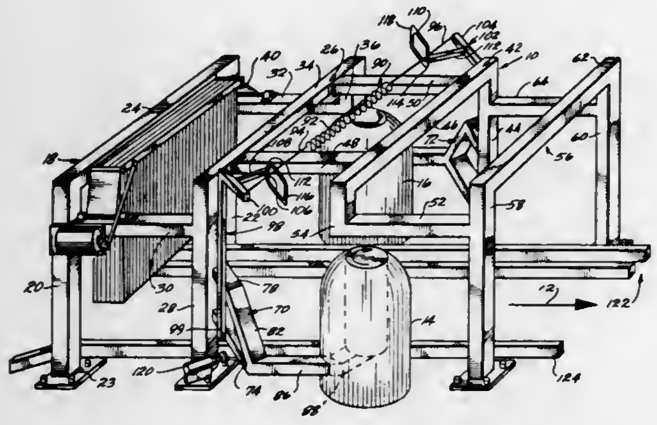
Filed May 16, 1974, Ser. No. 470,441

Int. Cl.² B60S *3/06*

U.S. Cl. 15—53 AB **11 Claims**

1. In a vehicle wash apparatus having a vehicle path therethrough, an improvement comprising:

a. a unitary frame including:
  - i. a first arch having a pair of spaced-apart vertical posts straddling the path and a beam bridging the path and connecting the posts;
  - ii. a first L-shaped beam assembly adjacent to the first arch, and spaced from and parallel to the first arch, the L-shaped beam assembly having a vertical post to a first side of the path and a horizontal beam over the path;
  - iii. a second L-shaped beam assembly adjacent to the first L-shaped beam assembly and spaced from and parallel to the first beam assembly on the opposite side thereof from the first arch, the second L-shaped beam assembly having a vertical post to a second side of the path, the second side being opposite the first side, and a horizontal beam over the path;
  - iv. a second arch having a pair of spaced-apart vertical posts straddling the path and a beam bridging the path and connecting the posts, the second arch being adjacent to the second L-shaped beam assembly and spaced from and parallel to the second L-shaped beam assembly on the opposite side thereof from the first L-shaped beam assembly; and
  - v. beam means along the path rigidly interconnecting both arches and both L-shaped beam assemblies;



b. a first brush assembly having an arm rotatably secured to the vertical post of the first L-shaped beam assembly and an arc of rotation which intersects an imaginary line below the distal end of the horizontal beam of the second L-shaped beam assembly;

c. a second brush assembly having an arm rotatably secured to the vertical post of the second L-shaped beam assembly and an arc of rotation which intersects an imaginary line below the distal end of the horizontal beam of the first L-shaped beam assembly; and

d. means for coordinating brush movement in response to vehicle movement along the path.

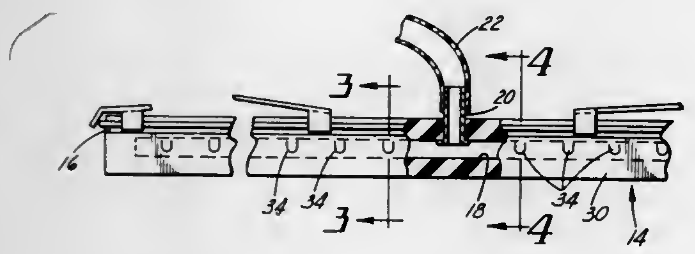
3,969,783
COMBINATION WINDSHIELD WASHER/WIPER

William A. Shipman, 6 Eastshore Blvd., Timberlake, Ohio 44094

Filed June 4, 1975, Ser. No. 583,642

Int. Cl.² B60S *1/46*

U.S. Cl. 15—250.04 **1 Claim**



1. The combination of windshield washing and wiping blade and a fluid supply reservoir assembly comprising,

- an elongated blade of elastomeric material having means for securement thereof to a wiper arm,
- a hollow central portion thereof extending longitudinally therealong,
- said blade being generally triangular in cross-section,
- through openings formed in said blade member on the two legs that normally contact the windshield surface for communication with said hollow central portion,
- said openings being a plurality of generally "u" shaped slots, said slots being formed such that they are normally closed when the material is in the unstressed condition to prevent leakage therefrom and open when stressed in tension to allow fluid to pass therethrough and be dispensed in a "u" shaped pattern,
- flexible tube means,
- means to secure one end of said tube means to said blade in communication with said hollow central portion of the blade,
- a fluid reservoir connected to the opposite end of said flexible tube, and means to selectively pump fluid from said reservoir through said tube to the hollow central portion of said blade.

3,969,784
PRESSION SECTOR WINDSCREEN-WIPER BLADE FOR MOTOR VEHICLES

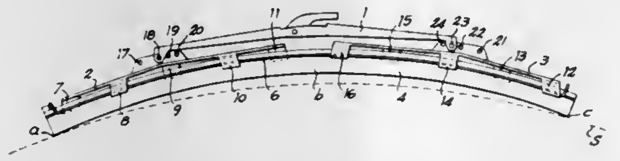
Paul Journée, Chateau de Reilly, 60 Reilly par Chaumont-en-Vexin, France

Filed Jan. 30, 1975, Ser. No. 545,383

Claims priority, application France, Jan. 30, 1974, 74.03099

Int. Cl.² B60S *1/04*

U.S. Cl. 15—250.42 **4 Claims**



1. In a windshield wiper blade assembly having a primary bridge member, a secondary bridge member pivotally mounted on each end of said primary bridge member and a flexible wiper member engaging each of said secondary bridge members at a plurality of spaced zones, the improvement comprising:

- said primary bridge member being substantially rigid;
- each of said secondary bridge members being of a unitary single structure and being resiliently bendable in a plane containing all said bridge members;
- means fixed on said secondary bridge members defining at least three of said pressure zones longitudinally spaced along each of said secondary bridge members; and
- said pressure zones of each of said secondary bridge members, when said bridge members are unstressed and at rest, being relatively arranged to each other to cause said wiper member to define a curve concave on the side thereof facing away from said bridge member.

3,969,785
RESIDUAL TONER REMOVING APPARATUS

Masaya Ogawa, Sakai, and Tetsuhisa Furukawa, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1974, Ser. No. 463,177

Claims priority, application Japan, May 8, 1973, 48-53769[U]

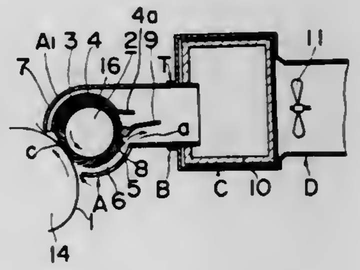
Int. Cl.² A47L *5/38*; G03G *21/00*

U.S. Cl. 15—301 **9 Claims**

1. In a residual toner removing apparatus for use in cleaning a photoreceptor surface of an electrostatic copying machine, said apparatus being of the type including a cleaner section including a housing and a cleaner brush rotatably provided within said housing, said housing having an opening, said cleaner brush extending through said opening so that it is engageable with a photoreceptor surface to be cleaned, and said cleaner section further having a first semi-circular concave casing partially enclosing said cleaner brush, said first casing extending away from said opening into said housing, and a duct section extending from said cleaner section housing, a filter section housing having a filtering member therein and coupled to said duct section and a suction section coupled to said filter section;

the improvement including means for removing toner particles from a photoreceptor surface and said cleaner brush and comprising:

- a semi-circular concave second casing forming a portion of said cleaner section housing opening and leading to said duct section and partially enclosing said cleaner brush, said first casing contacting at an inner face thereof bristles of said cleaner brush, an air passage formed between said cleaner section housing and said first casing, a rear portion of said first casing and a rear portion of said second casing leading to said duct section and forming a duct opening;
- a flicker member positioned substitutially centrally of said duct opening, said flicker member being positioned to contact said bristles of such cleaner brush during rotation of said brush; and
- an air flow regulating plate means, fixed to said flicker member and extending from said flicker member substantially centrally of said duct section toward said filter section housing, for preventing the formation of air vortices at the back of said flicker member, there being open communication through said duct opening between said cleaner brush and said duct section both above and below said plate means;
- the toner particles removed from said cleaning brush thereby being prevented from becoming reattached to said brush.



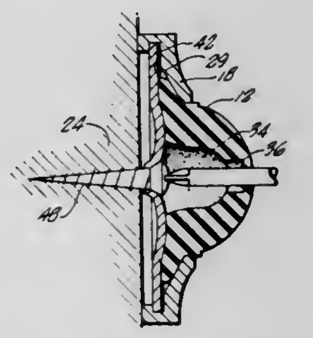
3,969,786
WALL BUMPER

Ben Peak, Yorba Linda, Calif., assignor to Builders Brass Works, Los Angeles, Calif.

Continuation of Ser. No. 412,657, Nov. 5, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,068

Int. Cl.² E05D *15/58*

U.S. Cl. 16—86 A **3 Claims**



1. A wall bumper comprising a housing having a forward wall portion with an aperture therethrough and an annular

side wall portion defining an open end adapted to abut a wall, said wall portion having an annular channel therein, the forward wall of said channel defining a substantially flat support surface, a resilient bumper member having a forward contact portion extending through said aperture and an enlarged rear portion abutting the interior of said forward wall portion of said housing, a retaining plate having an aperture therethrough and being disposed within said housing rearwardly of said bumper member, the perimeter portion of said plate being disposed within said annular channel in the side wall portion of said housing and in contact with said support surface and the central portion of said plate being deformed to press said enlarged portion of said bumper member against the interior of said forward wall portion of said housing thereby securing said resilient bumper member within said housing and a threaded fastening means adapted to extend through said aperture in said retaining plate and into a wall to which said bumper is to be secured.

3,969,787
HINGE DEVICE

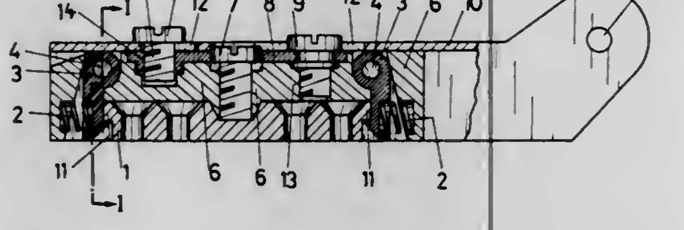
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Blum Gesellschaft m.b.H., Hochst, Austria

Continuation of Ser. No. 533,745, Dec. 18, 1974, abandoned. This application July 17, 1975, Ser. No. 596,809

Claims priority, application Austria, Dec. 24, 1973, 10792/73

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 **9 Claims**



1. A hinge device, particularly for mounting a door to a piece of furniture, said device comprising:

a mounting plate adapted to be attached to a piece of furniture, said mounting plate having recesses therein;

an intermediate part positioned on the top of said mounting plate, said intermediate part having hook members received in said recesses, said intermediate part having clamping means extending therethrough into abutment with said mounting plate to fix said intermediate part to said mounting plate;

a hinge arm connected to said intermediate part and having a substantially U-shaped lateral cross-sectional configuration to embrace said mounting plate; and

said hinge arm having open opposite ends, the open width of which is greater than the lateral breadth of said mounting plate, the breadth of said hook members being equal to said open width of said open ends of said hinge arm.

3,969,788
DOOR LOCK HINGE

Richard C. McCullough, 11154 Eastwood Ave., Inglewood, Calif. 90304

Filed July 14, 1975, Ser. No. 595,381

Int. Cl.² E05D *11/10*

U.S. Cl. 16—144 **8 Claims**

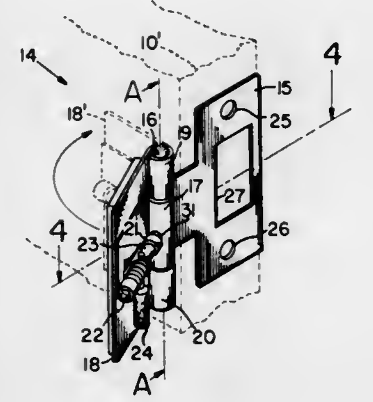
1. A door lock hinge comprising, in combination:

a. a first hinge plate;

b. hinge shaft means secured to an edge of said first hinge plate;

c. a second hinge plate having journalling means at an edge adjacent to said first mentioned edge surrounding at least a portion of said hinge shaft means to hinge said second plate to said first plate at the adjacent edges for swinging movement about the axis of said hinge shaft means; and,

d. bolt means mounted on said second plate for sliding movement in a direction normal to the axis of said hinge shaft means, said hinge shaft means including a receiving bore normal to its axis positioned to receive said bolt means when said second plate is at a right angle to said first plate whereby said plates may be locked in a right angle position so that when one plate is secured to the inside edge of a door frame, the other plate will overlie a marginal face portion of a door when closed to thereby hold said door closed.



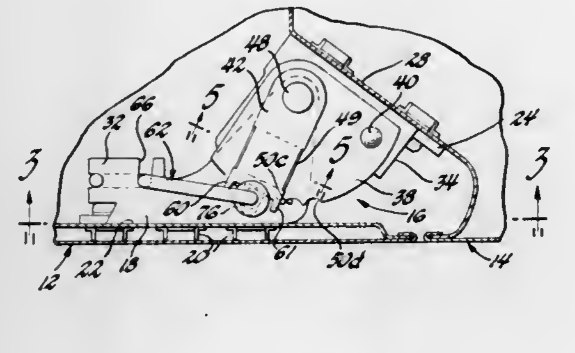
3,969,789
DOOR HOLD-OPEN MECHANISM

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1975, Ser. No. 581,157

Int. Cl.² E05D *11/10*

U.S. Cl. 16—145 **3 Claims**



1. In a door hinge mechanism mounted between an automotive door edge and a rigid body portion adjacent thereto, the improvement comprising a hinge member secured to said door edge, a bracket secured to said rigid body portion, a hinge pin mounted through portions of said hinge member and said bracket, a hinge sector secured to said hinge member, a plurality of detent slots formed along an edge of said hinge sector, a directional cam pivotally mounted adjacent said hinge sector, a cam slot formed in an edge of said directional cam, first and second shoulders forming opposite corners of said cam slot, first and second seats formed adjacent said first and second shoulders, respectively, a torque-rod secured at one end thereof to said bracket, and a roller rotatably mounted on said torque-rod adjacent the other end thereof and urged thereby into contact with one of said plurality of detent slots when the door is stopped and urged by one of said first and second shoulders onto one of said first and second seats, respectively, when the door is set in motion, overriding said detent slots until the door is once again stopped, after which any slight reverse force thereagainst causes said roller to snap back into said cam slot and the nearest of said detent slots.

3,969,790
POULTRY PROCESSING EQUIPMENT

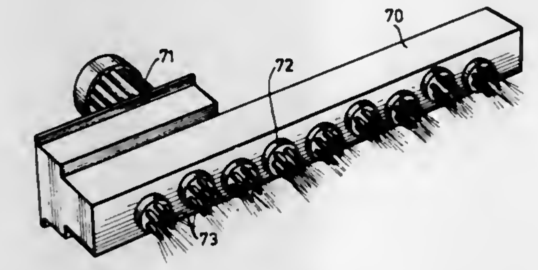
Johannes Jacobus Smorenburg, Abcoude, Netherlands, assignor to Stork Brabant, B.V., Boxmeer, Netherlands

Filed Jan. 18, 1974, Ser. No. 434,621

Claims priority, application Netherlands, Jan. 25, 1973, 7301113

Int. Cl.² A22C *21/00*

U.S. Cl. 17—11.1 R **6 Claims**



1. Apparatus for processing slaugtered poultry which is hanging from a conveyor track by its legs and moved along a path, comprising a plucking device having a plurality of rotatable discs on either side of the path of the poultry, said disks having plucking fingers directed to the path of the poultry, said plucking device having pipe means with a plurality of outflow openings therein and in the proximity of the plucking discs said openings being directed towards said path, and said pipe means being connected to one or more sources of hot water, hot air, steam or another suitable medium or a mixture thereof such that during the plucking operation performed by the plucking fingers the poultry is exposed to the effect of the medium brought thereon via the outflow openings.

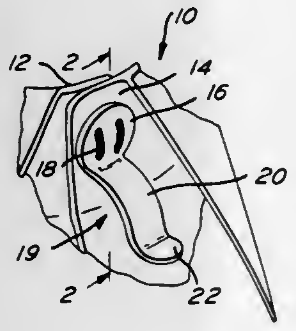
3,969,791
BUTTON AND RETAINER

Alvin H. Bernstein, 221 Countryside Lane, Mount Laurel, N.J. 08054, and Domenic J. Santulli, 344 S. 18th St., Philadelphia, Pa. 19103

Filed Apr. 14, 1975, Ser. No. 568,213

Int. Cl.² E05F *3/04*

U.S. Cl. 24—56 **11 Claims**



1. An article of manufacture comprising a button and a retainer associated therewith, said button having means thereon for enabling the button to be secured to a portion of a shirt collar so that the button may extend through a buttonhole in another portion of the shirt collar, said retainer having a portion angled downwardly and terminating in a free end, said retainer portion projecting forwardly from a front face of the button so that said portion may be pivoted upwardly for contact with a necktie as a result of force on the button by tightening of the necktie, and said means for enabling said button to be secured to a portion of a shirt collar being at an elevation above the elevation of the upper end of said retainer portion, said downwardly extending retainer portion being curved so as to be concave downwardly.

3,969,792
BUCKLE FOR STRAPPING PARCEL OR THE LIKE WITH TAPE

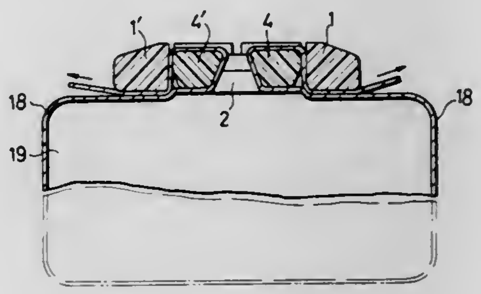
Kenji Hattori, 6,9-Banchi, Miyamae-cho, Numazu, Shizuoka, Japan

Filed Feb. 18, 1975, Ser. No. 550,342

Claims priority, application Japan, Sept. 21, 1974, 49-108322; Oct. 4, 1974, 49-119362

Int. Cl.² A44B *11/02, 11/06*

U.S. Cl. 24—74 A **1 Claim**



1. In a buckle for strapping packages having a rectangular frame portion (A) with one pair of lateral parallel sides (1, 1'), a pair of end sides (2, 2') with a rectangular aperture (3) in the center, a leg portion (B) having a pair of parallel legs (4, 4') and a connecting portion (C) having a pair of parallel connecting members (5, 5') connecting said legs (4, 4') and one of said end sides (2'), in combination: angular projections (6, 6') on said lateral sides (1, 1') inclined toward the outside of said lateral sides leaving narrow flat planes slightly higher than the surfaces of said end sides (2, 2') along those edges of said lateral sides (1, 1') facing the rectangular aperture (3), said aperture (3) being formed with inclined planes (7, 7', 8, 8') of said end sides (2, 2'), said inclined planes being inclined toward the inside of said end sides (2, 2'), the width (W, W1) of said legs (4, 4') being selected so that when said legs (4, 4') are folded at said connecting members (5, 5') toward the framed portion (A) some spaces (S, S1, S2) will be left between said legs (4, 4') and said projections (6, 6'), said legs (4, 4') being formed with inclined convex planes (9, 9', 10, 10') and also with flat planes (13, 13', 14, 14'), said inclined convex planes (7, 7', 8, 8') of said end sides (2, 2') and said flat planes (13, 13', 14, 14') being capable of connecting the surfaces of said end sides (2, 2') when said legs (4, 4') are fitted into said rectangular aperture (3), said legs moreover having groove-like recesses (17, 17') in their bottom at right angles to the directions of their parallel arrangement and a width (W3) nearly equal to the width (W2) of the rectangular aperture (3), the depth of said recesses (17, 17') nearly corresponding to the thickness of a strapping tape the top longitudinal width of said legs (4, 4') being equal to the width (2) of said aperture (3), said legs (4, 4') being formed with upwardly inclined planes (15, 15') on their confronting sides and also with upwardly inclined planes (16, 16') on their other sides leaving some flat planes, said legs (4, 4') having a space between confronting planes, the connecting members (5, 5') being relatively thin and having widths somewhat smaller than the widths (W, W1) of the legs (4, 4') so that when the legs (4, 4') are bent at the connecting members (5, 5') toward the aperture (3), the inclined convex planes (9, 9', 10, 10') come into tight contact with the inclined planes (7, 7', 8, 8') and the flat planes (13, 13', 14, 14') of said legs (4, 4') come into tight contact with the flat planes of said end sides (2, 2') and said legs (4, 4') span over the aperture (3).

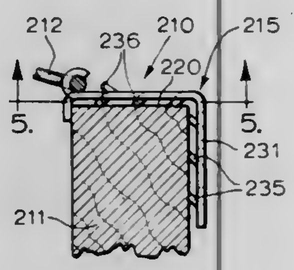
3,969,793
SPRING CONSTRUCTION

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Chicago, Ill.

Continuation of Ser. No. 415,940, Nov. 15, 1973, abandoned, which is a continuation of Ser. No. 185,196, Sept. 30, 1971, Pat. No. 3,773,310. This application June 17, 1975, Ser. No. 587,717

Int. Cl.^{2} A44B *21/00;* F16F *3/02;* A47C *23/02*

U.S. Cl. 24—84 B **9 Claims**



1. A rail attachment arrangement for attaching a sinuous spring band to a frame rail, comprising:

a. an attachment clip,
b. said rail having vertical inner and outer surfaces and a horizontal top surface,
c. said attachment clip including an anchor leg seated on said outer surface and an attachment leg seated on said top surface,
d. said attachment leg having hook means formed thereon and a linear wire segment of the spring band being seated in said hook means for connecting the end of said band to said clip,
e. said hook means being positioned on said top surface so that said linear wire segment is disposed at least substantially in back of the plane of said inner surface,
f. said spring band normally being effective to draw said anchor leg against said outer rail surface and, at the same time, tending to draw it upwardly on said surface,
g. a plurality of anchor tangs formed inwardly from said anchor leg and being inclined upwardly from the horizontal whereby when forced against said outer rail surface by spring band force they bite into the wood and prevent upward movement of said clip on said rail,
h. and anti-backoff means on said attachment leg for preventing outward movement of said clip on said rail,
i. said anti-backoff means comprising foot means depending from the free end of said attachment leg and bearing against the inner surface of said rail to prevent rearward movement of said clip on said rail.

3,969,794
CONCEALED ZIPPER FASTENER

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

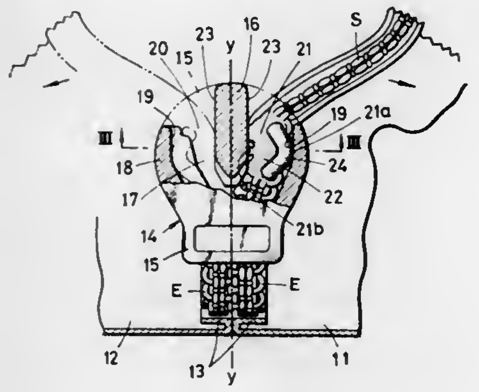
Continuation of Ser. No. 329,589, Feb. 5, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,106

Claims priority, application Japan, Feb. 7, 1972, 47-15624

Int. Cl.^{2} A44B *19/36*

U.S. Cl. 24—205.11 F **3 Claims**

1. A zipper fastener which comprises a pair of stringer tapes each having an inside edge portion, a row of fastener elements formed from plastic filament and secured to the inside edge portion of each stringer tape, a slider movably mounted on said tapes for coupling and uncoupling said fastener elements and provided centrally with a guide post and side flanges defining therewith guide channels each for the passage of a respective row of fastener elements, said side flanges each having an inner side wall surface which lies adjacent an inlet of a corresponding guide channel and in spaced apart relation to a side wall of said guide post, and retaining means defined by at least one portion of a row of fastener elements deformed into an expanded sidewise configuration disposed for pressure engagement with a respective side wall of the guide post and a respective inner side wall of a side flange to lock the slider against retractive movement in the fully closed disposition of the fastener, said inner side wall surface being oppositely disposed to the guide post and extending substantially parallel with the longitudinal axis of the slider whereby the retaining means is held in pressure engagement with said wall surface and the guide post against the influence of external lateral forces applied to the tapes and tending to open the fastener.



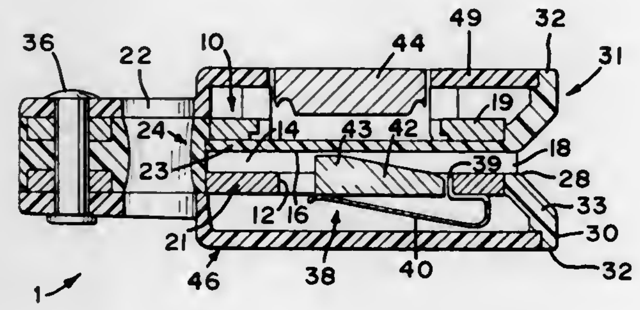
3,969,795
SAFETY BELT BUCKLE

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 16, 1974, Ser. No. 506,070

Int. Cl.^{2} A44B *11/26*

U.S. Cl. 24—203 AL **13 Claims**



1. A safety belt buckle comprising:

a. a housing having an opening therein and provided with a cavity extending from said opening to a wall of said housing opposite said opening;
b. inlet means communicating with said cavity for receiving a tongue of a seat belt;
c. connecting means for connecting the housing to the seat belt;
d. movable latching means for engaging the tongue of said seat belt;
e. manually operable actuation means for actuating said latching means;
f. said housing formed of at least three laminated plates in contact with one another and secured together, said laminated plates including a first plate, a second plate and a third plate, said second plate disposed between said first plate and said third plate;
g. each of said plates having a cavity in the central portion thereof, said cavities in substantial alignment with one another;
h. said cavity in at least said second plate extending from an edge of said second plate into the central opening thereof for receiving said tongue, a portion of said latching means extending in and movable within said cavity of at least said second plate and said third plate, a portion of said actuating means extending in and movable in said cavity of at least said first plate;
i. said second plate being made of a polymeric material and further including guide means extending from the interior of said cavity to a point of termination on the exterior surface of said housing for guiding the tongue into the housing.

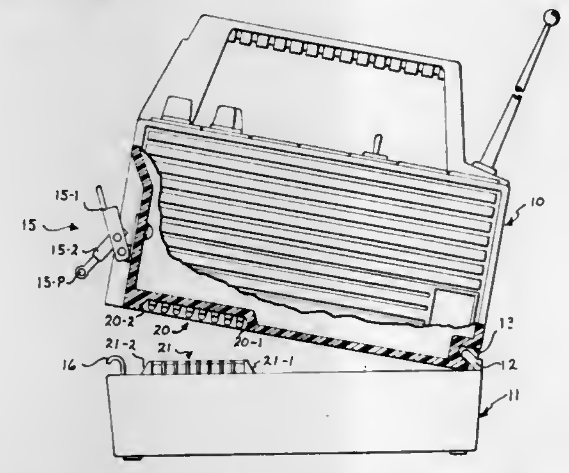
3,969,796
RELEASABLE FASTENING ARRANGEMENT FOR A RADIO HOUSING AND A BATTERY HOUSING

Roy F. Hodsdon, and Friedrich H. Mann, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Sept. 17, 1975, Ser. No. 614,260

Int. Cl.^{2} H01R *13/54;* H01B *1/38*

U.S. Cl. 24—270 **4 Claims**



1. An improved arrangement for releasably fastening a radio housing or the like to a battery housing or the like comprising:

a. a retaining projection mounted on the upper surface of the battery housing near a first end thereof, said retaining projection extending at an acute angle from said upper surface toward a second end of said battery housing opposite said first end;
b. a first retaining member mounted on said battery housing near said second end thereof, said first retaining member having a retaining surface facing in a direction generally toward the bottom of said battery housing;
c. a separating projection mounted on said upper surface of said battery housing between said ends thereof, said separating projection having at least one separating surface that slopes upwardly from said upper surface in a direction from one of said ends toward the other of said ends of said battery housing;
d. a retaining recess positioned in the lower surface of the radio housing near a first end thereof, said retaining recess having a configuration which receives said retaining projection and removably holds said first end of said radio housing and said first end of said battery housing together when said retaining projection is inserted into said retaining recess;
e. a latching arm pivotally mounted on said radio housing near a second end thereof opposite said first end, said latching arm having a second retaining member that is adapted to engage said first retaining member on said battery housing and to hold said second end of said radio housing and said second end of said battery housing together;
f. a separating recess positioned in the lower surface of said radio housing between said one end and said other end thereof, said separating recess having at least one separating surface that slopes inwardly from said lower surface in a direction from one of said ends of said radio housing toward the other of said ends of said radio housing;
g. and said separating surface of said separating projection and said separating surface of said separating recess being correspondingly positioned and configured so as to be substantially in registry when said radio housing and said battery housing are positioned and held together, and so that impact to said radio housing and said battery housing when so held tends to separate said housings.

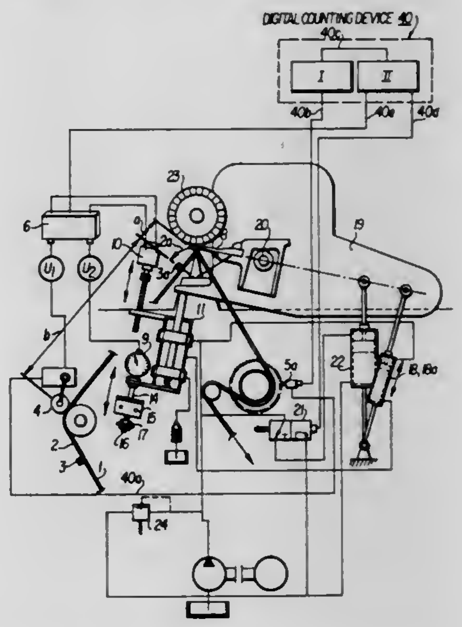
3,969,797
APPARATUS FOR REGULATING THE SHEARING OF PILE FABRIC

Dieter Riedel; Horst Rathert, both of Minden, and Gerhard Grannemann, Friedewalde, all of Germany, assignors to Drabert Sohne, Minden, Westphalia, Germany

Continuation-in-part of Ser. No. 120,545, March 3, 1971, abandoned. This application Apr. 4, 1973, Ser. No. 347,713

Int. Cl.^{2} D06C *13/00, 13/02*

U.S. Cl. 26—15 R **8 Claims**



1. In a control arrangement incorporated in a shearing machine for shearing material having a base layer and a nap,

cutter means,
shearing bar means spaced by a gap from the cutter means and supporting the said material in nap cutting relationship with the cutter means,
means carrying the shearing bar and cutter means for adjusting the gap between the bar means and the cutter means whereby the cut effected is varied,
means for sensing continuously the thickness of the base layer and generating a signal having a value dependent upon that thickness,
a measured value recorder for measuring the actual size of the shearing gap of the machine and for generating a signal having a value dependent upon that gap,
regulating means connected to the sensing means and the measured value recorder whereby to receive both said signals and to generate a difference signal, and
a re-set device connected to receive said difference signal and to vary the shearing gap of the machine by action on said carrying means until the difference signal reaches zero magnitude.

3,969,798
BLANKS FOR COFFINS

Anders Lennart Sahlin, Vallingby, Sweden, assignor to Anders Sahlin AB, Vallingby, Sweden

Filed Jan. 23, 1974, Ser. No. 435,792

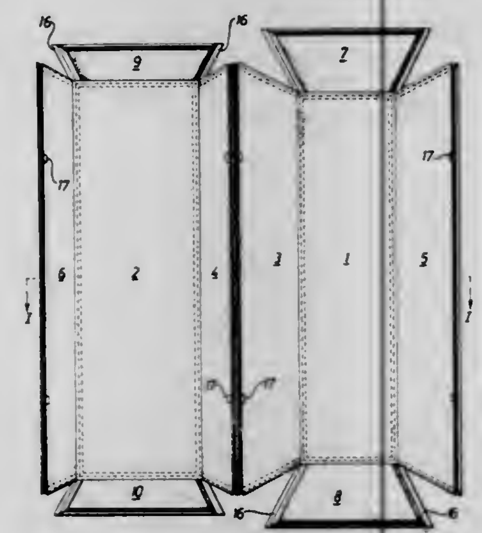
Claims priority, application Sweden, Jan. 23, 1973, 7300930

Int. Cl.^{2} A61G *17/00*

U.S. Cl. 27—4 **6 Claims**

1. A blank for a coffin consisting essentially of the combination of a thin outer layer of a flexible material with high tensile strength forming the entire outer surface of the coffin, a plurality of rigid sheet sections attached to various portions of the inner side of said outer layer of flexible material, which rigid sheet sections are intended to be folded in an unobstructed edge-to-edge relationship to each other along lines parallel to

their adjacent edges and directly abut against each other to form a coffin cavity using said flexible outer layer as a combined pivot and connecting member to hold the edges of said rigid sections together under tension in direct edge-to-edge abutting relationship, said outer surface extending beyond the sections forming the sides of the coffin so as to make flaps which can be fastened to the outer sides of the coffin, each of said rigid sheet sections having its inner surface covered with separate thin layers of material that extend beyond the edges of each rigid section so as to form outwardly extending edge flaps, the outwardly extending edge flaps of one rigid sheet section being fastened to the adjacent rigid sheet section when the coffin is assembled so as to both form a seal between adjacent rigid sheet sections and to lend structural stability to the coffin.



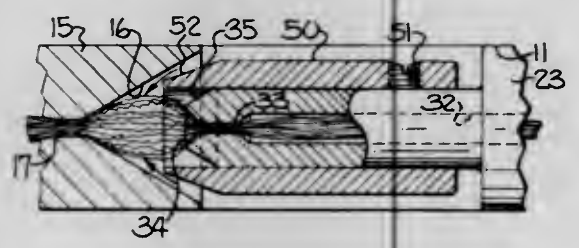
3,969,799
TURBULENCE GENERATOR FOR YARN TEXTURING AIR JET

Richard J. Polney, New Castle, Del., assignor to Enterprise Machine and Development Corporation, New Castle, Del.

Filed May 12, 1975, Ser. No. 576,296

Int. Cl.^{2} D02G *1/16*

U.S. Cl. 28—1.4 **9 Claims**



1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, a venturi supported in the central bore and in the exit end of said housing, an inwardly tapering conical surface on the inner end of said venturi and terminating in an exit orifice extending through the exit end of said venturi, a yarn guiding needle positioned in the central bore of said housing and having an inner end portion defining an exit end of said needle, said needle having an axial yarn guiding channel extending therethrough for directing multifilament yarn through said needle and toward said venturi, said inwardly tapering conical surface of said venturi defining the exit end of a turbulence chamber, and means for directing pressurized gas into the central bore of said housing and along said inner end portion of said needle whereby the gas passes through said turbulence chamber and outwardly through said exit orifice of said venturi to impart crimps, curls and loops to the filaments as the yarn passes through said turbulence chamber, the combination therewith of means for improving the turbulence and enhancing the crimps, curls and loops imparted to the yarn passing through said turbulence chamber, said means comprising a tubular extension projecting outwardly beyond said exit end of said needle and having an inner end portion positioned closely adjacent said inwardly tapering conical surface on the inner end of said venturi whereby the entrance end of said turbulence chamber is defined by said exit end of said needle and said tubular extension on the inner end of said needle.

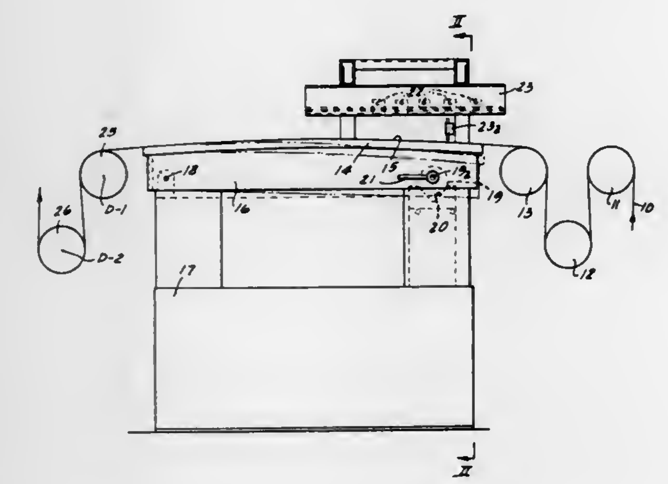
3,969,800
STRETCHING DEVICE FOR FILAMENTS OR STRANDS

Giorgio Baldini, and Gianpietro Trentini, both of Turin, Italy, assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 284,210, Aug. 28, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,159

Int. Cl.^{2} D02J *1/22*

U.S. Cl. 28—71.3 **4 Claims**



1. A mechanism for producing plastic filaments comprising in combination:

- means for supplying continuous filaments of plastic, said filaments extending from a delivery roll to a receiving roll;
- a heating means having an arcuate heat transfer surface positioned to be contacted by said filaments with said filaments wrapping said arcuate surface and sliding therealong in a circumferential direction in heat transfer engagement therewith;
- radiant heating means opposite said heat transfer surface for heating said heat transfer surface to a predetermined temperature for heating said filaments;
- means for applying a continuous axial tension to said filaments holding them in sliding heat transfer surface engagement with said heat transfer surface;
- and means for adjusting the position of said heat transfer surface toward or away from the path of travel of said filaments so as to change the length of arc on said heat transfer surface contacted by said filaments so that the time of engagement of said filaments with said heat transfer surface is changeable, said adjusting means including a pivotal support for the trailing end of said heat transfer surface adjacent said receiving roll and adjustable means for moving the leading end of said heat transfer surface adjacent said delivery roll to change said length of arc on said heat transfer surface contacted by said filaments whereby the location where said filaments first engage said heat transfer surface is variable.

3,969,801
FLEXURE COMPENSATING ROLL

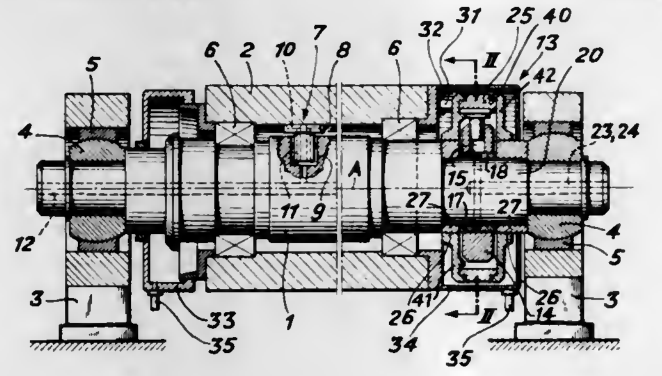
Anton Dolenc, Winterthur, Switzerland, and Anton Herter, Friedrichshafen, Germany, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed May 2, 1975, Ser. No. 574,099

Claims priority, application Switzerland, May 8, 1974, 6245/74

Int. Cl.^{2} B21B *13/02*

U.S. Cl. 29—116 AD **7 Claims**



1. A flexure compensating roll comprising a core, a hollow annular shell disposed about the core, hydraulically actuated pistons supported in the core and bearing against the inside surface of the shell, and a rotary radial piston hydraulic motor coupled between the core and shell for delivery of torque to the shell.

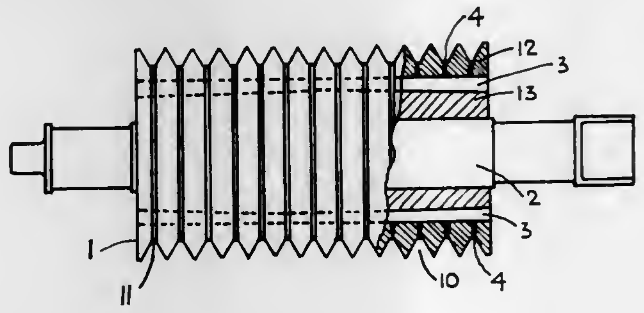
3,969,802
MILL ROLL

Jean Bouvet, P.O. Box 131, Ookala, Hawaii 96774

Continuation-in-part of Ser. No. 464,140, April 25, 1974. This application Feb. 3, 1975, Ser. No. 546,694

Int. Cl.^{2} B21B *27/02*

U.S. Cl. 29—121 R **5 Claims**



1. A mill roll of the character described, to be used in combination with one or more rolls in a mill for grinding a material, such as sugar cane and the like, while extracting the juice therefrom, comprising a rigid body having a plurality of peripheral grooves formed circumferentially thereon, a plurality of channels within the body of the roll extending axialy of the roll throughout the roll body, a plurality of holes extending substantially radially from the bottom of said grooves and communicating with said channels, whereby, during operation, the passage of extracted juice through the holes and channels tends to increase the recovery of juices.

3,969,803
METHOD OF MANUFACTURING SPHERICAL BEARING

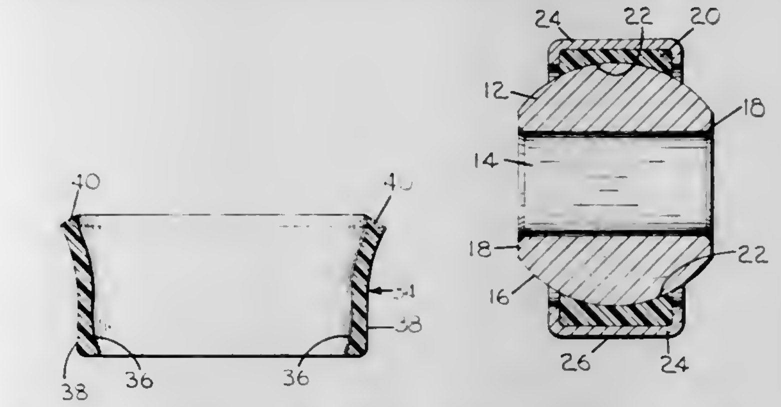
Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Filed Oct. 25, 1974, Ser. No. 517,878

Int. Cl.^{2} B21D *53/10*

U.S. Cl. 29—149.5 C **3 Claims**

1. A method of manufacturing a spherical bearing having an outer sheet metal cylindrical member, an intermediate yieldable plastic member enclosed and supported thereby, said intermediate member having a concave inner surface and a spherical ball in bearing relationship with said intermediate plastic member, said spherical ball having an outer surface complementary to said concave inner surface of said intermediate member comprising the steps of preforming the outer member into a truncated conical member having a first radially inwardly annular lip formed at one end thereof, preforming the plastic intermediate member wherein the outer surface of said intermediate member is substantially cylindrical with one end outwardly flared, the inner surface of said intermediate member being partially spherical in the region remote from said flared end of said intermediate member, inserting said ball within the inner surface of said intermediate member such that a portion of the convex outer surface of said ball intimately engages the preformed concave inner surface of the intermediate member, inserting the intermediate member with the spherical ball contained therein within the outer member, applying a deforming force to the outer surface of the outer member by die means to form the outer member into a cylindrical shape and to deform the plastic intermediate member completely around said spherical ball and to fill the space between said spherical ball and said outer member said intermediate member providing the entire bearing surface for said spherical ball, deforming the undeformed end of said outer member around the intermediate member to form a second radially inwardly annular lip and to complete the bearing.



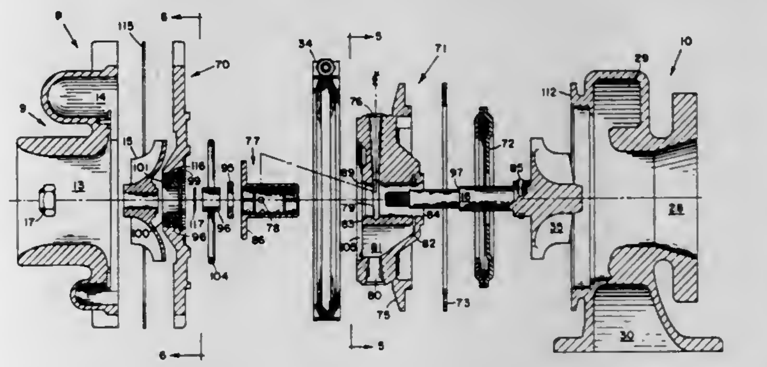
3,969,804
BEARING HOUSING ASSEMBLY METHOD FOR HIGH SPEED ROTATING SHAFTS

Hugh MacInnes, La Canada, and Paul M. Uitti, Huntington Beach, both of Calif., assignors to Rajay Industries, Inc., Long Beach, Calif.

Division of Ser. No. 428,832, Dec. 27, 1973, Pat. No. 3,941,437. This application Apr. 14, 1975, Ser. No. 567,857

Int. Cl.^{2} B23P *15/00;* **F04B** *17/00*

U.S. Cl. 29—156.4 R **4 Claims**



1. A method of assembling a turbocharger for use on any given design of internal combustion engine, said turbocharger having a two part bearing housing for enclosing a semi-floating axial thrust type bearing, a first part of said bearing housing having a hole for receiving said bearing and a shaft therein, said first part having passages therethrough substantially perpendicular to said hole for allowing gravity flow of lubricant to said bearing and shaft, a second part of said two part bearing housing also having a hole to receive said bearing and said shaft and having a surface for counteracting axial thrust of said bearing, said method consisting of;

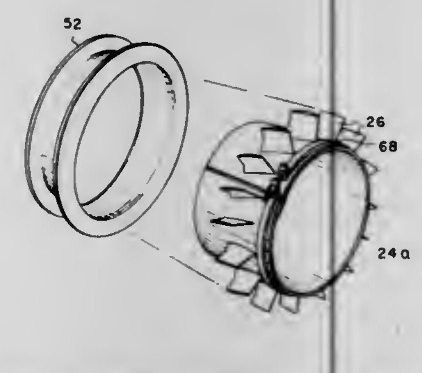
a. positioning an exhaust turbine portion of said turbocharger in proper relationship for connection to an exhaust system of said engine;
b. rotating said first part of said bearing housing in relation to said exhaust turbine portion to provide essentially vertical alignment of said lubricant passages for gravity flow of lubricant therethrough;
c. positioning a compressor portion of said turbocharger in proper relationship for connection to the fuel intake of said engine;
d. rotating said second part of said bearing housing for proper alignment with said compressor portion;
e. rotationally adjusting said first part of said bearing housing for alignment with said second part of said bearing housing while maintaining gravity flow of lubricant through said lubricant passages;
f. connecting said first part of said bearing housing to said second part of said bearing housing;
g. connecting said first part to said exhaust turbine portion; and
h. connecting said second part to said compressor portion.

3,969,805

METHOD OF CONSTRUCTING AN AXIAL FLOW FAN

Ronald J. Lievens, Onalaska, and Richard W. Kabat, Genoa, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 23, 1974, Ser. No. 535,431
Int. Cl.^{2} B23P *15/04, 11/02*
U.S. Cl. 29—156.8 R **7 Claims**



1. In the method of assembling an axial flow fan, the steps of providing an axially extending generally circular annular stator housing member having a radially inner surface; providing a substantially circular split ring member; providing a plurality of separate stator vanes; attaching said vanes to said split ring member; reducing the diameter of said substantially circular split ring member by applying a constraining force thereto; axially inserting said substantially circular split ring member in axially co-extensive relationship within said stator housing member with said stator vanes radially interposed between said substantially circular split ring member and said inner surface of said stator housing member; subsequently relieving said constraining force to reduce the radial clearance at the ends of said vanes; and welding each of said vanes to said substantially circular split ring member in this position.

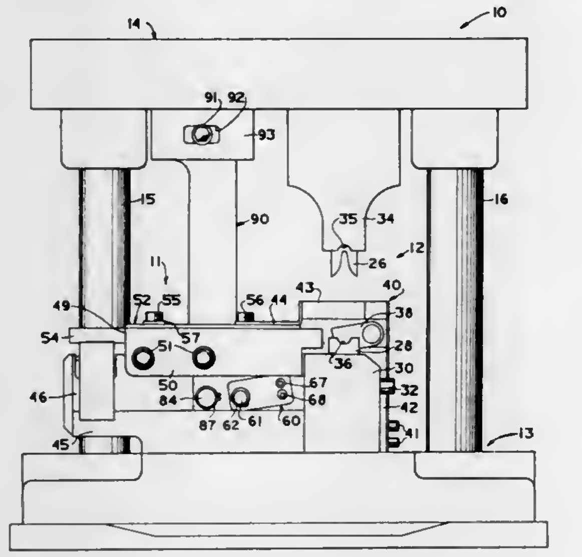
3,969,806

APPARATUS AND METHOD FOR CRIMPING TERMINALS

William S. McCaughey, Naperville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 333,630, Feb. 20, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,900
Int. Cl.^{2} H01R *43/04*
U.S. Cl. 29—203 DS **8 Claims**

1. Apparatus for connecting conductors to electrical terminals supplied to such apparatus in the form of strips whereon said terminals are carried at uniformly spaced intervals along an elongated carrier having feed apertures formed therein and spaced along the length thereof at the same interval as said terminals, and wherein said terminals may be supplied as different strips having different uniformly spaced terminal intervals as aforesaid, but said different strips having a constant value of spacing between a terminal and a feed aperture therefor, said apparatus being capable of accepting, without adjustment, strips as described and having interval spacings from a minimum value to slightly less than twice that minimum value, said apparatus comprising: crimping means for crimping a terminal positioned therein to a conductor, and reciprocating feed means for feeding a terminal strip in a longitudinal direction to said crimping means to successively position terminals in a crimping position therein, said feed means comprising an engagement element movable in a stroke toward and away from said crimping means and arranged to engage and advance the terminal strip by entering an aperture thereof during movement of said engagement element toward said crimping means, and to release from engagement with the terminal strip during movement of said engagement element away from said crimping means, the stroke of said movement of said engagement element being slightly less than twice the length of said minimum value of interval spacing, and the position of said engagement element at the end of its stroke toward said crimping means being such as to place the aperture of the strip in which said engagement element is engaged at a distance from said crimping means the same as said aforementioned constant value of spacing.

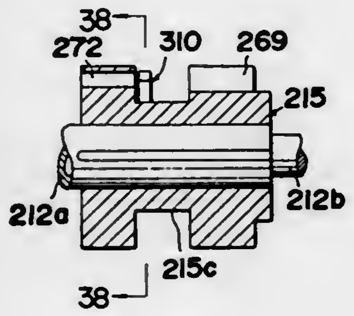


3,969,807

CORE WIRE-CONNECTING DEVICE

Jun Takizawa, Tokyo; Kazuyuki Oshima, Kawasaki; Hikaru Yamamoto, Chiba; Kooji Kuribayashi, Ichihara, and Toshio Suzuki, Kamakura, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation; The Fujikura Cable Works, Ltd.; The Furukawa Electric Co., Ltd., all of Tokyo and Sumitomo Electric Industries, Ltd., Osaka, all of, Japan

Filed Dec. 31, 1975, Ser. No. 645,886
Int. Cl.^{2} H01R *43/04*
U.S. Cl. 29—203 DT **36 Claims**



1. A core wire-connecting device which comprises a driving shaft and a main shaft rotatably received in a fixed housing in parallel relationship with each other; a movable housing reciprocatively mounted on the main shaft; a rotor reciprocating therewith and capable of rotating with the main shaft; a plurality of connector receptacle means formed in the periphery of the rotor equidistantly spaced in a circumferential direction for receiving connectors, each formed of a sleeve and a conical wedge received therein; intermittent rotation means provided between said main shaft and driving shaft for intermittently rotating the main shaft, together with the rotor through an angle defined by the respective adjacent receptacle means with the main shaft, each time the driving shaft is rotated through a prescribed angle; reciprocating means for moving the rotor back and forth along the main shaft when the main shaft is not rotated by the intermittent rotation means and for bringing core wires into the sleeve; connector-feeding mechanism for delivering connectors one by one from a belt-like magazine on which the connectors are arranged equidistantly lengthwise in parallel with each other to any of the receptacle means when said any of the receptacle means is brought to a first station of said movable housing; conical wedge-removing means disposed at one end of the rotor in alignment with the receptacle means at said first station for pushing the conical wedge out of the sleeve of the connector received in said receptacle means to the other end of the rotor; a core cutting-off mechanism mounted on the movable housing in alignment with the receptacle means disposed near said one end of the rotor at a second station of said movable housing which is circumferentially separated from said first station through an angle corresponding to an angle defined by the adjacent front receptacles with the axis of said rotor for cutting off the unnecessary parts of the joinable end portions of the core wires, thereby allowing the tips of the cut-off ends of the core wires to be brought into alignment; conical wedge-inserting means provided at the other end of the rotor in alignment with the receptacle means at said second station for inserting the conical wedge into the sleeve; driving means for carrying the conical wedge-inserting means toward said one end of the rotor to an extent corresponding to the distance through which the conical wedge-inserting means pushes the conical wedge now released from the sleeve received in the receptacle means at said second station; and core-holding means for immovably supporting the core wires lengthwise of the main shaft.

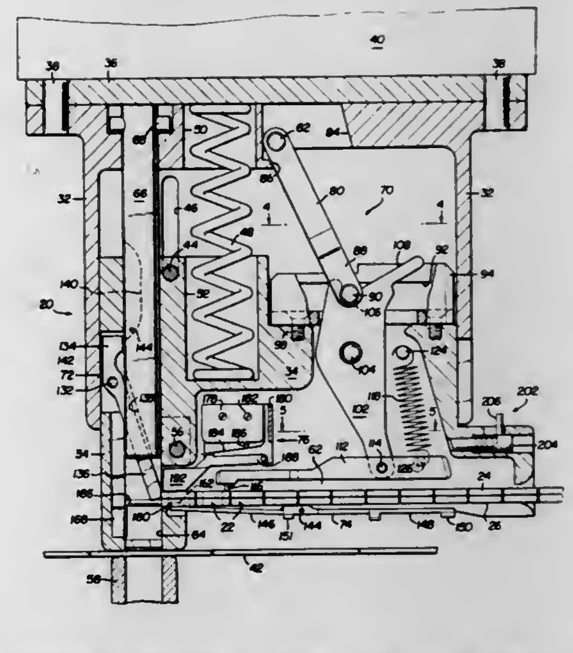
3,969,808

FASTENER INSTALLATION HEAD

Dale H. Goodsmith, and Harold A. Ladouceur, both of Livonia, Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed May 5, 1975, Ser. No. 574,776
Int. Cl.^{2} B23P *19/04*
U.S. Cl. 29—208 D **15 Claims**

11. In a fastener installation head having two housing components, the first housing component having a plunger and a second housing component having a first passageway generally transverse to the plunger axis for receiving fasteners and a second passageway receiving said plunger and communicating with said first passageway, extension means normally extending said housing components with the plunger spaced above the intersection of said passageways, and a fastener feed means adapted to feed individual fasteners from said first passageway into said second passageway, beneath said plunger, for installation by said plunger through said second passageway, the improvement comprising: said feed means including a first lever pivotally connected to said first housing component having a free end and a second lever pivotally connected between its ends to said second housing component, said second lever pivotally connected adjacent one end to a pawl means adapted to feed fasteners into said second passageway upon rotation movement of said second lever, the opposed end of said second lever having a configured drive control face receiving said first lever free end, said control face including a slot opening toward and receiving said first lever free end when said housing components are in said extended position and a dwell face, said slot having a drive face defining one side of said slot and said dwell face extending and a linear guide means in said second housing component translating the arcuate motion of said first lever free end into linear motion relative to said second housing component, transversely from said drive face, whereby relatively closing said housing components biases said first lever free end against said second lever drive face, pivotally rotating said levers in opposite directions about their respective axes until said first lever free end engages said dwell face, thereby feeding a fastener beneath said plunger, continued closing of said housing components causing said plunger to engage and install the fastener.

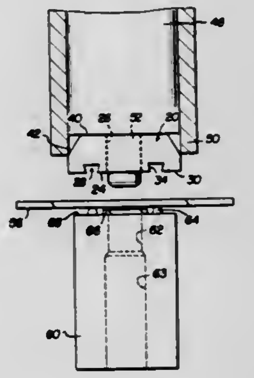


3,969,809

SELF-FASTENING NUT, PANEL ASSEMBLY AND APPARATUS

Thomas M. Pouch, Farmington, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 454,656, March 25, 1974, Pat. No. 3,926,236, which is a division of Ser. No. 302,312, Oct. 30, 1972, Pat. No. 3,829,957. This application Apr. 14, 1975, Ser. No. 567,785
Int. Cl.^{2} B23P *11/00*
U.S. Cl. 29—243.5 **2 Claims**



1. An apparatus adapted to secure a nut to a panel, said nut having a planar end face, a central bore and a pair of grooves in said end face on either side of said bore, comprising: a punch member having a cylindrical punch portion and a nut retainer means surrounding said punch portion adapted to releasably retain a nut telescopically assembled on said punch portion having an external diameter substantially equal to the internal diameter of said nut bore and having an axial extent greater than the axial extent of said nut bore to extend beyond said planar end face of the nut with the nut assembled on said punch portion, and a die member having a generally planar end face, said die end face having an opening in registry with

said punch portion to receive the punch portion and a pair of upstanding lips, on either side of said opening in registry with said nut grooves, whereby a panel, interposed between said nut and said die will, upon relative movement of said punch and die members, be sequentially punched to form a hole in registry with said nut bore and deformed into said nut grooves by said upstanding lips, in one continuous movement.

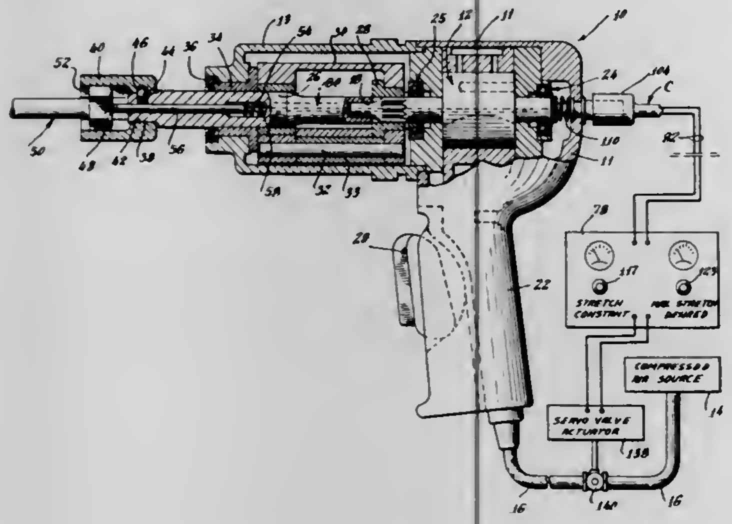
3,969,810
METHOD FOR TIGHTENING A BOLT TO EXERT A PREDETERMINED TENSION FORCE BY MONITORING BOLT ELONGATION WHILE THE BOLT IS BEING INSTALLED

Dominick A. Pagano, 10 Sasqua Trail, Georgetown, Conn. 06829

Division of Ser. No. 469,298, May 13, 1974. This application Mar. 27, 1975, Ser. No. 562,446

Int. Cl.² B23Q *17/00*

U.S. Cl. 29—407 **4 Claims**



1. The method of tightening a bolt to exert a predetermined tension force by monitoring bolt elongation while the bolt is being installed comprising the steps of:

engaging the head of the bolt with drive means rotatable about an axis for tightening the bolt,

providing a bore extending through said drive means along the axis of rotation thereof,

positioning an ultrasonic transducer capable of generating and receiving ultrasonic energy in said drive means aligned with said bore,

engaging the drive means with a bolt head,

urging the ultrasonic transducer against the top surface of the bolt head while the bolt head is engaged by said drive means,

regularly repeatedly feeding electrical signal pulses through said axial bore to said transducer for energizing said ultrasonic trandsucer for generating regular repeated ultrasonic energy pulses transmitted through the bolt's head to the bolt's other end and reflected back to the bolt's head,

receiving the regular repeated reflected ultrasonic energy pulses at the bolt's head with said ultrasonic transducer,

rotating said drive means for turning the bolt for tightening the bolt,

allowing said transducer to turn with the turning movement of the bolt's head,

measuring the length of time required by each regular, repeated ultrasonic energy pulse to be transmitted through said bolt to bolt's end and reflected back to said bolt's head to measure bolt elongation, and

continuing rotating said drive means and thus rotating and tightening the bolt while continuing the step of urging the transducer against the bolt's head, the step of feeding electrical signal pulses for energizing the ultrasonic transducer as it turns with the bolt's head, the step of receiving and the step of measuring until the predetermined bolt elongation and hence tension force exerted by the bolt is achieved.

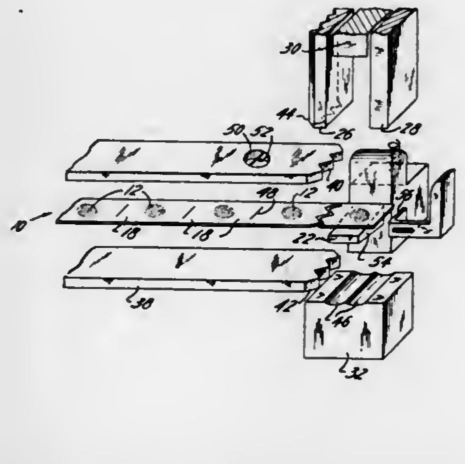
3,969,811
METHOD FOR APPLYING DESIGNS TO PIERCEABLE MATERIALS

Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., New York, N.Y.

Division of Ser. No. 396,462, Sept. 12, 1973, Pat. No. 3,902,866. This application June 23, 1975, Ser. No. 589,032

Int. Cl.² B23P *17/00*

U.S. Cl. 29—417 **4 Claims**



1. A method for applying designs to pierceable materials from a supply strip containing intermittent design portions equally spaced along the length of said supply strip, which method comprises,

a. determining a proper starting point for said supply strip by employing a locating device on said supply strip;
b. severing the end of said supply strip at a position determined by said starting point, to form a first crimping portion;
c. thereafter intermittently feeding said supply strip to a severing, bending, driving and crimping station;
d. severing a blank from the end of said supply strip to form a second crimping portion with a design portion disposed intermediate said first and second crimping portions;
e. bending said first and second crimping portions in an approximate U-shape by draping said blank over an anvil;
f. positioning a material to be decorated over the face of a clinching die; and
g. attaching said approximately U-shaped blank to said material by projecting said crimping portions through said material and into said clinching die.

3,969,812
METHOD OF MANUFACTURING AN OVERWRAPPED PRESSURE VESSEL

Emory J. Beck, Golden, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,356

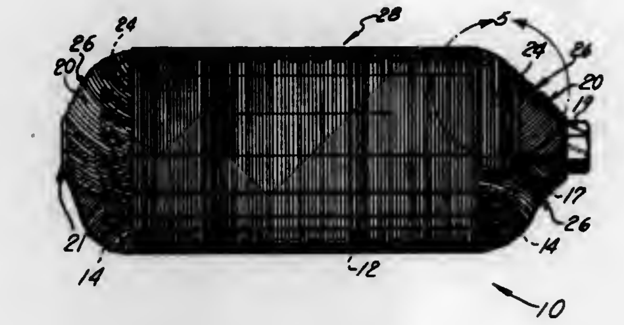
Int. Cl.² B23P *17/00*

U.S. Cl. 29—421 R **14 Claims**

1. A method of manufacturing a pressure vessel including the steps of forming a liner in the shape of a cylindrical portion and a dome portion at each end thereof, overwrapping the liner by winding filament material thereabout in the following sequence:

a. wrapping filament material about the liner in the polar direction to form a first polar overwrap,
b. wrapping filament material over the first polar overwrap in a cylindrically oriented direction and of sufficient extent to cover the junctions of the cylindrical portion with the dome portions to form a first cylindrical overwrap, and

c. wrapping filament material over the first cylindrical overwrap in the polar direction to form a second polar overwrap which holds the cylindrical overwrap against movement relative to the liner.



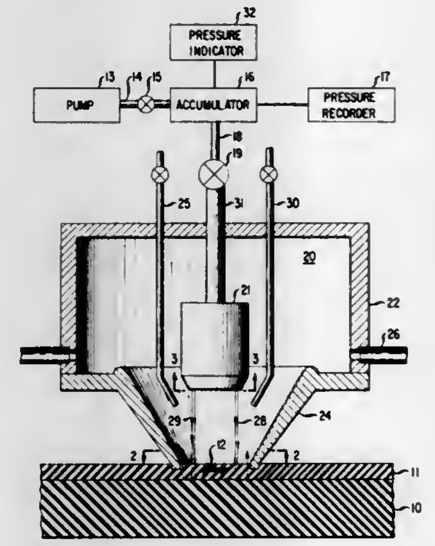
3,969,813
METHOD AND APPARATUS FOR REMOVAL OF SEMICONDUCTOR CHIPS FROM HYBRID CIRCUITS

Richard Henry Minetti, Allentown, Pa., and Robert Walter Strickland, Clarendon Hills, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,072

Int. Cl.² B32B *35/00*

U.S. Cl. 29—575 **20 Claims**



1. In the fabrication of circuits on a substrate, a method for removal of elements having top and bottom surfaces from said substrate comprising the steps of:

forming a sealed region around the area adjacent to the element to be removed; and

simultaneously directing a plurality of jet streams comprising a liquid medium at the area adjacent to the element and within said sealed region of sufficient force such that a portion of the jet streams is deflected by the substrate to a portion of the bottom surface of said element and lifts said element off the substrate.

3,969,814
METHOD OF FABRICATING WAVEGUIDE STRUCTURES

Albert Toy, Gardena; Paul T. Nelson, Rolling Hills Estates, and Clarence E. Schafer, Costa Mesa, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 15, 1975, Ser. No. 541,169

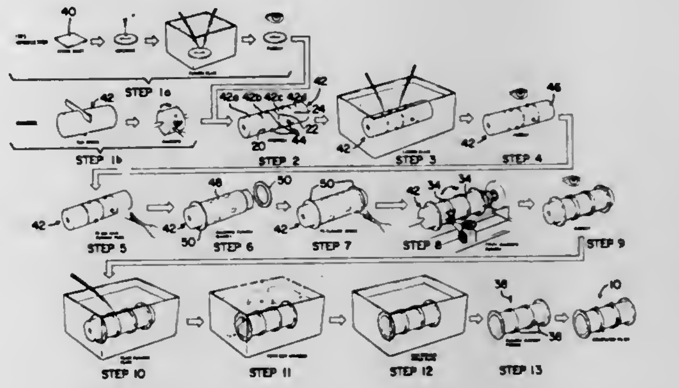
Int. Cl.² H01P *11/00*

U.S. Cl. 29—600 **14 Claims**

1. The method of fabricating a waveguide structure comprising the steps of:

selecting a mandrel having a transverse cross-section conforming to the desired internal cross-section of said structure, a relatively smooth circumferential surface and at least one threaded stud projecting radially beyond said mandrel surface;

plating said mandrel, including each stud, with a metal of relatively high electrical conductivity to form on said mandrel surface a relatively thin and uniform layer of said metal having an inner surface conforming to said mandrel surface and on the threads of each stud a layer of said metal integrally joined to said mandrel surface metal layer;



plasma spray coating the plated mandrel, including each plated stud, with a selected material to form a relatively thick layer of said material over and bonded to said metal layers; and

removing said mandrel, including each stud, to form a microwave structure wherein said material layer forms the body of the structure, said mandrel surface metal layer forms a high conductivity liner within said body, and said body contains a threaded radial hole corresponding to each stud and having an internal metal layer integrally joined to said mandrel surface layer for receiving a tuning screw.

3,969,815
PROCESS FOR FORMING A THROUGH CONNECTION BETWEEN A PAIR OF CIRCUIT PATTERNS DISPOSED ON OPPOSITE SURFACES OF A SUBSTRATE

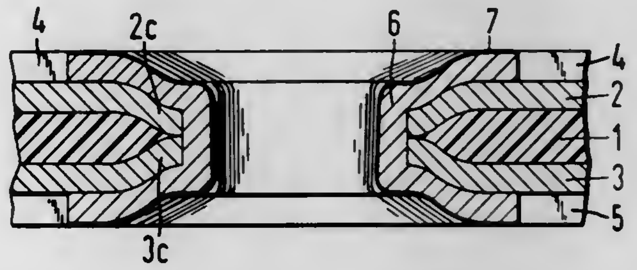
Hans-Jürgen Hacke, Munich, and Robert Graf, Starnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 19, 1974, Ser. No. 498,606

Claims priority, application Germany, Sept. 19, 1973, 2347217

Int. Cl.² B41M *3/08*

U.S. Cl. 29—625 **10 Claims**



1. In a process for making a circuit board having a substrate with metal circuit patterns on each side with at least one connection extending through the substrate to electrically interconnect portions of the circuit patterns on opposite sides of the substrate by providing a substrate with metal conducting layers on opposite surfaces, removing portions of the metal layers to form the metal circuit patterns on opposite sides of the substrate, and forming at least one through connection to electrically connect portions of the metal circuit patterns on opposite sides of the substrate, the improvement comprising the steps of forming the through connection comprising forming an aperture having a diameter through the substrate and the metal layers on opposite sides of the substrate, increasing

the diameter of the aperture in the substrate to produce an enlarged aperture with the overlying portions of the metal layers providing unsupported annular portions, deforming the unsupported annular portions of the layers towards each other into the enlarged aperture, and subsequently forming an electrical connection between the deformed annular portions.

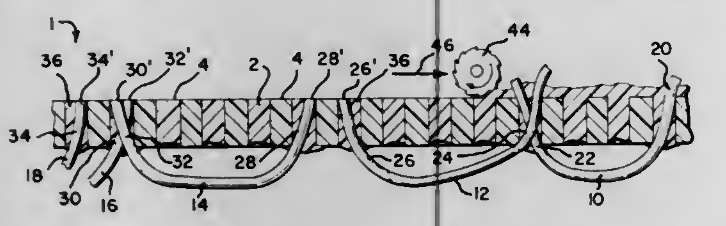
3,969,816
BONDED WIRE INTERCONNECTION SYSTEM

Robert Charles Swengel, Sr., York; Timothy Allen Lemke, and Frederick Phillip Villiard, both of Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 314,062, Dec. 11, 1972, Pat. No. 3,872,236, which is a continuation-in-part of Ser. No. 152,140, June 11, 1971, abandoned. This application Jan. 6, 1975, Ser. No. 538,663

Int. Cl.² H05K *3/20*

U.S. Cl. 29—625 **14 Claims**



1. A method for fabricating an interconnection system of insulation covered wire anchored to a substrate, comprising the steps of:

- bridging loops of insulation covered wire across a first surface of a substrate,
- inserting portions of each of said loops into corresponding openings through said substrate,
- projecting said loop portions in said openings at a second surface of said substrate,
- sealing and electrically isolating said first and second surfaces of said substrate one from the other by placing solidifiable material within said openings,
- bonding solidifiable material in each of said openings in encirclement around the insulation of said loop portions,
- bonding solidifiable material to said substrate and to the insulation covering said loop portions, thereby anchoring said loop portions to said substrate,
- trimming said loop portions adjacent said second surface to provide exposed wire ends encircled by said insulation and said solidifiable material, whereby said wire ends provide energizable signal energy surfaces.

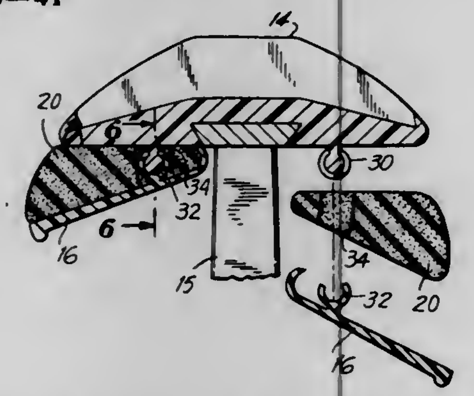
3,969,817
SHAVING MOISTURIZER DEVICE

Frank M. DiBuono, 68 Merrit St., Port Chester, N.Y. 10573

Filed Apr. 15, 1975, Ser. No. 568,210

Int. Cl.² B26B *21/40*

U.S. Cl. 30—41 **3 Claims**



1. A shaving moisturizer device comprising

- a razor head adapted to be mounted on a stem;
- a blade mounted in said head;
- said head comprising a main part or body and a lower flap, said lower flap being formed integrally or unitarily with the main part or body of the razor head, said lower flap having hinge means mounting it to said main part or body and defining with said part or body a slot;
- a moisture applicator disposed along and within the aforesaid slot; and
- the outer edge of said lower flap being on or ahead of a line which is tangent to the edge of the body of said razor head and passes through the cutting edge, the lower flap contacts the user's face ahead of contact by the moisture applicator and is operable to produce pressure on the moisture applicator so as to express moisture onto the user's face.

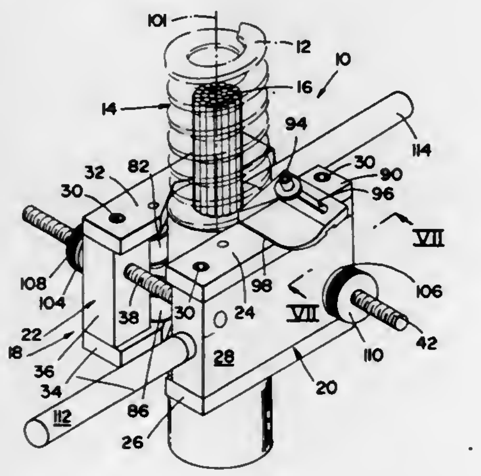
3,969,818
CABLE INSULATION STRIPPING TOOL

Walter J. Maytham, Los Altos, Calif., assignor to Speed Systems, Inc., Los Altos, Calif.

Filed Oct. 8, 1975, Ser. No. 620,632

Int. Cl.² H02G *1/12*

U.S. Cl. 30—90.1 **9 Claims**



1. A tool for stripping insulation from an insulated conductor cable, comprising:

- body means;
- support means mounted to said body means to contact and support a cable seated thereon, said support means comprising roller means rotatably mounted to the body means, the rotational axis of the roller means being angled relative to the longitudinal axis of a cable seated on said support means to provide that, upon relative turning of the body means and cable supported by the support means about the longitudinal axis of the supported cable, the supported cable and body means relatively move generally along the longitudinal axis of the supported cable for each turn of the body means and cable relatively; and
- blade means mounted to said body means and having a cutting edge, the blade means being positioned so that upon relative turning of the body means and cable supported by the support means, about the longitudinal axis of the supported cable, the cutting edge cuts the insulation thereof.

3,969,819
HAIR TRIMMER ATTACHMENT

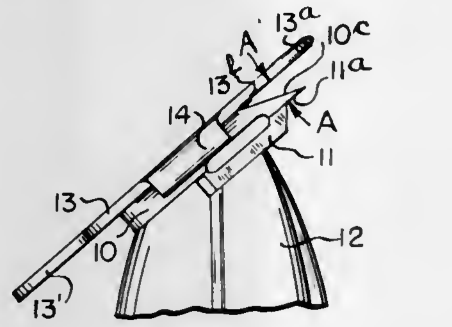
Frank R. Pepera, 4211 Milford Ave., Parma, Ohio 44134

Filed Oct. 1, 1973, Ser. No. 402,405

Int. Cl.² B26B *19/38*

U.S. Cl. 30—200 **2 Claims**

1. In a hair trimmer comprising a housing and a flat stationary shear plate of predetermined width fixed at one end of said housing and a flat oscillatable shear plate of less than said predetermined width engaging an upper side of said stationary plate and operatively connected with means in said housing for oscillating said oscillatable shear plate relative to said stationary shear plate, said plates having mutually engaging generally parallel cutting teeth extending on one side thereof and adapted to cut hair between them upon said oscillation of said oscillatable shear plate, the combination therewith of a plurality of comb plate attachments which may be interchangeably attached to or detached from said stationary shear plate, each of said attachments, consisting of a thin flat main plate slightly wider than said predetermined width and having substantially parallel top and bottom surfaces and a series of parallel comb teeth of approximately the thickness of said thin flat plate forming a flat portion extending from the front end thereof, and clip means at opposite sides of said comb plate and rigid therewith and positioned to slidably embrace opposite ends of said stationary shear plate as said comb plate is slid into cutting position with its top surface flat against the bottom of said stationary shear plate backward from said cutting teeth to a position where said comb teeth will guide hairs on a user's head into said cutting teeth, in such cutting position said comb teeth and said cutting teeth lying in separate planes, said comb plate attachments varying from each other only in the angle between the comb teeth and the plane of the main plate of the attachments so as to vary the angle between said separate planes, whereby to vary the distance between the attachment teeth and said shear plate, and whereby a user may use said trimmer with the bottom of said comb teeth flat portion of said attachment plate always against his head and whereby a user may smoothly vary the length of cut of his hairs by changing attachment plates to a shorter cut as he approaches his neck line, or other stopping point.



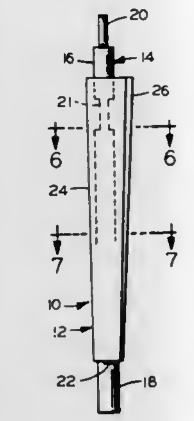
3,969,820
COMPOSITE DOWEL PIN FOR DENTAL MODELS

Frank M. Kulig, Bloomfield; Robert A. Semrow, Southington, and Harry P. Yorgensen, Jr., Manchester, all of Conn., assignors to The J. M. Ney Company, Bloomfield, Conn.

Filed Feb. 21, 1975, Ser. No. 551,628

Int. Cl.² A61C *13/00*

U.S. Cl. 32—11 **9 Claims**



1. A composite dowel pin for dental models comprising a metal pin and an elongated body member of synthetic resin molded about said metal pin and having a bore extending longitudinally therethrough, said metal pin extending longitudinally through the length of said bore of said body member and projecting beyond at least one end thereof, said metal pin having an external configuration providing interlocking engagement with the wall of said body member defining said bore to prevent relative movement therebetween, said body member tapering longitudinally from said one end to a reduced dimension at the other end thereof, the portion of said metal pin projecting beyond said one end of said body member providing a head with at least a portion of non-circular cross section upon which may be cast a tooth form, and said body member having a non-circular cross sectional configuration to index said dowel pin upon insertion into a model base and thereafter prevent rotation within the model base.

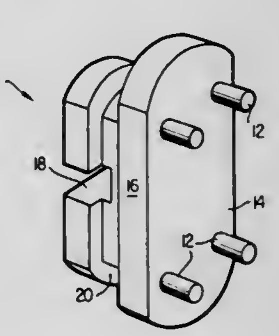
3,969,821
ORTHODONTIC BRACKET

Henry L. Lee, Jr., and Jan A. Orlowski, both of P.O. Box 3836, South El Monte, Calif. 91733

Filed Jan. 22, 1975, Ser. No. 543,159

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 A **8 Claims**



1. In an orthodontic bracket having a base which is adapted to be directly bonded to the front surface of a tooth by glueing and a body joined to said base, an improved orthodontic bracket comprising:

a. a posterior surface formed on said base; and
b. means attached to said posterior surface for producing a predetermined glue-line thickness measured between a tooth and said posterior surface when said posterior surface is directly bonded to said front surface of said tooth by glueing with a dental cement.

3,969,822
POROUS, STATIC PRESSURE AIR BEARING DEVICE IN A DENTIST'S HANDPIECE

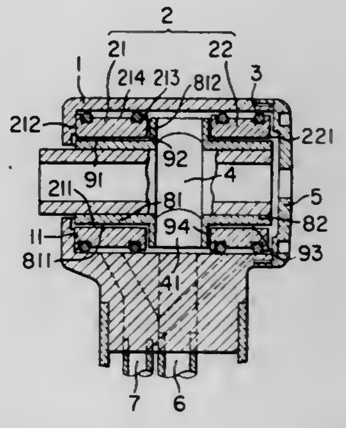
Hiromasa Fukuyama, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,208

Claims priority, application Japan, Mar. 6, 1973, 48-27291[U]

Int. Cl.² A61C *1/10*

U.S. Cl. 32—27 **7 Claims**

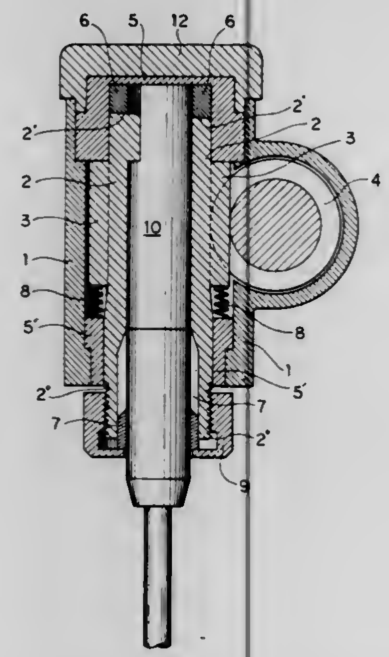


1. A porous, static pressure air bearing device in a dentist's handpiece, said device comprising a rotatable shaft for mounting thereon a cutting tool, a bearing case, an air bearing portion provided in said bearing case for supporting said rotatable shaft, a turbine blade on said rotatable shaft, said air bearing portion being formed of a hard porous material, and radial and thrust clearances between said air bearing portion and said

shaft whereby pressurized air passing through said bearing portion to said clearances provide radial and thrust bearings.

3,969,823
DENTAL HANDPIECE FOR A MOTOR DRIVEN REAMER

Toshimasa Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Manufacturing Co., Ltd., Kanuma, Japan
Filed Jan. 27, 1975, Ser. No. 544,331
Claims priority, application Japan, Jan. 28, 1974, 49-12074
Int. Cl.² A61C *1/10*
U.S. Cl. 32—27 **2 Claims**

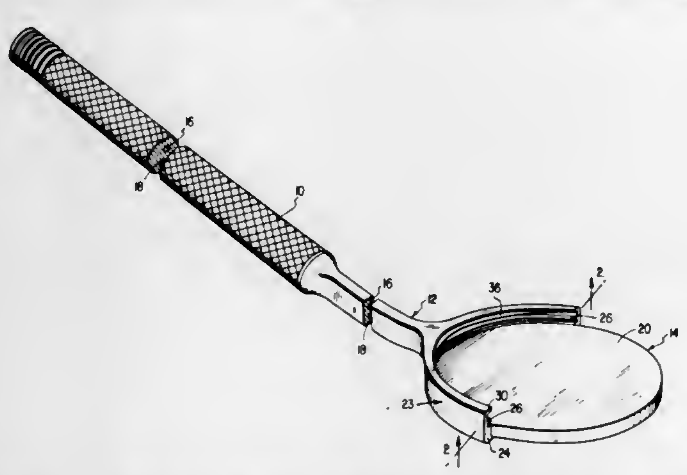


1. A dental handpiece for a motor driven reamer comprising a cylindrical member having a cup bearing coupled to its upper end and an annular bearing disposed in an opening in its lower end, wherein an annular space is formed in said cylindrical member between said cup bearing and said annular bearing, a portion of the side wall of said cylindrical member partially projecting into said annular space to form a lateral cylinder for receiving a worm gear, an annular member secured to said cup bearing, said annular member having a bottom face inclined with respect to the axis thereof, a bushing having a worm wheel around the central portion thereof, said bushing being rotatably inserted into said cylindrical member, the top face of said bushing being inclined with respect to the axis thereof thereby forming a cam mechanism with the bottom face of the annular member, said bushing having an annularly widened opening therein adjacent its lower end to receive a collet chuck, a plurality of springs inserted at intervals in an annular space formed between the bottom of said worm wheel and the top of said annular bearing, a shank of a reamer inserted into said bushing through said collet chuck, said shank being firmly held therein, a head cap engaging the upper portion of said cylindrical member for covering said cup bearing, and said worm gear being inserted into said lateral cylinder to mesh with said worm wheel.

3,969,824
SELF CLEANING DENTAL MIRROR

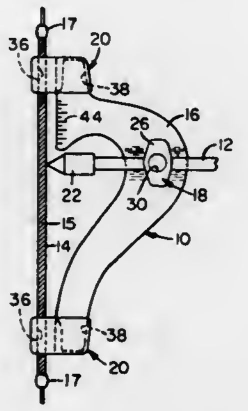
Randy Miles Widen, 1601 18th St. NW., Washington, D.C. 20009, and Donald Simon, 1762 Spruce St., Berkeley, Calif. 94709
Filed Dec. 18, 1974, Ser. No. 534,136
Int. Cl.² A61C *3/00*
U.S. Cl. 32—69 **16 Claims**

1. In a dental mirror having a disk-like mirror, an elongated handle, and means at one end of said handle for supporting said mirror, the improvement comprising: a liquid conduit and a gas conduit extending through said handle; a first nozzle means disposed in said support means and extending along the periphery of said mirror, said first nozzle means being associated with said liquid conduit for dispensing a thin layer of a liquid onto the surface of said mirror, and a second nozzle means, disposed in said support means above said first nozzle means and associated with said gas conduit, for dispensing a thin layer of gas across and parallel to said surface of said mirror in a laminar flow above said layer of liquid to draw said layer of liquid across said surface of said mirror in a laminar flow.



3,969,825
ARCHER'S BOW SQUARE FOR LOCATING ARROW NOCKING POINT POSITION

Larry W. Mathes, Rte. 5, Corydon, Ind. 47112
Filed Apr. 28, 1975, Ser. No. 571,981
Int. Cl.² G01B *3/30*
U.S. Cl. 33—180 R **9 Claims**

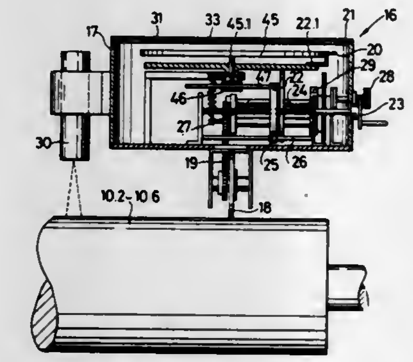


1. An archer's bow square comprising
confining means confining and for guiding a pointed end of a bow supported arrow when the latter is moved toward and against a string bow string so that a pointed end of an arrow will indicate a position on a strung bow string for a nocking point, said confining means being spaced from a strung bow string, and
means for detachably and slidably attaching said confining means to a strung bow string, so that a pointed end of a bow supported arrow may be adjusted to a position approximately perpendicular to a strung bow string for locating a nocking point.

3,969,826
APPARATUS FOR PRE-ADJUSTING THE PLATE CYLINDERS OF PRINTING PRESSES

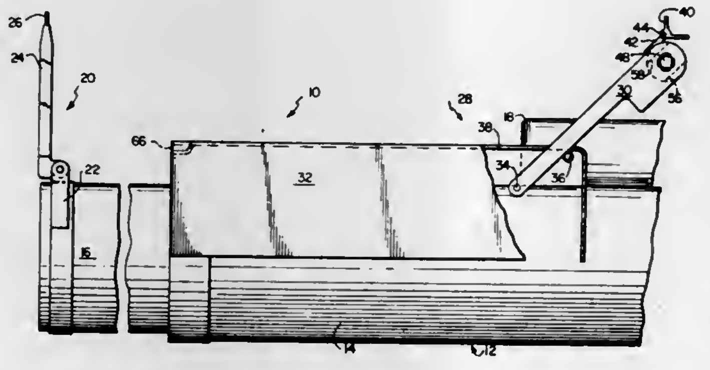
Ludger Ottenhues, Riesenbeck, and Willi Meyer, Ibbenburen, both of Germany, assignors to Windmoller & Holscher, Lengerich, Westphalia, Germany
Filed Aug. 29, 1974, Ser. No. 501,611
Claims priority, application Germany, Aug. 30, 1973, 2343855
Int. Cl.² B41B *1/00*
U.S. Cl. 33—184.5 **6 Claims**

1. A gauge for pre-adjustment of a plurality of printing cylinders in a multi-color rotary printing press having a plurality of printing stations, each including one of the printing cylinders for a web advancing in a path comprising, in combination, a housing, a contact roller rotatably mounted on said housing for rolling engagement with the periphery of a printing cylinder to be pre-adjusted, a dial on said housing, a drive transmission for drivably connecting said contact roller to said dial for indicating on said dial the angular displacement of a printing cylinder in peripheral contact with said roller, means for adjusting the transmission ratio of said drive transmission, indicia means on said housing including a plurality of printing cylinder diameters and a plurality of angular adjustment values for each of the printing cylinders with respect to each of the cylinder diameters of the indicia means and means for operatively connecting said indicia means to said transmission ratio adjustment means whereby the transmission ratio is adjusted by said adjusting means in relation to a selected cylinder diameter of said indicia means for angular adjustment of all of said plurality of printing cylinders with said gauge in accordance with the adjustment values corresponding to said selected cylinder diameter.



3,969,827
FOLDING WEAPON SIGHT

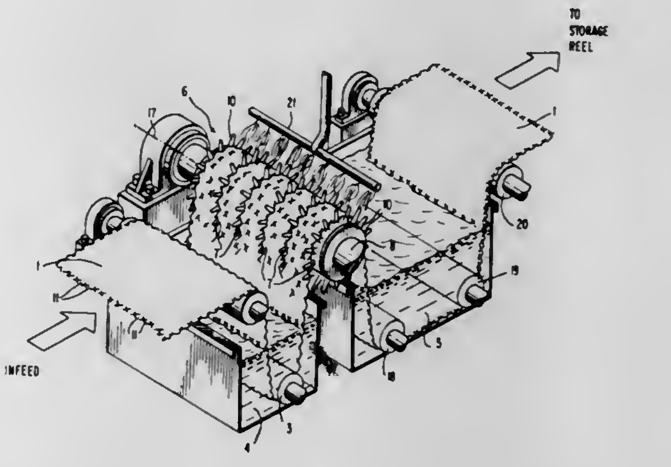
Paul H. Ellis, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed July 11, 1975, Ser. No. 595,191
Int. Cl.² F41G *1/16, 1/04*
U.S. Cl. 33—255 **9 Claims**



1. A sighting device for a weapon comprising:
a housing to be mounted to said weapon;
an arm rotatably mounted at one end to said housing for movement between a stored position and an operative position;
first sighting means mounted on the other end of said arm, the sighting member thereof being adjustable with respect to said arm for setting said sighting member for various ranges; and
means on said sighting means for automatically adjusting said sighting means to a predetermined range setting when said arm is pivoted into said stored position.

3,969,828
MEANS TO VIBRATE CHAIN LINK FABRIC

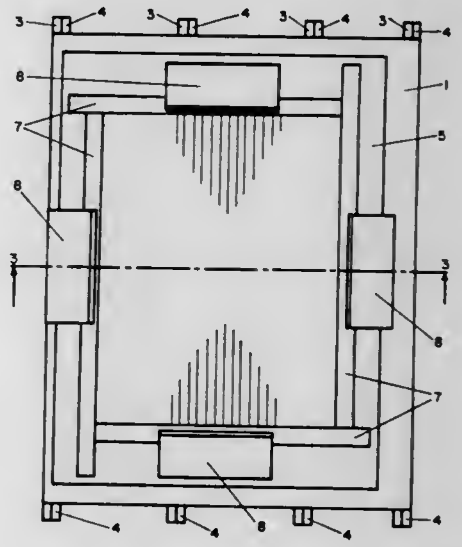
Keith E. Roberts, P.O. Box 485, Huntsville, Ala. 35804
Division of Ser. No. 330,118, Feb. 6, 1973, Pat. No. 3,845,741. This application Aug. 23, 1974, Ser. No. 499,930
Int. Cl.² F26B *13/12*
U.S. Cl. 34—14 **18 Claims**



1. An arrangement for removing excess molten coating material from chain link fabric of the type having a plurality of openings formed between intersecting fabric members; said arrangement comprising:
at least one sprocket member having a plurality of outwardly projecting sprocket teeth,
and means for movably guiding chain length fabric over a predetermined portion of the circumference of said at least one sprocket member such that portions of said teeth extend through respective openings in said fabric during movement of said fabric over said at least one sprocket member,
wherein said teeth includes vibration inducing means configured and positioned with respect to said openings such that said teeth cause vibration of said fabric when said fabric is moved from a position with said portions of said teeth extending through said openings to a position with said portions of said teeth removed from said openings.

3,969,829
DEHYDRATION

William C. Urban, 2765 Glen Mawr Road, Jacksonville, Fla. 32207
Filed July 23, 1974, Ser. No. 490,971
Int. Cl.² F26B *19/00*
U.S. Cl. 34—93 **6 Claims**

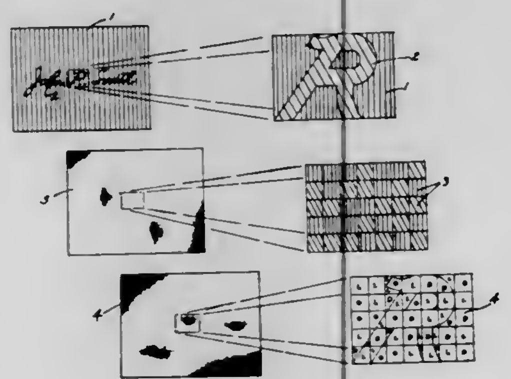


1. A solar dehydration device for solid organic material consisting of

a. a thin metal sheet having a plurality of small openings therein, upon which organic material adapted to be placed;
b. prop means formed of a material having a low thermal conductivity for supporting said thin metal sheet in spaced relation from the ground;
c. a sheet of thin black flexible plastic adapted to be placed over the organic material;
d. solid rigid strips means engaging the entire peripheral edges of said thin black flexible plastic and said solid rigid strips means to hold the thin black plastic sheet down around the edges of the arena of said thin metal sheet to enclose the organic material between said plastic and said metal sheets;
e. and weights means engaging said solid rigid strips to maintain the solid strip means in engagement with the plastic and metal sheets to seal the flexible plastic sheet to peripheral edges of metal sheet so that the water vapor escaping from the organic material will be expelled solely through the opening in said thin metal sheet.

3,969,830
COLOR ENCODING-DECODING METHOD

James A. Grasham, P.O. Box 518, Kentfield, Calif. 94904
Continuation of Ser. No. 311,229, Dec. 1, 1972, abandoned. This application Sept. 15, 1975, Ser. No. 613,315
Int. Cl.² G09C *1/00*
U.S. Cl. 35—2 **22 Claims**



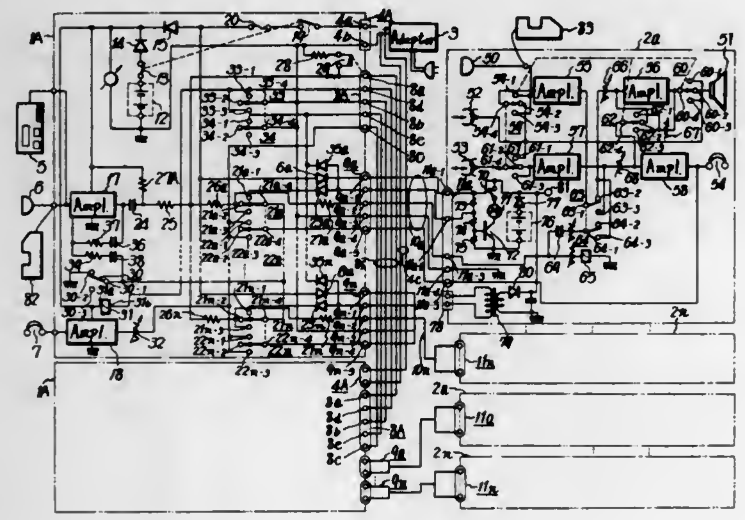
1. A method of encoding and decoding graphic material having first and second colors, said method comprising the steps:

forming a graphic having first and second colors, said first and second graphic colors being located in first areas of said graphic to correspond to, respectively, said first and second material colors, said first and second graphic colors being located in second areas of said graphic to correspond to, respectively, said second and first material colors, said graphic constituting an encoded form of said material;

superimposing a first pattern of first and second colors and said graphic, said first and second first-pattern colors located to coincide during superimposition with, respectively, said first and second graphic areas, said first-pattern colors mixing with the graphic colors they overlie to form a multicolored image that is a reconstruction of said material.

3,969,831
TEACHING SYSTEM

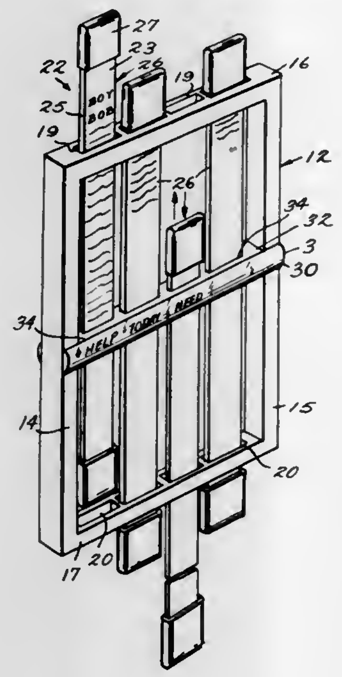
Akio Hanaoka, Yokohama, and Ken Yoshimochi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 13, 1974, Ser. No. 469,081
Claims priority, application Japan, May 15, 1973, 48-57045[U]
Int. Cl.² G09B *5/04*
U.S. Cl. 35—8 A **4 Claims**



1. A teaching system comprising at least one control table having a power supply and first and second groups of switches, said first control table also including audio input and output means, student portable tape recorders which are capable of operation independently of said control table with internal power supplies as well as connected to said control table under control of said control table, said portable tape recorders including audio input and output and including transistors, a record motor in each portable tape recorder controllable by one of said transistors, a relay in each of said portable tape recorders, a plurality of electrical terminal devices at said control table with a terminal device for each of said portable tape recorders, each portable tape recorder having a terminal device which is connectible to one of said plurality of terminal devices at said control table, third and fourth groups of switches connected to said terminal devices in each tape recorder, said first group of switches controllable at said control table and connected to said one transistor to stop said record motor to interrupt operation of the tape recorder in said student tape recorder to allow two way audio communication between said control table and said student tape recorder and to also allow monitoring of the audio input and output devices of said student portable tape recorder at said control table, said second group of switches connected to said terminal devices and said relays to provide one way audio communication between said control table and said portable student tape recorder as well as independent record mode operation of said student tape recorder, said relay in each of said student tape recorders connected to said second group of switches in said control table through said terminal devices, said relays controlling the position of said fourth group of switches such that operation of said portable tape recorders can be controlled by said first and second group of switches from said control table, at least one additional control table connected to said first control table and having first and second groups of switches connected through terminal devices to the first and second groups of switches of said first control table, said first group of switches are control switches for each of said tape recorders and are connected to a terminal device and said tape recorder receives a control signal for controlling the operating mode of the said corresponding tape recorder and receives a teaching signal source, a microphone for supplying a teaching signal to said tape recorder and for paging a pupil, said second group of switches connectable in parallel with other second group switches provided in the other control table, a common control terminal connected directly to said first and additional control tables for controlling the mode of all of said tape recorders at the same time, a common supply terminal directly connectible between said teaching signal source and said microphone and said supply terminals for supplying said teaching signal to all said tape recorders at the same time and for calling all pupils at the same time, and a common receiving terminal which is connectible with other common receiving terminals and connectible through other first control switches with corresponding other tape recorders.

3,969,832
TEACHING AID

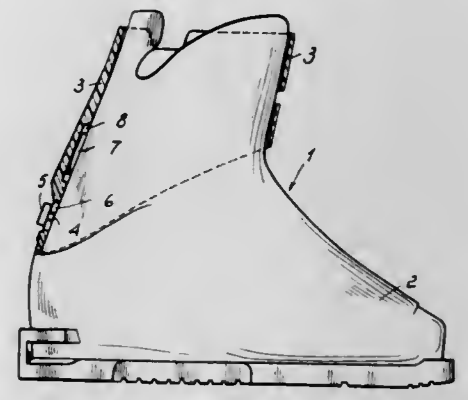
Peter G. Garruto, 2791 Florida Ways Road, Apt. 107, Lake Worth, Fla. 33460
Filed Aug. 18, 1975, Ser. No. 605,297
Int. Cl.² G09B *1/28*
U.S. Cl. 35—75 **8 Claims**



1. A teaching aid comprising
a. an open frame, said frame including a pair of generally parallel side legs, and top and bottom legs, said top and bottom legs being generally parallel to each other and generally transverse to said side legs,
b. a plurality of cooperating openings formed in said top and bottom legs,
c. a plurality of slide members received within cooperating openings in said top and bottom legs and reciprocal through said openings in a direction parallel to said side legs of said open frame, each slide member having a pair of opposite generally flat faces thereof, and each face having formed thereon a plurality of lines of indicia, each indicia line formed on one flat face of a given slide member having a corresponding indicia line formed in the same relative position on the opposite face of said given slide member, and
d. a pair of lenses extending from one of said side legs to the other between said top and bottom legs of said open frame, and for receiving said slide member therebetween, said lenses extending generally parallel to said top and bottom frame legs and generally perpendicular to the direction of movement of said slide members, one lens for cooperation with a given indicia on one face of a slide member while the other lens cooperates with the corresponding indicia on the opposite face of said given slide member.

3,969,833
ARTICULATION DEVICE BETWEEN VAMP AND LEG, PARTICULARLY FOR SKI BOOTS

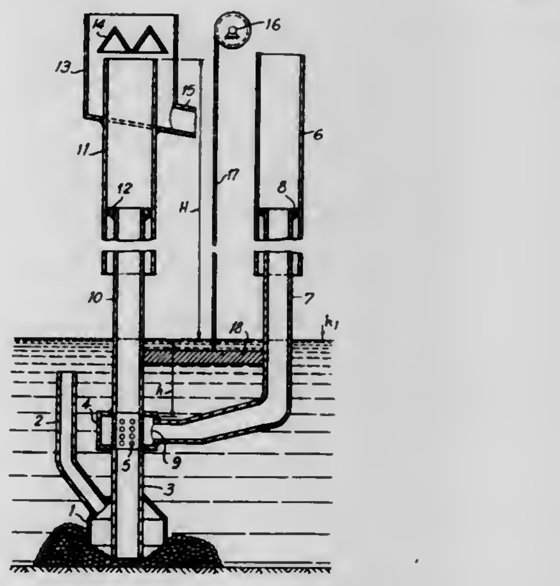
Franco Vaccari, Via Paleoveneti, 3, Montebelluna (Prov. Treviso), Italy
Filed July 5, 1974, Ser. No. 486,030
Claims priority, application Italy, July 10, 1973, 21832/73[U]
Int. Cl.² A43B
U.S. Cl. 36—117 **1 Claim**



1. Articulation device between vamp and leg, particularly for ski boots, comprising a pin with an enlarged head extending from the rear zone of a ski boot vamp and removably coupled with a slot provided in a central portion of the leg, guide means for the relative swing between said vamp and said leg, in which said guide means consist of a vertical rib extending to the rear of said vamp above said pin, said rib being arranged to engage with a corresponding vertically extending cavity formed inside said leg in a position above said aperture, the coupling between said rib and said cavity allowing only forward and backward swing of said leg with respect to said vamp.

3,969,834
AIRLIFT

Viktor Georgievich Geier, bulvar Pushkina, 33, kv. 3; Vladimir Ivanovich Gruba, bulvar Pushkina, 12, kv. 27; Nikolai Grigorievich Logvinov, Komsomolsky prospekt 25/111, kv. 34; Evgeny Vasilievich Uskov, ulitsa Artema, 58, kv. 35; Viktor Semenovich Kostanda, ulitsa Gornovaya 18, kv. 1, and Vladimir Georgievich Mirgorodsky, prospekt Metallurgov, 25, kv. 1, all of Donetsk, U.S.S.R.
Continuation of Ser. No. 387,129, Aug. 9, 1973, abandoned. This application June 20, 1975, Ser. No. 588,954
Int. Cl.² E02F *3/88*
U.S. Cl. 37—58 **1 Claim**

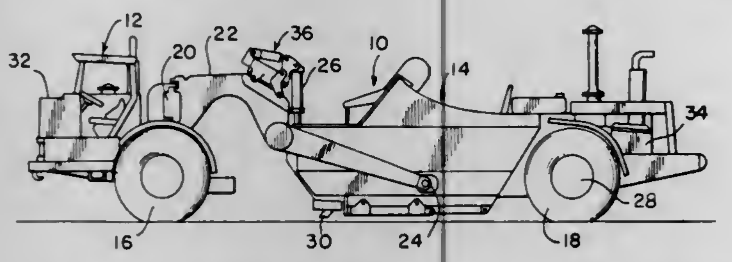


1. An airlift for lifting liquids and pulps from the bottoms of seas and rivers, comprising a submerged suction unit for sucking in a mass being transported which is a mixture of a liquid and solids; a mixer rigidly fixed to, communicating with said suction unit, and serving to mix the mass with compressed air; a partly submerged air duct rigidly fixed to said mixer for supplying the compressed air thereto; an air separator for separating the mass from the compressed air; a partly submerged pipeline respectively fixed to both said mixer and said air separator and extending below said mixer and said suction unit, for lifting the mass together with the compressed air from the former to the latter, and having an open end remote from said mixer; said air duct and said pipeline having vertical portions, each being made up by a pair of pipe sections, fitted one into the other for vertical movement relative to each other, and for simultaneously changing the combined lengths of said pipe sections; a lifting gear attached to the lower ones

of said pairs of pipe sections for simultaneous vertical movement thereof, for varying the combined length of said air duct and of said pipeline, for lifting said suction unit and said mixer; wherein said suction unit has a chamber open from below and communicating with a submerged feed pipe for supplying the liquid to said chamber from the surrounding sea and river, said pipeline having a bottom end portion extending below the open, lower edge of said chamber; means for causing phase separation in said air separator between the compressed air, that is allowed to move upwards through said open end of the pipeline, and the mass, that accumulates at the bottom of said air separator; and means for discharging the mass from said air separator.

3,969,835
LOCKABLE SUSPENSION SYSTEM FOR A SCRAPER

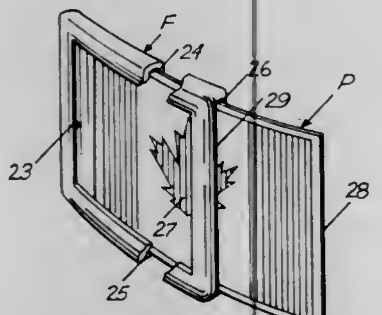
Steven Erdelyan, Glen Ellyn, Ill., assignor to International Harvester Company, Chicago, Ill.
Continuation-in-part of Ser. No. 437,263, Jan. 28, 1974. This application Mar. 5, 1975, Ser. No. 555,643
Int. Cl.² E02F *3/62*
U.S. Cl. 37—129 **7 Claims**



1. A lockable suspension system for a scraper having a tractor and a bowl pivotally connected and pivotally supported by wheels powered by an engine and a hydraulic jack attached to said bowl for controlling the vertical position of said bowl, said system comprising, in combination:
   a lever pivotally attached to said hydraulic jack;
   a hydraulic ram having a head end and a rod end, and pivotally attached to said lever;
   a variable spring rate shock absorber rigidly attached to said tractor, pivotally attached to hydraulic ram, and pivotally supporting and connected to said lever; and
   a control means operably connected to said hydraulic rams for neutralizing the variable spring rate shock absorber by locking said rams.

3,969,836
BUCKLE WITH REMOVABLE DISPLAY INSERT

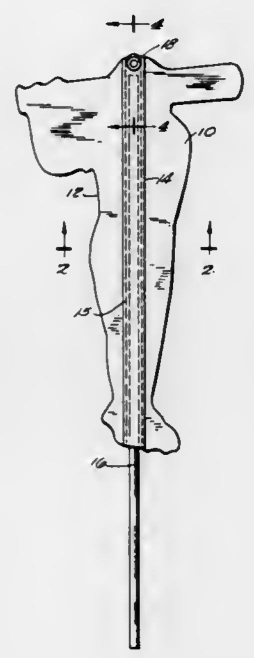
Donald E. DuBois, 2700 Neilson Way, Santa Monica, Calif. 90405
Filed Nov. 14, 1974, Ser. No. 523,676
Int. Cl.² G09F *3/14*
U.S. Cl. 40—21 C **1 Claim**



1. The combination of a resiliently-planar display panel and a buckle including strap-attachment means, a generally upstanding support plate and frame-forming walls extending forward a short distance therefrom so as to spacedly overlie the forward face of the support plate, being disposed generally parallel thereto extending at least partially about the peripheral margin of the plate and forming a longitudinally-convex channel, open along one edge for sliding insertion and removable retention of said display panel, said panel being of lesser thickness than the channel whereby its resilience disposes it to seat by flexure toward a planar position in opposition to the curvature of the channel, with its rear face in general juxtaposition with the support plate, whereby such display panels can be interchanged in the channel without disturbing a functional position or use of the buckle.

3,969,837
DISPLAY FIGURE

Suzanne Kresse, 7838 W. Ohio Ave., Milwaukee, Wis. 53219
Filed Mar. 6, 1975, Ser. No. 556,045
Int. Cl.² G09F *19/00*
U.S. Cl. 40—126 R **2 Claims**



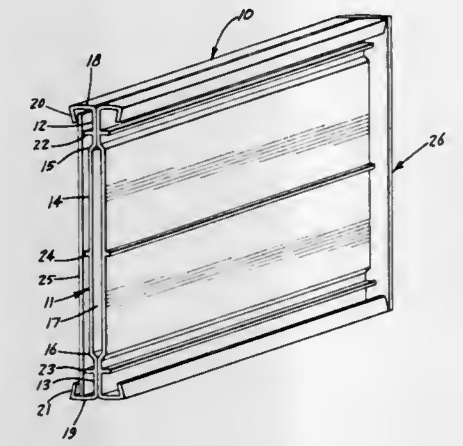
1. A display comprising a flat figure panel made of material stiff enough to remain erect without being waved, said panel having uneven edges, an elongated backing strip attached to an intermediate portion of said figure panel to form with the portion of the panel to which it is attached a tube having one end open, said tube being disposed well within the outline of said uneven edges so as not to intrude thereon, an abutment closing the other end of the tube, a display supporting staff removably receivable through the open end of said tube and into contact with said abutment to define the fully inserted position of the staff, said abutment including a hang tab comprising an eyelet through the backing strip and panel.

3,969,838
SIGN

Charles T. Moore, Minneapolis, Minn., assignor to Dayton-Hudson Corporation, Minneapolis, Minn.
Filed Aug. 13, 1975, Ser. No. 604,138
Int. Cl.² G09F *7/02*
U.S. Cl. 40—140 **7 Claims**

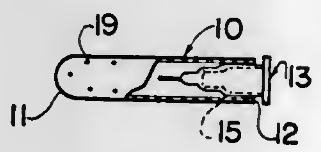
1. An interchangeable sign comprising:
A. an elongated rectangular generally flat sign holder body having a pair of channel members disposed in back-to-back relation, each of said channel members having:
   1. a back plate having flat top and bottom longitudinal edge portions lying in a common plane and a flat mid-portion displaced slightly outwardly therefrom, whereby, when said back plates are secured in back-to-back relation, a narrow tongue-receiving slot is formed between the mid-portions of the back plates,
   2. a pair of flanges extending outwardly from the top and bottom edges of said back plate,

   3. a lip extending inwardly from the free edges of said flanges,
   4. a pair of parallel longitudinal ribs projecting from the top and bottom edge portions of said back plate spaced inwardly from the top and bottom flanges by a distance at least equal to the width of said lips, and
   5. at least one further longitudinal rib projecting from the mid-portion of the back plate,
B. an end member at each end of said body, each of said end members having:
   1. a generally flat plate lying in a plane perpendicular to the plane of the body, said plate having a width substantially equal to the combined width of the two flanges at the top and bottom of the body and a length substantially equal to the width of the body, and
   2. a generally flat longitudinal tongue projecting from one side of said end member plate, perpendicular thereto and spaced inwardly from the ends of the plate, said tongue being in engagement with the tongue-receiving slot at the end of the body, and
C. an interchangeable sign card held in at least one side of said sign holder body, said sign having indicia thereon and being formed from flat sheet material of generally the size and shape of the body to fit with a slide fit therein, the top and bottom edges of said sign card being retained by said flange lips and the back of said card being supported by said longitudinal ribs.



3,969,839
PORTABLE ELECTRIC LIGHT DEVICE

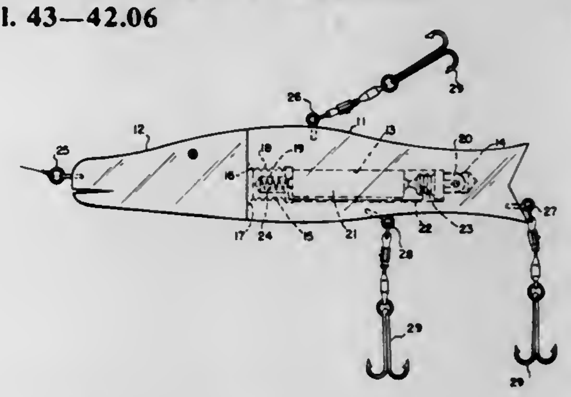
Moses Ziegler, 12638 Roselawn, Detroit, Mich. 48238
Filed May 23, 1975, Ser. No. 580,530
Int. Cl.² A01K *85/00*
U.S. Cl. 43—17.6 **1 Claim**



1. A portable electric light device comprising a body of non-conductive material having a long bore whose closed end is of small diameter, whose central part is of somewhat larger diameter, and whose open end is even larger and internally or female threaded;
   a switching-sealing-closing cap having a male threaded projection formed complementary to the female threaded part of the body bore, whereby to provide a separable switch-seal-closing juncture of the cap and the body;
   an electric light device in said body bore comprising a flashlight bulb formed to fit into the small part of the body bore and whose contact tip is exposed to the central part of the body bore; a conductor formed to lie in such central part and having one end joined to the contact tip of the bulb and another end formed as a coil spring and formed to lie in the threaded part of said bore to be engaged by the cap projection when the cap is threaded into the body bore, for switching and bore sealing, and closing;
   a dry cell formed with contact ends and formed to lie in the central part of the body bore alongside said conductor, with one cell contact end positioned to engage the contact tip of the lightbulb when the cap projection is fully threaded into the body bore threaded part and biases the coil spring inner end into engagement with the other contact end of the cell, to make the circuit of spring-conductor wire-bulb-cell-spring; and to release the spring from the cell other end, when the cap projection is threaded at least partially outward from the body bore threaded part, to break the circuit, said body and cap being at least partially formed of translucent plastic so as to be illuminated by the lightbulb, and thus be effective as an illuminated lure, said cap projection having an axial bore receiving said spring and on inward movement of said cap, guiding said spring into contact with said dry cell.

3,969,840
FISHING LURE

John R. E. Charron, 106 Horace St., Winnipeg, Manitoba, Canada (R2H OV9)
Filed Jan. 20, 1975, Ser. No. 542,231
Claims priority, application Canada, Jan. 17, 1974, 190616
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.06 **4 Claims**



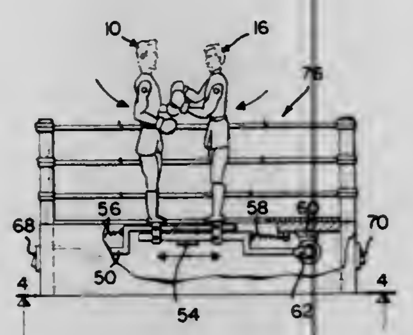
1. A fishing lure comprising in combination a hollow tube, closed at the trailing end, detachable closure means at the leading end and a hook element secured to said tube, said closure means including a hollow plug inserted by the inner end thereof into said leading end and being frictionally held therein with the outer end outside of said tube, said hollow plug being closed at the inner end and opened at the outer end thereof whereby the action of said lure moving through the water is influenced, and a tube piercing device secured to and extending from the inner end of said plug.

3,969,841
BOXING TOY

Lancelot Joseph, Lasalle, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Apr. 7, 1975, Ser. No. 565,854
Int. Cl.² A63H *13/06*
U.S. Cl. 46—268 **5 Claims**

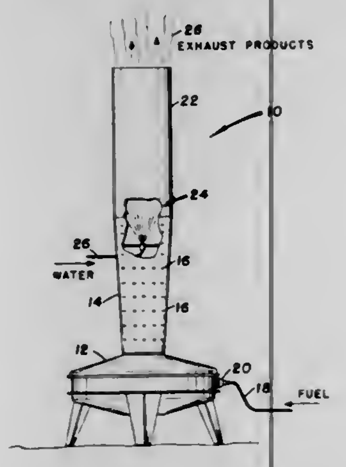
1. A toy comprising first and second boxer representations disposed in facing relationship, each said representation being

carried on an elongated slide, each slide being carried for selective longitudinal reciprocating movement in general alignment with each other, said apparatus further including electromechanical means for selectively moving said slides.



3,969,842
WATER INJECTION HEATER

Wallace W. Velie, Upland, Calif., assignor to Scheu Manufacturing Company, Upland, Calif.
Filed Oct. 8, 1974, Ser. No. 513,070
Int. Cl.² A01G *13/00*
U.S. Cl. 47—2 **5 Claims**



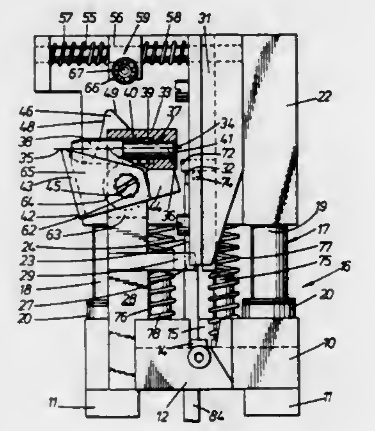
1. A heater comprising a primary combustion chamber for containing fuel and supporting a primary flame for fuel vaporization, a stack communicating with the interior of said primary combustion chamber, said stack having a plurality of louvers in the lower portion thereof adjacent said primary combustion chamber and forming a secondary combustion chamber wherein vaporized fuel is consumed in the presence of air entering said louvers, said stack further having an upper portion for increasing the convection of the natural draft resulting from combustion, and water spray means mounted internally in said secondary combustion chamber and adapted to being connected to a pressurized water supply, said water injection means being directed upward for producing a water spray which is distributed into the combustion products to vaporize at least a portion of the water and produce a column of heated combustion products exiting said stack containing water which is substantially in the vapor state whereby the amount of water vapor in said combustion products is increased.

3,969,843
DEVICE FOR GRAFTING GRAPEVINES

Eugen Wahler, and Hans Wahler, both of Buchhaldenstr. 21, 7056 Weinstadt-Schnait, Germany
Filed Dec. 29, 1975, Ser. No. 645,214
Claims priority, application Germany, Oct. 21, 1975, 7533447[U]
Int. Cl.² A01G *1/06*
U.S. Cl. 47—6 **18 Claims**

1. A device for grafting plant shoots, especially grapevines, by cutting and joining the extremities of scion and stock in a contoured joint in which the scion is held by the stock both longitudinally and in axial alignment, the device comprising in combination:

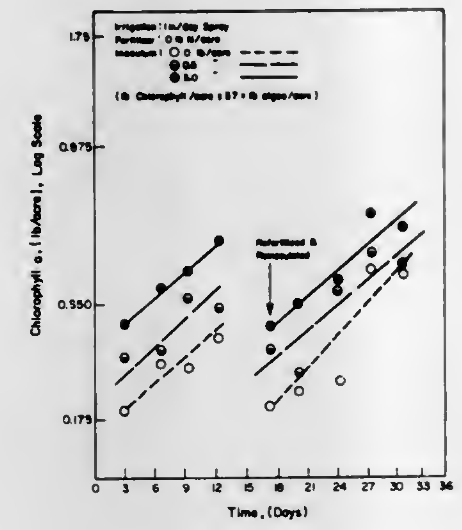
- a stationary base plate having arranged thereon shoot positioning means defining a generally horizontal transverse shoot axis;
- a vertically movable cutter blade of thin stock defining a generally vertical plane at right angles to the shoot axis and having a cross-sectional shape which produces a transverse cut on the shoots with a central bulge resembling the shape the Greek letter omega, so that cut extremities have matching tooth and tooth gap shapes, the cutter blade having a corresponding vertical fold profile defining a bead on one side and a groove on the other side thereof;
- means for moving the cutter blade in a generally vertical reciprocating motion, so as to cause the cutter blade to sever a first shoot which is positioned underneath it, in the shoot axis of the shoot positioning means;
- means for retaining the cut extremity of the first shoot on the upwardly moving cutter blade, while the cutter blade severs a second, oppositely extending shoot which has subsequently been positoned underneath it, in the shoot axis; and



- means for releasing the first shoot from the cutter blade simultaneously with the second shoot, while joining the extremities of both on their shaped cuts, said releasing means including:
- an upwardly movable ejector member arranged laterally adjacent to the fold profile of the cutter blade above the shoot axis;
- a stationary stripper bracket arranged adjacent to the fold profile of the cutter blade, on the opposite side of the ejector member, so as to remove from the cutter blade any clipping or shoot that may be carried upwardly by the fold profile of the bladebyblockingtheupwardmovement of the clipping or shoot;
- latching means for selectively blocking the upward mobility of the ejector member by engaging the latter at a level at which the blocked ejector member forcibly removes the previously retained first shoot from the upwardly moving cutter blade by blocking the upward movement of the former;
- toggle means for alternatingly engaging the latching means against the ejector member, when the cutter blade performs a cut on the second shoot, and not engaging the latching means against the ejector member, when the cutter blade performs a cut on the first shoot.

3,969,844
SOIL TREATMENT METHODS

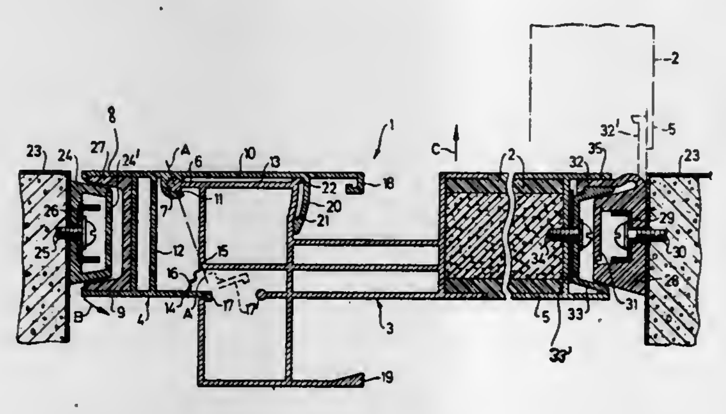
Samuel Fogel, Newton; Patricia L. Foster, Cambridge; Paula Schenck, Boston, and William W. Walker, Jr., Allston, all of Mass., assignors to American Bioculture, Inc., Plumsteadville, Pa.
Continuation of Ser. No. 434,332, Jan. 17, 1974, abandoned, and a continuation-in-part of Ser. No. 421,527, Dec. 4, 1973, abandoned. This application May 1, 1975, Ser. No. 573,609
Int. Cl.² A01G *7/00*
U.S. Cl. 47—58 **9 Claims**



1. A method of conditioning soil by binding the particles thereof into small workable aggregates which comprises inoculating the soil with a flocculant producing algae, maintaining in the inoculated soil available nitrogen, other nutrients and moisture in sufficient quantities so that the algae continue to multiply on the soil for a first period of time until a predetermined population density is reached, and thereafter maintaining in the inoculated soil plant nutrients other than nitrogen in quantities that are not growth limiting so that the algae continue to grow in a nitrogen deficient state in which soil aggregating compounds are produced.

3,969,845
DOOR CONSTRUCTION

Leon Yulkowski, 4390 Derry Road, Bloomfield Hills, Mich. 48013
Filed Dec. 9, 1974, Ser. No. 530,958
Claims priority, application Germany, Feb. 11, 1974, 2406428
Int. Cl.² E05B *65/06*
U.S. Cl. 49—394 **15 Claims**

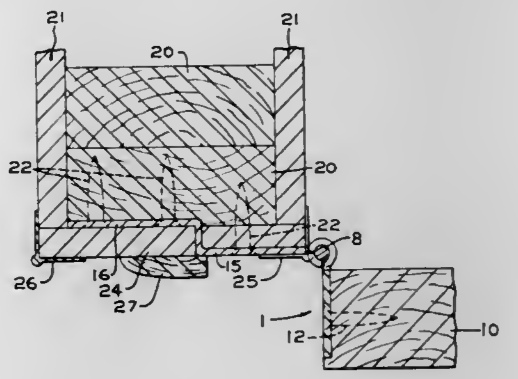


1. In a combination door and locking mechanism, wherein the door is hingedly connected to a door frame along one of its major longitudinal sides and the locking mechanism is operably connected to the opposed major longitudinal side of the door, the improvement of:

- said locking mechanism including a longitudinal engaging element carried by said opposed door side and being hingedly mounted about a pivot axis which is generally parallel to the door hinge axis,
- a corresponding longitudinal counter element connected to a door frame and being generally parallel to and engageable with the engaging element,
- said engaging element and counter element extending substantially the entire height of the opposed door side,
- said engaging element being channel [illegible] cross section and including a pair of spaced [illegible] substantially parallel projections extending [illegible] the door,
- said counter element being [illegible] shaped member nesting within said projections [illegible] the door is in the closed position,
- said engaging element being in substantial planar alignment with the door when the door is in the closed position and being sufficiently pivotal in a direction opposite the door pivotal movement to pivot one of said projections out of lateral alignment with said counter element so that the door may open relative to the frame,
- over center means for biasing said engaging element (a) in a closed position in substantial planar alignment with the door and nesting with the counter element when the door is closed and (b) in a pivoted position whereby one of said projections is out of lateral alignment with the counter element when the door is opened;
- stop means carried by the door and movable therewith for restraining pivotal movement of the engaging element in one direction beyond the closed position;
- blocking means operably connected with the door and selectively engageable with said engaging element for preventing pivotal movement thereof for locking the door in the closed position; and
- door opening means carried by said opposed door side and being pivotally mounted thereto, said opening means being operable with the engaging element for effecting pivotal movement of said engaging element upon manual operation of the opening means.

3,969,846
DOOR HINGE

Delbert Scott, 594 Ripley, Akron, Ohio 44312
Filed Oct. 23, 1974, Ser. No. 517,323
Int. Cl.² E06B *1/04*
U.S. Cl. 49—504 **1 Claim**



1. A door assembly comprising a hinge member having a pair of leafs, one of said leafs attached to a door, the other of said leafs having a first planar portion and a second planar portion spaced from but parallel to said first portion, an interconnecting portion connecting said first portion to said second portion, bores in each of said first and second portions for receiving screws for attaching said other leaf to a door framing stud, said screws of said first portion and said second portion having their central longitudinal axes parallel to each other, hinge means interconnecting said leafs, a plaster board member interposed between said first portion and said stud, plaster board means secured to said stud and overlaying said second portion of said other hinge leaf, and an elongated door stop attached to said plaster board means.

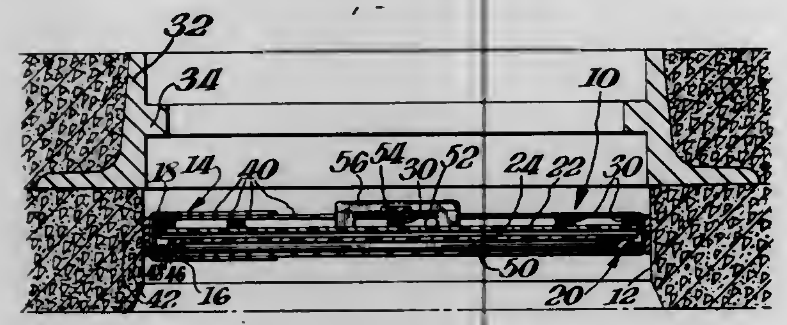
3,969,847
COMBINATION MANHOLE CLOSURE ASSEMBLY AND SEPARATE SUPPORT RING

Benjamin J. Campagna, Newark, Del., and Samuel A. Campagna, Jr., Deptford, N.J., assignors to Benjamin J. Campagna, Newark, Del.

Filed Nov. 18, 1974, Ser. No. 524,537

Int. Cl.² E02D *29/14*

U.S. Cl. 52—1 **11 Claims**



1. The combination of a manhole closure assembly for preventing storm water from entering into a manhole opening and a separate support ring for the assembly including a lower closure supporting flange, an upper flange spaced therefrom, and sealing means on the lower flange, the closure assembly including a substantially circular cover plate the arcuate edge portions of which engage the sealing means on the lower flange and the cover plate comprising a pair of semi-circular segments, means for holding the semi-circular segments of the cover plate together at their diametral edge portions while allowing movement of at least one segment about a substantially horizontal axis in close proximity to its diametral edge portion, and spaced apart biasing means along the arcuate edge portions of the cover plate extending between the plate and the upper flange of the support ring for urging the plate against the sealing means until a pressure force acting upon the underside of the cover plate exceeds the force of the biasing means whereby the arcuate edge portions of the cover plate lift away from the sealing means to relieve such pressure force.

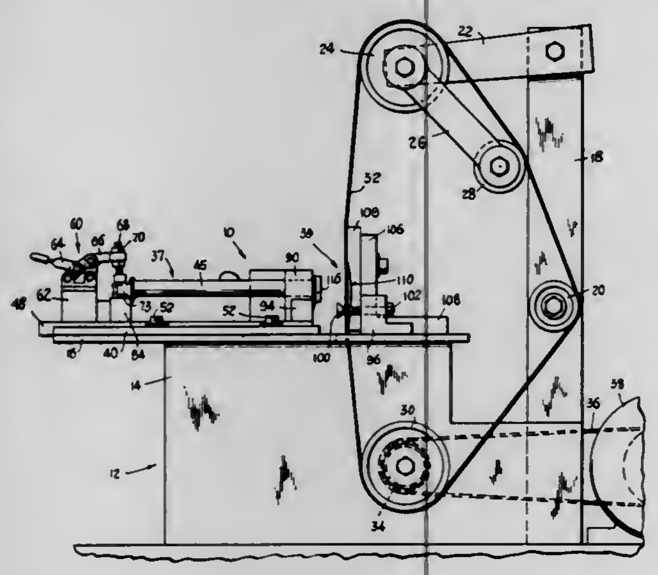
3,969,848
TURBINE BLADE AIR SEAL EDGE GRINDER

Ralph T. DeMusis, 1 Commercial St., Branford, Conn. 06405

Filed May 5, 1975, Ser. No. 574,564

Int. Cl.² B24B *21/08*

U.S. Cl. 51—141 **10 Claims**



1. A machine for refinishing the end edges of air seal flanges which are located at the extremities of turbine blades and which have been resurfaced by welding, comprising in combination:

a. a stationary base,

b. a contoured back-up shoe affixed to the base at a work-performing station thereon and having a contoured surface fixedly disposed in a work-performing zone,

c. an abrasive belt having a surface provided with cutting particles,

d. means for driving said belt over the back-up shoe with the back of the belt engageable with the shoe, said belt being capable of yielding upon said engagement and conforming to the shape of the contoured surface,

e. a slide movable over the base toward and away from said shoe at the work-performing station,

f. a clamping device carried by the slide, adapted to clamp a turbine blade so as to enable the slide to present the resurfaced seal flange of the blade to the cutting belt to be resurfaced thereby, said slide including means for positioning the blade at a predetermined fixed elevation above the base in said work-performing zone, and

g. cooperable adjustable stop means including a stop member on the base, for limiting the advancing movement of the turbine blade on the belt, thereby to establish the amount of flange required to be retained on the blade after the resurfacing thereof.

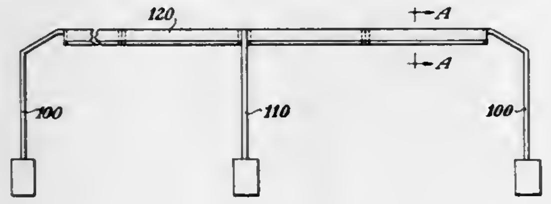
3,969,849
SELF-SUPPORTING LIGHTING FIXTURE

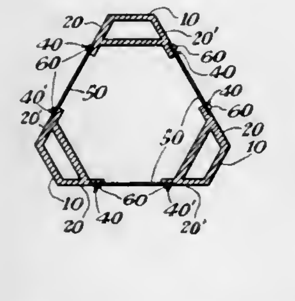
D. E. Franklin, 555 E. Rambling Drive, West Palm Beach, Fla. 33406

Continuation of Ser. No. 445,245, Feb. 25, 1974, abandoned. This application May 12, 1975, Ser. No. 576,665

Int. Cl.² F21V *21/00*; E04H *14/00*

U.S. Cl. 52—28 **4 Claims**





1. A lightweight electrical lighting supporting fixture requiring a reduced number of vertical supports per length of fixture capable of withstanding relatively high wind velocities comprising:

at least three elongated relatively lightweight rigid supporting members;

a plurality of relatively thin lightweight reflecting elongated metal sheets, each of said sheets being substantially rectangular, each of said supporting members having angularly disposed sheet attaching walls and a bracing wall connected between said sheet attaching walls, said sheet attaching walls each having a notched edge disposed along the elongated longitudinal direction of said supporting member, said notched edges having a gap substantially equal to the thickness of one of said sheets, said supporting members disposed such that adjacent supporting members have adjacent sheet attaching walls disposed in a common plane enjoined together by one of said reflective thin sheets lying in said common plane, said sheet longitudinal edge portion being disposed in adjacent wall attaching notches;

a plurality of fasteners connecting said thin sheets to said supporting members; and

at least two rigid frames, each of said frames connecting said supporting members together.

3,969,850
METAL ROOF CONSTRUCTION

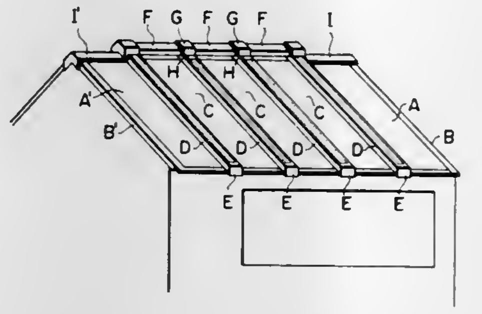
Takashi Hirai, Ukita, Japan, assignor to Kabushiki Kaisha Hirai Giken, Tokyo, Japan

Filed Feb. 27, 1975, Ser. No. 553,507

Claims priority, application Japan, Apr. 17, 1974, 49-42323; Nov. 26, 1974, 49-135127; Jan. 18, 1975, 50-8245

Int. Cl.² E04D *13/00*; E04B *1/74*

U.S. Cl. 52—97 **4 Claims**



1. A metal roof construction comprising a metal roof unit which includes a backing, a surface metal plate having a series of notches therein and a heat insulating material disposed integrally between said backing and said surface metal; a joint member having a series of slits therein for jointing said surface metal plate of one said metal roof unit with a said surface metal plate of a neighbouring metal roof unit, by means of nails that are driven through said notches in said surface metal plate and said slits in said joint member into a rafter on which said metal roof unit is held at each fringe of said connecting extensions, said series of notches being located to coincide with another series of said notches provided at the fringe of a neighbouring one of said metal roof units so as to make said metal roof unit and said joint member movable due to heat expansion, said metal roof unit having a pair of vertical rising portions and connecting, extensions at each opposite ends, said connecting extensions of adjacent metal roof units being at least partially overlapped; and a covering member which covers said joint member.

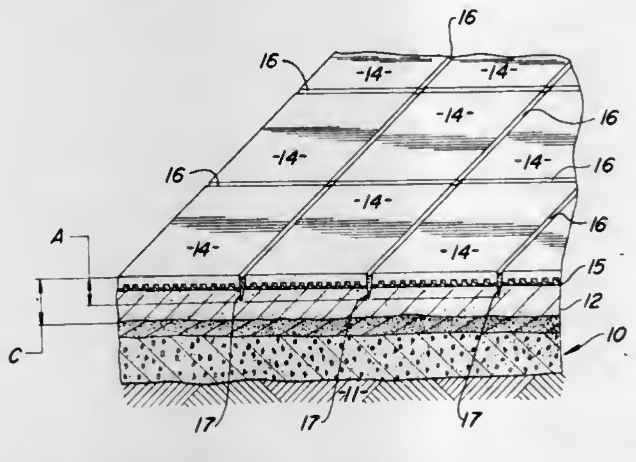
3,969,851
ARCHITECTURAL PAVING SYSTEM WITH INDIVIDUAL CONTROL JOINT PAVING

Daniel C. Whitacre, Massillon, Ohio, assignor to Structural Stoneware Incorporated, Minerva, Ohio

Filed July 11, 1975, Ser. No. 595,026

Int. Cl.² E04C *1/28*; E01C *7/00*

U.S. Cl. 52—98 **7 Claims**



1. In an architectural paving system the combination of a setting bed laid wet upon and supported by a base without becoming firmly attached to said base when the bed has finally set, thin architectural pavers laid on the top of said bed, an adhesive bond coat interposed between the top of said bed and the bottoms of said pavers while the bed is green, said coat firmly attaching said pavers to said bed when the bed has finally set, said pavers being arranged on said bed in patterns as desired and spaced from each other with gaps between the sides of adjacent pavers, said bed having downward cuts made while the bed is green and made downwardly through said gaps and through any part of said coat in a gap and extending below said gaps to an appreciable depth all around and below the peripheries of the pavers, said cuts tending to confine cracking of said bed, after it has set and been subjected to external stress sufficient to cause said cracking, to cracks which extend downwardly in substantially the vertical direction of said cuts, each parametric continuity of such cracks which extend the full depth of the bed tending to define a fractured-out, monolithic block comprising a whole flawless paver integrated with the part of the setting bed subjacent thereto.

3,969,852
SELF-SUPPORTING SHEETING PANEL FOR TRENCHES OR THE LIKE

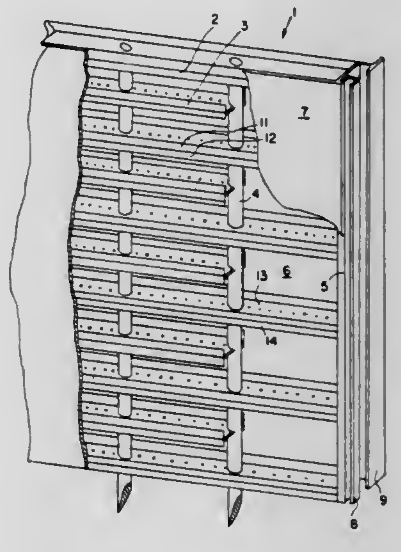
Josef Krings, Hans-Boeckler Str. 23, D 5138 Heinsberg, Oberbruch, Germany

Filed Sept. 4, 1974, Ser. No. 503,091

Claims priority, application Germany, Sept. 12, 1973, 2345859

Int. Cl.² E02D *5/74*; E04H *17/22*

U.S. Cl. 52—155 **4 Claims**



1. A sheeting panel for trenches or the like comprising a generally rectagular frame, said frame being defined by horizontally disposed spaced parallel beams and vertically disposed spaced parallel beams, a plurality of horizontally disposed spaced parallel reinforcing members disposed between said horizontal beams and defining therewith a plurality of chambers, said reinforcing members being fixed to said vertical beams, a plurality of vertically disposed spaced parallel tubes disposed between said vertical beams, said tubes being fixed to said horizontal beams, a pair of cover plates secured to opposite faces of said frame beams, foam plastic filling said chambers, reinforcing means embedded in said foam plastic whereby the sheeting panel is reinforced for resisting loads placed thereon by earth when used for shoring trenches or the like, said reinforcing means consists of steel cord waste, vertically extending channel guide means secured to each vertical beam for vertically guiding the sheeting panel relative to posts associated therewith in a trenching environment, and each guide channel means being a vertically extending guide channel defining a generally U-shaped opening which faces laterally outwardly of said sheeting panel.

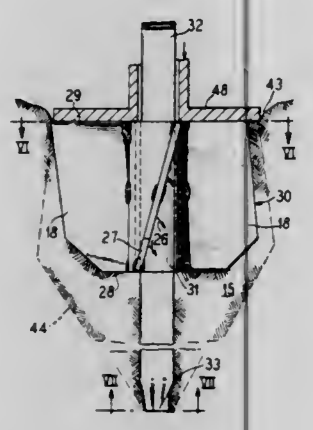
3,969,853
TORQUE FIN ANCHOR

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed Feb. 3, 1975, Ser. No. 546,335

Int. Cl.² E02D *5/80*

U.S. Cl. 52—156 **3 Claims**



1. A ground anchor adapted to anchor a cable or support a post which comprises a hollow central pile slidable over said post, a plurality of circumferentially spaced planar fins with tapered front portions radially secured along their length to said pile and inclined in the same direction relative to the longitudinal axis thereof at substantially the same clockwise angle with respect to the longitudinal axis, and said fins having large surface areas confronting and compacting the ground to resist shifting and retraction of the anchor under load and which cause said anchor to rotate slightly to minimize restriction of entry into the ground and a cable attachment hole through one of the fins near an outer longitudinal edge thereof and rearwardly of the longitudinal mid point of said fin.

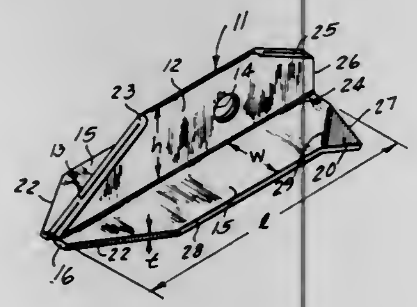
3,969,854
PLANING FIN ANCHOR

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed Dec. 23, 1974, Ser. No. 535,428

Int. Cl.² E02D *5/80*

U.S. Cl. 52—163 **3 Claims**



1. A ground anchor for underground submergence comprising an elongated rigid member having a small frontal surface area with a pointed leading end for ease in inserting the member lengthwise in the ground, a large longitudinal planar surface area for restricting retraction from the ground having downturned fins on the trailing end and an upturned longitudinal central web, and a cable attached to the web sufficiently rearwardly of the longitudinal midpoint of the member to provide about 55% of the area of the member forwardly of the cable and in substantial laterally offset relation from the large longitudinal planar surface area thereof, said cable freely suspending the member in an inclined position with the pointed end below the level of the trailing end, and said cable being operable from above ground to pull the submerged member causing the pointed end to plough into the ground while the fins rotate the member from a lengthwise to an inclined transverse position with the pointed end below the level of the trailing end presenting the large planar surface thereof to the ground above the member and providing a large area of earth above the planar surface holding the member submerged in the ground to anchor tension applied to the cable.

3,969,855
MOVABLE PLATFORM FOR PARKING ONE VEHICLE ABOVE ANOTHER

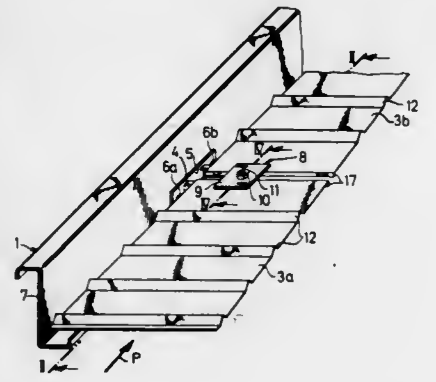
Ulrich Lendi, Stafa, Switzerland, assignor to Mageba S.A., Switzerland

Filed Aug. 23, 1974, Ser. No. 500,197

Claims priority, application Germany, Aug. 25, 1973, 2342987

Int. Cl.² E04B *5/10*

U.S. Cl. 52—177 **6 Claims**



1. A platform assembly, for use in apparatus for parking one vehicle above another, comprising:

i. two transversely-spaced longitudinal struts, each strut including a vertical wall, a first flange extending outwardly from the upper edge of said vertical wall, a second flange extending inwardly from the lower edge of said vertical wall and having an upwardly extending free end;

ii. a plurality of transverse members disposed in spaced relationship and extending between said struts, said transverse members being rectangular hollow section members with a longitudinal slot in the top wall thereof, said transverse members overlying at each end the second flange of a respective strut, said transverse members having at each end a flange secured to the vertical wall of the respective strut, said transverse members having a drainage aperture adjacent each end in the portion thereof overlying the second flange;

iii. a plurality of metal base plates disposed on said transverse members in a row longitudinally of the struts, said base plates extending transversely for substantially the entire width between the vertical walls of the two struts, said base plates having at each of their transverse edges a downwardly bent edge portion engaging into the slot of a transverse member, said base plates at least partially overlying said second flange and being of a length not greater than the length of said transverse members.

3,969,856
ADJUSTABLE PROTECTIVE HOOD FOR A ROTARY TOOL

Gerhard Zerrer, Korb, Germany, assignor to Andreas Stihl Maschinenfabrik, Neustadt, Germany

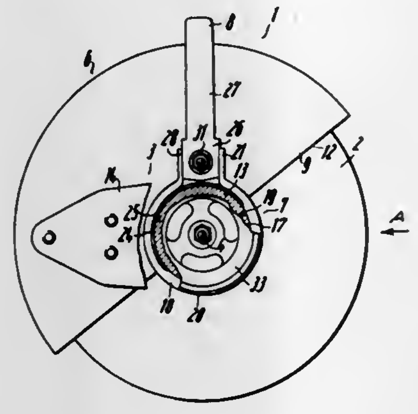
Filed Sept. 20, 1974, Ser. No. 507,806

Claims priority, application Germany, Sept. 25, 1973, 7334640[U]

Int. Cl.² B24B *55/04;* **B27G** *19/04*

U.S. Cl. 51—268 **15 Claims**

1. A protective device for a rotary tool such as a grinding wheel comprising; a hood having a peripheral portion surrounding a portion of said tool in radially spaced relation thereto, said hood having side walls at the sides of said tool and connected to said peripheral portion, stationary means engaging one of said side walls and supporting said hood for pivotal movement substantially on the axis of said tool, clamp means operable to clamp said hood in adjusted positions of pivotal movement thereof, and a lever pivotally connected to said hood and operatively connected to said clamping means and operable when moved in a respective direction about the pivotal connection thereof with the hood to release said clamp means momentarily and to permit automatic movement of the hood in the same said direction.



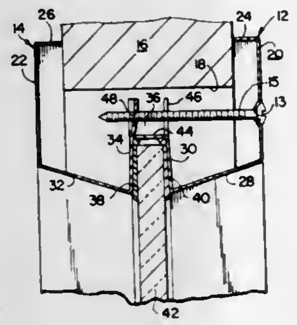
3,969,857
TAMPER-PROOF WINDOW UNIT

Carroll G. Stark, North Hollywood, Calif., assignor to Anemostat Products Division Dynamics Corporation of America, Scranton, Pa.

Filed Oct. 15, 1975, Ser. No. 622,758

Int. Cl.² E06B *3/58, 3/26*

U.S. Cl. 52—208 **12 Claims**



1. A tamper-proof window unit for assembly in multi-lateral openings in doors and the like; said unit comprising similar first and second multilateral centrally open frame members adapted to be mounted about an opening respectively on opposite sides of a door, each of said frame members comprising a narrow elongated multilateral front panel extending generally in a plane parallel to the door and marginally about the door opening with an outer edge portion partially overlapping the door adjacent the opening, the front panel of said first frame member having a small front to rear opening communicating with the door opening in each of at least two generally opposite sides of the panel, and each frame member also comprising a narrow elongated multilateral generally L-shaped integral flange extending along the inner edge of its said front panel, each L-shaped flange including a first narrow elongated panel which projects generally rearwardly from its associated front panel and a second narrow elongated panel which projects from a rear edge of the first panel outwardly with respect to the center of the door opening and in a plane generally parallel with the door faces and front panels, the two second panels on the opposite frame members being spaced apart in parallel relationship to define a groove which opens inwardly toward the center of the door opening and which is adapted to receive and hold a marginal portion of a pane of glass, a pane of glass disposed in the door and frame opening with a marginal portion thereof entered in said groove, said second panel of one of said frame members having an outer and free edge portion divided into first and second sections along each of at least two generally opposite sides of the panel, each first section being arranged substantially at right angles with the panel and projecting rearwardly toward the second panel on the other frame member and adjacent the marginal edge of the pane of glass, and each second section residing substantially in the plane of the panel, each of at least two generally opposite sides of said second panel of said second frame member having a small front to rear opening therein, said two front to rear openings being aligned in front to rear relationship respectively with the two openings in said front panel sides of said first frame member, and two screws entered and threadably engaged respectively in said aligned openings and serving to secure the window unit and door in assembly with said outer edge portions of said two front panels clampingly engaging opposite sides of the door adjacent its opening and with said two second panels clampingly holding the marginal portions of the pane of glass.

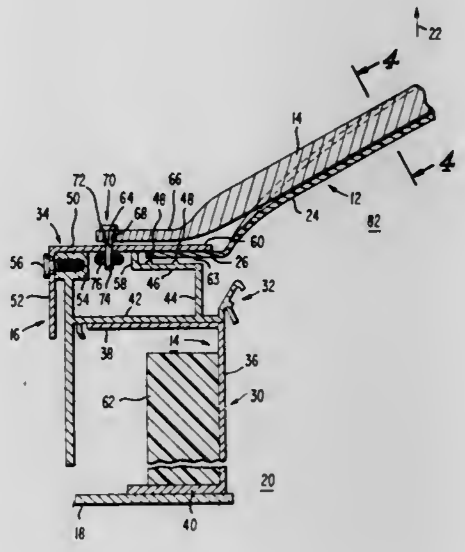
3,969,858
EXPLOSION VENT CONSTRUCTION

Edward Sidney Naidus, Glen Rock, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 458,187, April 5, 1974, abandoned. This application June 20, 1975. Ser. No. 588,862

Int. Cl.² E04B *7/18*

U.S. Cl. 52—232 **2 Claims**



1. A building explosion venting apparatus for enclosing an explosion vent opening comprising:

a curb defining said opening and having a plurality of pin receiving apertures spaced in a predetermined array,

a flexible thermoplastic skylight sheet member releaseably secured to said curb for enclosing said opening, said curb and sheet member being arranged for the release of said sheet member from said curb when said sheet member is forced in a given direction toward the building exterior by an explosion occurring within the building,

a rigid brace member disposed across said opening, said sheet member being disposed between said brace member and the building interior, said brace member including a portion juxtaposed with said apertures, and

a plurality of elongated pins extending from said brace member portion in a direction opposite said given direction and disposed in said given array in slideable engagement with said pin receiving apertures for releasing upon the occurrence of said explosion, said apertures and said pins being arranged to jam said pins in said apertures when said brace member receives a force in a direction different than said given direction thereby preventing the release of said sheet member in the presence of an ambient force in said different direction.

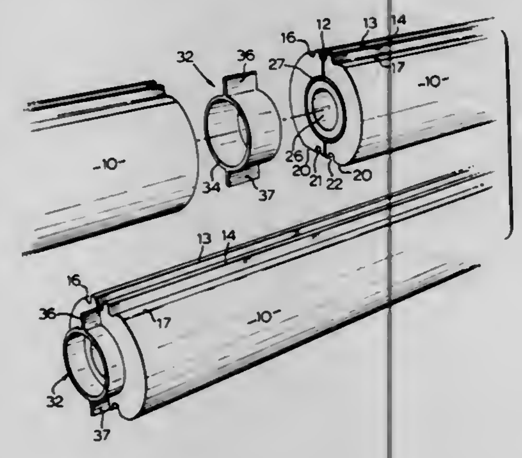
3,969,859
PREFABRICATED BUILDING LOG SECTIONS

Thomas Bruce Hisey, Thornhill, Canada, assignor to Homestead Logs Limited, Thornhill, Canada

Continuation-in-part of Ser. No. 467,340, May 6, 1974, abandoned. This application Feb. 14, 1975, Ser. No. 550,086

Int. Cl.² E04B *1/10*

U.S. Cl. 52—233 **10 Claims**



1. In a wall structure of a log building comprising at least two log sections joined together end-to-end, and said log sections being interfitted with at least a third log section in a superposed manner, each of said log sections and third log section having a pair of spaced parallel longitudinal tongue members formed in the upper surface therein, said tongue members defining a central upper groove extending throughout the entire longitudinal upper surface of the log section, two raised platforms formed on the longitudinal edge portions of the upper surface therein, a pair of spaced parallel longitudinal channels formed in the middle portion of the lower surface therein, said channels having a complementary cross-sectional configuration of that of said tongue members and having cross-sectional dimensions at least equal to or larger than the cross-sectional dimensions of said tongue members and said channels defining a central lower tongue extending throughout the entire longitudinal lower surface therein, two rabbets formed at the longitudinal edge portions of the lower surface therein, said rabbets having a configuration complementary to that of said raised platforms whereby said rabbets of at least one of said log sections interfit with said raised platforms of said third log section to form an enclosed space between the channels of said one of said log sections and the tongue members of said third log section, each of said log sections and third log section having a center bore extending throughout their respective entire longitudinal central portion, a circular groove formed at the end surfaces of each of said log sections and third log section, said circular groove encircling the end portions of said center bore therein, said circular groove having two diametrically opposite radial grooves extending radially outward from said circular groove and extending to the bottom surface of said central upper groove and central lower tongue respectively.

3,969,860
THERMAL EFFICIENCY STRUCTURE

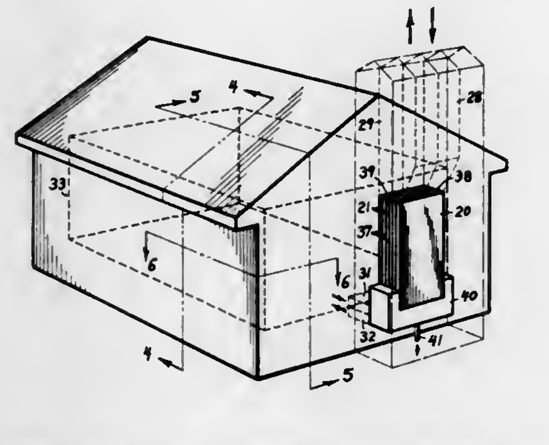
Richard Paul Bentley, Mount Arab, N.Y. 12986

Filed July 31, 1974, Ser. No. 493,616

Int. Cl.² E04B *1/00, 1/74*

U.S. Cl. 52—261 **1 Claim**

1. A thermal efficiency structure with interior and exterior surfaces consisting of airtight, moisture proof, structural panels, said surfaces spaced apart from each other with built-up beams, said beams comprising the only internal structural connection between interior and exterior surfaces with such connection between interior and exterior surfaces being required to provide structural strength and rigidity, and said beams composed of two edge members attached to, and held apart from each other, by at least one connecting panel or by bridging members, said beams arranged in a series of frames standing vertically on the building plate, each frame usually consisting of one floor beam, two side wall beams, and one roof beam assembled together into the configuration of a cross section of the structure and said beams in each frame connected to each other with gussets, said frames spaced parallel to each other along the length of the structure at intervals coincident with the interior and exterior surface panel joints, end walls for said structure consisting of vertically positioned beams resting at their lower end on the building plate and attached to the last frame at each end of the structure, said last frames being set in from the end of the building a distance equal to the width of the vertical end wall beams, said end wall beams arranged parallel to each other at intervals coincident with the interior and exterior surface panel joints, said interior and exterior surface panels further supported and reinforced with a system of spacers or laths, aligned generally parallel to each other and perpendicular to the built-up beams, and immediately adjacent to the surface paneling in walls, floor, ceiling, and roof at intervals necessary to impart rigidity to the surface panels and at all parallel surface panel joints, said surface panel joints throughout the entire structure located on and joined to built-up beams, spacers, laths, corner members, building plate, ridge, eave members, or filler pieces such that all said joints constitute airtight lap joints, said surface panel lap joints at all corner joints specifically including side wall to end wall joints, wall to ceiling joints, wall to floor joints, wall to roof eave joints, roof eave to roof surface joints, and roof surface to roof surface ridge joints being made through the attachment of the two joined panel surfaces to a single structural member consisting of a lath member, building plate member, eave member, ridge member, or corner member, said lap joints being made using nails and an airtight adhesive bond, said surface paneling and mechanically strong airtight lap joints being continuous over the entire structure interior and exterior surface and across the edges of door, window, and other openings which connect interior and exterior surfaces, said continuous surface paneling and airtight lap joints providing a highly airtight structure, and further, the space between said interior and exterior surfaces filled with a thermal insulating material.



3,969,861
LEAKPROOF ROOF AND METHOD OF CONSTRUCTING SAME

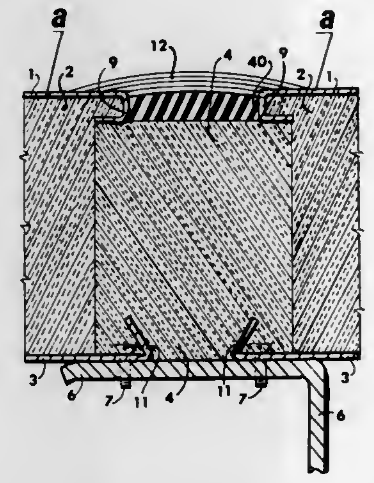
Edward J. O'Hanlon, Assembly Point, Lake George, N.Y. 12845

Filed June 17, 1974, Ser. No. 480,600

Int. Cl.² E04B *1/68, 1/80;* E04D *1/36*

U.S. Cl. 52—309 **6 Claims**

1. A substantially non-expanding and non-contracting roof or top cover of a building or part thereof, on which rain, hail, snow or ice accummulates and which is subject to the wide seasonal changes in temperature but which is without any roof cover covering said roof as a whole, said roof comprising similar flat panels, each panel composed of rigid foam held tightly between two sheets with hard surfaces, said panels resting on and fastened to purlin, and at right angles to said purlin, said flat panels being closely adjacent to each other, and placed in lines end-to-end and closely side-by-side, the contiguous ends of adjacent panels fastened firmly to the same purlin, and means closing and waterproofing the narrow spaces between the sides and the ends of said panels by being further joined laterally and longitudinally by a secondary application of foam substantially filling the crosswise and lengthwise spaces between the panels and, and an elastic cover positioned on and waterproofing over said secondary application of foam.



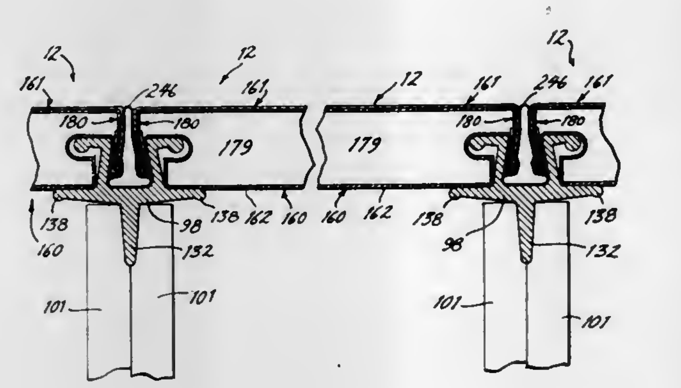
3,969,862
BUILDING CONSTRUCTION AND METHOD

Robert Kuss, c/o Production Specialties, Inc., 1020 Ford St., West Conshohocken, Pa. 19428

Division of Ser. No. 171,896, Aug. 16, 1971, Pat. No. 3,807,100. This application Feb. 20, 1974, Ser. No. 444,085

Int. Cl.² E04B *1/74*

U.S. Cl. 52—404 **7 Claims**



1. A surface construction comprising a panel, said panel comprising inner surface means and outer wall means, said inner surface means comprising a first web, said first web including opposed generally upstanding portions at its ends, said upstanding portions supporting substantially flat faces, each of said substantially flat faces supporting a downwardly directed leg the lower edge of which comprises a reverse bend, said outer wall means comprising a second web in overlying relation to said first web, opposed downwardly directed legs extending from said second web, said last named legs including a free edge which is received in said reverse bend, the distance between said second web and said free edge being large enough so that said first web and said substantially flat faces will be spaced from said second web to define an insulation zone therebetween.

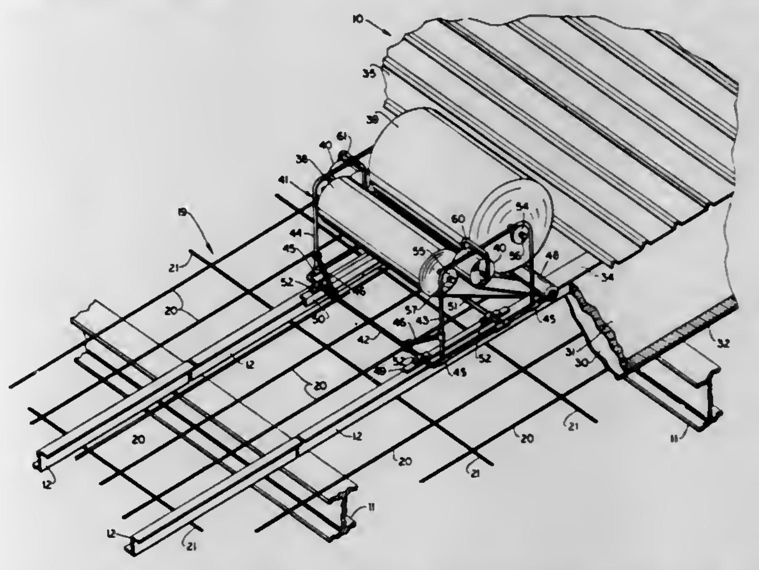
3,969,863
ROOF SYSTEM

Robert J. Alderman, Rte. 1, Box 205E, Ruskin, Fla. 33570

Filed Aug. 2, 1974, Ser. No. 494,097

Int. Cl.² E04B *2/28, 2/60;* E04F *21/00*

U.S. Cl. 52—407 **8 Claims**



1. In a roof structure comprising a plurality of spaced rafters oriented parallel to one another, a plurality of approximately equally spaced purlins mounted on said rafters and oriented parallel to one another and perpendicular to said rafters, each of said purlins including an upwardly extending central web and at least one laterally extending lower flange, the improvement therein of a plurality of support straps oriented parallel to one another and parallel to said purlins and resting on said rafters between said purlins, elongated strips of insulation material of a width sufficient to substantially span the space between the central webs of adjacent ones of said purlins positioned between and extending parallel to said purlins and resting on said support straps and on the lower flanges of said purlins, and sheets of roofing material mounted on said purlins and extending over said strips of insulation material.

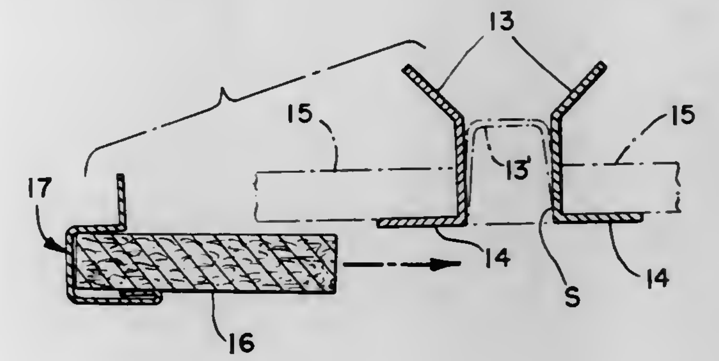
3,969,864
FIRE RESISTANT CEILING CONSTRUCTION

Fred J. Stephenson, Overland Park, Kans., and Donald J. Rush, Grandview, Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Oct. 4, 1974, Ser. No. 512,068

Int. Cl.² E04B *5/57;* E04C *1/36*

U.S. Cl. 52—475 **8 Claims**

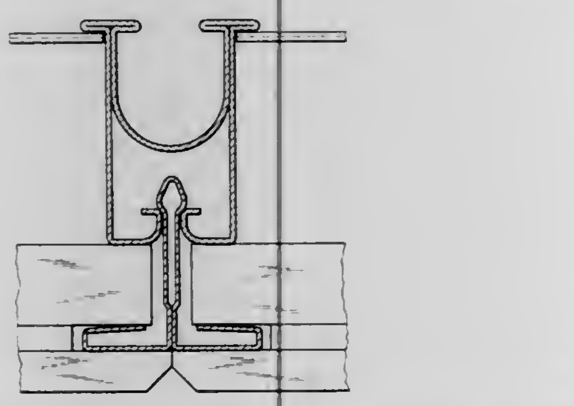


1. A fire resistant space grid ceiling system, comprising: a plurality of steel space trusses arranged to form a rectangular space grid ceiling construction, said trusses having base members with opposite, horizontally outwardly extending flanges thereon; rectangularly shaped, fire resistant ceiling panels supported at their opposite edges on top of said flanges in spanning relationship to adjacent base members and leaving exposed therebeneath a lower portion of the base members; rectangularly shaped, fire resistant grid protecting panels having a width substantially the same as the width of the exposed portion of the base members and secured to the underside of the flanges of the base members; and separate,

elongate channel members having a generally vertical wall with top and bottom edges and generally horizontal top and bottom walls on the top and bottom edges of the vertical wall, the bottom wall thereof engaged under an adjacent edge of the grid protecting panel and the top wall thereof engaged directly over and against an adjacent flange of a base member, the channel members having a length substantially the same as the length of the panel members, to readily releasably attach the grid protecting panel members in position against the underside of the base members to protect the base members from heat and fire.

3,969,865
CEILING STRUCTURE

Finn Andersen, Greve Strand, Denmark, assignor to Finn Andersen and Keld Andersen, both of, Denmark
Filed Aug. 26, 1974, Ser. No. 500,549
Claims priority, application Denmark, Aug. 29, 1973, 4746/73
Int. Cl.² E04B *5/52*
U.S. Cl. 52—483 **2 Claims**

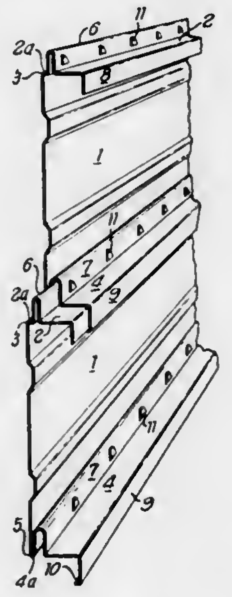


1. A ceiling structure of the type having a plurality of adjoining ceiling sheets having two mutually parallel grooves, said ceiling sheet being supported by suspension means shaped as in inverted T, the lower part of the suspension means being provided with protruding suspension portions, and the upper part of said suspension means being thickened, said suspension means being secured to a plurality of main beams being symmetrical with regard to a longitudinal central plane and at their lower parts being provided with resiliently movable end webs facing each other and their upper parts engaging parts of transverse suspension beams, characterized by each of the main beams having two side webs mutually connected by means of a resilient intermediate web which is U-shaped and having legs of lengths permitting the upper portions of the side webs to be displaced with respect to each other, said upper portion having flanges received by the suspension beams, said lower part of the main beams being provided with mutually facing end webs disposed in a plane perpendicular to said centre plane.

3,969,866
SHEET ASSEMBLIES AND SHEETS THEREFOR

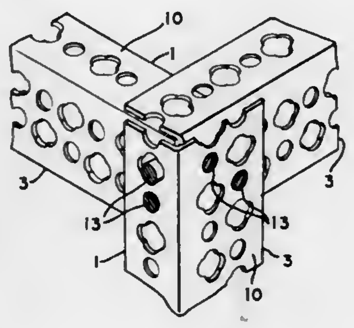
Peter John Kyne, Hemel Hempstead, England, assignor to P.J.K. Projects Limited, Hemel Hempstead, England
Filed Apr. 11, 1974, Ser. No. 459,927
Claims priority, application United Kingdom, Apr. 16, 1973, 18223/73; July 25, 1973, 35344/73
Int. Cl.² E04C *1/10*
U.S. Cl. 52—588 **8 Claims**

1. A fabricated rigid sheet profiled for engagement with an adjacent similar sheet for assembly as a panel, the sheet being of substantially rectangular shape and having a first flange extending rearwardly of one longitudinal edge, a first fold connecting said first flange to said one longitudinal edge and providing a first U-shaped channel, a second flange of greater width than said first flange and extending rearwardly of a second longitudinal edge opposed to said one longitudinal edge, a second fold connecting said second flange to said second longitudinal edge and providing a second U-shaped channel, a third flange extending in one direction from the rear longitudinal edge of said first flange and substantially parallel to the general plane of the sheet, a fourth flange extending in said one direction from the rear longitudinal edge of said second flange and substantially parallel to the general plane of the sheet, said first and second folds extending from the respective first and second flanges in the direction opposite to said one direction, and being rearward of the general plane of the sheet with the first and second channels opening in said one direction and being so dimensioned that the first fold is engageable within the second fold of an adjacent similar sheet by relative displacement of the sheets in the general plane thereof to locate the adjacent sheets with the first flange against and in supporting engagement with the second flange of the adjacent similar sheet, a first plurality of spaced openings in the wall of said second fold remote from the general plane of the sheet, a second plurality of spaced openings in the wall of said first fold remote from the general plane of the sheet located to register with said openings in the second fold of an adjacent similar sheet, a strip dimensioned to be received within said first fold and a plurality of projections integrally formed with said strip and dimensioned to extend into the registering openings formed in the first and second folds of adjacent similar sheets.



3,969,867
CONSTRUCTIONAL ELEMENT

James A. MacKenzie, 100 Bronson Ave., Ottawa, Ontario, Canada
Continuation of Ser. No. 143,272, May 13, 1971, abandoned, which is a continuation of Ser. No. 879,183, Nov. 24, 1969, abandoned. This application Apr. 25, 1975, Ser. No. 571,862
Int. Cl.² E04B *1/24*
U.S. Cl. 52—633 **2 Claims**



1. A constructional element of constant L-shaped cross-section comprising two flanges of uniform thickness which merge at right angles in which one flange is wider than the other and wherein:

a. the narrower width flange contains a first longitudinally extending row of alternating circular and quatrefoil apertures;

b. the wider of said flanges contains an inner and at least one additional longitudinally extending row of alternating circular and quatrefoil apertures which have the same dimensions as the circular and quatrefoil apertures in said first row;

c. the apertures in each row in said wider flange are transversely aligned, the circular apertures in one row in said flange being transversely opposite the quatrefoil apertures in the other row in said wider flange, and wherein

d. the centre lines of two rows of apertures in said wider flange are transversely spaced a distance equal to the centre-to-centre distance between adjacent apertures in any of said rows;

e. the lengthwise centre-to-centre distance between adjacent apertures in each row in each flange is the same;

f. the centre line of each row of apertures adjacent the line of merger of the two flanges is equidistant from said line of merger;

g. each quatrefoil aperture has a minimum dimension which is not less than the diameter of the circular apertures;

h. each quatrefoil aperture is defined by four regularly arranged, congruent, arcuate curves, each curve having a radius substantially equal to the radius of the circular apertures;

i. each quatrefoil aperture has two equal maximum dimensions, each said maximum dimension being substantially equal to the diameter of a circular aperture plus twice the thickness of said flange;

j. said maximum dimensions extending longitudinally and transversely of the element;

k. the apertures in each row being transversely aligned, the circular apertures in one row being transversely opposite the quatrefoil apertures in the next adjacent row; and wherein

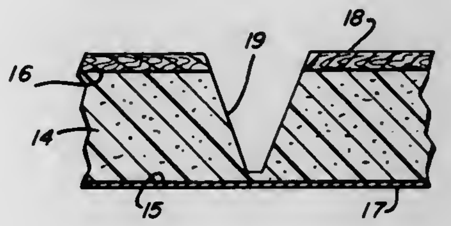
l. there is a small radius of curvature at the junction between the two flanges and in which the centre lines of each of said first row and said inner row of apertures are the same distance from the inner surface of the opposing flange, said distance in each case being equal to the sum of (a) the lengthwise centre-to-centre distance between adjacent apertures in said rows, plus (b) the thickness of said element, plus (c) said small radius;

m. the specified arrangement and configuration of holes being such that two horizontal members may be joined to a vertical member to make a corner construction with the horizontal flanges of the horizontal members in face-to-face contact with one another and with at least four bolts in vertical and horizontal load bearing relationship supporting the horizontal members on the vertical member.

3,969,868
INSULATION STRUCTURE

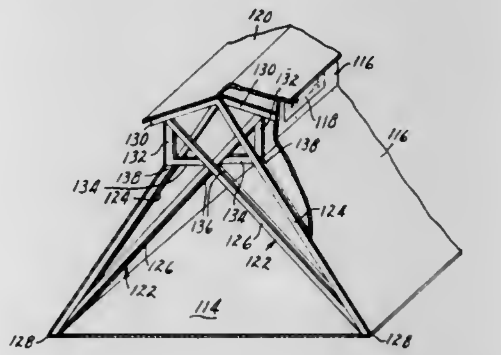
Huston K. Bainter, and Marvin E. Nerem, both of Forest City, Iowa, assignors to Winnebago Industries, Inc., Forest City, Iowa
Division of Ser. No. 173,234, Aug. 19, 1971, Pat. No. 3,909,995, which is a continuation of Ser. No. 15,602, March 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,934, Sept. 9, 1968, abandoned, which is a continuation of Ser. No. 536,058, March 21, 1966, abandoned. This application Oct. 10, 1974, Ser. No. 513,531
Int. Cl.² E04C *2/22, 2/24*
U.S. Cl. 52—622 **10 Claims**

1. An insulation board structure comprising: a cellular plastic foam member having a first side and a second side, a continuous deformable first sheet member covering and secured to the first side of the foam member, adhesive means attaching the entire first side to the first sheet member, said foam member having a series of truncated, V-shaped grooves formed substantially through the thickness of the foam member, said grooves extending from the second side toward the first side, the apexes of said grooves being spaced from the first sheet member, said foam member being continuous adjacent the first sheet member, second sheet members covering the second side of the foam member between said grooves, adhesive means attaching the second side to the second sheet members, and rigid members located between said first and second sheet members adjacent opposite transverse edges of the sheet members, said rigid members having end surfaces used when the insulation board structure is installed.



3,969,869
BUILDING TRUSS

Arthur F. Partridge, 1775 Delaware Ave., St. Paul, Minn. 55118
Filed Sept. 20, 1974, Ser. No. 507,952
Int. Cl.² E04C *3/02*; E04B *1/32*
U.S. Cl. 52—639 **15 Claims**



1. A scissors truss comprising a framework of rigid structural members forming a pair of distinct, mated complementary truss components, each of said components comprising distinct longitudinally extending continuous members forming corresponding upper and lower chords, said chords being in angled relation whereby said lower chord intersects and connected with said corresponding upper chord, a transverse member adjacent an end of at least one of said chords and connecting said upper and lower chords to form a triangle, said complementary truss components juxtaposed and mated to form a scissors truss and including fastening means mating said truss components and resisting relative angular movement of said truss components and wherein at least one upper chord crosses and extends beyond the complementary upper chord.

3,969,870
BAFFLE ASSEMBLY AND ILLUMINATOR GRID

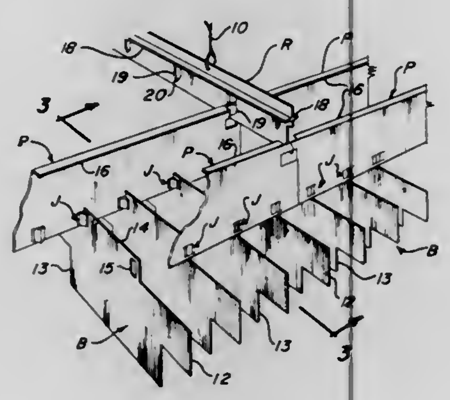
Charles U. Deaton, Genesee Mountain, Golden, Colo. 80401
Filed Mar. 17, 1975, Ser. No. 558,641
Int. Cl.² E04H *12/18*
U.S. Cl. 52—645 **12 Claims**

1. A baffle assembly for an illuminator grid adapted to be supported below a source of light, comprising:

a normally parallel pair of primary baffle plates;

a series of secondary baffles normally in a generally perpendicular relation to said primary baffle plates;

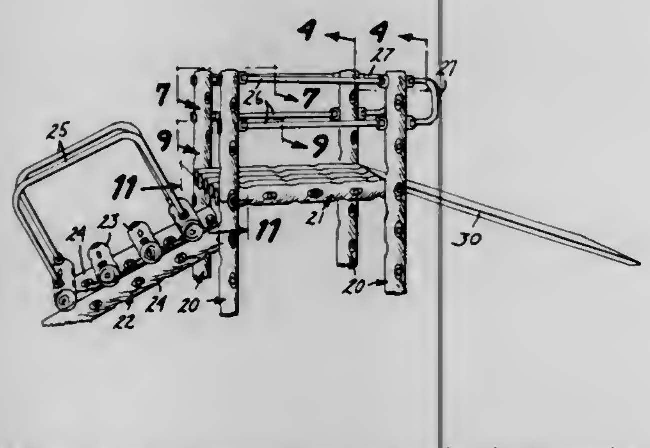
said secondary baffles extending between said baffle plates, at least a substantial portion of each secondary baffle being below said plates, at least a portion of said secondary baffles extending laterally beneath and beyond the corresponding baffle plate at one side and at least a portion of said secondary baffles extending laterally beneath and beyond the opposite baffle plate; and



pivotal connections between said secondary baffles and said pair of baffle plates, whereby said baffle plates may be moved toward each other and said secondary baffles will pivot into an overlapping relation with the respective baffle plates at opposite sides thereof.

3,969,871
FASTENING CONSTRUCTION FOR PLAYGROUND EQUIPMENT

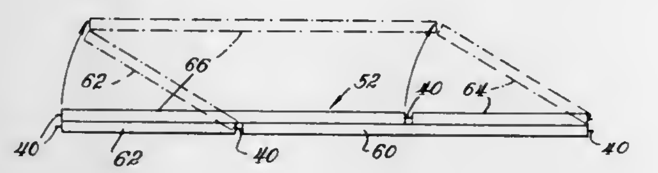
Ronald L. Ewers, Litchfield, Mich., assignor to The Toro Company, Minneapolis, Minn.
Filed Feb. 10, 1975, Ser. No. 548,563
Int. Cl.^{2} E04C *3/30;* **A63B** *17/04*
U.S. Cl. 52—721 **6 Claims**



1. A basic unit of construction for use in playground equipment of the type constructed from interfitting tubular members and wooden timbers, comprising:
- a wooden timber having a cross bore extending therethrough, said timber having a pair of recesses therein at opposite ends of said cross bore, said recesses each having a bottom comprising a substantially flat surface, said surfaces being parallel to one another;
- a threaded tension member, said member having a diameter substantially less than the diameter of said cross bore and extending freely through said bore;
- a pair of fittings, one each engaging said tension member at opposite ends thereof, at least one of said fittings being threadedly adjustable along said tension member, with said fittings each contacting an associated one of said flat surfaces so that said timber is placed in compression in the vicinity of said cross bore by threaded rotation of said fitting; at least one of said fittings having a recess therein for receipt of a tubular member;
- a tubular member received within said fitting recess; and
- means carried by said recessed fitting for securing one end of said tubular member to said fitting within said recess.

3,969,872
METHOD OF CONSTRUCTING MODULAR BUILDINGS

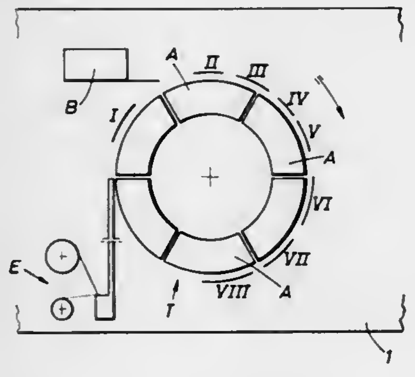
Harry M. Wesse, c/o Harry M. Weese and Associates, 10 W. Hubbard St., Chicago, Ill. 60610
Division of Ser. No. 181,693, Sept. 20, 1971, Pat. No. 3,744,196. This application Oct. 30, 1972, Ser. No. 302,110
Int. Cl.^{2} E04B *1/348*
U.S. Cl. 52—745 **3 Claims**



1. Method of constructing a building module of four connected lateral walls comprising casting two separate oblong layers of concrete superposed on each other with a series of reinforcing rods extending lengthwise of and embedded in each layer, attaching unfolded hinges between the two layers at their ends, embedding folded intermediate hinge means in each layer, allowing said layers to set, and thereby attaching the hinge leaves to the adjacent edges of the respective layers, then cutting the reinforcing rods at said intermediate hinge means, and then separating and moving the two layers into a four-sided hollow module by bending said hinge means.

3,969,873
MACHINE FOR MAKING BAG-LIKE TWO-COMPARTMENT PACKAGES PARTICULARLY TEA BAGS

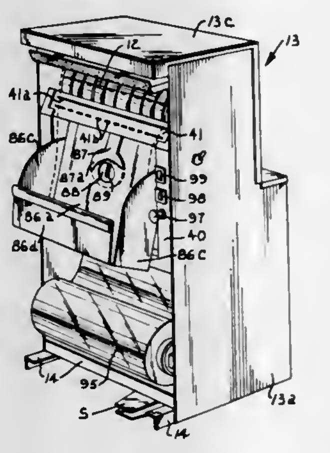
Paul Gerhard Klar, Haus Seeblick, D-8992 Wasserburg, Germany
Filed Feb. 3, 1975, Ser. No. 546,697
Claims priority, application Germany, Feb. 7, 1974, 2405761
Int. Cl.^{2} B65B *11/28, 29/04*
U.S. Cl. 53—134 **12 Claims**



1. In a machine for making bag-like compartment packages of a pliant material, particularly tea bags having a tag secured thereto by a thread, which are formed solely by folding operations and closed by staples, from bag strips, filled with dosed portions of the substance to be packaged, fed continuously into the machine, and of the type including conveyance means circulating along a closed conveyance path and having mounted thereon manufacturing units which are controlled by means located outside the conveyance path, with each unit including folding members for forming the bag bottom, two raising arms for erecting the bag halves and a member on one raising arm for receiving a tag, and also including a device for cutting the bag strip: the improvement comprising, in combination, said conveyance means being continuously movable without interruption along said conveyance path; a respective common supporting frame for each unit mounted on said conveyance means for movement therewith; means mounting on each common supporting frame, for conjoint movement therewith along the conveyance path, all the devices for folding, closing and separating a bag from the strip, including respective said raising arms, one of which has a pocket for receiving a tag, a respective fold plate movable transversely to the bag strip and associated, for forming the bag bottom, with respective clamping holders movable oppositely thereto, a respective device for cutting a tag thread, respective folders for forming the V-shaped top closure of the bag, a respective device for further folding and finishing the top closure and a respective device for fastening the thread to the bag top; and means mounted stationarily outside the conveyance path for movement of said common supporting frames successively thereby, and controlling the operation of all of the devices mounted on each common supporting frame.

3,969,874
PACKAGING MACHINE

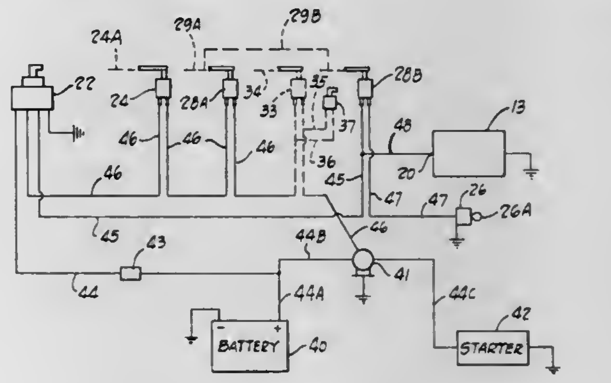
Walter C. Halcomb, 600 Galaxie; Naomi A. Eastman; Robert D. Eastman, both of 1004 Green; Harvey A. VanMeter, 809 E. Pearl, all of Harrisonville, Mo. 64701, and Russell W. Chapman, Rte. 1, Lee's Summit, Mo. 64063
Filed Oct. 17, 1974, Ser. No. 515,621
Int. Cl.^{2} B65B *9/08*
U.S. Cl. 53—183 **9 Claims**



1. Apparatus for packaging objects in bags successively formed from a supply of flexible tubular packaging material having opposing interconnecting panels, said apparatus comprising:
- an upright frame;
- guide means associated with said frame for receiving and supporting said packaging material;
- a first sealing member supported on said frame to intermittently engage said packaging material and to effect a first seal between said opposing panels whereby said first seal forms a sealed bottom for a bag;
- a cutting member supported on said frame to effect a cut substantially through one panel of said packaging material to form an open top portion of the bag at a location longitudinally offset along said packaging material from said first seal whereby objects can be received in said bag through the open top portion;
- support means positioned to underlie the bag to support same thereon in a stationary position with the open top portion of the bag disposed to receive objects;
- a second sealing member supported on said frame to effect a second seal between the opposing panels closely adjacent the top portion of the bag while the bag is maintained in its stationary position on said support means, whereby said bag can be sealed after receiving objects therein;
- severing means supported on said frame to sever both panels of said packaging material above said second seal to separate the bag from the supply of packaging material while the bag is maintained in its stationary position on said support means; and
- drive means to actuate said first and second sealing members, said cutting member, and said severing means.

3,969,875
SAFETY GROUNDING CIRCUITS

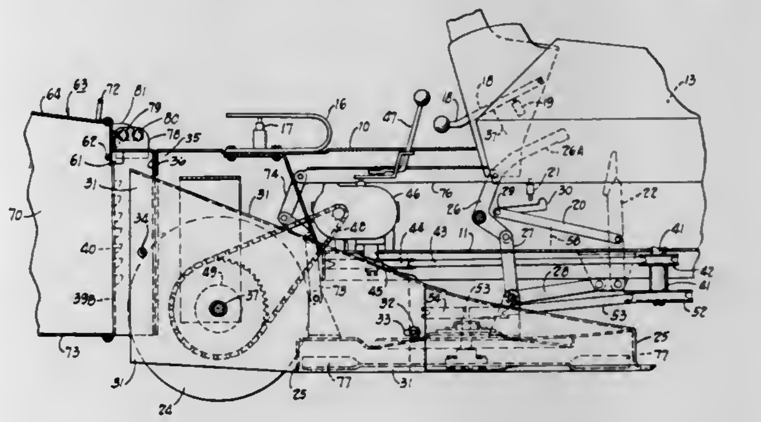
Thomas J. Nofel, Brookpark, Ohio, assignor to MTD Products Inc., Cleveland, Ohio
Filed Apr. 18, 1975, Ser. No. 569,561
Int. Cl.^{2} A01D *75/20*
U.S. Cl. 56—10.2 **9 Claims**



1. In an electrical system for controlling a function of a grass mower driven by an internal combustion engine having a magneto which if grounded stops the operation of the engine, said mower having a grass cutting unit powered by said engine, a clutch for engaging and disengaging the cutting unit with the engine, and a catcher carried by the mower for catching cut grass discharged therefrom when the catcher is in proper grass catching position on the mower, the combination of an electrical switch normally closed when the said clutch is engaged and disposed to be automatically opened upon the disengagement of said clutch, a second electrical switch normally closed when the said catcher is not in its proper grass catching position on the mower and disposed to be automatically opened upon the movement of said catcher to a location where it is at its said proper grass catching position, and electrical circuit means electrically connecting said magneto, said switches and ground to connect the magneto with ground to stop the engine upon the closing of said second switch when the catcher is not in said proper grass catching position unless the said first switch is then open upon the disengagement of said clutch to disconnect the magneto with ground.

3,969,876
COMBINATION MOWER AND CATCHER

William E. Turos, Parma, Ohio, assignor to MTD Products Inc., Cleveland, Ohio
Filed Apr. 18, 1975, Ser. No. 569,465
Int. Cl.^{2} A01D *35/22*
U.S. Cl. 56—202 **20 Claims**



1. The combination of an engine driven rotary mower having a pair of laterally spaced rear wheels and having a cutting unit including a rotary blade and housing for the blade, said cutting unit being movable to different elevations relative to said mower, the housing having a discharge opening through which cut grass and a current of air blown by the blade is discharged, a grass catcher having a forwardly directed open-

ing and carried by the mower at the rear thereof for receiving cut grass blown with air into said forwardly directed opening thereof, said catcher having screened egress means for the escape of the current of blown air therefrom while retaining cut grass in the catcher, chute means carried by the mower extended between said rear wheels and providing communication between said discharge opening of the said blade housing and to said catcher for directing cut grass and blown air from said discharge opening between said rear wheels and through said forwardly directed opening of the catcher into said catcher, said chute means being movable with the cutting unit to accommodate different elevations of the said cutting unit.

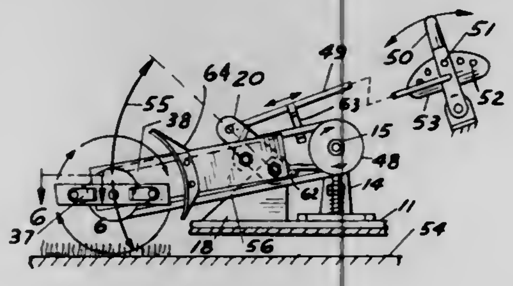
3,969,877
EDGER ATTACHMENTS

Robert J. Moss, 6319 S. Inwood Road, Shreveport, La. 71109, and Forrest G. Hurst, 417 Town South Drive, Shreveport, La. 71105

Filed Oct. 10, 1974, Ser. No. 513,830

Int. Cl.² A01D *53/14*

U.S. Cl. 56—256 **4 Claims**



1. An edger attachment for a lawn mower comprising an edger receiving assembly adapted for attachment to the deck of a lawn mower and a blade cutting assembly adapted for attachment to said receiving assembly, said receiving assembly including a pulley arranged in drivable relationship with the driving means of said mower, a tubular socket member on said receiving assembly, an arm rotatably mounted on said socket member, a blade supporting housing on said cutting assembly having a mounting shaft adapted for insertion into said socket member and means for locking the same thereto against axial movement along said shaft, a control rod rotatably affixed to said arm and remotely connected to the handlebar of said mower for moving said arm through arcuate movements in a vertical plane, said blade supporting housing including a blade supporting shaft having a rotatable pulley adapted for connection with a pulley on said receiving assembly by a driving belt, said blade supporting housing also including a bearing for said supporting shaft, said bearing being slidably mounting in said housing and spring means for normally urging said bearing forwardly in said housing to place a yieldable pressure against said driving belt.

3,969,878
FRUIT PICKING TECHNIQUE

Herman C. Morganeier, 110 W. Williamson Ave., Harlingen, Tex. 78550

Filed Sept. 5, 1974, Ser. No. 503,391

Int. Cl.² A01D *46/00*

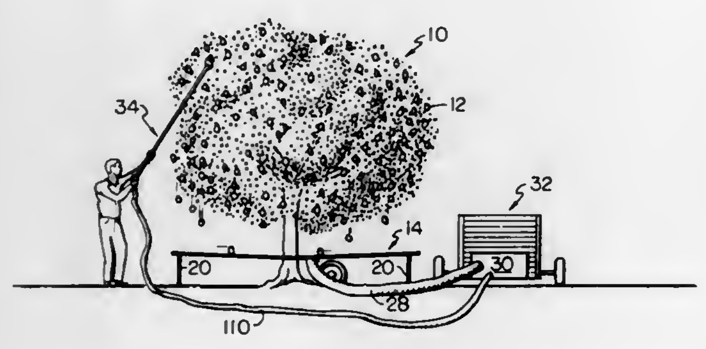
U.S. Cl. 56—328 R **5 Claims**

1. A device for picking a stem supported fruit of a generally uniform predetermined mixture size transverse to the stem axis, the device comprising:

an elongate frame having a fruit receiving end including an open ended cup smaller in size than the predetermined maximum size;

a vacuum pneumatic motor for rotating the cup for severing the fruit from its source;

means for selectively applying a vacuum to the cup for grasping fruit therein prior to applying a vacuum to the motor; and



means for releasing the vacuum and allowing the fruit to fall by gravity from the cup.

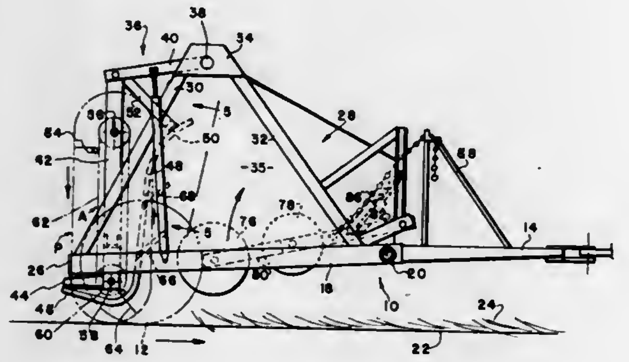
3,969,879
HAY ROLLING MACHINE WITH IMPROVED ROLL STARTING AND COMPRESSION MEANS

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 1, 1975, Ser. No. 564,177

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 **15 Claims**



1. In a machine of the type adapted to form a swath or windrow of hay or other suitable crop material lying upon a field into a roll thereof by rolling the same along the field until a roll of predetermined size is formed and including a mobile frame being open at the bottom thereof and adapted to be moved along the field, supplemental frame means carried by said mobile frame at a rearward end thereof and endless flexible means movably mounted by said supplemental frame means and having hay engaging means which, upon movement of said flexible means, elevate said windrow of hay and engage said roll thereof as formed to rotate said roll of hay forwardly within said mobile frame; the improvement comprising a lower transverse series of hay-directing fingers supported by said supplemental frame means in spaced relation above the field and extending forwardly therefrom for engagement with hay being elevated by said hay engaging means and operable to strip the hay therefrom and direct the same forwardly in a roll-forming direction at least during an initial period in the formation of a roll thereof, said fingers being adapted to yield and move upwardly from their initial forwardly extending positions as the diameter of said roll increases as formed within said mobile frame.

3,969,880
MACHINE FOR MANUFACTURING CABLES BY STRANDING INDIVIDUAL WIRES

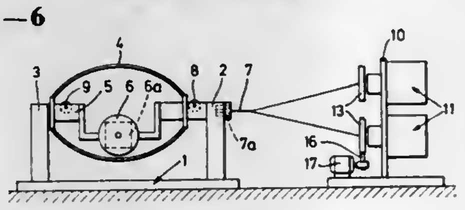
Charles Maillefer, Renens, and René Schlaeppi, Prilly, both of Switzerland, assignors to Maillefer S.A., Switzerland

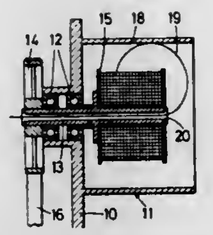
Filed Feb. 18, 1975, Ser. No. 550,739

Claims priority, application Switzerland, Mar. 1, 1974, 2961/74; Nov. 18, 1974, 15327/74

Int. Cl.² D01H *7/02*

U.S. Cl. 57—6 **14 Claims**





1. A machine for manufacturing cables by stranding individual wires, comprising: a pay-out apparatus having four pay-out reels and fixed supports therefor; a stranding apparatus situated after said pay-out apparatus and comprising a forming die receiving said individual wires; a take-up apparatus having a take-up reel, a support for said take-up reel, and cable-pulling means for pulling said cable through said die at a predetermined speed; and further comprising wire-tensioning means disposed between each of said pay-out reel supports and said die, each of said wire-tensioning means comprising a guide member for one of said wires, disposed at a fixed location and coaxial with a respective one of said reels, a zone situated before said guide member for nonguided passage of a portion of said wire from said reel to said guide member, means for driving each said pay-out reel at a variable speed of rotation, said speed being sufficient to cause said portion of wire to assume the form of a loop under the effect of centrifugal force, thus tensioning said wire through said centrifugal force, and means independent of said cable-pulling means for controlling said variable speed of rotation, said speed of rotation being constantly the same for all said pay-out reels.

3,969,881
MACHINES FOR THE PRODUCTION OF CHENILLE YARNS AND SPOOLING THEREOF

Luigi Boldrini, Via dell'Olivuzzo 54, Florence, Italy

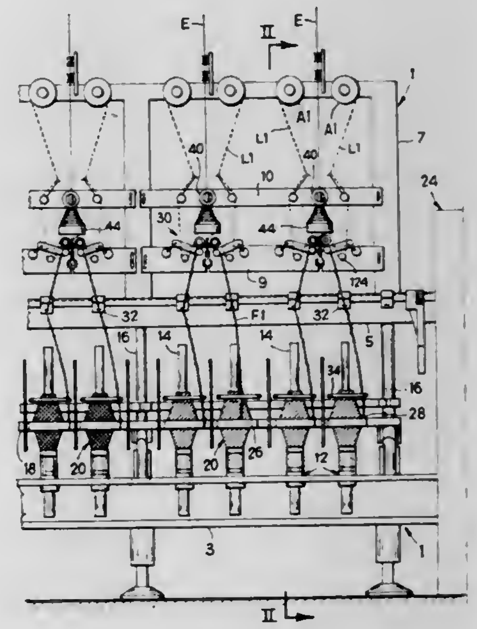
Filed June 17, 1975, Ser. No. 587,653

Claims priority, application Italy, Dec. 23, 1974, 9656/74

Int. Cl.² D02G *3/42*

U.S. Cl. 57—24 **10 Claims**

1. A machine for the production of pairs of chenille yarns, each formed by two binding yarns twisted together to bind therebetween short sheared lengths of an effect yarn, said machine comprising, in combination, an upright frame; respective forming units, for each pair of chenille yarns, mounted on said frame; a plurality of pairs of spindles mounted on said frame for rotation about substantially vertical axes, each pair of spindles receiving the chenille yarns from a respective forming unit; a horizontal bench mounted on said frame for vertical displacement relative to said spindles, and carrying annular tracks each coaxial with a respective spindle; respective annular sliders angularly displaceable on each track and entrainable by the yarn to be wound on the associated spindle; two pairs of binding yarn supplies, mounted on said frame, for forming each pair of chenille yarns; each forming unit including a respective control shaft rotatably mounted on said frame; motor means operable to rotate said control shafts; driving means interconnecting each control shaft and the associated pair of spindles to rotate the latter; a respective rotary bell member, for each forming unit, rotatably mounted on said frame, each bell member having an axial passage therethrough for a respective effect yarn and two guide bushes spaced radially from said axial passage and through which the respective effect yarn, threaded through said axial passage, is successively threaded in opposite radial directions; a respective winding and sizing member, for forming the sheared lengths of effect yarn, mounted on said frame beneath each rotary bell member; each winding and sizing member being formed by two spaced profile portions converging upwardly toward a leg portion and defining two outwardly facing concave surfaces merging with respective opposite surfaces of said leg portion, the profiled portions defining a slot therebetween extending into said leg portion; respective driving means connecting each bell member to the associated control shaft for rotation thereby; each effect yarn, by rotation of the associated bell member, being wound on the associated winding and sizing member to form turns around the leg portion thereof; a respective shearing blade disposed symmetrically in the slot between each pair of profiled portions and projecting into the associated leg portion to shear the turns of effect yarn wound on the latter to form, from each turn, two sheared lengths of effect yarn; a respective pair of feed rollers, for each forming unit, each engaged with a respective said concave surface to entrain a respective half of the sheared turns of effect yarns; means operable to feed, between each feed roller and the adjacent concave surface, a first one of the two binding yarns of each chenille yarn to overlie the respective halves of the sheared turns of effect yarn on such adjacent concave surface; each profiled portion having a hole therethrough opening into its concave surface; positive feed means operable to feed the second one of the two binding yarns of each chenille yarn through said hole of the respective profiled portion to underlie the respective halves of the sheared turns of the effect yarn on such concave surface; a respective supporting means for each feed roller oscillatably mounted on said frame; resilient means operatively associated with each supporting means and operable to bias the associated feed roller toward and into engagement with the adjacent said concave surface; a respective auxiliary roller, cooperable with each feed roller, rotatably mounted on each supporting means adjacent the lower end of the associated said concave surface; and means biasing each auxiliary roller toward the associated feed roller to exert a traction on the respective binding yarns; each feed roller and its associated auxiliary roller feeding the two respective binding yarns, between which the sheared lengths of effect yarn are engaged, over a free span to the associated annular slider for twisting of the two binding yarns about each other by cooperation of the associated spindle and annular slider.



3,969,882

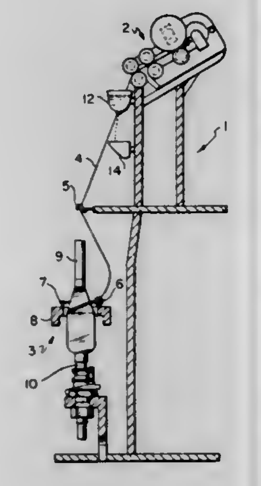
PROCESS AND APPARATUS FOR FIBER WETTING IN SPINNING DEVICE OF THE RING-SPINDLE-TRAVELER TYPE

Manuel Cilloniz Oberti, P.O. Box 544, Lima, Peru

Filed Sept. 30, 1974, Ser. No. 510,868

Int. Cl.² D01H *13/30*

U.S. Cl. 57—35 **5 Claims**



1. In a spinning apparatus for drawing and twisting fibers and winding said fibers on a bobbin, said apparatus including:
- drafting means for drawing said fibers;
- a ring-spindle-traveler device positioned downstream of said drafting means for twisting the fibers drawn by said drafting means and winding the thus twisted fibers on a bobbin; and
- an eyelet member positioned between said drafting means and said ring-spindle-traveler device, said eyelet member having an eyelet opening through which said fibers pass;
- the improvement comprising:
  - a trough positioned in the path of travel of said fibers between said drafting means and said eyelet member, said trough having therein a fiber wetting liquid, said trough and liquid being spaced from and completely out of contact with said drafting means, said trough having in the bottom thereof opening means for allowing passage therethrough of said fibers, said opening means being of a size greater than the diameter of said fibers, said fibers passing from said drafting means and through said liquid, such that said fibers are wetted after they are drawn by said drafting means and before they pass through said eyelet opening and are twisted by said ring-spindle-traveler device, the path of travel of said fibers from said drafting means, through said liquid, and to said eyelet member being inclined to the vertical.

3,969,883

SPINDLE FOR FALSE TWIST BY FRICTION

Jacques Neveux, Riorges, France, assignor to Chavanoz S.A., Chavanoz, France

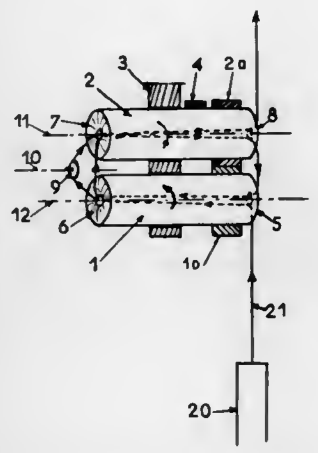
Filed Oct. 10, 1974, Ser. No. 513,624

Claims priority, application France, Oct. 19, 1973, 73.37987

Int. Cl.² D02G *1/04*, *1/06*; D01H *7/92*

U.S. Cl. 57—77.4 **6 Claims**

1. In a device for false twisting a moving textile yarn by friction including two hollow cylindrical elements positioned in generally side-by-side relation with their axis substantially parallel and mounted for rotation in opposite directions, said elements being equipped at all their ends with friction elements for engaging a yarn strand passing therethrough to impart twist to the yarn during rotation of the elements, the improvement comprising at least one thread guidance and return means positioned adjacent one end of the hollow rotary cylindrical elements for directing the yarn strand at least twice into engagement with each of said friction elements to impart twist thereto, and said means is offset with respect to a plane containing the longitudinal axes of the hollow cylindrical elements whereby the plane in which the thread is contained at the time of its passage about said thread engaging surface of the guidance and return means intersects the plane formed by the longitudinal axes of the hollow cylindrical elements.



3,969,884

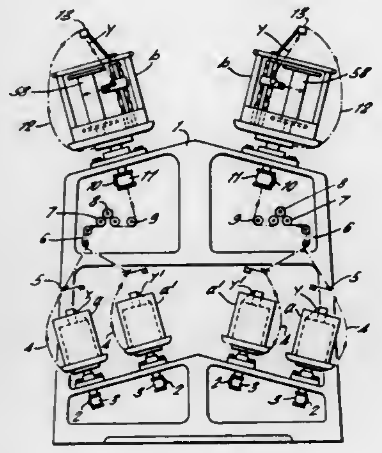
TWISTER

Shu Inohara, Sakai, and Yasuyuki Nagamune, Osaka, both of Japan, assignors to Kabushiki Kaisha Kajitekkosho, Japan

Filed Nov. 8, 1974, Ser. No. 522,126

Int. Cl.² D01H *1/10*, *7/86*

U.S. Cl. 57—58.54 **2 Claims**



1. An apparatus for the manufacture of twisted yarns and cordage which comprises a plurality of double twisters disposed in juxtaposition with respect to each other and a single cable double twister disposed above said plurality of twisters and containing a power-driven bobbin rotatably disposed therein, means associated with said bobbin for controlling the torque in said bobbin so as to ensure a constant stretch of the yarns and a plurality of feed rollers and tension adjuster rollers disposed between said double twisters and said single cable double twister for conveying the yarn from said plurality of twisters to said single-cable double twister.

3,969,885

METHOD FOR MANUFACTURING A TEXTURED YARN

Meiji Anahara, Kyoto; Yukio Kawasaki, Takatsuki, and Yasuo Suzuki, Gifu, all of Japan, assignors to Toyo Boseki KK, Osaka, Japan

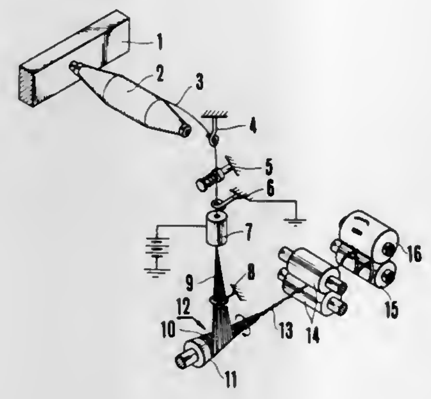
Filed Nov. 27, 1974, Ser. No. 527,768

Claims priority, application Japan, Dec. 6, 1973, 48-139136

Int. Cl.² D02G *3/00*, *3/36*

U.S. Cl. 57—157 R **24 Claims**

1. A method for manufacturing a textured yarn, comprising the steps of: passing at least one continuous multi-filament yarn of artificial fiber to a rotating spindle from a fixed point while simultaneously spreading said multi-filament yarn into individual filaments; wrapping at least part of said filaments around said spindle in the form of a sleeve; continuously withdrawing said sleeve along the spindle axis at a speed lower than the feed speed of said multi-filament yarn; and collecting the yarn thus obtained in an orderly manner.



3,969,886

DIGITAL ELECTRONIC WATCH FOR DISPLAYING BOTH TIME AND THE TIME REMAINING WITHIN A PRESELECTED TIME PERIOD

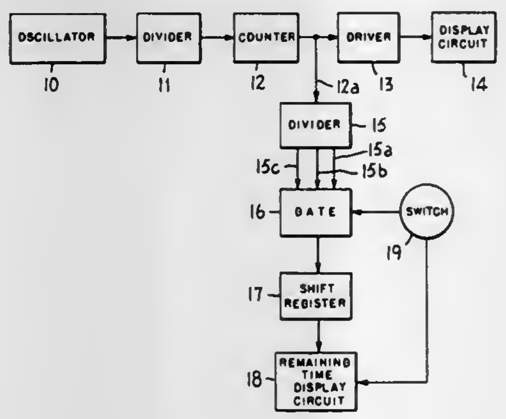
Kazuhiro Yoda, Komae, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation of Ser. No. 276,651, July 31, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,731

Claims priority, application Japan, June 30, 1971, 46-57300

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R **13 Claims**



1. In a digital electronic watch: means for generating an electric timing pulse signal having a sufficient pulse repetition rate to be used as a time reference; solid-state time display means receptive of and responsive to said electric timing pulse signal for displaying the time in minutes and hours in digital form; solid-state remaining-time display means receptive of and responsive to said electric timing pulse signal and operative when turned ON for displaying information representative of the time remaining within at least one preselected time period in discrete digital form; and a single manually-actuated switching means coacting with said solid-state remaining-time display means for manually switching ON said remaining-time display means to initiate the running of said time period.

3,969,887

ELECTRONICALLY CONTROLLED TIMEPIECES USING LIQUID CRYSTAL DISPLAY ELEMENTS

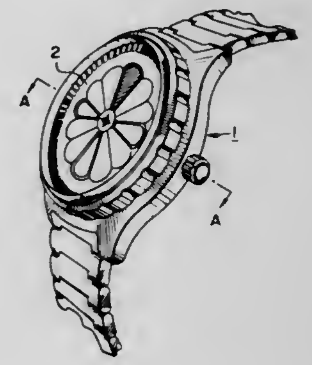
Shigeru Fukumoto, Kobe, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan

Filed Mar. 6, 1974, Ser. No. 448,692

Claims priority, application Japan, Mar. 8, 1973, 48-27260; Mar. 24, 1973, 48-33698

Int. Cl.² G04B *19/30*, *19/06*

U.S. Cl. 58—50 R **27 Claims**



1. An electronic time display device comprising a case, a source of electric power, a time base, an electronic circuit and a time display body wherein said time base generates time output pulses with a prime frequency, said electronic circuit including means for producing a plurality of pulses suitable for driving display sections and means for producing a plurality of control pulses to control said plurality of pulses, said time display body comprising a plurality of liquid crystal display sections to create a time display pattern representing an analogical time indication, said plurality of liquid crystal display sections including hour information display sections and minute information display sections, said hour and minute information display sections including segment electrodes and common electrodes, and said segment electrodes and common electrodes in blocks, said blocks including boundaries defined by said common electrodes, said hour information segment electrodes positioned symmetrically within the boundaries of said blocks; each said block including a plurality of segment electrodes; a plurality of said segment electrodes electrically connected in series with a selected segment electrode in an adjacent block, said minute information segment electrodes positioned symmetrically within the boundaries of said blocks; each said block including a plurality of segment electrodes; a plurality of said segment electrodes electrically connected in series with a selected segment electrode in an adjacent block.

3,969,888

DRIVING MECHANISM FOR DAY-DATE CALENDAR DEVICE

Cyril Veuilleumier, Chemin de Beaumont 64, 2500 Bienne; André Triponez, Lyss-Str. 75, 2560 Nidau; Jean-Pierre Schindler, Chemin des Alouettes 10, 2710 Tavannes, and Michel Schwab, Allee de la Champagne 42, 2502 Bienne, all of Switzerland

Filed Dec. 10, 1973, Ser. No. 423,186

Claims priority, application Switzerland, Dec. 11, 1972, 18006/72; Jan. 18, 1973, 669/73

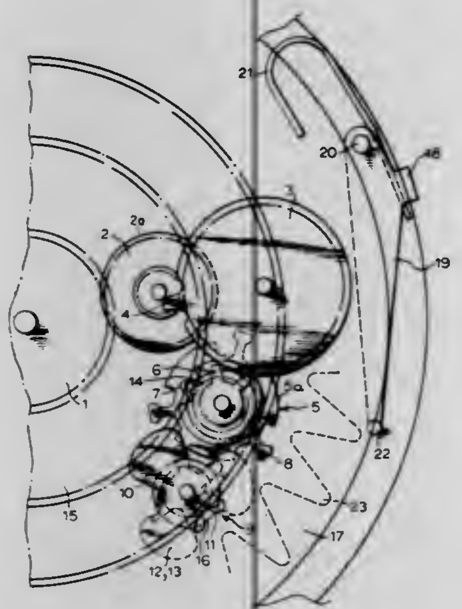
Int. Cl.² G04B *19/24*

U.S. Cl. 58—58 **10 Claims**

1. A mechanism for driving a day and date calendar indication means of a watch, comprising:
- means (1, 2) for transmitting continuous rotary motion;
- means (5) for converting said continuous rotary motion into intermittent rotary motion;
- a rotatable day calendar (15);
- means (5) for transmitting said intermittent rotary motion to index the rotatable day calendar (15);

a rotatable date calendar (17);

clutch means (12, 13) disposed between said rotatable date calendar (17) and said converting means for transmitting motion to index said date calendar when said day calendar is indexed; and



means for blocking transmission of motion from said date calendar to said day calendar so that said date calendar may be indexed independently of said day calendar.

3,969,889
METHOD OF MANUFACTURING STEPPED BUSHINGS FOR CHAINS

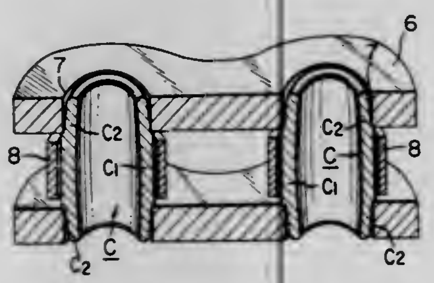
Kumakichi Araya, No. 2, Daishoji Seki, Kaga, Ishikawa, Japan

Filed Oct. 24, 1974, Ser. No. 517,609

Claims priority, application Japan, Oct. 31, 1973, 48-121683; Dec. 12, 1973, 48-137630

Int. Cl.² B21L *9/02*

U.S. Cl. 59—8 **3 Claims**



1. A method of manufacturing a stepped bushing having two portions extending beyond a central portion of lesser diameter than the central portion comprising forming a cylindrical bushing blank body of a predetermined length, inserting a pin of substantially the diameter of the interior of the body into said body, applying pressure and form rolling by grooved rolls, said blank body to form a stepped bushing with the outside diameters in the extreme outer peripheral edges of the reduced diameter portions greater in diameter than the outside diameter at the juncture with the central portion, the interior diameter of the bushing at the outer peripheral edge being greater in diameter than the interior diameter of the bushing at the juncture with the central portion, the extreme outer edge of the bushing having an angle of enlargement with the interior of the bushing at the outer edge of from 1 to 2 degrees.

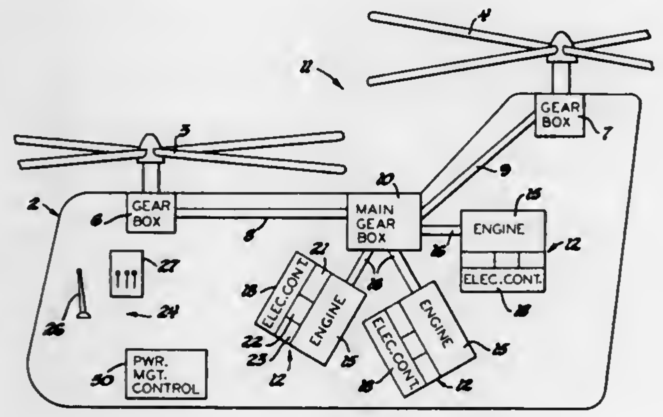
3,969,890
HELICOPTER POWER PLANT CONTROL

Robert E. Nelson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 17, 1974, Ser. No. 489,262

Int. Cl.² F02C *7/02*

U.S. Cl. 60—39.15 **5 Claims**



1. A control system for a power plant including a plural number of combustion engines connected to drive a common load comprising, in combination, a fuel control for each engine operative to control fuel flow to the respective engine, first means settable by an operator effective to vary the power setting of said fuel controls, power trim means coupled to each fuel control effective to modify the power setting of the fuel control, digital up/down counter means having an input and an output, digital-to-analog conversion means having an input to receive the output of said digital counter means and means to convert the output of said digital counter means into an analog electrical signal for transmission to the power trim means, means effective to load the counter means to a predetermined set count when the fuel control is initially energized, beeper means effective to vary the power trim means of the engine over a preset range from a nominal rated speed, said beeper means including second means settable by an operator including a normally open switch having a speed increase and a speed decrease position, means including first logic means having gates operable in response to positioning of said switch in speed increase or decrease positions to send increase and decrease electrical pulse signals to the input of the preset counter means, and second logic means receiving signals from the output of said counter means prior to passage thereof to the input of said conversion means, said logic means having gates responsive to critical digits in the counter and effective to condition said first logic means to block transmission of signals from said first logic means to the input of said counter means at preset minimum and maximum count levels at the output of said counter means.

3,969,891
COMBINED GAS TURBINE AND STEAM POWDER PLANT

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 25, 1974, Ser. No. 491,631

Claims priority, application Switzerland, Jan. 10, 1974, 269/74

Int. Cl.² F01K *23/06;* **F02C** *7/02*

U.S. Cl. 60—39.18 B **5 Claims**

1. A combined gas turbine and steam power plant comprising

a pressure vessel;

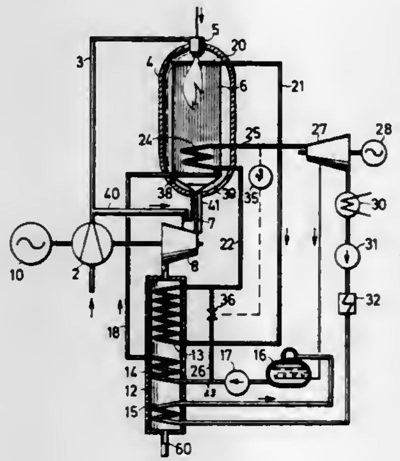
an air compressor connected with said pressure vessel to deliver compressed air to said pressure vessel;

an evaporator within said pressure vessel for receiving and evaporating a flow of working medium;

a gas turbine connected to an outlet of said pressure vessel to receive a flow of combustion gases therefrom;

a housing connected to an outlet of said gas turbine to receive a flow of exhaust gases therefrom;

at least one feedwater preheating surface in said housing for conducting a flow of feedwater in heat exchange relation with said flow of exhaust gases, said preheating surface being connected to said evaporator to deliver the preheated feedwater thereto;



a first superheating surface disposed in the flow of exhaust gases from said gas turbine outside said pressure vessel and connected to said evaporator to receive the working medium; and

a second superheating surface inside said pressure vessel connected to said first superheating surface to receive the working medium therefrom.

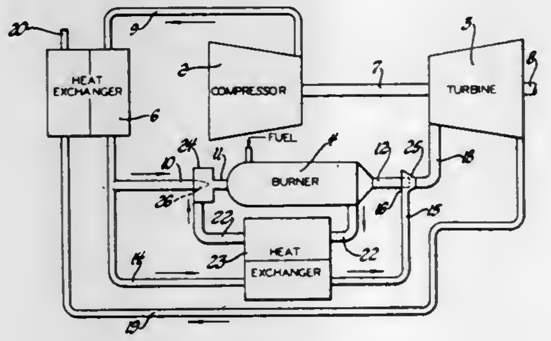
3,969,892
COMBUSTION SYSTEM

Richard J. Stettler, and Albert T. Verdouw, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,191

Int. Cl.² F02C *7/10*

U.S. Cl. 60—39.51 R **13 Claims**



1. A gas turbine engine comprising, in combination, rotary air compressor means adapted to deliver substantially unadulterated compressed air, combustion apparatus supplied with the said air by the compressor means, and turbine means supplied with motive fluid by the combustion apparatus and connected to drive the compressor means, characterized by combustion apparatus adapted to deliver hot combustion products relatively free of contaminants including means defining a combustion zone, means defining a dilution zone downstream of the combustion zone, means for directing some of the said air from the compressor as unadulterated combustion air to the combustion zone and some as unadulterated dilution air to the dilution zone, means for recirculating combustion products from the combustion zone to the combustion zone by-passing the dilution zone, and means for transferring heat from the recirculating combustion products to the said dilution air flowing to the dilution zone.

3,969,893
EXHAUST GAS EMISSION CONTROL DEVICE FOR MULTI-CYLINDER ENGINES

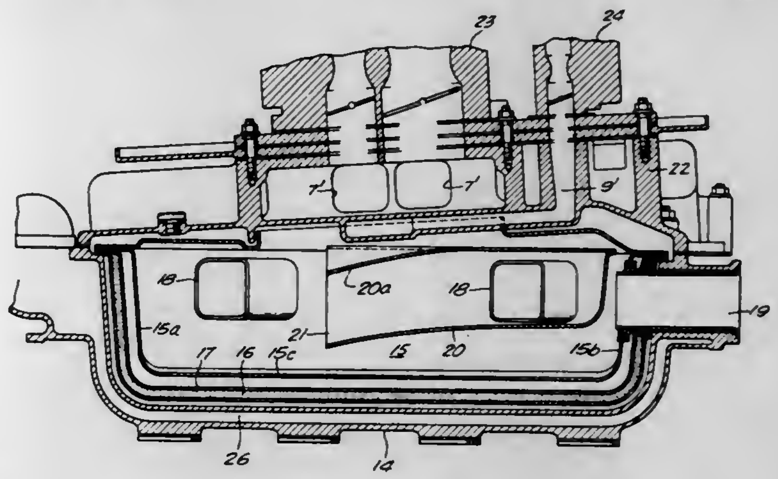
Yoshitoshi Sakurai, Kawaski, and Takao Okura, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,809

Claims priority, application Japan, Oct. 15, 1973, 48-114763

Int. Cl.² F01N *3/08, 3/10*

U.S. Cl. 60—282 **6 Claims**



1. In an internal combustion piston engine having cylinders arranged in two banks in a V-shape, each cylinder having an exhaust passage, the combination of: walls forming an exhaust gas reaction chamber positioned between the two banks of cylinders, a plurality of exhaust tubes connected to receive hot exhaust gases from the cylinder exhaust passages and each having a discharge end projecting through said walls, a shroud positioned within the reaction chamber and extending for substantially less than the length of the reaction chamber, said shroud having a discharge opening directed toward an end wall of said reaction chamber, an exhaust pipe associated with an opposite end wall of said reaction chamber, said shroud having a closed end adjacent said exhaust pipe, certain of said exhaust tubes discharging into said shroud and certain of said exhaust tubes discharging into said reaction chamber.

3,969,894
INTERNAL COMBUSTION ENGINE

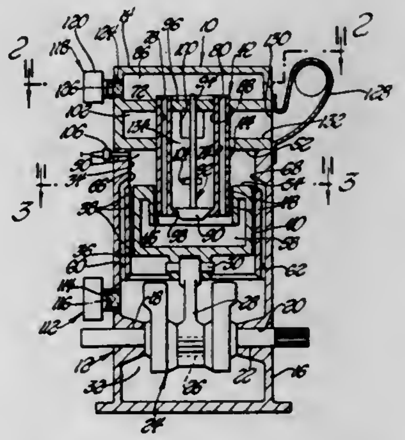
William V. Bachmann, 22517 Ten Mile Road, St. Clair Shores, Mich. 48080

Continuation of Ser. No. 452,259, March 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,161, May 30, 1973, Pat. No. 3,805,524, which is a continuation of Ser. No. 116,892, Feb. 19, 1971, abandoned.

This application Sept. 3, 1974, Ser. No. 502,640

Int. Cl.² F02B *75/10, 75/18*

U.S. Cl. 60—307 **36 Claims**

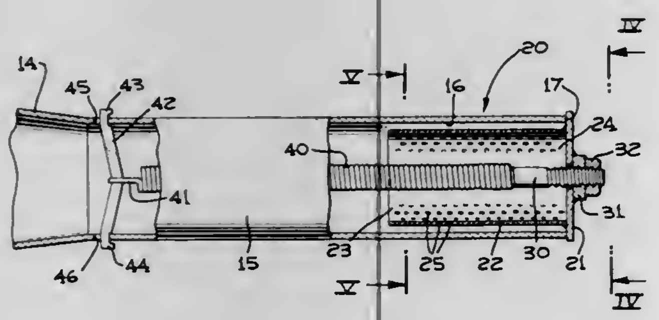


1. An internal combustion engine, comprising engine housing means, an annular cylinder formed in said housing means, said annular cylinder comprising a first radially inner annular wall and a second radially outer annular wall, combustion chamber means communicating with said annular cylinder,

cup-like ring piston means received in said annular cylinder for reciprocating movement therein, motion transmitting means operatively connected to said ring piston means for transmitting the reciprocating movement of said ring piston means to associated power output means, afterburner means situated generally radially inwardly of said first inner annular wall and in communication with the ambient atmosphere, and exhaust passage means communicating between said combustion chamber means and said radially inwardly situated afterburner means, said afterburner means being effective to receive said exhaust gases from said exhaust passage means to enable further continued combustion of said exhaust gases within said afterburner means before discharging said exhaust gases to said ambient atmosphere.

3,969,895
POWER CONTROL VALVE ATTACHMENT FOR TWO CYCLE MOTORCYCLE TYPE ENGINE EXHAUST SYSTEMS

John Krizman, 13935 Nordhoff, Arleta, Calif. 91331
Filed June 24, 1974, Ser. No. 482,010
Int. Cl.^{2} F02B *27/02*
U.S. Cl. 60—312 **2 Claims**

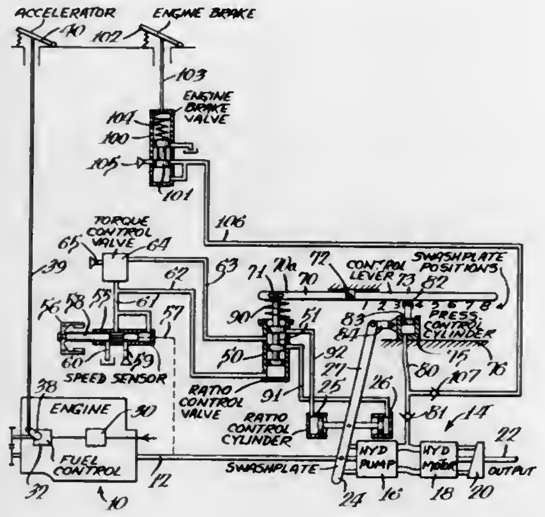


1. A power control valve attachment for assembly to a pre-existing exhaust system of a two cycle type engine for increasing the power output characteristics thereof, said exhaust system having a back pressuring chamber including an outlet duct section of a given predetermined minimum internal cross sectional area of the exhaust system duct section for effecting a given back pressuring of the engine cylinder chambers during operation of the engine, said attachment comprising:

- an assembly of pressure plate means for sensing the pressure of exhaust gases flowing out said duct section and biasing means for biasing said pressure plate means against deflective movement under pressure of said exhaust gases, said pressure plate means including a tubular member having an open end, a side wall including a plurality of ports and a closed end closed by a plate having an outer diameter larger than the internal diameter of said outlet duct section;
- means for mounting said assembly in a slip fit relationship to said outlet duct section with said tubular member extending into the open end of said outlet duct section, with said biasing means extending into said duct section and with said plate being exteriorly and biased toward said open end of said duct section; and
- means for retaining said attachment in assembled relation to said duct, whereby said pressure plate means tubular member and plate are movable under the pressure of exhaust gases from a duct section closure position wherein said plate abuts and closes the open end of said duct section to variable back pressuring positions wherein portions of said tubular member protrude from said duct section open end and said plate is axially spaced therefrom.

3,969,896
TRANSMISSION RATIO CONTROL SYSTEM

Joseph E. Louis, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.
Filed May 8, 1975, Ser. No. 575,450
Int. Cl.^{2} F15B *15/18*; F16H *39/46*
U.S. Cl. 60—431 **15 Claims**



1. A drive, comprising,

a. an engine having fuel supply means for controlling engine torque,

b. a hydrostatic transmission driven by the engine including means for setting and varying the transmission ratio,

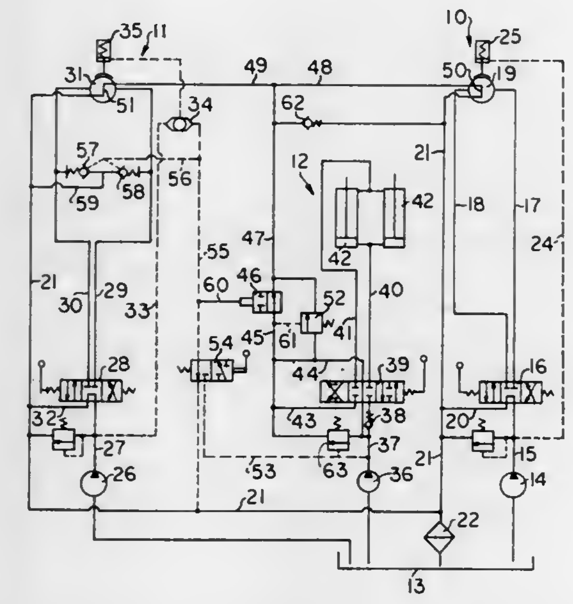
c. a ratio control valve for controlling the ratio setting and varying means,

d. means for applying a bias to the ratio control valve proportional to engine speed, and

e. means responsive to the system pressure of said hydrostatic transmission for applying an opposing bias to the ratio control valve proportional to engine torque.

3,969,897
TEMPERATURE-CONTROL ARRANGEMENT FOR A PAIR OF HYDRAULIC MOTORS

Rex T. Humphreys, Washington; Glenn J. Medina, Joliet, and Patrick A. Parker, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 28, 1975, Ser. No. 554,346
Int. Cl.^{2} F15B *21/04*
U.S. Cl. 60—456 **6 Claims**

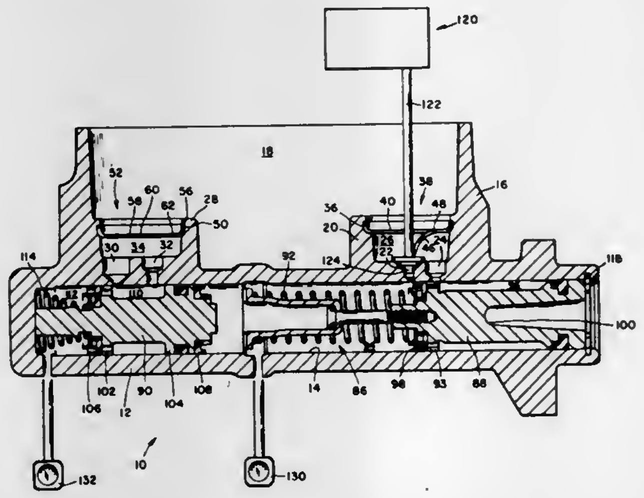


1. In a hydraulic system having a plurality of hydraulic motors operated by fluid from a common reservoir, and incorporated in a pipelayer having a movable boom, a winch suspended from said boom, an extensible counterweight for countering the load on said boom, a first circuit including a rotary hydraulic motor for operation of said boom, a second circuit including a rotary hydraulic motor for operation of said winch, and a third circuit including a motor for operation of said counterweights, and a separate pump for each of said circuits, the improvement comprising:

- circulating means for circulating a flow of fluid from said reservoir through the housings of said motors to thereby maintain a substantially equal temperature between said motors and said fluid, said circulating means including conduit means operatively connected for circulating fluid from said pump for said counterweight circuit through said rotary hydraulic motors.

3,969,898
RESERVE RESERVOIR COVER

Keith H. Fulmer, South Bend, Ind.; Raymond Kosarski, Jr., and Harold W. Hughes, both of St. Joseph, Mich., assignors to The Bendix Corporation, South Bend, Ind.
Filed June 30, 1975, Ser. No. 591,749
Int. Cl.^{2} B60T *17/22*
U.S. Cl. 60—534 **7 Claims**

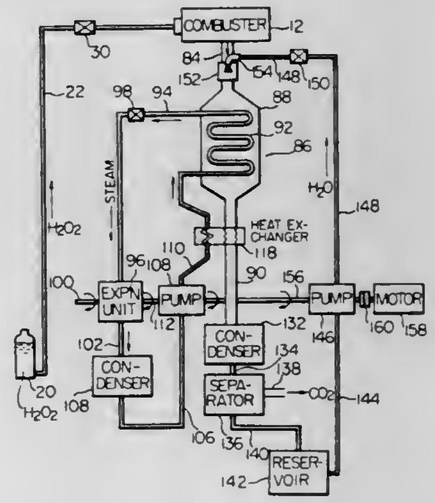


1. A master cylinder comprising:

- a housing having an axial bore therein, said housing having a projection extending therefrom to form a supply reservoir adjacent the axial bore, said housing having a first compensator port for connecting the supply reservoir to a first pressurizing chamber in the axial bore and a second compensator port for connecting the supply reservoir to a second pressurizing chamber in the axial bore;
- first shoulder means surrounding said first compensator port for establishing a first fixed retention chamber in the supply chamber;
- second shoulder means surrounding said second compensator port for establishing a second fixed retention chamber in the supply chamber;
- first cover means secured to said first shoulder means having a first flapper valve for preventing unrestricted fluid flow from the first retention chamber into the supply chamber;
- second cover means secured to said second shoulder means having a second flapper valve for preventing unrestricted fluid flow from the second retention into the supply chamber;
- piston means located in said axial bore for establishing said first and second pressurizing chambers therein; and
- actuation means responsive to an input force for sequentially moving said piston means in said axial bore past said first compensator port to produce a first pressurizing fluid in said first pressurizing chamber and past said second compensator port to produce a second pressurizing fluid in said second pressurizing chamber, a portion of the fluid in the second pressurizing chamber being transmitted through said second compensator port into said second retention chamber during the time period required to move the piston means past said first compensator port and said second compensator port, said second flapper valve means intercepting said portion of the fluid in the second retention chamber to prevent expulsion into said supply chamber.

3,969,899
FUEL BURNING APPARATUS AND HEAT ENGINE INCORPORATING THE SAME

Sadaharu Nakazawa, 30-8, Nagaham, Kanazawa, Yokohama, and Hisashi Izumi, 2-9-1-305, Nishikaigan, Tsuijido, Fujisawa, both of Japan
Division of Ser. No. 349,042, April 9, 1973, abandoned. This application Aug. 27, 1974, Ser. No. 501,088
Claims priority, application Japan, Apr. 18, 1972, 47-38266
Int. Cl.^{2} F01K *21/04*
U.S. Cl. 60—670 **14 Claims**



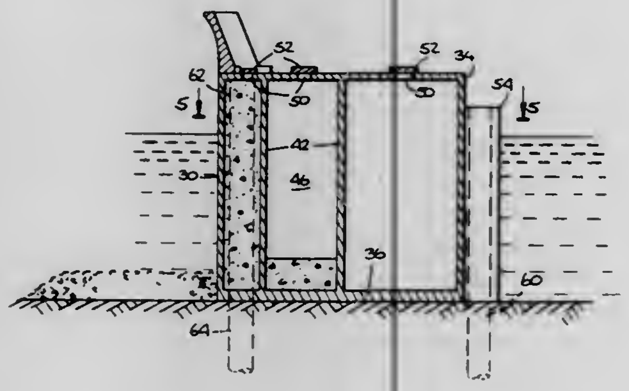
1. A steam engine comprising a combustion chamber, fuel feeding means for feeding a fuel into said combustion chamber, oxidizer feeding means for feeding into said combustion chamber hot oxidizing gases produced through exothermic decomposition of hydrogen peroxide for promoting burning of said fuel in said combustion chamber and consequently producing hot combusted gases, first water feeding means for injecting water into said combusted gases for producing working gases having a suitable end predetermined temperature and volume, an evaporator unit including an evaporation chamber communicating with said combustion chamber for receiving said working gases and at least one heat-exchange pipeline passing through said evaporation chamber, second water feeding means for feeding water into said heat-exchange pipeline for producing steam in said pipeline as water is passed through said pipeline, and a steam expansion unit having an inlet end leading from an outlet end of said pipeline for allowing said steam to expand and produce a driving force.

3,969,900
BREAKWATER CONSTRUCTION

Tomasz Plodowski, Upper Montclair, N.J., assignor to Raymond International, Inc., Houston, Tex.
Filed Aug. 29, 1974, Ser. No. 501,829
Int. Cl.^{2} E02B *3/06*
U.S. Cl. 61—4 **15 Claims**

1. A breakwater structure comprising at least one module having an upstanding wall-like surface for resisting wave action, said module being positioned such that said wall-like surface extends from below the sea surface to a location above the sea surface for encountering sea waves, said module having front and rear portions displaced from each other in a direction transverse to the plane of said wall-like surface, and a plurality of pile members connected to and extending downwardly from said front and rear portions into engagement with the sea bed therebelow to a depth sufficient to attain resis-

tance to lateral movement of said module and to resist vertical loading forces from said module, said rear portion of said module having greater buoyancy than said front portion and the pile members extending from the front portion of said



module being subjected to a greater compressive stress than the pile members extending from the rear portion of said module whereby the module is enabled to counter the forces produced on said structure by wave action.

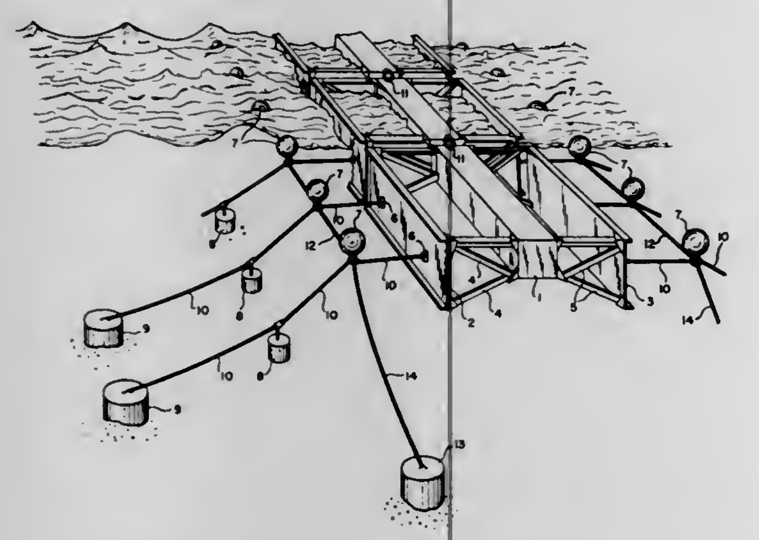
3,969,901
FLOATING BREAKWATERS
Tadashi Matsudaira, Tokyo, and Yoshihiro Mishina, Matsudo, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,178

Claims priority, application Japan, Aug. 28, 1973, 48-95769; Sept. 26, 1973, 48-107534

Int. Cl.² E02B *3/04*

U.S. Cl. 61—5 **8 Claims**



1. A floating breakwater comprising a plurality of floating breakwater units interconnected in side by side relation with each other, each of said floating breakwater units including a float, a front and rear barrier joined to the front and rear sides of said float in forwardly and backwardly spaced apart relation therewith, respectively, and anchor cables for mooring said floating breakwater unit to anchor blocks.

3,969,902
CONTRUCTION METHOD FOR CONTINUOUS ROW OF PILES AND EARTH DRILL FOR USE THEREFOR
Yoshio Ichise, and Akio Yamakado, both of Tokyo, Japan, assignors to Yoshino Ichise, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,246

Claims priority, application Japan, July 23, 1973, 48-83450; June 29, 1974, 49-76663[U]

Int. Cl.² E02D *29/00, 5/20*

U.S. Cl. 61—35 **12 Claims**

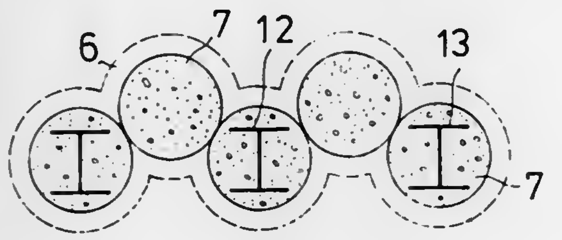
1. A method for forming a continuous row of piles comprising the steps of:

boring a first hole in the ground;

hardening the ground surrounding said first hole by forcing a ground hardening liquid under high pressure into said ground surrounding said first hole;

filling said first hole with mortar;

boring a second hole adjacent said first hole;



hardening the ground surrounding said second hole by forcing a ground hardening liquid under high pressure into said ground surrounding said second hole, a portion of the ground surrounding said first and second holes being common to both said holes;

filling said second hole with mortar, and

repeating said steps of forming said piles until a row of piles has been completed.

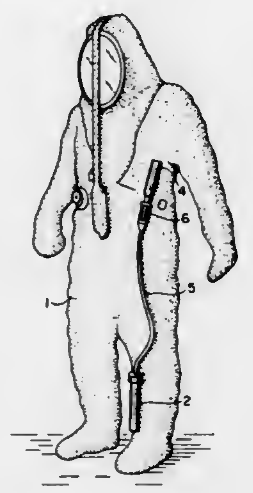
3,969,903
UNDERWATER ESCAPE APPARATUS
Gérald Marc Albert Boisrayon, Le-Beausset; Gilbert Marius Henri Martin, La Seyne-sur-Mer, and Edmond G. Fagnen, Toulon, all of France, assignors to Etat Francais, Paris Armies, France

Filed May 20, 1975, Ser. No. 579,215

Claims priority, application France, Aug. 22, 1974, 74.28787

Int. Cl.² B63C *9/00*

U.S. Cl. 61—70 **8 Claims**



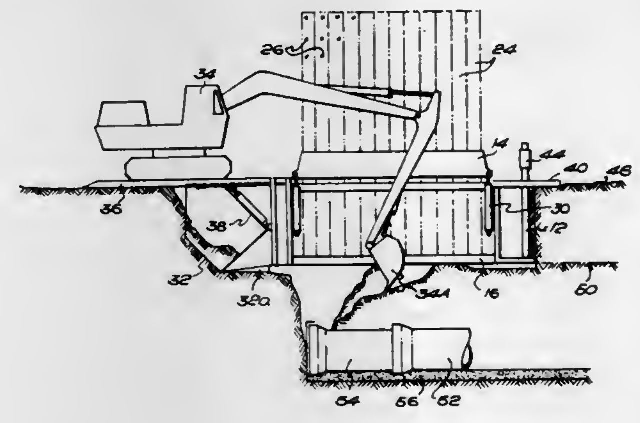
1. Underwater escape apparatus intended for use in conjunction with an underwater escape suit provided with means for imparting to the suit an ascent velocity to permit escape from an underwater location to the water surface, said apparatus comprising a container adapted to be fixed to the suit, ascent retarder means normally inside said container but movable from said container to retard the ascent of a suit to which the container is fixed, pressure responsive means carried by said container for, when pressurized, moving said ascent retarder means from said container, a pressure gas cylinder adapted to be carried by the suit and connected to said container by flexible conduit for pressurizing said pressure responsive means so as to effect movement of said ascent retarder means from said container, obturating means normally closing off fluid communication through said conduit between said container and said gas cylinder, and water depth responsive trigger means adapted to be carried by the suit for automatically triggering opening of said obturating means as soon as immersion depth becomes smaller than a predetermined threshold depth, whereby to effect operation of said ascent retarder means and hence reduction of ascent velocity during ascent from said threshold depth.

3,969,904
METHOD OF LAYING A PIPELINE IN A TRENCH
Anthony Ronald Seaton Morrice, Harrogate, England, assignor to Hudswell Morrice Ltd., Leeds, England

Filed Feb. 11, 1974, Ser. No. 441,713

Int. Cl.² F16L *1/00;* **E21D** *7/00*

U.S. Cl. 61—106 **3 Claims**



1. A method for the laying of the pipeline in a ground trench comprising the steps of

a. excavating a first pilot trench below ground level,

b. inserting into said pilot trench a trench shoring frame that provides lateral barriers to the inward movement of the sides of the pilot trench,

c. inserting a plurality of vertically disposed plate means downwardly into said pilot trench along two lines which are inwardly of and substantially parallel to the aforesaid lateral barriers,

d. forcing said two lines of plate means vertically downwardly into the earth to a level substantially below the level of the bottom of said pilot trench,

e. excavating the material between said two lines of plate means so as to form a second trench disposed below said pilot trench so that the sides of said second trench are fully supported by said two lines of plate means, the width of said second trench being less than the width of said pilot trench so that a ledge is formed between the bottom of said pilot trench and the top of said second trench,

f. inserting a pipe section into said second trench,

g. withdrawing said two lines of plate means vertically upwardly, and

h. supporting said trench shoring frame by ground level supporting means while advancing the trench shoring frame horizontally into an area which has been excavated for said first pilot trench, said advancement being achieved by applying hydraulic pressure between said trench shoring frame and a substantially stationary wall of earth.

3,969,905
METHOD AND APPARATUS FOR LAYING PIPELINES
Claudio Dolza, Strada del Nobile, 36-Turin, Italy

Filed Dec. 23, 1974, Ser. No. 535,672

Claims priority, application Italy, Jan. 22, 1974, 67169/74

Int. Cl.² F16L *1/00*

U.S. Cl. 61—111 **11 Claims**

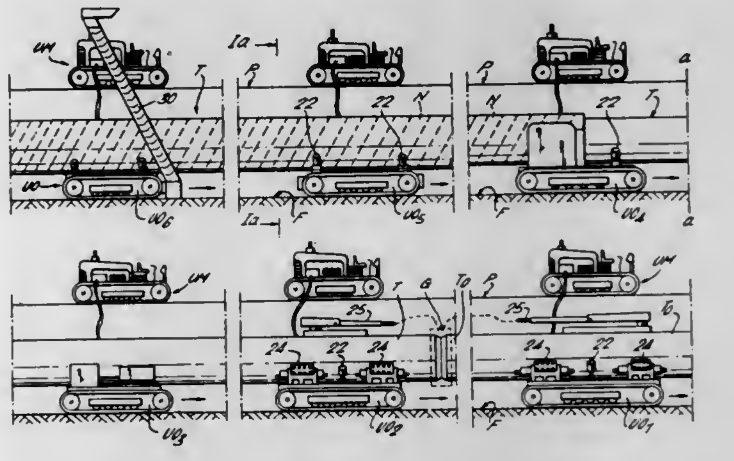
1. A method of laying large diameter pipelines, especially oil pipelines of, for example, one to two meters in diameter, comprising the steps of:

preparing an elongated excavation to receive a pipeline along the axis thereof;

supporting the end of an already completed length of pipeline on at least one operating trolley movable along the bottom of the excavation in which the pipeline is being laid;

lowering an additional length of pipeline into the excavation on to at least one further operating trolley movable along the excavation bottom ahead of the already completed pipeline;

positioning the end of the additional pipeline length in juxtaposition with the end of the already completed pipeline by use of the operating trolleys and utilizing welding equipment carried by the operating trolleys to weld the additional pipeline length to the already completed pipeline while the pipelines are in the excavation;



supplying power to the operating trolleys for movement thereof and for operating the welding equipment thereon from service vehicles movable along a service path outside of and to the side of the excavation; and

advancing the operating trolleys along the bottom of the excavation after connection of the additional pipeline length has been completed, so that said at least one operating trolley lays a further portion of completed pipeline on to the bottom of the excavation and said at least one further operating trolley is advanced ahead of the completed pipeline ready to receive a further pipeline length to be connected and laid on the bottom of the excavation.

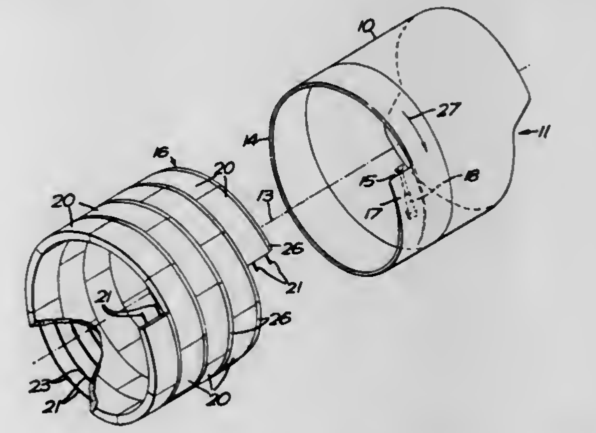
3,969,906
TUNNELLING SHIELDS
Rupert John Sidney McBean, Croydon, England, assignor to Charcon Tunnels Limited, Great Britain

Division of Ser. No. 336,332, Feb. 27, 1973, Pat. No. 3,850,000. This application Sept. 13, 1974, Ser. No. 505,947

Claims priority, application United Kingdom, Mar. 2, 1972, 9751/72

Int. Cl.² E01G *3/00*

U.S. Cl. 61—85 **2 Claims**



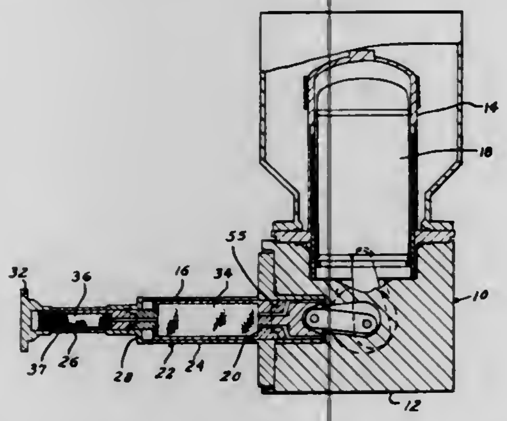
1. An arcuate tunnel lining segment for a spiral tunnel lining, the segment having circumferential edges which extend along parallel spiral paths, each edge having an outerside and an inner side; and a single rebate formed along the outer side of only one of the circumferential edges of the segment to receive a spiral trailing edge of a tunnelling shield so that the

outside dimensions of the shield and the segment are substantially the same as the dimensions of the tunnel being formed so that no grouting is necessary between the outerside of the lining and the tunnel, the rebate having a radial depth which is relatively small in relation to the radial depth of the remainder of said one edge so that a bearing surface is provided on said one edge for action of hydraulic rams on said one edge to move the shield forward as the tunnelling advances, the other circumferential edge of the segment being plain.

3,969,907
COLD CYLINDER ASSEMBLY FOR CRYOGENIC REFRIGERATOR

Richard D. Doody, Culver City, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,767
Int. Cl.² F25B *9/00*
U.S. Cl. 62—6 **3 Claims**



1. In a two-stage Vuilleumier cycle cryogenic refrigerator system; a cold cylinder assembly, comprising: an outer cylindrical member having a first portion, with a large diameter and a second portion, with a smaller diameter; a radial wall member interconnecting the large diameter portion of the cylindrical member to the smaller diameter portion, and forming the end wall for a first expansion volume adapted to be connected to a first heat load; an end member closing the smaller portion of said outer cylindrical member; said end member being adapted to be connected to a second heat load; a displacer member within said outer cylindrical member; said displacer having a first portion of a larger diameter adapted for movement within the larger diameter portion of the outer cylindrical member and a second portion of a smaller diameter adapted for movement within the smaller diameter portion of the outer cylindrical member; a first regenerator in the first portion of said displacer; a second regenerator in the second portion of said displacer; means for providing a gas flow path into said first regenerator; means, in said displacer between the first regenerator and the second regenerator for providing a first gas flow path to said second regenerator and a second gas flow path for impingement on said radial wall member; means adjacent the end of said second regenerator for providing a gas flow for impingement on the end member closing the smaller portion of the outer cylindrical member

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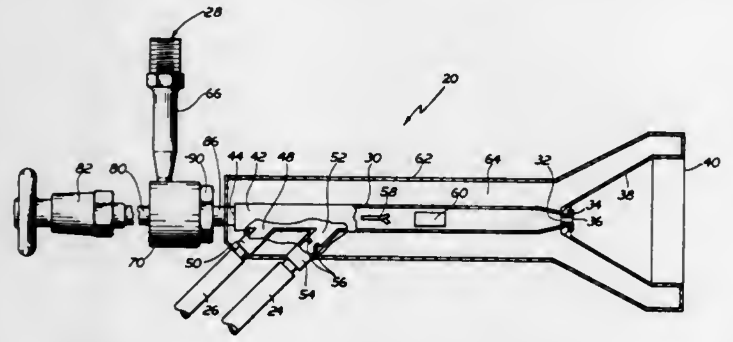
3,969,908
ARTIFICIAL SNOW MAKING METHOD

John F. Lawless, 753 Elizabeth Road, Rydal, Pa. 19046; Leonard J. Ohrin, 2211 Hillthorpe St., Roslyn, Pa. 19001, and William M. Emery, 36 Red Maple Lane, Levittown, Pa. 19055

Filed Apr. 29, 1975, Ser. No. 572,778
Int. Cl.² F25C *3/04*
U.S. Cl. 62—74 **7 Claims**

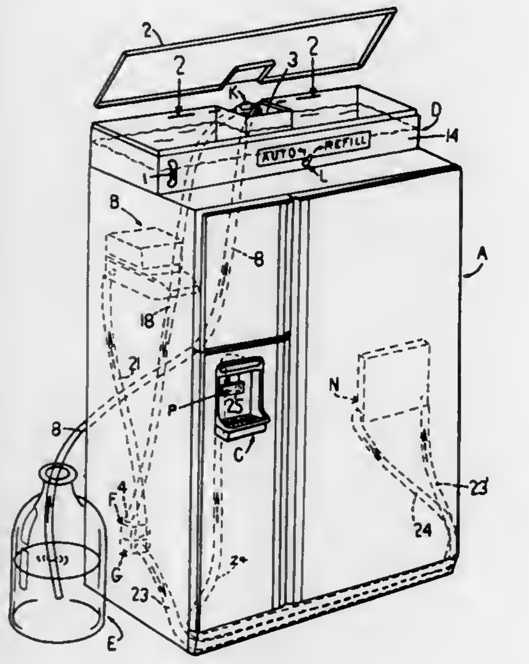
1. Apparatus for producing artificial snow and for providing the same to the ambient atmosphere comprising a thermally insulated mixing chamber, first means for providing water in the form of atomized droplets to said chamber, second means for providing first cold, compressed air to said chamber for expansion therein, third means for effectively cooling said first compressed air such that when said first compressed air expands in said chamber it is effective to reduce the temperature of said water droplets substantially below the freezing point of water, whereupon said water droplets instantly freeze, said third means comprising a Vortex tube having second compressed air supplied thereto and operative for causing the second compressed air to flow in a gyratory, helical motion therethrough, whereupon a portion of said air exits said tube at temperatures substantially below the freezing point of water, and nozzle means connected to said chamber and through which said artificial snow exits to the ambient atmosphere.



3,969,909
REFRIGERATOR WATER RESERVOIR ASSEMBLY FOR THE AUTOMATIC ICE MAKER AND THE ICE WATER DISPENSER

Robert W. Barto, 2019 Duval Lane, Hayward, Calif. 94545, and Leonard A. Brown, 13229 Casa Vista, Poway, Calif. 92064

Filed Jan. 13, 1975, Ser. No. 540,553
Int. Cl.² F25C *1/04*
U.S. Cl. 62—179 **3 Claims**



1. A refrigerator having an automatic ice maker unit with a first water conveying conduit communicating with said unit and having a solenoid valve which will automatically open when the ice maker needs water;

a. a water reservoir containing water;
b. a motor driven pump that has a water inlet communicating with the water in said reservoir, said pump having a water outlet second conduit communicating with said solenoid valve; and
c. a water pressure sensitive switch in communication with said pump outlet, said switch being set to connect said motor to a source of electricity for starting the motor and pump automatically when the water pressure in said pump outlet second conduit drops below a predetermined point;
d. whereby when said automatic ice maker unit starts operating and needs additional water to make ice it will open said solenoid valve and draw on the pressurized water in said water outlet second conduit for reducing the pressure therein and cause said water pressure sensitive switch to automatically close an electric circuit to said motor for operating said pump for feeding water from said reservoir through said pump and said water outlet second conduit through said valve and said first water conveying conduit to said automatic ice maker, the water flow continuing until said automatic ice maker unit completes its cycle and shuts off and until the water pressure in said second water conveying conduit builds up to the predetermined water pressure whereupon said pressure sensitive switch will open the electric circuit to said motor and will stop both the motor and the pump.

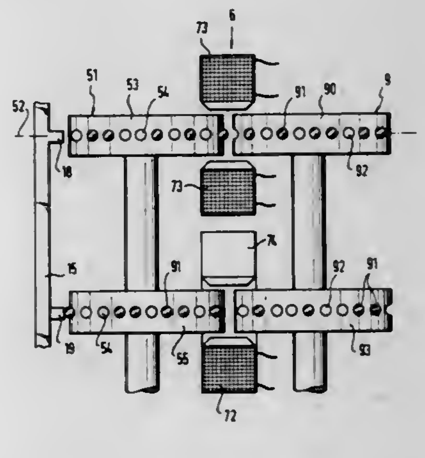
3. A refrigerator having an automatic ice maker unit and an ice water dispensing unit with a first water conveying conduit communicating with said ice maker unit and having a first solenoid valve which will automatically open when the ice maker requires water;

a. a second water conveying conduit communicating with said ice water dispensing unit and having water in said second conduit, and a second solenoid valve which will open when a water dispensing lever is depressed for delivering ice water, the depressing of said lever closing a switch which causes an electric current to open said second solenoid valve;
b. a water reservoir containing water;
c. a motor driven pump having a water inlet communicating with the water in said reservoir, said pump having a third water outlet conduit communicating with both of said solenoid valves;
d. a water pressure sensitive switch in communication with said pump outlet, said pressure switch being set to connect said motor to a source of electricity for starting the motor and pump automatically when the water pressure in said pump outlet conduit drops below a predetermined point;
e. whereby when said automatic ice maker unit starts operating and needs additional water to make ice it will automatically open said first solenoid valve and draw on the pressurized water in said first water outlet conduit for reducing the pressure therein and cause said pressure sensitive switch to automatically close an electric circuit to said motor for operating said pump for feeding water from said reservoir through said pump and said pump water outlet conduit thence through said first solenoid valve and said first water conveying conduit to said automatic ice maker, the water flow continuing until said automatic ice maker unit completes its cycle and shuts off said first solenoid valve and until said third water conveying conduit builds up to the predetermined water pressure whereupon said pressure sensitive switch will open the electric circuit to said motor and will stop both the motor and pump; and
f. whereby when said ice water dispenser lever is depressed for dispensing ice water it will close said lever actuated switch for opening said second solenoid valve and draw on the pressurized water in said third pump water outlet conduit for reducing the water pressure therein and cause said water pressure sensitive switch to automatically close an electric circuit to said motor for operating said pump for feeding water from said reservoir through said pump and its water outlet conduit, thence through said second solenoid valve and said second water conveying conduit to said ice water dispenser, the water flow continuing until said lever is released and opens the lever switch and until the water pressure in said second water conveying conduit and said third pump water outlet conduit to build up to the predetermined water pressure whereupon said water pressure sensitive switch will open the electric circuit to said motor and will stop both the motor and the pump.

3,969,910
SELECTION APPARATUS FOR PATTERN CONTROL ELEMENTS

Franz Deisinger, Ingolstadt; Gert Hüsges, Zuchering, Seehof; Erich Bock, Feldkirchen; Heinrich Niestroj, and Detlef Henzgen, both of Ingolstadt, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed May 30, 1974, Ser. No. 474,579
Int. Cl.² D04B *15/74, 15/76*
U.S. Cl. 66—50 R **7 Claims**



1. In a textile machine having a series of substantially equally spaced textile processing implements, program means for indicating sequence of selection of the processing implements, a plurality of selector elements, each movable between an inoperative and an operative position for selecting processing implements in accordance with the program means, selector element store means for receiving the selector elements in their inoperative positions, and selector element support means for supporting the selector elements in their operative positions and including socket means for receiving the selector elements, the socket means being spaced apart and defining a pitch corresponding to the pitch of the textile processing implements, apparatus for selectively moving the selector elements between their inoperative and operative positions comprising a first disc in the selector element store means including first magnet means for maintaining unselected selector elements on said first disc, a second disc in the selector element support means carrying the socket means and including second magnet means for maintaining selected selector elements on said second disc, said discs being disposed with an arc of said first disc adjacent to an arc of said second disc between which arcs selector elements are transferred, said first and second magnet means being of opposite polarity, and third magnet means for transferring selector elements along a path between said first disc arc and said second disc arc.

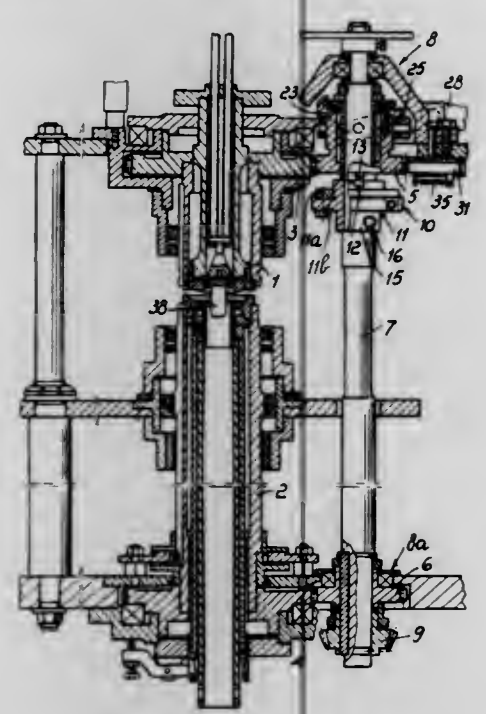
3,969,911
TOE CLOSER

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Faust, Tiberio) S.n.c., Bresica, Italy

Filed Jan. 31, 1975, Ser. No. 545,869
Claims priority, application Italy, Feb. 6, 1974, 20229/74
Int. Cl.² D04B *15/02*
U.S. Cl. 66—95 **9 Claims**

1. A circular knitting machine for stockings with a lower and an upper support structure for knitting elements, said upper and lower support structure being rotationally operated by corresponding gear wheels arranged on a common drive shaft, and with a coupling joint between at least one of said

gear wheels and said drive shaft, wherein said coupling joint comprises a substantially flanged element rigid with said drive shaft and provided with means for removable engagement with said one gear wheel and said one gear wheel is mounted rigidly and axially displaceable on said drive shaft, the machine further comprising means for the axial displacement of said one gear wheel to a position of disengagement from said substantially flanged element, said means being responsive to a machine program.



3,969,912
PATTERNING MEMORY FOR CIRCULAR KNITTING MACHINE

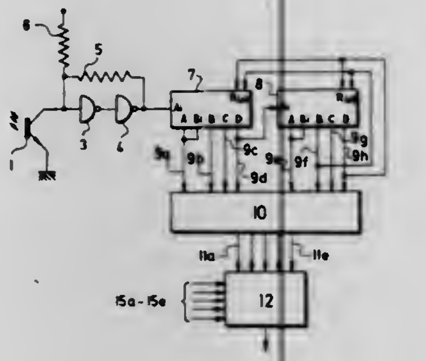
Ivo Kouklik, Trebic, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed July 8, 1974, Ser. No. 486,322

Claims priority, application Czechoslovakia, July 12, 1973, 5009-73

Int. Cl.² D04B *15/66*

U.S. Cl. 66—154 A **5 Claims**



1. In a circular knitting machine having a plurality of needles operable to knit yarn into a plurality of loops in wales and courses, a patterning memory having means for the storage of a knitting pattern and an output for the control of the needles with respect thereto derived from an input based upon the position of the needles and the particular course of the knitwork, the improvement for reading said patterning memory comprising means for counting the passage of both said needles and said courses from an initial point, said counters having a capacity to read the total number of needles and the total course passage from said initial point and said patterning memory having a capacity significantly smaller than said total number of needles and the total course passage, and a decoder interposed between each of said counters and said inputs of said patterning memory to reduce the output of said counters to the capacity of said patterning memory.

3,969,913
CONTRA-FLOW WASHING MACHINE

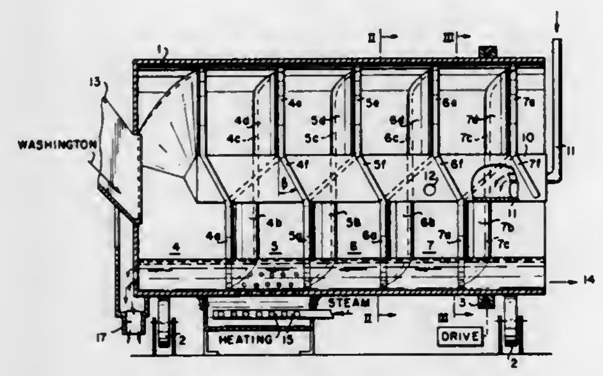
Karl Schaper, Triftstr. 25, D 3203 Sarstedt, Germany

Filed Oct. 21, 1974, Ser. No. 516,432

Claims priority, application Germany, Oct. 22, 1973, 7337934[U]

Int. Cl.² D06F *37/08*

U.S. Cl. 68—143 **2 Claims**



1. A contra-flow washing machine comprising a horizontal drum, driving means for rotating said drum for washing by oscillatory motion alternatively in one direction and in reverse direction and for driving and conveying motion of the washing in a single direction only, a plurality of partition means for subdividing each cross section part of the interior of said drum into a plurality of zones of washing and for conveying the washing from one of said zones of washing into the next adjacent one, a plurality of partition means within each cross section of said drum, each of said partition means including a flat partition part transverse to the axis of the drum and a following guide part spirally inclined to said flat partition part inside the drum, of which at least one part is disposed within the range of oscillatory motion of the drum for the washing process.

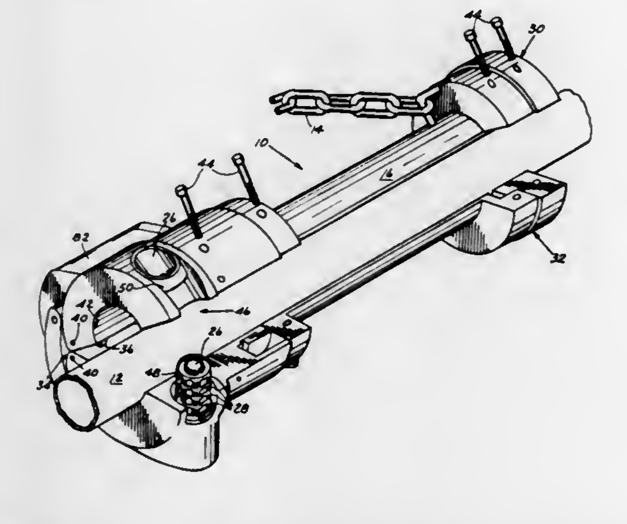
3,969,914
FLEXIBLE CORD LOCKING DEVICE

Robert S. Dennen, Littleton, Colo., assignor to Recreational & Scientific Devices, Inc., Littleton, Colo.

Filed July 21, 1975, Ser. No. 597,525

Int. Cl.² B62H *5/00*

U.S. Cl. 70—234 **12 Claims**



1. A flexible cord locking device adapted to be clamped on a bar comprising co-operating first and second body portions having hinge means for pivotally interconnecting said body portions along one side thereof, said body portions co-operating to define throughout the length thereof a recess through which a support bar upon which the locking device is to be mounted is received, means for securing said body portions in clamped relationship including locking portions on said first and second body portions which co-operate when the body portions are brought together to define a locking channel, a cord reel having separable first and second sections supported on said body portions for rotation relative thereto, a flexible cord secured at one end to said reel and having a lock bolt connected to the free end thereof, releaseable locking means associated with said locking channel and operable to engage and lock said locking bolt when inserted into said locking channel to thereby secure the flexible cord to said body portions and prevent opening of said body portions.

3,969,915
LOCK

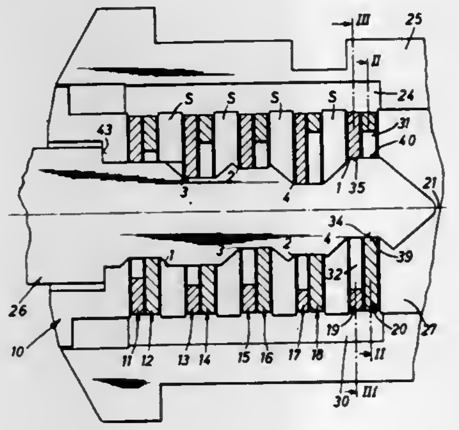
Klaus Droske, Gifhorn, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Aug. 23, 1974, Ser. No. 500,193

Claims priority, application Germany, Sept. 29, 1973, 2349182

Int. Cl.² E05B *15/14, 19/06, 29/06*

U.S. Cl. 70—364 R **4 Claims**



1. In a cylinder lock, the combination which comprises:

a. a non-rotatable part having an axially extending chamber and recess means communicating with said chamber;

b. a plug arranged in said chamber of said non-rotatable part for rotation about an axis;

c. a reversible key axially insertable into said plug, from the same axial end thereof, while the key is in either of two angular positions;

d. a plurality of plate-shaped tumblers slidably mounted on said plug for movement transverse to said axis into and out of said recess means, said tumblers preventing rotation of said plug when at least one of said tumblers extends into said recess means, each of said tumblers having an opening through which said key, when inserted into said plug, may extend, said openings of said tumblers having respective contours which provide at least two contact edges which are next to each other and which are stepped in said transverse direction of movement of said tumblers, said tumblers being arranged in pairs, the tumblers of each pair being identical and located next to each other but oriented to occupy positions which are angularly displaced with respect to each other by 180° about said axis; and

e. spring means associated with said tumblers for continually biasing the same for movement into said recess means, the spring means associated with the two tumblers of each pair urging said two tumblers in opposite directions;

f. said key having two parallel axially extending longitudinal edges each of which engages a contact edge of at least one of said tumblers for pressing the respective tumbler against the action of its associated spring means out of said recess means, said longitudinal edges of said key being arranged at least approximately opposite each other and each engaging one contact edge of a respective one of the two tumblers of each pair, each longitudinal edge of said key when the same is inserted in the lock, and the respective contact edge of the respective tumbler engaged thereby when such tumbler is out of said recess means, being spaced the same distance from said axis such that upon interengagement of said key and tumblers, the latter are maintained out of said recess means, the distance which each longitudinal edge of said key, at the point along its length where such edge is in axial alignment with a given tumbler but is out of engagement with any contact edge thereof, is spaced from said axis being the same as the distance which the non-engaged contact edge of such tumbler is spaced from said axis, the distance which each longitudinal edge of said key is spaced from said axis being constant throughout that portion of the length of the key which, when the key is inserted in the lock, is aligned with a pair of tumblers, said longitudinal edges of said key being non-symmetrical with respect to said axis such that upon reversal of said key, that longitudinal edge of said key which, prior to reversal, did not engage one of the tumblers of a given pair of tumblers is opposite and in contact with the contact edge of such tumbler which, prior to such reversal, was not contacted.

3,969,916
ISOSTATIC PRESS

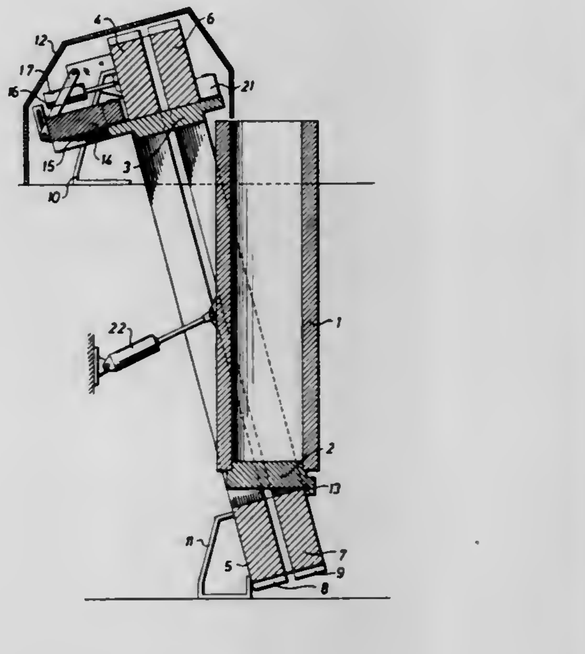
Robert Wiberg, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed May 20, 1975, Ser. No. 579,248

Claims priority, application Sweden, June 10, 1974, 7407649

Int. Cl.² B21D *26/04;* **B21C** *35/00*

U.S. Cl. 72—56 **6 Claims**



1. An isostatic press, comprising:

a frame for receiving a pressure vessel which is relatively tall in relation to its width, said pressure vessel including a movable lid for closing the vessel to enclose workpieces and tools together with a pressure fluid in said vessel, the pressure fluid being pressurized after the pressure vessel has been introduced into the frame, said frame absorbing forces substantially in the longitudinal direction of the vessel;

pivot means for pivotally coupling said frame and the pressure vessel in relation to one another; and

means for producing a relative pivoting movement between said frame and the pressure vessel so as to give access to the top end of the pressure vessel.

3,969,917
HEAT TREATMENT POTS

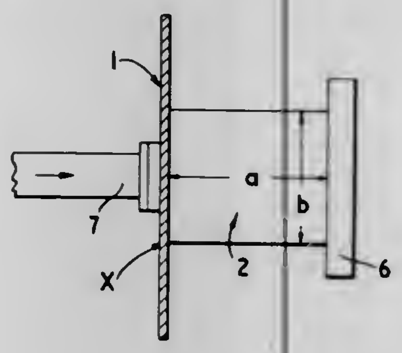
Frederick David Waterfall, Harborne, England, assignor to Frederick David Waterfall

Filed Mar. 26, 1974, Ser. No. 454,865

Claims priority, application United Kingdom, Apr. 3, 1973, 15852/73; June 30, 1973, 31266/73

Int. Cl.² B21D *22/16*

U.S. Cl. 72—69 21 Claims



1. A method of producing a heat treatment pot having sufficient strength and resistance to chemical attack to resist wall failure over a useful service life when holding molten salts, comprising: providing a circular disc blank of metal sheet of a thickness of at least about 3/16 inch, said blank comprising heat resisting nickel chromium alloy; providing a mandrel having a parallel-sided cylindrical surface and a flat circular end face; and shaping the blank into a pot having substantially parallel sides by a metal spinning process which includes, at least in the final stages, applying the blank to the flat circular end face of the mandrel, pressing a spinning element against the blank to shape the blank into engagement with the cylindrical wall of the mandrel while controlling the spinning process to produce a pot body having a depth which is not greater than 110% of the difference between the initial diameter of the disc blank and the diameter of the circular end face of the mandrel, the pot having an internal shape complementary with the mandrel.

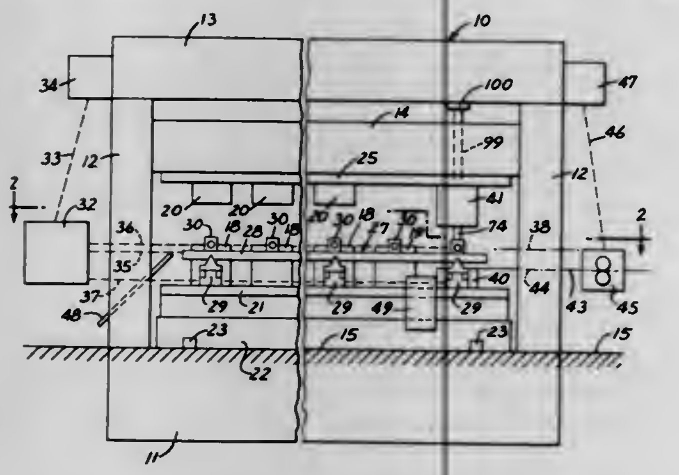
3,969,918
METHOD AND APPARATUS FOR BLANKING COIL STOCK FOR TRANSFER PRESSES

Donald E. Bernotus, Dyer, Ind., and Leo L. Levitt, Harvey, Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,548

Int. Cl.² B21D *28/00*

U.S. Cl. 72—337 31 Claims



1. A method for blanking from coil stock blanks to be supplied to and formed in a transfer press having a transfer feed line through the press along which the blanks are fed, comprising the steps of intermittently feeding the coil stock over an upwardly facing lower male blanking punch along a coil stock feed line which is located below the transfer feed line of the press, lowering a downwardly facing upper female blanking die from above the transfer feed line of the press over the male blanking punch for blanking blanks from the coil stock, raising the female blanking die above the transfer feed line of the press, elevating the blanks from the male blanking punch to the transfer feed line of the press for transfer thereof along the transfer feed line, and discharging the scrap of the coil stock along the coil stock feed line below the transfer feed line of the press.

3,969,919
WORKPIECE FEED CHANNEL

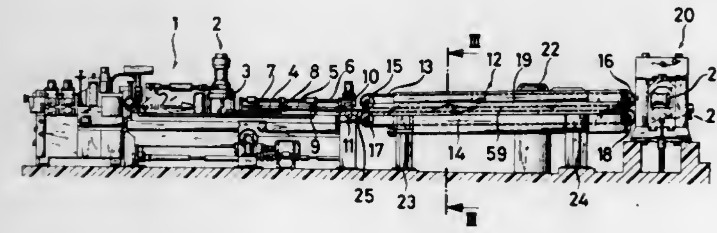
Alfons Goeke, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed July 10, 1975, Ser. No. 594,732

Claims priority, application Germany, July 12, 1974, 2433600

Int. Cl.² B21D *3/04*

U.S. Cl. 72—405 23 Claims



1. A feed channel for metal peeling machines and straightening machines for working elongated workpieces, comprising:

an elongated workpiece feed channel associated with one of said machines and having input and output ends for carrying workpieces therethrough in a predetermined direction, a workpiece handling device positioned adjacent at least one of said ends for operating on elongated workpieces having a predetermined cross-sectional size, said feed channel including a plurality of opposed pairs of profiled elements, drive means for driving said opposed pairs of profiled elements in said predetermined direction, each said pair of opposed profiled elements defining a workpiece receiving opening therebetween having a cross-sectional size approximately 1.5 to 10 times larger than said predetermined cross-sectional size of said workpiece.

3,969,920
SPLICER FOR REINFORCING BARS

Ronald Eric Marsden; Franklyn Walter Webb, and George Rukavina, all of Mississauga, Canada, assignors to Stricon Products Limited, Mississauga, Canada

Filed June 25, 1974, Ser. No. 482,927

Claims priority, application Canada, June 28, 1973, 175205

Int. Cl.² B21D *39/04*

U.S. Cl. 72—415 6 Claims

1. A tool for applying radial forces to a tension splicer to deform the splicer radially into contact with adjacent end portions of reinforcing bars arranged in end-to-end alignment within the splicer, the tool comprising:

a housing;

a plunger movable longitudinally in the housing and normally in a withdrawn position;

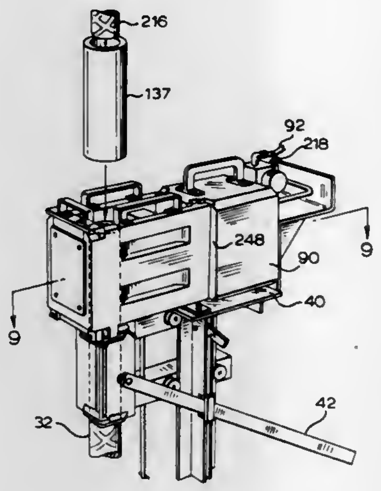
control means coupled to the housing and operable to cause the plunger to move longitudinally between an advanced position and said withdrawn position;

a die holder coupled to the plunger for movement with the plunger;

an action die disposed about a transverse axis and held in place by the die holder;

a pair of side members releasably coupled to the housing and projecting longitudinally from the housing in parallel relationship, the side members being independently movable in parallel with said transverse axis to remove the side members from the housing; and

a reaction die releasably coupled to the side members remote from the housing and disposed about a second transverse axis parallel to the first mentioned transverse axis, and movable in parallel with said transverse axes relative to the side members to remove the reaction die from the side members, the reaction die combining with the action die to compress the splicer into engagement with the end portions of the reinforcing bars upon operating the control means to move the plunger from the withdrawn position to the advanced position.



3,969,921
METAL BENDING PRESS WITH REMOVABLE UPPER BEAM

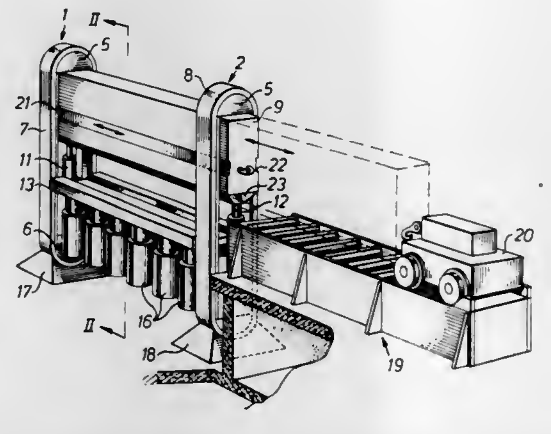
Finn L. Jonsson, Ystad, and Rune G. Adolfsson, Boras, both of Sweden, assignors to AB Carbox, Ystad, Sweden

Filed Mar. 31, 1975, Ser. No. 563,308

Claims priority, application Sweden, Apr. 5, 1974, 7404632

Int. Cl.² B21J *9/12*

U.S. Cl. 72—453.06 11 Claims



1. A press, particularly for press bending of plates, comprising:

two spaced apart end frames (1, 2), each of said end frames (1, 2) including two spaced apart columns (3, 4) interconnected at the top and bottom via yokes (5, 6), and a tension biased wire bandage (7, 8) surrounding and pressing together said columns and yokes to form a force-absorbing frame;

upper and lower beams (9, 10) mounted between said end frames (1, 2) with a press gap being formed between said upper and lower beams, end portions of said beams being received in the respective spaces formed between said spaced apart columns of said end frames and said upper beam (9), in its unloaded state, being arranged to be laterally movable relative to said end frames (1, 2) through said space in at least one end frame (2) to permit the removal and reinsertion of a workpiece in the press;

means (11, 12) for forcing said upper beam (9), in the working position thereof, towards the upper yokes (5) of the end frames (1, 2); and

hydraulic cylinder means (16) loadably mounted along both sides of said lower beam (10) and including means for supporting a pressing tool (13) which has at least two force carrying surfaces (14, 15) located on respective opposite sides of a longitudinal center line of said lower beam (10) and extending over a substantial length of said pressing tool (13), said hydraulic cylinder means (16) being operable for selectively raising and lowering said pressing tool (13) relative to said upper beam (9), said hydraulic cylinder means (16) being mounted substantially in registration with said force carrying surfaces (14, 15) of said pressing tool (13) for supporting said pressing tool (13) substantially along said force carrying surfaces (14, 15) thereof.

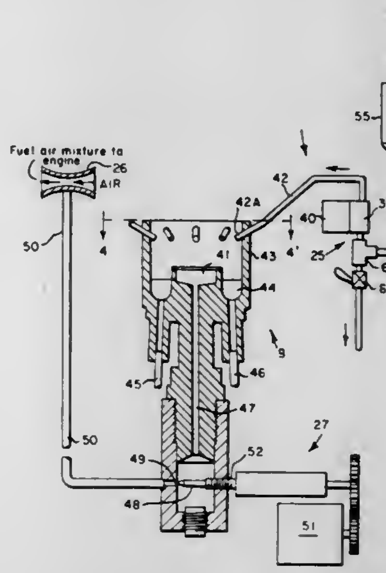
3,969,922
APPARATUS FOR FEEDING FUEL TO AN ENGINE

W. Barry Baker, Newark; John Charles Kochur, New Castle, both of Del., and Estel McKinley Stoneman, Pennsville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 19, 1975, Ser. No. 588,644

Int. Cl.² G01L *23/22;* F02M *43/00*

U.S. Cl. 73—35 2 Claims



2. In an apparatus for determining the octane numbers of fuels of unknown octane numbers that are fed to a knock test engine from a source of each fuel of known and unknown octane numbers wherein said knock test engine generates knock intensity signals for each fuel of known and unknown octane numbers over a range of fuel feed-rates, said apparatus comprising:

fuel feed means adapted to feed a fuel of known octane number and a fuel of unknown octane number to the test engine,

a knock intensity receptor that accepts knock intensity signals from the test engine and transmits them to memory means,

memory means that store knock intensity signals transmitted by the receptor and transmit such signals to the calculating means,

calculating means that compare knock intensity signals of known and unknown octane fuels to determine unknown octane numbers,

wherein the improvement comprises said fuel feed means having a feeding apparatus between the fuel source and the knock test engine by means of which there is cooperation between the furl source and a spill chamber surrounded by an overflow trough, through a feed line having an on-off valve along its length and an exit to said chamber, said chamber feeding fuel to said knock test engine, said feeding apparatus characterized in that:

a. the feed line and on-off valve are related to fuel flow direction in that said feed line and on-off valve are positioned so that fuel in the feed line travels generally in a direction away from gravity pull immediately before and after passing through said valve, and

b. the feed line exit is fixedly positioned to direct a jet of fuel into the chamber when the valve is turned on and to drip leaking fuel into said trough surrounding the chamber when the valve is turned off.

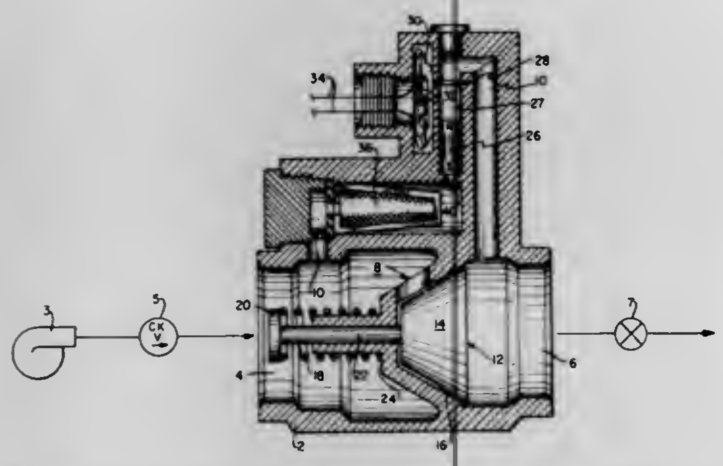
3,969,923
LEAK DETECTOR

Jack M. Howell, Lighthouse Point, Fla., assignor to Valcor Engineering Corporation, Kenilworth, N.J.

Filed Aug. 29, 1975, Ser. No. 608,826

Int. Cl.^{2} G01M *3/28*; F17D *3/04*

U.S. Cl. 73—40.5 R **7 Claims**



1. Means for detecting leaks in a closed fluid system comprising:

means comprising an inlet and outlet, and parallel main and secondary channels connecting said inlet and outlet,

sealing means in said main channel normally urged to prevent fluid flow in the main channel between said inlet and outlet, said sealing means being movable to permit such flow in response to a first threshold pressure differential between said inlet and outlet,

a sensing element with magnetic flux movably positioned in said secondary channel from a first position to a second position in response to a second threshold pressure differential applied between said inlet and outlet passages, said second pressure differential threshold being less than said first pressure differential threshold, and

switch means adjacent said magnetic flux when said sensing element is in one of said first and second positions, said switch means being responsive to said magnetic flux for indicating when the sensing element is in said one position whereby such element occupies such position whenever said second pressure differential threshold is exceeded, whereby leakage downstream of the outlet causes a pressure drop across said secondary channel sufficient to move the sensing element to its second position. such movement being detected by the switch means.

3,969,924
FLUID FLOW CONTROL APPARATUS AND METHOD

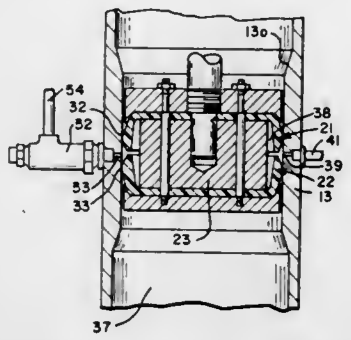
Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed May 2, 1975, Ser. No. 573,904

Int. Cl.^{2} G01M *3/28*

U.S. Cl. 73—46 **9 Claims**

1. In a fluid flow control apparatus, a sleeve having an inner cylindrical surface and a converging entrant portion at at least one end of the same, means forming liquid enclosing spaces communicating with the ends of the sleeve, a plunger assembly, means serving to carry the plunger assembly for movement axially of the sleeve between positions within and retracted out of the sleeve, and sealing means carried by the plunger assembly and serving to establish a seal between said spaces when the plunger is within the sleeve, the sealing means comprising two cup-shaped seaing members of resilient material, each member having a base portion and an annular rim portion, the outer periphery of the rim portion having an annular sealing area located intermediate the base portion and the free edge of the rim portion, the rim portion when relaxed being of a diameter greater than the inner diameter of the sleeve and being contracted with radial flexing of the rim when moved to a position within the sleeve with said area in sealing engagement with the inner sleeve surface, said cup-shaped sealing members being spaced along the axis of the plunger and having the free edges of their rim portions faced toward each other, and means for mounting the sealing members, said means forming a closed annular space surrounded by the rims of the sealing members, successive contraction and radial flexing of the rim portions as the plunger is moved into the sleeve serving to trap liquid thereon under pressure greater than the static pressure in the space from which the plunger is moved, said pressure serving to urge the rim portions in an outward radial direction to press said sealing means against the inner sleeve surface.



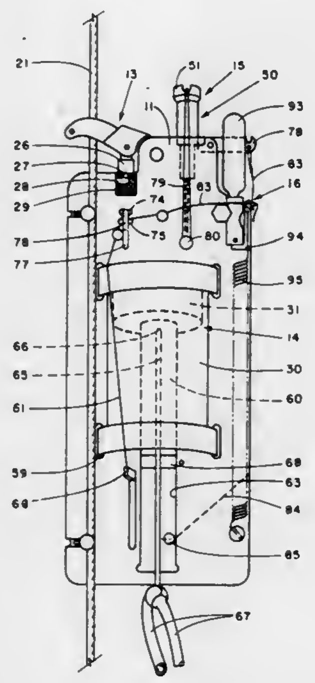
3,969,925
IN SITU OCEANOGRAPHIC SAMPLE SEPARATOR

Shale Jack Niskin, Miami, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 16, 1975, Ser. No. 613,843

Int. Cl.^{2} G01N *15/00*

U.S. Cl. 73—61 R **17 Claims**



1. A deep water sampling device and in situ separator of particulate matter comprising:

a cylindrical sample chamber having end closure means;

means for admitting ambient water into said chamber at a selected depth;

a labeling liquid in said device and means for introducing said liquid in situ into said chamber upon said chamber receiving a selected volume of ambient water;

means for retaining particulate matter in said device upon evacuation of said volume of water; and

means for evacuating in situ said volume of water, whereby particulate matter may be separated from a water sample in situ and examination and counting thereof may be commenced as soon as said device is retrieved and said retaining means is removed from the device.

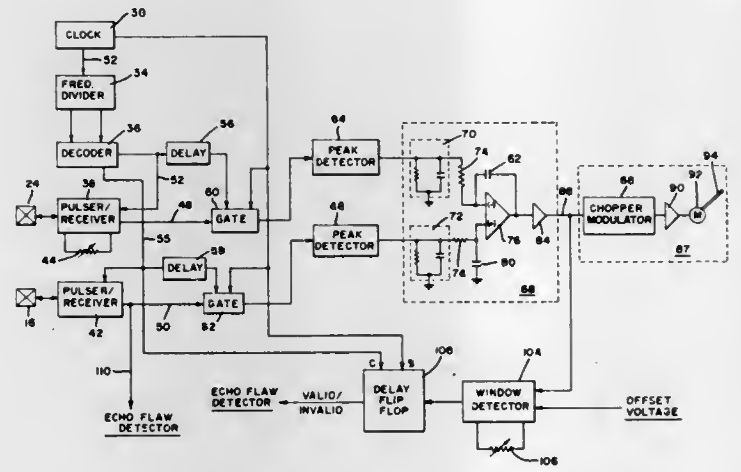
3,969,926
ALIGNMENT OF ULTRASONIC TRANSDUCER PROBE IN PULSE-ECHO TESTING

Philip A. Walker, Trumbull, and Karl G. Walther, Ridgefield, both of Conn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Mar. 27, 1975, Ser. No. 562,550

Int. Cl.^{2} G01N *29/04*

U.S. Cl. 73—67.8 S **17 Claims**



1. An apparatus for use in immersion pulse-echo ultrasonic testing comprising:

transducer means comprising a test probe means and alignment determining probe means disposed in fixed spatial relationship with each other and each providing when energized and acoustically coupled to a workpiece respective ultrasonic energy beams whose axis are converging toward a point upon a workpiece to be tested and form an acute angle with respect to each other;

means coupled to said transducer means for cyclically energizing said transducer means for causing said transducer means to transmit ultrasonic search signals toward the workpiece and receive in response thereto echo signals arising from such search signals being incident upon a selected surface of the workpiece;

means coupled to said transducer means for receiving said echo signals and providing in response thereto an output signal commensurate with the deviation of the beam axis of said test probe from a predetermined angle of incidence upon a selected surface of the workpiece, and

positioning means coupled to said transducer means and receiving said output signals for positioning said transducer means responsive to said output signal.

3,969,927
VIBRATION MEASURING AND THE APPARATUS THEREFOR

Masafumi Yoshida; Naohiro Murayama, and Hiroshi Obara, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

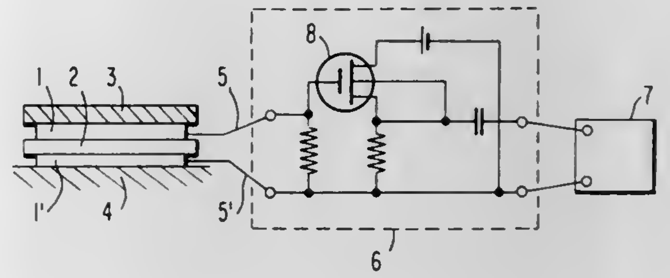
Filed Aug. 8, 1974, Ser. No. 495,740

Claims priority, application Japan, Aug. 8, 1973, 48-88959

Int. Cl.^{2} G01H *1/00*

U.S. Cl. 73—71.4 **3 Claims**

1. A method of measuring or detecting vibration comprising uniformily contacting one of the surfaces of a piezoelectric element comprising a polarization treated polyvinylidene fluoride piezoelectric film having a metal thin film as electrodes deposited on both surfaces thereof with an object to be measured while covering the opposite surface of said piezoelectric element contacted with the object to be measured with a soft polymer film having a lower Young's modulus than said polyvinylidene fluoride piezoelectric film, and measuring or detecting the vibration of the object by the changes in the electric field caused by the vibration of the object on the surface of said piezoelectric element.



3,969,928
NON-DESTRUCTIVE TESTING METHOD FOR DETERMINING A BODY'S MECHANICAL PROPERTIES AND STRESSES

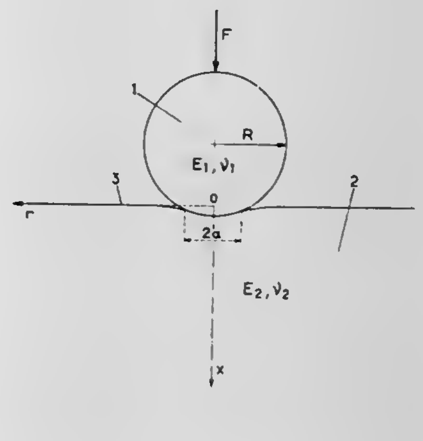
Joseph Zarka, Bagneux, France, assignor to SKF Compagnie d'Applications Mecaniques and Anvar, Agence Nationale de Valorisation de la Recherche, both of, France

Filed June 25, 1974, Ser. No. 483,022

Claims priority, application France, June 26, 1973, 73.23319; Feb. 21, 1974, 74.5884

Int. Cl.^{2} G01N *3/08*

U.S. Cl. 73—88 R **18 Claims**



1. A non-destructive testing method for determining the elastic limit of a body or part as a function of depth suitable for a part having been subjected to surface treatment comprising:

a. subjecting the surface of said part to an increasing pressure exerted by a series of punches, each punch having a contact surface with a different radii of curvature;

b. measuring the deformation in the vicinity of the punch of the surface of said part for each punch pressure;

c. measuring the force (F_{e1}) at which the deformation for each punch ceases to be elastic;

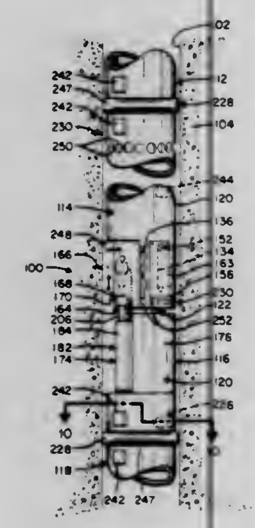
d. removing the pressure applied to each punch in order that the surface deformation to the part is reversible;

e. constructing a curve for each punch from the force (F_{e1}) data representing the relation between the main stresses as a function of depth; and

f. constructing an envelope-curve over each of said curves in step (e) whereby said envelope-curve represents the elastic limit of the part as a function of the depth.

3,969,929
DRILL MODULE FOR BOREHOLE STRESS MEASURING INSTRUMENT

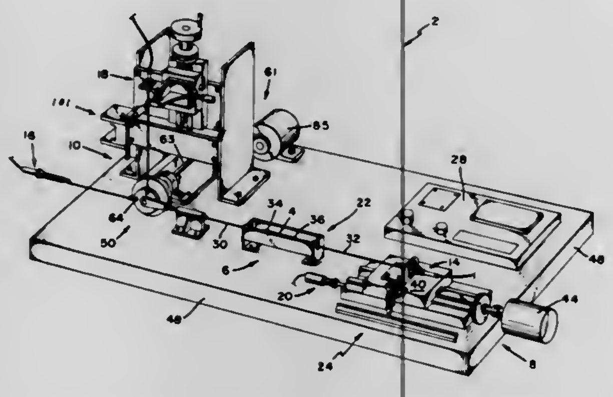
Garrett D. Shaw, Rancho Palos Verdes Peninsula, and Clyde E. Williamson, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed June 9, 1975, Ser. No. 585,428
Int. Cl.² E21B *49/00*
U.S. Cl. 73—88 E 11 Claims



1. A drill module for a holographic borehole stress measuring instrument having an elongate holographic optics module, comprising:
- an elongate support housing;
- coupling means on an end of said housing for releasably connecting the housing to one end of said optics module in end-to-end relation with said optics module;
- a drill head at said one housing end for supporting a drill with its axis transverse to the longitudinal axis of said housing;
- means supporting said drill head on said housing for extension and retraction relative to said housing along a first direction line parallel to said housing axis and along a second direction line parallel to said drill axis; and
- means for extending said drill head along said first direction line and then extending the drill head along said second direction line and thereafter retracting said drill head along said second direction line and then retracting the drill head along said first direction line.

3,969,930
TESTING VISCOELASTIC SOLIDS

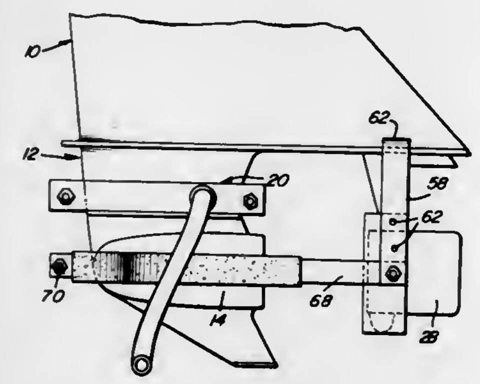
Dusan Ciril Prevorsek; Young Doo Kwon; Raj Kumar Sharma, all of Morristown, and Edward T. Gilliam, Lake Hiawatha, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.
Filed Apr. 10, 1975, Ser. No. 567,144
Int. Cl.² G01N *3/34*
U.S. Cl. 73—91 26 Claims



1. An apparatus for testing a viscoelastic material, comprising:
- a holding means connected to the material for holding the material in a predetermined position during testing;
- a pretension means coupled to the material for applying tension to the material during testing;
- a displacement generator having an eccentric means coupled to the material for applying cyclic displacement to the material; and
- a mechanical-electrical transforming means coupled to the material for transforming mechanical motion into electrical signals.

3,969,931
POWER TESTER FOR OUTBOARD DRIVE ASSEMBLIES

Charles T. Lanning, 303 NW. 10th St., Watertown, S. Dak. 57102
Filed Mar. 31, 1975, Ser. No. 563,516
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.1 14 Claims

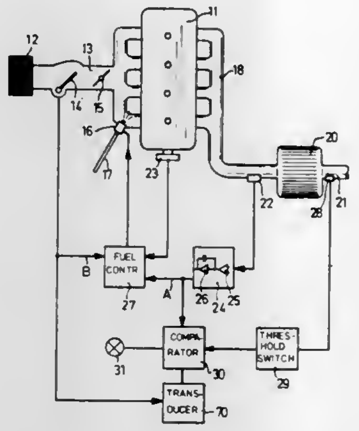


1. In combination with a marine drive assembly of the type including an upstanding power leg having a lower end gear housing extending in a front-to-rear direction and including a rotary propeller shaft projecting rearwardly outwardly from said housing adapted to have a marine propeller mounted thereon, said power leg also including a laterally outwardly projecting peripheral cavitation plate spaced above the gear housing and propeller shaft, a fluid pressure pump including a rotary input shaft, a fluid inlet and a fluid outlet means, means drivingly coupling said propeller shaft to said input shaft, control valve means operatively associated with said outlet means for variably controlling the flow of fluid from said pump through said outlet means, and mounting means connected to said pump and releasably supported from said power leg stationarily supporting said pump from said power leg.

3,969,932
METHOD AND APPARATUS FOR MONITORING THE ACTIVITY OF CATALYTIC REACTORS

Franz Rieger, Wasseralfingen; Ernst Linder, Muhlacker, and Peter Jürgen Schmidt, Schwieberdingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Aug. 13, 1975, Ser. No. 604,320
Claims priority, application Germany, Sept. 17, 1974, 2444334
Int. Cl.² G01M *15/00*
U.S. Cl. 73—118 11 Claims

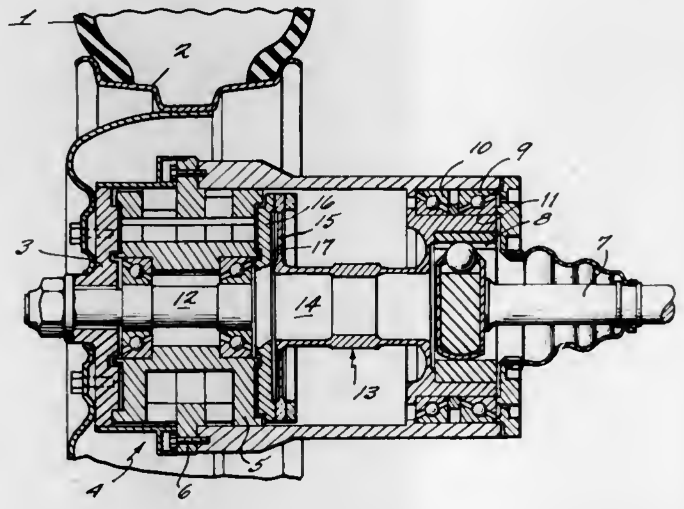
1. A method for monitoring the activity of a catalytic reactor used in association with an internal combustion engine with fuel control, comprising the steps of:
- A. providing an exhaust gas composition sensor at the inlet and at the outlet of said catalytic reactor;
- B. finding a predetermined operational state of said internal combustion engine;
- C. initiating a change of the output signals of said exhaust composition sensors; and
- D. measuring the time delay between the occurrence of the change of output signals from said exhaust composition sensors;



said time delay being an indicaton of the activity of said catalytic reactor.

3,969,933
SPRING JOINT FOR MEASURING DEVICE

Gunther Himmler, Darmstadt, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany
Filed Oct. 21, 1974, Ser. No. 516,813
Claims priority, application Germany, Dec. 18, 1973, 7344802
Int. Cl.² G01L *5/16, 5/20*
U.S. Cl. 73—133 R 2 Claims

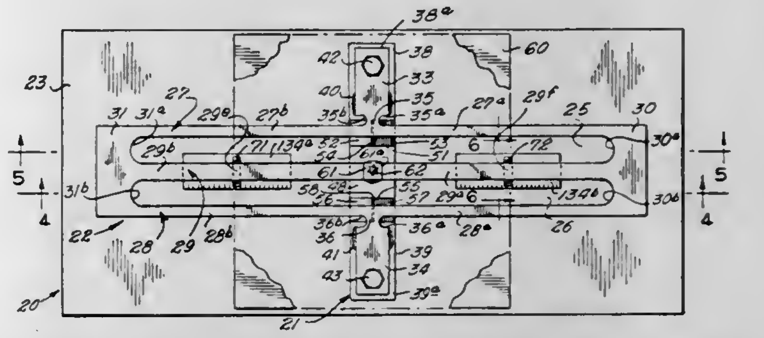


1. A homo-kinetic joint interconnecting a measuring arrangement and a drive unit, said measuring arrangement comprising a wheel shaft rotatably supported by a measuring hub that measures forces and moments acting on a wheel connected to said measuring arrangement, said joint comprising a diaphragm connected to said wheel shaft and flexible in the axial direction but rigid in a peripheral direction and a cylindrical tube coupled at one end to said diaphragm and connected at the other end to said drive unit, said tube functioning as a bar spring which, while axially rigid, is radially resilient.

3,969,934
LOAD CELL AMPLIFIER

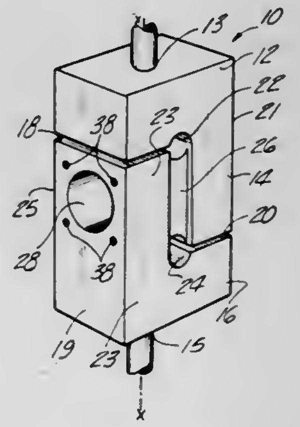
Seymour H. Raskin, P.O. Box 35549, 6901 Forest Park, Dallas, Tex. 75235
Continuation-in-part of Ser. No. 280,772, Aug. 15, 1972, Pat. No. 3,837,222. This application Sept. 16, 1974, Ser. No. 506,318
Int. Cl.² G01L *1/04*
U.S. Cl. 73—141 A 24 Claims

1. A load cell comprising: a beam having a neutral axis; a pair of bearing members spaced from and parallel to said beam; end portions connecting outer ends of said beam and said bearing members; a pair of support members spaced outwardly of the bearing members and connected at at longitudinally central portions of the bearing members for supporting the bearing members; load support means secured to said beam centrally between outer ends of said beam; an indicator arm, said indicator arm being spaced equidistantly between one end of said beam and said load support means; and means securing said indicator arm to said beam such that upon deflection of said beam the angular relationship between said indicator arm and the neutral axis of the beam at the point of attachment of the indicator arm to the beam is unchanged.



3,969,935
LOAD CELL

Ralph S. Shoberg, Farmington Hills, Mich., assignor to GSE, Inc., Farmington Hills, Mich.
Filed Oct. 29, 1974, Ser. No. 518,455
Int. Cl.² G01L *1/22*
U.S. Cl. 73—141 A 6 Claims



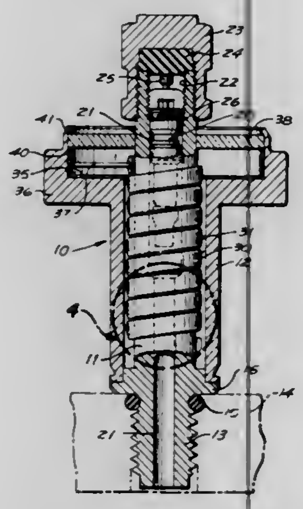
1. A single axis force transducer comprising: a solid body of high modulus of elasticity material having a longitudinal axis of sensitivity, said body being configured to define first and second longitudinally spaced transverse slots oppositely opening into the body, said slots defining first and second end portions and a central flexure portion acting as a shear-link between said end portions, a bore formed through said central portion creating stress concentrating flexure areas on opposite sides thereof, and strain gage means disposed on said flexure areas in orthogonal pairs and responsive only to shear forces in the flexure areas as a result of a load having a component applied along the longitudinal axis of the transducer, said bore being formed between said slots and perpendicular to the longitudinal axis of the transducer body.

3,969,936
INFLATION VALVE GAUGE

James E. Lindsay, 24712 Evereve Circle, El Toro, Calif. 92630
Continuation-in-part of Ser. No. 394,108, Sept. 4, 1973, abandoned. This application May 14, 1975, Ser. No. 577,173
Int. Cl.² B60C *23/04*
U.S. Cl. 73—146.8 5 Claims

1. An inflation valve gauge for connection to a pressurized means subject to high mechanical stress, said gauge comprising:

a. a tubular stem connected to the pressurized means;
b. an inflation valve sealing the tubular stem;
c. a pressure gauge tube wrapped about the stem in the form of a cylindrical helix in close proximity thereto but normally spaced therefrom a distance of the order of 0.005 to 0.010 inches and with the coils thereof normally spaced apart about 0.003 inches;
d. the gauge tube including a fixed end penetrating the stem to permit entrance of a pressure fluid into the gauge tube and a free end movable in response to pressure of the pressure fluid in the gauge tube to monitor the pressure thereof;

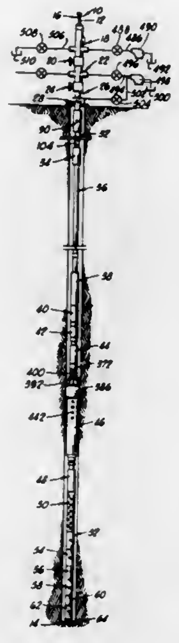


e. and a sleeve surrounding the gauge tube in close proximity thereto but normally spaced therefrom a distance of the order of 0.015 to 0.020 inches;
whereby the spacing between said gauge tube and said stem and sleeve is such that said gauge tube is elastically movable under mechanical stress into supported contact with the confronting surfaces of the tube and sleeve whereby, upon release of the mechanical stress, the gauge tube returns to its initial state to again monitor the pressure of the pressure fluid therein.

3,969,937
METHOD AND APPARATUS FOR TESTING WELLS

Burchus Q. Barrington; David L. Farley, and O. L. Morrisett, all of Duncan, Okla.; assignors to Halliburton Company, Duncan, Okla.
Continuation-in-part of Ser. No. 517,488, Oct. 24, 1974. This application Sept. 12, 1975, Ser. No. 612,841
Int. Cl.^{2} E21B *47/00*
U.S. Cl. 73—151 26 Claims

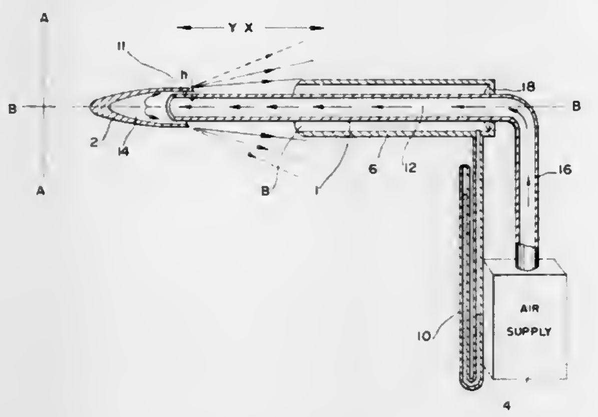
1. A method of testing a formation in a zone intersected by a well bore, comprising the steps of:
a. maintaining hydrostatic pressure on the formation with a column of first liquid in the well bore, said hydrostatic pressure exceeding the formation pressure at the zone;
b. positioning a conduit, having closed valve means interposed therein closing the conduit to fluid flow therethrough, in the well bore with the lower end of the conduit opening proximate to the zone under test;
c. introducing a quantity of a second liquid into the conduit;
d. isolating the annulus above the zone under test from said zone;
e. opening the valve means in the conduit;
f. allowing fluid from the formation in the zone under test to enter the lower end of the conduit and flow a distance therethrough;
g. trapping a sample of the formation fluid in the conduit; and



h. closing the valve means in the conduit to close the conduit to the fluid flow therethrough.

3,969,938
APPARATUS FOR MEASURING THE VELOCITY AND/OR DENSITY OF A FLUID STREAM

John W. Tanney, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Feb. 18, 1975, Ser. No. 550,560
Claims priority, application Canada, May 13, 1974, 199720
Int. Cl.^{2} G01N *9/32*; G01F *1/00*
U.S. Cl. 73—189 5 Claims



1. Apparatus for measuring the velocity and/or density of a fluid stream comprising:
a. an elongated, fluid guiding member which is symmetrical in cross-section about at least one plane passing through and along a longitudinal axis of the elongated, fluid guiding member, with said longitudinal axis extending along a portion of the flow path of said fluid stream,
b. nozzle means spaced from said member to define at least one nozzle orifice therewith and for directing pressurized fluid in the direction of said longitudinal axis and along and in contact with at least, substantially identical opposing surface portions of said member on each side of said plane,
c. means for supplying said nozzle means with said pressurized fluid,
d. receiver means alongside the said substantially identical opposing surface portions and having at least one receiver mouth, in the path of said pressurized fluid from said nozzle means, to have fluid pressure imposed therein

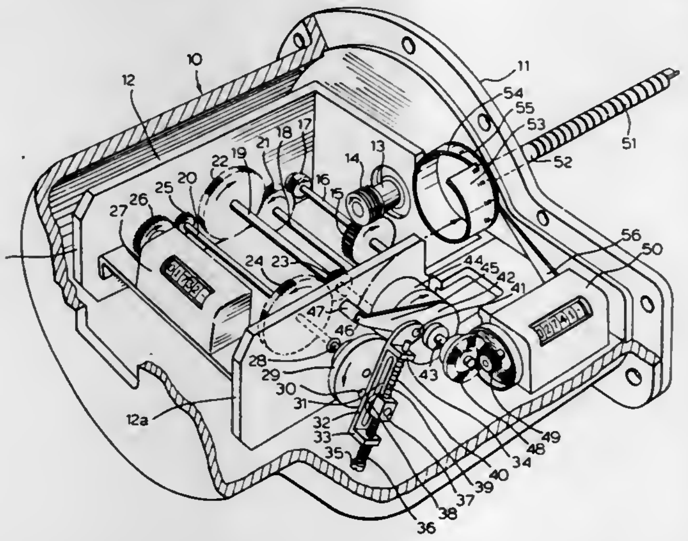
from said fluid directed along said opposing surface portions from said nozzle means, and
e. indicating means connected to said receiver means for indicating, in terms of the fluid pressure therein, the velocity and/or density of said fluid stream, and wherein
f. the nozzle means has a nozzle orifice where geometry is such that the Reynolds number at the nozzle orifice is greater than 2,300 as defined in consistent units by:

$$Re = h\rho V/\mu$$

where
Re = dimensionless Reynolds number
h = the mean height of the nozzle orifice normal to the surface of the fluid guiding number
ρ = the density of the pressurized fluid supplied to the nozzle means when the apparatus is in use,
V = the mean velocity of the pressurized fluid in the nozzle orifice when the apparatus is in use, and
μ = the viscosity of the pressurized fluid in the nozzle orifice when the apparatus is in use.

3,969,939
TEMPERATURE COMPENSATOR FOR GAS FLOW METER

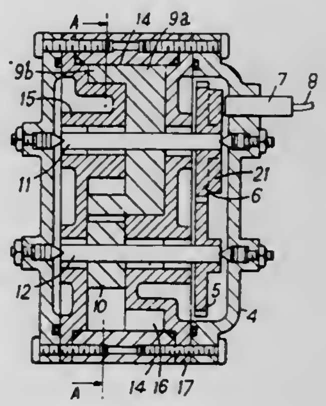
Ignacy John Grzeslo, 97 Poynter Drive, Weston, Ontario, Canada (M9R 1L6)
Filed Apr. 28, 1975, Ser. No. 572,172
Claims priority, application Canada, Mar. 20, 1975, 222660
Int. Cl.^{2} G01F *15/04*
U.S. Cl. 73—194 M 7 Claims



1. A temperature compensating device for use with a fluid flow meter, said device comprising:
a driving element adapted to be driven by fluid flowing through the meter;
first fluid volume recording means drivingly connected with said driving element to record fluid volumes flowing through the meter;
temperature sensing means adapted to contact the fluid flowing through the meter;
a cam surface bearing element connected to said temperature sensing means, the position of said cam surface being determined by the temperature sensed by the temperature sensing means;
an oscillatable cam striker element adapted to oscillate through an arc of travel defined at the first extremity by contact with said cam surface and at the second extremity by pre-set limiting means;
driven means which drives the cam striker element for oscillation in both directions, into and out of contact with the cam surface, the driven means comprising an eccentric driven by the driving element, and a lever connected to the eccentric by a pin and slot connection and pivotally connected with the cam striker element to cause oscillation thereof as said eccentric is driven, said pin and slot connection providing lost motion to permit continued drive of said eccentric when oscillation of the cam striker element is limited by contact thereof with the cam surface;
second fluid volume recording means drivingly connected with the cam striker element and responsive to the length of the arc of travel of the cam striker element.

3,969,940
FLUID FLOW METER

Alan George Butcher, Wokingham, England, assignor to Dresser Europe, S.A., Brussels, Belgium
Filed Dec. 11, 1974, Ser. No. 531,746
Claims priority, application United Kingdom, Dec. 11, 1973, 57435/73
Int. Cl.^{2} G01F *3/08*
U.S. Cl. 73—253 4 Claims



1. A fluid flow metering device comprising:
a housing, said housing having an inlet port, and an outlet port, and a plurality of annular passages coupling said inlet and outlet ports;
a plurality of rotor means rotatably fitted in said annular passageway for rotating as fluid flows through said passageways from said inlet to said outlet, each rotor means being comprised of:
a rotor body rotatably fitted in said annular passageways, said rotor body having at least one blade portion depending therefrom fitting in one of said annular passages in a sealing relationship therewith, so that the fluid passing between the inlet and outlet ports through the passageway causes the rotor body to rotate by forcing against said blade portion, said rotor body further having at least one longitudinal pocket therein accommodating a blade portion of another rotor body in said passageways as the blade portion of the other rotor body rotates from the outlet to the inlet, said pocket forming a liquid seal for said blade portions; and
gear means coupled to said rotor means for causing said plurality of rotor means to rotate together in opposite directions.

3,969,941
LEVEL DETECTOR FOR LIQUIDS AND OTHER FLOWABLE MASSES

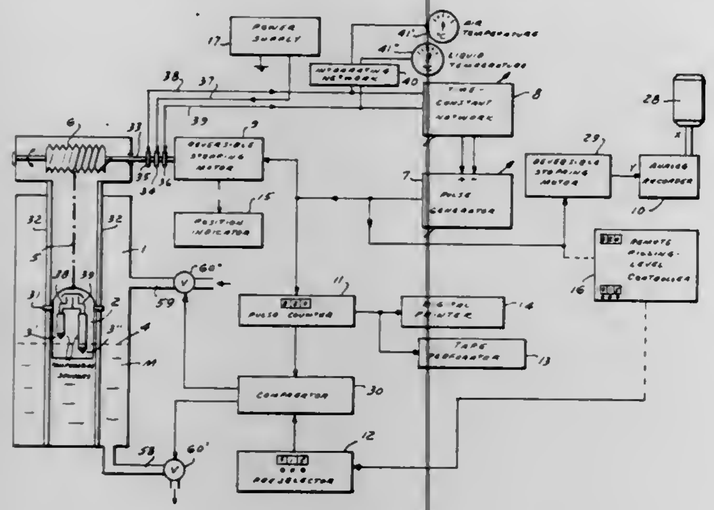
Eugen Rapp, Moordeich, Germany, assignor to E. Rapp Elektronik GmbH, Moordeich, Germany
Filed Nov. 8, 1973, Ser. No. 413,788
Int. Cl.^{2} G01F *23/00*, *23/10*; H02P *8/00*
U.S. Cl. 73—290 R 14 Claims

1. A level detector for a flowable mass, comprising:
a vessel containing a flowable mass whose level is to be determined;
reversible hoist means above said mass including a flexible link depending into said vessel;
a sensing head suspended from said link within said vessel;
signal-generating means controlled by said sensing head for emitting a first signal upon the level of said mass relative

to said head lying above a predetermined upper limit and for emitting a second signal upon said relative level lying beneath a predetermined lower limit;

a reversible stepping motor for driving said hoist means;

pulse-generating means connected to said signal-generating means for emitting a train of forward-stepping pulses for said stepping motor in the presence of said first signal to raise said sensing head and for emitting a train of backward-stepping pulses for said stepping motor in the presence of said second signal to lower said sensing head whereby the position of said sensing head is adjusted by a predetermined increment per pulse to maintain said relative level between said limits; and



monitoring means connected to said pulse-generating means in parallel with said stepping motor for determining the current position of said sensing head in response to said forward-stepping and backward-stepping pulses.

3,969,942

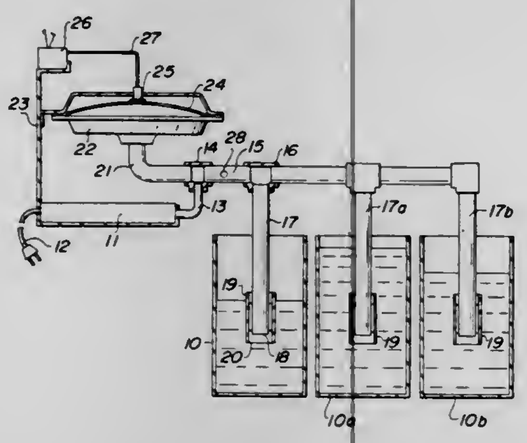
LIQUID LEVEL RESPONSIVE APPARATUS

Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090

Filed Aug. 11, 1975, Ser. No. 603,779

Int. Cl.^{2} G01F *23/16*

U.S. Cl. 73—302 8 Claims



1. Liquid level responsive apparatus comprising

a source of gas under pressure,

a probe tube connected to said source and immersed in the liquid whose level is to be measured and having a lower terminal end exposed upon fall of the liquid level therebelow,

a pressure responsive member connected to said probe tube and having a normal position responsive to said gas under pressure,

said tube having vent means for normal discharge of gas from said source,

said probe tube upon exposure of said terminal end discharging the gas in said tube whereby pressure responsive member is movable to a different position, and

a control member responsive to the positioning of said pressure responsive member.

3,969,943

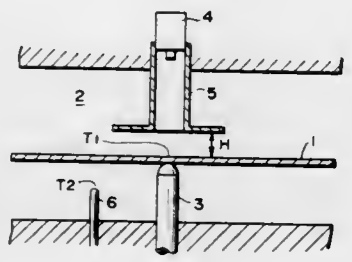
METHOD OF MEASURING THE TEMPERATURE OF FURNACE HOT STOCK AND APPARATUS THEREFOR

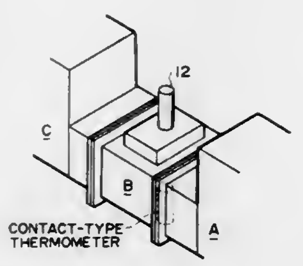
Jiro Ohno, Kawasaki; Tohru Iuchi, Tokyo; Yasuo Tokita, Kitakyushu; Hisanori Karasima, Kitakyushu; Kunitoshi Watanabe, Kitakyushu, and Seiichhiro Murashima, Ikuhashi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,457

Int. Cl.^{2} G01J *5/06*

U.S. Cl. 73—355 EM 16 Claims





1. A method for measuring a heated material in an industrial furnace by the use of a radiation thermometer comprising the steps of positioning a shielding means at the tip portion of the radiation thermometer; moving the shielding means to thereby change the distance between the heated material and the shielding means to determine a background radiation rate of an energy reflected from the furnace atmosphere as determined by the combination of an output energy of the radiation thermometer, an accurate temperature of the heated material, and an ambient temperature of the furnace; calculating a temperature error at arbitrary distances on the basis of said background radiation rate; setting the shielding means of the radiation thermometer in a position at which the temperature error is within a tolerable range; and measuring the heated material with use of the radiation thermometer.

3,969,944

SENSOR FOR ACCELEROMETERS

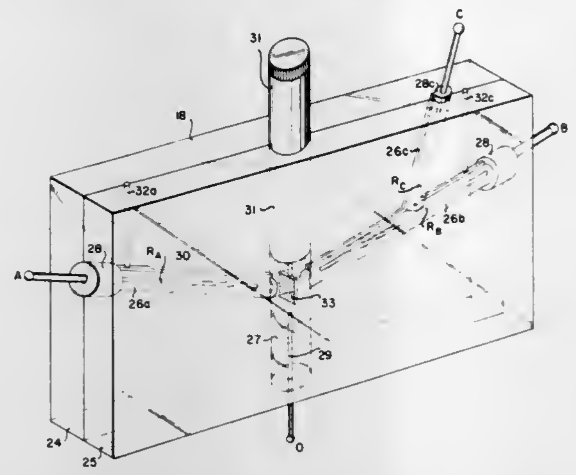
Gianfranco Cirri, Florence, Italy, assignor to Fabbrica Italiana Magneti Marelli, S.p.A., Milan, Italy

Filed Dec. 26, 1973, Ser. No. 431,070

Int. Cl.^{2} G01P *15/12*

U.S. Cl. 73—516 LM 2 Claims

1. An accelerometer sensor comprising: an electrically insulating body having a bottom portion and a top portion; said body being provided with at least two internally located tubular passages extending between said bottom portion of said body and said top portion, at said bottom portion of said body, the two said passages are intercommunicating and a chamber also being formed near said bottom portion of said body in which said passages intercommunicate; an electric resistor located in each of said passages and each said resistor having an upper end projecting from said insulating body; an electrical conductor sealingly passing from an outer end outside said body through said bottom portion of said body and terminating in said chamber, said upper ends of said resistors and said outer end of said conductor being connectable to an electrical circuit for detecting the resistance unbalances in said resistors; a conductive liquid completely filling said chamber and partially filling said passages, so as to assure for each rate of the acceleration within the measurement range that, due to acceleration, said conductive liquid will assume different levels in said passages, involving different portions of said resistors and thereby causing the resistance unbalance which is used for measuring said acceleration; a piston vertically sliding within said connection chamber for adjusting the liquid level; to dampen the fluctuations of the conductive liquid from one said passage to another, there is a level adjusting piston carrying a flag and said flag being located in said chamber, said flag, depending on its angular position controlled by said piston, selectively resists the flow oscillations between said passages.



3,969,945

INDEXING MECHANISM

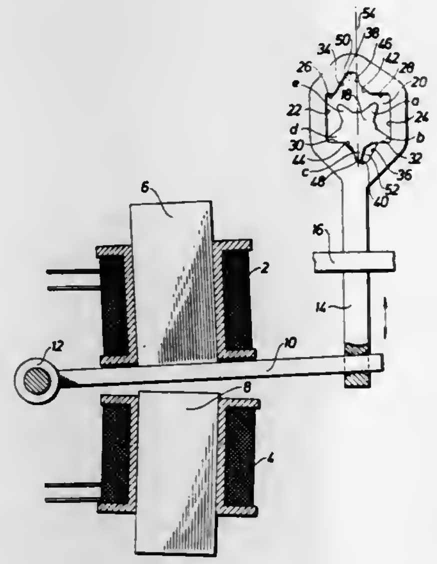
G. Roland Englund, Stockholm, Sweden, assignor to Svenska Dataregister AB, Sweden

Filed Aug. 5, 1974, Ser. No. 494,477

Claims priority, application Sweden, Oct. 3, 1973, 7313468

Int. Cl.^{2} F16H *27/02*

U.S. Cl. 74—128 8 Claims



1. An indexing mechanism comprising:

an indexing wheel having at least three cogs;

an indexing arm movable by an actuator device between two limit positions;

said indexing arm at least partially enclosing said indexing wheel and being provided with first and second recess means;

each of said recess means including a first surface for coacting with a first cog whenever said indexing arm is moved from a first limit position to a second limit position to thereby move said indexing wheel through a predetermined angle;

each of said recess means further including second and third surfaces adapted for engaging, respectively, a portion of said first cog and a portion of the next-adjacent cog when said indexing arm is in a limit position.

3,969,946

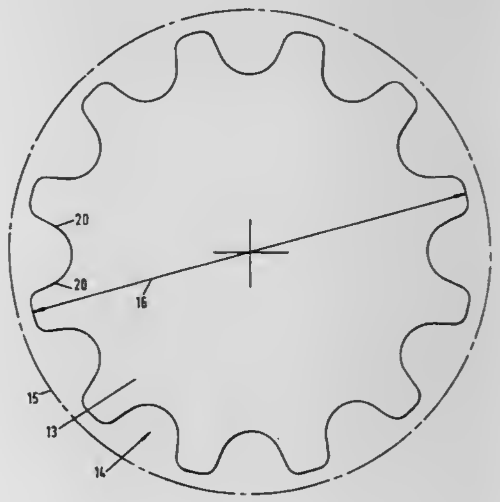
CIRCULAR SIDE POSITIVE DRIVE BELT TEETH

Michael J. W. Gregg, Antrim, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 485,642, July 3, 1974, Pat. No. 3,924,481. This application Oct. 14, 1975, Ser. No. 622,307

Int. Cl.^{2} F16H *55/36*; F16G *1/28*, *55/30*

U.S. Cl. 74—230.5 2 Claims



1. A pulley for use with a belt in a synchronous drive wherein the belt has a plurality of uniformly spaced, substantially identical teeth of a width W, said pulley having a plurality of substantially identical belt engaging teeth to mate with said belt teeth and defining a pulley cavity between each adjacent pair of teeth with each cavity having substantially identical fore and aft surfaces, at least part of which surfaces are shaped in cross-section as the arc of a circle of radius W + CA where CA is one-half the desired belt tooth: pulley cavity clearance; both said arcs being centered on the pitch circle at centers spaced at a distance W apart, the pitch circle diameter being the outer diameter of the pulley teeth plus twice the distance between the pulley surface of the belt between the teeth and the belt pitch line.

3,969,947

TAPERED TOOTH SPROCKET

Virgil B. Martin, West Bend, and Roger L. Villers, Fredonia, both of Wis., assignors to Gehl Company, West Bend, Wis.

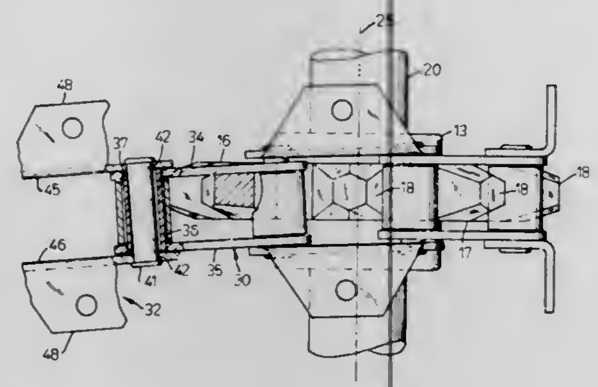
Filed May 22, 1975, Ser. No. 580,027

Int. Cl.^{2} F16H *55/30*

U.S. Cl. 74—243 R 10 Claims

1. In a sprocket rotatable in at least one direction about an axis: a plurality of teeth radially extending in a plane normal to said axis, each tooth having an upper side and a lower side, at least some of said teeth each having on the upper side

thereof a surface level with said plane located near the tooth root and a portion contiguous with said surface which slopes



downwardly away from the center of said sprocket and downwardly in said one direction.

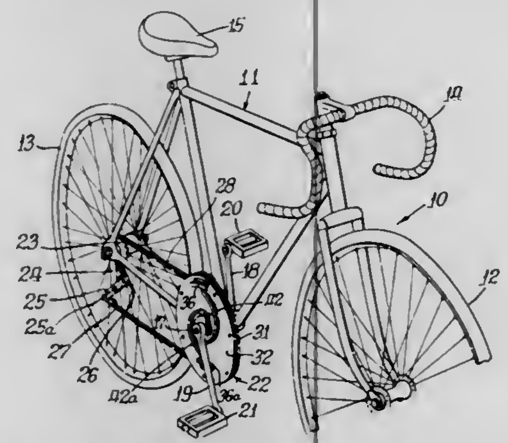
3,969,948
AUTOMATIC BICYCLE TRANSMISSION

Charles A. Pipenhagen, Jr., 835 Butternut Court, Roselle, Ill. 60172

Filed Aug. 25, 1975, Ser. No. 667,556

Int. Cl.² B62M *9/06*

U.S. Cl. 74—244 **15 Claims**



1. A chain carrying sprocket of automatically varying diameter comprising a supporting plate, a plurality of relatively short identical arms pivotally mounted on said supporting plate, the pivot mountings of said arms defining a circle on said supporting plate, a small sprocket carried on each of said arms, a one-way clutch interposed between each of said small sprockets and said identical arms to permit rotation of said small sprockets in only one direction, a link member pivotally mounted at a position spaced from said small sprocket on each of said arms, means joining said link members, and spring means joining said supporting plate to said means joining said link members and arranged and constructed so that resistance to turning said supporting plate causes said small sprockets to uniformly swing radially inwardly on their identical arms.

3,969,949
FILLERLESS WELDED CHAIN

Tatsuo Ohnishi, Kishiwada, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

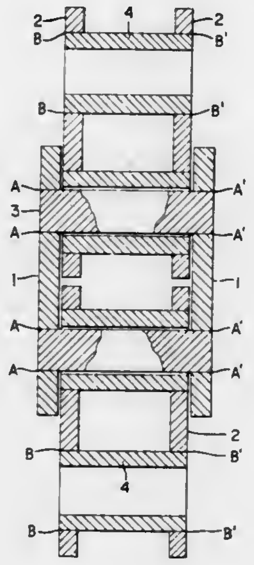
Continuation-in-part of Ser. No. 353,794, April 23, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,454

Claims priority, application Japan, May 1, 1972, 47-42580

Int. Cl.² B21L *9/08;* **F16G** *13/02;* **B21L** *9/00*

U.S. Cl. 74—255 R **6 Claims**

1. A roller chain comprising a series of inner links each comprising a pair of parallel inner link plates having opposed openings adjacent the opposite ends thereof and a pair of hollow bushes respectively extending into and between said opposed openings for securing said inner link plates together, said inner links being connected together by a series of outer links each comprising a pair of parallel outer link plates having opposed openings adjacent the opposite ends thereof and a pair of pins extending into and between said opposed openings for securing said outer link plates together, said pins on a given outer link extending through the bushes on the adjacent ends of two inner links to connect same together, the improvement wherein said bushes extend completely through the associated openings in said inner link plates, both ends of each of said bushes terminating substantially flush with the outer surfaces of the associated inner link plates, and both ends of each of said bushes being fused in the associated openings of the inner link plates by a fillerless fusion welded connection which extends through the entire thickness of the inner link plates so that the entire circumference of the end portions of the bushes as disposed in the opposed openings are fixedly and integrally united to their associated inner link plates.



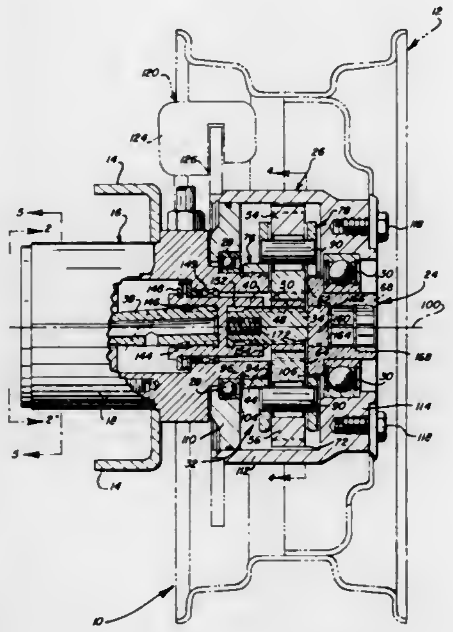
3,969,950
DRIVE ASSEMBLY

Jim Lee Rau, Lafayette, and Hollis Newcomb White, Jr., West Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 4, 1974, Ser. No. 448,057

Int. Cl.² F16H *35/00, 1/28;* **F16D** *13/44;* **B60K** *3/00*

U.S. Cl. 74—391 **17 Claims**



1. An assembly for use in rotating an output member relative to a base, said assembly comprising an axially extending spindle fixedly connected with the base, a rotatable hub fixedly connected with the output member, a first bearing assembly disposed between and connected with axially inner portions of said spindle and said hub, a second bearing assembly disposed between and connected with axially outer portions of said spindle and said hub, said hub being rotatably supported on said spindle by said first and second bearing assemblies, a rotatable input member, motor means for rotating said input member, and gear means disposed between said first and second bearing assemblies and connected with said input member and said hub for rotating said hub at a rotational speed which is different than the rotational speed of said input member.

17. An assembly for use in rotating an output member relative to a base, said assembly comprising an axially extending spindle fixedly connected with the base, said spindle including an axially extending wall having axially inner and outer end portions, first surface means for at least partially defining an axially extending chamber within said spindle, and second surface means for defining a plurality of openings to said chamber in said wall at locations between said axially inner and outer end portions of said wall, a hub fixedly connected with the output member, a first bearing assembly connected with said hub and said axially inner end portion of said spindle, a second bearing assembly connected with said hub and said axially outer end portion of said spindle, said first and second bearing assemblies being effective to rotatably support said hub on said spindle, a rotatable input member at least partially disposed within said chamber in said spindle, motor means disposed in a coaxial relationship with said spindle for rotating said input member about a central axis of said spindle, and gear means disposed between said first and second bearing assemblies and connected with said input member and said hub for rotating said hub at a rotational speed which is different than the roational speed of said input member upon rotation of said input member, said gear means including a sun gear disposed in said chamber in said spindle and rotatable about the central axis of spindle under the influence of forces transmitted to said sun gear by said input member upon operation of said motor means, a plurality of idler gears extending through said openings in said wall of said spindle into meshing engagement with said sun gear, means for supporting said idler gears for rotation about a plurality of spaced apart parallel axes disposed outside said chamber and extending parallel to the central axis of said spindle, and a ring gear connected with said output member and disposed in meshing engagement with said idler gears.

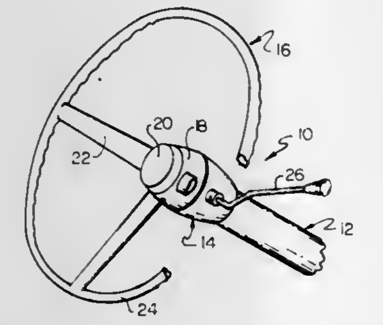
3,969,951
TECHNIQUE FOR STRENGTHENING STEERING COLUMN SHIFT SOCKETS

Everett E. Blackwood, 205 Sabine Drive, Portland, Tex. 78374

Filed May 14, 1975, Ser. No. 577,154

Int. Cl.² G05G *9/12;* **B23P** *7/04*

U.S. Cl. 74—473 SW **16 Claims**



9. A steering column comprising
- a repaired shift socket having an amputated pin retaining boss;
- a sleeve, secured about the boss, having a shift lever connecting section disposed beyond the end of the amputated boss;
- a shift lever disposed through the sleeve in the boss; and means connecting the shift lever to the connecting section.

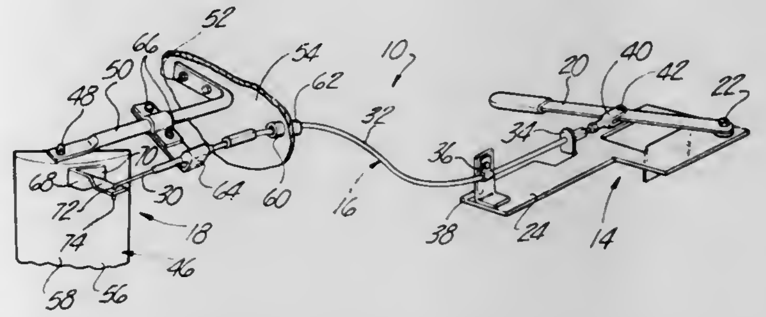
3,969,952
MIRROR ACTUATOR

Clyde M. McKee, 22175 Bernard St., Taylor, Mich. 48180, and Ward Scott, 429 Rochdale Drive, Rochester, Mich. 48063

Filed Nov. 25, 1974, Ser. No. 526,794

Int. Cl.² G05G *1/00*

U.S. Cl. 74—501 M **3 Claims**



1. A mirror actuator for use in conjunction with an exteriorly mounted right hand rear view mirror on a vehicle, said mirror having a housing, said actuator comprising:
- a lever assembly having a mounting bracket for securing said lever assembly to said vehicle and an elongated lever having one end free and its opposite end pivotally mounted to said mounting bracket around a single axis of rotation;
- said mirror housing pivotally mounted only around a generally vertical axis of rotation by at least one support strut, said strut being also secured to said vehicle; and
- a single cable, said cable having an outer sleeve portion and an inner wire member, said sleeve being secured at one end to said mounting bracket and at its other end to said strut, said wire member being secured at one end to said lever at a point intermediate the free end and the pivotally mounted end of said lever and at its other end to a forwardly projecting second bracket secured to the housing of said mirror so that pivotal movement of said lever affects a corresponding pivotal movement of said mirror housing around its axis of rotation.

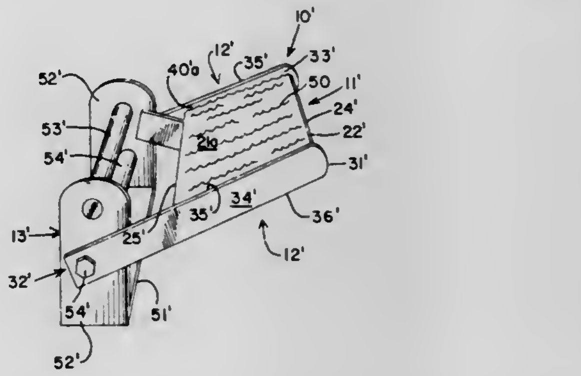
3,969,953
TRACTOR FOOT PEDAL GUIDE

Gerald E. Sponberg, Seaside, Oreg., assignor to Gerald E. Sponberg, Seaside, Oreg.

Filed Apr. 3, 1975, Ser. No. 564,760

Int. Cl.² G05G *1/14*

U.S. Cl. 74—560 **1 Claim**



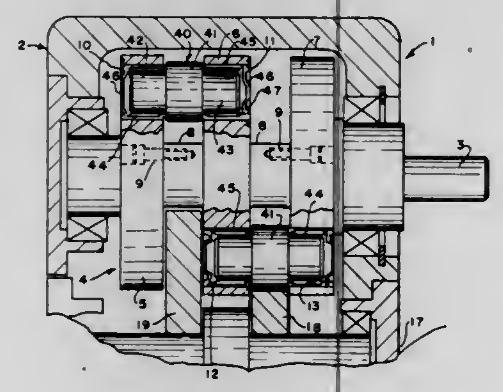
1. A tractor foot pedal guide for use in preventing a tractor driver's foot from slipping off a foot pedal during wet or muddy conditions, the foot pedal guide comprising:
- a foot plate for engaging a portion of the tractor driver's shoe wherein side members are affixed to the foot plate to prevent the driver's shoe from inadvertently slipping out of contact therewith, with the foot pedal guide being further characterized by a rubber member affixed over the top surface of the foot plate, and a plurality of treads disposed above the top surface of the rubber member to

provide a better grip between the rubber member and the driver's shoe; and

said side members provided on the tractor foot pedal guide being identical to each other with each being manufactured of an elongated flat strap like member having a flat exterior surface, a flat interior surface, opposed end edges, and opposed side edges, the side edges of the foot plate being joined to the interior surfaces of the side members with a portion of the side members projecting upwardly from the top surface of the foot plate to define foot engaging shoulders completely along the side edges of the foot plate for engaging a driver's shoe and preventing the driver's shoe from slipping off the foot plate, wherein the foot plate is of a flat rectangular member having a flat top surface, a flat bottom surface, opposed flat side edges, and opposed flat front and back end edges; and

a mounting bracket having a U-shaped configuration with a flat horizontal base member and a pair of parallel spaced apart vertical side arms extending upwardly therefrom, a pair of vertically spaced apart horizontal parallel bolts extending between the side arms wherein one of the bolts extending between the side arms engages one of the end edges of each of the side members for pivotably retaining the side members to the mounting bracket for pivotal movement of the foot plate thereabout.

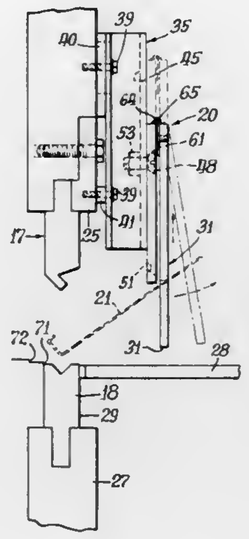
3,969,954
INDEX DRIVE SYSTEM CAM FOLLOWER ASSEMBLY
Wilfried E. Dehne, 14405 Lombard, Berwyn, Ill. 60402
Filed June 23, 1975, Ser. No. 589,039
Int. Cl.² F16H *53/06*
U.S. Cl. 74—569 **7 Claims**



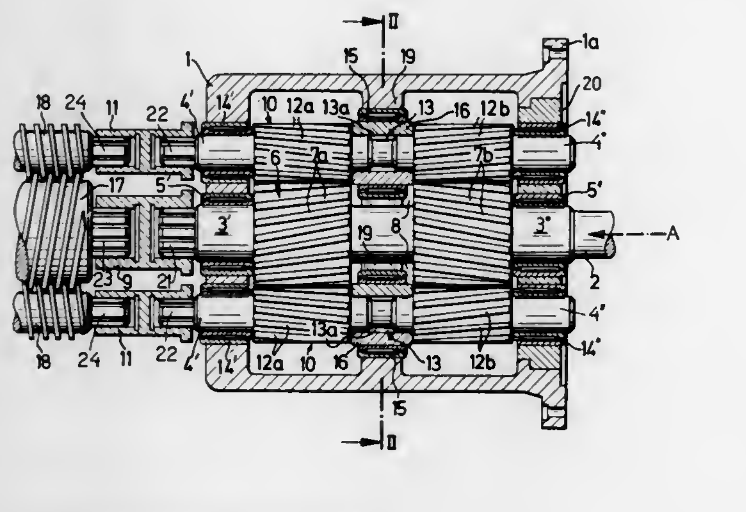
1. In an index drive system wherein a cam follower is yoke mounted in a wheel to engage a cam plate, the improvement comprising a cam follower tire and trunions concentric with, fixed to, and projecting from either side of said tire and journalled in antifriction bearings carried by said wheel.

3,969,955
PRESS BRAKE SAFETY DEVICE
Robert D. Markham, Peoria, Ill., assignor to H C Products Co., Princeville, Ill.
Filed Aug. 14, 1975, Ser. No. 604,595
Int. Cl.² F16P *3/04*
U.S. Cl. 74—613 **4 Claims**

1. A safety device for precluding accidental operator invasion of the work zone between the die and anvil of a press brake or like machine, comprising: a horizontal elongated planar safety shield vertically movable with the ramhead of the press and mounted to depend beyond the lower edge of the ramhead between the operator and the work zone of the die and anvil, and mounting means supporting said shield on said ramhead including means providing limited vertical sliding movement thereof relative to said ramhead, and additional means providing pivotal movement thereof about a horizontal axis; whereby said shield is operational to move with and relative to the ramhead for engaging a workpiece and following upward movements thereof during forming operations and additionally is swingable away from the work zone for withdrawing a formed workpiece from the die zone.



3,969,956
TRANSMISSION FOR MULTISCREW EXTRUDER
Wilhelm Hanslik, Linz, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany
Filed Aug. 29, 1975, Ser. No. 609,062
Claims priority, application Germany, Aug. 31, 1974, 2441865
Int. Cl.² F16H *37/06, 1/18;* **A01J** *21/02*
U.S. Cl. 74—665 GD **10 Claims**



1. A transmission comprising:

a stationary support centered on an axis;

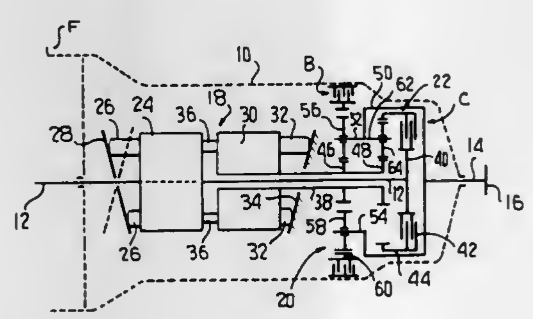
a unitary central spur gear centered on said axis;

a plurality of unitary peripheral spur gears symmetrically distributed about said axis in mesh with said central spur gear, each of said spur gears being provided with two axially spaced toothed sections separated by a median zone and with extremities beyond said toothed sections, the mediam zone of said central gear forming an annular gorge;

two sets of terminal bearings on said support receiving respective extremities of said central and peripheral spur gears; and

a set of intermediate journal bearings on said support each receiving said median zone of a respective peripheral spur gear, said intermediate journal bearings having undivided inner and outer races large enough to slip over the toothed sections of said peripheral spur gears, parts of said intermediate journal bearings extending into said gorge.

3,969,957
SYNCHRONOUSLY SHIFTABLE DUAL RANGE PLANETARY TRANSMISSION WITH COAXIAL INPUT SHAFTS
George M. DeLalio, 81 Gazza Blvd., Farmingdale, N.Y. 11735
Division of Ser. No. 317,528, Dec. 22, 1972, Pat. No. 3,855,879. This application Sept. 16, 1974, Ser. No. 506,593
Int. Cl.² F16H *47/04, 37/06, 57/10*
U.S. Cl. 74—687 **36 Claims**

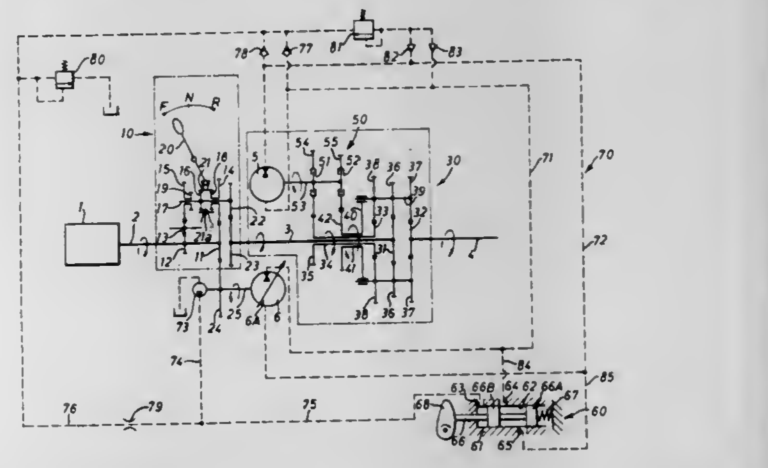


1. In a drive train of the type including power input means; an output shaft; hydrostatic transmission means comprising a driving member connected to said power input means, a driven member and means for effecting relatively reverse directions of rotation of said driven member; output planetary gearing including a plurality of drivingly interconnected members for selectively imparting low/reverse speed drive and high speed drive to said output shaft, one of said members of the output planetary gearing being connected to said driven member, said output shaft being drivingly connected with a second of said members of the output planetary gearing, a third one of said members of said output planetary gearing being adapted for selective connection to said power input means for drive input rotation thereby at a fixed ratio with respect to the rotation of said driving member, and a fourth one of said members of the output planetary gearing being adapted for selective braking to prevent its rotation; and input shaft and clutch means connecting said power means to said third member of the output planetary gearing; fixed means; brake means connecting said fixed means to said fourth member of the output planetary gearing; and means for engaging said clutch means while disengaging said brake means and vice versa; the improvement wherein:

said output shaft is coaxial with said input shaft and a quill shaft concentric with said input shaft connects said driven member to said one member of the output planetary gearing; and

said third member of the output planetary gearing being idly driven in the same direction as said output shaft and at said fixed ratio with respect to said driving member when said fourth member is fixed and said driven member attains a first maximum rotational speed with respect to said driving member whereby said clutch means may be engaged under synchronous conditions, and said one member of the output planetary gearing being driven from said first maximum speed to a second maximum speed which is of opposite rotational sense when said clutch means is engaged whereby progressively to increase the speed of said output shaft with respect to that of said power input means to a selected final ratio.

3,969,958
OUTPUT SPLIT TYPE HYDROSTATIC TRANSMISSION
Takayuki Miyao; Hiroaki Maeda, both of Toyota; Masanori Sato, Nagoya, and Toshimitsu Sakai, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan
Filed Mar. 25, 1974, Ser. No. 454,583
Claims priority, application Japan, Mar. 28, 1973, 48-35294; May 31, 1973, 48-60313; July 4, 1973, 48-74900; May 23, 1973, 48-56881; July 3, 1973, 48-74411; July 4, 1973, 48-76000
Int. Cl.² F16H *47/04, 37/06*
U.S. Cl. 74—687 **17 Claims**



1. A steplessly adjustable hydrostatic-mechanical compound transmission, comprising:

an input drive shaft;

a four-shaft drive system disposed upon the output side of said transmission, one of said four shafts being the output drive shaft, and the other three of said four shafts being mechanically and hydrostatically driven by means of said input drive shaft and mechanically connected to said output drive shaft for driving the same;

a hydrostatic speed differential drive means including a first, non-adjustable positive displacement pump-motor, and a second positive displacement pump-motor driven by means of said input shaft and adjustable in both directions of pumping and which is disposed, along with said first pump-motor, in a closed hydraulic circuit serving as hydraulic communication means between said two pump-motors;

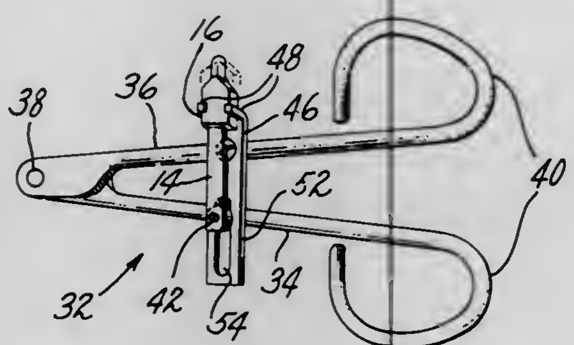
a drive power train selector means including a two-speed reversing drive means, having two operative mode positions and a neutral position, interposed between and connecting said input drive shaft with one of said three shafts, said first displacement pump-motor being connected, through means of a hydraulic coupling drive, with the other two of said three shafts; and

operating means disposed within said selector means and operatively connected with an adjustment means of said second adjustable pump-motor for facilitating synchronization of the movement of said reversing drive means between said two operative mode positions.

3,969,959
ADJUSTING TOOL FOR SURGICAL BLADE GUARD
John R. Beaver, 21 Lincoln St., Lexington, Mass. 02173
Division of Ser. No. 507,079, Sept. 18, 1974, which is a continuation of Ser. No. 332,611, Feb. 15, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,814
Int. Cl.² B25B *27/00*
U.S. Cl. 81—3 R **4 Claims**

1. A tool for receiving an elongated blade having a movable guard frictionally positioned thereon to adjust the position of the guard on the blade, comprising a pair of members pivoted at one end so as to be movable in a plane towad and away from each other and having handles at the other end, and means projecting from the members between the pivot and the han-

dles in a direction perpendicular to the plane of movement for supporting and engaging the blade and guard assembly to

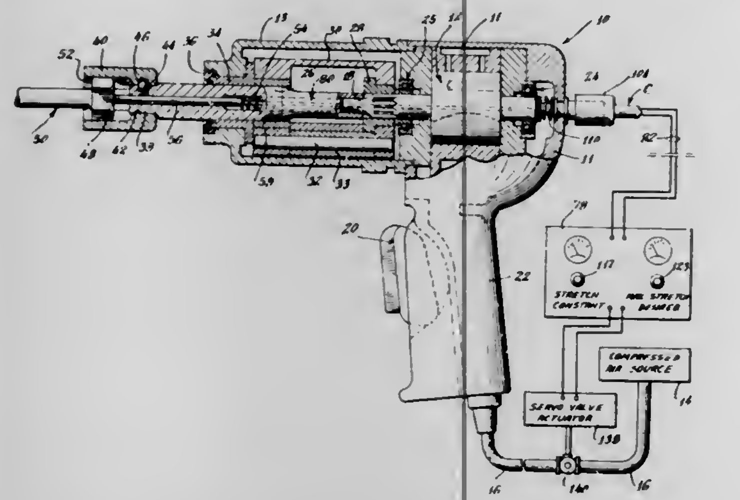


cause relative motion therebetween with relative motion between the handles.

3,969,960
METHOD AND APPARATUS FOR TIGHTENING A BOLT TO EXERT A PREDETERMINED TENSION FORCE BY MONITORING BOLT ELONGATION WHILE THE BOLT IS BEING INSTALLED

Dominick A. Pagano, 10 Sasqua Trail, Georgetown, Conn. 06829

Filed May 13, 1974, Ser. No. 469,298
Int. Cl.² B25B *23/142*
U.S. Cl. 81—52.4 R **19 Claims**

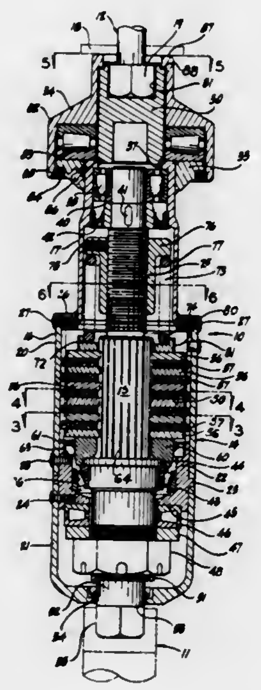


1. Torque wrench apparatus for tightening a bolt to exert a predetermined tension force by monitoring bolt elongation while the bolt is being installed comprising:
   drive means adapted to engage the head of the bolt;
   a main shaft equipped to carry said drive means on one end and having an axial bore therethrough;
   means, coupled to said main shaft, for rotating said main shaft and said drive means to thereby rotate and tighten said bolt;
   a rod mounted in said main shaft axial bore and movable axially with respect to said bore and projectable out of said main shaft axial bore at the end of said main shaft which is associated with said drive means; said rod being adapted to rotate with said main shaft;
   an ultrasonic transducer, capable of generating and receiving ultrasonic energy, mounted on the projectable end of said rod and also associated with said drive means;
   means for urging said end of said rod out of said main shaft axial bore and thus urging said ultrasonic transducer into contact with top surface of the head of the bolt when engaged by said drive means, said ultrasonic transducer and said rod being rotatable with the bolt when in contact therewith during bolt installation;
   means for energizing said ultrasonic transducer to generate ultrasonic energy, for transmitting through the bolt from its head to its threaded end for being reflected from this end back to the bolt's head, finally to be received by said ultrasonic transducer; and
   monitoring means coupled to said ultrasonic transducer for sensing the time required for the ultrasonic energy to be transmitted through the bolt to the bolt's threaded end and reflected back to the bolt's head to measure bolt elongation.

3,969,961
TORQUE LIMITING ADAPTOR

Michael J. Amoroso, Marion, Ill., assignor to M.A.T. Industries, Inc., West Frankfort, Ill.

Filed Dec. 9, 1974, Ser. No. 530,935
Int. Cl.² B25D *23/142*
U.S. Cl. 81—52.4 R **5 Claims**

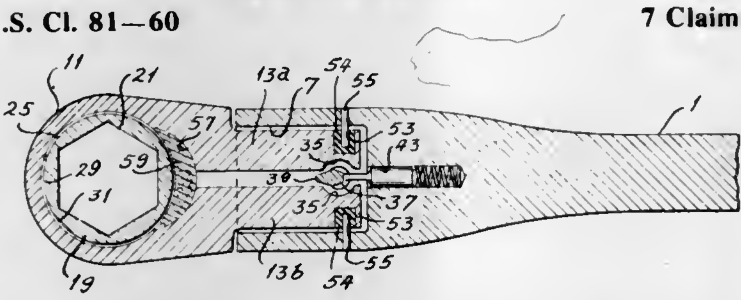


1. An adaptor for limiting torque applied to a bolt by a wrench, the adaptor comprising:
   a. a housing including engagement means at one end and an exterior abutment means,
   b. an elongate shaft disposed coaxially within the housing and including engagement means at the end remote from said housing engagement means, one of said engagement means engaging the bolt and the other of said engagement means engaging the wrench, and
   c. means mounting the shaft within the housing including:
      1. journal bearing means between the shaft and the housing for relative rotation of said shaft and housing,
      2. thrust bearing means between the shaft and the housing for transferring axial load from the shaft to the housing, and
      3. clutch means between the shaft and the housing including first friction disc means keyed to the shaft and second friction disc means keyed to the housing, said first and second disc means being operatively pressure engageable to rotate the shaft and housing together when the torque applied to the bolt by the wrench, through the medium of the adaptor, is below a predetermined value,
      4. said clutch means including pressure adjustment means carried by the shaft for selectively increasing the engagement pressure between the first and second friction disc means to predetermine the slippage point between said disc means, and
   d. a second thrust bearing means seated on said abutment means and projecting axially beyond the housing end to transfer thrust to the mine roof by said projecting portion rather than by the relatively rotating housing engagement means.

3,969,962
FRICTION DRIVE WRENCH

Theodore A. Campbell, Paradise, Calif., assignor to C.M.T. Co., Paradise, Calif.

Filed May 27, 1975, Ser. No. 580,669
Int. Cl.² B25B *13/46*
U.S. Cl. 81—60 **7 Claims**

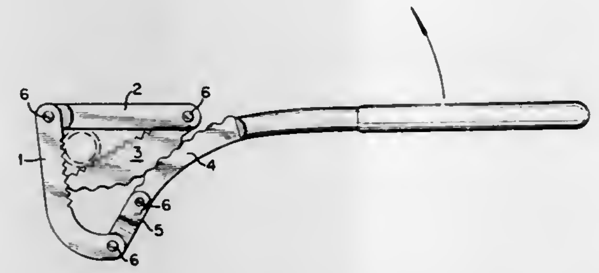


1. A wrench having an elongated shank, an axial cavity in one end of said shank, an annular gripping eye member split radially of itself and having a pair of radial tangs separated by the radial split extending into said cavity with their outer sides spaced from the sides of said cavity to permit limited tipping of said tangs therein in a plane normal to the axis of said gripping eye member, a cylindrical head member grippingly positioned in said gripping eye, and a key-like member rotatably journaled in shank wall structure defining said cavity and extending parallel to the axis of said eye member through said cavity and between said tangs and having an eccentric projection alternatively engageable with the opposing surfaces of one or the other of said tangs for biasing said tangs in selected directions circumferential of the axis of said gripping eye member in said cavity whereby movements of said shank in opposite directions causes tightening of said gripping eye member on said head member and back-up movements of said shank releases the grip of said gripping eye member on said head member.

3,969,963
ADJUSTABLE PIPE WRENCH

Bernard Roseby, 150 W. Edith Ave., No. 21, Los Altos, Calif. 94022

Filed Sept. 25, 1974, Ser. No. 509,015
Int. Cl.² B25B *13/50, 13/28*
U.S. Cl. 81—66 A **1 Claim**

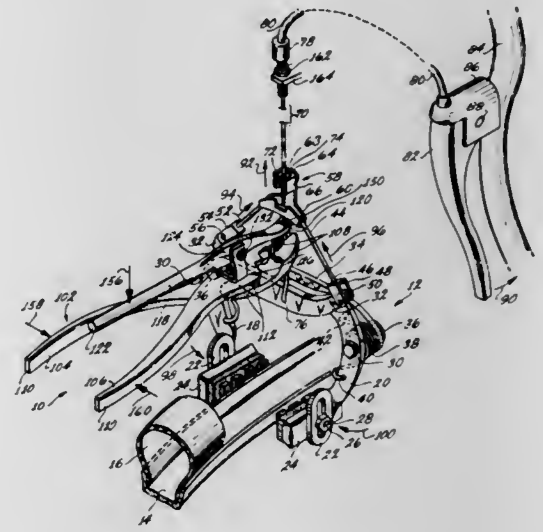


1. An adjustable wrench comprising an arcuate, elongated handle having a convex face with gear teeth thereon and a smooth concave face opposite the convex face, a swivel link pivotally connected to one end of the handle, a main link having one end curved and pivotally connected to said swivel link, the other end of said main link is pivotally connected to a connecting link, said connecting link is pivotally connected, at the end opposite the end connected to the main link, to an anvil, said anvil having a work engaging straight surface with teeth, said teeth being inclined to grip the work in one direction and slip around the work in the other, and mating gear teeth on a curved surface of said anvil to mesh with said gear teeth on said elongated handle, said main link having oppositely inclined teeth on a work engaging surface thereof, said curved surface of said anvil being opposite the work engaging straight surface whereby force applied to said handle causes said gear teeth to mesh with said mating gear teeth and force said anvil to engage a workpiece, said main link having a bifurcated portion at said curved end to receive the end of said anvil opposite its pivotal connection to said connecting link thus allowing the said wrench to be used on a variety of different sizes of workpieces.

3,969,964
HAND TOOL FOR HOLDING AN ELONGATED MEMBER WHILE SIMULTANEOUSLY MOVING A SECOND MEMBER AXIALLY ALONG THE ELONGATED MEMBER

Douglas Franklin George, 324 Jefferson St., Bakersfield, Calif. 93305, and Wayne Lester Yowell, 3729 Ethyl St., Bakersfield, Calif. 93308

Filed Sept. 2, 1975, Ser. No. 609,585
Int. Cl.² B25B *7/02*
U.S. Cl. 81—310 **10 Claims**

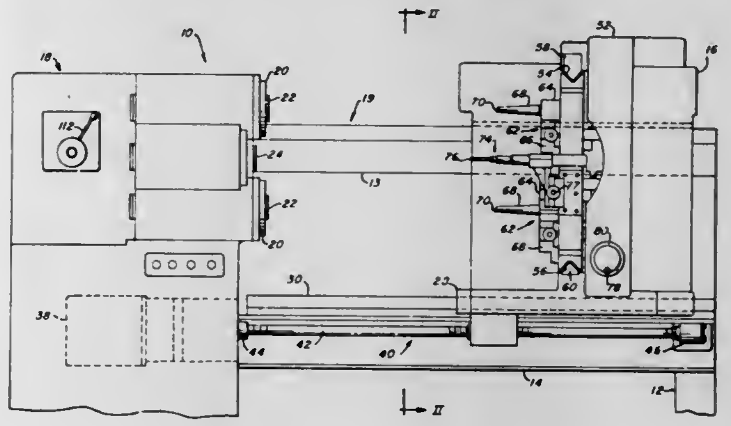


1. A hand tool for holding an elongated member while simultaneously moving a second member axially along said elongated member, comprising:
   means for gripping said elongated member normal to its major axis;
   means for engaging said second member and moving it along said elongated member; and
   means connecting said second-mentioned means to said first-mentioned means for movement in a plane normal to the plane in which said first-mentioned means exerts its gripping force.

3,969,965
MULTIPLE MOLD FORMING MACHINE

Ernest C. Hawkins, Saginaw, Mich., assignor to Gateway Machine & Design, Inc., Saginaw, Mich.

Filed Jan. 29, 1974, Ser. No. 437,677
Int. Cl.² B23B *3/30, 3/28*
U.S. Cl. 82—3 **9 Claims**



1. A multiple mold forming machine comprising, an elongated bed,

a longitudinal lower guide rail rigidly mounted on said bed,

a longitudinal upper guide rail rigidly mounted on said bed and laterally positioned above and in parallel relationship with said lower guide rail,

a headstock fixedly mounted on said bed for supporting a plurality of workpieces,

a carriage having a bottom portion and a side portion, said carriage bottom portion slidably mounted on said lower guide rail and said side portion slidably mounted on said upper guide rail for longitudinal movement of said carriage relative to said bed toward and away from said headstock,

means for longitudinally moving said carriage toward and away from said headstock on said bed,

said upper and lower guide rails and said carriage positioned thereon arranged to provide an access opening between said carriage and said headstock to permit unobstructed access to said carriage and said headstock,

said carriage having upper and lower V-guide bars spaced in parallel relationship to each other,

a cross slide, having upper and lower V-guide members spaced in parallel relation to each other, said carriage upper and lower V-guide bars slidably mounted in said cross slide upper and lower V-guide members to permit transverse movement of said cross slide on said carriage,

means for traversing said cross slide on said carriage, and

a plurality of cutting elements rigidly supported by said cross slide.

7. A multiple mold forming machine as set forth in claim 1 which includes,

a tracing element rigidly supported by said cross slide,

means integrally connected to said headstock adapted to receive a master mold,

means for maintaining said tracing element in abutting contact with the master mold retained in said master mold receiving means to permit each of said cutting elements to follow a cutting path on each of the workpieces which corresponds to the path followed by said tracing element on the master mold such that a plurality of molds are formed having a configuration identical to that of the master mold, and

means for adjusting the deflection of said tracing element from the surface of the master mold.

3,969,966

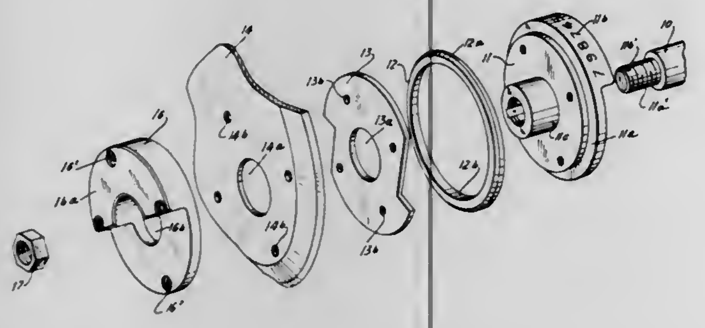
APPARATUS FOR SLICING MEAT PRODUCTS

Oscar W. Dillon, Essex, Conn., assignor to Cashin Systems Corporation, Williston Park, N.Y.

Filed June 9, 1975, Ser. No. 584,950

Int. Cl.^{2} B26D *1/28, 1/56, 4/42*

U.S. Cl. 83—340 **2 Claims**



1. A rotary cutting blade assembly for slicing a product as it is fed into the path of the cutting edge of the blade in the direction of its longitudinal axis, said assembly comprising:

a flat metal blade having a sharpened cutting edge of varying radii from the center of the blade to define a generally involute configuration around the periphery thereof graduated between a first portion positioned relatively close to said center and a second portion spaced a greater distance from the said center so that when the product is fed into the blade as the blade is rotated a slice is cut for each rotation of the blade;

a shaft for rotating the said blade;

means to mount the said blade on the said shaft for rotation in a direction generally transverse of the path of the feed of the product, said mounting means being located adjacent the evolute center of the blade from which the involute configuration is generated, said mounting means including a flat portion normal to the said shaft; and

a ring graduated in thickness from a first arc of the circumference to a greater thickness at a second arc of the circumference opposite the said first arc, the said ring being inserted between the said flat portion of the mounting means and the said blade to position the said blade at an angle to the axis of rotation, the said ring being rotatable with respect to the blade whereby the said first arc can be adjusted to any desired radius of the blade.

3,969,967

WOOD TRIMMING MACHINE

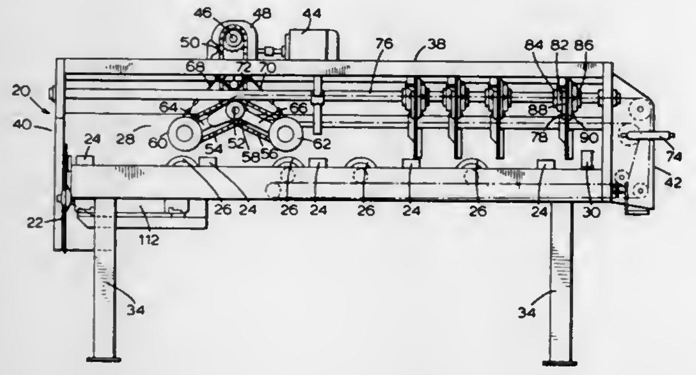
Reggald E. Isley, 8504 100th A St., Grande Prairie, Alberta, Canada

Filed Oct. 16, 1975, Ser. No. 623,162

Claims priority, application Canada, Oct. 24, 1974, 212218

Int. Cl.^{2} B27B *5/29*

U.S. Cl. 83—435.2 **5 Claims**



1. Apparatus for cutting unwanted end portions off lumber in the form of planks, studs and the like such that each of the remaining pieces of lumber is in one of several preferred lengths, the apparatus comprising:

a supporting framework;

a plurality of conveyors coupled to the framework and adapted to drive lumber sideways through the apparatus;

a saw coupled to an end of the apparatus and lying in a vertical plane parallel to the direction of movement of the conveyors and operable to cut lumber as the lumber is driven through the apparatus by the conveyors;

a drive mechanism operable to move the lumber longitudinally towards the other end of the apparatus before the lumber meets the saw; and

swinging stops coupled to the framework for arcuate movement in planes parallel to said plane containing the saw, the swinging stops being adjustable to change the spacings between the stops and the saw according to said required preferred lengths, each of the swinging stops comprising: a first portion extending generally downwardly and mounted adjacent its upper end for pivotal movement about a first axis in a respective one of said planes; a second portion pivotally connected to the first portion adjacent a lower end of the first portion on a second axis parallel to the first axis, said axes being such that with the stop in a rest position a line joining said axes defines an acute angle with the horizontal at a side of the first portion facing incoming lumber, the second portion lying generally horizontally to stop lumber moving longitudinally and having an overhanging inclined face for engagement by incoming lumber which is to pass under the stop whereby lumber engaging this face causes the stop to swing upwardly and to jack-knife as said acute angle is reduced until the lumber passes under the stop in engagement with an underside of the second portion, and whereby as the lumber passes the second axis a turning moment is created in the second portion about the second axis to lower the second portion rapidly into a position for stopping lumber moving longitudinally in the apparatus.

3,969,968

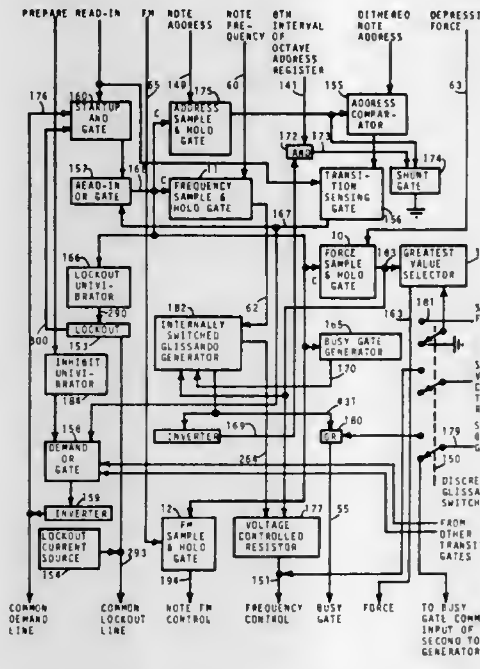
MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Cochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.

Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 491,160

Int. Cl.^{2} G10H *1/00*

U.S. Cl. 84—1.01 **4 Claims**



1. Sound generating apparatus comprising,

output means,

a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,

a plurality of note selecting means for selecting note signals characteristic of selected notes for production by said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of at least one of note pitch, speed of note selction and force applied to note selecting means,

means coupled to each note selecting means for providing continuous data signals representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signals,

and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means,

said control means including means responsive to said note selecting means for providing a first number of control signals representative of selected notes and means responsive to said control signals for providing a second number less than said first number of time sequenced control signals,

and second means for coupling said time sequenced control signals to selected ones of said tone generators,

said scanning means further comprising a temporal sequencer having means for sequentially sampling the states of said note selecting means,

a note address generator having means for indicating the note status to be sensed,

a note-selected detector having means for indicating the state of selection of a note,

a note address tolerance generator having means for establishing a predetermined region of acceptable note addresses,

and gating means responsive to a signal from said note-selected detector indicating selection of a note,

wherein said gating means comprise means for separating signals representative of even ordered notes from signals representative of odd ordered notes.

3,969,969

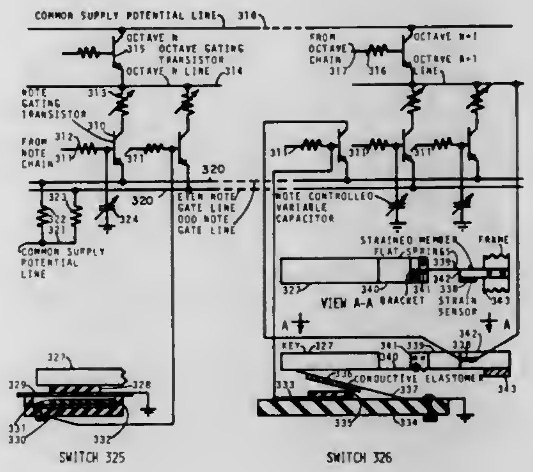
MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Chochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.

Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 490,385

Int. Cl.^{2} G01H *1/02*

U.S. Cl. 84—1.26 **23 Claims**



1. Sound generating apparatus comprising,

output means,

a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,

a plurality of note selecting means for selecting note signals characteristic of selected notes for production by said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of at least one of note pitch, speed of note selection and force applied to note selecting means,

control means coupled to said tone generators for providing a continuous data signal representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signal,

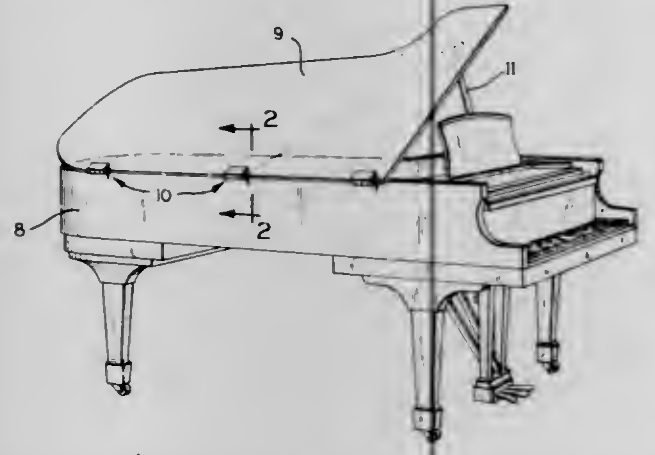
and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means,

wherein said note selecting means comprises a plurality of force sensitive members for receiving at least one of vertical and horizontal forces and means associated with each such member for providing at least one of vertical and horizontal signals respectively representative of the vertical and horizontal forces applied thereto.

3,969,970
TRANSPARENT GRAND PIANO TOPS

Howard R. Swift, and Kenneth C. Livingston, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 8, 1974, Ser. No. 522,239
Int. Cl.² G10C *3/02*
U.S. Cl. 84—177 **6 Claims**

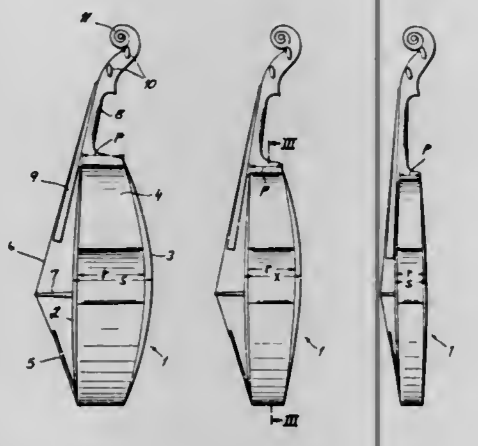


1. The combination, with a case for a grand piano that includes means for holding a cover therefor raised and in an open position; of a transparent cover shaped to fit said case, and hinge means embracing a margin of said transparent cover and mounted on said case to permit pivotal movement of said cover into open and closed positions; and in which a part of said hinge means comprises a pair of L shaped members positioned with the legs thereof on opposite sides of said margin of said transparent cover and the bottoms thereof overlapping an edge of said cover and in sliding relation to each other, means for retaining said members in embracing relationship to said margin, and means mounting one of said members on said case for pivotal movement relative thereto.

3,969,971
INSTRUMENT SYSTEM AND STRINGED-INSTRUMENTS THEREFOR

Ion Delu, Bucharest-Mogosoaia, Romania, assignor to Complexul Pentru Prelucrarea Lemnului Reghin, Bucharest, Romania

Continuation-in-part of Ser. No. 70,130, Sept. 8, 1970, Pat. No. 3,691,891, and a continuation-in-part of Ser. No. 83,466, Oct. 23, 1970, Pat. No. 3,680,424. This application Feb. 18, 1972, Ser. No. 227,531
Int. Cl.² G10D *1/02*
U.S. Cl. 84—274 **5 Claims**

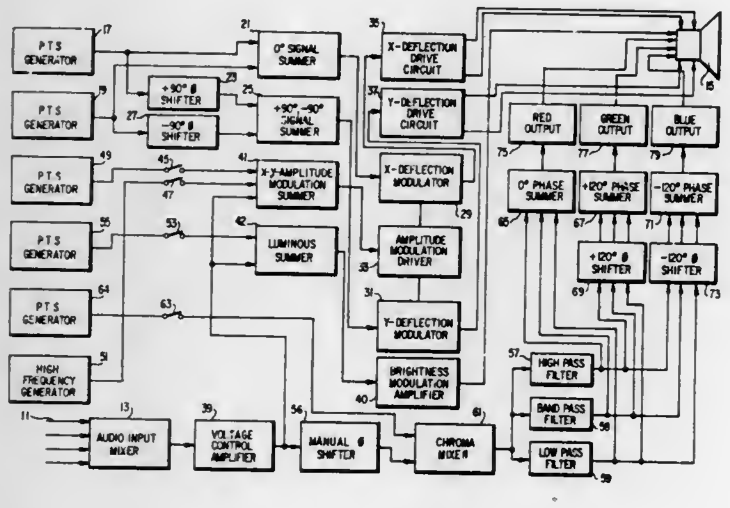


1. A musical-instrument system comprising at least four, stringed, violin-type, bow-operated instruments in ensemble and played da braccio all with identical overall length, notation clefs and substantially identical effective string length, said instruments having a common fingering and graduated body width with resonance shades corresponding at least to soprano, alto, tenor, and bass voices.

3,969,972
MUSIC ACTIVATED CHROMATIC ROULETTE GENERATOR

Robert L. Bryant, Box 6, Dry Fork, Va. 24549

Filed Apr. 2, 1975, Ser. No. 564,361
Int. Cl.² A63J *17/00;* H04M *1/00*
U.S. Cl. 84—464 **11 Claims**



1. A system for creating and displaying colored roulette curves representative of performed music comprising:

a display means for converting signals into a visual display, said display means including a screen, an X-,Y-deflection means for moving a trace on said screen, and a color means for determining the color of said trace; and

an X-,Y-deflection control means including a signal producing means for producing at least two synthetic musically-related signals having frequencies f_1 and f_2 in a ratio of integers one to the other, where said frequencies f_1 and f_2 are very nearly equal to the frequencies of notes in a standard music scale, modulation means for modulating each of said at least two synthetic signals by performed-music signals, and a means for applying said modulated signals to said X-,Y-deflection means to thereby produce roulette curves on said screen having elements related to the physical characteristics of said at least two synthetic signals as well as those of said performed-music signals; and

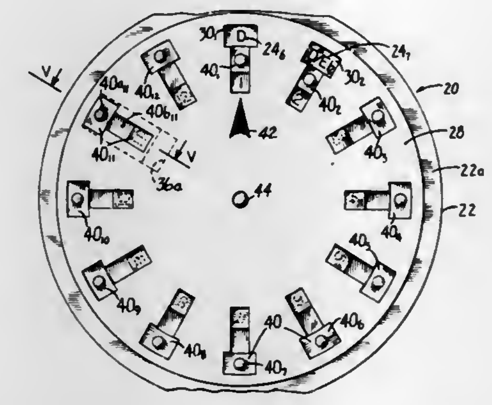
a music-signal processing means for receiving said performed-music signals and for further modifying the physical characteristics of said visual display in a manner responsive to the physical characteristics of said performed-music signals.

3,969,973
DEVICES FOR SELECTIVE DISPLAY OF INFORMATION

George Pandapas, Jr., 322 W. 72nd St., New York, N.Y. 10003

Filed June 16, 1975, Ser. No. 587,246
Int. Cl.² G09B *15/02*
U.S. Cl. 84—474 **15 Claims**

1. A musical information display device comprising a first member having a surface bearing spaced musical indicia, a second member overlying said first member surface and rotatable relative to said first member, said second member having apertures registrable with said first member indicia on such relative rotation of said first and second members and a closure element for each said aperture operable for opening the same to provide display therethrough of the first member indicium registered therewith, each said closure element being

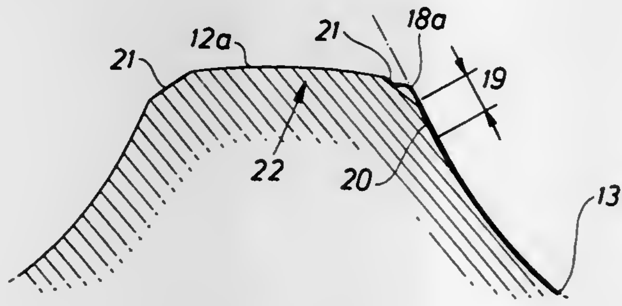


operable independently of operation of the others of such closure elements.

3,969,974
CONFIGURATION FOR NUTS AND BOLT HEADS

Sixten H. Lejdegård, Ramnas, Sweden, assignor to Bulten-Kanthal Aktiebolag, Sweden

Filed Feb. 26, 1974, Ser. No. 445,920
Claims priority, application Sweden, Feb. 27, 1973, 73027195
Int. Cl.² F16B *23/00, 35/00*
U.S. Cl. 85—45 **6 Claims**



1. A threaded metal fastener having an external rotational drive formation having a surface which, when viewed in plan, comprises an outer cylinder having a plurality of at least partially concave re-entrant surfaces of smaller radius of curvature than said outer cylinder and equiangularly spaced about its periphery, each of the regions of intersection of said re-entrant surfaces with said outer cylinder being planar and disposed at an angle on the order of 20° with respect to an immediately adjacent drive face portion of the re-entrant surface to provide a clearance for reception of any built-up metal.

3,969,975
HEAVY DUTY STAPLE

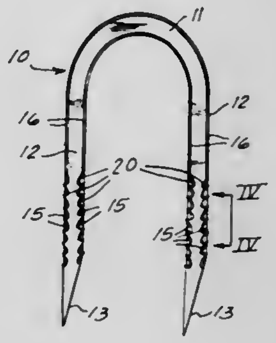
Harry J. Krol, Arlington Heights, Ill., assignor to King-Koral, Inc., Glenview, Ill.

Filed Apr. 28, 1975, Ser. No. 572,207
Int. Cl.² F16B *15/06*
U.S. Cl. 85—49 **15 Claims**

1. A staple having a head end and elongated spaced substantially coextensive prongs with pointed tips, the prongs being of generally square cross section each provided with four longitudinal corners:

a plurality of the corners on each of the prongs having respective series of longitudinally spaced interlock notches;

each of said notches being defined by a shoulder facing generally toward the head end of the staple and a surface slanting from the inner end of the shoulder and running out at the associated prong corner, the shoulders on said four corners being arranged so as to be in sets with each set disposed in a common plane extended transversely of a longitudinal axis through the associated prong and with the sets being arranged in a series of generally parallel planes extending along the length of the prong enabling each set of shoulders to be simultaneously embedded when the staple is driven into an object and with the



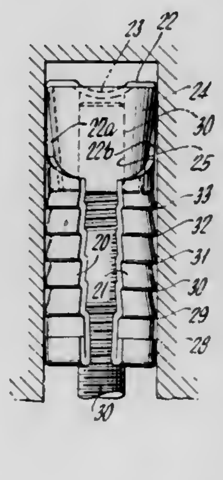
shoulders and the associated notches in each set being spaced from one another about a central axis of the associated prong;

said notches being coined, and with material displaced from the notches providing lateral shoulder bulges on the faces of the prongs alongside the notches thus increasing the effective areas of the shoulders.

3,969,976
EXPANSION UNIT

Peter Amico, 4854 Glenfield Drive, Syracuse, N.Y. 13215

Filed Sept. 5, 1974, Ser. No. 503,352
Int. Cl.² F16B *13/04*
U.S. Cl. 85—75 **5 Claims**



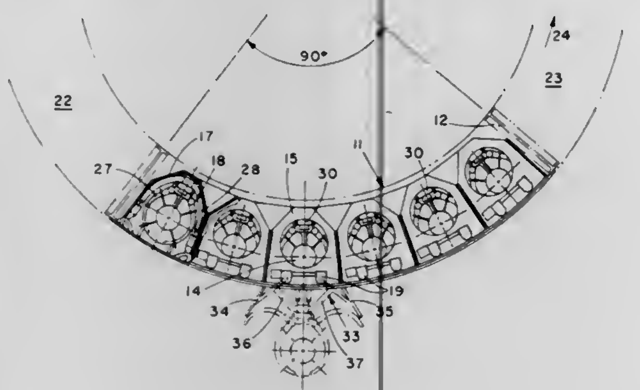
1. An expansion unit for mine roof bolts and the like comprising a generally cylindrical shell formed from sheet metal and wedging means for expanding said shell, wherein said shell comprises a pair of like opposed arcuate leaves connected at one end by a generally U-shaped strap; each of said leaves (i) being provided at its free end with an external cuff having a solid, continuous upper edge formed by an outward foldover of metal; (ii) having a relatively smooth internal surface so as to allow free downward travel of said wedge without binding; and (iii) having an external surface provided with a plurality of lateral and outwardy extending serrations or ridges defining circumferential arcs, said serrations or ridges being of gradually diminishing radial height from the cuff end to the connected end so as to provide said unit with an effective external taper prior to insertion of the unit in a mine roof hole or the like; wherein said cuff and said ridges are dimensioned to ensure that, upon said insertion, the outer surface of said cuff and said ridges simultaneously contact the inner wall of said hole to thereby increase the holding power of said unit, so that expansion of said unit occurs in a substantially parallel fashion alongsubstantially its entire length, and said unit maintains its generally cylindrical shape during said expansion. along substantially

3,969,977

HULL MODULE WEAPON OR EQUIPMENT SYSTEM

Everett W. Opdahl, Lutherville, and Chang K. Kim, Serverna Park, both of Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 16, 1974, Ser. No. 461,466
Int. Cl.² F41F *3/10*
U.S. Cl. 89—1.810 **12 Claims**



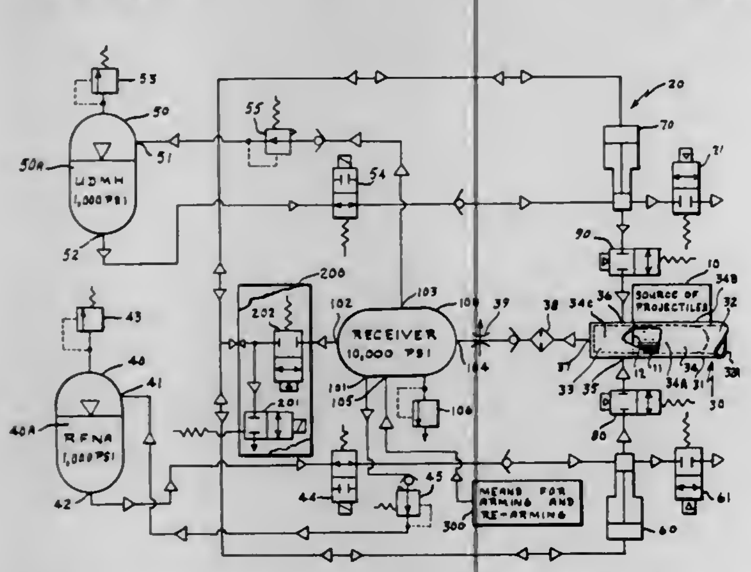
1. The combination with the double hulls of a submarine of exteriorly disposed launchable payloads comprising:
- a unitary payload module including a plurality of individual capsules and a payload in each capsule,
  - said module occupying and secured in recesses between the double hulls of a submarine;
- each of said capsules containing combined means for storing and deploying the payload therein; and
- control means connecting said capsules to a central control in the submarine so that said payloads may be remotely and selectively deployed and launched.

3,969,978

DIRECT INJECTION LIQUID PROPELLANT GUN SYSTEM

Kerry D. Seifert, and Parker C. Smiley, both of Oakland, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 535,339
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **5 Claims**



1. A direct injection liquid hypergolic bipropellant gun system, adapted for use as a rapid fire, small caliber, high muzzle velocity aircraft cannon system which is in combination with a source of small caliber projectiles suitable for use in the aircraft cannon system, wherein each of the said projectiles has a base at the rear thereof comprising:

a. at least one aircraft cannon, having a barrel of preselected finite length, with said barrel having a fore end with a muzzle thereat and an aft end with a chamber therein, with said chamber having a fore end portion with a closeable opening capable of receiving, accepting, and housing a projectile from the source of projectiles, and with said chamber also having an aft end portion located to the rear of the base of the projectile, wherein said aft end portion of said barrel chamber is capable of receiving, housing, and withstanding the combustion of a suitable liquid hypergolic propellant which includes a liquid fuel and a liquid oxidizer, and further wherein said aft end portion of said barrel chamber has a first inlet, a second inlet, and an orifice;

b. a first reservoir containing a suitable liquid oxidizer of the hypergolic type, with said reservoir having an outlet and an inlet, with said outlet of said first reservoir connected to said first inlet of said aft end portion of said barrel chamber, and with said first reservoir having attached thereto a first relief valve;

c. a second reservoir containing a suitable liquid fuel of the hypergolic type, with said reservoir having an outlet and an inlet, with said outlet connected to said second inlet of said aft end portion of said barrel chamber, and with said second reservoir having attached thereto a second relief valve;

d. a first valve interposed between, and connected to, said first reserovir and said aft end portion of said barrel chamber, with said first valve being of the shut-off type to control the flow of said liquid oxidizer;

e. a second valve interposed between, and connected to, said second reservoir and said aft end portion of said barrel chamber, with said second valve being of the shut-off type to control the flow of said liquid fuel.

f. a first pressure intensifier interposed between said first valve and said aft end portion of said barrel chamber, with said first pressure intensifier having attached thereto a first venting valve;

g. a second pressure intensifier interposed between said second valve and said aft end portion of said barrel chamber, with said second pressure intensifier having attached thereto a second venting valve;

h. a first injector valve interposed between, and connected to, said first pressure intensifier and said first inlet of said aft end portion of said barrel chamber;

i. a second injector valve interposed between, and connected to, said second pressure intensifier and said second inlet of said aft end portion of said barrel chamber;

j. a third reservoir having a first outlet, a second outlet, a third outlet, an orifice, and an inlet, with said third reservoir connected at said orifice to the said orifice at the said aft end portion of said barrel chamber to permit the inflow, the storage, and the outflow of said resultant combustion gases which flow out of said orifice at said aft end portion of said barrel chamber, and with said third reservoir connected at said first outlet to said inlet of said first reservoir containing said liquid oxidizer of the hyperbolic type, and with said third reservoir connected at said third outlet to said inlet of said second reservoir containing said liquid fuel of the hyperbolic type, and with said third reservoir having attached thereto a third relief valve;

k. a third valve interposed between, and connected to, said third reservoir and said first reservoir, with said third valve being of the pressure regulator type;

l. a fourth valve interposed between, and connected to, said third reservoir and said second reservoir, with said fourth valve being of the pressure regulator type;

m. a filter interposed between, and connected to, said orifice of said aft end portion of said barrel chamber and said third reservoir;

n. a fifth valve interposed between, and connected to, said filter and said orifice of said third reservoir, with said fifth valve being of the flow control type;

o. a sixth valve interposed between, and connected to, said second outlet of said third reservoir, and said first and said second pressure intensifiers, with said sixth valve being of the piezoelectric three-way type;

p. means for arming said liquid bipropellant gun system;

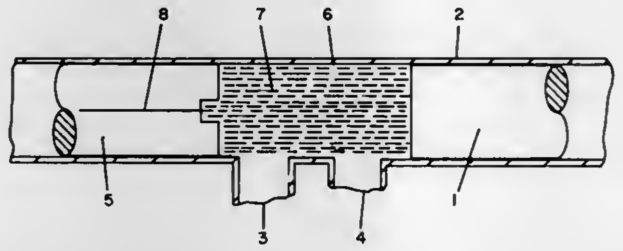
q. and, means for rearming said liquid bipropellant gun system.

3,969,979

LIQUID PROPELLANT FOR A GUN

Abraham Schneider, Overbrook Hills, Pa.; Stanley E. Wood, and James T. Bryant, both of Inyokern, Calif., assignors to Sun Ventures, Inc., St. Davids, Pa. and The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1975, Ser. No. 600,016
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **3 Claims**



1. In a liquid propellant gun system wherein an emulsion of a liquid hydrocarbon and nitric acid is employed in the breech of a gun behind the projectile, the improvement comprises that the hydrocarbon is selected from the group consisting of

a. exo-tetrahydrodicyclopentadiene;

b. a mixture of a major amount of (*a*) and a minor amount of its endo form;

c. exo-tetrahydrodimethyldicyclopentadiene;

d. a mixture of a major amount of (*c*) and a minor amount of its endo form;

e. exo-tetrahydromethyldicyclopentadiene;

f. a mixture of a major amount of (*e*) and a minor amount of its endo form;

g. exo-tetrahydroethyldicyclopentadiene;

h. a mixture of a major amount of (*g*) and a minor amount of its endo form;

i. a mixture of trans-syn-2-methyldecalin and trans-anti-1-methyldecalin;

j. trans-perhydroacenaphthene;

k. perhydrofluorene; and

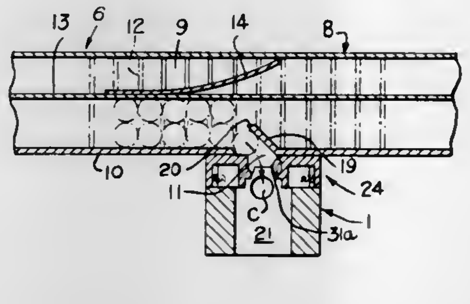
l. a mixture of any of the foregoing.

3,969,980

MACHINE GUN

Hubertus Brandstätter, and Oswald Tschöll, both of Kufstein, Austria, assignors to American International Corporation, Salt Lake City, Utah

Filed Apr. 12, 1974, Ser. No. 460,601
Int. Cl.² F41C *25/10*
U.S. Cl. 89—33 D **12 Claims**



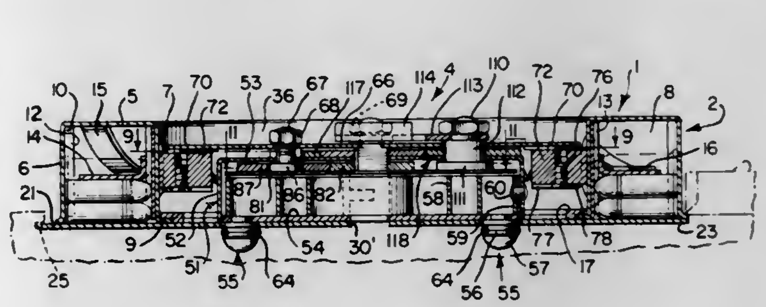
1. A machine gun for cartridges having rims with a diameter greater than the body of the cartridges including, a receiver having a reciprocating bolt and provided with an upwardly facing cartridge feeding access area adjacent the opening to the chamber of a barrel connected to said receiver, a feed block having a cartridge throat therethrough disposed within said access area and provided with a main body having at least a portion thereof straddling the top of said bolt when said bolt is in its forwardmost position of travel, a cartridge magazine mounted atop said gun and including a bottom facing cartridge exit overlying said feed block throat, drive means within said magazine sequentially urging cartridges under pressure through said exit to said feed block throat, fixed and displaceable stop means in said block bounding said throat for supporting in a forwardly downwardly inclined manner each cartridge being urged from said magazine exit for subsequent delivery by said bolt into said chamber, said fixed stop means including a pair of oppositely disposed ledges adjacent the rear of said throat and extending transversely into said throat to support there-atop only the rim of a cartridge, said displaceable stop means including a pair of oppositely disposed moveable flange members disposed below the plane of said fixed rim ledges each having an inwardly projecting lip normally extending only into the forward area of said throat, spring means constantly urging said lips into said throat and said spring means resists the pressure of said drive means and supports each cartridge in said inclined manner upon said lips until subsequent downward and forward delivery of said cartridge into said chamber by said bolt.

3,969,981

MACHINE GUN CARTRIDGE MAGAZINE

Hubertus Brandstätter, and Oswald Tschöll, both of Kufstein, Austria, assignors to American International Corporation, Salt Lake City, Utah

Filed Apr. 12, 1974, Ser. No. 460,602
Int. Cl.² F41C *25/10*
U.S. Cl. 89—33 D **22 Claims**



1. A drum cartridge magazine for a machine gun having a receiver mounting surface, including, a base plate adapted to overlie the gun receiver surface and having a cartridge exit therethrough for delivering cartridges to the gun receiver, means on said base plate for fixed attachment to said receiver mounting surface, a ring-shaped cover defining a storage cavity adapted to contain a plurality of cartridges overlying said base plate, means connecting said cover to said plate while permitting relative angular displacement therebetween, alignment means within said cover cavity maintaining cartridges therein in a plurality of adjacent vertically disposed columns, a drive assembly centrally disposed within the confines of said cover, means removably attaching said drive assembly to said base plate, said drive assembly including a base member fixedly attached relative said magazine base plate, a rotatable drive arm on said drive assembly provided with a distal portion engageable with said cover to angularly displace said cover relative to said magazine base plate and drive assembly base member and to sequentially advance cartridges therein to said plate exit, spring means within said drive assembly having opposite ends respectively fixed relative said drive assembly base member and drive arm to rotate said drive arm when said spring means is energized, and said drive assembly including brake means operable to immobilize said drive arm against rotary displacement when said spring means is energized whereby, said drive assembly may be removed from said magazine base plate without de-energizing said spring means when said brake means is operated.

3,969,982
APPARATUS FOR DAMPING THE FORWARD AND RETURN MOVEMENTS OF AN AUTOMATIC FIRING WEAPON

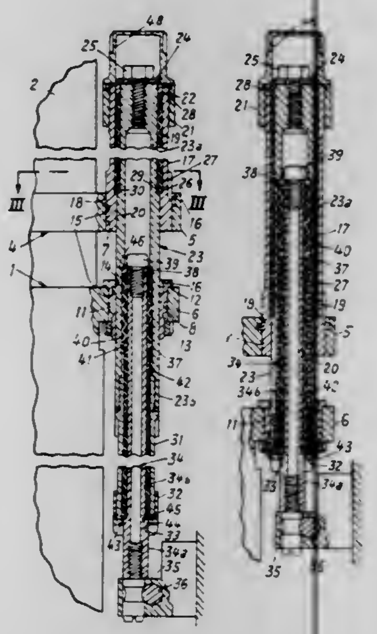
Jacques Pier-Amory, Chatelaine, and Beat Koch, Hunibach, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Apr. 15, 1974, Ser. No. 461,119

Claims priority, application Switzerland, May 4, 1973, 6337/73

Int. Cl.² F41F *19/12*

U.S. Cl. 89—178 **13 Claims**



1. An apparatus for damping the forward and return movements of an automatic firing weapon comprising a stationary weapon mount, a weapon housing and a weapon barrel, a first annular spring for damping movement of the weapon housing with respect to the stationary weapon mount, said annular spring being arranged externally of the weapon housing in a damping mechanism, means for displaceably arranging the weapon barrel with respect to the weapon housing, a second annular spring for damping the movement of the weapon barrel with respect to the weapon housing, said second annular spring being arranged in said damping mechanism, said damping mechanism comprising a first sleeve member secured at the weapon housing substantially parallel to the weapon barrel, said sleeve member being supported via the first annular spring at the stationary weapon mount, the weapon barrel being supported at the sleeve member via the second annular spring, a further sleeve member, said two sleeve members being arranged parallel to and at both sides of the weapon barrel and provided at the weapon housing.

3,969,983
BREECHBLOCK FOR AUTOMATIC FIRING WEAPON

Jürg Zellweger, Neerach, and Max Fierz, Rumlang, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zurich, Switzerland

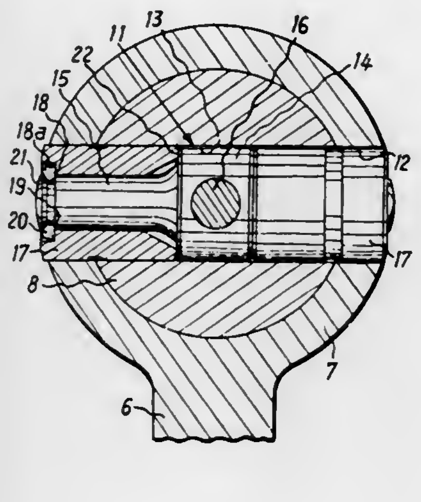
Filed Sept. 30, 1974, Ser. No. 510,913

Claims priority, application Switzerland, Oct. 3, 1973, 14151/73

Int. Cl.² F41D *3/06*

U.S. Cl. 89—185 **3 Claims**

1. A breechblock arrangement for an automatic firing weapon comprising a breechblock carrier, a substantially cylindrical breechblock body rotatably and axially displaceably mounted in said breechblock carrier, said breechblock body having a transversely extending bore, a control bolt arranged in said transversely extending bore of said breechblock body, said breechblock carrier being provided with control grooves, said control bolt having opposed ends, a sleeve surrounding each end of the control bolt, said sleeves being rotatably mounted in said bore of the breechblock body and engaging with the control grooves of the breechblock carrier, and holding means fastened to the control bolt for securing the sleeves against axial displacement.



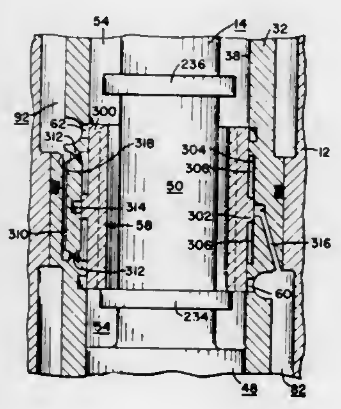
3,969,984
HYDROACOUSTIC APPARATUS AND VALVING MECHANISMS FOR USE THEREIN

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,978

Int. Cl.² F01B *7/18;* F01L *17/02*

U.S. Cl. 91—276 **26 Claims**



1. For use in hydraulic oscillator apparatus in which a pressure actuated mass intermittently engages a valving element which is separate from said mass and is movable together therewith over a substantial portion of the trajectory of said mass to modulate the flow of fluid for producing pressure variations to sustain the oscillation of the mass, a valve mechanism which comprises means including said valving element for confining a volume of said fluid, and means for controlling the flow of said fluid into and out of said volume as a function of the position of said valving element as said element moves whereby to control the motion of said valving element and substantially eliminate any differences in the displacement of said mass and said element as they move together over said substantial portion of said trajectory.

3,969,985
FLUID ACTUATING DEVICE FOR AN ELECTRIC CIRCUIT BREAKER

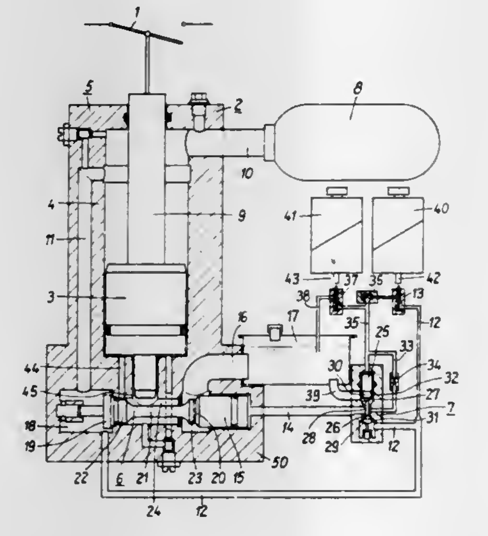
Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 2, 1973, Ser. No. 375,746

Claims priority, application Germany, July 12, 1972, 2235074

Int. Cl.² F15B *13/043, 15/17;* H01H *35/38*

U.S. Cl. 91—416 **18 Claims**



1. A fluid actuating device for an electric switching apparatus such as a high-voltage power circuit breaker or the like comprising an actuator for actuating the electric switching apparatus, said actuator including a cylinder and an actuator differential piston movable in said cylinder between first and second positions corresponding to the open and closed positions of the switching apparatus, said actuator differential piston having two end-faces for receiving fluid pressure force; high-pressure fluid supply means for supplying fluid under high-pressure to said end-faces; a main-valve arrangement including a main-valve differential piston movable between two end positions for alternately interrupting and connecting the fluid from said fluid supply means to one of said end-faces of said actuator differential piston whereby said actuator differential piston is caused to move between said first and second positions, said main-valve differential piston having two end-faces fluidly connected to said fluid supply means; and, a control valve arrangement including a control differential piston movable between two end positions for interrupting and connecting the fluid supply from said fluid supply means to one of said end-faces of said main-valve differential piston, said control differential piston having two end-faces also fluidly connected to said fluid supply means, and control means for actuating said control differential piston in response to inputs for opening and closing the switching apparatus by alternately interrupting and connecting the fluid from said fluid supply means to one of said end-faces of said control differential piston; said other one of said end-faces of each of said differential pistons being connected directly to said high-pressure fluid supply means to cause the same to be subjected continuously to the pressure of said fluid, said other one of said end-faces of each of said differential pistons being smaller than said one end-face thereof; said actuator differential piston, said main-valve differential piston and said control differential piston being actuable exclusively by the pressure of the fluid of said fluid supply means whereby said two end positions of each of said differential pistons are maintained independent of the instantaneous value of the pressure of the fluid.

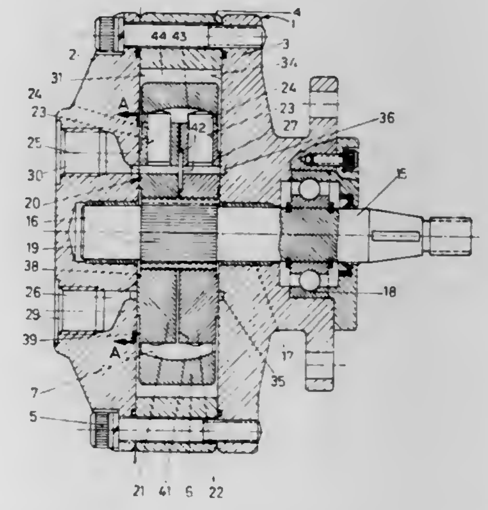
3,969,986
RADIAL PISTON PUMP

Carl Verner Ohrberg, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 169,827, July 6, 1971, abandoned, which is a continuation of Ser. No. 877,363, Nov. 17, 1969, abandoned. This application Jan. 11, 1973, Ser. No. 322,883

Int. Cl.² F01B *13/06*

U.S. Cl. 91—492 **8 Claims**



1. A radial piston pump comprising a casing having a generally cylindrically shaped chamber with first and second walls having first and second spaced and parallel internal surfaces, one and only one of said walls having fluid feeding and exhausting passages which have direct fluid communication with the exterior of said casing, a shaft rotatably mounted in said casing, a pair of first and second generally cylindrically shaped piston carriers in said chamber, said carriers having adjacent and opposite surfaces, said carriers being attached to said shaft for rotation therewith and axial movement relative thereto, one of said carriers having a first set of fluid inlet and outlet passages extending transversely thereof, the other of said carriers having a second set of fluid inlet and outlet passages extending transversely thereof, said carriers being indexed relative to each other with said first set of passages in said one carrier being respectively aligned with and having fluid communication with said second set of passages in said other carrier, at least one of said adjacent surfaces having at least one recessed surface portion in surrounding relation to at least one of said passages and sealing means between said adjacent carrier surfaces in surrounding and radially spaced relation to the mouths of said passages, said sealing means including at least one sealing element in surrounding relation to said recessed surface portion, said recessed surface portion being exposed to pressurized fluid in at least one of said passages to force said carriers apart into sealing engagement with said first and second wall surfaces.

3,969,987
HYDROACOUSTIC APPARATUS AND VALVING MECHANISMS FOR USE THEREIN

Boyd A. Wise, Webster, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

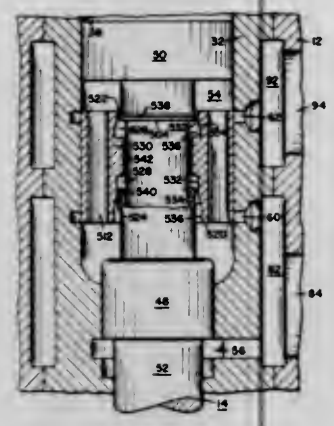
Filed Nov. 11, 1974, Ser. No. 522,824

Int. Cl.² F01L *25/04;* F01B *7/18*

U.S. Cl. 91—317 **16 Claims**

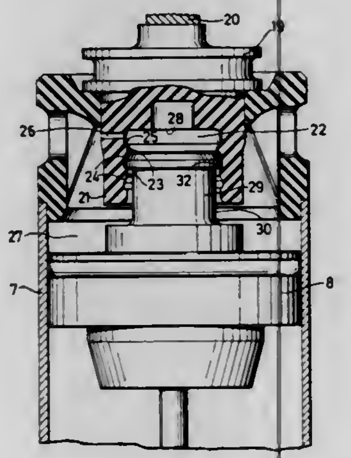
1. For use in a hydraulic oscillator having a housing, means for continuously introducing hydraulic fluid under pressure into said housing, a pressure actuated mass and a valving element which modulates the flow of the fluid to produce pressure variations for sustaining the oscillations of said mass, a mechanism for actuating said valving element which comprises means for maintaining said mass and said element out

of contact with and in close proximity to each other to define a plurality of fluid resistances therebetween for coupling said mass and said element, said resistances being spaced from each other in the direction of movement of said mass.



3,969,988
ARRESTING DEVICE FOR IMPACT DRIVE TOOLS

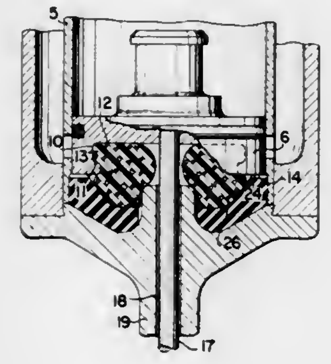
Werner Maurer, Zizishausen, Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Germany
Filed July 24, 1974, Ser. No. 491,265
Claims priority, application Germany, Aug. 2, 1973, 2339162
Int. Cl.^{2} F15B *15/26*
U.S. Cl. 92—19 **5 Claims**



1. In an impact tool having a cylinder with a longitudinal axis, a percussive piston movable in the cylinder, pressure medium supply means secured to one end of the cylinder for applying pressure to one end of said piston to cause said piston to travel in an impact stroke, pressure storage means at another end of the cylinder for storing pressure medium during an impact stroke for returning the piston to a rest position at said one end of the cylinder following the impact stroke, and an arresting device including a stationary member at said one end of said cylinder and a locking shoulder at the upper end of said piston movable with the piston for holding the piston in said rest position in the absence of pressure for causing stroking of the piston and for releasing the piston upon the application of sufficient pressure medium to cause an impact stroke, the improvement wherein said stationary member of said arresting device comprises a rubber elastic sleeve including a plurality of rubber elastic arresting bulges inside said sleeve, each rubber elastic arresting bulge including a first ring surface slanted at a given angle relative to said longitudinal axis to flare outwardly and to face toward said percussive piston, and a second ring surface facing away from said percussive piston and forming an angle with said longitudinal axis, which is larger than said given angle, and means axially spacing said rubber elastic arresting bulges apart with respect to said longitudinal cylinder axis to form grooves inside said stationary rubber elastic arresting sleeve, said shoulder of said piston deflecting said bulges radially outwardly until the shoulder is locked by one of said bulges in any one of a plurality of positions in said cylinder during the return piston stroke, the locking position of said piston being determined by the stored pressure for returning the piston.

3,969,989
IMPACT BUFFER FOR IMPACT DRIVE TOOLS

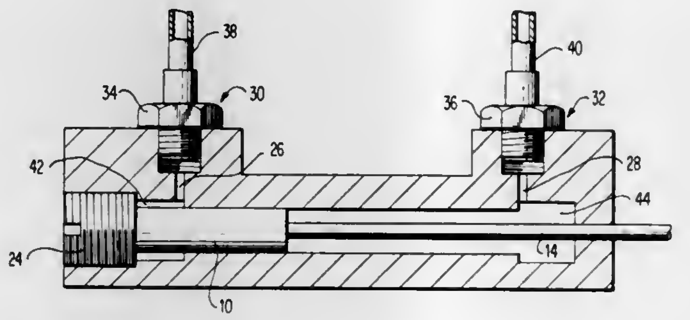
Werner Maurer, Zizishausen, and Erich Skuthan, Holzmaden, both of Germany, assignors to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Germany
Filed July 24, 1974, Ser. No. 491,264
Claims priority, application Germany, Aug. 2, 1973, 2339163
Int. Cl.^{2} F01B *11/02*
U.S. Cl. 92—85 R **6 Claims**



1. In an impact drive tool for driving nails or similar articles having a percussive piston mounted for movement in a cylinder, means for directing a pressure medium into one end of the cylinder to initiate an impact stroke driving the piston toward the other end of the cylinder, and impact buffer means positioned to absorb driving energy at the end of the impact stroke, wherein said buffer means comprise a first buffer element secured to said piston to face the other end of the cylinder, and a second buffer element secured to the other end of the cylinder, the improvement wherein said first buffer element comprises a material having an open cell structure in which the open cells are distributed substantially uniformly whereby the volume of said first buffer element is compressible, wherein said second buffer element comprises an elastic material which is harder than the material of the first buffer element, wherein said percussive piston has a surface facing toward said other end of said cylinder, said first buffer element having a portion projecting toward said other end of said cylinder past said piston surface, said second buffer element having a cavity open toward said percussive piston and a ring surface surrounding said cavity and positioned to be struck by said surface of said piston, said ring surface of said second buffer element having radially extending grooves, said cavity in the second buffer element being positioned so that the first buffer element is compressed in said cavity prior to the piston reaching its work stroke end position in which the piston impacts on said annular surface of the second buffer element, the first buffer element substantially filling the available space of said cavity in said second buffer element when the piston has reached the end of said impact stroke, said radially extending grooves allowing escape of the air expelled from said open cell structure of the first buffer element.

3,969,990
SELF-SNUBBING MINIATURE PISTON ASSEMBLY

Bayard G. Gardineer, Patterson, and Hugh A. Panissidi, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 319,818, Dec. 29, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,253
Int. Cl.^{2} F15B *15/22*; **F01B** *11/02*
U.S. Cl. 92—85 B **22 Claims**



1. A self-snubbing miniaturized piston assembly comprising:

a. a cylinder having a diameter on the order of one-eighth inch which is adapted to contain a working fluid, said cylinder also having spaced from one end thereof a port having a cross-sectional area sufficiently large to permit the unimpeded flow of said working fluid, said port serving as both the sole outlet and the sole inlet means for said fluid at that end of said cylinder;

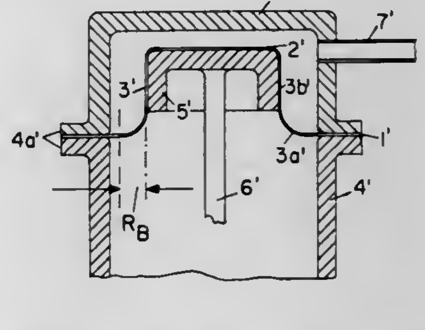
b. a piston having a diameter on the order of one-eighth inch disposed for reciprocal displacement in said cylinder, said piston having a cross-sectional area at least a first portion thereof sufficient substantially to prevent the flow of said fluid past said first portion when said first portion is in at least a first portion of said cylinder, said piston also having a cross-sectional area at at least a second portion thereof sufficiently smaller than the cross-sectional area of said cylinder at at least as second portion thereof to permit the impeded flow of said fluid between said second portion of said piston and said second portion of said cylinder, the cross-sectional area of said first portion of said piston being equal to the cross-sectional area of said second portion of said piston and said second portion of said cylinder extending from a first end of said cylinder at least to the edge of said port adjacent to said first portion of said cylinder; and

c. means for displacing said piston in said cylinder, whereby the displacement of said piston is snubbed rapidly as the leading edge of said second portion of said piston passes said port and is thereafter snubbed gradually as the leading edge of said second portion of said piston continues its displacement in said second portion of said cylinder.

3,969,991
ROLLING DIAPHRAGM AND ROLLING DIAPHRAGM DEVICES

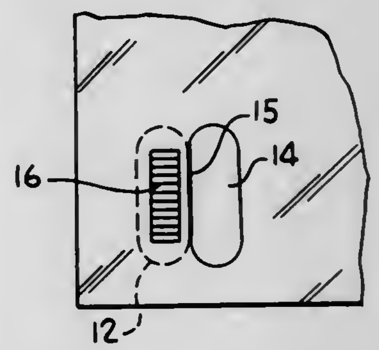
Donald W. Comstock, Lexington, and Peter B. Marchetti, Westford, both of Mass., assignors to Bellofram Corporation, Burlington, Mass.
Filed Mar. 3, 1975, Ser. No. 554,945
Int. Cl.^{2} F01B *19/00*; **F16J** *3/02*
U.S. Cl. 92—99 **2 Claims**

2. A substantially hat-shaped rolling diaphragm as a separate structure including a cylinder clamping flange having a radially inner relatively large diameter, a piston clamping flange parallel to said cylinder clamping flange having a radially outer edge of relatively small diameter and a rolling wall extending between said cylinder clamping flange and said radially outer edge of said piston clamping flange wherein said rolling wall (3′) includes a first region (*3a′*) immediately adjacent said cylinder clamping flange (1′), the radii of the transverse cross-sections of said first region (*3a′*) decreasing at a relatively rapid rate in axial direction from the plane defined by said cylinder clamping flange (1′) toward the plane defined by said piston clamping flange (2′), the radial cross-sections of said first region (*3a′*) of said rolling wall (3′) having radii of curvature (R_B) larger than one fourth of the difference between said radially inner diameter (D_C) of said cylinder clamping flange (1′) and the diameter (D_P) of said radially outer edge of said piston clamping flange (2′), and wherein said rolling wall (3′) includes a second region (*3b′*) relatively remote from said cylinder clamping flange (1′), the radii of the transverse cross-sections of said second region (*3b′*) decreasing at a relatively slow rate in axial direction from the plane defined by said cylinder clamping flange (1′) toward the plane defined by said piston clamping flange (2′).



3,969,992
METHOD OF FASTENING SHEET MATERIAL

Franklin J. Calderazzo, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Dec. 4, 1975, Ser. No. 637,692
Int. Cl.^{2} B31F *5/02*
U.S. Cl. 93—1.1 **10 Claims**



1. A method of mechanically bonding a plurality of sheets of material so as to form a unitized body of sheets, comprising the steps of:

a. supporting as a unitized mass, a plurality of sheets of material for the purpose of mechanically bonding said sheets together;

b. perforating said mass of sheet material so as to form a multilayered flap in said mass of sheets;

c. folding said multilayered flap upon said mass of sheets; and

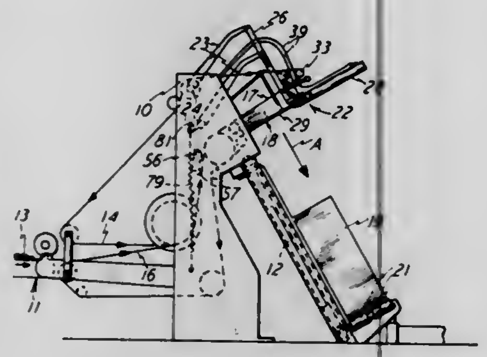
d. simultaneously crimping said multilayered flap and said mass of sheets by pressing-in undulations so as to form a mechanical bond in the mass of sheets, in the multilayered flap, and between the multilayered flap and said mass of sheets, so as to form a unitized body of sheets.

3,969,993
SEPARATOR FOR A SHEET STACKER

Anton R. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.
Filed July 7, 1975, Ser. No. 593,849
Int. Cl.^{2} B31B *1/98*
U.S. Cl. 93—93 C **12 Claims**

1. A separator for a sheet stacker, comprising a support for receiving a stack of sheets, a stack conveyor on said support,

a conveyor assembly extending to said support for transporting sheets in a stream and into a stacked relation on said stack conveyor, a sheet counter for counting the sheets passing into the stacked relation, a stack separator plate movably mounted adjacent said stack conveyor for movement into said stream for intercepting said stream and for movement in the direction along the extent of said stack conveyor for defining one end of a stack of sheets on said stack conveyor, control mechanism operatively connected with said stack separator plate for movement of said stack separator plte into the stream, and said sheet counter and said control mechanism being operatively interconnected for movement of said separator plate into said stream after a selected number of sheets have moved into said stack.



3,969,994

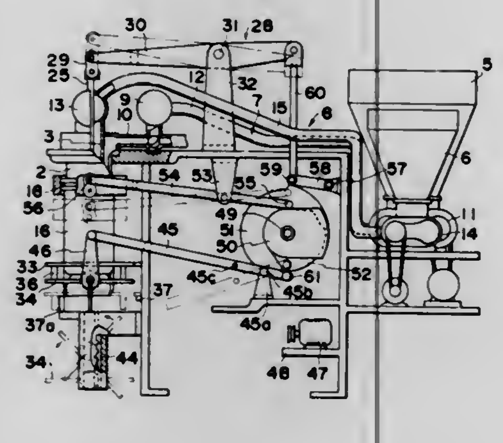
APPARATUS FOR FORMING RING-SHAPED FOODSTUFFS

Ryutaro Kaneko, and Yoshio Kaneko, both of 8, Sanno-cho 1-chome, Minami, Yokohama, Kanagawa, Japan

Filed July 11, 1975, Ser. No. 595,309

Int. Cl.^{2} A21C *9/06*

U.S. Cl. 99—450.6 **6 Claims**



1. In an apparatus for forming ring-shaped foodstuffs having annular fillings therein, said apparatus comprising:

a plurality of forming units disposed side by side, each unit comprising an outer pipe, and inner pipe concentrically disposed within said outer pipe with an annular space therebetween, the lower end of said inner pipe extending beyond the lower end of said outer pipe to define a first outlet post of an enclosure material of the foodstuffs, a cylindrical sleeve slidably mounted on the outer circumferential surface of said outer pipe to have a lowered position closing said first outlet port and an elevated position opening said first outlet port, a member urged against the lower open end of said inner pipe to normally close said open end, a piston assembly adapted for pushing a filling material in said inner pipe downwardly against the urging force of said member to form a second outlet port for said filling material between the lower end of said inner pipe and said urged member;

a first hopper for storing the enclosure material of the foodstuffs;

a second hopper for storing the filling material of the foodstuffs;

a first pipe means for feeding said enclosure material in said first hopper into the annular space between the inner and outer pipes in each of said units;

a second pipe means for feeding said filling material in said second hopper into said inner pipe in each of said units;

a means for simultaneously operating all of the cylindrical sleeves in said units;

a means for simultaneously operating all of the piston assemblies in said units; a product receiving plate extending in the transverse direction of the plural units;

a means for moving said product receiving plate from the upper position adjacent to said second outlet port in each of said units to a lower position spaced away from the lower end of each of said units;

a means for rotating said product receiving plate about **180** degrees while said plate moves down from the lower ends of said units; and

means for driving said cylindrical sleeves operating means, said piston assemblies operating means, and said product receiving plate rotating means in predetermined time relationships.

3,969,995

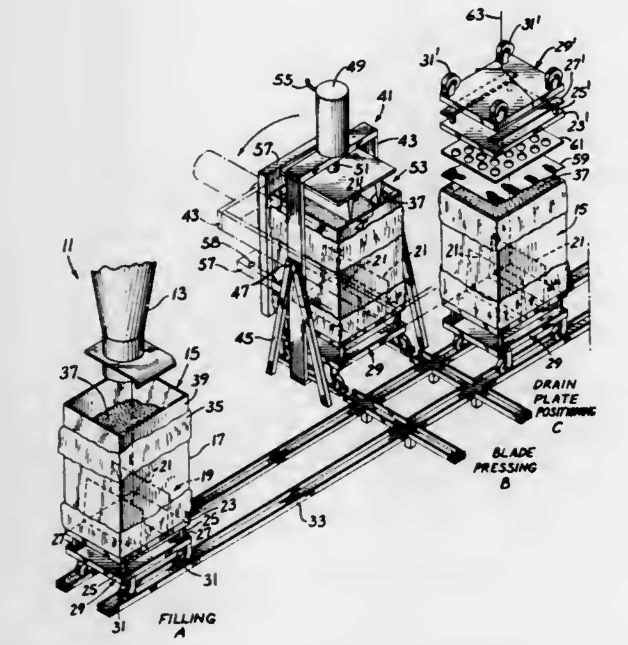
APPARATUS FOR MAKING LARGE SIZED BLOCKS OF CHEESE

Grant Edward Krueger, and Richard John Leitner, both of Green Bay, Wis., assignors to Kraftco Corporation, Glenview, Ill.

Filed Aug. 13, 1973, Ser. No. 388,101

Int. Cl.^{2} A01J *25/11*

U.S. Cl. 99—458 **14 Claims**



1. Apparatus for manufacturing a block of cheese from curd in particulate form, comprising, in combination, an open ended container for holding the curd and having a peripheral configuration substantially identical to the desired block shape of the cheese to be manufactured, blade means including at least one V-shaped blade adapted to extend into said container from one end thereof for direct contact with curd therein, said blade including side walls connected along one corresponding edge of each wall and diverging from the connected edges to define said V-shaped blade, said side walls being perforated generally uniformly over substantially their entire surfaces and being spaced apart at the spaced edges a maximum distance of 2 inches, means for inserting and removing said blade means from within said container, said blade means extending substantially throughout a vertical cross section of said container when inserted therein, whereby insertion of said blade means facilitates drainage of whey from the curd, and subsequent removal of said blade means permits knitting together of the curd to provide a cheese block of uniform texture.

3,969,996

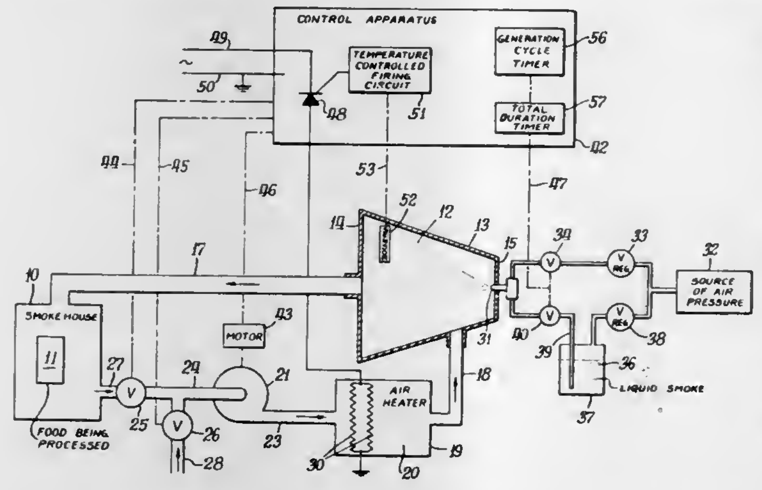
APPARATUS FOR LIQUID SMOKE REGENERATION

Min-Nan Huang, Madison, and Neil F. Walter, Lodi, both of Wis., assignors to DEC International, Inc., Madison, Wis.

Filed Apr. 10, 1975, Ser. No. 566,766

Int. Cl.^{2} A23B *4/04*

U.S. Cl. 99—476 **8 Claims**



1. In the combination of a food smokehouse, a smoke generator having a vaporizing chamber and a nozzle through which liquid smoke is introduced into the chamber to produce smoke vapor therein, and duct means connecting the chamber and the smokehouse for conducting the smoke vapor to the smokehouse, the improvement comprising:

air heater means externally of said chamber, means defining an air passage between the air heater means and the chamber, and means for producing a flow of heated air from the air heater means into said chamber, said air heater means producing an air temperature of at least 500°F. in said chamber for vaporizing the liquid smoke from said nozzle.

3,969,997

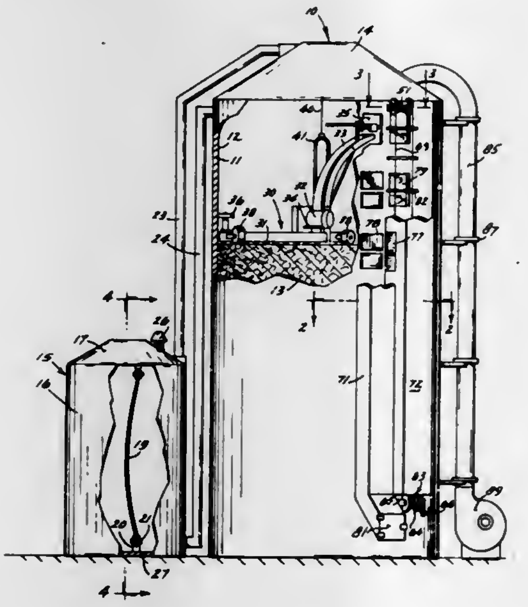
SEALED STORAGE UNIT WITH ACCESS

Darwin O. Haag, 411 W. Walworth Ave., Elkhorn, Wis. 53121

Continuation-in-part of Ser. No. 327,422, Jan. 29, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 519,991

Int. Cl.^{2} A01F *25/18, 25/20, 25/22*

U.S. Cl. 99—646 S **2 Claims**



1. A sealed storage unit comprising a substantially completely sealed storage structure adapted to contain a perishable material, sealed loading and unloading chutes in communication with the interior and exterior of said structure, unloading means positioned at the top of said perishable material and constructed to convey said material into said unloading chute, raising and lowering means for said unloading means in sealed communication with said sealed storage structure, and a building unit with a diaphragm disposed in said building comprising a pressure balancing means disposed outside and spaced from said storage structure, said diaphragm in fluid communication with the inside of said structure by means of two sealed conduits communicating independently with said structure and said building at different levels, said pressure balancing means effecting pressure balance without substantial entry of outside air, said pressure balancing means being substantially the sole source of communication between the interior of said unit and the outside atmosphere, said sealed storage unit requiring no gas separation means or gas return conduits in communication with said unloading means.

3,969,998

PRINTING ACTUATOR

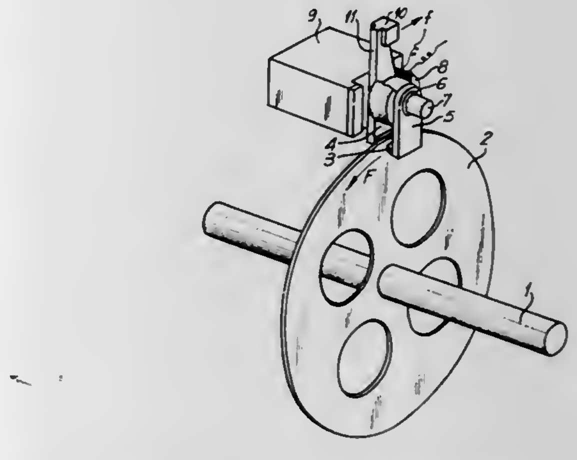
Hilrich Jan Matthijs Venker, Heemstede, Netherlands, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 479,416, June 14, 1974, abandoned, which is a continuation of Ser. No. 308,876, Nov. 22, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,626

Claims priority, application France, Nov. 30, 1971, 71.42939

Int. Cl.^{2} B41J *9/02*

U.S. Cl. 101—93.48 **13 Claims**



1. A striking device for a printing machine comprising, in combination:

an axle defining a pivot axis;

a plurality of hammers pivotally mounted on said axle;

a continuously rotating shaft disposed in spaced parallel relation to said axle;

electromagnetic means associated with each individual hammer for selectively causing said individual hammer to pivot on said axle to perform a strike, each said electromagnetic means including a magnetic frame defining a closed magnetic circuit having an air gap and formed in part by a pair of magnetic arms rotatable around said pivot axis and connected to said individual hammer, said pair of magnetic arms extending from said axle toward said shaft and having free end portions presenting spaced poles defining said air gap, means for selectively creating a magnetic flux field between said free end portions across said air gap, and a disc of non-magnetic, electrically conductive material fixed to said continuously rotating shaft so as to rotate continuously therewith, said disc having opposite side faces, said arms straddling said disc to position said disc within said air gap whereby, when said magnetic flux field is created between said free end portions across said air gap, said flux field causes currents to flow in said disc, which currents act forcibly on said pair of magnetic arms to move said hammer.

3,969,999

DYESTUFF APPLICATOR FOR SCREEN PRINTER

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria

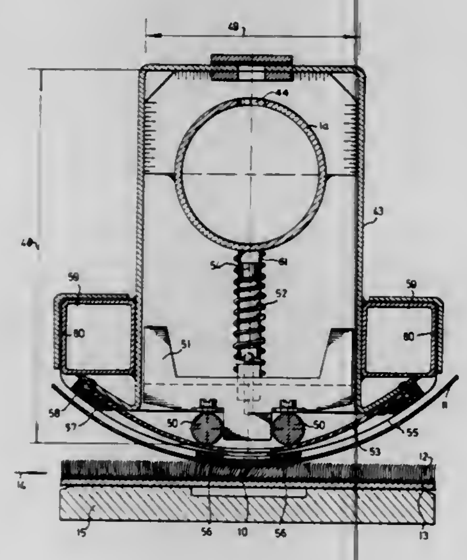
Filed Jan. 31, 1974, Ser. No. 438,282

Claims priority, application Austria, Feb. 7, 1973, 1096/73

The portion of the term of this patent subsequent to Jan. 24, 1992, has been disclaimed.

Int. Cl.^{2} B41F *15/40, 15/44*

U.S. Cl. 101—120 **5 Claims**



1. In a printing machine, in combination:

an apertured printing screen overlying a substrate to be imprinted along a contact area, said screen and said substrate being movable in a predetermined direction;

a source of liquid dyestuff under superatmospheric pressure;

a dyestuff applicator including a housing with a bottom closed by an elastic membrane engaging said screen in said contact area along a narrow zone perpendicular to said direction, said membrane being provided in said zone with an outlet extending substantially completely across said screen, a horizontal supply tube in said housing with an axis paralleling said outlet, said tube communicating with said source and with the interior of said housing to fill said interior with said dyestuff, and a downwardly extending guide structure fixedly mounted on said tube; and

loading means in said housing slidably engaging said guide structure, said loading meand supplementing the pressure exerted by said dyestuff upon said membrane in urging same into firm contact with said screen around said outlet.

3,970,000

LABEL STOCK OVERPRINTING MACHINE

Jack Rowley, Congleton, England, assignor to Berisfords Limited, Congleton, England

Filed Dec. 6, 1974, Ser. No. 530,135

Claims priority, application United Kingdom, Sept. 12, 1974, 39771/74

Int. Cl.^{2} B41F *5/06, 5/16*

U.S. Cl. 101—181 **7 Claims**

1. A machine for overprinting continuous woven label stock comprising:

a printing station,

a support for supporting the woven label stock and progressing it past the printing station,

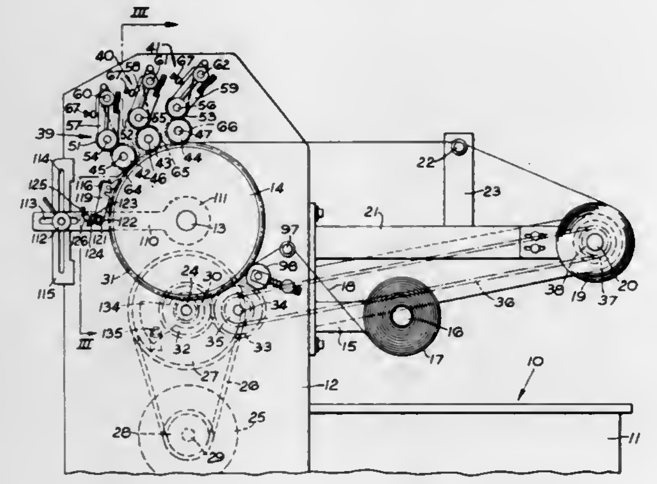
the printing station including a printing head consisting of a printing roller carrying an impression of data to be printed and an inking arrangement,

a drive means for the printing roller sufficiently for a single printing operation upon the passage of each label of the woven label stock through the printing station,

a sensor means for initiating the driving of the printing roller through the sensing of a datum mark on each label of the woven label stock,

a separate printing head for each color to be printed,

each printing head including a respective printing roller carrying a respective impression of the respective data to be printed and a respective inking arrangement,



the printing rollers being driven successively and sufficiently for respective single printing operations upon te passage of each label through the printing station,

the driving of the first of the printing rollers being initiated by the sensor means serving to sense the datum mark on each label,

and the driving of each succeeding printing roller being initiated from the rotation of the preceding printing roller.

3,970,001

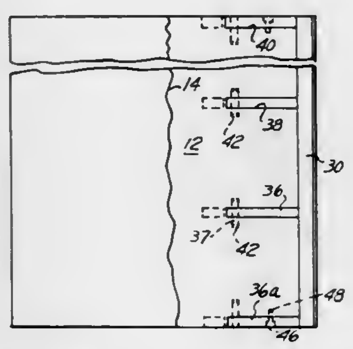
LOCK-UP FOR THIN PRINTING PLATE

Leslie Mollon, Southfield, and John E. Kline, Farmington, both of Mich., assignors to Brooks & Perkins, Incorporated, Southfield, Mich.

Filed Oct. 26, 1972, Ser. No. 300,903

Int. Cl.^{2} B41F *27/06*

U.S. Cl. 101—415.1 **3 Claims**



1. Printing plate lock-up structure comprising a generally partly cylindrical saddle having opposite arcuate side edges and straight end edges and adapted to be fixed to a cylindrical press roll, means at one straight edge of said saddle for fixed engagement with one edge of a thin flexible printing plate, a movable bar adjacent the opposite straight edge of said saddle, means on said bar for fixedly engaging the opposite edge of said plate, toggle means connecting said bar to said saddle to tension the printing plate as said toggle means is straightened, said toggle means comprising arms extending laterally from the ends of said bar and pivoted to the sides of said saddle at the outer ends of said arms, locking means acting between said arms and said saddle for locking said arms to said saddle with said bar in position adjacent the said opposite free edge of said saddle and against said press rolls, said locking means comprising outwardly biased spring pressed pins in the sides of said saddle, and openings in said arms adapted to receive the ends of said pins when said bar is in position against said press roll.

3,970,002

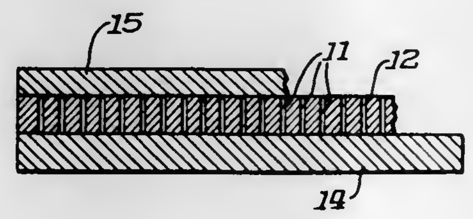
IMAGE TRANSFER LAYERS FOR INFRARED TRANSFER PROCESSES

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 83,397, Oct. 23, 1970, Pat. No. 3,730,091. This application Feb. 7, 1973, Ser. No. 330,337

Int. Cl.^{2} B41M *5/02*; **G01N** *21/34*

U.S. Cl. 101—463 **7 Claims**



1. In a process for producing radiation absorbing images disposed on the surface of an original the steps of disposing a sandwich comprising a thermally anisotropic transfer sheet having a layer of transfer material thereon and a copy sheet in heat transfer relation to said original, said transfer material having a plurality of thermally conductive particles dispersed therethrough and oriented in a predetermined relationship with respect to other portions of said transfer material with a greater thermal conductivity in a direction perpendicular to the surface of said transfer sheet than in a parallel direction, exposing said images on said original to radiant energy sufficient to generate a heat pattern thereon, preferentially heating said particles and transferring said heat pattern to said layer of transfer material whereby said transfer material is transferred and adhered to said copy sheet in a pattern corresponding to said heat pattern.

3,970,003

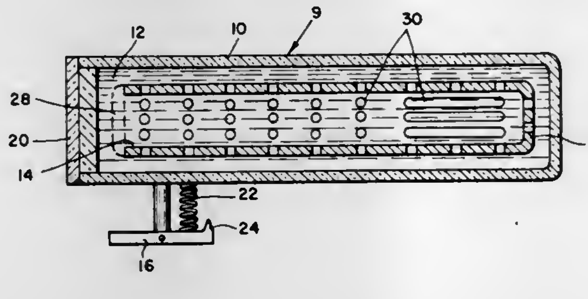
PYROPHORIC FLARE

Frederick R. Hayward, Westford, and L. James Larson, Boxford, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Oct. 16, 1974, Ser. No. 515,182

Int. Cl.^{2} F42B *4/26*

U.S. Cl. 102—37.8 **5 Claims**



1. A pyrophoric flare comprising:

a. a frangible container;

b. a pyrophoric substance contained in said container;

c. means for fragmenting the container for releasing the pyrophoric substance to the atmosphere; and

d. measuring means for containing a portion of said pyrophoric substance and for gradually releasing measured amounts of said pyrophoric substance into the atmosphere to extend the duration of the flare.

3,970,004

SPINNING PROJECTILE

Xaver Suter, Thalwil, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zurich, Switzerland

Filed Nov. 25, 1974, Ser. No. 526,750

Claims priority, application Switzerland, Dec. 21, 1973, 17993/73

Int. Cl.^{2} F42B *13/10*

U.S. Cl. 102—56 SC **7 Claims**

1. A spinning projectile comprising a projectile body, a hollow charge component rotatably mounted in the projectile body and axially displaceable by propellant gases, means for maintaining the hollow charge component in the displaced position, said maintaining means comprising locking elements which hold the hollow charge component in the displaced position at the projectile body even after abatement of the propellant charge pressure.

3,970,005

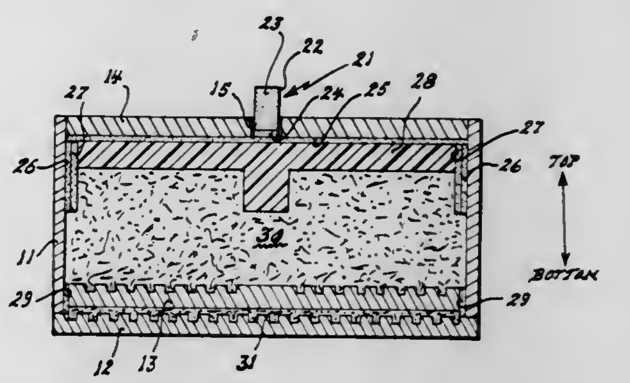
MASS FOCUS EXPLOSIVE LAYERED BOMBLET

Mathew Rothman, Seminole County, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 25, 1969, Ser. No. 803,521

Int. Cl.^{2} F42B *13/18, 13/48*

U.S. Cl. 102—67 **3 Claims**



1. A fragmentation-type munition comprising:

a. a centrally located main explosive charge;

b. means for peripherally initiating said main explosive charge, wherein said means for peripherally initiating said main explosive charge includes:

  1. a detonator;
  2. and, a flexible sheet-type high explosive abutting said detonator and the periphery of said centrally located main explosive charge;

c. and, an outer case housing said main explosive charge and at least partially housing said means for peripherally initiating said main explosive charge, with said outer case having at least an internal portion thereof weakened to promote fragmentation thereof.

3,970,006

PROTECTIVE COVER FOR A MISSILE NOSE CONE

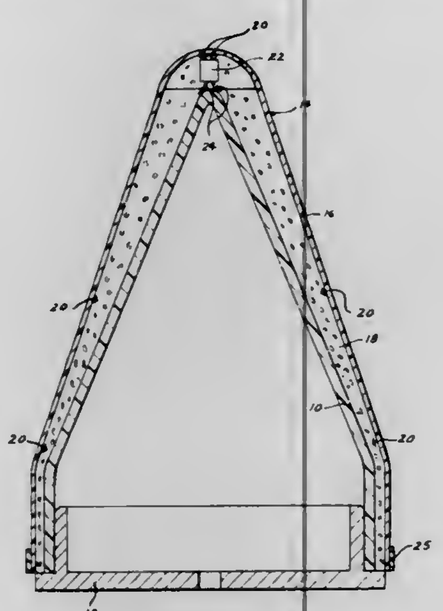
Robert L. Copeland, Marion, Va.; Ralph F. Greene, Wichita Falls, Tex.; David R. Beeler, Cincinnati, Ohio; Robert A. Eastridge, Saltville, Va., and Vance A. Chase, Poway, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1975, Ser. No. 541,487

Int. Cl.^{2} F42B *13/00*

U.S. Cl. 102—105 **2 Claims**

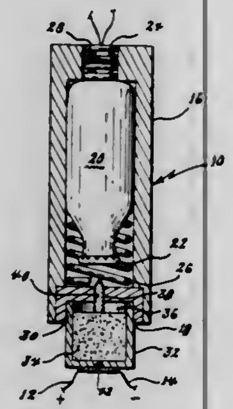
1. A protective cover for a nose cone of a missile, normally mounted external to an aircraft in captive flight, which is removable before arming and firing of the missile, comprising: a rigid cover of cross-linked polyethylene spaced from said nose cone; a semirigid backing of polyurethane foam in the space between the missile and said cover; a linear triangular shaped charge positioned in a pedetermined serpentine pattern between the cover and the backing; the apex of the triangle of said triangular shaped charge being remote from said



cover; means for detonating said linear triangular shaped charge to thereby cut the cover to permit removal of the cover and backing by aerodynamic forces.

3,970,007
SALVAGE SWITCH

Joseph R. Klein, East Northport, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Continuation-in-part of Ser. No. 743,906, July 10, 1968, abandoned. This application Jan. 20, 1971, Ser. No. 112,492
Int. Cl.^{2} F42C *13/00*
U.S. Cl. 102—70.2 P **10 Claims**

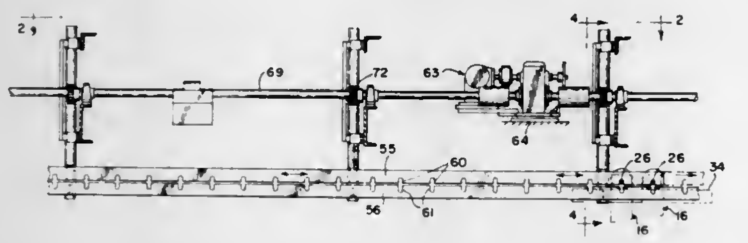


1. A salvage switch comprising a hollow protective case, said case containing therein a cartridge, an actuator operably associated with said cartridge and a biasing means for holding said cartridge in an inoperative position, a container having a piercing means operably attached thereto being mounted on the underside of said case, and said piercing means protruding into said case and being capable of penetrating said cartridge, whereby actuation of said actuator drives said cartridge against the force of said biasing means and into an operative position wherein said piercing means penetrates said cartridge.

3,970,008
WALKING BEAM CONVEYER

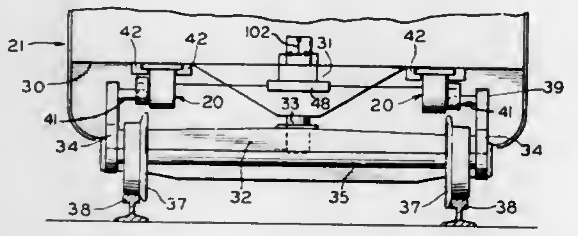
Alvin Borsuk, and Charles H. Johnson, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.
Filed Mar. 11, 1975, Ser. No. 557,301
Int. Cl.^{2} B61B *13/00*
U.S. Cl. 104—162 **21 Claims**

1. Apparatus for intermittently driving a unit supported for guided movement along a given path through a given distance and locking the unit in a given position, comprising: a locking bar and a moving bar, each said bar having a plurality of connecting means equally spaced apart therealong for selective connection with the unit, means above said bars for supporting and driving said bars together along a first axis extending perpendicular to said given path of movement such that one bar is at all times connected to the unit and such that as one bar connects to the unit the other bar disconnects from the unit, said locking bar being rigidly connected to said supporting and driving means and said moving bar being slidably supported thereby for movement along an axis parallel to said given path of movement, and means driving said moving bar when it is connected to the unit through a given distance to align one connecting means thereof with the next adjacent connecting means of the locking bar to move the unit to a new position and to return the moving bar to its starting position when it disengages from the unit and a connecting means of the locking bar engages the unit, whereby the locking bar locks the unit in a given position and the moving bar moves the unit from one position to another.



3,970,009
FLUID RAILROAD PASSENGER CAR SUSPENSION

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Sept. 24, 1973, Ser. No. 399,918
Int. Cl.^{2} B61F *3/08, 5/16, 5/24, 5/38*
U.S. Cl. 105—164 **20 Claims**



1. In a railroad car suspension system wherein the car has a body and trucks spaced longitudinally under the body for running along rails and for automatically positioning the body relative to said trucks,

means coupling the car body to the trucks and for permitting vertical movement between the car body and said trucks,

a plurality of reversible hydraulic actuator means connected to and between the car body and said trucks at different points and operable selectively to move the body relative to said truck at said points and said plurality of hydraulic actuator means connected to and between said car body and said trucks so that rotation of said body can occur about vertical axes through each truck,

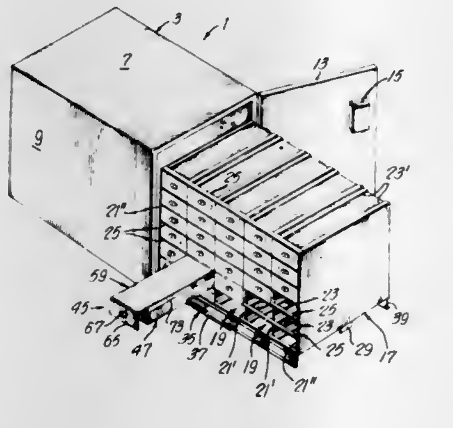
means providing a dynamic power source,

and control means for selectively controlling the power source for supplying hydraulic fluid under pressure to said actuator means to operate the actuator means for varying the verticle positions of the car body relative the trucks at said points, and

a plurality of sensor means connected to said control means and supplying inputs thereto such that said plurality of actuator means are operated to position said body relative to said trucks.

3,970,010
SAFE DEPOSIT BOX SYSTEM

Ross H. Cantley, 577 Essex Road, Beaconsfield, Quebec, Canada
Filed Mar. 20, 1974, Ser. No. 453,088
Int. Cl.^{2} A45C *11/12;* **A47B** *88/20;* **E05B** *65/46;* **E05G** *1/08*
U.S. Cl. 109—56 **3 Claims**



1. A safe deposit box storage system comprising a storage housing having bottom, inner, side, top and rear walls defining a predetermined space having an open front of a predetermined width and a height, a frame defining compartments, the frame having dimensions such that it closely fits within the predetermined space and including a depth materially exceeding the width of said open front with the number of said compartments materially exceeding that accommodatable within said open front, track means for mounting the frame in the housing for sliding movement into and out of the housing through said open front, said track means including a pair of parallel slide members, one mounted to each side wall and to the sides of the frame, such that the frame may be slid out in line from a position completely within the confines of the housing, the frame comprising a plurality of vertical and horizontal partitions defining said compartments, said compartments extending substantially perpendicular to the direction of movement of the frame into and out of the housing and access to the compartments being from the side of the frame, a safe storage box for mounting snugly in each compartment, each safe storage box including an elongated open walled container, a cover hinged to the container, the cover extending past one end of the container and having a flanged extension flush with the side of the frame and closing the opening to the respective compartment, the flanged extension of the cover carrying locking means for use in locking the storage box to a partition forming each compartment to lock the box in the frame, and means for locking said frame within the housing for preventing access to said safe storage.

3,970,011
COMBUSTION WITH FLUIDIZABLE BED

Michael John Virr, Stourbridge, and Douglas Ernest Elliott, Sutton Coldfield, both of England, assignors to Fluidfire Development Limited, England
Filed Feb. 4, 1975, Ser. No. 546,943
Int. Cl.^{2} F23G *5/00*
U.S. Cl. 110—8 F **12 Claims**

1. Apparatus comprising:

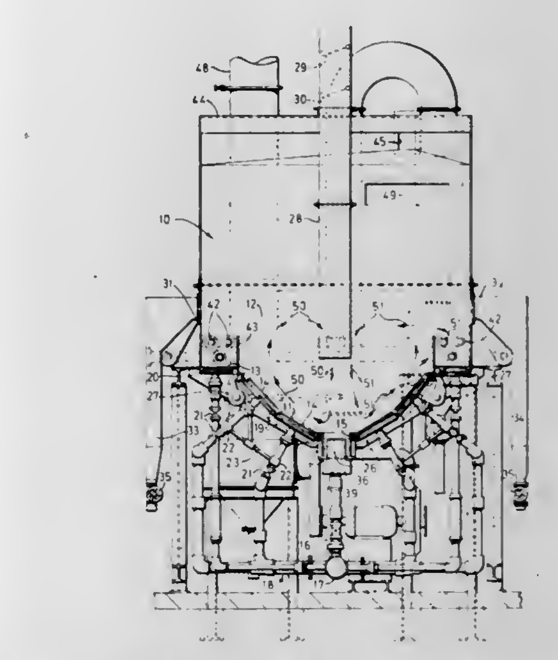
a. a combustion chamber,

b. a support adapted to support a bed of particles in the combustion chamber and to admit gas to the bed so that the bed can be fluidised,

c. first discharge means for discharging nongaseous material into the bed,

d. second discharge means in the form of a weir for discharging solids from the bed,

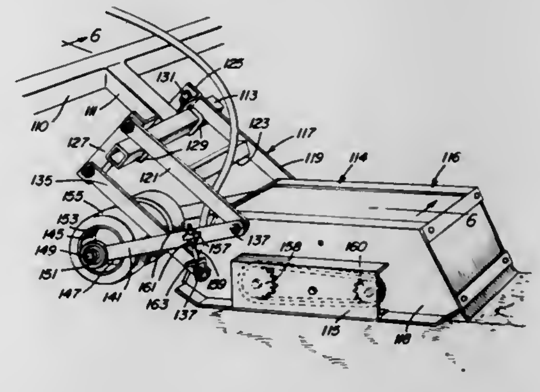
e. third discharge means for discharging from the bottom of the bed solid material which does not fluidise, and



f. feed means for mixing a gaseous fuel and air and feeding the mixture into the bed through said support at a rate such as to fluidise at least a part of the bed.

3,970,012
SOIL AGITATING DEVICE

Donald F. Jones, Sr., Warren, Minn. 56762
Filed Feb. 21, 1975, Ser. No. 551,971
Int. Cl.^{2} A01C *23/02;* **A01B** *49/06, 33/02*
U.S. Cl. 111—6 **6 Claims**



1. A soil working apparatus for support from a farm implement support member and movement along the ground in contact with the latter, said apparatus comprising a downwardly opening housing defining front and rear ends and including opposite side walls, front and rear transverse shafts extending between and journaled from said side walls, said shafts each including generally radially outwardly projecting and circumferentially axially spaced ground impaling spikes supported therefrom for rotation therewith, the lower end portions of the lower spikes on said shafts projecting downwardly below the lower marginal portions of said side walls, and means drivingly connecting said front shaft to said rear shaft for rotation of the latter in response to rotation of the front shaft and at a slightly greater angular speed than the angular speed of rotation of said front shaft, said side walls including corresponding upper marginal edges and corresponding upstanding front and rear marginal edges, said front and rear edges being rearwardly and forwardly upwardly inclined, respectively, upper and lower transverse braces extending between and secured to corresponding upper and lower end portions of said edges, said housing including a top wall extending between said upper marginal edges of said side walls and having the opposite end portions thereof disposed

between and supported from said upper transverse braces, corresponding ends of said walls including front and rear end walls extending therebetween, said top wall comprising a sheet of flexible resilient material, said end walls comprising opposite end downwardly directed integral end portions of said sheet of flexible resilient material with the lower end portions thereof disposed between and supported from said lower braces, the terminal lower end of said rear end wall projecting downwardly below the marginal edges of said side walls and defining a flexible ground sweep.

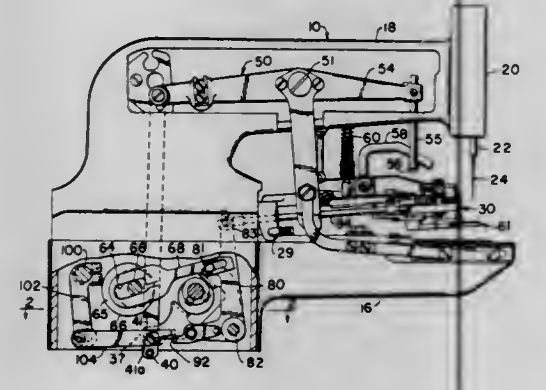
3,970,013
AUTOMATIC SAFETY STOP MECHANISM

James C. Hsiao, Chicago, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,759

Int. Cl.² D05B *3/00*

U.S. Cl. 112—67 **6 Claims**



1. A sewing machine having a main shaft means,

work clamping means;

lever means for raising and lowering said work clamping means;

article indexing means movable through awork cycle;

force transfer means operable from the main shaft whereby indexing an article;

manually operated means actuating said machine wherein the improvement comprises:

safety stop means including:

first lever means operable between first and second positions;

said first lever means cooperating with at least one member of the force transfer means,

second lever means moving into and out of the path of movement of said first lever means; and

said second lever means connected to and controlled by the movement of said raising and lowering means and said manually operated means whereby said first lever means lies in an abutting relationship with said second lever means preventing the movement of said second lever means into its operative position when said article indexing means is not moved through said predetermined cycle.

3,970,014
AUTOMATIC SEWING MACHINE

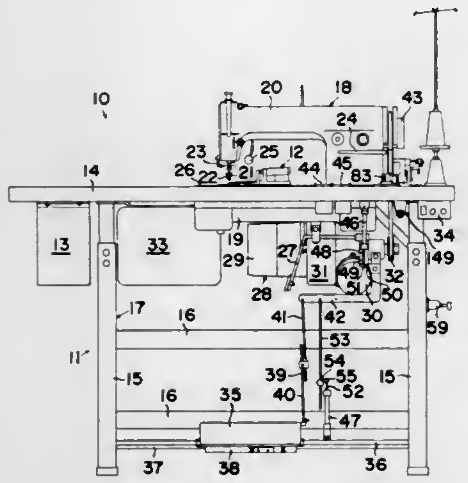
Takashi Chano, Yokohama, and Koji Masuda, Sagamihara, both of Japan, assignors to Kayabakoyo-Kabushiki-Kaisha, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,210

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.11 **5 Claims**

2. An automatic sewing machine, comprising operating means for performing a plurality of operations, including sewing of a seam on upper and lower sheet materials which are to be joined and have side edges; selectively actuatable control means for controlling at least some of said operations in a programmed sequence; and alignment control means responsive to operation of said selectively actuatable control means for independently maintaining the side edge of each of said upper and lower sheet materials in a position parallel to and at a predetermined spacing from said seam irrespective of deviations of the respective side edge from said position in direction toward or away from said seam, including upper and lower manipulator members each having an arm extending toward the upper and lower side of said sheet materials, respectively, and a driven pinion rotatably carried at a free end of the respective arm for engaging the respective sheet material and, in response to deviations of the respective side edge, shifting the respective sheet material relative to said seam so as to maintain the respective side edge in said position parallel to and at a predetermined spacing from said seam.



3,970,015
AUTOMATIC SEAMING METHOD AND LONG SEAMER THEREFOR

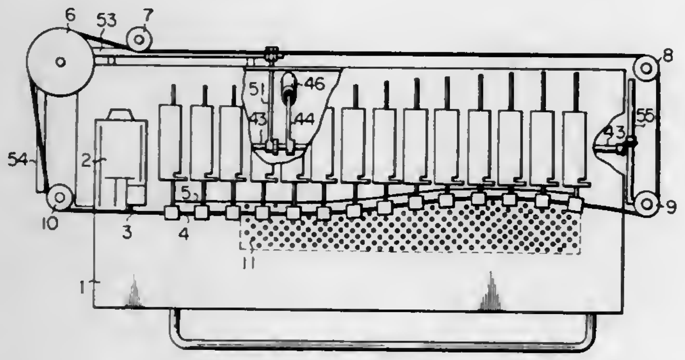
Yoshinobu Fukuyama, Kashiwara, Japan, assignor to Takatori Machinery Works Ltd., Japan

Filed May 30, 1975, Ser. No. 582,216

Claims priority, application Japan, Nov. 8, 1974, 49-129356; Mar. 4, 1975, 50-25565

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.12 **8 Claims**



1. An automatic seaming method for seaming fabrics by means of a long seamer comprising a sewing machine head at an end of a working table, a plurality of patterning devices arranged in parallel and upstream from said sewing machine head, an endless and flexible flat member guided by said patterning devices which moves the fabric to be seemed to the sewing machine head characterized by the steps of:

deforming a flexible guide band to a curve by means of said plurality of patterning devices, along which curve seaming is carried out by said sewing machine head;

guiding the endless and flexible flat member by means of corresponding guide devices on said patterning devices along a curved passage similar to the curve of the flexible guide band;

moving clothes to be seamed together with the movement of said endless and flexible flat member along the curved surface of said flexible guide band in such a way that all portions on the stitching line of said clothes or garment sections are moved along the same curved passage;

stitching said clothes by the sewing machine head.

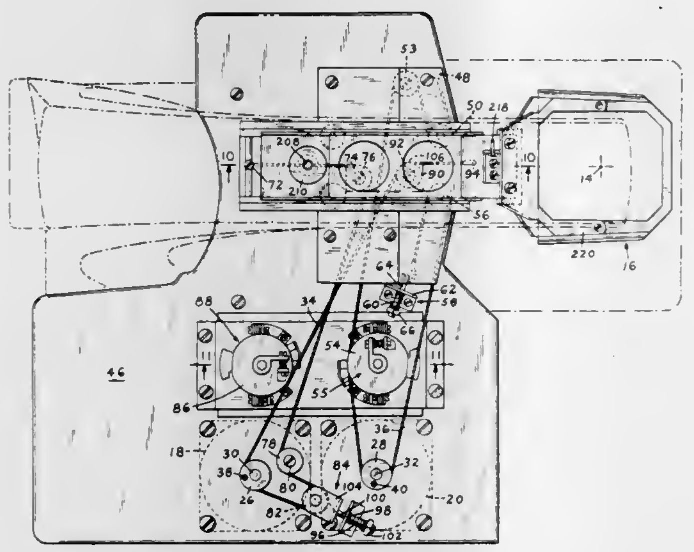
3,970,016
AUTOMATIC SEWING MACHINE

Florian F. Yanikoski, Braintree, Mass., assignor to Union Special Corporation, Chicago, Ill.

Filed Aug. 12, 1974, Ser. No. 496,749

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.12 **59 Claims**



10. An automatic sewing machine for moving a movable element and work piece relative to a needle, comprising:

a pivoting means for pivoting the movable element and work piece around a pivot point,

an extendable arm carried by the pivoting means for translating the movable element and work piece radially with respect to said pivot point,

first mechanical drive means for driving said pivoting means,

second mechanical drive means for driving said extendable arm, with said first and second drive means having a fixed position relative the needle and being spaced from both said pivoting means and extendable arms,

first linkage means connecting the first drive means to the pivoting means, and

second linkage means connecting said second drive means to said extendable arm for moving the movable element and work piece relative to the needle so that approximately a straight line is traced on the work piece whenever the movable element is pivoted about said pivot point.

3,970,017
FABRIC EDGE FINISHING MACHINES

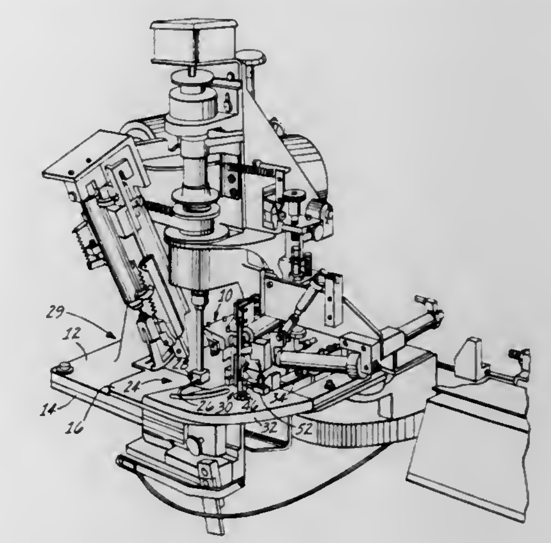
Edward S. Babson, Ipswich; Oliver C. Brett, Jr., West Boxford; Warren A. Cavicchi, Ipswich, and Carlton G. Lutts, Salem, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Nov. 11, 1974, Ser. No. 522,734

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.12 **9 Claims**

5. In combination with a sewing machine having stitching instrumentalities including a reciprocable needle, a reciprocable edge trimmer, a work support and means for rectilinearly feeding multi-sided flexible workpieces on the support to and through the operating localities of the needle and the trimmer, each piece initially having a thicker inner portion delineating it from its margins, and edge guide having an undercut end adapted to guide the workpieces along the edges of the thicker portion, a corner turning mechanism, and an automatic work guidance control mechanism including a sensor for actuating the corner-turning mechanism, the sensor being responsive to distinction of the margins from the thicker material and being spaced ahead of the knife and needle and more inwardly of the work than the needle whereby each piece is progressively trimmed of its margins as the thicker portion has its corners rounded and edges stitched.



3,970,018
WORK FEEDING MECHANISM FOR SEWING MACHINES

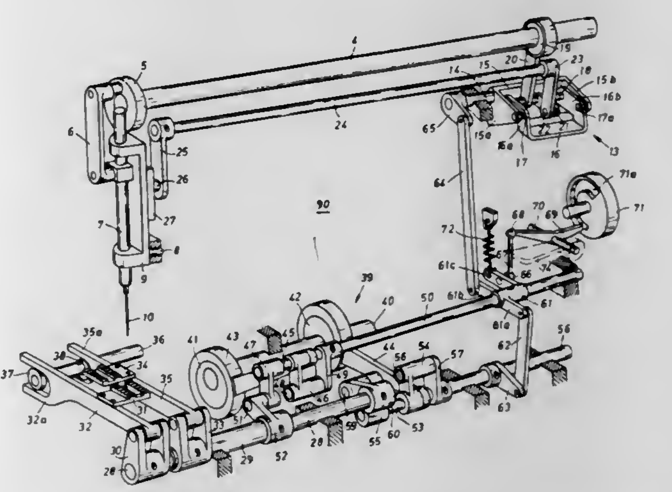
Walter Hager, Kaigerslautern, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

Filed Aug. 27, 1975, Ser. No. 608,162

Claims priority, application Germany, Sept. 6, 1974, 7430111[U]

Int. Cl.² D05B *27/20*

U.S. Cl. 112—206 **7 Claims**



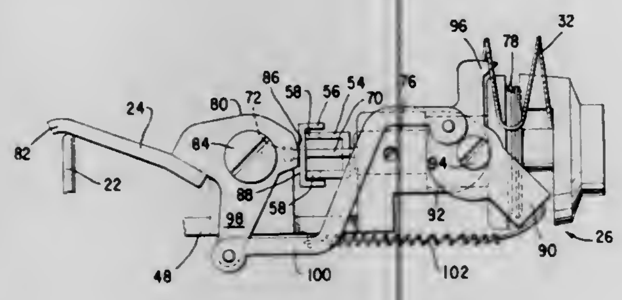
1. A sewing machine for sewing a material workpiece, comprising a needle holder having a sewing needle, means mounting said needle holder for pivotal movement to swing said holder with said needle backwardly and forwardly, a rotatable sewing machine main shaft, means connected between said main shaft and said needle holder to reciprocate said holder with said needle to periodically engage and disengage the workpiece, first and second feed dogs cyclically engageable with the material to be sewn for advancing it in timed relationship to the reciprocation and swinging movement of said needle, means connected to said first and second feed dogs and said sewing machine main shaft to move said first feed dog into engagement with the workpiece during the downward reciprocation of the needle into engagement with the workpiece and to advance it in a feed direction to the final feed position while said needle is swinging in the feed direction and while the second feed dog is moved out of phase with said first feed dog out of engagement with the material from the final feed position and returned to a feed starting position and subsequently engages the material after its release by the first feed dog and the needle from the final feed position during the return of the first feed dog to the starting position.

3,970,019

THREADING APPARATUS FOR SEWING MACHINES

Lionel J. Coulombe, Matawan, and Anthony Giaimo, Staten Island, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Dec. 12, 1975, Ser. No. 640,085
Int. Cl.^{2} D05B *49/00*
U.S. Cl. 112—245 **7 Claims**



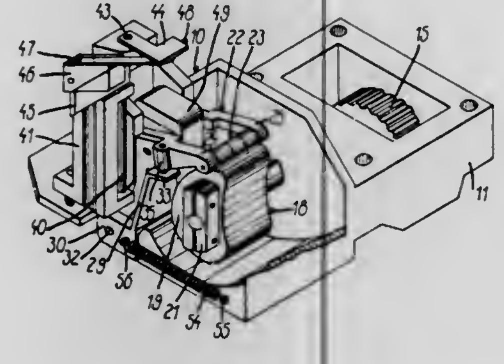
1. In a sewing machine, a tension device including spaced friction discs for applying frictional resistance to movement of a thread therebetween, presser means including means for raising and lowering the presser means responsive to raising and lowering said presser means for initiating movement of said discs toward and away from each other, the improvement comprising, movable thread engaging means disposed in proximity to said tension device, said thread engaging means being operative when said discs are moved toward each other for guiding the thread between and in disposition for operative engagement with said discs.

3,970,020

SEWING THREADS TRIMMING DEVICE FOR SEWING MACHINES

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed Apr. 19, 1974, Ser. No. 462,387
Claims priority, application Italy, Apr. 27, 1973, 42905/73
Int. Cl. D05b *65/02*
U.S. Cl. 112—252 **4 Claims**



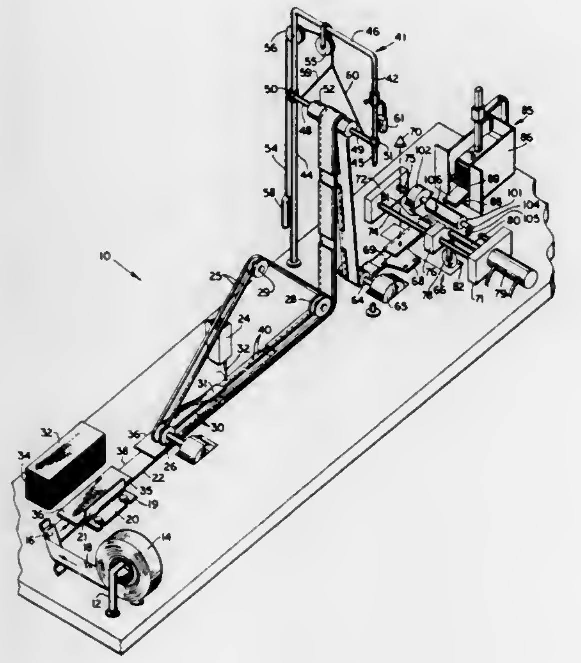
1. A sewing threads trimming device for sewing machines provided with a blade and a counterblade, means to operate said blade at the end of a sewing operation and in a suitable timing relation with the hook and needle movements, in a first displacement over the hook during which a thread loop closes over said blade and thereafter a second movement in the opposite direction to bring the sewing threads into contact with said counterblade and cut them, said trimming device including a cam of magnetizable material deriving its motion from the sewing machine main shaft and a cam follower, said follower being a member of a magnetic circuit, a coil linked to said follower to obtain coupling through magnetic attraction between said cam follower and said cam.

3,970,021

METHOD OF FABRICATING SHIRT CUFFS

James L. Meadows, Honea Path, S.C.; Donald H. Smith, Vidalia, Ga.; Gordon H. Ellington, Vidalia, Ga.; William O. Mitchell, Vidalia, Ga., and W. Wade Frost, Vidalia, Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 391,645, Aug. 27, 1973, which is a division of Ser. No. 243,573, April 13, 1972, Pat. No. 3,780,682, which is a continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application July 3, 1974, Ser. No. 485,722
Int. Cl.^{2} D05B *19/00*
U.S. Cl. 112—262 **17 Claims**



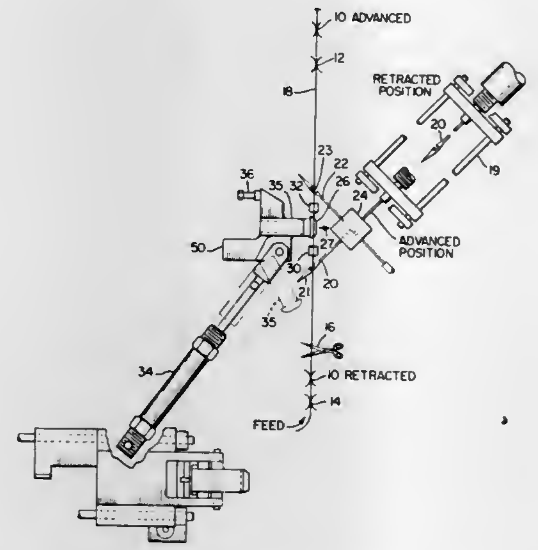
1. A continuous process of forming shirt cuffs or the like comprising moving the free end of a continuous web of lining material or the like from a supply along a path through a sewing machine, placing a series of panels of cuff material or the like in spaced relationship with respect to one another on the web of lining material along the length of the web of lining material before the web of lining material is moved through the sewing machine, folding an edge portion of the series of panels of cuff material about an edge of the continuous web of lining material, sewing through the folds of the series of panels of cuff material and the continuous web of lining material to form a connected series of partially completed cuff assemblies, accumulating a predetermined length of the connected series of partially completed cuff assemblies which extend from the sewing machine, continually cutting the free end of the web between the panels to separate the partially completed cuff assemblies from the connected series of partially completed cuff assemblies in response to the accumulation of at least a first predetermined length of the connected series of partially completed cuff assemblies and terminating the separating of the series of partially completed cuff assemblies in response to the accumulation of less than the first predetermined length of the connected series of partially completed cuff assemblies and terminating the moving of the web of lining material and the series of panels of cuff material through the sewing machine in response to the accumulation of more than a second predetermined length of the connected series of partially completed cuff assemblies.

3,970,022

METHOD AND APPARATUS FOR STITCHING STRING TO FOAM USED IN TAMPONS

William H. Kopatz, Levittown; Rey W. Cooper, Bryn Athyn, and Russell W. Watson, Hatboro, all of Pa., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 575,200, May 7, 1975. This application May 7, 1975, Ser. No. 575,198
Int. Cl.^{2} D05B *3/12*
U.S. Cl. 112—265 **15 Claims**



1. A stitching apparatus for attaching a finite length of string to a material such as a foam pre-form for use in a sanitary device comprising:

a. a first needle having an open eyelet near the point thereof;
b. means for advancing and retracting said first needle through said volume of material;
c. a second needle having an open eyelet near the point thereof;
d. means for advancing and retracting said second needle through said pre-form;
e. means for selectively indexing said string into a line which permits the simultaneous engagement of said string by both of said eyelets of said needles; and
f. means for cutting said string at the instant at which the retraction of said needles begins,

whereby, upon the full retraction of said needles, said pre-form is interiorly stitched along two lines, said lines, at one end of each, being exteriorly integral in the form of a loop and, at the other end of each comprising two ends hanging freely and protruding from said pre-form.

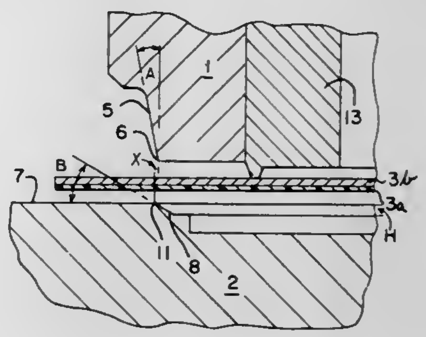
3,970,023

TOOLING ARRANGEMENT FOR END CLOSURE SCORING

Edward J. Herbst, Posen, and Harry A. Peyser, Olympia Fields, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,450
Int. Cl.^{2} B21D *51/26, 51/46*
U.S. Cl. 113—1 F **8 Claims**

1. An improved tooling configuration for production of an opening score line in a metal end panel of a can or similar container without fracturing an enamel coating previously applied to the panel, said tooling comprising a punch and an anvil for receiving a panel therebetween, said punch having a flat substantially horizontal bottom face and a lateral outer face, said anvil having a flat substantially horizontal top face, a lateral inner face depending from said top face and a side face depending from said lateral face, said outer face being inclined in the range of about 90° to about 110° relative to said bottom face, said lateral face being inclined in the range of about 25° to about 35° relative to said top face, said punch and said anvil meeting with said bottom face and said top face in substantially parallel relation and said outer face opposing said lateral face, whereby the movement of said punch into said panel against said anvil displaces a portion of the metal of said panel, thereby forming a score line therein without fracturing the enamel coating.

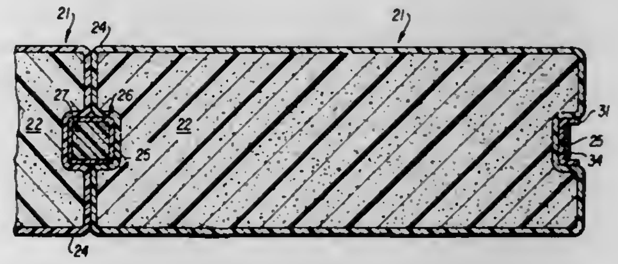


3,970,024

MODULAR FLOATING LOAD-SUPPORTING ASSEMBLAGE

John A. Fisher, 2458 Red Apple Drive, Dayton, Ohio 45431

Filed Sept. 4, 1975, Ser. No. 610,392
Int. Cl.^{2} B63B *35/72*
U.S. Cl. 114—.5 F **10 Claims**



1. A floatable load-supporting structure adapted for ease of assembly and disassembly which comprises:

a. a plurality of floatable box-shaped modules disposed in juxtaposition;
b. each said module being provided with a groove about its periphery whereby said grooves in adjacent modules are in contraposition;
c. bars received in said contrapositioned grooves of adjacent modules whereby such adjacent modules are joined by said bars;
d. said joined modules forming a closed polygonal figure having a plurality of sides as seen from above with those grooves of said grooves which face outboard relative said figure providing a continuous channel around the perimeter of said figure; and
e. a continuous tension band provided in said channel around said perimeter, said band being in a state of tension whereby said modules are pressed together into an essentially rigid platform structure.

3,970,025

CATAMARAN

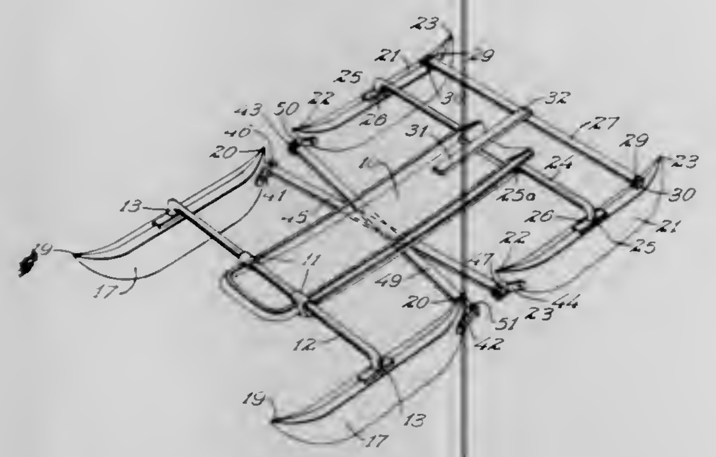
Cedric C. Sovia, 319 S. Lake St., Forest Lake, Minn. 55025, and Kenneth W. Krengel, 1800 Highland Parkway, St. Paul, Minn. 55116

Filed Sept. 11, 1974, Ser. No. 504,966
Int. Cl.^{2} B63B *1/00*
U.S. Cl. 114—61 **3 Claims**

1. A catamaran including:
a catamaran frame having a longitudinal centerline,
a forward pair of parallel pontoons connected to said frame on opposite sides of said centerline,
a rear pair of parallel pontoons pivotally connected to said frame on parallel vertical axes on opposite sides of said centerline,

means connecting said rear pontoons for pivotal movement in spaced parallel relation, and

means for moving said connecting means to pivot said rear pair of pontoons,



said forward pair of pontoons being also connected to said frame on parallel vertical pivots,

said frame being of generally rectangular form, and including vertical pivot means extending downwardly from said frame into engagement with said pontoons.

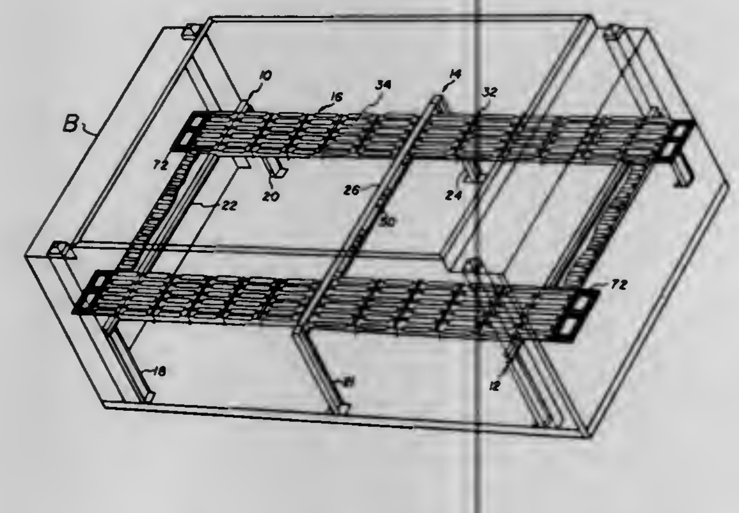
3,970,026
PORTABLE TWEEN DECK

Grady Burton, Mountain Lakes, N.J., assignor to MacGregor-Comarain, Inc., Cranford, N.J.

Filed May 29, 1975, Ser. No. 582,035

Int. Cl.² B63B *3/48*

U.S. Cl. 114—85 **6 Claims**



1. A portable tween deck for watercraft comprising a center support means and two end support means, panel assemblies supported between said center support means and said end support means, said panel assemblies each comprising a plurality of spaced pipes, transverse collars secured to said spaced pipes, said collars have a generally C-shaped cross sectional configuration having a central web and two depending flange portions, said central web having a plurality of spaced openings with each opening having a configuration corresponding to the cross sectional configuration of said pipes, said pipes being accommodated within said openings, longitudinally spaced deck plates bridging the space between said pipes, first connecting means for detachably securing said panel assemblies to said center support means, and second connecting means for detachably securing adjacent panel assemblies to each other.

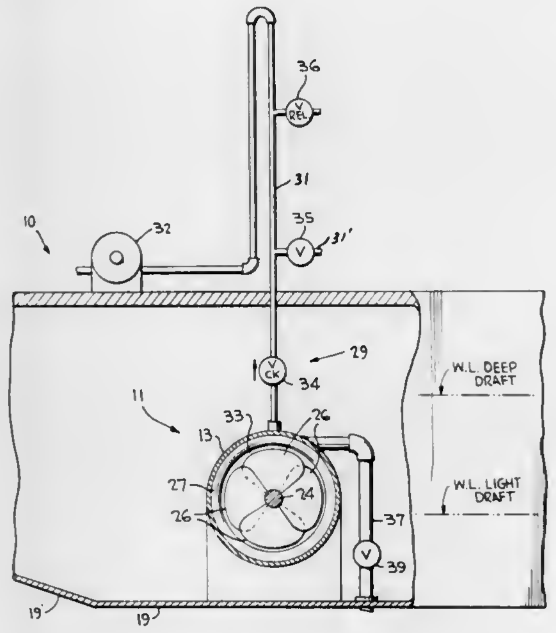
3,970,027
PRIMING MEANS FOR BOW STEERING PUMPS

William M. Jackson, 109 Hursey Ave., Pass Christian, Miss. 39571

Filed Sept. 16, 1975, Ser. No. 613,742

Int. Cl.² B63H *25/46*

U.S. Cl. 114—151 **9 Claims**



1. In a bow steering unit for barges and the like having a bottom hull and a transversely extending casing defining first and second nozzles respectively communicating with spaced first and second openings in said bottom hull, an axial flow pump including at least one propeller unit disposed within a central portion of said casing between said nozzles for steering the vessel in one direction as water is inletted through said first nozzle and outletted through said second nozzle, and in an opposite direction as water is inletted through said second nozzle and outletted through said first nozzle, the improvement comprising a means for priming the blades of said propeller unit during various speeds and operating conditions of the vessel, said priming means comprising a vacuum tube interconnecting a vacuum pump with an upper area of said central portion, whereby any accumulation of air in said propeller unit caused during movement of the vessel may be evacuated and said blades accordingly maintained primed by permitting a sufficient amount of water to flow through one of said nozzles for effectively maintaining said blades submerged, said priming means further comprising at least one inlet tube communicating with a third opening in said hull bottom and extending through said upper area of said tube central portion for permitting water to inlet thereto during negative pressure build-up while water rapidly passes over said openings, said first and second openings each being of a predetermined size and said third opening being of a size substantially less than the size of said first and second openings, whereby the difference in the negative pressure at said first and second openings and at said third opening causes water to inlet through said inlet tube and into said casing to thereby maintain said blades submerged and accordingly primed.

3,970,028
VESSEL MOORING SYSTEM

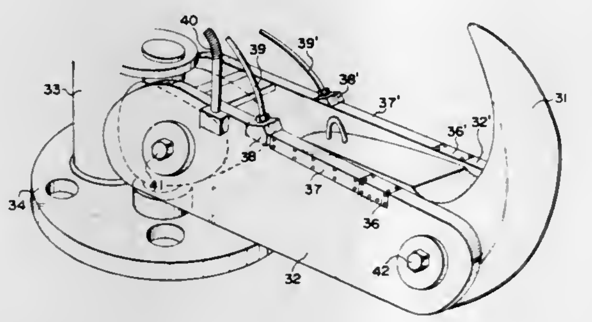
Yoichi Motai, Urawa; Keijiro Gouda, Chofu, and Atsuya Isono, Tokyo, all of Japan, assignors to Nippon Oil Company Ltd. and Miwa Shokai Company, Ltd., both of Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,570

Int. Cl.² B63B *21/16*

U.S. Cl. 114—230 **10 Claims**

1. A system for mooring a vessel to a facility on a wharf or pier, said system comprising a plurality of mooring means, tensional force detecting means comprising a strain gauge incorporated in each said mooring means, said detecting means including means for generating a tension signal and means for adjusting the tensional force exerted on said respective mooring means in accordance with the signals generated by said detecting means whereby the vessel is moored to the facility in a well balanced condition, said mooring means further comprising a plurality of fixing means rigidly secured to the mooring facility, at least one hook formed on each said fixing means, a plurality of ropes each having one end connected to said hook, and a winch which is provided on board said vessel and to which the other end of said ropes are connected, there being further provided a conductor connected to said strain gauge and indicator means connected to said conductor, there being still further provided a notched, covered frame plate pivotally supporting each said hook, said conductor and said strain gauge being positioned within said notch.



3,970,029
EARTH MOVING MACHINERY MADE AMPHIBIOUS

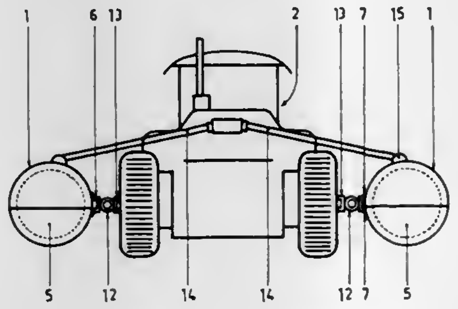
Gilbert Abel Bibaut, 22, rue de Compiegne, 60880 Le Meux, France

Filed Aug. 7, 1974, Ser. No. 495,372

Claims priority, application France, Aug. 9, 1973, 73.29469

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 R **7 Claims**



1. Apparatus for making amphibious a dry-land earth moving machine which is inherently incapable of supporting itself on water, said apparatus comprising

at least two tubular, water-tight elements adapted to be positioned on either side of said machine;

detachable coupling means between said machine and each of said tubular elements; and

means for controlling the elevation of said elements relative to the machine,

said elements being constructed to be of substantially unchanging interior volume and to make the machine capable of supporting itself on water,

said detachable coupling means comprising substantially vertical ears protruding from the elements toward the machine and mating with substantially vertical ears protruding from the machine toward the elements and removable pins for joining the ears for pivotal movement of the elements about substantially horizontal axes defined by the pins.

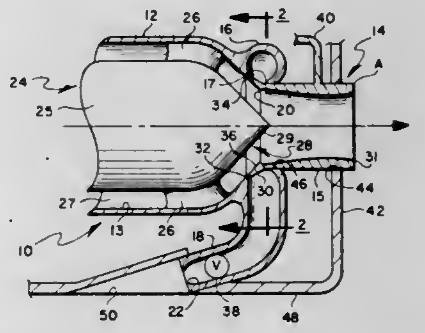
3,970,030
INTERNAL THRUST REVERSER

Maynard L. Stangeland, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 25, 1975, Ser. No. 616,748

Int. Cl.² B63H *11/10*

U.S. Cl. 115—12 R **6 Claims**



1. An internal thrust reverser for waterjet driven craft comprising:

an outer housing member having a concentric inner pintle body spaced from said outer housing, said pintle body being supported by two or more flow straightener vanes downstream of an inducer pump, said vanes being equidistantly positioned and radially disposed between an inner wall of said outer housing and an outer wall of said pintle, said inner and outer wall forming an annular chamber therebetween, said pintle body terminating in a cone-shaped end downstream of said flow straighteners,

a collector volute connected to said outer housing, said volute having at least one reversing conduit attached thereto, said volute is positioned downstream of said flow straightener vanes, said volute being substantially radially disposed with respect to a longitudinal axis of said pump, said volute forming an inwardly facing opening which communicates with said annular chamber,

a movable nozzle member is positioned adjacent said collector volute, said movable nozzle member is axially slidable within said outer housing member, a first upstream end of said nozzle member having an end face, the surface of said end face mates with said cone-shaped end of said inner concentric pintle body, when said movable nozzle member is positioned in a forward reverse thrust position fluid flow is blocked from entering said nozzle and diverted through said opening in said volute into said reversing duct to reverse said watercraft, said first upstream end further forming a peripheral sealing lip that closes off said opening in said volute when said movable nozzle is positioned in a rearward forward thrust position, thus diverting all of the fluid through said nozzle, and

means to axially manipulate said movable nozzle.

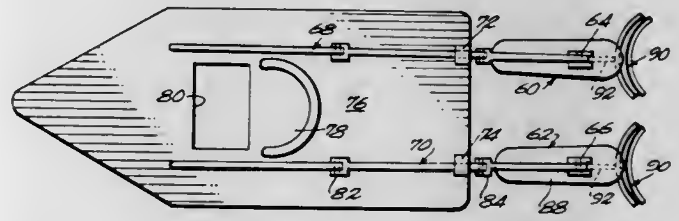
3,970,031
FLOATING OARS

Charles K. Vrana, 60 Helen Lane, Fort Myers Beach, Fla. 33931

Continuation-in-part of Ser. No. 488,248, July 12, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,742

Int. Cl.² B63H *16/00*

U.S. Cl. 115—21 **6 Claims**



1. A floating oar device for propelling a person through the water comprising handle bar means, a floatation pad fixed

relative to each outer end of said handle bar means, flap means pivotally connected along their upper edges relative to bottom surfaces of the respective floatation pads whereby said flap means alternately pivot downwardly and upwardly to substantially vertical and horizontal positions relative to respective rearward and forward movement of said floatation pads along the surface of the water, and means to limit said downward pivotal movement, said handle bar means comprises a pair of handle bars, each carrying one of said floatation pads and associated flap means on an outer extended end thereof, the inner ends of said pair of bars being operably restrained and positioned relative to a person, supported on an elongated floatation board, said floatation pads and flap means being located rearwardly of said floatation board.

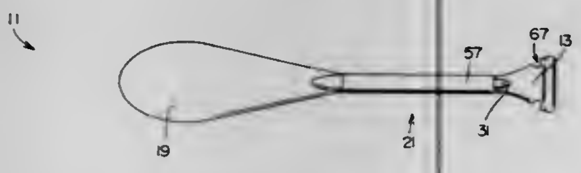
3,970,032
PADDLE

Wayne R. Phillips, 8537 Second St., Cordova, Tenn. 38018

Continuation-in-part of Ser. No. 450,991, March 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,040, June 20, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,529

Int. Cl.² B63H *16/04*

U.S. Cl. 115—24.1 **14 Claims**



1. A paddle for manually propelling waterborne craft, said paddle comprising a grip member establishing the upper end of said paddle and having major and minor axes thereto, a blade member establishing the lower end of said paddle, an elongated intermediate member having said grip member attached to the upper end thereof with said blade member being attached to the lower end thereof, pivot means coextending with the longitudinal axis of said paddle and being attached to said elongated intermediate member for providing pivotal movement of said grip member relative to said blade member whereby the major axis of said grip member may selectively be angularly aligned and disaligned with the plane of said blade member, and quick release locking means for selectively locking said grip member relative to said blade member in any one of several discrete predetermined positions while the craft is being propelled with said paddle.

3,970,033
PORTABLE REFLECTOR DEVICE

Henry Lindner, Woodale, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Company, Elgin, Ill.

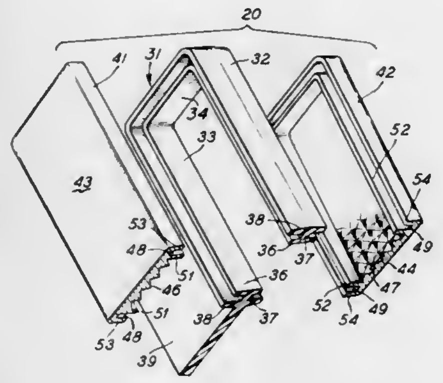
Continuation-in-part of Ser. No. 351,308, April 16, 1973, abandoned. This application Feb. 4, 1974, Ser. No. 439,045

Int. Cl.² E01F *9/10*; G09F *1/10*

U.S. Cl. 116—63 P **15 Claims**

1. A construction for a display device, reflector, or the like comprising:

A. a closed loop of material comprising a pair of spaced, parallelly extending wall members which are interconnected together generally across their respective adjacent midregions by a connecting rib, one said wall member formed so as to be continuously oriented in said loop inwardly relative to the other such wall member, said wall members being generally vertically oriented relative to said rib, said rib generally transversely extending in said loop, each wall member having opposed vertically extending spaced edge portions with the inward wall member shorter in length than the other wall member B. a pair of plate-like members with each plate-like member adapted to have display, reflector, elements and the like incorporated therein, each said plate-like member having an outside face and an inside face, each inside face having a channel defined therein adjacent the perimeter thereof, each said plate-like member being adapted to fit in mating engagement over a different one of the opposed edge portions of said inwardly oriented wall member of said closed loop with said channel thereof receiving said edge portions and with the perimeter portion near to portions of said other wall member, each said plate-like member furthr having upstanding shoulder portions circumferentially projecting about inside edge portions of said channel from said inside face, said respective shoulder portions of each plate-like member being adated to abut against one another for bonding when said plate-like members are each so matingly engaged over said opposed edge portions.



3,970,034
PISTON POSITION SENSING DEVICE

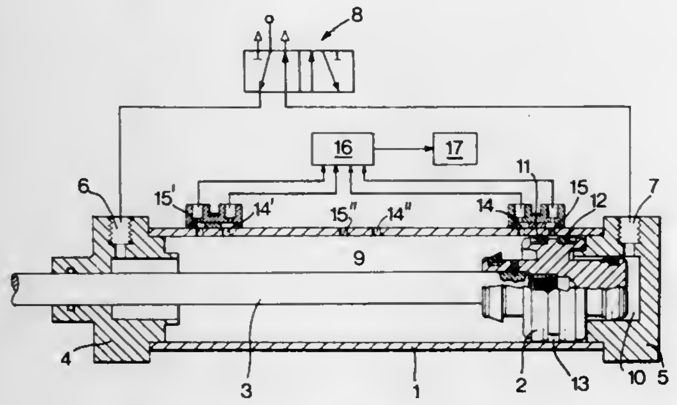
Colin John Kirk, Twickenham, England, assignor to Martonair Limited, Twickenham, England

Filed Feb. 27, 1975, Ser. No. 553,742

Claims priority, application United Kingdom, Mar. 9, 1974, 10635/74

Int. Cl.² G01D *5/42*; G09F *9/00*

U.S. Cl. 116—124 D **9 Claims**



1. A sensing device for sensing the position of a movable element in a fluid-operable actuator including a relatively movable piston and cylinder comprising a pair of co-pending pressure tappings in the peripheral wall of said cylinder, a pair of seals on the piston for sealing between the piston and the peripheral wall of said cylinder and spaced apart in the directions of said relative movement, the spacing of said pressure tappings being greater than the width of each of said seals in the directions of said relative movement and less than the distance between said seals in the directions of said relative movement, detector means responsive to the pressure at each said pressure tapping to give an output of magnitude determined by the position of said seals with respect to said pressure tappings and hence the position of said piston in said cylinder and indicator means to which said output is applied to indicate the position of said piston.

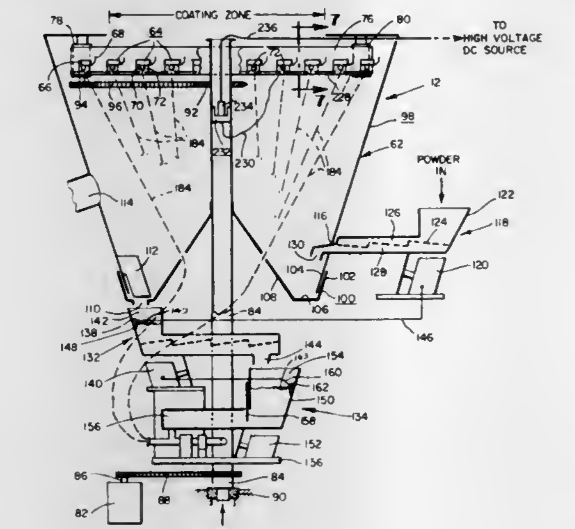
3,970,035
POWDER DEPOSITION SYSTEM

Lennox Birckhead, Jr., Rowayton, Conn., assignor to Vitek Research Corporation, Stamford, Conn.

Division of Ser. No. 210,723, Dec. 22, 1971, Pat. No. 3,777,874. This application Nov. 20, 1973, Ser. No. 417,633

Int. Cl.² B05C *5/00*

U.S. Cl. 118—7 **3 Claims**



1. An apparatus for forming a particulate layer on a substrate surface from a gaseous suspension of particulate, thermoplastic material, said apparatus comprising:

A. classifying means for removing from a supply of particulate, thermoplastic material substantially all particulate material above a predetermined size which will inhibit the formation of a substantially continuous and uniform layer of particulate material on said substrate surface, and for directing from said supply of particulate, thermoplastic material to a metering feed means properly-sized particulate material from which a substantially continuous and uniform layer of particulate material can be formed on said substrate surface;

B. metering feed means for feeding said properly-sized particulate material at a controlled volumetric rate to delivery conduit means, said metering feed means including a hopper section at an upstream end thereof and a trough section at a downstream end thereof;

C. at least one spray means in communication with said delivery conduit means disposed for directing said properly-sized particulate material in a gaseous suspension onto said substrate surface,

 1. movable retaining means to which said spray means are secured, substrate conveying means for conveying said substrate in a first direction and drive means for moving said retaining means along a path, at least a portion of which passes in a second direction substantially transverse to said first direction past the substrate surface upon which said particulate layer is to be formed,

 2. said movable retaining means for said spray means being in the form of a closed loop, said movable retaining means further including a rotatably mounted support member for said metering feed means, and means for rotating said support means and for moving said retaining means through said closed loop in synchronism to prevent twisting of said delivery conduit means,

 3. a housing in which said movable retaining means is disposed, at least a portion of said housing being rotatably mounted, said delivery conduit means extending through said rotatable portion of said housing, said drive means moving said rotatable portion of said housing in synchronism with said retaining means and said support member to prevent twisting of said delivery conduit means;

D. control circuit means for controlling the operation of said classifying means to direct properly-sized particulate material from said classifying means into said hopper section when said control circuit means is energized; and

E. pressure responsive sensing means operably associated with said control circuit means for energizing said control circuit means when the particulate material in said hopper section is below a predetermined amount, and for de-energizing said control circuit means when said predetermined amount of properly-sized particulate material is disposed within said hopper section.

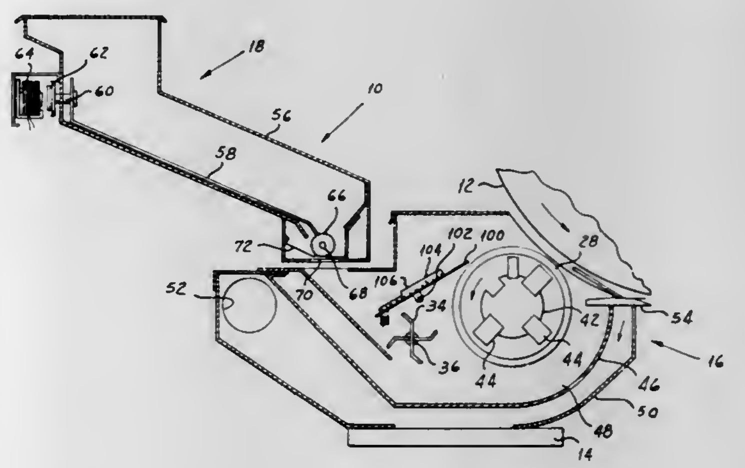
3,970,036
TONER CONCENTRATION DETECTOR FOR DRY POWDER MAGNETIC BRUSH TONING SYSTEM

James A. Baer, Menlo Park; Charles B. Clark, Los Altos, and Louis F. Schaefer, Palo Alto, all of Calif., assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Filed July 17, 1974, Ser. No. 489,389

Int. Cl.² G03G *15/08*

U.S. Cl. 118—7 **17 Claims**



1. In an electrostatic copier having a member carrying a photoconductor adapted to receive a latent electrostatic image and a developer applicator for applying a developer made up of a mixture of toner particles and ferromagnetic carrier particles to said photoconductor to develop said image, a system for replenishing the toner in said developer including in combination, a supply of developer adapted to be applied to said photoconductor by said applicator, an elongated generally tubular conduit having an inlet and an outlet, means for carrying developer from said applicator to said inlet to cause developer to flow through said conduit from said inlet to said outlet, said conduit having a certain cross-sectional area immediately ahead of said outlet, means forming a restricted opening of a cross-sectional area substantially less than said certain area adjacent to said outlet for inhibiting unstable flow of said developer through said conduit, a winding carried by said conduit, means for measuring changes in the inductance of said winding, a supply of toner, and means responsive to said measuring means for feeding toner from said toner supply to said developer supply.

3,970,037
COATING COMPOSITION VAPORIZER

John F. Sopko, Plum Borough, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 315,395, Dec. 15, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,609

Int. Cl.² C23C *13/12*

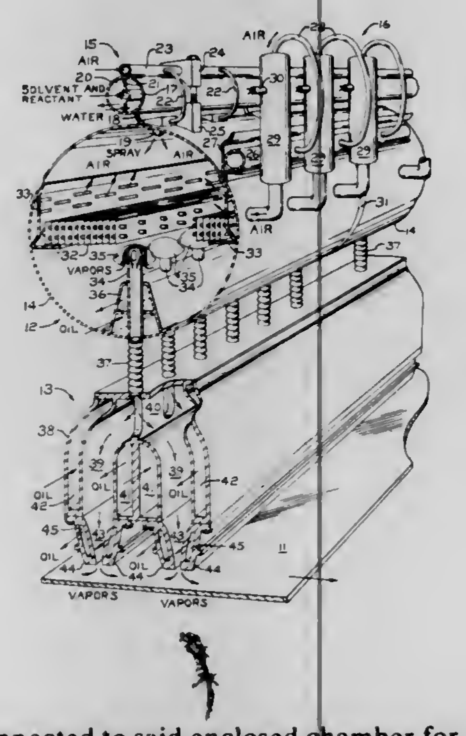
U.S. Cl. 118—48 **5 Claims**

1. Apparatus for applying a coating to a substrate, comprising:

an enclosed chamber;

means for spraying a vaporizable coating reactant into said enclosed chamber in a first direction at a temperature below its vaporization temperature;

means for (1) moving a stream of carrier gas into said enclosed chamber in a second direction intersecting the first direction of the coating reactant and (2) heating the carrier gas to a temperature above the vaporization temperature of the coating reactant and below the decomposition temperature of the coating reactant to mix the coating reactant with the carrier gas and vaporize the coating reactant by the heat of the carrier gas to form a gaseous mixture;



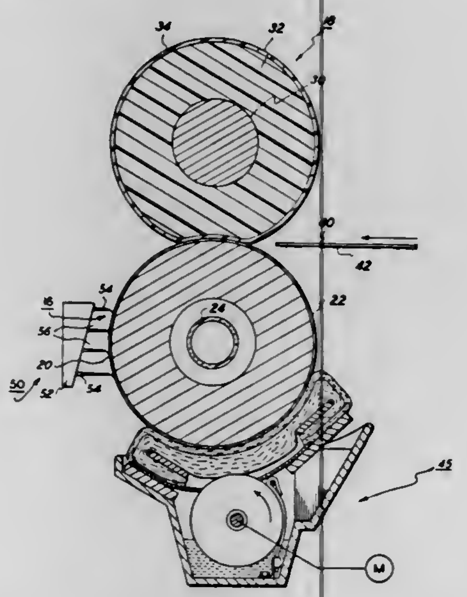
means connected to said enclosed chamber for directing the gaseous mixture against the substrate to be coated, and

heating means mounted in said enclosed chamber between said dispersing means and said directing means to stabilize the temperature of the gaseous mixture passing therethrough, said heating means having sufficient heat capacity to heat a cooler mixture and to cool a hotter mixture to the temperature of said heating means while maintaining the temperature of said heating means substantially unchanged.

3,970,038
ROLL FUSER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1975, Ser. No. 537,991
Int. Cl.^{2} G03G *15/20*
U.S. Cl. 118—60 **10 Claims**



1. In a contact fuser for fixing toner images to substrates, in combination:

a heated fuser member;

a backup member cooperating with said heated fuser member to form a nip through which said substrates pass to thereby soften toner images;

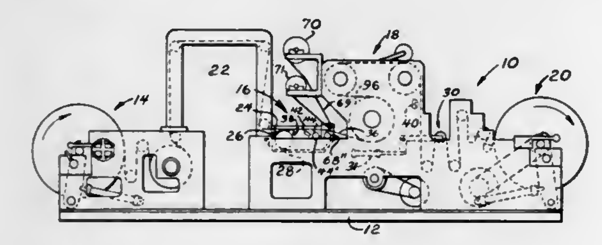
wick means for applying offset preventing liquid to said heated fuser member; and

cleaning means contacting one of said members for removing toner offset thereto, said cleaning means being disclosed intermediate said nip and said wick such that toner offset to said fuser member is removed therefrom prior to offset preventing liquid being applied to said fuser member, said cleaning means comprising a plurality of spaced-apart fingers supported in wiping contact with said fuser member and having spaces therebetween for accumulating toner removed from said heated member.

3,970,039
HIGH SPEED CARBONIZING MACHINE

Mak S. Kawano, Wheaton, Ill., assignor to American Tara Corporation, Chicago, Ill.

Filed Sept. 18, 1975, Ser. No. 614,553
Int. Cl.^{2} B05C *1/08, 11/04*
U.S. Cl. 118—60 **13 Claims**



1. In apparatus for coating tissue paper webs of the type including a coating roller for applying a hot liquid coating to the web and chilling rollers to solidify the coating, the improvement comprising: metering rod means for controlling the ink thickness on the coating roller, first doctor blade means positioned downstream of the coating roller and metering rod for lightly contacting the web for removing portions of the coating which exceed a predetermined thickness; second doctor blade means positioned downstream of said first doctor blade means for removing additional portions of said coating; an equalizer rod positioned for rotation about its axis downstream of the second doctor blade means, said equalizer rod having a diameter of less than 0.100 inches; and means for guiding the web to and from the equalizer rod so that the web changes its direction as it passes over the equalizer rod.

3,970,040
COATING TRAY

Frank L. Porth, Morley, Mich., assignor to James A. Black, Kent City, Mich.

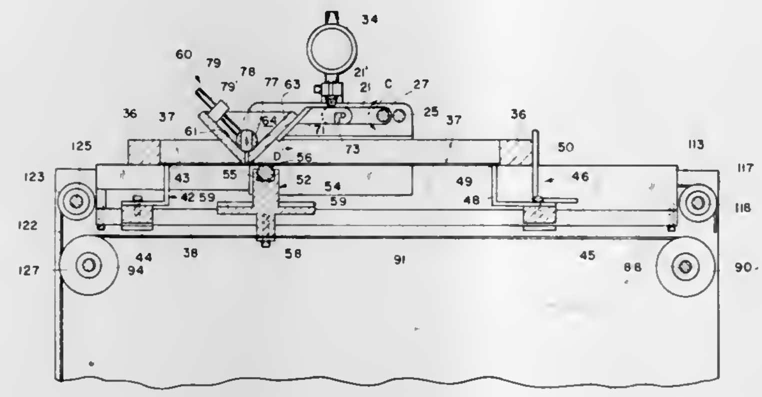
Continuation of Ser. No. 341,486, March 15, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,735
Int. Cl.^{2} B05C *11/04*
U.S. Cl. 118—406 **7 Claims**

1. A coating system for applying a uniform coat of fluid to planar stock material, said system comprising:

means for holding planar stock;

a tray comprising a generally V-shaped trough with end walls defining a reservoir for fluid and including a plurality of apertures formed through the bottom apex of said trough and spaced along at least a portion of the length of the tray wherein said tray includes a channel formed in the apex of said trough on the exterior thereof and in communication with said apertures, said channel being defined by a continuous spreading blade extending adjacent said apertures and a second blade wherein said blades span said apertures and extend the length of said channel and wherein said apertures are separated by lands having side walls tapered inwardly toward adjacent apertures in a direction toward said channel to facilitate the uniform filling of said channel with fluid from said trough;

means for mounting said tray with respect to planar stock held by said holding means such that said blade is spaced a predetermined distance from the surface of such stock; and

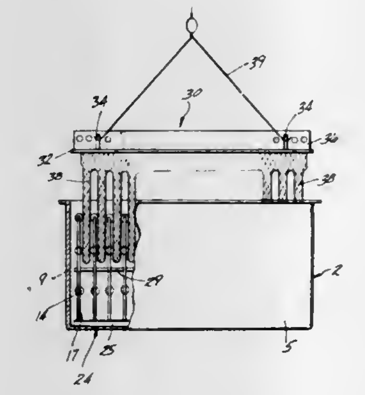


means providing relative motion between said tray and the stock while maintaining the distance between said blade and the stock relatively constant to apply a uniform thickness coat of fluid to the stock wherein said mounting means causes said tray to be pivotally coupled to said providing means such that said second blade of said tray rests upon the surface of the planar stock and said spreading blade is adjustably spaced from the surface of the stock.

3,970,041
APPARATUS FOR DEPOSITING FIBROUS DIAPHRAGMS

Morton S. Kircher, Oakville, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 2, 1975, Ser. No. 564,967
Int. Cl.^{2} B05C *3/02*
U.S. Cl. 118—428 **11 Claims**

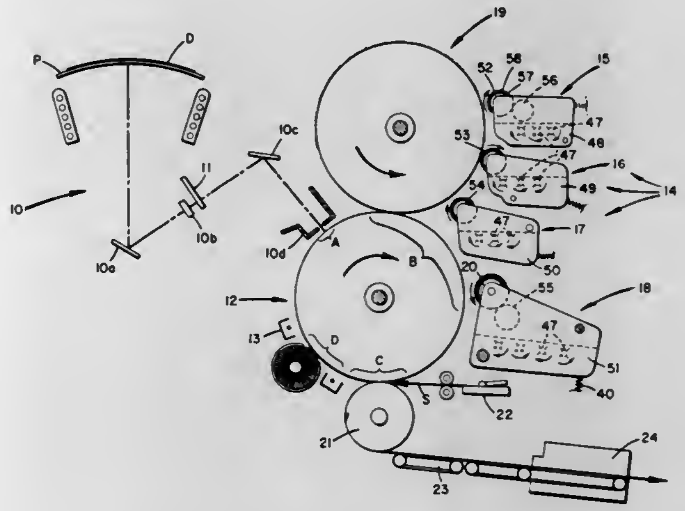


1. Apparatus for depositing a fibrous diaphram on a plurality of electrodes having foraminous surfaces comprising a tank for holding a slurry of fibrous material having a bottom and walls and having dividing means for separating said electrodes from each other and removably secured to one of said walls, said means comprising pluralities of rod elements; each plurality of rods lying in a substantially vertical plane spaced from another such plane; and roller means disposed on said rod elements whereby said dividing means functions to maintain said electrodes, when immersed, spaced apart and to inhibit abrasion thereon.

3,970,042
COLOR DEVELOPMENT APPARATUS

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1975, Ser. No. 541,773
Int. Cl.^{2} G03G *15/01, 15/08*
U.S. Cl. 118—637 **8 Claims**



1. Development apparatus for a multi-color electrostatic printing machine for producing copies of an original in which a plurality of electrostatic latent images are in series on a movable photoconductive member, comprising:

a. a color toner development roller for developing said plurality of electrostatic images, said color development roller applying different color toners to each of said latent electrostatic images, said color development roller applies said different color toners in sequence to each of said latent electrostatic images; and

b. means for providing said different color toners on said color development roller, said means for providing provides each of said color toners onto a different area of the color development roller, said means for providing provides one color toner to the same area of the color development roller, this area to which the one color toner is provided being spaced from another area of said color development roller on which another color toner is provided, said color development roller having sequential areas of color toner thereon, said means for providing includes a plurality of color toner donor apparatus, each applying a different color toner to the color development roller and spaced about the periphery of the color development roller, said donor apparatus are movable and further comprising means for sequentially moving each of said color toner donor apparatus into and out of contact with said color development roller to provide said roller with the color toner. Said means for sequentially moving includes a plurality of cams, one for each of said color toner donor apparatus and located on the periphery of the color development roller; and a plurality of cam followers, one for each of said cams and connected to said donor apparatus.

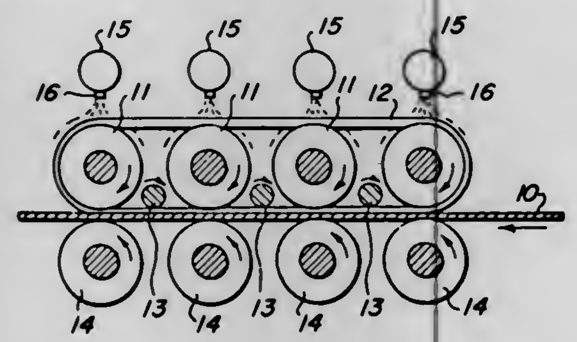
3,970,043
ELECTROPHOTOGRAPHIC DEVICE FOR LIQUID DEVELOPMENT

Masamichi Sato, and Shigeru Tezuka, both of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 370,908, June 18, 1973, Pat. No. 3,870,514. This application Oct. 7, 1974, Ser. No. 512,382
Int. Cl.^{2} G03G *13/10*
U.S. Cl. 118—637 **4 Claims**

1. An electrophotographic device for liquid development of an imaging member comprising support rollers for said imaging member, development electrode rollers positioned opposite the image bearing surface of said imaging member, said

development electrode rollers having an endless belt mounted thereon, said support rollers having grooves therein at each end thereof, said grooves facing and aligned with grooves in the development electrode rollers so that said support rollers



are in physical contact with said development electrode rollers in the absence of said imaging member, driving means for said support rollers, means for supplying a voltage potential across said imaging member, and means for supplying liquid developer to said imaging member.

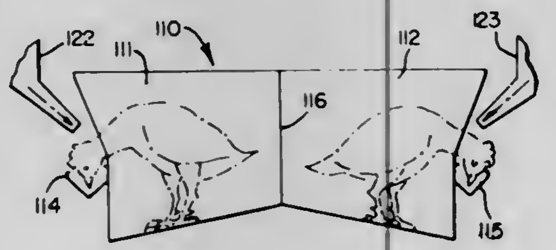
3,970,044
CONTROLLED FEEDING OF LIVESTOCK

William S. Peppler, New York, N.Y.; Everett M. Keen, and Anthony J. Siciliano, both of Vineland, N.J., assignors to Diamond International Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,835

Int. Cl.² A01K *5/02*

U.S. Cl. 119—18 **10 Claims**



1. Method of feeding poultry comprising the steps of:

a. confining matured size poultry of about five birds in each group of two or more groups with each of said groups being in separate cage units having separate feed receptacles of which each feed receptacle has a width of about 15 inches accessible to feed the poultry;

b. accurately measuring and dispensing feed at the rate of approximately 1 ounce per 15 inches of each of said feed receptacle in a first feed period;

c. repeating the step of accurately measuring and dispensing feed at the rate of approximately 1 ounce per 15 inches of each of said feed receptacle over from about three to 19 additional feed periods at generally regular intervals each day.

3,970,045
PORTABLE ANIMAL PEN AND GATE STRUCTURE

Joseph A. Graham, Jr., Milo, Iowa 50166

Filed May 7, 1975, Ser. No. 575,430

Int. Cl.² A01K *29/00*

U.S. Cl. 119—20 **8 Claims**

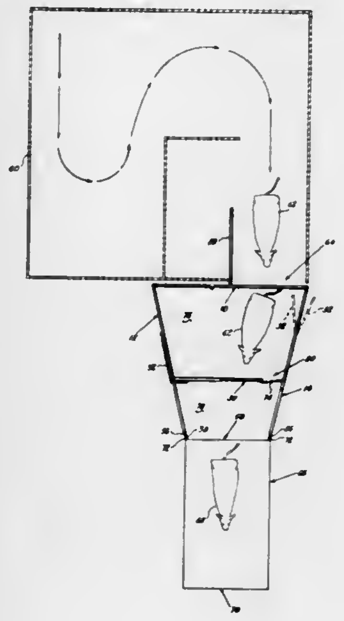
1. A knockdown portable animal pen structure for use intermediate an animal enclosure such as a corral or barn and a holding chute in which an animal is restrained to be administered various treatments, said pen structure comprising:

first, second and third rectangular fence sections defining suitable barrier members with respective top, bottom and opposed ends, fastening means carried by the respective ends of said respective sections for removable interlocking hinged engagement with each other,

a respective latchable gate within the confines of said first and second fence sections,

the respective ends of said second fence section being hingedly engaged to a respective end of said first and third fence sections so that said second fence section is disposed immediately adjacent an animal enclosure such as a corral or barn and intermediate said corral or barn and an animal holding chute with the gate in said second fence section being openable for communication with a gate opening in the corral or barn,

said first and third fence sections being positioned relative to respective opposite ends of said second fence section in a converging relationship towards the holding chute and with said fastening means on said other ends of said first and third fence sections being removably attached to respective opposite sides of the entrance to the holding chute, and



the gate in said first fence section being movable towards and operably latchable to said third fence section to establish first and second pens or enclosures intermediate and in direct line beween the corral or barn and said holding chute wherein said first enclosure is accessible only to the corral or barn and said second enclosure is accessible only to the holding chute but with access between the enclosures available by movement of said gate away from said third fence section towards said first fence section.

3,970,046
VETERINARY SURGICAL METHOD

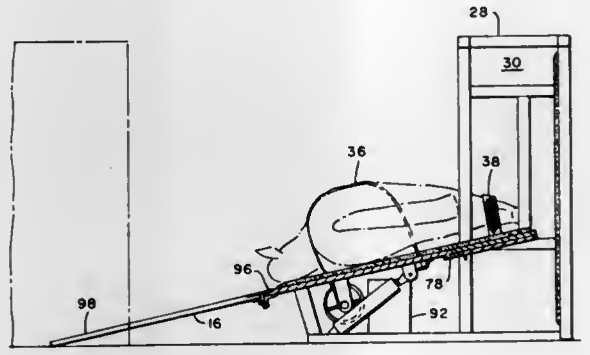
George L. Boggs, 2507 W. Hibbard, Rte. 5, Owosso, Mich. 48867

Filed Apr. 18, 1974, Ser. No. 461,863

Int. Cl.² A61D *3/00*

U.S. Cl. 119—103 **4 Claims**

1. The method of moving a large animal before and after operating on the animal comprising securing the animal in a standing position to a vertically positioned operating table, tilting the operating table to a horizontal position for performing an operation on the animal, further tilting the operating table in the same direction approximately 15° to permit sliding of the animal from the operating table, attaching a chute to the operating table and sliding the animal between the operating table and a recovery stall on the chute.



3,970,047
REDUCED PRESSURE TYPE STEAM GENERATOR

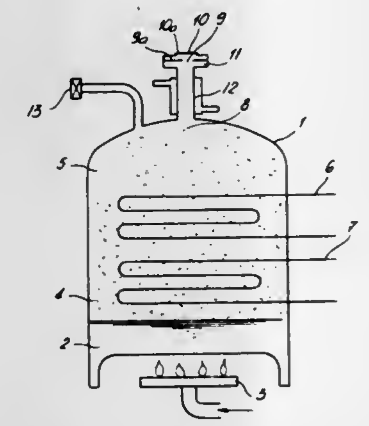
Sadakazu Yamada, Kyoto, Japan, assignor to Stotz & Co. AG, Zurich, Switzerland

Filed Mar. 17, 1975, Ser. No. 559,371

Claims priority, application Japan, Mar. 18, 1974, 49-31192

Int. Cl.² F22B *5/00*

U.S. Cl. 122—13 R **5 Claims**



1. A reduced pressure type steam generator comrising a vessel containing therein an air tight steam chamber, the interior of said vessel being maintained at reduced atmospheric pressure, a heatable liquid medium enclosed in the vessel, a gas reservoir connected with the top region of the vessel, said gas reservoir being equipped with an outlet covered with a polymer film for permeating out any non-condensible gas formed in the vessel.

3,970,048
LOW PRESSURE STEAM GENERATOR

John F. Finger, and Merle E. Pachop, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Mar. 6, 1975, Ser. No. 555,810

Int. Cl.² F22B *21/22*

U.S. Cl. 122—328 **5 Claims**

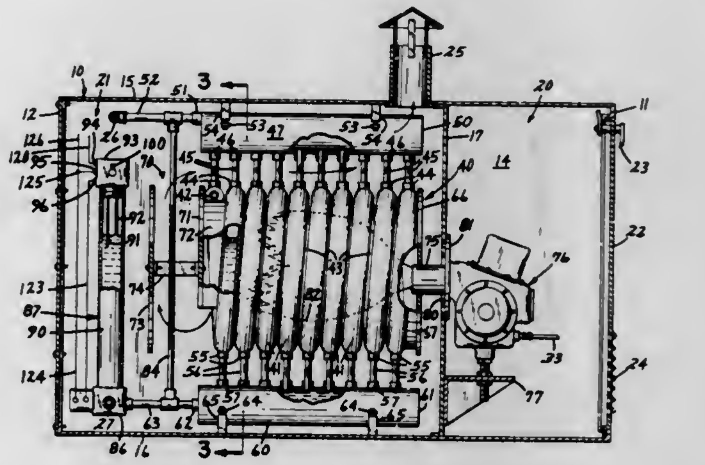
1. In a low pressure steam generator:

a water tube structure comprising a plurality of generally annular portions slightly spaced from one another along a common horizontal axis to define a hollow laterally discontinuous combustion chamber;

an elongated water header having an axis parallel to said common axis and located below said water tube structure;

means individually connecting the bottoms of said annular portions with said water header;

an elongated steam header having an axis parallel to said common axis and located above said water tube structure;



and means individually connecting the tops of said annular portions with said steam header.

3,970,049
IGNITION SYSTEM FOR ROTARY PISTON ENGINE

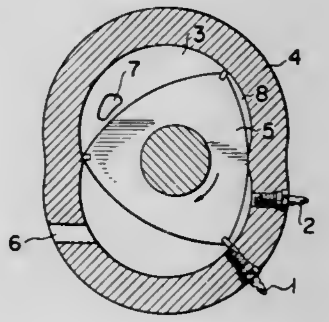
Shunzo Yamaguchi, Nishio; Toshihiko Igashira, Toyokawa, and Masami Hujita, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 4, 1974, Ser. No. 476,273

Claims priority, application Japan, June 5, 1973, 48-66701[U]; June 7, 1973, 48-67229[U]

Int. Cl.² F02B *53/04*

U.S. Cl. 123—8.05 **4 Claims**



1. An ignition system for a rotary piston engine comprising:

a rotor;

a rotor housing in which said rotor is mounted to contact with the walls thereof;

first and second sparking means, said first sparking means being positioned in said rotor housing proximate a forward end of a combustion chamber in the direction of rotation of said rotor wherein the combustion chamber is defined by said rotor and said rotor housing when said rotor is at a top dead center, said second sparking means being positioned in said rotor housing at the rear of the position of said first sparking means relative to said combustion chamber in the direction of rotation of said rotor, both said first and second sparking means being positioned on a forward side of the short axis of said rotor housing in the direction of rotation of said rotor;

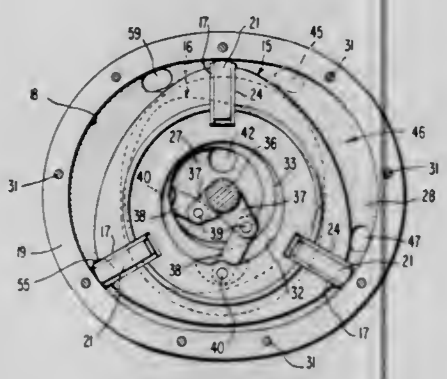
a speed sensor for detecting the rotational speed of said engine;

a vacuum sensor for detecting the vacuum in the intake manifold of said engine; and

switching means responsive to the output of said speed sensor and said vacuum sensor for coupling current to said second sparking means only when said engine goes into high speed operation and/or high load operation, and for coupling current to only said first sparking means under other conditions of said engine.

3,970,050
TWO-STAGE ROTARY ENGINES

Harry W. Hoadley, 139 Laquineo St., Findlay, Ohio 45840
Filed Mar. 7, 1975, Ser. No. 556,433
Int. Cl.^{2} F02B *53/08*
U.S. Cl. 123—8.05 **5 Claims**



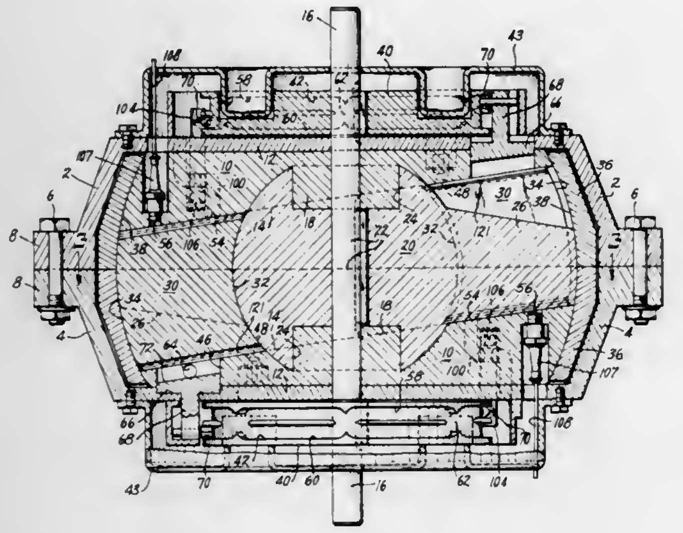
1. A rotary engine comprising a two-stage housing means having first and second stage variable volume oblong working chambers whose major axes are substantially perpendicular, first and second stage three-sided rotors movably mounted in said first and second stage working chambers, a single engine output shaft journaled on said housing means for rotation and having cranks adjacent the first and second stage working chambers which are spaced apart substantially ninety degrees circumferentially, connecting links pivotally interconnecting said cranks and rotors in said first and second stage working chambers, spaced seals carried by said rotors and having wiping engagement with peripheral and side walls of said first and second stage working chambers, said rotors having communicating central cooling passage means, said housing means having a fuel intake passage communicating with the rotor cooling passage means and having a delivery passage for fuel leading from the cooling passage means into the first stage working chamber, said housing means additionally having a charge transport passage interconnecting said first stage and said second stage working chambers and delivering a charge from the former to the latter, the housing means having another delivery passage for transporting a fired charge from the second stage chamber back to the first stage chamber and having an exhaust passage leading from the first stage chamber, and fuel ignition means in a compression zone of the second stage working chamber.

3,970,051
ROTARY ENGINE DEVICE

Thomas E. Kirkman, R.R. 2, Box 342, Odon, Ind. 47562
Filed May 2, 1975, Ser. No. 573,928
Int. Cl.^{2} F02B *53/00, 53/10*
U.S. Cl. 123—8.09 **11 Claims**

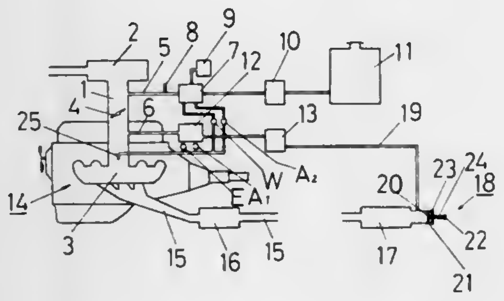
1. A rotary engine device comprising:
- a housing having means defining an axis and means defining side walls of a chamber, said side walls being opposed, axially spaced parallel walls extending oblique to and around said axis;
- a rotor journalled in said housing for rotation about said axis, said rotor having a spherical portion spanning the space between said side walls and defining the radially inner surface of said chamber;
- a circumferential web fixed to said spherical portion and extending radially of said axis between said side walls;
- a ring fixedly mounted on the outer edge of said web to rotate therewith and having a spherical inner surface, concentric to said spherical portion, and completely spanning the space between said side walls, throughout the periphery thereof, to define the radially outer surface of said chamber;
- a plurality of radial slots extending axially through said web;
- a vane axially slidable in each of said slots and having edges complementary to and slidably engaging said side walls and said radially inner and outer surfaces of said chamber to divide said chamber, on each side of said web, into variable volume compartments; and

fluid inlet and outlet ports in said housing arranged to successively communicate with each of said compartments as said rotor and vanes rotate in said housing.



3,970,052
APPARATUS FOR CONTROLLING NOXIOUS EXHAUST GASES FROM INTERNAL-COMBUSTION ENGINE

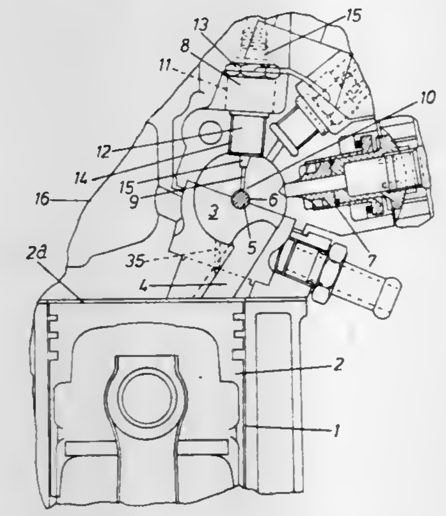
Akira Andoh, Yokohama, Japan, assignor to Clemix Co., Tokyo, Japan
Filed Oct. 29, 1974, Ser. No. 518,937
Int. Cl.^{2} F02D *19/00*
U.S. Cl. 123—25 R **10 Claims**



1. An apparatus for minimizing the amount of noxious gases such as nitrogen oxides, carbon monoxides and hydrocarbons contained in the exhaust gases to be produced by burning fuel in an internal-combustion engine, comprising a conduit leading to a combustion chamber of the engine for the supply of air-fuel mixture to said combustion chamber and provided with throttle valve means therein, two branch pipes extending from said conduit and located on opposite sides of said throttle valve means, respectively a first control section connected to one of said two branch pipes and operative for selectively controlling the supply of water and air to said combustion chamber, a second control section connected to the other of said two branch pipes and operative for controlling the supply of part of said exhaust gases and air to said combustion chamber for reburning said part of said exhaust gases and said air therein, a distribution pipe for the supply of the amount of said water and said air supplied by said first control section and for the supply of the amount said part of said exhaust gases and said air supplied by said control section and having one end thereof present inside said conduit or intake manifold connected to said conduit, and control elements provided in said first control section and actuated in response to changes in pressures within said first control section said second control section for controlling the flow of said water, air and exhaust gases.

3,970,053
INTERNAL COMBUSTION ENGINES

Charles Lindsay Goodacre, London, England, assignor to Fiat Societa per Azioni, Turin, Italy
Filed Oct. 25, 1974, Ser. No. 518,118
Claims priority, application United Kingdom, Nov. 5, 1973, 51181/73; May 2, 1974, 19347/74
Int. Cl.^{2} F02B *3/02*
U.S. Cl. 123—30 D **21 Claims**

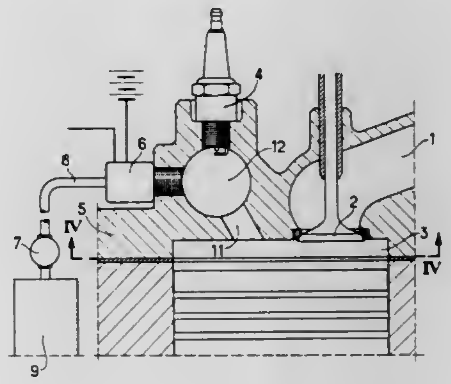


1. A internal combustion engine comprising at least one cylinder, a piston reciprocable in the cylinder, means for admitting air into said cylinder for compression by the piston, a substantially spherical combustion chamber externally of the cylinder, transfer passage means communicating the combustion chamber with the cylinder and through which air compressed by the piston can pass into the combustion chamber, fuel injector means for injecting fuel into the combustion chamber, and spark ignition means for igniting a fuel/air mixture in the combustion chamber, the spark ignition means comprising a first electrode extending diametrically of the combustion chamber and a second electrode which extends into the combustion chamber and defines with said first electrode a spark gap located in a central region of the combustion chamber, said transfer passage means extending tangentially of the combustion chamber in a plane perpendicular to said first electrode whereby air compressed by the piston and transferred to the combustion chamber will be caused to rotate within the combustion chamber about the axis provided by said first electrode.

3,970,054
INTERNAL COMBUSTION ENGINE FED WITH A STRATIFIED DOUBLE CHARGE

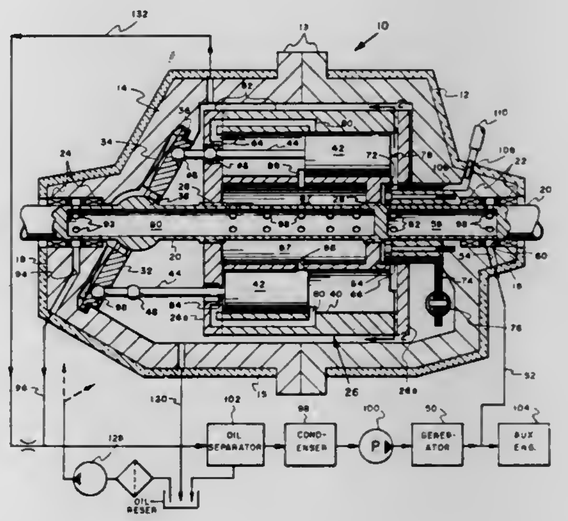
Claude Henault, Chevilly Larue, and Pierre Cochard, Saint Germain les Arpajon, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France
Filed Feb. 20, 1975, Ser. No. 551,415
Claims priority, application France, Feb. 21, 1974, 74.06010; Sept. 17, 1974, 74.31408
Int. Cl.^{2} F02B *19/10, 19/16*
U.S. Cl. 123—32 ST **2 Claims**

1. An internal-combustion engine fed with a stratified charge comprising means for injecting into a combustion chamber a main charge of a lean mixture of a first fuel and air, and an injection device, for injecting a second fuel into an ignition zone of the combustion chamber, comprising an injector holder and an injector mounted on said injector holder, said holder comprising a retaining element defining a fluid passage in said holder, a seat opposite said retaining element and a ball valve including a ball freely mounted with a given degree of clearance for movement between said retaining element and said seat, said retaining element being disposed in said holder closer to the combustion chamber, while said seat is integral with the holder and disposed closer to the injector such that the pressure in the combustion chamber at the end of the compression stroke and during ignition and the subsequent expansion stroke pushes the ball against its seat, thereby protecting the injector, with the retaining element being a baffle plate having two opposite flat lateral portions which define said fluid passage and said baffle plate being press-fitted in a bore in the injector holder.



3,970,055
UNIFLOW-TYPE EXTERNAL COMBUSTION ENGINE FEATURING DOUBLE EXPANSION AND ROTARY DRIVE

Otto V. Long, 3440 SW. Veterans Hospital Road, Portland, Oreg. 97201
Filed May 17, 1974, Ser. No. 470,820
Int. Cl.^{2} F02B *57/06*
U.S. Cl. 123—43 A **13 Claims**

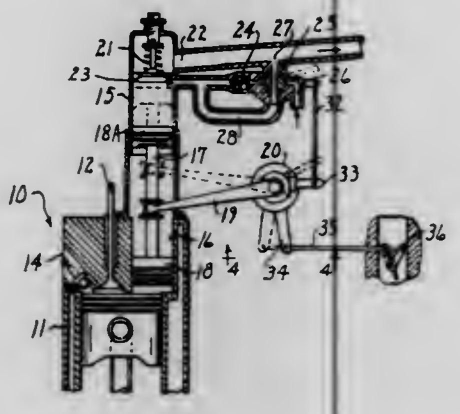


1. Engine apparatus of the type having at least one cylinder in which a piston reciprocates, said cylinder defining respective chambers located at first and second ends of said cylinder on either side of said piston, wherein the improvement comprises:
- a. means defining an exhaust port in the wall of said cylinder adjacent the center thereof positioned so as to be exposed to the interior of said cylinder when said piston is adjacent the first end of said cylinder and blocked by said piston when said piston is adjacent the second end of said cylinder;
- b. means defining a transfer port in the wall of said cylinder adjacent the center thereof separate from said exhaust port and positioned so as to be exposed to the interior of said cylinder when said piston is adjacent said second end and blocking said exhaust port;
- c. means defining an inlet port in the wall of said cylinder adjacent said second end thereof and positioned so as to communicate with the interior of said cylinder when said piston is adjacent said second end and blocking said exhaust port; and
- d. means defining a transfer passageway joining said transfer port and said inlet port for selectively transferring gas

from said chamber at said first end of said cylinder to said chamber at said second end of said cylinder when said piston is adjacent said second end and blocking said exhaust port.

3,970,056
VARIABLE COMPRESSION RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kenneth B. Morris, 4213 Belmar Blvd., Neptune, N.J. 07753
Filed Oct. 11, 1974, Ser. No. 514,105
Int. Cl.² F02B *75/36*
U.S. Cl. 123—48 D **6 Claims**

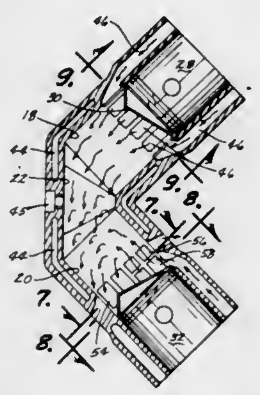


1. A variable compression ratio internal combustion engine controlled by a throttle comprising, a main cylinder block with a cylinder bore and a cylinder head over said cylinder bore, a piston reciprocatingly mounted in said cylinder bore, a combustion space between said piston and said cylinder head, a passage for compressed combustible gases passing through said cylinder head, said passage connected to a separate second cylinder in which a first auxiliary piston is slidably mounted, said auxiliary piston supported on a piston rod, said piston rod extending to a second auxiliary piston that is also reciprocatingly mounted so that both pistons float in opposed relationship in said separate cylinder, said first and second auxiliary pistons movable in said separate cylinder away from said combustion area when there is an increased pressure in said main cylinder, and a check valve in said cylinder to limit the degree of movement, a hydraulic fluid pressure system controlled by the throttle that is in turn connected to a differential resolver, said differential resolver controlling a rotary valve through which the hydraulic fluid pressure passes to one end of said second cylinder to act upon said second auxiliary piston, said fluid pressure acting upon the second auxiliary piston producing a floating motion of both first and second auxiliary pistons between a maximum compression and a minimum compression to in turn vary the position of the first auxiliary piston and in turn vary the compression in the combustion area, said second cylinder having a stop at one end to limit the movement of said first auxiliary piston when said combustion area of said main cylinder is exhausted of its pressure charge.

3,970,057
INTERNAL COMBUSTION ENGINE

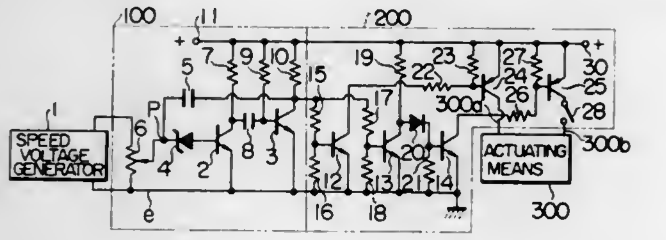
George A. Schauer, 2023 Kellogg Ave., Ames, Iowa 50010
Filed June 14, 1973, Ser. No. 370,165
Int. Cl.² F02B *25/08, 75/28*
U.S. Cl. 123—51 BA **4 Claims**

1. Internal combustion engine comprising:
- a housing having first and second cylinders, a combustion chamber, and two crankcases,
- said cylinders each having first ends positioned adjacent one another, and second ends positioned adjacent one of said crankcases, said combustion chamber being between said first ends of said cylinders;
- first and second pistons slidably mounted in said first and second cylinders respectively for reciprocating movement therein;
- crankshaft means within said crankcases;
- means interconnecting said pistons with said crankshaft means for transferring said reciprocating movement of said pistons into rotational movement of said crankshaft means;
- first inlet ports arranged in a full circular array around the circumference of said first cylinder for charging said first cylinder whenever said first piston is in a predetermined position;
- exhaust ports in said second cylinder for venting said second cylinder and said combustion chamber to the atmosphere whenever said second piston is in a predetermined position within said second cylinder;
- second inlet ports in said second cylinder for charging and scavenging said second cylinder while said exhaust ports are open;
- said exhaust ports being arranged in a full circular array around the circumference of said second cylinder;
- said second inlet ports being in at least a partial circular array around the circumference of said second cylinder;
- said exhaust ports being positioned so as to be open whenever said second inlet ports are open;
- the relative port areas of said exhaust ports, said first inlet ports, and said second inlet ports being such that the total inlet port area exceeds the total exhaust port area during at least a portion of the cycle of said pistons.



3,970,058
REVOLUTION CONTROL CIRCUIT FOR INTERNAL COMBUSTION ENGINE

Hidaka Tsukasaki, and Tetsuya Inoue, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Oct. 25, 1973, Ser. No. 409,458
Claims priority, application Japan, May 11, 1973, 48-52736
Int. Cl.² F02M *39/00*
U.S. Cl. 123—102 **2 Claims**

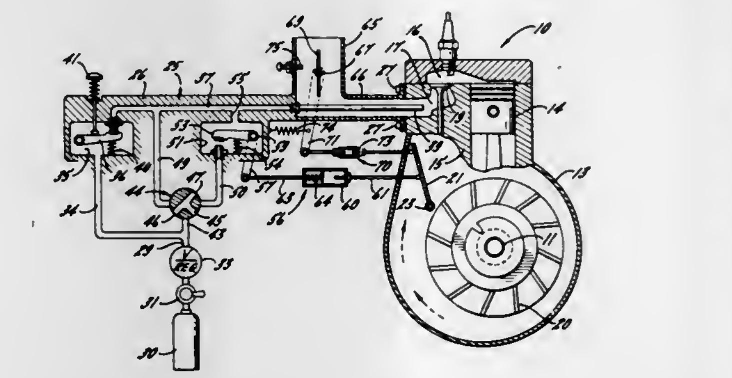


1. A revolution control circuit for an internal combustion engine comprising:
- a speed voltage generator for generating a speed voltage corresponding to the number of revolutions of said engine,
- an oscillator circuit adapted to start oscillating when said speed voltage generated by said speed voltage generator becomes higher than a predetermined value and having an on-off ratio varying in accordance with said speed voltage,

- a transistor circuit adapted to be turned on and off intermittently in accordance with said on-off ratio upon initiation of the oscillations of said oscillator circuit, and
- a control element for increasing and decreasing the quantity of fuel delivered in synchronism with the on-off operations of said transistor circuit to decrease on an average the fuel injection quantity in accordance with the degree of deviation of said speed voltage from said predetermined value,
- said control element including a servomotor operable in synchronism with the on-off operation of said transistor circuit and a control rack driven by the servomotor and said oscillator circuit including voltage detecting means having Zener diode for providing a signal when said speed voltage generator becomes higher than a predetermined value, a first transistor having a base circuit connected to said voltage detecting means being conductive when said voltage detecting means provides said signal, a capacitor connected to said first transistor, a second transistor having a base circuit connected across said emitter-collector circuit of said first transistor vai said capacitor, and a feedback circuit having another capacitor connected between the output of said second transistor and the input of said Zener diode.

3,970,059
ENGINE SPEED CONTROL FOR AN INTERNAL COMBUSTION ENGINE ADAPTED FOR OPERATION WITH L.P. GAS

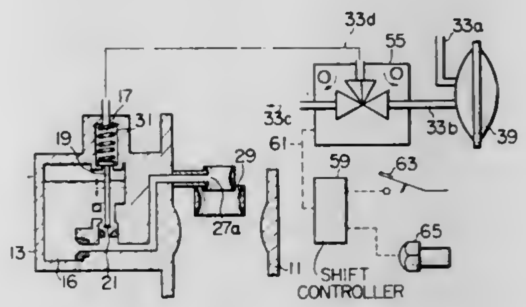
Robert J. Pisar, 2807 Spring Creek Road, Rockford, Ill. 61107
Filed Apr. 30, 1975, Ser. No. 573,128
Int. Cl.² F02D *11/08;* **F02M** *21/00*
U.S. Cl. 123—103 B **9 Claims**



1. An internal combustion engine having a combustion chamber, a shaft adapted to be rotated as an incident to combustion of a fuel-air mixture in said chamber, and a fan connected to said shaft and operating in accordance with the rotational speed of the shaft, said engine further including a vane mounted for pivotal movement in the path of the air circulated by said fan and adapted to swing in first and second directions as the speed of said fan respectively decreases and increases, the improvement in said engine comprising, a source of liquid petroleum gas connected to communicate with said combustion chamber, first valve means between said source and said chamber and manually adjustable to regulate the flow of gas to said chamber, second valve means between said source and said chamber and adapted, when opened, to increase the flow of gas to said chamber, an air intake communicating with said chamber, a butterfly valve mounted in said air intake for movement between open and closed positions to increase and decrease, respectively, the flow of air to said chamber, first linkage means connected between said vane and said butterfly valve for effecting movement of the latter toward said open and closed positions as said vane swings in said first and second directions, respectively, and second linkage means connected between said vane and said second valve means for effecting opening and closing of said second valve means as said vane respectively swings in said first and second directions.

3,970,060
FUEL CONTROL APPARATUS

Mitunori Sasano, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Nov. 19, 1974, Ser. No. 525,188
Claims priority, application Japan, Apr. 10, 1974, 49-40477
Int. Cl.² F02M *7/00*
U.S. Cl. 123—119 R **4 Claims**



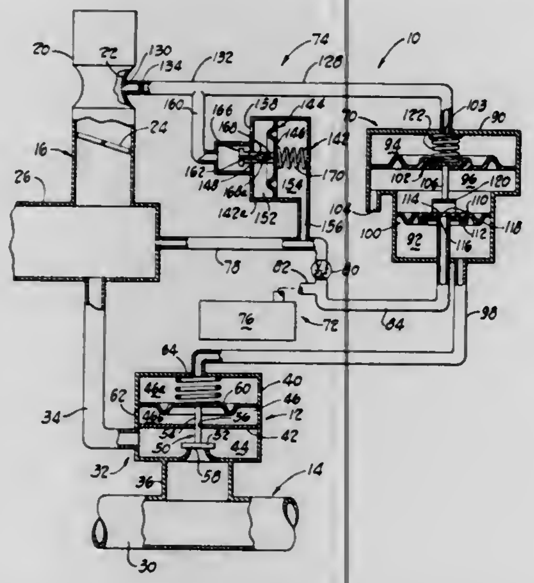
1. Apparatus for controlling the flow of fuel to an internal combustion engine having an intake manifold for delivering a mixture of fuel and air to a combustion space of the engine; a carburetor mounted on the intake manifold, the carburetor having a float chamber, fuel nozzles, a passageway connecting the float chamber to the fuel nozzles, valve means in the passageway for controlling the flow of fuel from the float chamber to the fuel nozzles, a vacuum chamber, and means for varying the opening of the valve means as a direct function of the absolute pressure in the vacuum chamber; and an accelerator pedal for controlling the flow of fuel and air mixture to the engine; the apparatus being of the type that includes a vacuum reservation tank, a first vacuum line for connecting the vacuum reservation tank to an intake manifold of an engine, a second vacuum line for connecting the vacuum reservation tank to a vacuum chamber of a carburetor, valve means for interrupting the connection through the first vacuum line when the absolute pressure in the intake manifold of the engine is higher than the absolute pressure in the vacuum reservation tank, and means for reducing the vacuum in the vacuum chamber of the carburetor at an adjusted slow rate when the engine is accelerating, wherein the improvement comprises:
- a three-way valve disposed in the second vacuum line between the vacuum reservation tank and the vacuum chamber of the carburetor;
- a third vacuum line connecting the three-way valve to the intake manifold of the engine; and
- means for shifting the three-way valve between a first vacuum circuit that connects the vacuum reservation tank to the vacuum chamber of the carburetor to a second vacuum circuit that connects the intake manifold of the engine to the vacuum chamber of the carburetor.

3,970,061
CONTROL SYSTEM FOR EXHAUST GAS RECIRCULATING VALVE

Roland B. Caldwell, Worthington, Ohio, assignor to Ranco Incorporated, Columbus, Ohio
Continuation of Ser. No. 447,767, March 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,126, Jan. 2, 1973, abandoned. This application Mar. 7, 1975, Ser. No. 556,558
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **11 Claims**

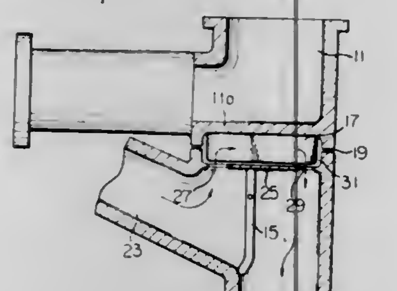
1. In a system for controlling the flow of exhaust gases from the exhaust system into the intake gas induction system of an internal combustion engine including a fuid operated valve to control said recirculating exhaust gas flow, fluid pressure source means providing a source of valve operating pressure, a fluid pressure regulator for controlling operating fluid pressure applied to said valve from said fluid pressure source to thereby control operation of said valve, fluid signal source

means for providing an input fluid signal to said regulator, said signal source means comprising structure for producing a fluid signal which varies as a function of the flow rate of gas through



the engine and control means responsive to pressure in the intake manifold of the engine to modify said fluid signal to provide said input fluid signal to which said regulator responds.

3,970,062
ARRANGEMENT FOR HEATING THE SUCTION GASES OF AN INTERNAL COMBUSTION ENGINE
Masahiko Nakada, and Takehiko Maekawa, both of Toyota, Japan, assignors to Toyota, Japan
Continuation of Ser. No. 419,237, Nov. 27, 1973, abandoned. This application Sept. 11, 1975, Ser. No. 612,519
Claims priority, application Japan, July 31, 1973, 48-85464
Int. Cl.^{2} F02M *31/00*
U.S. Cl. 123—122 AC **2 Claims**



1. A heater for incoming fuel-air mixture to an internal combustion engine of the type that includes an intake manifold for said mixture having a bottom floor area; a plurality of heat conducting fins extending downward from the exterior wall of the intake manifold in the bottom floor area; an exhaust manifold disposed underneath the intake manifold adjacent to the finned area for conveying hot combustion products from the engine; a circumscribing wall surrounding the finned area and having a flanged lower face for mating engagement with a flanged opening through the wall of the exhaust manifold underneath the finned area; a partition clamped between the flanged faces of the circumscribing wall and the opening in the wall of the exhaust manifold for enclosing the fins in a chamber defined by the partition, the circumscribing wall, and the exterior wall of the intake manifold, the partition having an inlet port adjacent to one side of the circumscribing wall for introducing the combustion products into the chamber and an outlet port spaced from the inlet port adjacent to the opposite side of the circumscribing wall for exhausting the combustion products from the chamber; and a butterfly type control valve mounted in the exhaust manifold in the way of the opening for rotation about a horizontal axis parallel to the wall between a first position and a second position, the valve when in the first position deflecting the flow of hot combustion gases through the inlet port to contact the fins for heating the intake gases and for returning the combustion products to the exhaust manifold through the outlet port, the valve when in the second position substantially blocking the opening through the wall of the exhaust manifold to prevent the combustion gases from contacting the fins, wherein the improvement comprises:

said partition being a thin plate having a flat unobstructed undersurface,

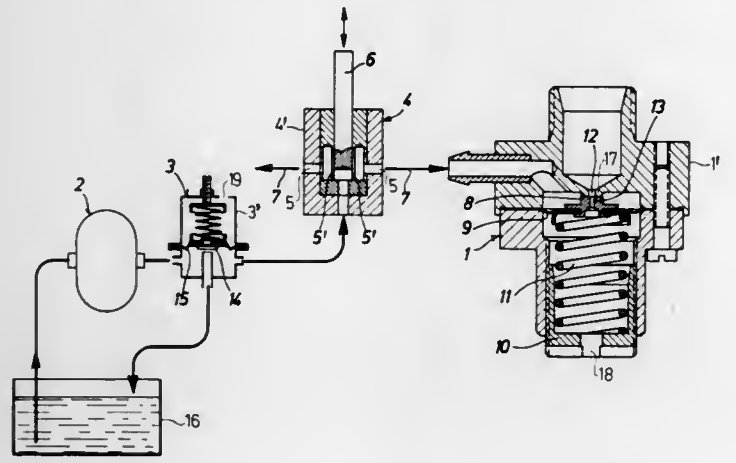
said opening in the wall of the exhaust manifold being obstructed only by said partition, and

the upper edge of said butterfly type control valve being positioned contiguous to the flat undersurface of the partition plate between the inlet port and the outlet port when the valve is in the first position

a first circumscribing sealing gasket secured to an entire marginal portion of one side of said flat plate and

a second circumscribing sealing gasket secured to an entire marginal portion of the other side of said thin plate, said first and second sealing gaskets having openings corresponding to said flanged openings and providing hermetic seals between the one side of the partition and the flanged lower face of the circumscribing wall and the other side of the partition and the flanged opening through the wall of the exhaust manifold, respectively, when the partition is clamped between said flanged faces.

3,970,063
FUEL INJECTION SYSTEM
Theodor Mayr; Siegfried Buchta; Rudolf Kleeberger, and Otto Bauer, all of Munich, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Oct. 24, 1974, Ser. No. 517,640
Int. Cl.^{2} F02B *3/02*
U.S. Cl. 123—139 AW **5 Claims**

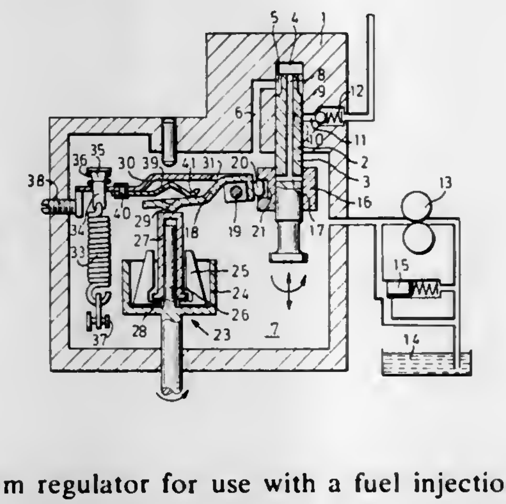


1. A fuel injection system for continuous fuel injection into the induction tube of a mixture compressing, internal combustion engine, comprising:

a. a fuel source;
b. a fuel pump connected to the fuel source;
c. a constant pressure regulator, said regulator being connected to said fuel pump and receiving therefrom a supply of fuel;
d. a fuel metering and distribution valve assembly, including:
  i. a housing, provided with a bore and plurality of fuel channels; and
  ii. a control slide, said control slide being mounted for displacement within said bore and extending through said housing for externally actuated displacement for the purpose of controlling the effective apertures of said plurality of fuel channels, the assembly being connected to said regulator and receiving therefrom a supply of fuel; and

e. a plurality of fuel injection valves, each being connected to a respective one of said plurality of fuel channels and each being supplied with fuel by said fuel metering and distribution valve assembly through its respective fuel channel, each of said valves including:
  i. a housing;
  ii. a valve seat located within said housing;
  iii. a valve closing member cooperating with said valve seat;
  iv. a diaphragm, fastened within said housing so that a portion thereof is movable in said housing, with said portion being attached to said valve closing member; and
  v. a spring, located within said housing, whereby said spring exerts its force against said diaphragm in a direction such that said valve closing member tends to obturate said valve seat, whereby the fuel is admitted to the side of said diaphragm facing said valve seat and exerts a pressure which tends to open said valve seat, and the rigidity of said spring is such that the effect of said spring on the pressure drop across the respective fuel channel aperture is negligible.

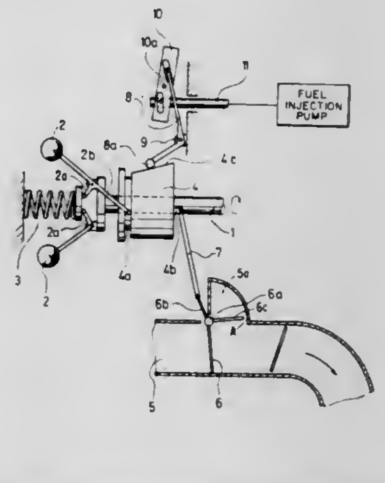
3,970,064
RPM REGULATOR FOR FUEL INJECTION PUMPS
Franz Eheim, Stuttgart; Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg, and Helmut Laufer, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Jan. 3, 1975, Ser. No. 538,374
Claims priority, application Germany, Jan. 23, 1974, 2403082; Oct. 19, 1974, 2449859
Int. Cl.^{2} F02M *39/00;* **F02D** *1/04*
U.S. Cl. 123—139 ST **12 Claims**



1. In an rpm regulator for use with a fuel injection pump associated with an internal combustion engine, said regulator including a housing, an intermediate lever, a pivot shaft which pivotably mounts the intermediate lever to the housing, a stop mounted to the housing, a main control spring, means mounting one end of the main control spring to the housing, said mounting means including means for arbitrarily changing the force exerted by the main control spring, a further spring mounted in series with the main control spring and being deformable up to the stop, and an rpm governor mounted to the housing which engages the intermediate lever and exerts an rpm dependent force in opposition to the forces of the main control spring and the further spring, the improvement comprising:

a. a single-arm drag lever mounted at one end for pivotal movement to the pivot shaft of the intermediate lever and in engagement at its other end with the main control spring, the further spring and the stop, said drag lever cooperating in its movement with the intermediate lever; and
b. a compression spring mounted between the intermediate lever and said drag lever, the stroke of said compression spring being limited in both directions of force application by stops defined by the intermediate lever and said drag lever, respectively, said compression spring being embodied as a temperature dependent leaf spring having a pre-load which is greater in cold conditions and an opening formed in its middle region which produces a reduced cross section in this region.

3,970,065
FUEL INJECTION PUMP CONTROL SYSTEM
Nobuhiro Kaibara, and Kazuro Nishizawa, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed June 28, 1974, Ser. No. 484,151
Claims priority, application Japan, June 29, 1973, 48-72772
Int. Cl.^{2} F02D *1/04;* **F02X** *1/06*
U.S. Cl. 123—140 CC **3 Claims**



1. In a fuel injection pump assembly, especially one for use in spark-plug ignited internal combustion engines, including

a control rod, for regulating the amount of fuel metered out to the engine;

a centrifugal force governor whose rotational speed depends on the r.p.m. of the engine; and

a cam element, wherein the centrifugal force governor influences the orientation of the cam element and wherein the orientation of the cam element is transmitted mechanically to said control rod to influence the position thereof, the improvement comprising:

a. an air measuring member located within the induction tube of the engine;
b. first mechanical linkage means connecting said air measuring member to said cam element; and
c. second mechanical linkage means connecting said cam element to said centrifugal force governor, wherein said cam element is embodied as a three-dimensional cam capable of motion in at least two degrees of freedom, whereby said three-dimensional cam is displaced in one direction, preferably the axial direction, by said centrifugal force governor via said first mechanical linkage means and is displaced in another direction, preferably in rotation about its own axis, by said air measuring member acting via said second mechanical linkage means to said three-dimensional cam.

3,970,066
RPM REGULATOR FOR FUEL INJECTION PUMPS
Edgar Schmitt, Moglingen, and Karl Konrath, Ludwigsburg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Sept. 24, 1974, Ser. No. 508,891
Claims priority, application Germany, Oct. 3, 1973, 2349655
Int. Cl.^{2} F02D *1/04*
U.S. Cl. 123—140 A **5 Claims**

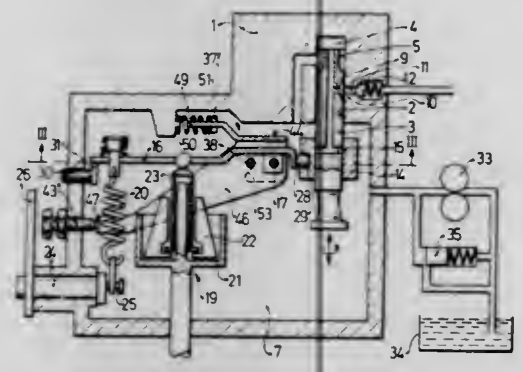
1. In an rpm regulator for use with a fuel injection pump associated with an internal combustion engine, said regulator having a housing, an intermediate lever, a regulating spring connected to the intermediate lever, and a device for generating an rpm signal and applying a corresponding force to the

intermediate lever in opposition to a force exerted by the regulating spring, the improvement comprising:

a. a two-armed control lever;

b. a shaft pivotably mounting the intermediate lever to the control lever;

c. a further shaft pivotably mounting the control lever to the housing;

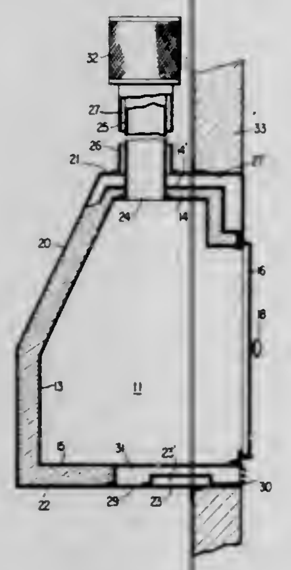


d. an adjustable stop mounted to the housing; and

e. spring means mounted to the housing and engageable with the control lever for biasing the control lever against the adjustable stop, wherein one arm of said control lever engages said adjustable stop and the other arm engages said spring means.

3,970,067
FIREPLACE ASSEMBLY FOR MOBILE HOMES

Charles O. Vaughn, P.O. Box 2, Dayton, Tenn. 37321
Filed Jan. 31, 1975, Ser. No. 545,980
Int. Cl.² F24B *1/18*
U.S. Cl. 126—120 7 Claims



1. A fireplace assembly particularly suited for use with a mobile home or the like, which fireplace assembly comprises in combination:

A. a firebox housing secured to an exterior wall and communicating with the interior of the mobile home;

B. a chimney communicating with the interior of the firebox housing for conducting away the products of combustion formed therein to the exterior of the mobile home;

C. a continuous annular spacing formed in the walls of said firebox housing and said chimney;

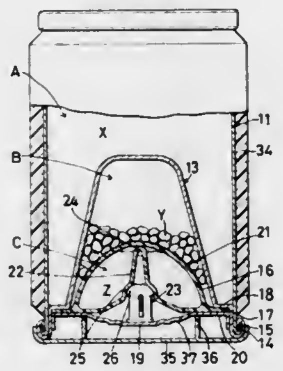
D. a combustion air intake means connected to said firebox housing for conducting exterior air directly into the interior of a mobile home said combustion air intake means including a first conduit formed within the lower portion of the firebox housing;

E. a cooling air intake means connected to said firebox housing for conducting exterior air into said annular spacing for cooling the firebox housing and chimney said cooling air intake means including a second conduit formed within said first conduit, and thereby inhibiting thermosyphonic aspiration;

F. a closure means for controlling the passage of combustion air from the interior of the mobile home to the interior of the firebox housing.

3,970,068
HEAT EXCHANGE PACKAGE FOR FOOD

Shotaro Sato, No. 3, 1-chome, Nakatsu-Hamadori, Oyodo, Osaka, Osaka, Japan
Continuation of Ser. No. 453,897, March 22, 1974, abandoned. This application May 15, 1975, Ser. No. 577,580
Claims priority, application Japan, May 29, 1973, 48-60499
Int. Cl.² F24J *1/00;* B65B *25/22*
U.S. Cl. 126—263 2 Claims



1. A foodstuff container comprising, in combination:

a. an enclosed container housing having a bottom, a removable top, a first inner partition of one-piece construction comprising an essentially spherical top portion and a bottom portion provided with an upwardly projecting portion extending to adjacent said essentially spherical top portion, said upwardly projecting portion defining an essentially cylindrical container, a radial shoulder on said upwardly projecting portion defining a radial recess in said essentially cylindrical container, and a second inner partition of inverted U-shape disposed between said first inner partition and said removable top;

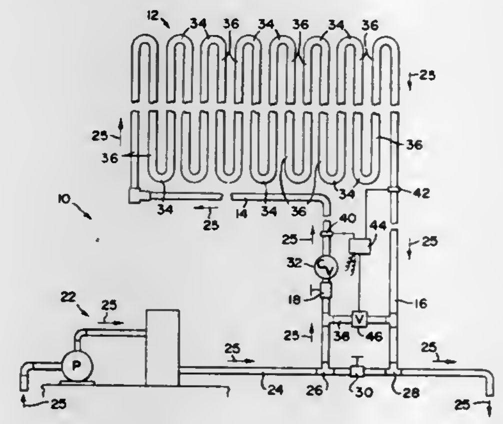
b. a first closed compartment in said container housing defined by said essentially spherical top portion and said bottom portion of said first inner partition and containing therein a reaction-inducing agent, a second closed compartment in said container housing defined by said first and second inner partitions containing therein a reaction agent;

c. a third closed compartment in said container housing defined by said removable top and said second inner partition for containing therein food or beverages, the mixing of said reaction-inducing agent and said reaction agent producing a thermal heating reaction; and

d. manually operable piercing means comprising an elongated needle-member comprising an upper needle, a base portion having two arc-shaped saws projecting laterally outward on opposite sides therefrom and an oval projection portion connecting said upper needle to said base portion with said saws joining said oval projection portion at right angles to the axis of the elongated needle-member, said oval projection portion being positioned within said radial recess in said cylindrical container for firmly holding said needle-member in said cylindrical container and outside said first compartment, said elongated needle-member extending upwardly from said base portion adjacent said housing bottom to said upper needle within said cylindrical container thereby coupling said needle-member to said cylindrical container, said housing bottom being provided with pleats for imparting elasticity to said housing bottom and said first inner partition being easily breakable by said needle-member, said housing bottom being manually movable upwardly together with said needle-member to permit said upper needle to pierce said upwardly projecting portion and said spherical top portion of said first inner partition thereby producing a mixing of the two agents in said first and second compartments for producing a desired thermal reaction so as to heat the food or beverages in said third compartment.

3,970,069
SOLAR HEATER/COOLER ASSEMBLY

John Pickett, 1232 Zacchini Ave., Sarasota, Fla. 33577
Filed Feb. 24, 1975, Ser. No. 552,286
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 4 Claims



1. A swimming pool solar heater/cooler primarily designed for use with a swimming pool pump/filter system comprising heat exchanger means, inlet conduit means in fluid transmitting communication with said heat exchanger means, outlet conduit means in fluid transmitting communication with said heat exchanger means, first valve means in flow termination contact with said inlet conduit means, check valve means in said inlet conduit means, first T-connector means in fluid driving communication with the flow line of the pool pump/filter system and said inlet conduit means, second T-connector means in fluid dividing communication with the flow line of the pool pump/filter system and said outlet conduit means and located downstream from said first T-connector means, second valve means in flow terminating relation with the flow line from the pool pump/filter system and located substantially between said first T-connector and said second T-connector, said heat exchanger means further comprising substantially hollow linear tube means, substantially hollow, generally U-shaped tube means fluidly connecting said linear tube means to form coils of said heat exchanger means, said heat exchanger means further comprises substantially solar radiation resistant heat absorbing plastic tube means, temperature difference sensing means located in temperature sensing communication with said inlet and outlet conduit means, cross connect conduit means substantially in fluid communication between said inlet and outlet conduit means, automatic valve means located substantially in said cross connect conduit means and in responsive communication with said temperature difference sensing means.

3,970,070
SOLAR HEATING SYSTEM

Stanley A. Meyer, 2931 Bryden Road, and Stephen R. Gray, 2772 Allegheny Ave., both of Columbus, Ohio 43209
Filed Sept. 3, 1975, Ser. No. 610,051
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 10 Claims

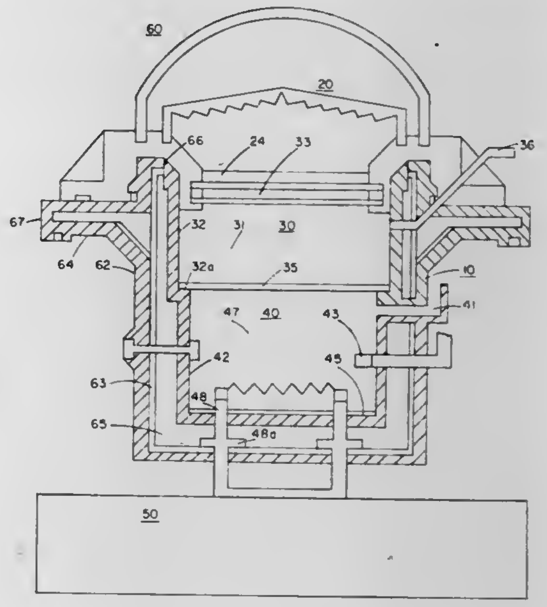
1. A solar heater comprising in combination:

an enclosure,

a collector lens positioned in the uppermost region of said enclosure, said collector lens comprising an array of light guide lenses of alternate high refractive material and low refractive material and a focusing lens;

a storage section positioned in the lowermost region of said enclosure comprised of material having a high rate of absorption to solar radiant energy to thereby convert said solar radiant energy to thermal radiant energy;

an insulating area positioned within said enclosure intermediate of said lens and said storage area, said insulating area further comprising a container with a liquid solution



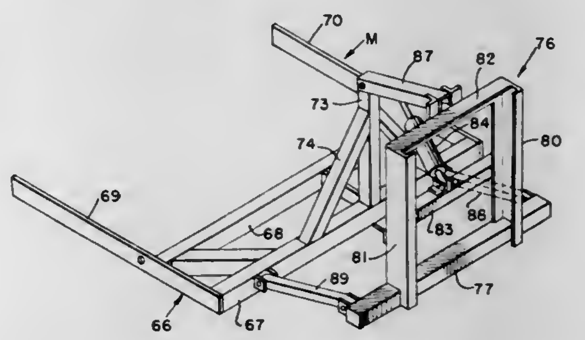
therein that is transparent to solar radiation and an isothermal convection barrier; and

said enclosure further comprising a liquid and air seal to said lens, insulating area, and storage section; and

utilization means for utilizing said thermal energy in said storage section.

3,970,071
SURFACE HEATER AND DRYER

Russell A. Miller, 1412 W. Woodside Drive, Dunlap, Ill. 61525, and Earl R. Schmidgall, 702 N. Cherry Lane, Peoria, Ill. 61604
Filed Nov. 14, 1974, Ser. No. 523,830
Int. Cl.² E01C *11/24;* E01H *5/10*
U.S. Cl. 126—271.1 30 Claims



30. A surface heater and dryer, comprising: a housing having an upper, air intake portion; an air heating portion connected to the air intake portion to receive air therefrom; and a lower, air discharge shroud portion, blower means mounted in the air intake portion for drawing atmospheric air into the housing and discharging it into the air heating portion; burner means mounted in the air heating portion for heating the air forced therethrough; air bypass vane means in the housing adjacent the burner and located to be in operative relationship relative to that burner, such that when the vane means is closed, the air from the blower is forced through the burner, and when the vane means is open, a portion of the air is caused to flow in bypassing relationship to the burner; fuel vaporizer tubes connected to and between a source of liquid fuel and the burner and disposed between the burner and air discharge shroud portion, such that liquid fuel flowing through the vaporizer tubes is vaporized by the heat from the burner prior to the fuel being fed to the burner to thus increase the temperature output of the burner; movable vapor control means operatively associated with the vaporizer tubes and having a plural-

ity of positions to control the passage of heated air over the tubes, whereby in one position thereof the amount of fuel vaporized is reduced, and in another position thereof the amount of vaporization of the fuel is increased; and said shroud portion including a forwardly extending portion beneath the air intake portion and having a forwardly facing air discharge opening and an open bottom, such that air heated by the burner is discharged both in a forward direction and in a downward direction against the surface to be heated and dried.

3,970,072

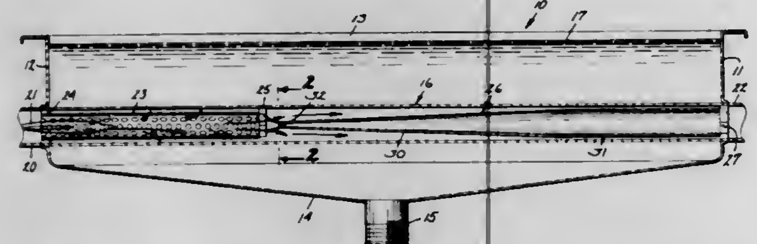
HEATING MEANS FOR COMESTIBLE KETTLE

Frank D. Chipchase, West Milford, N.J., assignor to International Multifoods Corporation, Minneapolis, Minn.

Filed Oct. 2, 1974, Ser. No. 511,226

Int. Cl.² A47J *27/026*

U.S. Cl. 126—391 **9 Claims**



1. In a fire-tube type of heater, for a comestible kettle, comprising an outer tube in heat exchange relation with cooking fluid to be heated, a flue connection to said outward tube thereof, and burner means directing a flame into said outer tube at the other end thereof, the improvement which comprises:

- an inner shroud tube of perforated metal mounted within and spaced from said outer tube at the burner end thereof so that said flame is directed into said shroud tube, whereby some flame passes outward through the perforations to heat said outer tube directly, and some flame remains within said shroud tube to heat said shroud tube until it acts as a radiant heat source within said outer tube;
- and an inner baffle tube mounted coaxially at the flue end of said outer tube to displace hot gases from said shroud tube toward the inner surface of said outer tube.

3,970,073

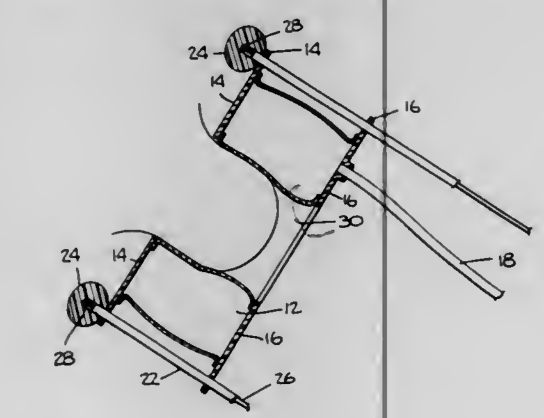
POSITIONING DEVICE FOR RADIATION TREATMENT OF CERVICAL CARCINOMA

Franklin R. Greene, Flushing, N.Y., assignor to Howlin Enterprises, Inc., Old Westbury, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,694

Int. Cl.² A61N *5/00*

U.S. Cl. 128—1.2 **4 Claims**



1. Apparatus for radio-active treatment of cervical tumors comprising:

- a flexible, collapsible, cylindrical toroidal chamber having an aperture therethrough adapted to be positioned around the cervix, said toroidal chamber having top and bottom surfaces,
- top and bottom flanges extending radially outward respectively, from said top and bottom surfaces of said chamber,
- each of said flanges having a plurality of openings, each opening in said top flange being aligned with a corresponding opening in said bottom flange,
- an inlet tube in communication with the interior of said toroidal chamber and adapted to extend to the outside of the body and to permit flow of radio-opaque fluid into and out of said toroidal chamber, flow of fluid into said chamber when said chamber is collapsed causing said chamber to expand and flow of fluid out of said chamber when said chamber is expanded permitting collapse of said chamber,
- each pair of aligned openings of said flanges being adapted, when said toroidal chamber is filled, to hold a support stem of an ovoid and to position said ovoid relative to the cervix.

3,970,074

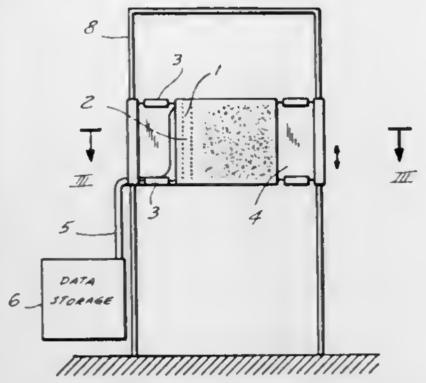
METHOD OF AND APPARATUS FOR MAKING MEDICAL THERMOGRAPHS

Ion Mogos; Cornel Ionescu; Dionisie Angelescu; Nicolae Dumitrescu; Millo Andreescu; Constantin Neascu; Mircea Bruzici; Mihai Birzanescu; Alexandru Puie, and Gheorghe Vasilica, all of Bucharest, Romania, assignors to Spitalul Clinic Filantropia Bucuresti, Bucharest, Romania

Filed Aug. 22, 1974, Ser. No. 499,408

Int. Cl.² A61B *5/00*; G01K *7/24*

U.S. Cl. 128—2 H **6 Claims**



1. A method of thermographically monitoring the body of a human subject comprising the steps of displacing over the skin of the subject an array of thermistors and generating outputs representing the temperature at the body sites adjacent said thermistors; measuring said outputs with a digital voltmeter; numerically recording the temperatures as determined by said digital voltmeter as a function of the position of the respective thermistor on the subject upon a common sheet; and connecting equal temperature recordals on said sheet to form isotherms mapping the monitored portion of the body of the subject.

3,970,075

SURGICAL RETRACTOR ANCHOR APPARATUS

Frank J. Sindelar, 8 Kimball Road, and Howard J. Greenfield, 32 Yates Blvd., both of Poughkeepsie, N.Y. 12601

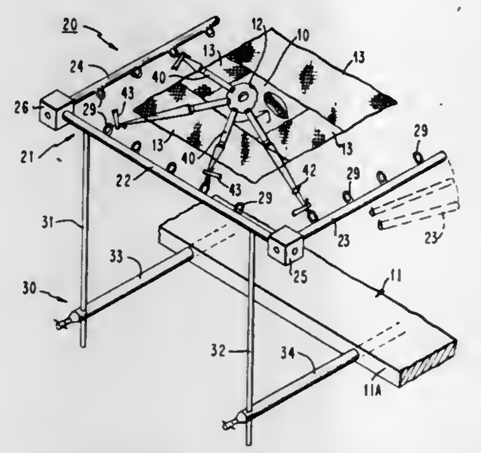
Filed Sept. 30, 1974, Ser. No. 510,218

Int. Cl.² A61B *17/02*

U.S. Cl. 128—20 **10 Claims**

1. Apparatus for fixing retractors in an adjustably predetermined position relative to an operating table, said apparatus comprising:

- an anchor frame including a base member having at least one extension member projecting substantially perpendicular to said base member, a plurality of spaced apart, inwardly projecting anchor rings serially arranged along said anchor frame;
- a support frame comprising upstanding post members connected to and supporting said base member of said anchor frame;
- leg means, an adjustment means for adjustably connecting said leg means to said post members, and means for adjustably connecting said leg means to an operating table; said adjustment means operable to clamp said post members and thus said anchor frame at a preselected height;
- at least one resilient band adapted for connection of a retractor thereto; and,
- means for connecting said at least one resilient band to one of said anchor rings.



3,970,076

APPARATUS FOR HEART STIMULATION

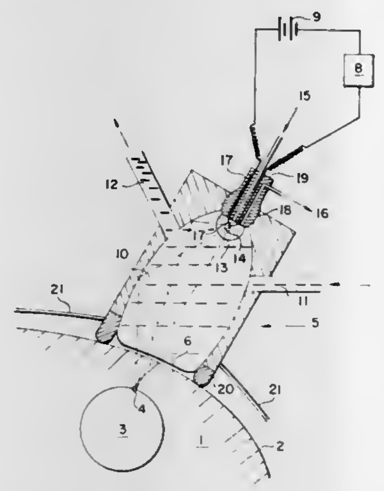
Wolfgang Hepp, Immenstaad, and Alexander Wirtzfeld, Thanning, both of Germany, assignors to Dornier System GmbH, Germany

Filed Feb. 4, 1975, Ser. No. 546,907

Claims priority, application Germany, Apr. 18, 1974, 2418631

Int. Cl.² A61H *29/00*

U.S. Cl. 128—24.5 **12 Claims**



1. A heart stimulator adapted to be used outside the body comprising pressure wave generating means and coupling means adapted to be placed on the surface of the body in the area of the heart without an air gap.

3,970,077

SUPPORT FOR PATIENTS IN BEDS OR CHAIRS

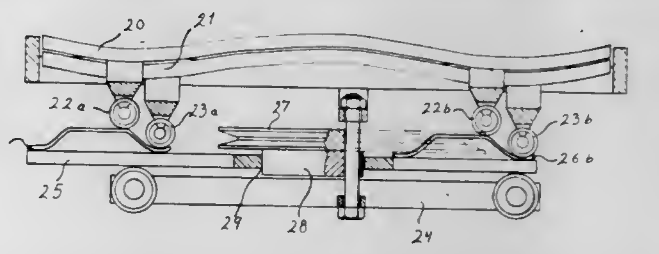
Flemming Dahl, 70 Borgervaenget, 2100 Copenhagen, Denmark

Filed Mar. 6, 1975, Ser. No. 555,730

Int. Cl.² A61H *1/00*

U.S. Cl. 128—33 **9 Claims**

1. A mechanical support for a bed or chair for eliminating bed sores, comprising at least two sets of vertically displaceable support members having rigid upper surfaces defining a contour of a human body, a separate cam follower attached to each set of support members for simultaneously vertically displacing all the support members of the set of support members attached thereto, a cam contacting each cam follower and movable with respect to each cam follower, said cam having raised surfaces concurrently contacting said cam followers attached to at least two of said sets of support members and having lower surfaces non-currently contacting said cam followers, and a motor connected to said cam for moving said cam with respect to said cam followers, said cam followers thereby raising said sets of support members to an upper position wherein they reside concurrently and lowering said sets of support members separately.



3,970,078

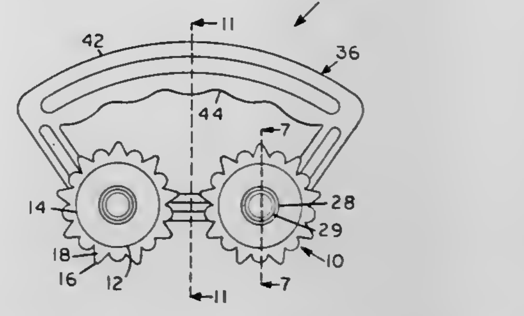
HAND ROLLER MASSAGE DEVICE

Charles G. Rogers, Jr., 5201 Roosevelt St., Hollywood, Fla. 33021

Filed Mar. 10, 1975, Ser. No. 556,725

Int. Cl.² A61H *15/00*

U.S. Cl. 128—57 **11 Claims**



1. A massage roller means (10) comprising a wheel-like roller member (10) having a somewhat broad peripheral rim (12), said rim (12) having alternate spaced-apart transverse projecting ridges (16) curved in peripheral cross-section, and intermediate rectangular base pyramid shaped ridges (18) extending outwardly therebetween, in combination with a handle frame (36) having a journal means (30, 32) on which said massage roller means (10) is journaled, said pyramid ridges (18) having their peaks (20) extending beyond a plane tangent to the two adjacent curved ridges (16).

3,970,079

BODY SUPPORT BINDER AND METHOD OF FABRICATING SAME

John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Mar. 21, 1975, Ser. No. 560,641

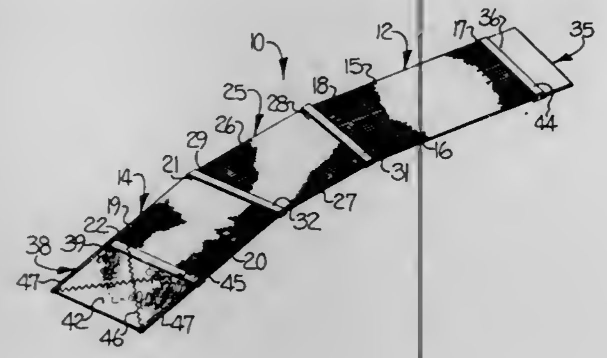
Int. Cl.² A61F *5/02*

U.S. Cl. 128—78 **16 Claims**

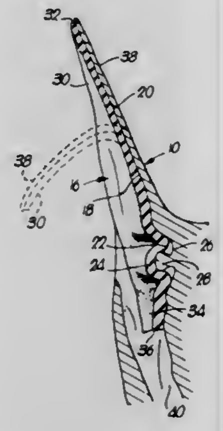
1. An elongate body support binder adapted to encircle and reinforce a portion of the body of a wearer and characterized by the ability to resist rolling of the longitudinal side edges when in use without employing separate stiffeners or the like, said binder comprising

- a plurality of fabric panels arranged serially in adjacent end to end relationship and with the adjacent ends of the adjacent panels in substantially abutting, non-overlapping relationship to define an elongate binder having sufficient length to encircle a body member of a wearer, means joining the adjacent ends of the adjacent panels and comprising a strip of plastic material extending along the length of the adjacent ends, said strip having an H-shaped cross-sectional configuration to define oppositely facing channels and with said adjacent ends being received within said channels, said strip further having sufficient resistance to lateral bending to effectively prevent rolling of the longitudinal side edges of the panels when the binder is positioned about the body member of a wearer, and

fastening means carried by the panels for releasably interconnecting the distal ends of the binder.



3,970,080
ANIMAL EAR SUPPORT DEVICE
Billy H. White, 2220 Garden St., Titusville, Fla. 32780
Filed Mar. 17, 1975, Ser. No. 559,033
Int. Cl.^{2} A61F *13/00*
U.S. Cl. 128—82 **8 Claims**



1. An animal ear support comprising a pliable, self-supporting, generally concavo-convex body conforming substantially to the interior surface of the animal ear with which the support is to be used, and means for removably attaching said body to the ear against said interior surface, said body including an outer flap portion adapted to bend with the ear and an inner stem portion of increased rigor relative to the flap portion adapted to fit at least partially into the ear canal to promote retention of the ear and flap portion in an erect condition.

3,970,081
TENNIS ELBOW BRACE
Leslie T. Applegate, Jr., Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio
Filed Jan. 28, 1974, Ser. No. 437,207
Int. Cl.^{2} A61F *5/24*
U.S. Cl. 128—95 **8 Claims**

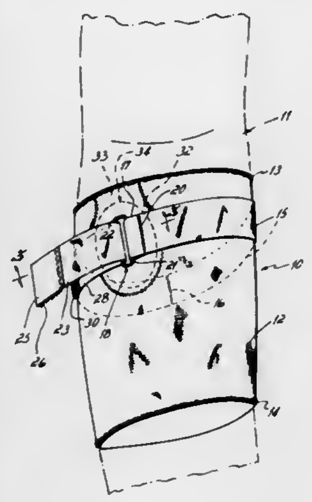
1. Elbow brace means for alleviating the discomfort of tennis elbow comprising:

a flexible elastic tubular sleeve for encircling the wearer's arm near the elbow, said tubular sleeve being of a size to be circumferentially stretched when disposed over the wearer's arm and having two edges;

a resilient pad of geometric configuration mounted upon said sleeve, the maximum transverse dimension of said pad being substantially less than the circumference of and the length of said sleeve;

a strap secured to the outside surface of said sleeve, said strap completely encircling said sleeve adjacent to, but spaced inwardly from, one of said edges;

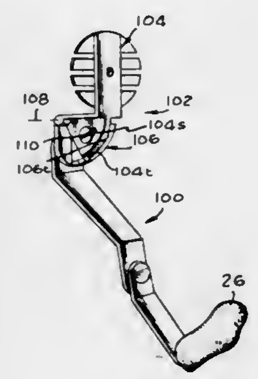
means for securing the free end of said strap in position about said sleeve, whereby said strap is in tension;



said strap overlying said pad and being centered relative thereto, said strap being effective to exert an inwardly directed pressure upon said pad;

said pad being effective to exert a concentrated pressure upon the wearer's arm extending over an area not greater than the maximum transverse dimension of said pad, and being effective, when worn below the wearer's elbow, to change the direction of pull on the common extensor or common flexor origins.

3,970,082
HARD HAT EAR PROTECTOR
Howard S. Leight, 16027 Northfield St., Pacific Palisades, Calif. 90272
Continuation-in-part of Ser. No. 346,747, April 2, 1973, Pat. No. 3,841,326. This application Sept. 3, 1974, Ser. No. 502,308
The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.
Int. Cl.^{2} A61F *11/00*
U.S. Cl. 128—152 **2 Claims**



1. Protective apparatus for mounting on a protective helmet that has a rim comprising:

a mount which is mountable on a protective helmet;

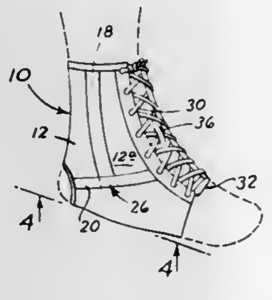
link means having a first end pivotally connected to the mount and a second end;

an earplug; and

means for mounting said earplug on said second end of said link means;

said mount including a first member having means for fixing it to a helmet and a second member which is pivotally connected to said link means, said first and second members being pivotally joined to permit pivoting about a predetermined axis, and said first and second members having teeth spaced about said axis with at least one tooth on each member engaged with a tooth on another member, to maintain said members at any one of a plurality of relative angular orientations.

3,970,083
ANKLE SUPPORT
Gordon R. Carrigan, Rte. 1, Box 608, West Linn, Oreg. 97068
Filed Sept. 11, 1974, Ser. No. 504,899
Int. Cl.^{2} A61F *13/06*
U.S. Cl. 128—166 **8 Claims**



1. An ankle support in operative condition comprising

a pliable jacket removably fitted about a person's foot and ankle, including a pair of side expanses which extend over opposite sides of the ankle,

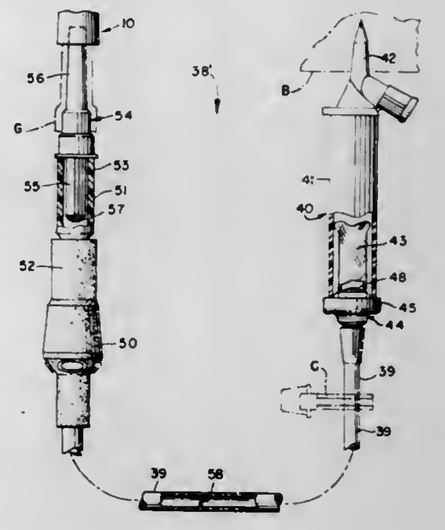
a first elongated stiffening strip joined to the outside of and stiffening one elongated region in that expanse which extends over the lateral side of the ankle, said first stiffening strip extending over the Lateral Malleolus in the ankle, along a course substantially paralleling natural ligaments in the ankle, and

a second elongated stiffening strip joined to the outside of and stiffening another elongated region of the same expanse, said second stiffening strip having one end overlapping said first stiffening strip at a point therealong which is adjacent the Lateral Malleolus, and extending upwardly away from its said one end along a course substantially paralleling other natural ligaments in the ankle,

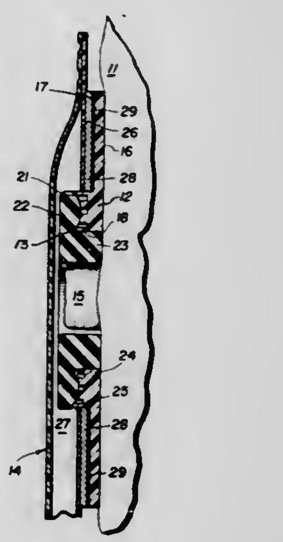
said first and second stiffening strips being arranged in a generally T-shaped configuration on said expanse of said jacket.

3,970,084
INTRAVENOUS INJECTION APPARATUS AND NEEDLE ADAPTER WITH FILTER AND METHOD OF MAKING SAME
Kenneth Raines, and George K. Burke, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.
Continuation-in-part of Ser. No. 299,268, Oct. 20, 1972, abandoned. This application Dec. 11, 1973, Ser. No. 423,682
Int. Cl.^{2} A61M *5/16*
U.S. Cl. 128—214 C **8 Claims**

1. An intravenous injection assembly, comprising: a length of IV tubing having source attachment means at one end thereof for attachment to a source of liquid; said source attachment means including a drip chamber; a first filter in the assembly for filtering contaminants from the liquid flowing from a source of liquid; a needle attachment means at the other end of said IV tubing including a needle adapter and filter assembly having a tubing connector connected to said IV tubing other end, a hollow filter tube connected to said tubing connector, and a needle adapter having a second filter secured thereto and removably connected to said filter tube so that said second filter is received within the hollow filter tube to be positioned between said IV tubing and a needle attached to the assembly by said needle adapter so that liquid flowing from said IV tubing into said needle flows through said second filter thereby, said first filter being located upstream of said second filter and cooperating therewith to maintain flow through the assembly substantially at a predetermined constant flow rate therethrough and into said needle.



3,970,085
OSTOMY APPLIANCES AND SEALING ELEMENTS
Elayne R. Mersan, Minocqua, Wis., assignor to Marsan Manufacturing Company, Inc., Wausau, Wis.
Filed Nov. 29, 1974, Ser. No. 528,348
Int. Cl.^{2} A61F *5/44*
U.S. Cl. 128—283 **10 Claims**



1. In appliances for post-surgical collection of discharges from the stoma of a patient, an improvement is a combination of sealing elements, said improvement comprising:

a base gasket element having an operative front surface and a flat back surface and including,

a centrally disposed aperture,

a tubular flange annularly disposed about said aperture and extending outwardly substantially normally from said gasket front surface, said tubular flange having a radially outwardly extending front wall,

at least one depression in said tubular flange front wall; and

a pliable washer element, said washer element including,

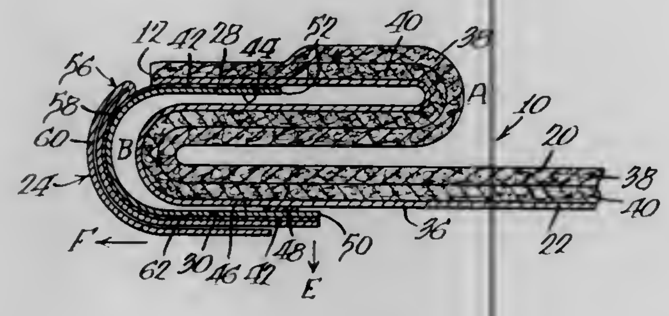
a radially outwardly-extending annular ring element, and,

a centrally-disposed stoma-accommodating tubular flange extending outwardly substantially normally from said ring element and having a substantially flat face adapted to contact with and seal against the skin of a patient around the stoma,

said washer element ring and flange being so dimensioned that said washer flange is registerable within said gasket flange and at least a portion of said washer ring is pliably engageable within said annular depression of said gasket tubular flange front wall when said washer flange is registered within said gasket tubular flange.

3,970,086
DISPOSABLE DIAPER HAVING TAB FASTENING MEANS WITH ONE END THEREOF RELEASABLY ADHERED TO DIAPER

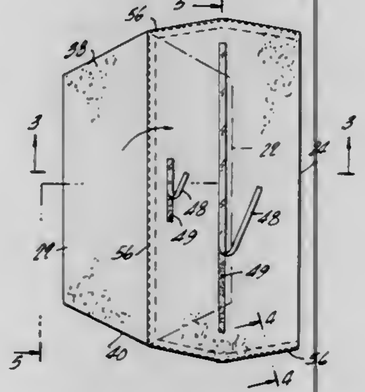
Ernest Cheslow, Glencoe, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed May 7, 1975, Ser. No. 575,281
Int. Cl.^{2} A61F *13/16*
U.S. Cl. 128—287 **8 Claims**



1. A disposable diaper which comprises a moisture-impermeable backing sheet forming a diaper outside surface for direction away from an infant when the diaper is worn by that infant, a moisture-retaining layer adhered to the backing sheet and having a facing which forms a diaper inside surface for direction toward the infant, tab fastener means having a fixed end permanently secured to said diaper backing sheet and a working end folded back against said diaper backing sheet and provided with a pressure-sensitive adhesive presenting a tacky surface facing in the same direction as the diaper inside surface, a cover strip means releasably adhered to said tacky surface, and an adhesive spot between the diaper backing sheet and the face of the working end opposite said tacky surface which adhesive spot abuts said diaper outside surface, whereby said working end of said tab fastener means is releasably adhered to said diaper backing sheet on the diaper outside surface.

3,970,087
HYGIENIC NAPKIN

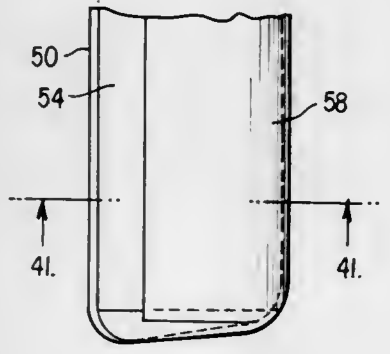
Rosa Maria Castaneda, Jardin Balbuena, Mexico, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Dec. 30, 1974, Ser. No. 537,158
Int. Cl.^{2} A61F *13/6*
U.S. Cl. 128—290 H **5 Claims**



1. An hygienic napkin comprising an envelope of liquid penetrable non-woven, hydrophobic material or woven fabric, said envelope having opposed longitudinal and lateral edges and including a front portion, a back portion and a flap portion integral with the front portion and foldable to overlie said back portion, a sheet of liquid impervious waterproof material between said front and back portions, means securing said back portion to said front portion along a first opposed lateral edge portion, and wherein said front and back portions are bent inwardly along a second opposed lateral edge portion to form abutting hem portions and means securing said hem portions together.

3,970,088
ELECTROSURGICAL DEVICES HAVING SESQUIPOLAR ELECTRODE STRUCTURES INCORPORATED THEREIN

Charles F. Morrison, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.
Division of Ser. No. 501,224, Aug. 28, 1974. This application Apr. 24, 1975, Ser. No. 571,110
Int. Cl.^{2} A61B *17/36;* A61N *3/06*
U.S. Cl. 128—303.14 **9 Claims**

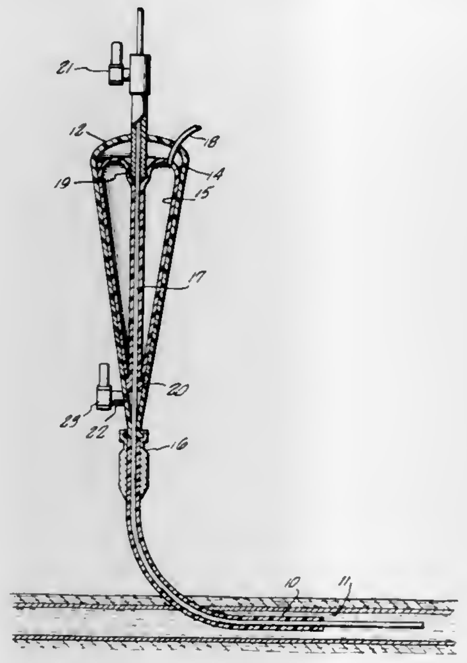


1. An electrosurgical device adapted to be connected to an electrical generator having active and return output terminals, said device being used to cut, coagulate or otherwise treat human tissue or the like, said device comprising:
- an insulative electrode support means;
- a first electrode adapted for connection to said active output terminal;
- a second electrode adapted for connection to said return output terminal, said first and second electrodes being rigidly supported a fixed distance apart by said electrode support means, both said first and second electrodes being adapted for electrical connection to said tissue;
- means for respectively connecting said first and second electrodes to said active and return output terminals; and
- means for maintaining a separation between said first electrode and said tissue whenever said second electrode is in contact with said tissue and said first and second electrodes are connected to their respective output terminals to insure that a current arc is established between said first electrode and the tissue.

3,970,089
CARDIOVASCULAR CATHETER SEAL DEVICE

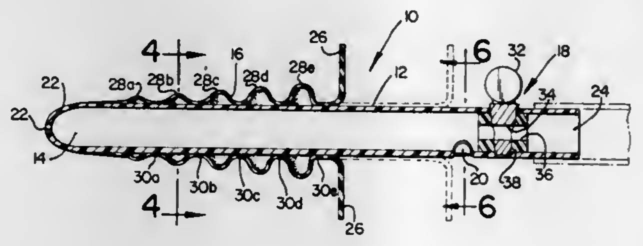
Dwayne D. Saice, 1800 Rose Glen Ave., San Pedro, Calif. 94931
Filed Aug. 5, 1974, Ser. No. 494,463
Int. Cl.^{2} A61M *25/00*
U.S. Cl. 128—348 **9 Claims**

1. A cardiovascular catheter seal device comprising:
- A hollow rigid body whose interior walls define a chamber open at its proximal and distal ends for the passage of a catheter therethrough;
- within said chamber, a thin-walled elastomeric member whose innermost surface defines a lumen in communication with said openings so as to receive and pass said catheter, said member being secured within said body so as to prevent passage of blood through the chamber exteriorly of said lumen during catheterization;
- means to adjustably distend the innermost surface of said member radially inwardly to constrict said lumen, sealing the interface between said surface and a catheter received in the lumen against the passage of blood therealong; and
- catheter sheath attachment means adjacent the proximal end of said device said attachment means being a luer fitting.



3,970,090
CATHETER

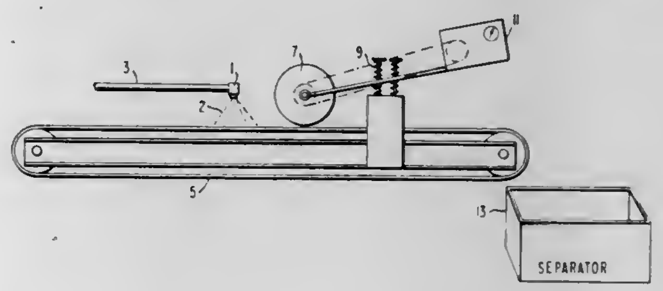
Vincent R. Loiacono, New London, Conn., assignor to Physio Medics, Inc., New London, Conn.
Filed Feb. 3, 1975, Ser. No. 546,393
Int. Cl.^{2} A61M *25/00*
U.S. Cl. 128—349 R **10 Claims**



1. A catheter comprising an axially elongated tubular inner part defining a single fluid drainage passageway having a fluid inlet opening at one end and a fluid outlet opening at the other end thereof, an axially elongated elastomeric outer tubular retention sleeve integrally connected to said tubular inner part at only said one end and extending in the direction of said other end in concentric surrounding relation to said tubular inner part, said retention sleeve having a normal retention configuration characterized by an undulated outer peripheral surface defined by an axial series of annular portions including alternately arranged radially enlarged annular portions and radially reduced annular portions for engaging the peripheral wall of an associated body passageway to releasably retain said catheter in preselected position within the body passageway, said radially reduced portions of said retention sleeve being in general annular engagement with the peripheral surface of said tubular inner part when said sleeve is in its retention configuration, said retention sleeve being stretchable in the direction of said other end to an insertion configuration to permit said catheter to be freely inserted into the body passageway and removed therefrom, said retention means having gripping means at its free end providing surfaces for manual gripping to stretch the retention sleeve axially of said inner tubular part and to its insertion configuration, valve means for closing the outlet end of said passageway to prevent passage of fluid therethrough, and fluid pressure relief means associated with said tubular inner part and disposed between said inlet end and said valve means for venting fluid from said fluid drainage passageway in response to a predetermined fluid pressure condition therein.

3,970,091
CRYOGENIC THRESHING OF TOBACCO

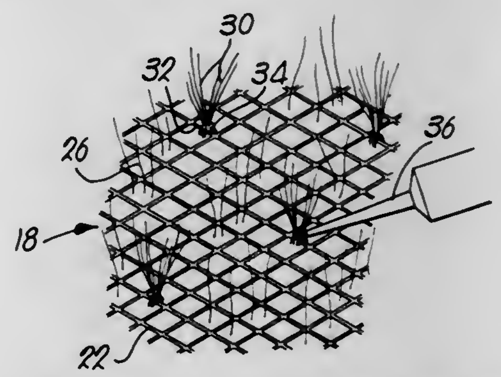
Jon F. Banks; Eugene F. Livesay, both of Louisville, Ky., and Reynold W. Martin, Union Beach, N.J., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Feb. 6, 1975, Ser. No. 547,458
Int. Cl.^{2} A24B *5/06*
U.S. Cl. 131—122 **14 Claims**



1. A process of removing tobacco stem and vein structures from tobacco leaves comprising:
- a. cooling said leaves to a temperature of between 0°C and about −210°C whereby said tobacco leaves are frozen;
- b. flexing said frozen leaves whereby tobacco lamina is broken free from said stem and vein structures; and
- c. separating said stem and vein structures from said lamina.

3,970,092
METHOD OF ATTACHING A HAIRPIECE

Charles W. Nelson, 3534 Main St., Kansas City, Mo. 64111
Continuation of Ser. No. 401,995, Oct. 1, 1973, abandoned. This application Jan. 14, 1975, Ser. No. 540,792
Int. Cl.^{2} A41G *3/00*
U.S. Cl. 132—5 **1 Claim**

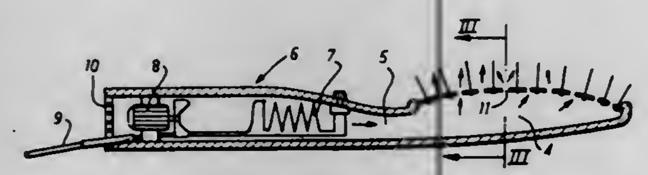


1. A method of attaching a hairpiece to the head of a recipient having at least some natural hair, said method comprising the steps of:
- providing a hairpiece having a base element in the form of an open hole netting to which strands of filaments or the like have been attached to present said hairpiece;
- positioning said hairpiece on the head of a recipient such that at least a portion of the recipient's natural hair underlies said base element when the hairpiece is in position;
- pulling the natural hair underlying said netting through the same for protrusion therethrough to extend above said element;
- selectively forming in a random pattern throughout the area of said element a series of groups of natural hair lengths comprised of a plurality of adjacent lengths thereof protruding through said netting;
- dividing each group of hair lengths into two distinct groups disposed on opposite sides of an adjacent stretch of said netting;
- joining together each pair of groups at a point above their respective adjacent stretch of netting;

- pulling and twisting together each pair of groups such that they are in direct engagement with the proximal netting stretch to snugly dispose the same against the recipient's head beneath the point at which the pair of groups are cojoined;
- locating and tying a knot in each cojoined pair of groups of hair lengths adjacent the proximal netting stretch, after the latter have been pulled and twisted together, such that the portions of hair lengths extending above each knot present free lengths and said hairpiece is firmly secured to the head of said recipient;
- applying a flowable adhesive substance to each knot; and
- blending the free lengths of said cojoined groups of natural hair lengths and the remaining natural hair lengths protruding through said netting with the filaments of said hairpiece.

3,970,093
APPARATUS FOR TREATMENT AND CARE OF THE HAIR

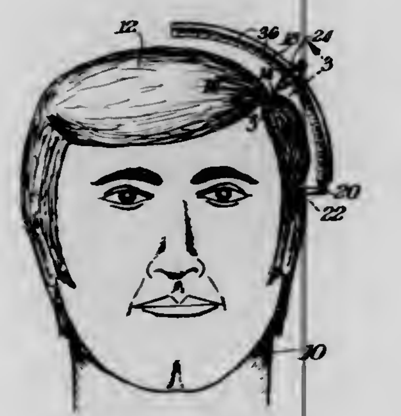
Robert A. Lardenois, Neuilly-sur-Seine, France, assignor to Etablissements Lardenois, Hermes, France
Filed Feb. 5, 1975, Ser. No. 547,211
Claims priority, application France, Feb. 25, 1974, 74.06273
Int. Cl.² A45D *20/00*
U.S. Cl. 132—9 **3 Claims**



1. A hair treating device comprising a housing, heating means disposed within said housing, an air-cushion type brush mounted upon said housing, said air-cushion type brush having a convex piece made of an elastically deformable material supporting a plurality of external teeth made of heat-conducting material, hole means mounted upon said housing and means for directing heated air from said housing through said hole means towards said teeth of the air cushion type brush.

3,970,094
HAIR TREATMENT APPARATUS

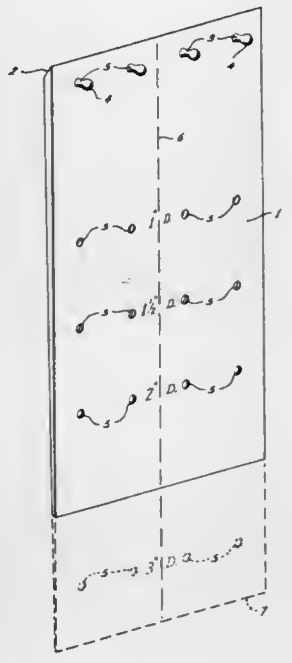
John P. Wright, R.D. No. 1 Lot D-16, Port Deposit, Md. 21904
Filed Mar. 27, 1975, Ser. No. 562,654
Int. Cl.² A45D *1/00*
U.S. Cl. 132—9 **8 Claims**



1. An apparatus for use in the treatment of hair comprising a retaining arcuate element spanning at least a portion of the human head and having slidably mounted thereon a device for treating said hair; positioned at one end of said arcuate element a positioning bracket adapted to rest on the top of an ear to align said hair-treating device in a desired position; and slidably positioned on said arcuate element a means for holding in a fixed position said hair-treating device.

3,970,095
DISPOSABLE HAIR ROLLER

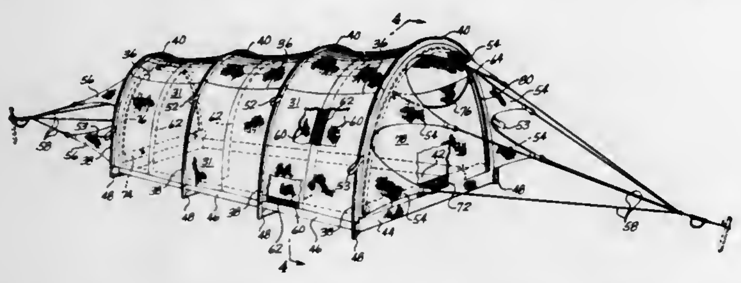
Zodell W. Prince, 8000 Bellaire Blvd., Houston, Tex. 77036; Dallas D. Weatherholt, 13207 Buxley, Houston, Tex. 77045, and Adelene Trombatore Reistino, 1002 San Jose, Hearne, Tex. 77859
Filed Mar. 10, 1975, Ser. No. 556,957
Int. Cl.² A45D *2/02*
U.S. Cl. 132—39 **3 Claims**



1. In a hair roller, a sheet of pliable material, the thickness of said sheet being gradually reduced longitudinally, buttons integral with the pliable material projecting laterally from a point adjacent one end, rows of button receiving openings spaced in vertical alignment in said material, each row being adapted to selectively receive said buttons and maintain said material in a cylindrical shape.

3,970,096
TENT

William S. Nicolai, 3314 Wallingford Ave. N., Seattle, Wash. 98103
Filed Mar. 10, 1975, Ser. No. 556,776
Int. Cl.² A45F *1/10, 1/12, 1/16*
U.S. Cl. 135—14 V **11 Claims**

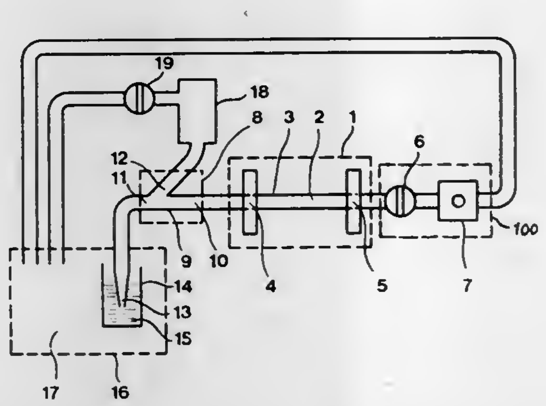


1. A tent comprising a plurality of spaced, arched rafters disposed in substantially, parallel, spaced relation to each other and symmetrically disposed about a common longitudinal axis; an outer, nonporous tent layer supported by said rafters and forming a substantially semicylindrical outer tent layer; a porous inner tent layer; means suspendedly supporting said inner tent layer, connected to said outer tent layer, supporting said inner layer relatively close to and in spaced relation to said outer tent layer, and providing an air passage between said tent layers; nonporous, substantially semiannular shaped, end members, extending radially and angularly between the outer and inner tent layers; means holding the lower end portions of said end members downwardly and spacing

the inner tent layer from the outer tent layer; and tensioning means connected to the opposite end portions of said outer tent layer permitting forces directed in opposite directions to be, respectively, connected therewith to tension the end portions of the outer tent layer longitudinally and in opposite directions.

3,970,097
APPARATUS FOR MEASURING A VOLUME OF LIQUID AND METHOD OF OPERATING SAID APPARATUS

Hans Rudolf Voellmy, and Hermann Gähwiler, both of Zurich, Switzerland, assignors to Contraves AG, Zurich, Switzerland
Filed Sept. 8, 1975, Ser. No. 611,499
Claims priority, application Switzerland, Sept. 23, 1974, 12846/74
Int. Cl.² G01F *1/00*
U.S. Cl. 137—1 **13 Claims**

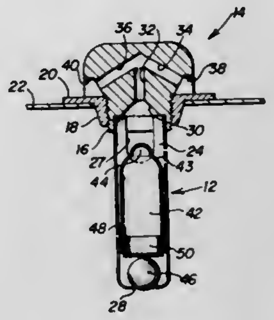


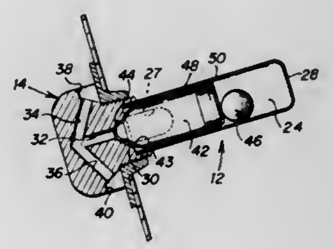
1. An apparatus for measuring a predetermined volume of a liquid, comprising conduit means through which the liquid flows, said conduit means having a first conduit section containing a measurement path, a connection element having an outlet conduit means, said first conduit section having opposed ends, one end of said first conduit section being in flow communication with the outlet conduit means of said connection element, a first inlet conduit and a second inlet conduit, said connection element interconnecting said first inlet conduit and said second inlet conduit with one another, a first valve, a pump device having a low pressure side and a high pressure side, said first conduit section being connected at its other end by means of said first valve with the low pressure side of said pump device, a liquid container for the liquid flowing through the conduit means, a second conduit section including means providing a dynamic pressure drop at the flowing liquid, said first inlet conduit being continuously connected with said liquid container via said second conduit section, a fluid container, said second inlet conduit being continuously in flow communication with said fluid container, a second valve for flow communicating said fluid container with a space, said liquid container being continuously in flow communication with said space, the high pressure side of said pump device opening into said space.

13. A method of measuring a predetermined volume of a flowing liquid, comprising the steps of:
- a. providing a conduit through which flows the liquid whose volume is to be determined;
- b. at least partially filling the conduit with such liquid;
- c. applying a negative pressure to the conduit in order to convey the liquid contained therein through the conduit;
- d. introducing a fluid slug from a fluid supply into the liquid in the conduit;
- e. detecting the passage of the fluid slug along a predetermined path of travel through the conduit in order to thereby measure a predetermined volume of the flowing liquid; and
- f. substantially equalizing the pressure between the fluid supply and a space with which communicates the liquid in order to re-establish a starting condition of the apparatus.

3,970,098
TANK VENT

Stuart E. Boswank, Garland; Robert H. Jones, Euless, and Newton P. Whaley, Carrollton, all of Tex., assignors to Southwest Wheel and Manufacturing Company, Dallas, Tex.
Filed Nov. 1, 1974, Ser. No. 520,059
Int. Cl.² F16K *17/36*
U.S. Cl. 137—39 **6 Claims**

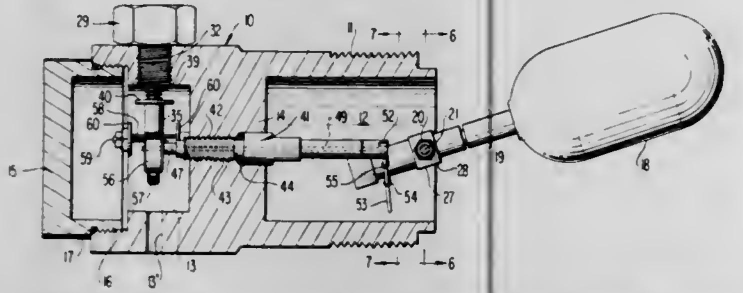




4. A wall mounted tank vent for selectively venting the differential in gas pressure between the interior and exterior of a tank containing a liquid comprising:
- a. a flanged head member formed of a thermosensitive material and containing a set of exterior threads adapted to be sealably disposed within the wall of said tank;
- b. a housing connected at one end to said head and forming a chamber therein which communicates with the interior and exterior of said tank;
- c. a fixed annular frustro-conically shaped valve seat disposed within said chamber at the end of said chamber proximate said head member;
- d. a free sliding, elongated, cylindrical buoyant member adjacent said valve seat;
- e. a protruding cylindrical valve surface, disposed on the end of said free sliding buoyant member adjacent said fixed annular seat having a surface area substantially less than the surface area of said end;
- f. a free moving weighted member, disposed within said chamber adjacent the end of said buoyant member opposite said valve surface capable of direct contact with said buoyant member and having a weight at least slightly greater than the combined buoyant force of said buoyant member and said weighted member;
- g. a vertical passageway disposed within said head having one end communicating with said chamber through said annular valve seat;
- h. a pair of radial apertures contained in said head, sloped toward said tank, and communicating with said vertical passageway; and
- i. a pair of recesses, disposed within said head and having an inside diameter substantially larger than that of said radial aperture, each one communicating between one of said apertures and the exterior of said tank.

3,970,099
LIQUID LEVEL RESPONSIVE VENT VALVE

Frank W. Murphy, Jr.; J. David Nunneley, both of Tulsa, and Teddy Howard Cruse, Broken Arrow, all of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.
Continuation-in-part of Ser. No. 608,279, Aug. 27, 1975, abandoned. This application Jan. 6, 1976, Ser. No. 646,936
Int. Cl.^{2} F16K *31/18, 33/00;* G05D *9/00*
U.S. Cl. 137—101.25 **11 Claims**

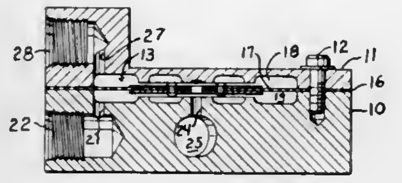


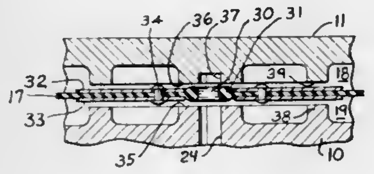
1. A liquid level monitoring and control fluid system venting device comprising a housing having separated chambers and adapted to be coupled in a liquid receptacle with one chamber in communication therewith, a pivoted float on said housing near said one end including a float arm extending into said one chamber, a vent valve for said control fluid system on the housing near the other end thereof and adjacent the other chamber of the housing and adapted for coupling in said control fluid system to be vented, said vent valve including a control fluid fitting having a tubular extension in said other chamber substantially at right angles to the axis of said housing and the common axis of said chambers, a sleeve valve element slidably mounted on said tubular extension, said sleeve valve element having a vent port and carrying a compressible seal element adapted to abut and close the end of said tubular extension, means resiliently biasing said sleeve valve element to a venting position with said seal element spaced from the end of the tubular extension, said housing having an interface wall separating said chambers, a rotary shaft means extending axially of the housing on said interface wall and operatively coupled with said float arm and said sleeve valve element whereby pivoting of the float arm will shift said sleeve valve element in concert with said biasing means between control fluid venting and non-venting positions.

3,970,100
PRIORITY VALVE

Robert L. Jones, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed May 7, 1975, Ser. No. 576,149
Int. Cl.^{2} G05D *16/06;* F15C *3/04*
U.S. Cl. 137—112 **6 Claims**

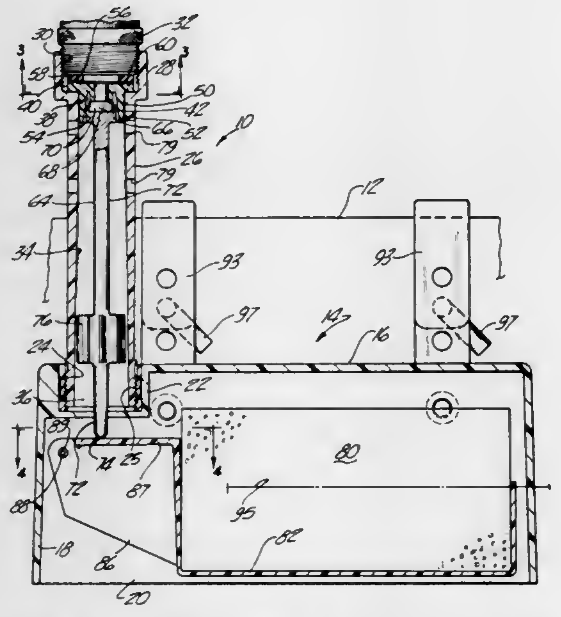
1. A priority valve comprising a housing having a valve chamber, first and second valve seats respectively on first and second opposite and parallel walls of said chamber, a flexible diaphragm of elastomeric material extending between said opposite walls and dividing the chamber into first and second subchambers, said diaphragm having an annular central portion of enlarged thickness with seating portions on opposite ends thereof so as to constitute a valve element, said valve element having an opening therethrough immediately adjacent said seating portions that serves as a passage for fluid, a first inlet port for fluid connected to said first subchamber, a second inlet port for fluid connected to second subchamber, an outlet port connected to said first subchamber centrally of one of said valve seats and registering with said opening, said diaphragm being movable by pressure of fluid in said first chamber when said latter pressure is greater than pressure of fluid in the second chamber whereby said valve element engages the second valve seat to seal said opening from said second chamber and is spaced from said first seat to permit flow of fluid from said first subchamber to said outlet port, and said diaphragm being movable by pressure of fluid in said second chamber when the latter pressure is greater than the pressure of fluid in the first chamber whereby said valve element engages said first seat to close communication between the first subchamber and said outlet port and whereby said valve element is spaced from said second seat to permit flow of fluid from said second chamber to said outlet port via said opening.





3,970,101
FLOAT CONTROLLED VALVE ASSEMBLY

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products, Incorporated, Battle Creek, Mich.
Filed Mar. 17, 1975, Ser. No. 559,218
Int. Cl.^{2} F16K *24/02*
U.S. Cl. 137—216 **5 Claims**

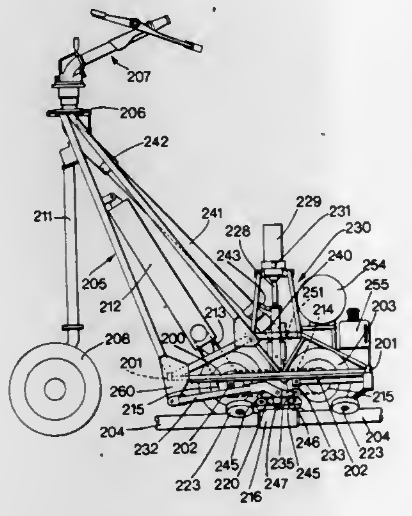


1. A float valve assembly for a liquid storage tank comprising; a housing, bracket means connected to said housing and adapted to support said housing in said tank below an upper edge of the latter, float means supported by said housing for movement relative thereto in response to changes in liquid level in said tank, an elongated conduit member extending vertically relative to said mounting means and projecting above said bracket means, said conduit member forming a liquid inlet above said bracket means and a liquid outlet in said housing, valve means disposed in said conduit between said inlet and outlet and being movable between open and closed positions, an elongated actuating member axially movable in said conduit for moving said valve means between said positions, said actuating member being disposed above and

having a portion resting in abutting engagement on said float means for movement upwardly to close said valve means in response to upward movement of said float means and being movable downwardly in abutting engagement with said float means upon downward movement of the latter, said actuating member being free to rotate generally about the axis of said conduit during upward and downward movement of said float means, guide means formed at spaced points axially of said actuating member and acting between said conduit and said actuating member for maintaining the latter in axial alignment in said conduit member during axial and rotational movement of said actuating member, said guide means including a plurality of annularly spaced guide elements disposed adjacent said inlet and being operable to guide said valve means into said closed position, and vent means communicating the interior of said conduit with the exterior of the latter and being disposed intermediate said valve means and said outlet.

3,970,102
PIPE-FOLLOWING IRRIGATION MACHINE

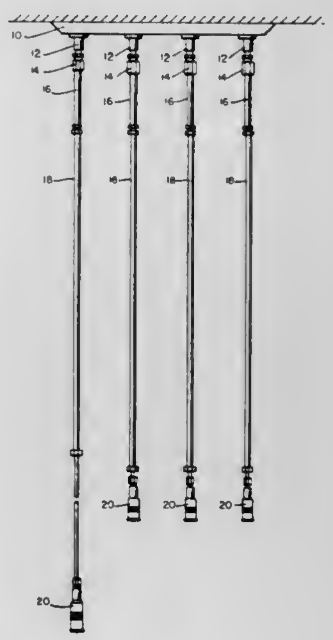
Vernon Bryan William Harvey, Ringwood, England, assignor to Wright Rain Limited, Ringwood, England
Filed Feb. 25, 1975, Ser. No. 552,743
Claims priority, application United Kingdom, Feb. 28, 1974, 9049/74; June 28, 1974, 28702/74; June 28, 1974, 28703/74
Int. Cl.^{2} E01H *3/02*
U.S. Cl. 137—344 **8 Claims**



1. Irrigation apparatus comprising a water supply pipe extending over ground to be irrigated; a plurality of upwardly-facing hydrants spaced apart in the length of the pipe; a self-closing valve in each hydrant and an irrigation machine arranged to follow the pipe and to be coupled to the hydrants in succession, the machine comprising a vehicle; at least one traction wheel supporting said vehicle and running on an upwardly-facing surface of the pipe; a pair of side guidance devices carried by said vehicle and engaging opposed side surfaces of said pipe to maintain said traction wheel substantially centrally aligned on said upwardly-facing surface of said pipe; a vertically-movable riser pipe carried by said vehicle; a driving motor connected to said vehicle to drive said traction wheel to propel said vehicle along said pipe from one hydrant to another and to stop said vehicle with said riser pipe positioned substantially vertically above a hydrant; a hoist to raise and lower said riser pipe to couple the lower end of said riser pipe with a hydrant at which said vehicle has stopped; a track on each hydrant extending in the longitudinal direction of said pipe and having end walls spaced apart by a known distance; a locating device carried on said riser pipe and engageable in said track of the hydrant at which said vehicle has stopped prior to coupling said lower end of said riser pipe with said hydrant to shift said riser pipe to bring said riser pipe into precise vertical alignment with said hydrant before coupling of said riser pipe with said hydrant is effected; a valve-opening member on said riser pipe and operable to hold open the valve in said hydrant while said riser pipe is coupled with said hydrant; and co-operable clamping faces on said vehicle and said hydrant to hold the vehicle in the position of precise vertical alignment while water is flowing from said hydrant to said riser pipe.

3,970,103
RETRACTABLE GAS LINE CONNECTING APPARATUS

Albert E. McKee, deceased, late of Chicago, Ill. (Harris Trust and Savings Bank, executor), assignor to Oxequip Health Industries Inc., Chicago, Ill.
Continuation of Ser. No. 265,050, June 21, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 432,108
Int. Cl.^{2} F16L *3/18*
U.S. Cl. 137—357 **16 Claims**



2. Apparatus adapted to interconnect (1) a termination gas line extending downwardly through a ceiling to (2) an item of gas utilizing equipment located on the floor beneath the ceiling, comprising in combinaton:

- a. a tubular outer member having a gas inlet end and a gas outlet end;
- b. a tubular piston rod of substantially the same length as said tubular outer member telescopically mounted in said tubular outer member with a first end thereof extending outwardly from said outlet end of said tubular outer member and having an internal diameter substantially smaller than the internal diameter of said tubular outer member;
- c. piston means mounted on the other end of said piston rod in the annular space between said piston rod and said tubular outer member and presenting an annular piston surface to the opening of said gas inlet end of said tubular outer member;
- d. spring means mounted in said annular space between said piston rod and said tubular outer member which exerts a biasing force on said piston greater than the force exerted on said piston at the gas inlet end of said tubular outer member, whereby said piston is urged toward said inlet end of said tubular outer member when the apparatus is connected to said gas line;
- e. a fixed coupling means mounted in the ceiling for coupling said inlet end of said tubular outer member to a termination gas line; and
- f. means for coupling said first end of said piston rod to an item of equipment located on the floor beneath said ceiling.

3,970,104

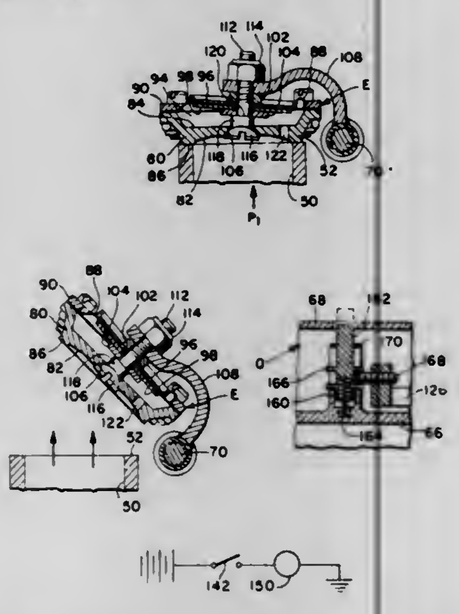
FUEL FILTER BYPASS VALVE WITH CONDITION PRELIMINARY INDICATOR AND SECONDARY INDICATOR

Maurice S. Decker, Columbus, Ohio, and George T. Downey, Corry, Pa., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 9, 1975, Ser. No. 539,814

Int. Cl.^{2} F16K *37/00*

U.S. Cl. 137—494 **9 Claims**



4. A valve assembly comprising; a valve body having a movable member attached thereto for limited movement away therefrom and defining a variable volume chamber with said valve body, yieldable biasing means attached to said movable member for biasing same toward said valve body and biasing said valve body against a valve seat, port means past said valve body communicating with said chamber, said movable member and valve body being proportioned for providing movement of said movable member away from said valve body against the force of said biasing means under influence of a substantially lower pressure than that required to move said valve body away from the valve seat against the force of said biasing means, a lever connected with said movable member, a rotatable shaft connected with said lever, and said biasing means being connected with said shaft for normally rotating same in a direction for applying force through said lever to move said movable member toward said valve body and said valve body toward a valve seat.

3,970,105

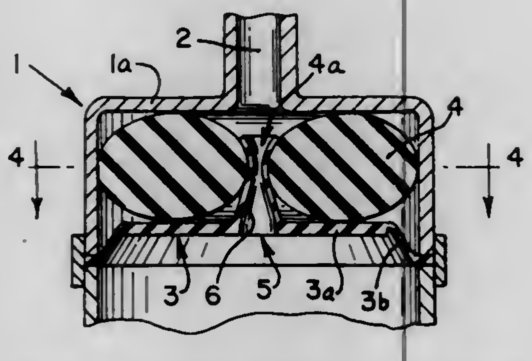
TOROIDAL PRESSURE REGULATOR

Peter G. Pelton, Carol Stream, and Obert M. Ostrem, Westmont, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed June 16, 1975, Ser. No. 587,484

Int. Cl.^{2} F16K *31/12*

U.S. Cl. 137—498 **3 Claims**



1. An improved pressure regulator comprising a double-ended hollow chamber member having outlet means at one end thereof and a pressure reactive member sealing the second end with inlet means therethrough, and inlet throttling means in said chamber member, said inlet throttling means being operable by said pressure reactive member to open and close said inlet means to maintain the pressure at a predetermined level in said chamber member, said pressure reactive member comprising a substantially flat and rigid plate element and a peripheral, extensible bellows element, said bellows element being attached to said chamber member, said inlet means comprising an opening in the center of said plate element, said throttling means comprising a body having a central passage therethrough, said body being oriented with the axis of said central passage substantially aligned with said passage in said plate element, said chamber member having a major axis and said place element of said pressure reactive member being displaceable along said major axis in response to pressure changes within said chamber member, said body being reformable consequent to axial displacement of said plate element of said pressure reactive member, the cross-sectional area of said central passage of said body being reduced consequent to compression of said body between planar elements perpendicular to said axis of said passage, said chamber member having an end panel at said first end, and said body being compressed between said plate element and said end panel consequent to axial displacement of said plate element toward said first end, said inlet means including a reformable tube member extending from said opening in said plate element through said central passage of said body, said compression of said body reducing the cross-sectional area of a portion of said tube member.

3,970,106

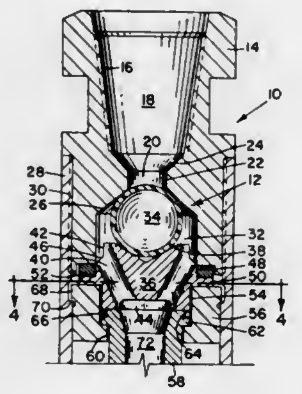
COLLAPSIBLE BALL VALVE

Jesse Harris, San Antonio, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Mar. 3, 1975, Ser. No. 554,640

Int. Cl.^{2} F16K *15/14*

U.S. Cl. 137—843 **9 Claims**



1. A collapsible ball check valve for use with high pressure fluid, said valve comprising:

a housing having an inlet passage therein with a space therebetween;

a hollow ball located in a fixed position in said space for sealing said inlet passage by pressing against walls forming said inlet passage as the walls connect to said space;

seat means for retaining said hollow ball in said space, flow passages extending through said seat means to said outlet passage, said seat means having a retaining surface abutting said hollow ball in said fixed position;

said hollow ball sealing said inlet passage against fluid flow by being pressed between said wall forming said inlet passage and said retaining surface of said seat means in said fixed position, said hollow ball being resilient to collapse under a given pressure in said inlet passage to allow unrestricted fluid flow through said inlet passage, flow passages and outlet passage, upon loss of said given pressure in said inlet passage said hollow ball resumes a spherical configuration to prevent reverse flow through said inlet passage, flow passages and outlet.

3,970,107

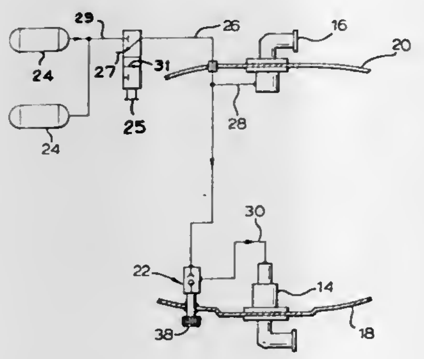
ROLL OVER VALVE FOR TANK TRUCK

Allen M. Bower, Painsville, Ohio, assignor to Emco Ltd., London, Canada

Continuation-in-part of Ser. No. 506,941, Sept. 18, 1974, abandoned. This application Apr. 15, 1975, Ser. No. 568,345

Int. Cl.^{2} F16K *24/00*

U.S. Cl. 137—587 **3 Claims**



1. A gasoline or like tank truck assembly comprising a tank having a top and a bottom,

an air operable vent on said top of said tank,

an air operable emergency valve on said bottom of said tank,

a drain and roll over valve having a body on the bottom of said tank,

said body of said drain and roll over valve having an air supply passage, an air outlet passage and a drain passage,

a manually operable closure for said drain passage of said drain and roll over valve accessible from the outside of said tank,

said air supply passage communicating with said air outlet passage to form a through passage through said body of said drain and roll over valve,

said drain passage communicating with said air outlet passage of said body of said drain and roll over valve to form a through passage through said body of said drain and roll over valve,

a check valve,

a retainer in said drain passage for said check valve,

a seat in said air supply passage for said check valve, said check valve being free to move between said retainer and said seat,

said retainer being adapted to retain said check valve when air pressure is applied to said air supply passage,

said seat being adapted to seat said check valve whereby to close said air supply passage to said drain passage when said closure for said drain passage is opened and air pressure is applied to said drain passage,

an air supply valve having an outlet,

manual operating means for said air supply valve accessible from outside said tank for connecting said outlet of said air supply valve to said air operable vent and to said air supply passage of said drain and roll over valve,

said air outlet passage of said drain and roll over valve being connected to said air operable emergency valve.

3,970,108

PRIORITY HYDRAULIC CONTROL VALVE

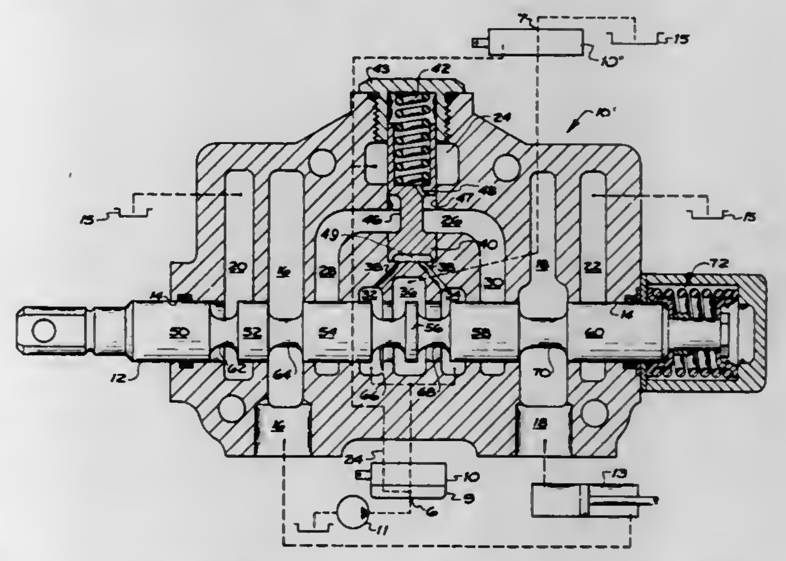
Roger Howard Ailshie, Lewis, Kans., assignor to Cross Manufacturing, Inc., Lewis, Kans.

Filed Oct. 23, 1973, Ser. No. 408,930

Int. Cl.^{2} F17D *3/00*

U.S. Cl. 137—596.13 **3 Claims**

1. An open-center valve section which establishes priority flow in the adjacent upstream section in a series of connected open-center valves utilized in a stack, the valve section having a body provided with a bore and a valve element slidable therein defining an open-center flow passage connecting a fluid pressure source to reservoir through the other sections in the stack; a motor passage; a return passage connected to reservoir; a blind-ended power passage connecting the fluid pressure source to said bore; the valve element having a first position with flow to the motor passage blocked and the open-center passage open, allowing fluid from the pressure source to pass to reservoir and second position blocking flow in the open-center passage and allowing flow from the power passage to the motor passage, the improvement comprising:



a load check valve means positioned in the power passage normally springbiasing the power passage closed; and

servo means having a piston and connecting chamber separate from said power passage operating the load check valve responsive to pressure in the open-center passage opening the power passage only when sufficient pressure exists in the open-center passage.

3,970,109

SHUTOFF AND CONTROL SLIDE

Johannes Uerlichs, Woffelsbach; Rudolf Müller, Merzenich, and Hermann-Josef Stolberg, Birkesdorf, all of Germany, assignors to Hermann Rappold & Co. GmbH, Duren, Germany

Filed Feb. 20, 1975, Ser. No. 551,509

Claims priority, application Germany, Feb. 27, 1974, 2409444

Int. Cl.^{2} F16K *1/44*

U.S. Cl. 137—601 **22 Claims**

1. A shutoff and control slide comprising:

an open-ended cylinder having therein at least one row of circumferentially spaced elongated openings;

an open-ended sliding sleeve mounted for axial displacement within said cylinder;

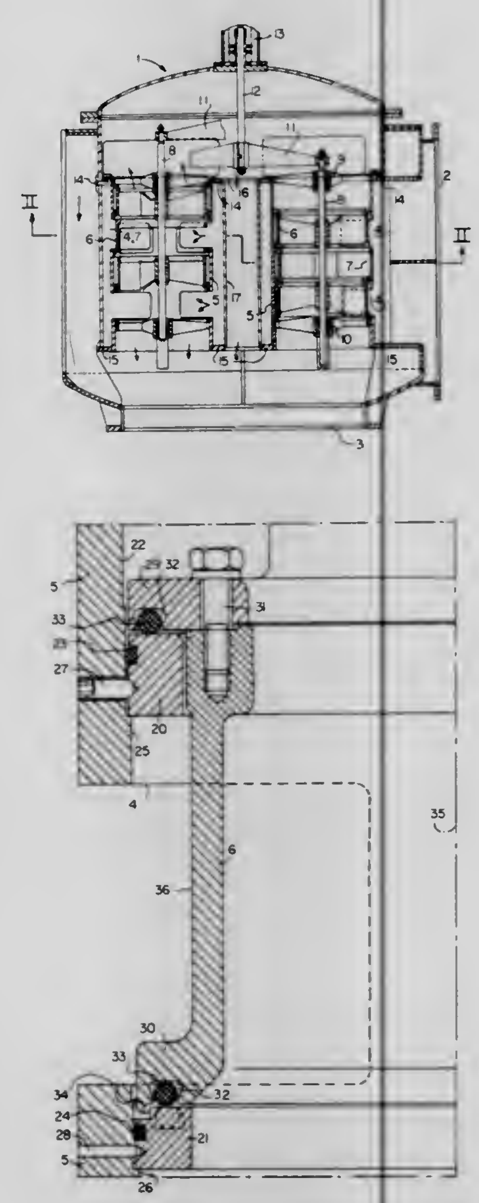
a plurality of rings sealingly positioned against the inner surface of said cylinder, one each on each axial side of said at least one row of openings in said cylinder, each of said rings having an axially facing annular abutment surface, the abutment surfaces of said rings being spaced by a predetermined axial distance;

a plurality of abutment members, equal in number to said plurality of rings, extending outwardly from the outer surface of said sliding sleeve, each of said abutment members having an axially facing abutment surface, the axial spacing between adjacent of said abutment surfaces of said abutment members being equal to said predetermined axial distance;

sealing members positioned on at least one of said abutment surfaces of said abutment members and said abutment surfaces of said rings; and

said sliding sleeve being axially movable from a first position wherein said abutment surfaces of said abutment members and said abutment surfaces of said rings are sealed by said sealing members and said openings in said cylinder are sealingly covered by said sliding sleeve, to a second position wherein said abutment surfaces of said abutment members and said abutment surfaces of said rings are spaced apart and said openings in said cylinder are uncovered by said sliding sleeve.

21. A shutoff and control slide assembly comprising a housing having therein a plurality of shutoff and control slides as



claimed in claim 1, and further comprising a first housing connection in said housing jointly communicating with said openings in said cylinders, and a second housing connection in said housing jointly communicating with open ends of said sliding sleeves and said cylinders.

3,970,110
SAFETY INLET AIR VALVE CONTROL ARRANGEMENT FOR AIR POWERED HAND HELD TOOL

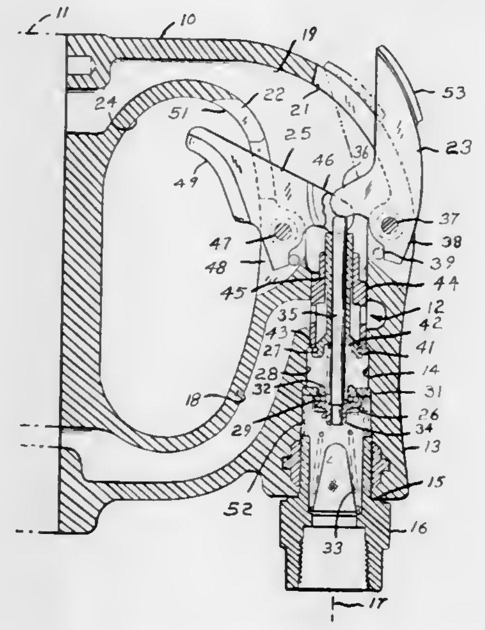
Raymond J. Schaedler, New Hartford, and Livio F. Marcantonio, Utica, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,473

Int. Cl.² F16K *11/10*

U.S. Cl. 137—613 **20 Claims**

17. In the handle of a pneumatically powered hand held tool, a chamber having an inlet at one end connectible to a live air source, and having an outlet at its opposite end connectible to an air motor of the tool; a first valve means controlling flow of source air through the inlet to the chamber comprising a first valve, a seat about the inlet engageable by the valve, a stem extending axially from the valve through the chamber, a spring in a passage below the seat biasing the valve closed upon the seat, and a manually depressible first lever for actuating the valve to open condition against the bias of the spring, the lever projecting externally of the handle and having an inner end abutting a rear end of the stem of the valve; and a second valve means controlling flow from the chamber through the outlet to the motor of source air admitted through the first valve means to the chamber, the second valve means comprising a second valve, a seat about the outlet engageable by the second valve, a hollow stem extending axially from the second valve in sleeved relation to the stem of the first valve, spring means in the chamber biasing the second valve closed upon its seat, and a manually depressible second lever for actuating the second valve to open condition, the second lever projecting externally of the handle and having an inner end abutting a rear end of the hollow stem of the second valve, and each lever being manually actuable independently of the other to move its related valve to open condition without affecting the closed condition of the other valve.



3,970,111
ELECTROMAGNETIC 3-WAY VALVE ARRANGEMENT

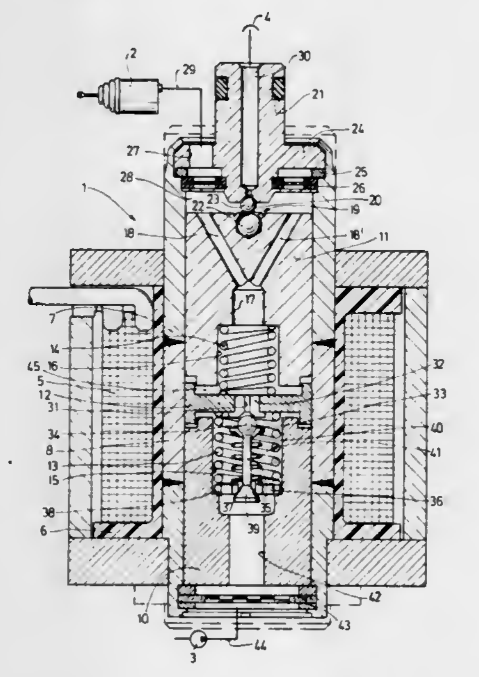
Gerhard Brüne, Bamberg-Gaustadt; Helmut Staib, Bamberg; Heinrich Kochendörfer, Rommelshausen; Waldemar Hans, Bamberg; Walter Röpstorff, Bamberg-Gaustadt; Heinz Leiber, Leimen, and Lothar Kirstein, Heidelberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 13, 1975, Ser. No. 604,500

Claims priority, application Germany, Sept. 4, 1974, 2442372

Int. Cl.² F15B *13/044, 13/043*

U.S. Cl. 137—627.5 **10 Claims**



1. In an electromagnetic 3-way valve arrangement for controlling the flow of a pressure medium between a pressure source and a pressure receiver, and between the pressure receiver and a pressure relief point, the arrangement comprising:
- inlet conduit means for connecting the valve arrangement to the pressure source;
- outlet conduit means for connecting the valve arrangement to the pressure receiver;
- relief outlet conduit means for connecting the outlet conduit means to the pressure relief point;
- inlet valve means for controlling flow of the pressure medium through the inlet conduit means; and
- outlet valve means for controlling flow of the pressure medium through the relief outlet conduit means, the improvement comprising:
- inlet armature means for controlling the inlet valve means, said inlet armature means including an inlet armature capable of limited movement between an energized and a de-energized position;
- outlet armature means for controlling the outlet valve means, said outlet armature means including an outlet armature capable of limited movement between an energized and a de-energized position; and
- a magnetic coil energizable in two stages, said coil causing one of said armatures to assume its energized position when the coil is energized at a first stage of excitation, and causing the other of said armatures to assume its energized position while said one of said armatures is maintained in its energized position when the coil is energized at a second stage of excitation.

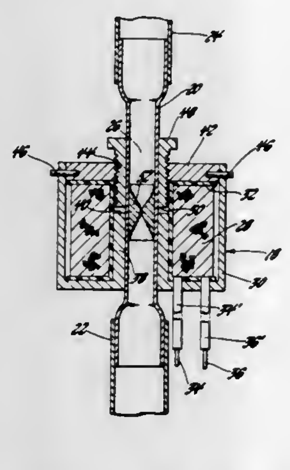
3,970,112
CONTROL VALVE

James A. Bernard, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1975, Ser. No. 638,967

Int. Cl.² F16K *9/00, 31/06*

U.S. Cl. 137—807 **2 Claims**



1. A flow control valve for a fluid having a quantity of small magnetic particles mixed therewith comprising: a tubular member of non-magnetizable material defining an intermediate control passage between end portions serving as an inlet and an outlet, respectively; an electromagnetic coil assembly with a substantially annular configuration encircling the intermediate portion of the tubular member and including multiple turns of conductive wire thereabout; said coil assembly including a housing of readily magnetizable material having an inner cylindrical wall closely encircling said intermediate portion and extending partially from one end toward a second end, terminating therebetween to form an end surface; said second end of the housing having an opening therein spaced from the intermediate portion of said tubular member; a calibration member closely encircling said intermediate portion and extending through the opening in said second end; said calibration member having an end surface movable with respect to said first end surface by insertion and withdrawal through the opening in said second end of the housing; said housing and said calibration member being of readily magnetizable material, such as iron, whereby when said coil means is energized, a magnetic field is produced in said housing and calibration member extending between the spaced surfaces to create magnetic poles thereof which attract a plurality of iron particles from said refrigerant to the inner wall of said intermediate portion, thereby creating an annular accumulation of particles to decrease the flow area.

3,970,113
BIMETAL MULTIPLE CYLINDER FOR EXTRUDERS IN PLASTICS PROCESSING MACHINERY

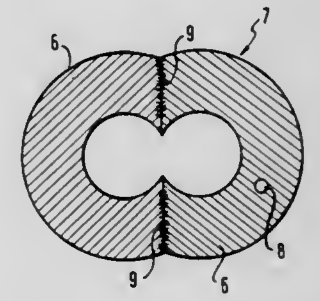
Urs Güttinger, Hagendorf, and Hans Hofer, Olten, both of Switzerland, assignors to Motorwagenfabrik Berna AG, Olten, Switzerland

Filed May 28, 1974, Ser. No. 473,896

Claims priority, application Germany, May 30, 1973, 2327684

Int. Cl.² F16L *9/00; 9/22;* **B29B** *1/04;* **B29F** *3/02*

U.S. Cl. 138—157 **18 Claims**



1. A bimetal multiple cylinder for extruders in plastics processing machinery comprising a plurality of longitudinally extending, cut-away, bimetal tubes mounted adjacent each other and with their longitudinal axes spaced from and substantially parallel to a common axis, each of said tubes being unitary and having an outer base metal supporting an inner metal lining, the outer base metal being of high strength to withstand distortion and provide strength, rigidity, and stability so that said multiple cylinder requires no external jacket in use and the inner lining being metallurgically bonded to and integral throughout with the outer metal and having greater wear resistance than said outer metal, each said tube having a longitudinally extending slot from the exterior to the interior thereof which is adjacent said common axis and having a pair of faces, one on each side of said slot, extending longitudinally and outwardly from said common axis; each said tube being mounted with one face thereof contacting a face of a next adjacent tube and with the other face thereof contacting another face of a next adjacent tube and said tubes being welded together by welds between the contacting faces formed by metal of the tubes themselves and extending both from adjacent the innermost extents of said faces outwardly of said common axis to the outermost extents of said faces and extending longitudinally along said faces.

3,970,114
HEALD FRAME WITH MOVABLE HOLDING ELEMENT FITTED ON THE FRAME STAVE

Hans Baumann, Horgen, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Apr. 9, 1975, Ser. No. 566,475

Claims priority, application Switzerland, Apr. 18, 1974, 5396/74

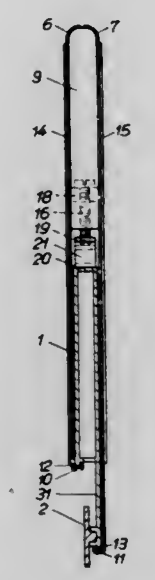
Int. Cl.² D03C *9/06*

U.S. Cl. 139—91 **10 Claims**

1. In a heald frame assembly the improvements comprising:
- a. at least one frame stave (1, 1′) with a hollow, closed cross-section having generally parallel side walls, and two ribs (12, 13) extending along the length of the frame stave and protruding beyond an end wall of the cross-section toward the longitudinal centerline of the heald frame

assembly, said ribs being in the same planes as the side walls of the frame stave;

b. at least one holding element (5, 26) displaceably attached to said at least one frame stave, said holding element having portions with groove-shaped sections to engage said two protruding ribs, and



c. securing means (16, 21, 28, 29) to secure said at least one holding element to said at least one frame stave.

3,970,115

DEVICE FOR MONITORING THE YARN TRAVEL IN THE SHUTTLE OF A SHUTTLE LOOM

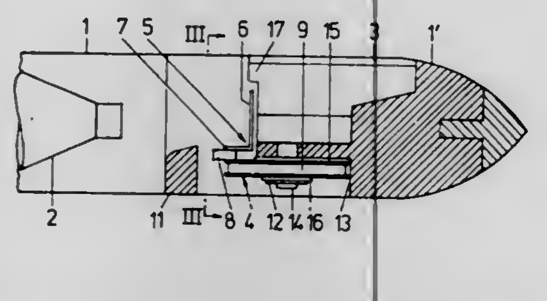
Erhard Kenk, Vaihingen, and Theo Kenk, Karlsruhe, both of Germany, assignors to Aktiengesellschaft Gebruder Loepfe, Wetzikon, Switzerland

Filed May 16, 1975, Ser. No. 578,213

Claims priority, application Germany, May 25, 1974, 2425437

Int. Cl.^{2} D03D *51/34*

U.S. Cl. 139—371 **11 Claims**



1. A piezoelectric transducer device for monitoring yarn travel in a shuttle of a loom, wherein the shuttle has a front end provided with a threader having a thread inlet, said device comprising an integral assembly which includes an induction coil unit, a yarn feeler member mounted on one side of the induction coil unit for being vibrated by the traveling yarn, and a piezoelectric transducer element mechanically coupled with the yarn feeler member and operatively connected with the induction coil unit, wherein the improvement comprises:

the induction coil unit is shaped as a substantially flat unit having two major faces in substantially parallel relationship to one another;

the yarn feeler member is arranged as a unilaterally clamped flexural vibratory member comprising an arm disposed in substantially perpendicular relationship to said major faces of the induction coil unit and having a free end for contacting the traveling yarn; and

means for directly and rigidly connecting the yarn feeler member and piezoelectric transducer element with one another.

3,970,116

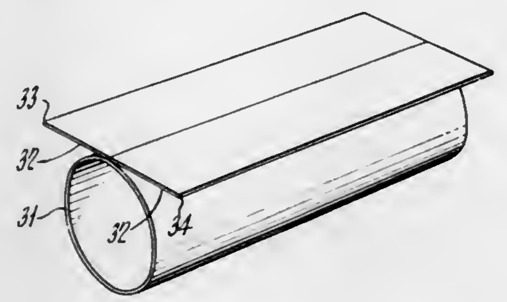
METHOD OF WEAVING A COMPOSITE TUBE AND WEB AND RESULTING ARTICLE

Takezo Takada, deceased, late of Hikone, Japan, and by Juichiro Takada, legal authorized heir, 3-12-1, Shin, Setagaya, Tokyo, Japan (154)

Continuation-in-part of Ser. No. 385,387, Aug. 3, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 546,162

Int. Cl.^{2} D03D *3/02;* **D03C** *13/00*

U.S. Cl. 139—387 R **5 Claims**



1. The method of producing a composite woven tube and web article in which the tube and web include longitudinally extending warps and are sustantially tangent to each other along a longitudinal axis parallel to said warps and spaced from and between the edges of the web comprising interweaving warps extending along said tube and said web with successive filling runs at least some of which are individually interwoven with warps both in the tube and web and extend along a portion of the periphery of said tube and between said longitudinal axis and an edge of said web and some of said filling runs extend for their full lengths only across the full width of said web and some of said filling runs extend for their full lengths only across the upper part of said tube.

4. A composite woven article including a longitudinally extending woven tube including longitudinal warps and peripheral fillings and a longitudinally extending woven web extending along the length of said tube and tangent thereto along a longitudinal axis of said web between the edges thereof and including longitudinally extending warps and transversely extending fillings interweaving said warps of said web, some of said web filling runs extending also along a lower adjacent portion of said tube and some of said filling runs extending for their full lengths only for the full width of said web.

3,970,117

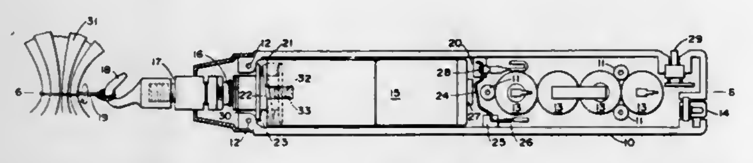
TWISTER FOR WIRE TIES

Asher Z. Zamansky, 33 Cottage St., and Hyman H. Zamansky, 114 Cottage St., both of Chelsea, Mass. 02150

Filed July 14, 1975, Ser. No. 595,520

Int. Cl.^{2} B21F *15/04*

U.S. Cl. 140—93 A **8 Claims**



1. An electrically powered hand held wire tying assembly comprising

a handle adapted to be held by an operator,

an electric motor non-rotatably seated within said handle,

said motor having a shaft oriented with its axis extending from the rear to the front of said handle,

said handle having a forward opening providing direct access to the shaft of said motor,

a hook rotatably interconnected with said shaft of said motor through said forward opening in said handle,

a first electrical switching means contained in said handle which, when said hook is engaged and restrained from rearward motion, is activated by the application to said handle of a rearwardly directed force,

said motor being so interconnected with said first switching means as to function only when said first switching means is activated,

said first switching means being deactivated upon cessation of the application of said rearwardly directed force.

3,970,118

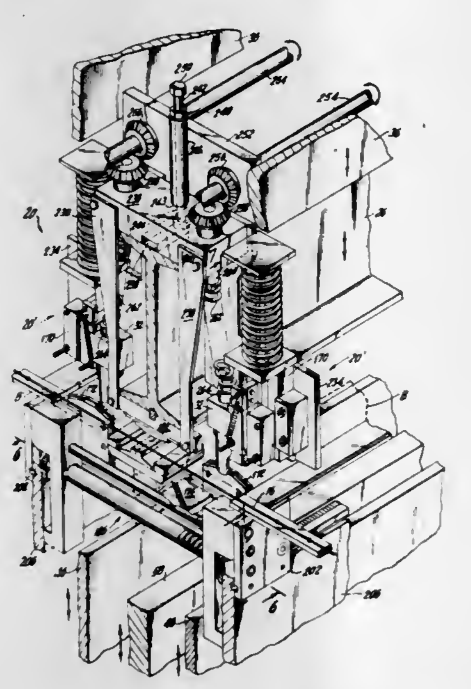
ROCK FASTENER MACHINE

Leroy M. Varga, Dover, N.J., assignor to Rockaway Corporation, Rockaway, N.J.

Filed May 29, 1975, Ser. No. 581,762

Int. Cl.^{2} B21F *27/14*

U.S. Cl. 140—93 C **50 Claims**



1. A prong forming and driving mechanism for use in a loop forming and fastening machine for making wirebound container blanks, said mechanism being adapted to be mounted on a first vertically reciprocal crossbar in the loop forming machine for movement therewith and being operated by a second vertically reciprocal crossbar in the machine, said mechanism including a housing operatively connected to said first crossbar for movement in unison therewith, a wire former bar slidably mounted in said housing for vertical reciprocal movement, a loop bar pivotally mounted on said housing for movement in a transverse vertical plane with respect to said former bar and having a lower end including a hook-like projection arranged to project beneath the free end portion of a binding wire extending beyond said projection from one side of a loop formed in the binding wire, said former bar having a lower end portion including an inner face generally coplanar with the plane of movement of the adjacent inner face of the loop bar and having a vertical groove formed therein for receiving said free end portion of said binding wire; a drive bar, including a lower end, being slidably mounted in said housing adjacent said former bar for vertical reciprocal movement with respect to said former bar and housing in the vertical plane of said loop bar, with said lower end thereof being normally located above said hook-like projection and above the level of the lower end of the former bar; said driver bar being adapted to be moved vertically downwardly in said housing by spring means being operatively connected between said driver bar and said housing for normally biasing said driver bar to a first uppermost position with respect to the housing; first means operatively connecting said driver bar to said former bar for holding the former bar with the driver bar in said uppermost vertical position with the lower end of the driver bar at a level above the lower end of the former bar, while allowing downward vertical movement of said driver bar with respect to said former bar under the influence of said second crossbar; second means operatively and simultaneously engaging the lower end of said driver bar, said former bar and a portion of said housing for initially preventing relative downward movement of said driver bar with respect to the former bar under the influence of the second crossbar whereby the driver bar and former bar move downwardly together for a predetermined distance until the former bar has been moved downwardly with respect to loop bar and bent the portion of the binding wire extending beyond the loop bar downwardly around the loop to form a prong in the vertical groove and for thereafter releasing said drive bar for further downward movement with respect to the former bar and housing under the influence of said second crossbar, said driver bar including cam means cooperating with said loop bar for pivoting said loop bar outwardly from beneath said binding wire as, and after, the driver bar is released for further downward movement whereby said wire prong is driven into the face material of the container blank with the prong being supported, as it is driven, on one side by said loop bar and on its other sides by the walls of said groove in the former bar.

3,970,119

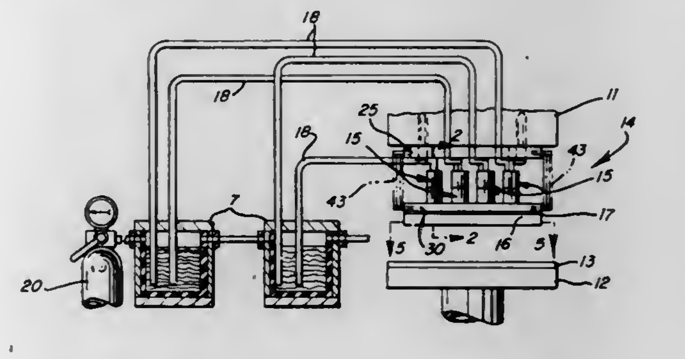
METHOD AND APPARATUS FOR MANUFACTURE OF DISPOSABLE THERMOMETERS

Frank A. Doane, Syosset, N.Y., assignor to Colorflo Leasing Inc., Villa Park, Ill.

Filed Apr. 19, 1974, Ser. No. 462,252

Int. Cl.^{2} B65B *3/12*

U.S. Cl. 141—1 R **9 Claims**



1. Apparatus for the manufacture of disposable thermometers wherein a thermometer comprises a carrier for receiving temperature responsive liquid crystal material, said apparatus comprising a base for supporting a plurality of carriers, storage means for storing liquid crystal material, a plurality of reciprocating injector means in fluid communication with said means for storing liquid crystal material, delivery means comprising a die plate connected to each of the plurality of reciprocating injector means for receiving liquid crystal material from said plurality of injector means and for depositing said liquid crystal material on selected ones of the carriers, means associated with each selected carrier for providing a visual indication of the temperature range in which a deposit of liquid crystal material on the carrier will change state, a spacer plate disposed between said plurality of injector means and a first side of said die plate, each of said injector means including an outlet passage, said die plate including a plurality of fluid passages extending therethrough, fluid passages in said spacer plate communicating with said outlet passage of said injector means and said fluid passages, in said die plate, means for simultaneously reciprocating said plurality of injector means so that the die plate reciprocates simultaneously with said injector means, means for substantially sealing the delivery means against leakage of liquid crystal material and for maintaining the liquid crystal material out of contact with hydrocarbons which are soluble in liquid crystal material comprising a sheet of Teflon disposed between said die plate and said spacer plate, the Teflon sheet being deformable by reciprocation of the injector means to fit portions of the contour of the first side of said die plate, fluid passages formed in said Teflon sheet in substantial alignment with the fluid passages in said spacer plate, the fluid passages allowing liquid crystal material to pass from the injector means to said first

side of said die plate and the Teflon sheet sealing the junction of the first side of the die plate and the spacer plate against liquid crystal material leakage while maintaining the liquid crystal material out of contact with hydrocarbons which are soluble in liquid crystal material.

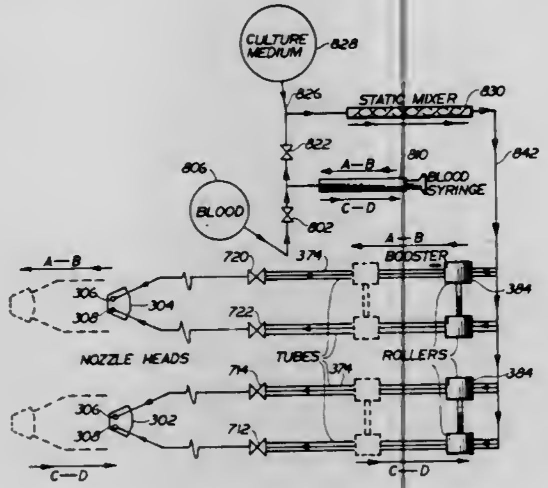
3,970,120
FILLING MACHINE

Alten E. Whitecar, Westville, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 20, 1974, Ser. No. 535,106

Int. Cl.² B65B *3/04*

U.S. Cl. 141—1 R **31 Claims**



26. The method of filling with a liquid elongated bodies each having an elongated cavity extending along its length and carried by a continuously rotating ring comprising:

causing a nozzle to follow a body as it is carried by the ring and to move along the length of the body cavity,

discharging a liquid through said nozzle into the body cavity as the nozzle follows the body, and

returning the nozzle to its original position preparatory to the filling of another body cavity.

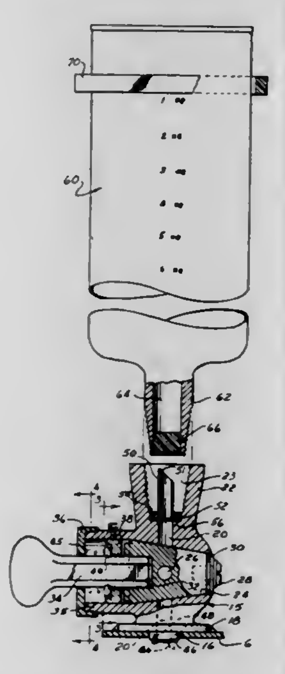
3,970,121
LIQUID INJECTOR

Michael W. Brandt, P.O. Box 1092, Stillwater, Okla. 74074

Continuation-in-part of Ser. No. 462,364, April 19, 1974. This application Dec. 13, 1974, Ser. No. 532,446

Int. Cl.² B65B *3/04*

U.S. Cl. 141—2 **14 Claims**



1. A process of injecting pesticide into a pressurizable container for spraying pesticide and water comprising the steps of: depositing a measured quantity of pesticide in a hollow tubular body having an outlet passage; detachably securing the tubular body to a valve body secured to the container; forming a fluid-proof seal between the tubular body and the valve body; venting the pressurizable container such that the interior of the container is at atmospheric pressure; moving a valve element in the valve body to a position such that a passage through the valve communicates with the inside of the container; increasing pressure inside the hollow tubular body to transfer the measured quantity of pesticide from the tubular body through the valve into the container; moving the valve element in the valve body to close the passage through the valve body; disconnecting the tubular member from the valve body on the container; depositing water in the container such the water is mixed with the measured quantity of pesticide in the container; and pumping air into the container such that pressure inside the container is greater than atmospheric pressure.

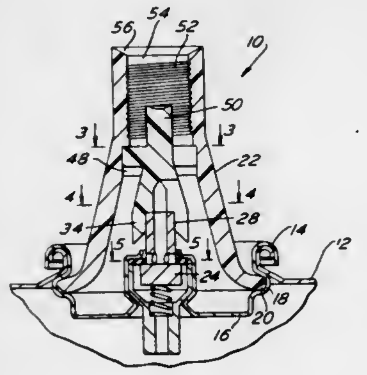
3,970,122
INFLATION DEVICE

Mark E. Scott, 616 Artwood Drive, Philadelphia, Pa. 19115

Filed July 17, 1974, Ser. No. 489,301

Int. Cl.² B65B *3/04*

U.S. Cl. 141—349 **7 Claims**



1. An inflation device comprising:

a. a container having a fluid therein under pressure, said container having a discharge valve which includes a hollow discharge tube,

b. a tubular nozzle housing open at both ends, one end portion of said nozzle housing being secured to said container and circumscribing said discharge tube, the other end portion of said nozzle housing having threads on its ID, a guide bore on the ID of said nozzle housing between the location of said thread and said one end portion of said nozzle housing,

c. a discrete actuator for said discharge valve, means for reciprocally disposing said actuator in said bore, said actuator having flange means in contact with said bore, said actuator having a depending portion below said flange means, said depending portions having a passage communicating with said discharge tube, said depending portion having a surface for contact with an end face of said discharge tube, and said actuator having a projection above the flange means so that the projection is circumscribed by said threads,

d. means defining a flow path within said nozzle housing from said passage to said other end portion of said nozzle housing, and

e. whereby external force on said projection causes said depending portions to move said discharge tube and open said discharge valve so that fluid may flow from said container through said discharge tube, passage and flow path.

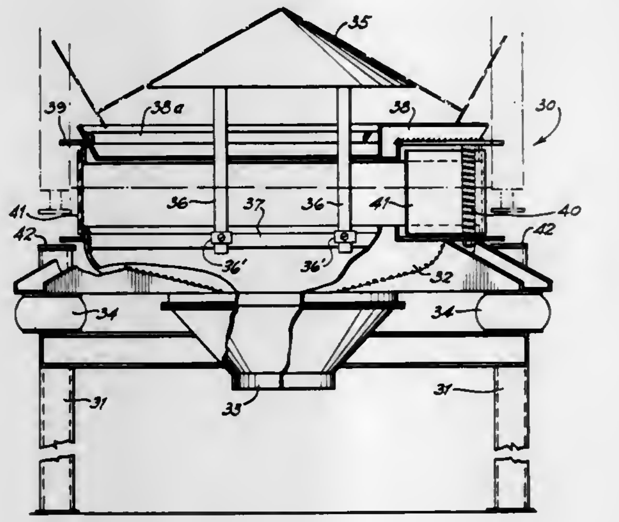
3,970,123
HANDLING OF MATERIALS

Barrie Armstrong Poulton, Cheltenham, and Robert Paton Bayne, Cheadle Hulme, both of England, assignors to Simon-Barron Limited, Stockport, England

Filed May 13, 1974, Ser. No. 469,481

Int. Cl.² B65G *67/40*

U.S. Cl. 141—351 **21 Claims**



1. Apparatus comprising the combination of a transportable container for particulate materials, and equipment adapted to be permanently located at the position where the material is to be dispensed from the container, and which is adapted to removably receive said transportable container and to actuate said container to promote flow of the material from the container to said equipment, said transportable container having an opening at its lower end defined at the base of a wall portion of downwardly decreasing cross section, a valve member mounted within the container in the direct path of material in the container to normally close said opening and to be movable upwardly within the interior of the container to define an annular dispensing opening between its periphery and the internal surface of said lower wall portion of the container, and said equipment having actuating means for said valve, the arrangement being such that when said transportable container is positioned on said equipment, said valve actuating means on said equipment is operatively connected to said valve member to automatically raise the same a predetermined extent relative to the body of the container and thereby provide said dispensing opening, and means operative when said container is so combined with said equipment for effecting material flow promoting vibration of surfaces of both said container and equipment that are contacted by said material during discharge of said material into the equipment, said equipment comprising a material receiving member of generally dish-like form and having a central circular bottom opening therein, frame means for supporting said material receiving member in an elevated position with respect to the ground, resilient isolator means disposed between the receiving member and the frame means, pad means on the frame means adapted to engage with and support said transportable container in position above the equipment, upstanding means supported by the material receiving member at a central elevated position and adapted to raise said valve member by a predetermined extent when the container is positioned on the equipment, means for forming a seal between the periphery of the material receiving member and the outside wall surface of the lower portion of the container when the container is positioned on the equipment, and said vibrating means comprising means for vibrating the material receiving member and said upstanding means whereby vibrations are also transmitted to the valve member of the transportable container in the combination.

3,970,124
METHOD AND APPARATUS FOR SEVERING AND MARKING TREES

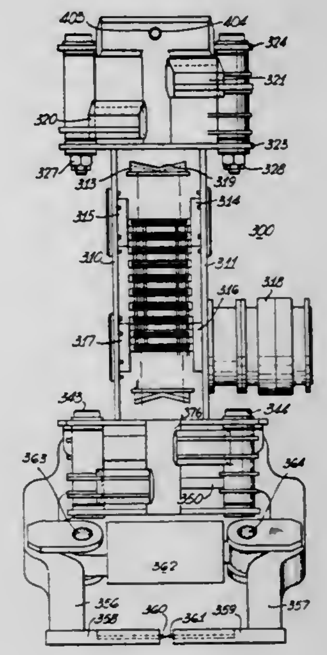
Douglas D. Hamilton, Mount Royal, Canada, assignor to Logging Development Corporation, Montreal, Canada

Filed June 27, 1975, Ser. No. 591,040

Claims priority, application Canada, July 3, 1974, 203948

Int. Cl.² A01G *23/08*; B44B *5/00*

U.S. Cl. 144—3 D **10 Claims**



1. In an apparatus having a tree gripping device and a severing device for severing a tree into discrete lengths, the improvement comprising: tree marking means mounted movably on said apparatus for placing a mark on the trunk of the tree, grasped by the gripping device, at a position spaced from the severing device, and means actuating the marking device for placing a mark on the tree trunk in response to severing of the same by said severing device, said mark on the trunk indicating the position to subsequently sever the trunk providing a log of selected length.

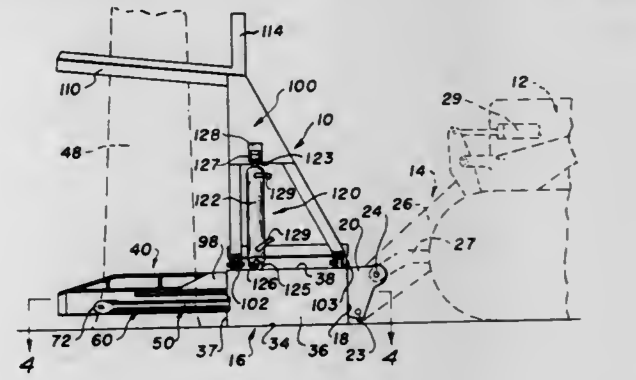
3,970,125
TREE CUTTING APPARATUS

Aubrey S. Muirhead; John Martin; Patrick J. Martin, and Ross H. Rigler, all of Prince George, Canada, assignors to Muirhead Machinery Ltd., Prince George, Canada

Continuation of Ser. No. 217,471, Jan. 13, 1972, abandoned. This application July 2, 1973, Ser. No. 375,804

Int. Cl.² A01G *23/08*; B27B *5/10*

U.S. Cl. 144—34 R **5 Claims**



1. Tree cutting apparatus attachable to a vehicle to be operated therefrom and comprising a base frame, an anvil blade carried by the base frame and extending outwardly therefrom in a generally horizontal direction, a movable blade mounted on the base frame in opposition to and for swinging movement towards and away from the anvil blade, a cutter rotatably mounted on the movable blade and extending longitudinally opposite the anvil blade, said cutter being a substantially cylindrical shaft having helical flutes and cutting edges on the outer surface thereof, drive means for rotating the cutter about its longitudinal axis, power means operable to swing the movable blade towards the anvil blade whereby the rotating cutter progressively is advanced to cut through a tree entered between the blades, a pusher frame hingedly mounted on the base frame for swinging movement about an axis extending substantially parallel to the longitudinal axis of the anvil blade, a tree-engaging arm extending outwardly from an upper end of the pusher frame, and power means interconnecting the pusher frame and the base frame, said power means being operable to swing the pusher frame whereby to tilt the tree and open the kerf formed by the cutter, said movable blade entering the kerf behind the cutter to engage the butt end of the cut tree and carry a major part of the weight of said cut tree, said tree-engaging arm cooperating with the movable blade to support the substantially upright and overbalanced cut tree.

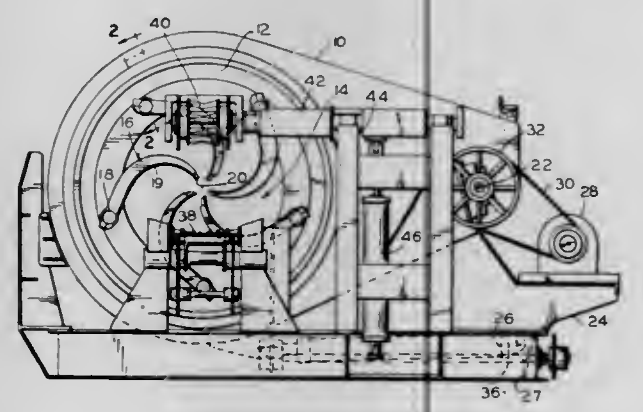
3,970,126
LOG DEBARKER

W. Henry Allen, Sherwood, Oreg., assignor to Kockum Industries, Inc., Talladega, Ala.

Filed July 14, 1975, Ser. No. 595,594

Int. Cl.^{2} B27L *1/00*

U.S. Cl. 144—208 E **25 Claims**



1. In a ring-type log debarker having a housing, an annular rotor mounted for rotation on said housing, plural barking tools mounted on said rotor symmetrically about the axis of rotation thereof for movement between an open inoperative position and closed operative positions, tool-operating means including an air motor means for operating each barking tool, and an external source of air pressure to said rotor, the improvement comprising:

- static air pressure chamber means within said rotor for supplying air under operating pressure to all of said air motor means,
- said air motor means comprising a separate double-acting air cylinder for opening and closing each said barking tool,
- remotely operable electrically operated cylinder control valve means on said rotor for controlling air communication between said rotor pressure chamber means and the opposite sides of said air cylinders, said valve means being operable in a first position to supply air from said pressure chamber means to one side of said cylinders and to exhaust air from the opposite side of said cylinders and being operable in a second valve position to exhaust air from said one side and supply air from said pressure chamber means to said opposite side of said cylinders for positive opening and closing of said barking tools,
- means on said rotor normally isolating said static air pressure chamber means from said external source of air pressure and from atmosphere during rotation of said rotor for maintaining said pressure chamber means under a predetermined static pressure,
- and means for adding pressurized air to said pressure chamber means from said external source during rotation of said rotor to maintain or increase static air pressure within said pressure chamber means.

3,970,127
MACHINE TOOL WORKPIECE FEED CARRIAGE

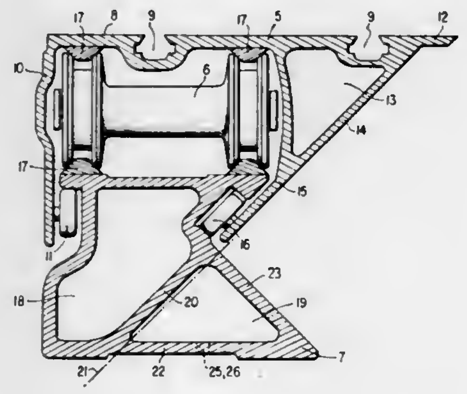
Siegfried Thiele, Minden-Haverstadt, Germany, assignor to Wilhelm Altendorf, Maschinenbau, Minden, Westphalia, Germany

Filed Feb. 26, 1975, Ser. No. 553,511

Claims priority, application Germany, Feb. 27, 1974, 2409420

Int. Cl.^{2} B27C *1/12*

U.S. Cl. 144—242 R **6 Claims**



1. In a feed carriage for holding a workpiece, the carriage being mounted on a housng of a machine equipped with a working tool, and being located to one side of the tool, the carriage including: an upper carriage portion in the form of a light-metal profile presenting a clamping surface for the workpiece; a lower carriage portion in the form of a light-metal profile fastened to the machine housing; and a center carriage composed of guide rollers on which the upper carriage portion moves and which supports the upper carriage portion on the lower carriage portion, the upper carriage portion and the lower carriage portion extending far beyond the machine housing in the direction of the length of the carriage, the improvement wherein said upper carriage portion is provided with a free arm member which extends downwardly at an angle of approximately 45° with respect to said clamping surface and said lower carriage portion comprises two closed profile members constituting a one-piece unit and including a common partition connecting said profile members together, said partition being positioned to constitute an extension of said free arm member.

3,970,128
ORIENTATION OF CANT FOR TRANSLATORY FEED THROUGH EDGING CUTTERS

Ulrich Kohlberg, Jarfalla, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Apr. 16, 1975, Ser. No. 568,609

Claims priority, application Sweden, Apr. 22, 1974, 7405347

Int. Cl.^{2} B27B *1/00, 31/06*

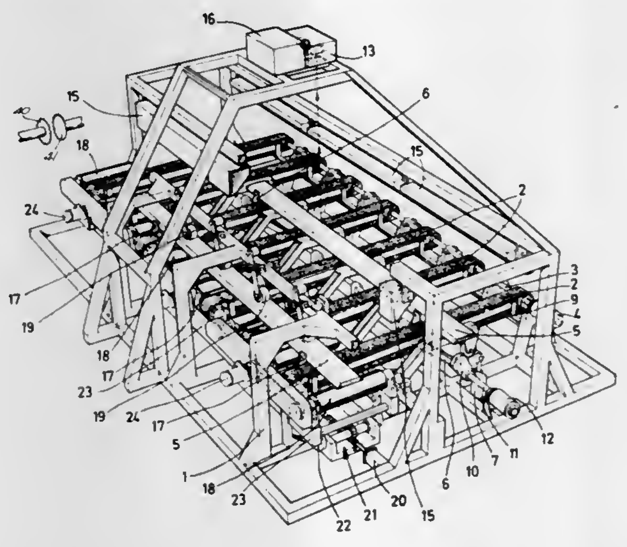
U.S. Cl. 144—245 A **5 Claims**

1. Apparatus by which a cant having substantially flat and parallel top and bottom surfaces and unfinished lengthwise extending wane surfaces can be oriented for substantially lengthwise translatory motion through a pair of spaced apart edging cutters by which the cant is converted into a finished piece of optimum size as determined by calculations made on the basis of data obtained with a scanning device at a scanning station, said apparatus comprising:

A. a plurality of endless conveyors having elongated upper stretches which
  1. are disposed in a common horizontal plane,

  2. extend across said scanning station in lengthwise parallel laterally spaced relation to one another and
  3. are driven for unison lengthwise motion in a forward direction to cooperate in transporting past the scanning station a cant that extends transversely across time;

B. a pair of scanning stops which are
  1. laterally adjacent to said stretches of the endless conveyors and
  2. spaced apart along a datum line at said scanning station that extends transversely to said stretches, said scanning stops having abutments which define said datum line and are engageable by the leading edge of a cant being transported on said stretches to hold the cant at the scanning station and establish a reference line on the cant to which data obtained during scanning of the cant can be related, said reference line corresponding with said datum line when the cant is so held;



C. means for effecting relative vertical motion between the scanning stops and said stretches whereby the scanning stops can be established alternatively
  1. in an operative position projecting above said plane for engaging a cant on said stretches, or
  2 in an inoperative position wholly below said plane to permit a cant on said stretches to be carried beyond the scanning station;

D. an orienting stop for each scanning stop,
  1 located above said plane and
  2 forwardly aligned with its scanning stop. to engage said points on the leading edge of a cant that is being transported forwardly away from the scanning station and stop the cant;

E. means for adjustingly moving each orienting stop to any selected one of a plurality of operative positions that are at different distances in said forward direction from the datum line, to enable the orienting stops to cooperate in establishing a cant with its said reference line in an optimum orientation according to calculations made on said data;

F. feed conveyor means arranged to carry a cant towards the edging cutters with horizontal translatory motion and in a direction transverse to said forward direction, said feed conveyor means being at a location adjacent to the orienting stops;

G. means for effecting relative vertical motion between the feed conveyor means and said stretches, to enable a cant to be transferred from said stretches to the feed conveyor means after the cant has been oriented by its engagement with the orienting stops, so that the cant can be translated towards the edging cutters by the feed conveyor means; and

H. means for moving each orienting stop to an inoperative position which is farther in said forward direction from said datum line than any of said operating positions of the orienting stop, so that the orienting stop does not disrupt the established orientation of the cant when it is moved towards the edging cutters by the feed conveyor means.

4. A method of orienting a cant having substantially flat and parallel top and bottom surfaces and untrimmed lengthwise extending wane surfaces, to so dispose the cant for substantially lengthwise translatory motion through a pair of spaced apart edging cutters that the cant is thereby converted into a finished piece of optimum size as determined by calculations made on the basis of a scanning of the top surface of the cant at a scanning station, and in which method the cant is carried to the scanning station and beyond the same to a location at which the cant is oriented as aforesaid by means of a plurality of endless conveyors having elongated, parallel and laterally spaced apart upper stretches that lie in a common horizontal plane and are driven in unison in a forward direction, said method comprising:

A. placing a cant, top surface uppermost, onto said upper stretches near the rear ends thereof, with the cant lengthwise substantially transverse to the lengths of said stretches;

B. at a scanning station located spaced from both ends of the belt conveyors, engaging the leading edge of the cant, at a pair of spaced apart points thereon, to confine the cant against forward movement with said upper stretches and establish a reference line on the cant which extends through said pair of points and to which data obtained during scanning can be related;

C. while the cant is stationary at the scanning station, scanning it to obtain data concerning the relationship of the longitudinal edges of its top surface to said reference lines;

D. on the basis of said data, adjusting a pair of orienting stops, one for each scanning stop and each aligned in said direction with its scanning stop and spaced in said direction therefrom, to bring the orienting stops to positions such that they cooperate to define a line corresponding to the optimum orientation of said reference line for translation of the cant through edging cutters in a direction transverse to said direction of motion of said stretches;

E. vertically disengaging the scanning stops from the cant and, after scanning, causing the cant to resume motion with said stretches of the belt conveyors so that it is carried by them into engagement with both orienting stops;

F. effecting relative vertical motion between said stretches of the endless conveyors and a set of conveyor means arranged to carry a cant in horizontal translatory motion in a direction transverse to said stretches of the endless conveyors, to transfer the cant from the belt conveyors to said conveyor means and cause the cant to be supported by said conveyor means, out of engagement with said stretches;

G. moving the orienting stops in the direction away from the scanning stops to disengage them from the cant; and

H. driving said conveyor means to translate the cant substantially lengthwise in said direction transverse to the lengths of said stretches and towards the edging cutters.

3,970,129
SALES SLIP WALLET

Barry Tepfer, 2 Lawrence St., New Hyde Park, N.Y. 11040

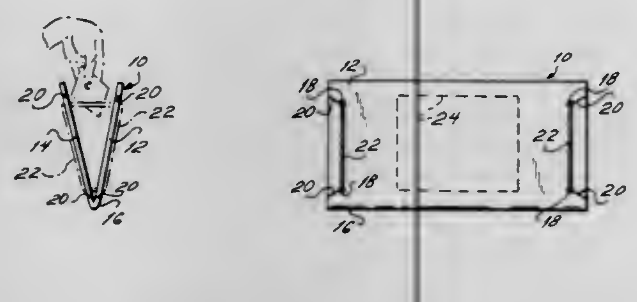
Filed Mar. 19, 1975, Ser. No. 559,698

Int. Cl.^{2} A45C *11/18*

U.S. Cl. 150—39 **10 Claims**

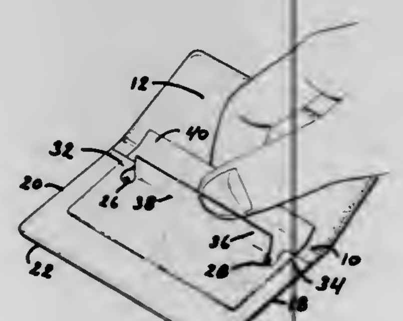
1. A low cost, easily fabricated wallet and holder particularly for credit card receipts, small pieces of paper and the like comprising panel means, and elastic means joining said panel means and positioned proximate the periphery thereof to couple the same and allow temporary separation thereof and insertion of the papers, wherein each of said panel means are formed with aperture means and slot means communicating therewith, said elastic means including a pair of elastic bands placed substantially opposed on said panel means coupling

same by passing through a respective array of said aperture means access to which is provided by said slot means extending from the outer edge of said panel means to receive said elastic means.



3,970,130
TICKET HOLDER

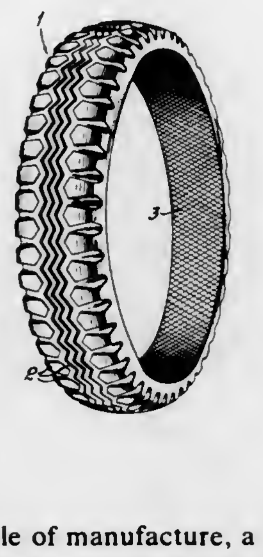
Everett Randolph Casey, 5845 Old Orchard Trail, Orchard Lake, Mich. 48033
Filed Sept. 15, 1975, Ser. No. 613,171
Int. Cl.² A45C *11/18*
U.S. Cl. 150—39 **6 Claims**



1. A carrying case for a ticket or the like comprising a flexible plastic sheet having a transverse fold line and foldable about said fold line to define mating front and back cover portions, a flat transparent plastic facing element having lateral, bottom and top edges and having a width between said lateral edges greater than the width of a ticket and a height between said bottom and top edges greater than the height of the ticket, means securing each of said lateral and said bottom edges to an inner portion of said foldable plastic sheet to one side of said transverse fold line to define a pocket open at said top edge to accept the ticket, said flexible facing element having first and second outboard flaps and a central flap, each of said flaps constituting a portion of said facing element adjacent to and including a portion of said top edge of said facing element, each of said outboard flaps extending from the adjacent lateral edge of said facing element to a point inboard thereof lying short of the midpoint of said top edge of said facing element, each of said outboard flaps having a side edge extending generally in the same sense as the lateral edges of said facing element, said central flap being disposed between said outboard flaps, the length of said central flap being established by a pair of spaced-apart side edges directed in a converging sense in a direction toward said bottom edge of said facing element to define a narrower portion of said flap spaced from said top edge, said central flap being bendable and bending along said narrower portion in response to a bending force applied to said central flap along the top edge portion thereof, tension forces lifting said central flap away from said plastic sheet being transmitted through portions of said facing element between said central flap and each of said outboard flaps to deflect portions of each of said outboard flaps away from said plastic sheet.

3,970,131
TREAD FOR THE RECAPPING OF TIRES AND METHOD OF MAKING THE SAME

Wilhelm Schelkmann, Witten, Germany, assignor to Vakuum Vulk Holdings Ltd., Nassau, Bahamas
Division of Ser. No. 394,721, Sept. 6, 1973. This application May 24, 1974, Ser. No. 473,305
Claims priority, application Germany, Sept. 9, 1972, 2244391
Int. Cl.² B60C *11/00*
U.S. Cl. 152—185 **17 Claims**



1. As a novel article of manufacture, a prefabricated tread for use in tire-recapping methods of the type wherein a bonding layer of unvulcanized rubber is inserted intermediate and pressed between the inner surface of a prefabricated tread and the outer surface of a tire carcass at a temperature high enough to cause the unvulcanized rubber of the bonding layer to flow into intimate contact with said surfaces and become vulcanized to effect permanent bonding of the prefabricated tread to the carcass, the novel prefabricated tread being a molded one-piece structure having a profiled external road-engaging surface and having an internal surface substantially completely covered with a crowded network of molded projections and recesses presenting to the unvulcanized rubber of such a bonding layer a large contact surface and a multitude of cavities into which the unvulcanized rubber of such a bonding layer can flow during the performance of such permanent-bonding method.

3,970,132
TIRE CHAIN ASSEMBLY

Victor S. Giannone, 952 Central Ave., Peekskill, N.Y. 10566
Filed July 2, 1975, Ser. No. 592,629
Int. Cl.² B60C *27/10, 27/02*
U.S. Cl. 152—233 **3 Claims**

1. An adjustable tire chain assembly comprising:

inboard and outboard flexible strap ropes, each of said strap ropes having loop ends;

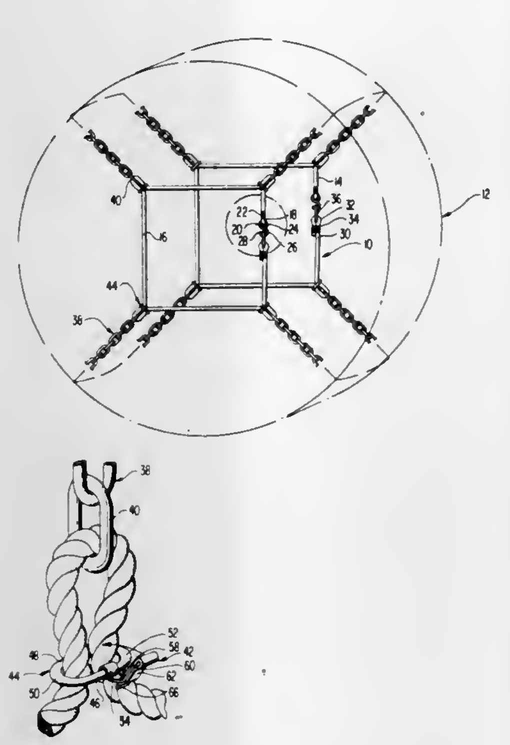
clasp means for connecting said loop ends releasably together;

link chains extending between the inboard and outboard strap ropes at spaced locations, said link chains having terminal links at each end thereof, and the strap ropes extending between said terminal links on the inboard and outboard ends respectively thereof;

a series of adjustment clamps for the strap ropes to tightly engage the assembly on a vehicle wheel, said adjustment clamps each comprising a band having side sections and end sections, a hinge sleeve pivotally mounted on one of said side sections, and a lever on said sleeve;

the lever being concave in the direction of the band, and having a release handle extending in the opposite direction; and

the strap ropes having loops thereof extended through said handle adjacent said locations where the link chains are located, the bands being slidable on said loops to positions effecting tight connection of the tire chain assembly on the wheel, and the levers being pivotal to locking positions which wedge the strap ropes and bands together.



3,970,133
CHLOROTHIO-SULFONAMIDE-MODIFIED RUBBERY TERPOLYMERS AND THEIR BLENDS

Roger J. Hopper, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 532,979, Dec. 16, 1974, Pat. No. 3,915,907. This application Oct. 17, 1975, Ser. No. 623,223
Int. Cl.² B60C *13/00;* C08L *7/00, 9/02, 9/06*
U.S. Cl. 152—353 R **2 Claims**

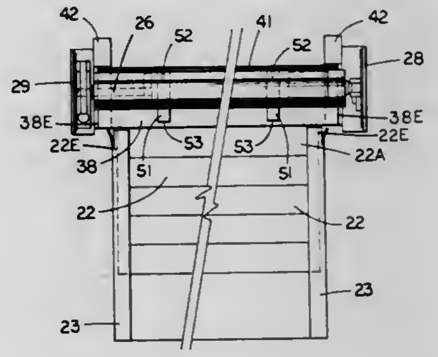
1. A pneumatic tire casing of toroidal shape, with outer tread portion and spaced beads and having a sidewall connecting said tread portion and bead, said sidewall comprised of a sulfur-cured composite comprised of 100 parts by weight of modified rubbery terpolymer in admixture with about 18 to about 670 parts by weight of a rubbery polymer comprised of at least one of cis-1,4-polyisoprene natural rubber, synthetic cis-1,4-polyisoprene, polybutadiene, butadiene-styrene copolymer with a butadiene/styrene mole ratio in the range of about 60/40 to about 95/5, butadiene acrylonitrile copolymer, polypentenamer of the type derived from open ring polymerization of cyclopentene, bromobutyl rubber, chlorobutyl rubber and polychloroprene, where said modified rubbery terpolymer is comprised of the admixture product of a rubbery terpolymer of ethylene, propylene, in a mole ratio in the range of about 30/70 to about 70/30, and about 0.1 to about 0.8 mole of non-conjugated diene per kilogram of terpolymer, and an N-chlorothio-sulfonamide, where said non-conjugated diene is selected from 1,4-hexadiene, dicyclopentadiene, 5-ethylidene-2-norbornene, 5-methylene-2-norbornene, 4,7,8,9-tetrahydroindene and 1,5-cyclooctadiene, and where said N-chlorothio-sulfonamide is selected from:

N-chlorothio-N-methyl-methanesulfonamide,
N-chlorothio-N-methyl-benzenesulfonamide,
N-chlorothio-N-methyl-p-toluenesulfonamide,
N-chlorothio-N-ethyl-p-toluenesulfonamide,
N-chlorothio-N-methyl-ethanesulfonamide,
N-chlorothio-N-phenyl-p-toluenesulfonamide,
N-chlorothio-N-(2-propyl)-methanesulfonamide,
N-chlorothio-N-(1-propyl)-p-chlorobenzenesulfonamide,
N-chlorothio-N-phenyl-methanesulfonamide,
N-chlorothio-N,N′,N′-trimethylsulfamide,
N-chlorothio-N-methyl-N′,N′-(pentamethylene)sulfamide,
N-chlorothio-N-methyl-N′,N′-diethylsulfamide and
N-chlorothio-N-phenyl-benzenesulfonamide

where the mole ratio of said N-chlorothio-sulfonamide to unsaturated sites in said terpolymer is in the range of about 0.06/1 to about 1/1.

3,970,134
SECURITY LOCKING OF ROLLING SHUTTERS

Pomeroy Sinnock; Joseph Robert Lauer; David H. Manthei, all of New Castle, and Arthur C. Rugg, Richmond, all of Ind., assignors to Amrol Corporation, New Castle, Ind.
Filed July 16, 1975, Ser. No. 596,209
Int. Cl.² E06B *9/08*
U.S. Cl. 160—133 **12 Claims**



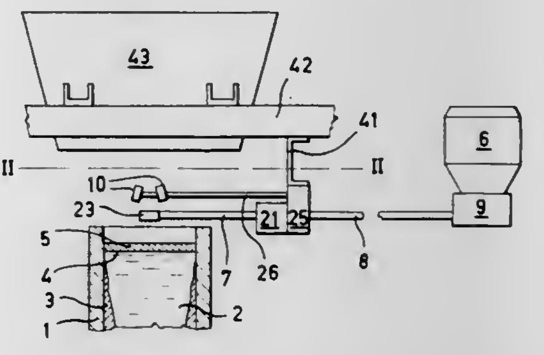
1. In a rolling shutter having a plurality of parallel, adjacent shutter slats capable of deployment in a shutter-closed array covering an opening in a building wall, and of being roiled from the array onto a roller for a shutter-open condition to uncover the opening and for storage of the shutter slats in a roll, the improvement comprising:

a plurality of lock slats connected to the roller between the roller and the shutter slats;

lock slat guide means adjacent said roller and disposed in position to guide the lock slats and prevent disorder thereof but clear said shutter slats to accommodate accumulation thereof in a roll on said roller.

3,970,135
METHOD FOR APPLYING FLUX POWDER TO THE BATH LEVEL IN A CONTINUOUS CASTING MOLD DURING CONTINUOUS CASTING

Markus Schmid, and Werner Bruderer, both of Zurich, Switzerland, assignors to Concast AG, Zurich, Switzerland
Filed May 20, 1974, Ser. No. 471,762
Claims priority, application Switzerland, May 30, 1973, 7799/73
Int. Cl.² B22D *11/16*
U.S. Cl. 164—4 **7 Claims**



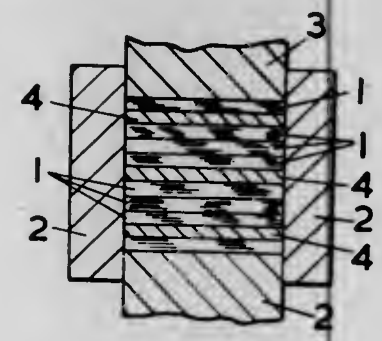
1. A method for the application of a casting agent to the bath level of liquid metal within a mold during continuous casting, comprising the steps of: monitoring the distribution of the casting agent at the surface of the bath level, obtaining monitoring results regarding the distribution of the casting

agent, and controlling at least the infed quantity of the casting agent at the bath level as a function of such monitoring results.

3,970,136
METHOD OF MANUFACTURING COMPOSITE MATERIALS

John Corjeag Cannell, Waltham Abbey; Rodney Seymour Leaper, Hoddesdon, and Noel James Parratt, Loughton, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 231,594, March 3, 1972, abandoned.
This application Mar. 14, 1975, Ser. No. 558,475
Claims priority, application United Kingdom, Mar. 5, 1971, 6093/71
Int. Cl.² B22D *19/02*
U.S. Cl. 164—108 22 Claims



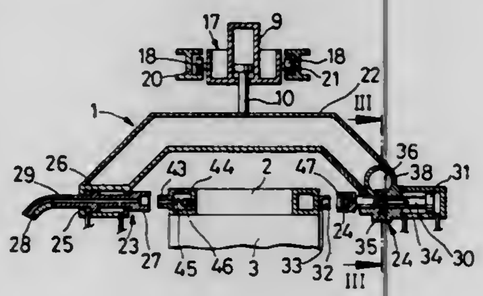
1. A process for forming a composite material comprising a metal matrix incorporating non-metallic fibrous reinforcement having a predetermined pattern of fiber orientation which includes the steps of:

a. providing in a mold a plurality of layers of fibers formed from at least one array of substantially coplanar fibers,
b. providing reservoirs of molten matrix metal between at least some of the layers of fibers, and
c. forcing said molten metal to penetrate said layers and intimately to surround substantially each of the fibers by applying pressure to the mold contents, sufficient matrix metal reservoirs being provided for the separation between neighboring reservoirs to be within twice the distance that the molten metal can penetrate before solidification under the applied temperature and pressure.

3,970,137
APPARATUS FOR PRODUCING AND TRANSFERRING CASTING MOULDS

Herbert Grolla, Laasphe, Westphalia, Germany, assignor to Heinrich Wagner Maschinenfabrik, Laasphe, Westphalia, Germany

Filed Feb. 10, 1975, Ser. No. 548,600
Claims priority, application Germany, Feb. 15, 1974, 2407264
Int. Cl.² B22C *25/00*
U.S. Cl. 164—160 4 Claims

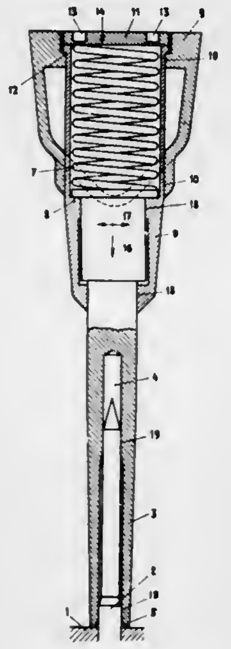


1. Apparatus for producing and transferring casting moulds utilising binderless sand subjected to a reduced pressure, said apparatus comprising a travelling gripper which is arranged to be raised and lowered and which is provided with two couplings to hold a moulding box, said couplings being rotatable about a horizontally extending axis, and one coupling being connected to a vacuum pipe for evacuating the moulding box.

3,970,138
PATTERN DEVICE INCLUDING AN UPPER TROUGH PATTERN FOR THE MANUFACTURE OF THE UPPER PART OF A FOUNDRY MOLD

Erwin Bührer, Vogelingasschen 40, 8200 Schaffhausen, Switzerland

Filed Aug. 29, 1974, Ser. No. 501,817
Claims priority, application Switzerland, Sept. 5, 1973, 12759/73
Int. Cl.² B22C *19/00*
U.S. Cl. 164—244 8 Claims



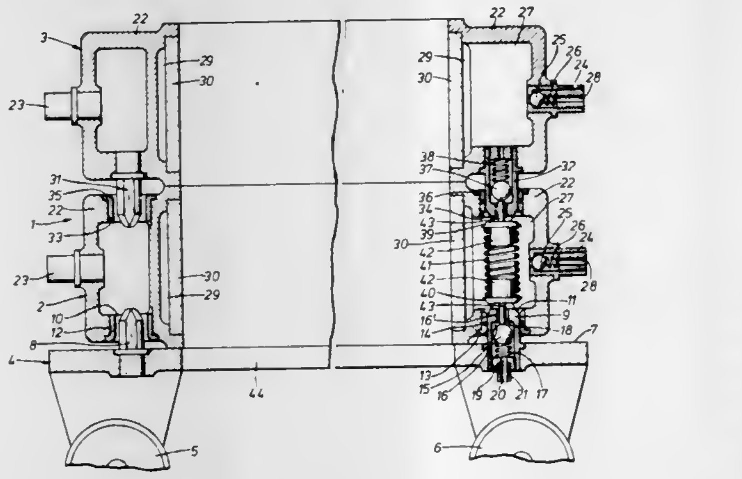
1. In a pattern device for the production of the upper part of a foundry mold including a mold pattern, an upper trough pattern configured to form a trough with a trough basin, and at least two gate pins configured to form at least two gates extending from said trough, with said trough connecting said basin with said gates, said mold being subject to compaction after filling thereof with mold forming material, the improvement comprising a first guide pin fixed to said mold pattern and extending longitudinally therefrom into said upper mold part, wall means defining a guide hole in at least one of said gate pins, said first guide pin being fitted into said guide hole to retain said pattern device in place during production of said upper mold part, said first guide pin including a lower guide wall portion generally proximate said mold pattern and an upper guide wall portion located proximate the opposite end thereof and spaced from said lower guide wall portion, said guide hole being configured to firmly engage said first guide pin about said lower guide wall portion and said upper guide wall portion to impede lateral deflection of said at least one gate pin when said mold is subjected to compaction forces, with said wall means and said guide pin being shaped to define a longitudinally extending annular spacing therebetween extending continuously from said lower guide wall portion to said upper guide wall portion, said first guide pin having a predetermined diameter and a predetermined distance between said upper and lower guide wall portions, with said first guide pin diameter and said distance between said upper and lower guide wall portions being dimensioned in accordance with the magnitude of the lateral displacement forces exerted against said at least one gate pin during compaction of said mold, another of said gate pins having a guide hole therein, and a second guide pin spaced from said first pin and fixed to

said mold pattern at a location to engage said guide hole in said another of said gate pins.

3,970,139
VACUUM CONTROL VALVING APPARATUS FOR A VACUUM SEALED MOLDING APPARATUS

Herbert Grolla, Laasphe, Germany, assignor to Heinrich Wagner Maschinenfabrik, Laasphe, Westphalia, Germany

Filed Jan. 6, 1975, Ser. No. 538,794
Claims priority, application Germany, Jan. 22, 1974, 2402870
Int. Cl.² B22C *11/12, 9/02*
U.S. Cl. 164—253 10 Claims

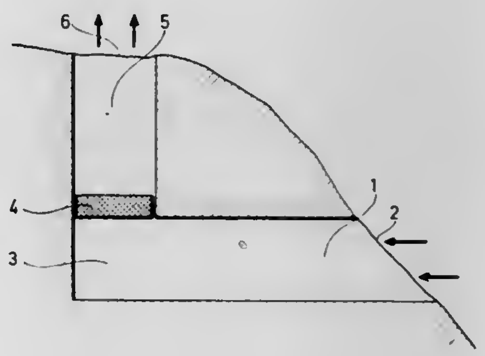


1. In a vacuum molding apparatus having a rail conveyor truck with a vacuum source connection thereon and a casting box for producing castings with the aid of binderless sand, said apparatus being comprised of frame-like upper and lower mold members each having an evacuation chamber, the improvement comprising wherein said evacuation chambers have first coupling means for connection to a vacuum source separate from said vacuum source connection on said rail conveyor truck and first normally closed valve means in said first coupling means and connected in circuit therewith for opening and closing said vacuum source connection, said first valve means being opened in response to the application of a vacuum pressure to said first coupling means, said upper and lower mold members each having second coupling means communicating with said evacuation chambers and second valve means for opening and closing said communication to said evacuation chambers, said second valve means being normally closed when said upper and lower mold members are separated from each other, first actuating means for opening said second valve means in response to a placement of said upper mold member in mating relation on top of said lower mold member to establish communication between said evacuation chambers, and third coupling means communicating with said evacuation chamber in said lower mold member and third valve means for opening and closing said communication to said evacuation chamber, said third valve means being normally closed when said lower mold member is separated from said rail conveyor truck, second actuating means for opening said third valve means in response to a placement of said lower mold member in mating relation on top of said rail conveyor truck and connecting said evacuation chamber in said lower mold member to a vacuum source connection on said rail conveyor truck.

3,970,140
AIR OPERATED UNDERGROUND COOLER MEANS WITH NATURAL LIFT

László Heller; László Forgó, and Árpád Bakay, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

Continuation of Ser. No. 286,515, Sept. 5, 1972, abandoned.
This application Oct. 11, 1974, Ser. No. 514,149
Claims priority, application Hungary, Sept. 4, 1971, EE-1961
Int. Cl.² F28B *5/00*
U.S. Cl. 165—45 3 Claims

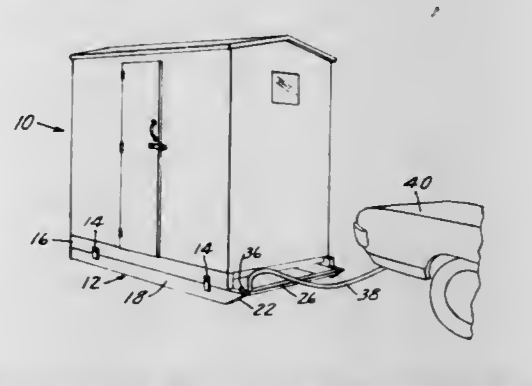


1. An industrial plant employing cooling means dependent solely on the difference in density between heated air and unheated air for movement of air therethrough, said cooling means comprising an underground passage having an inlet orifice and an outlet orifice opening into the ambient air, said passage comprising a first essentially vertical shaft having upper and lower ends, said upper end terminating proximate said outlet orifice, a second essentially horizontal shaft having inner and outer ends, said inner end communicating with said lower end of said essentially vertical shaft, and said outer end terminating in said inlet orifice, and heat transfer means located at least in part proximate the lower end of said first shaft, the length of said first shaft being substantially greater than the length of said heat transfer means, and said heat transfer means consisting of surface cooler means extending essentially across the entire cross-sectional area of said first shaft.

3,970,141
DISLODGING DEVICE

Roger J. Raether, Ortonville, Minn., assignor to Erwin F. Wellendorf, Ortonville, Minn.

Filed May 27, 1975, Ser. No. 580,974
Int. Cl.² F24H *3/00*
U.S. Cl. 165—47 1 Claim



1. A heat radiating frame mountable under the base of an ice fishing structure for dislodging the same from ice, comprising:

a pair of spaced opposed elongate generally parallel metal skids;
said skids each being hollow along its length,
a pair of spaced opposed connector members respectively joined near the end thereof adjacent to the end of one of said skids to form a frame with each of said skids coinciding with opposite sides of the base of said structure,

said connector members each being hollow along its length with said skids extending more deeply than said connector members,

an exterior inlet port and an outlet port disposed adjacent one another and communicating with the interior of said frame,

interior ports at the junction between said skids and connector members to provide a continuous path through and about the interior of said frame from one of said ports to the other,

means for directing pressurized hot gas along said path, and means on said frame for retaining the structure thereon as said frame is dragged upon said skids.

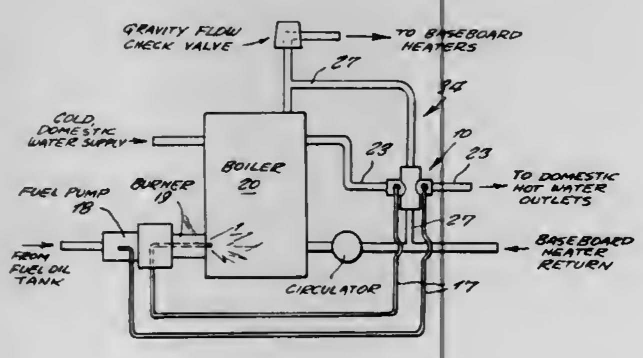
3,970,142
FUEL SAVING DEVICE

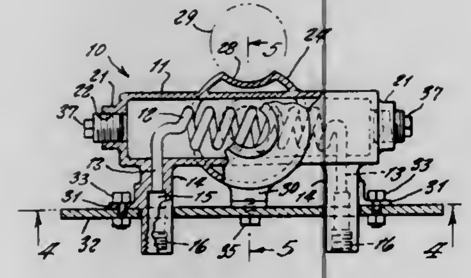
Joseph Troiano, c/o Able Carting Corp., 80 Mahan St., West Babylon, N.Y. 11704

Filed Apr. 18, 1975, Ser. No. 569,457

Int. Cl.^{2} F28D *7/00*

U.S. Cl. 165—163 **4 Claims**





1. In a heating system having a furnace which burns fuel to produce heat, a fuel oil line which feeds the furnace, a domestic hot water line at least part of which passes through the furnace to be heated therein, and a household baseboard heater line at least part of which passes through the furnace to be heated therein, the improvement comprising a fuel preheater positioned externally from said furnace, said preheater formed as a single unitary part and containing a narrow pipe and wide pipe, said narrow pipe being perpendicular to and extending transversely through said wide pipe, a coil of tubing located within said narrow pipe, connection means at each end of said coil tubing for connection along said fuel oil line at a part thereof prior to its feeding into the furnace, connection means at each end of said narrow pipe for connection along said domestic hot water line at a part thereof located subsequent said furnace, and connection means at each end of said wide pipe for connection to said household baseboard heater line at a part thereof subsequent to said furnace.

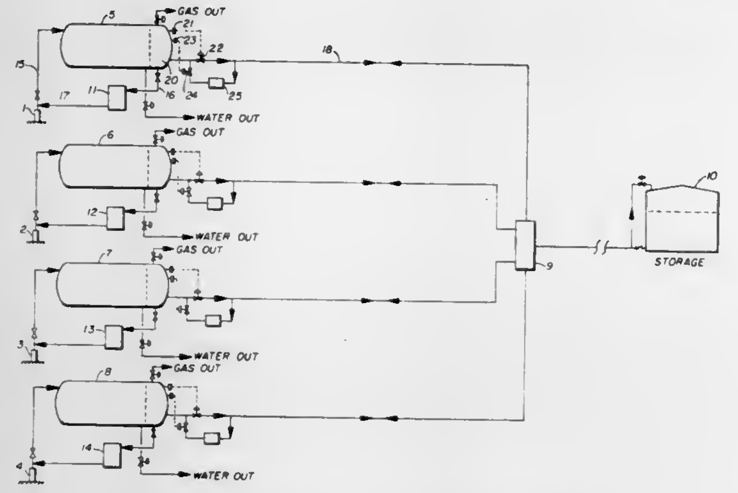
3,970,143
OIL WELL PRODUCTION SYSTEM

Sammy DeWitt Thrash, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed June 23, 1975, Ser. No. 589,329

Int. Cl.^{2} E21B *43/00*

U.S. Cl. 166—53 **2 Claims**



1. A production system for crude oil, including;

an oil well;

a downhole pump actuated by high pressure hydraulic fluid;

a crude oil processing unit located at the oil well and connected to the downhole pump to receive fluids produced from the oil well and including,

- a. means connected to the unit which heat the fluids,
- b. means connected to the unit which degas the liquids,
- c. means connected to the unit which electrostatically separate the liquids into clean crude oil and water,
- d. and a compartment within the unit arranged to receive the clean crude oil;

a high pressure pump connected to the clean oil compartment to receive the clean oil and connected to the downhole pump to supply the clean oil as the actuating hydraulic fluid;

a storage facility connected to the clean oil compartment to receive all the clean oil processed in excess of the quantity received by the high pressure pump;

and a control system connected between the storage facility and clean oil compartment and arranged to return processed clean crude oil to the high pressure pump from the storage facility during periods when the oil well output of the processing unit is less than the amount required to actuate the downhole pump.

3,970,144
SUBSURFACE SHUTOFF VALVE AND CONTROL MEANS

Robert O. Boykin, Jr., P.O. Box 5151, Midland, Tex. 79701

Filed Aug. 11, 1975, Ser. No. 603,306

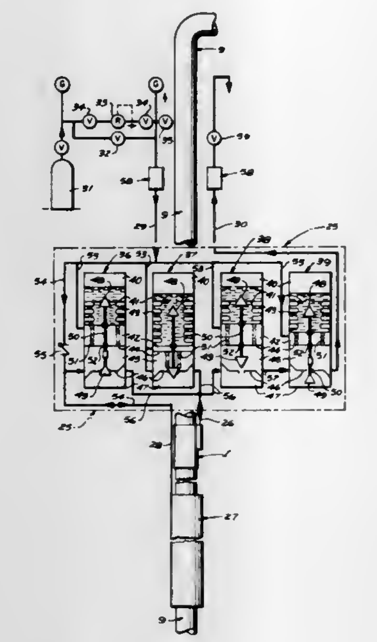
Int. Cl.^{2} E21B *43/12*

U.S. Cl. 166—53 **15 Claims**

1. A shutoff control system for a producing string extending within a well bore, comprising:

- a. a shutoff valve interposed in the producing string, the valve including a control chamber which, when subjected to a pressure that exceeds the internal pressure by a preselected differential, causes the shutoff valve to close, so as to stop all flow through the producing string;
- b. a pressure fluid reservoir carried by the producing string, connected to the shutoff valve control-chamber and having a pressure-fluid capacity capable of pressurizing the shutoff valve control chamber sufficiently to effect closure of the shutoff valve;
- c. a control line extending from the reservoir to the surface, at or near the wellhead;
- d. a source of pressure fluid connectable to the control line for supplying pressure fluid to the reservoir;

- e. a check valve preventing return flow of pressure fluid from the reservoir;



- f. and a valve means interposed between the reservoir and the shutoff-valve control-chamber for supplying pressure fluid to the shutoff-valve control-chamber in the event of loss of pressure in the control line.

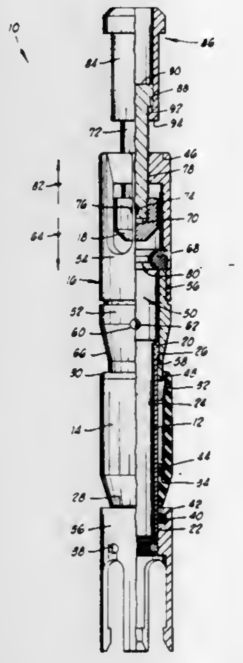
3,970,145
STANDING VALVE ASSEMBLY

Gerald K. Boyd, Kingfisher, Okla., assignor to Production Service & Equipment Incorporated, Kingfisher, Okla.

Filed Sept. 29, 1975, Ser. No. 617,867

Int. Cl.^{2} E21B *33/12*

U.S. Cl. 166—188 **7 Claims**



1. A standing valve for use in a tubing string, comprising:

a mandrel having an upper end, a lower end, and a bore therethrough communicating between the upper and lower ends thereof;

a packing element having a lower end sealingly connected around the mandrel between the upper and lower ends thereof, and an upper end circumferentially disposed between, and spaced from, the mandrel and the tubing string;

a valve body slidably retained on the mandrel between the packing element and the upper end of the mandrel, the valve body having an upper end, a lower end and a bore therein in fluid communication with the bore through the mandrel, and being slidable in a first direction to move the lower end thereof into the packing element between the upper end of the packing element and the mandrel to wedge the upper end of the packing element into sealing engagement with the tubing string; and,

a valve slidably retained in the bore through the valve body, the valve being slidable in the first direction to close the bore through the valve body, and in a second direction substantially opposite to the first direction to open the bore through the valve body.

3,970,146
SONIC CLEANING OF WELLS

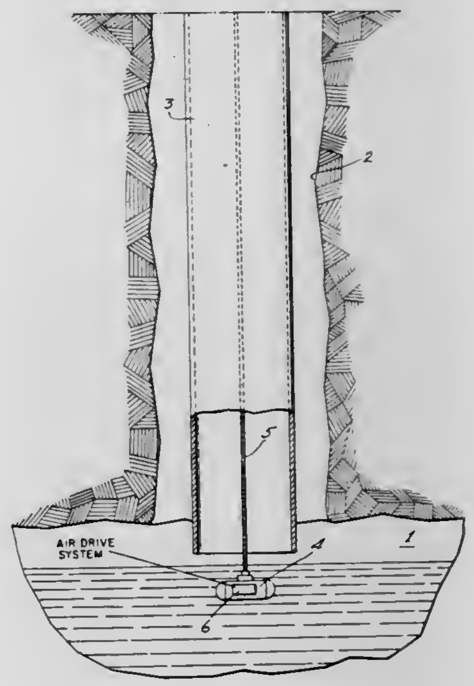
Bernard J. Keenan, Jr., West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 421,906, Dec. 5, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 519,961

Claims priority, application New Zealand, Sept. 2, 1974, 175302

Int. Cl.^{2} E21B *37/00*

U.S. Cl. 166—249 **1 Claim**



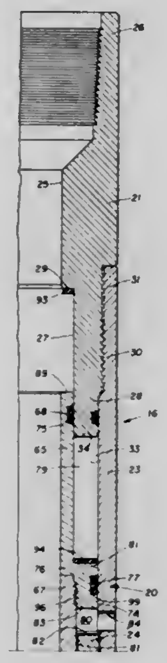
1. A method of cleaning a well pipe penetrating a fluid bearing formation comprising:

- a. adding diesel oil to the well pipe to maintain the liquid level at the desired level in the well pipe;
- b. placing a sonic generator with an air drive self propulsion unit below the liquid level in said well pipe;
- c. producing sound waves with the sonic generator in the liquid at sufficient intensity to break up residual tars and deposits inside the well pipe;
- d. activating the self propulsion unit so that the sonic generator is propelled through the entire length of pipe to be cleaned; and
- e. removing said deposits by means of fluid flow through said well pipe from said fluid bearing formation.

3,970,147
METHOD AND APPARATUS FOR ANNULUS PRESSURE RESPONSIVE CIRCULATION AND TESTER VALVE MANIPULATION

Robert L. Jessup, Duncan, Okla., and Joe E. Coleman, New Orleans, La., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 13, 1975, Ser. No. 540,361
Int. Cl.^{2} E21B *21/00, 47/06*
U.S. Cl. 166—250 **17 Claims**



1. In a pipe string located in a fluid filled wellbore so as to provide an annulus between said pipe string and said wellbore, said pipe string having an axial bore and a circulating valve, method of APR movement of said circulating valve from a first position preventing to a second position allowing fluid communication therethrough between said annulus and said axial bore, comprising the steps of:

a. isolating at least a portion of said axial bore from at least a portion of said annulus;
e. pressurizing said portion of said annulus to a pressure of at least a predetermined magnitude;
f. unlocking said circulating valve when said pressure of said portion reaches said predetermined magnitude;
g. moving said unlocked circulating valve from said first position to said second position in response to pressure in said portion of said annulus; and
h. maintaining said moved circulating valve in said second position in response to hydrostatic pressure in said portion of said annulus.

9. Apparatus for circulation of well fluids in response to pressure in an isolated portion of an annulus between the apparatus and a surrounding well bore, comprising:

a. a cylindrical housing having an axial interior bore and a passageway commmunicating the axial interior bore with the exterior of the housing;
b. a valve body carried by said housing and movable between a first position closing said passageway and a second position opening said passageway;
c. a first locking means for locking said valve body in said first position to said housing, and for unlocking said valve body from said housing upon a predetermined pressure applied to said valve body; and
d. piston means, attached to said valve body, for applying the pressure in said isolated portion of said annulus to said valve body, for moving said valve body to said second position upon the release of said first locking means and for maintaining said valve body in said second position in response to normal hydrostatic pressure in said isolated portion.

3,970,148
METHOD FOR STIMULATING WELLS COMPLETED IN OIL BEARING EARTH FORMATIONS

Loyd W. Jones, and George B. Holman, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

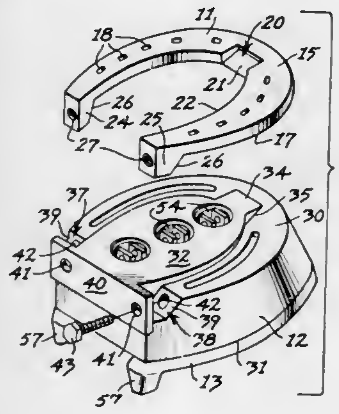
Filed Oct. 29, 1974, Ser. No. 518,441
The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl.^{2} E21B *43/27*
U.S. Cl. 166—307 **11 Claims**

1. In a process for cleaning and stimulating an oil, gas or injection well the improvement comprising introducing into said well an aromatic hydrocarbon solvent and thereafter injecting into said well an acidizing composition consisting essentially of from 30 to about 76 volume percent of an aqueous solution of a well acidizing nonoxidizing water-soluble acid and from about 70 to about 24 volume percent of a mixture of an octyl alcohol and a lower aliphatic alcohol selected from the group consisting of ethanol, the propyl alcohols and tertiary butyl alcohol, said octyl alcohol constituting at least about 2 volume percent of said composition and said lower aliphatic alcohol being present in a concentration of at least about 22 volume percent of said composition, said composition being capable of lowering the interfacial tension between the oil in said formation and said composition without the use of an added surface-active agent.

3,970,149
HORSESHOE

Sammie W. Featherstone, 2232 Maplecrest Drive, Donelson, Tenn. 37214

Filed Feb. 13, 1975, Ser. No. 549,464
Int. Cl.^{2} A01L *1/00*
U.S. Cl. 168—25 **4 Claims**



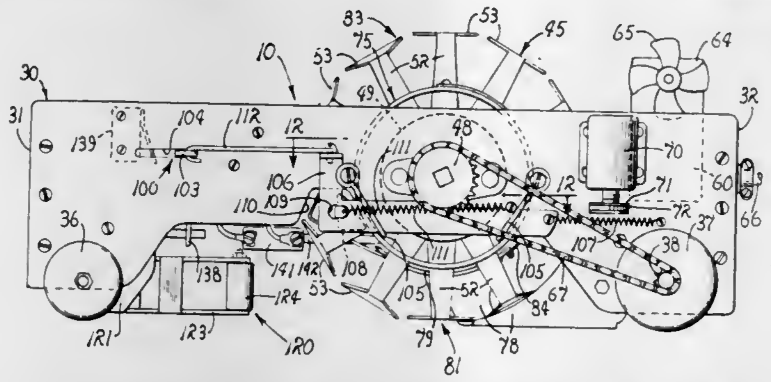
1. A horseshoe comprising:

a. a C-shaped upper shoe member resembling the shape of a conventional horseshoe, having top and bottom surfaces, a front portion, a large central opening, and separate rear portions forming depending calk members,
b. means for securing said upper shoe member to the bottom of a horse's hoof,
c. a body member having the shape of a hoof extension and having front and rear portions and top and bottom surfaces,
d. a boss projecting upward from the top surface of said body member and having a shape similar to the central opening in said upper shoe member for snug reception within said central opening in operative position, said boss projecting rearward between said calk members in operative position,
e. a first latch element on the front portion of said upper shoe member,
f. a second latch element on the front portion of said body member to latch the top surface of said body member flush against the bottom surface of said upper shoe member in operative position,
g. separate recesses formed in the rear portion of the top surface of said body member on opposite sides of said boss, each recess receiving a corresponding calk member in operative position,
h. a T-bar member fixed to the rear end portion of said boss and projecting transversely behind said recesses,
i. aligned threaded apertures through each depending calk member and its corresponding recess,
j. a registering aperture in each projecting portion of said T-bar aligned with said corresponding threaded apertures,
k. a threaded bolt for each calk member for registry with said aligned apertures to secure each of said calk members in its corresponding recess in operative position,
l. a lower shoe member having the general shape of a conventional horseshoe including a top surface conforming to the bottom surface of said body members, and
m. means for securing the top surface of said lower shoe member flush against the bottom surface of said body member in operative position.

3,970,150
METHOD AND APPARATUS FOR HARVESTING CROPS

Robert R. Gibson, Jr., 649 'C' St., Lemoore, Calif. 93245, and Joo I. Kim, 5275 N. Fresno St., No. 102, Fresno, Calif. 93710

Filed Dec. 5, 1974, Ser. No. 529,802
Int. Cl.^{2} A01D *23/06*
U.S. Cl. 171—56 **17 Claims**

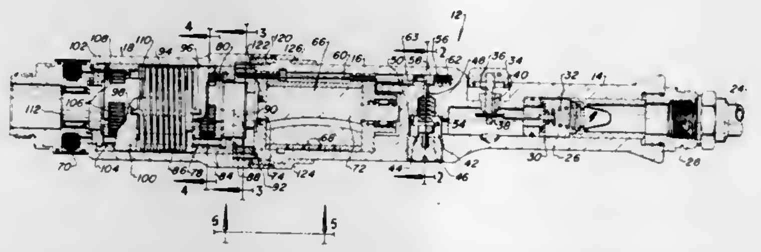


11. An apparatus for harvesting the mature growth of a crop, the apparatus comprising a frame having a picking station and adapted for movement relative to the crop to cause the growths of the crop to be passed in relative movement through the picking station; pairs of arms pivotally borne by the frame for picking the growths; means affixed on the frame for individually sensing mature growths; and guide means mounted on the frame in connection with the sensing means for urging said arms of said pairs toward each other and into the picking station, upon sensing of a mature growth by the sensing means, to pick said mature growth in the picking station, and resilient means between said arms resisting said movement toward each other.

3,970,151
TORQUE RESPONSIVE MOTOR SHUTOFF FOR POWER TOOL

William Workman, Jr., Spring Lake, Mich., assignor to Gardner-Denver Company, Dallas, Tex.

Filed July 3, 1975, Ser. No. 592,838
Int. Cl.^{2} B23B *45/04*
U.S. Cl. 173—12 **11 Claims**



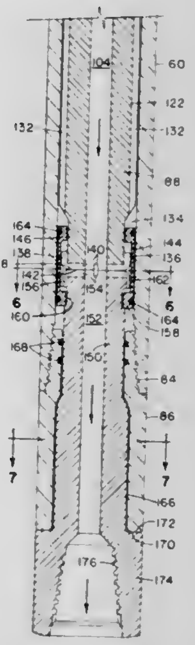
1. A power tool for tightening threaded fasteners and the like comprising:

housing means;
a pressure fluid operated motor disposed in said housing means;
valve means disposed in said housing means and operable to shut off the flow of pressure fluid through said motor;
drive mechanism including a planetary gear unit connected to said motor for rotatably driving a threaded fastener;
a first member disposed in said housing means and interposed in said drive mechanism, said first member comprising a rotatable ring gear of said planetary gear unit and a cam disposed on said first member and rotatable with said ring gear in response to a reaction torque imposed on said ring gear which is proportional to the torque exerted on said fastener;
a cam follower disposed for engagement by said cam and responsive to the rotation of said ring gear to effect actuation of said valve means to shut off the flow of pressure fluid through said motor at a predetermined torque exerted on said fastener; and,
a torsion coil spring disposed in said housing means and connected to said first member and being operable to be deflected from a substantially relaxed condition in response to rotation of said ring gear regardless of the predetermined torque at which motor shutoff is to be effected.

3,970,152
MUD ACTUATED DRILLING TOOL

Jesse W. Harris; Ross Bassinger, and Grey Bassinger, all of San Antonio, Tex., assignors to Bassinger Tool Enterprises, Ltd., San Antonio, Tex.

Filed June 14, 1974, Ser. No. 479,369
Int. Cl.^{2} E21B *1/06*
U.S. Cl. 173—15 **15 Claims**



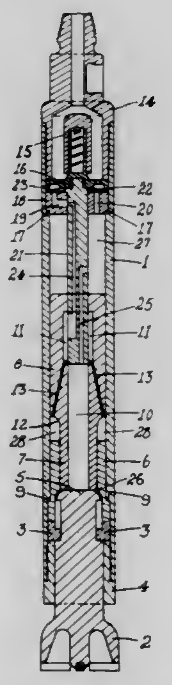
1. A fluid actuated impact drilling tool for use in rotary drilling comprising:

housing means;
means for connecting said housing means in a string of drilling pipe;
flow means through said housing means for allowing a fluid flowing in said drilling pipe to flow through said housing means;
single valve means slidably mounted in said housing means;
hammering means slidably mounted in said housing means, said single valve means and said hammering means moving independently of and relative to each other for periodically interrupting substantial flow of said fluid in said flow means by first moving along the axis of said drilling tool until both reach a plane perpendicular to said axis, said interruption of said fluid causing an increase in pressure of said fluid above said plane which drives both said

single valve means and hammering means in the direction opposite the first direction of movement along said axis;
said first movement of said single valve means and said hammering means being caused by a pressure differential between the fluid inside said flow means and outside of said housing means, pressure causing said pressure differential acting on given surfaces of said single valve and hammering means as defined by pressure areas enclosed by seal means; and
said housing means including an upper and a lower end with said fluid flowing in said upper end, through said housing means and out said lower end thereof, said hammer means forming a portion of said flow means that is in continuous and uninterrupted communication with said lower end of said housing means.

3,970,153
PNEUMATIC PERCUSSION MACHINES

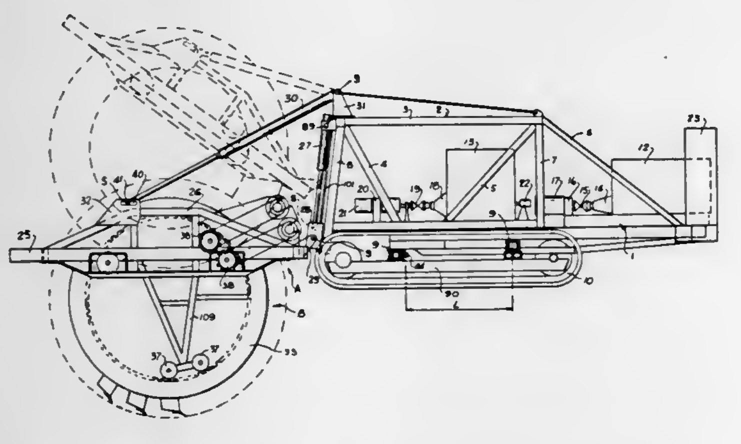
Abraham Gien, and Bernard Lionel Gien, both of P.O. Box 196, Swartruggens, Transvaal, South Africa
Filed Jan. 20, 1975, Ser. No. 542,411
Int. Cl.^{2} E21B *1/06*
U.S. Cl. 173—17 **5 Claims**



1. A pneumatic percussion machine including:
a hollow casing having opposite ends;
a valve assembly at one end of the casing;
a bit assembly at the other end of the casing;
a piston having opposite ends located in the casing and having an axially disposed bore extending the length of the piston;
a projecting member extending from the valve assembly into the bore of the piston and along which member the piston is adapted to reciprocate;
a first member chamber formed between one end of the piston and the valve assembly;
a second chamber formed in the vicinity of the other end of the piston between the piston and the casing,
a first fluid supply path through the valve assembly to the first chamber;
a second fluid supply path extending over a portion of its length through the valve assembly and projecting member and, for the remaining portion of its length, through the piston to the second chamber, such portions of the second fluid supply path being brought into communication with each other over a limited range of positions of the piston along the projecting member; and
a fluid exhaust path from the first chamber through the projecting member into the bore of the piston and then out through the casing end fitted with the bit assembly, such fluid exhaust path being open over a limited range of positions of the piston along the projecting member;
the piston being movable, as the valve assembly alternatively opens the first and second fluid supply paths, between a first position in which:
the piston is in contact with the bit assembly,
the second fluid path is open to the second chamber; and
the fluid exhaust path is open; and a second position, displaced towards the valve assembly from the first position, in which the first fluid supply path is open to the first chamber.

3,970,154
TOOL POWER SYSTEM USABLE AS SUBSTITUTE FOR VEHICLE PROPULSION

Fred Willie Bartels, Edmonton, Canada, assignor to Banister Pipelines, Ltd., Edmonton, Canada
Division of Ser. No. 343,107, March 20, 1973, Pat. No. 3,863,988. This application Aug. 23, 1974, Ser. No. 500,091
Int. Cl.^{2} E02F *5/02*
U.S. Cl. 173—24 **1 Claim**



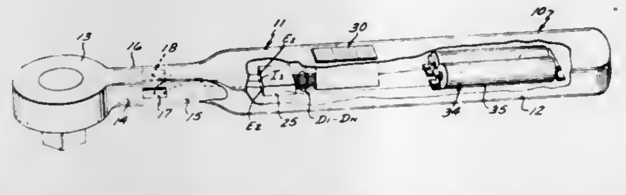
1. In a ditcher comprising
a carrier having a main frame carrying track assemblies, track assembly driving means, and an upstanding suspension frame secured to said main frame,
a rigid wheel frame carrying a rotatable digging wheel, conveyor, and conveyor driving means, said wheel frame being pivotally connected at its front end to the suspension frame and movable thereon between a lowered position and an elevated position, and
means for raising and lowering the wheel frame between said positions,
the improvement which comprises:
first engine means mounted on the carrier;
mechanical wheel drive means for rotating the digging wheel;
first hydraulic means, actuated by the first engine means, operatively connected to the wheel drive means;
second engine means mounted on the carrier;
second hydraulic means actuated by the second engine means, operatively connected to the track assembly driving means, conveyor driving means, and raising and lowering means; and
selectively operable cross-over means connecting the first and second hydraulic means to enable the first hydraulic means to actuate the track assembly driving means and the raising and lowering means.

3,970,155
ELECTRONIC TORQUE WRENCH

William M. Otto, Orange, Calif., assignor to Jo-Line Tools, Inc., Anaheim, Calif.
Division of Ser. No. 433,247, Jan. 14, 1974, Pat. No. 3,895,517. This application July 11, 1975, Ser. No. 595,135
Int. Cl.^{2} B25B *23/14*
U.S. Cl. 73—139 **6 Claims**

1. A torque wrench comprising, in combination:

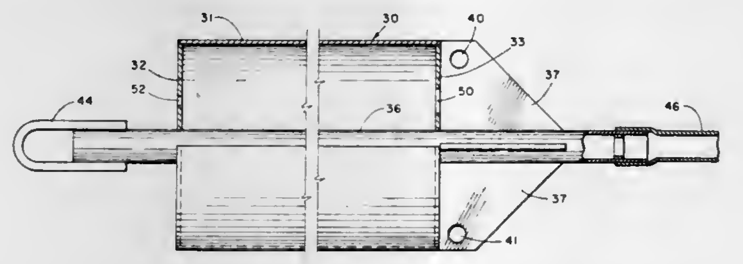
a wrench head;
a handle structure including an internal cavity at one end thereof and a beam section secured to said wrench head at the other end thereof;
a battery insertable into said internal cavity;
a pair of strain gages respectively attached to the opposed lateral surfaces of said beam section including a first and second resistive element connected in series and adapted to register strain deformation of said beam section in the form of resistive change;
resistive means connected across said first and second resistive elements to form a bridge circuit in combination therewith;
excitation means connected to said bridge circuit and to said battery for electrical excitation of said bridge circuit in a first and second polarity;
switching means connected to said excitation means for alternatively selecting said first or second excitation polarity according to the state of a received switching signal;



a clock circuit connected to said battery for producing a sequence of timed pulses;
counting means connected to said clock circuit for producing a plurality of binary signals indicative in combination to the accumulated count of said pulses;
gate means connected to selected ones of said binary signals for producing said switching signal corresponding to the status thereof;
connecting means connected to said bridge circuit, to said battery and to said counting means for alternatively passing a bridge balance signal produced by said bridge circuit or a fixed signal from said battery, selected according to the status of selected other ones of said binary signal;
accumulating means connected to said connecting means for accumulating in a first direction said bridge balance signal and in a second direction said fixed signal connected to said counting means and said accumulating means; and
readout means for displaying the accumulated count in said second direction.

3,970,156
WATER WEIGHTED CORER

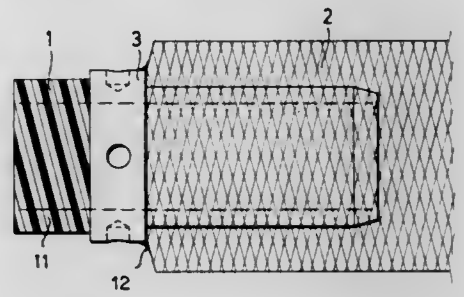
Shale Jack Niskin, Miami, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 15, 1975, Ser. No. 613,703
Int. Cl.^{2} E21B *7/12*
U.S. Cl. 175—6 **7 Claims**



6. An inherently stable free fall coring device comprising:
a body portion for providing the driving force of the device; and
structural means centrally disposed in said body portion and including a coring tube attached at the end thereof first entering the water and a bail attached at the end remote from said coring tube,
said body portion adapted to receive ambient water therein during the initial phase of free fall,
said received water forming substantially the entire weight required to drive said coring tube a selected distance into bottom sediment.

3,970,157
RAM-BORER APPARATUS

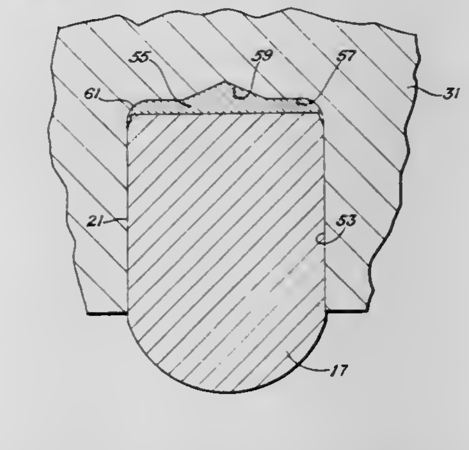
Paul Schmidt, Lennestadt, Germany, assignor to Tracto-Technik, Lennestadt, Germany
Filed July 30, 1973, Ser. No. 384,069
Claims priority, application Germany, Aug. 30, 1972, 2242605
Int. Cl.^{2} E21B *11/02*; F16L *1/02*
U.S. Cl. 175—22 **5 Claims**



1. A self-propelled pneumatic ram-borer apparatus, particularly suitable for effecting trial borings, comprising, in combination, a tubular housing having a forward end and a rearward end, a percussion piston reciprocally movable within said housing, a percussion tip arranged in said housing for axial displacement therein, said percussion tip being disposed to receive impact forces from said percussion piston to effect said trial borings and to bear against said housing, a resilient member interposed between said percussion tip and said housing through which said percussion tip bears against said housing, and a braided metallic drag-sock having an end connected to said tubular housing at the rearward end thereof and adapted to engage about a tube to be drawn through said trial borings, with said end of said drag-sock connected to said housing having an outer diameter which is approximately equivalent to the outer diameter of said tubular housing.

3,970,158
TOOTH LOADING FOR EARTH BORING BITS

Bill Adby Black, and Johannes Gerardus Leon Eenink, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.
Filed Apr. 28, 1975, Ser. No. 572,545
Int. Cl.^{2} E21C *13/00*
U.S. Cl. 175—410 **12 Claims**



1. An improved earth boring bit comprising a metal body, teeth formed of hard metal inserts secured interferringly in a circular row or drilled holes in the body to engage the bottom

of a borehole, a deformable pad under said inserts and in contact with said inserts and the mating associated interferring holes, the volume of the pad being greater than the remaining voids between the hole, the pad, and assembled insert upon initial assembly, and the hardness of the pad being less than that of the metal defining said holes, whereby the pad during drilling and repetitive loading fills said voids between the insert, the pad, and hole.

3,970,159
DOSING DEVICE FOR PNEUMATIC DELIVERY SYSTEMS

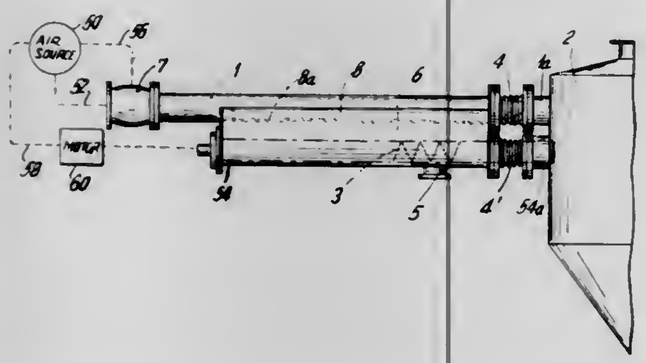
Horst Hahn, Offenbach am Main, Germany, assignor to Firma F. J. Gattys Verfahrenstechnik GmbH, Germany

Filed Aug. 4, 1975, Ser. No. 601,534

Claims priority, application Germany, Aug. 12, 1974, 2438699

Int. Cl.² G01G ***13/10***

U.S. Cl. 177—123 **8 Claims**



1. A dosing device for pneumatic delivery systems particular for handling powdery granular and similar materials, comprising a first delivery tube portion defining a first conduit portion for coarse dosing having a coarse dosing discharge, a second delivery tube portion defining a second conduit portion for fine dosing having a fine dosing discharge, means establishing a communication between said first and second conduits, screen means disposed in the communication between said first and second conduits for the passage of materials of selected size therethrough, valve means associated with said first delivery tube at a spaced location from said coarse dosing discharge for isolating said delivery tube from the pneumatic delivery system, and feed means associated with said second conduit for delivering material in said second conduit out through said fine dosing discharge after said valve means is closed.

3,970,160
CONTROL MEANS FOR ELECTRICALLY POWERED TRANSPORTATION MEANS

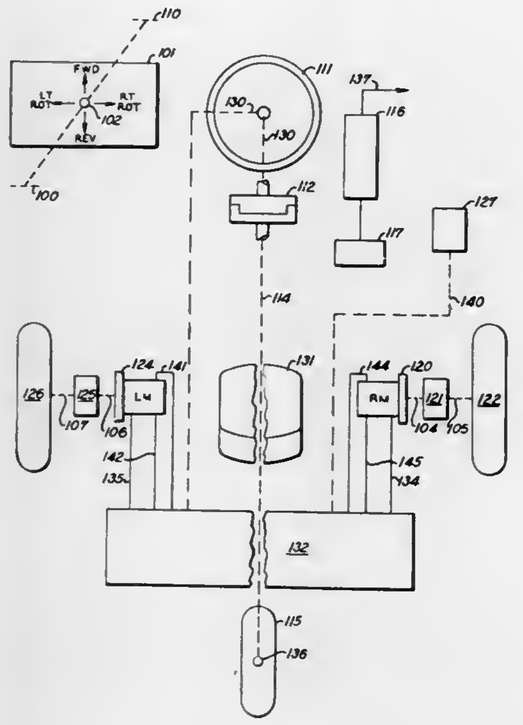
William Nowick, 1-B Plateau Place, Greenbelt, Md. 20770

Filed Nov. 6, 1973, Ser. No. 413,377

Int. Cl.² B62D ***11/04***

U.S. Cl. 180—6.5 **14 Claims**

1. An electrically powered transportation means which comprises frame means, a pair of propelling rotatable means on each side of said frame means, a pair of synchronous motors mounted on said frame means, one of each of said motors being connected to each of said rotatable means for turning said rotatable means at a rotational speed having a controlled predetermined relationship to the corresponding connected motor's rotational speed, each said motor including a torque producing drive field and a rotor field, a pair of electrical drive field producing means each determining the current frequency which separately synchronously determines substantially exactly the rotational speed of its corresponding said motors, electrical power producing means for the rotor field of each of said motors, and speed controlling means which performs the functions of separately and directly fixing the frequency of each said drive field producing means whereby said transportation means is propelled at a predetermined speed and steered in response to the separately governed rotational speeds of each of said motors.



3,970,161
MOTOR VEHICLE

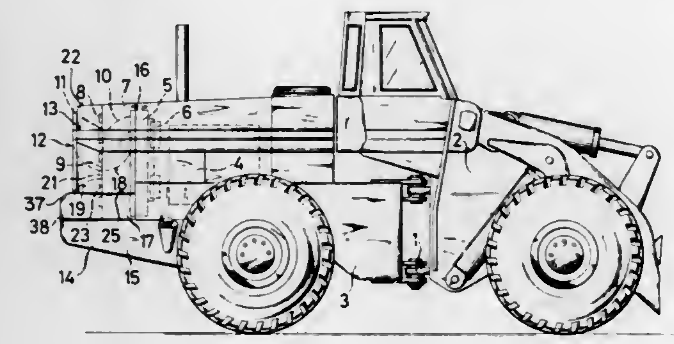
Wilhelm Rowe, Willich, and Jost Gerresheim, Dusseldorf, both of Germany, assignors to International Harvester Company, Chicago, Ill.

Filed July 24, 1975, Ser. No. 598,606

Claims priority, application Germany, July 31, 1974, 2436953

Int. Cl.² B60K ***11/04***

U.S. Cl. 180—54 A **5 Claims**



1. In a motor vehicle having a grill frame with top and lower sections, an engine, a radiator for cooling the engine and an engine-driven fan for blowing air through the radiator and out of said grill frame; the improvement comprising:

an air circulation box, having an upper portion and a protruding lower portion including upper faces thereon, connected air tight to said grill frame;

said upper portion defining with said grill frame a substantially vertical passageway;

said protruding lower portion forming a substantially horizontal passageway extending across the width of the vehicle and along the sides thereof essentially parallel to the longitudinal axis of the vehicle;

said horizontal passageway communicating with said vertical passageway adjacent said grill frame; and

at least one outlet opening formed in the upper faces of said protruding lower portion.

3,970,162
DEVICE FOR SUSPENDING THE BODY AND THE ENGINE-DRIVE UNIT IN AN AUTOMOBILE VEHICLE

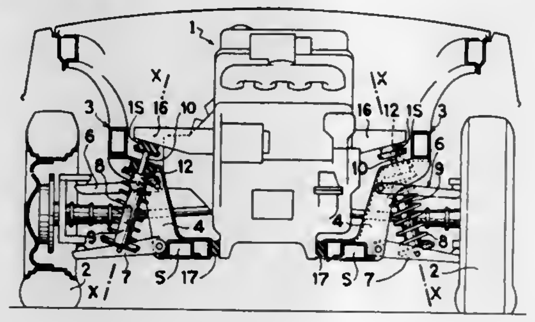
Robert Le Salver, Chanteloup les Vignes, and Dominique Poupard, Courbevoie, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Mar. 14, 1975, Ser. No. 558,358

Claims priority, application France, Mar. 28, 1974, 74.10934

Int. Cl.² B60G ***13/00;*** **B60K** ***5/00***

U.S. Cl. 180—64 R **9 Claims**



1. An elastically yieldable suspension device comprising a body of an automobile vehicle, a unit comprising an engine-drive assembly or engine of the automobile vehicle, a wheel assembly of the vehicle, a suspension member connecting the wheel assembly to the body, a damper having a lower part bearing against the suspension member and an upper part, the upper part and lower part being relatively movable in operation of the damper, a first elastically yieldable block elastically connecting said upper part to the body, and a second elastically yieldable block elastically connecting the upper part of the damper to said unit to support said unit.

3,970,163
AUTOMOTIVE VEHICLE DRIVE

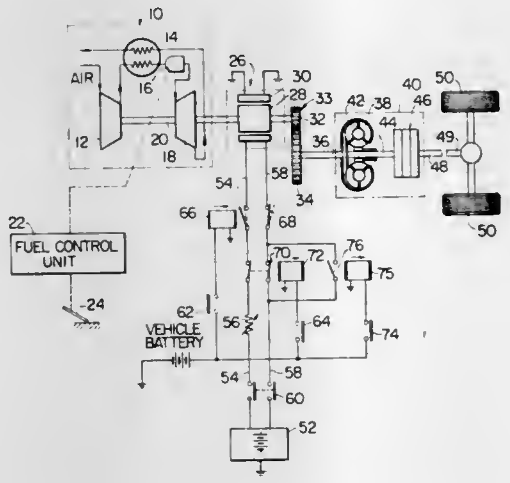
Keijiro Kinoshita, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,916

Claims priority, application Japan, Oct. 23, 1973, 48-119118

Int. Cl.² B60K ***9/00***

U.S. Cl. 180—65 A **5 Claims**



1. An automotive vehicle drive, comprising: a single shaft gas turbine engine having an output turbine shaft; a hydraulic torque converter driven by the output turbine shaft and including a forward-reverse gearbox; a motor-generator having an armature connected to the turbine shaft to rotate therewith and an electric field surrounding the armature; a battery; an accelerator switch which is closed as long as an accelerator pedal is depressed; an engine speed switch which is closed when the engine speed is higher than a predetermined level; a brake switch which is closed when a brake pedal is depressed; a first relay switch having a first pair of normally open contacts and a second pair of normally closed contacts, the first pair of normally open contacts of said first relay switch being connected in series with said electric field and said battery, the second pair of normally closed contacts of said first relay switch being connected in series with said electric field and said battery and in parallel with the first pair of normally open contacts; a first solenoid coactive with said first relay switch and connected in series with the accelerator switch, said first solenoid when energized urging said first relay switch to close the first pair of normally open contacts thereof and to open the second pair of normally closed contacts thereof; a second relay switch having a first pair of normally closed contacts and a second pair of normally closed contacts, the first pair of normally closed contacts of said second relay switch and the second pair of normally closed contacts of said second relay switch being connected with the first pair of normally open contacts of said first relay switch and the second pair of normally closed contacts of said first relay switch, respectively; a second solenoid coactive with said second relay switch and connected in series with said engine speed switch, said second solenoid when energized urging said second relay switch to open the first pair of normally closed contacts thereof and the second pair of normally closed contacts thereof; a sixth switch having a pair of normally open contacts connected in parallel with the second pair of normally closed contacts of said second relay switch; a third solenoid connected in series with said brake switch, said third solenoid when energized urging said sixth switch to close the pair of normally open contacts thereof; and a variable resistor connected with the first pair of normally closed contacts of said second relay switch.

3,970,164
SMALL-SIZED SNOWMOBILE

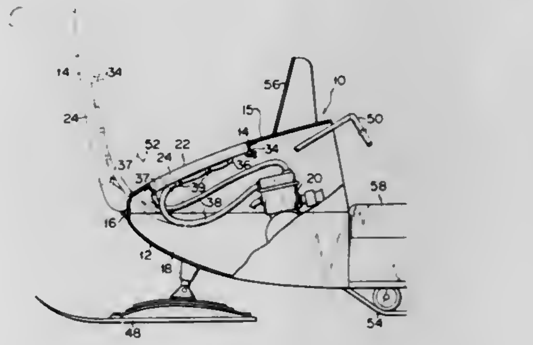
Keisuke Suzuki, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 17, 1974, Ser. No. 533,527

Claims priority, application Japan, Dec. 17, 1973, 48-144931[U]

Int. Cl.² B60K ***11/04;*** **B62D** ***25/12***

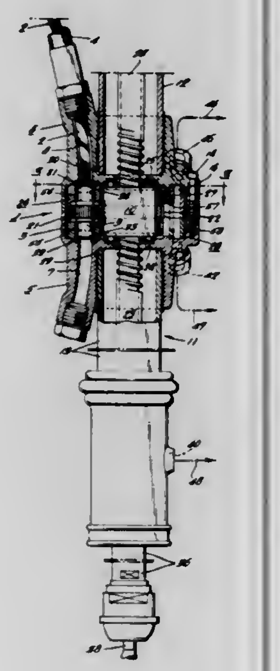
U.S. Cl. 180—68 R **6 Claims**



1. A small-sized snowmobile comprising a body, a water-cooled engine disposed within the forward end portion of the body, a cowl made of synthetic resin and including a wide upper portion inclined toward the forward end of the snowmobile to define, together with the body, an engine compartment, said wide upper portion of said cowl having an opening and a mounting portion at the marginal edge portion of the opening, and a radiator disposed in a manner to incline toward the forward end of the snowmobile and to permit the radiator to be directly exposed to the atmosphere through said opening and supported by the mounting portion, the front end of said cowl being swingably mounted on the body by means of a hinge, whereby said cowl and said radiator may be disposed to expose or cover said engine compartment.

3,970,165
POWER ASSISTED STEERING SYSTEM

Per Ulf Andersson, Lidkoping, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden
Filed Nov. 4, 1974, Ser. No. 520,655
Claims priority, application Netherlands, Nov. 2, 1973, 73.15091
Int. Cl.² B62D *5/08*
U.S. Cl. 180—155 **13 Claims**

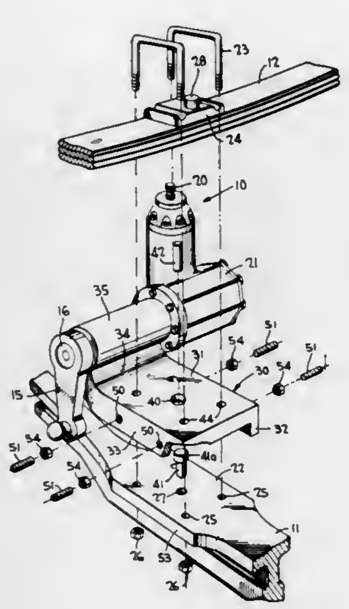


1. A power assisted steering system for a vehicle including a steering wheel operatively connected to steered wheels comprising a housing, a nut-and-screw mechanism mounted in said housing and comprising a nut member and a screw member, an input shaft mounted in said housing, at least one shaft connected at one end to the steering wheel and at its opposite end to said input shaft, intermeshing gear means carried by said input shaft and one of said members of said nut-and-screw mechanism, means operatively connecting the other member of said nut-and-screw mechanism to the steerable wheels, the members of said nut-and-screw mechanism being of a configuration to preclude rotation relative to one another whereby upon rotation of one of said members, the other member is actuated in a rectilinear direction to thereby effect movement of the steered wheels, hydraulic circuit means including a double-acting servo-cylinder and a control valve including a slide member for controlling flow of hydraulic medium to and from said servo-cylinder, said servo-cylinder being operatively connected to said other member of said nut-and-screw assembly, an element journalled to permit limited movement thereof in said housing circumferentially relative to the axis of one of the members of said screw-and-nut mechanism and operatively connected to the slide member of said control valve, said input shaft journalled in said element, said slide member normally disposed in a neutral position closing flow of pressure medium to said servo-cylinder, rotation of said shaft in one direction effecting rotation of said input shaft relative to said one member and circumferential displacement of said element from said neutral position to permit flow of pressure medium to said servo-cylinder.

3,970,166
AXLE MOUNTING OF INTEGRAL POWER STEERING GEAR

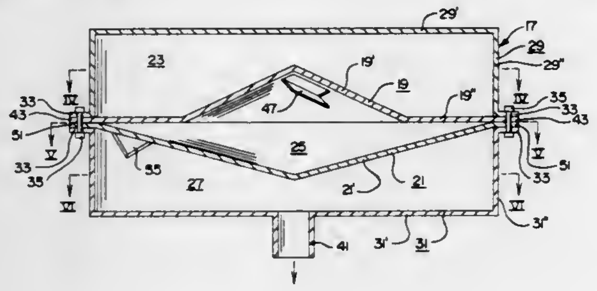
Richard H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331
Filed Jan. 23, 1975, Ser. No. 543,631
Int. Cl.² B62D *5/06*
U.S. Cl. 180—163 **14 Claims**

1. A bracket assembly for axle mounting of a power steering gear unit on a vehicle axle comprising
a base plate, means connecting said plate to said unit,
tight fitting pin means locating the base plate on said axle,
clamp means for holding said plate to said axle, and
positive locking means extending between said plate and said axle for positively resisting the lateral shifting and rotational reaction forces of said unit during operation.



3,970,167
ROTARY FLOW MUFFLER

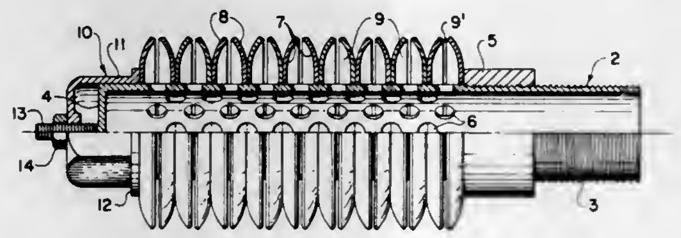
Joseph C. Irvin, 756 Ivy Road, Memphis, Tenn. 38117
Filed May 12, 1975, Ser. No. 576,635
Int. Cl.² F01N *1/08, 1/12*
U.S. Cl. 181—58 **11 Claims**



1. A rotary flow muffler for reducing the noise caused by exhaust gases emanating from an internal combustion engine, said muffler comprising a hollow circular body; first and second circular baffle memberrs fixedly interposed within said circular body, portions of said first and second baffle members being spaced apart from one another to divide the interior of said body into first, second, and third chambers; an inlet port commmunicating said first chamber with the exhaust structure of the engine with said inlet port being disposed substantially tangentially with respect to said circular body and being substantially parallel with the plane of said first baffle member for controllably directing the flow of exhaust gases to provide a spiraling counterclockwise motion within said first chamber, said first baffle member being provided with a plurality of centrally disposed ports for communicating said first and second chambers one with the other, said first baffle member including a plurality of central vortical vane means respectively being juxtapositioned relative to said plurality of centrally disposed ports for controllably redirecting the flow of the exhaust gases as they pass from said first chamber into said second chamber to provide an outward spiraling clockwise motion of the exhaust gases within said second chamber, said second baffle member being provided with a plurality of peripherally disposed ports for communicating said second and third chambers one with the other, said second baffle member including a plurality of peripheral vortical vane means respectively being juxtapositioned relative to said plurality of peripherally disposed ports for controllably redirecting the flow of the exhaust gases as they pass from said second chamber into said third chamber to provide a spiraling counterclockwise motion within said third chamber, and an outlet port concentrically disposed on said body for communicating said third chamber from without whereby the exhaust gases ultimately exit from said muffler.

3,970,168
MUFFLER

John R. Mucka, Pittsburgh, Pa., assignor to H. K. Porter Company, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 365,956, June 1, 1973, abandoned, which is a division of Ser. No. 484,587, July 1, 1974, Pat. No. 3,880,252
This application June 13, 1974, Ser. No. 478,909
Int. Cl.² F01N *1/10*
U.S. Cl. 181—60 **4 Claims**

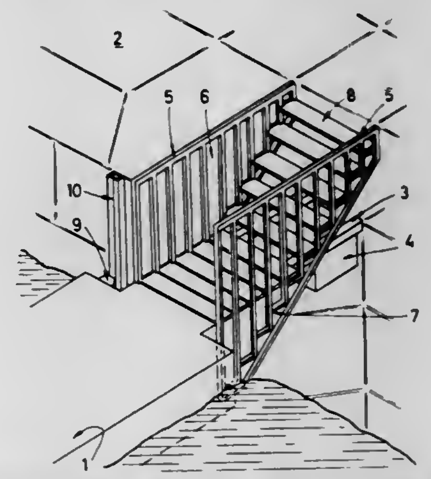


1. A muffler for reducing exhaust gas noise generated by internal combustion engines, air-driven tools and machines and the like comprising:

a. a straight tubular body of uniform diameter having means at one end for connecting it to the exhaust of an internal combustion or air-driven motor and having a closure at its other end, a length of the tubular body intermediate its ends having perforations therein extending lengthwise and circumferentially of the tubular body,
b. a series of generally substantially concavo-convex annuli all of the same diameter each having a central opening therethrough slidably fitted over the perforated lenght of the body, said annuli being arranged in several pairs in which the concave surfaces of the annuli of each pair are in confronting relation, each annulus having a flat central portion in which is the hole into which the tubular body is slidably fitted, the peripheral edge portion of the annuli of each pair being turned inwardly toward the peripheral edge portion of the other annulus of the pair, at least one annulus of each pair having spaced projections thereabout arranged to engage the confronting edge portion of the other annulus of the pair to provide between said confronting edge portions of each pair a circumferentially extending exhaust gas outlet which discharges directly to the ambient atmosphere, all of the projections in the muffler being of uniform height whereby the circumferentially extending exhaust gas outlets around each pair of confronting annuli is the same for all of the pairs, the spaces between the confronting faces of each such pair of annuli providing attenuation chambers around the tubular core into which the perforations in the tubular core discharge exhaust gases, the shape of said chambers being defined by the concave shapes of the confronting walls of the annuli, the circumferentially-extending exhaust gas outlet of each chamber having an area open directly to the atmosphere at least as great as te combined area of all of the perforations that open from the tubular body into each such chamber to avoid the build-up of back pressure in said attenuation chambers, the flat central areas of each annulus making face-to-face contact with the flat areas of the adjacent annulus whereby the annuli support one another against becoming tilted and thereby assure that the confronting edges of each pair of annuli are parallel around the periphery of each attenuation chamber; and
c. an abutment on the tubular body at each end of said series of annuli serving to confine the series of annuli on the tubular body over the perforated length of said body.

3,970,169
GANGWAY LADDER

Bernabe Hernandez Gonzalez, Calle Villalba Hervas 12°, Santa Cruze de Tenerife (Canarias), Spain
Filed Nov. 7, 1975, Ser. No. 630,063
Claims priority, application Spain, Mar. 8, 1975, 210608
Int. Cl.² B65G *11/00;* E06C *9/06*
U.S. Cl. 182—1 **4 Claims**

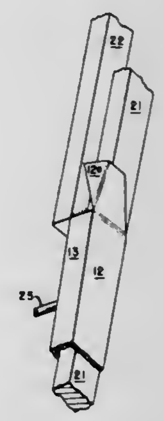


1. A gangway-ladder, for connecting a floating mooring platform to a dockside wall, comprising:

i. a guide structure secured to the dockside wall and defining a plurality of parallel vertical guide channels disposed in a row extending outwardly from the dockside wall, the base of each successive chanel considered in the direction away from the dockside wall being lower than the base of the preceding channel,
ii. a plurality of parallel steps disposed one in each of said guide channels,
iii. lifting beam means secured to the floating mooring platform and positioned to extend beneath the steps, and
iv. coupling means connecting the floating mooring platform and the dockside wall such that the floating mooring platform is held at a fixed spaced relationship from said dockside wall but is able to move vertically with respect thereto.

3,970,170
LADDER BRIDGING DEVICE

Robert D. Darling, 13 Jay St., Gloversville, N.Y. 12078
Filed Oct. 1, 1974, Ser. No. 510,992
Int. Cl.² E06C *7/50, 5/32*
U.S. Cl. 182—230 **1 Claim**



1. A ladder bridging device having an elongated U-shaped structure, said structure having first and second side walls interconnected by a central web connecting wall, said first side wall having an end portion inclined at an angle thereto,

wherein said second side wall has recesses formed therein to co-operate in supporting relationship with the rungs of a ladder structure, wherein said first and second side walls are of unequal length and are tapered longitudinally, and wherein said first side wall is longer than said second side wall.

3,970,171

THREE-STAGE LOAD-LIFTING ASSEMBLY FOR FORK-LIFT TRUCKS

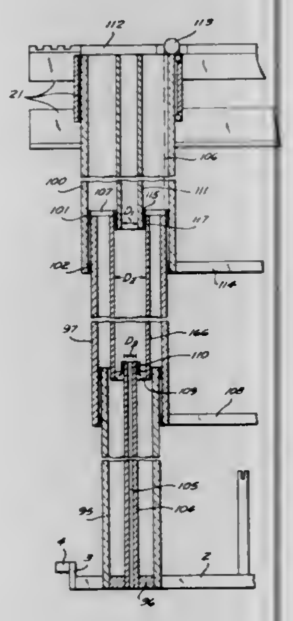
Gunter Honecker, Klein Welzheim, and Kurt Knappe, Sulzbach, both of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Germany

Filed June 26, 1975, Ser. No. 590,577

Claims priority, application Germany, June 26, 1974, 2430789

Int. Cl.² B66F *9/20*

U.S. Cl. 187—9 E **10 Claims**



1. A load-lifting assembly comprising:
a support;
an upright inner tube fixed on said support;
an intermediate tube vertically telescopingly slidable on said inner tube and guided thereon;
an outer tube vertically telescopingly slidable on said intermediate tube and guided thereon;
a load-engaging carriage vertically slidable along and guided on said outer tube;
a flexible elongated element connected to said carriage for controlling the displacement thereof;
a three-stage extensible hydraulic ram in addition to said tubes and having a first member secured to said inner tube, a second member riding on said first member and secured to said intermediate tube, and a third member riding on said second member and secured to said outer tube; and
means for pressurizing said three-stage ram to telescope said members for displacing said tubes and carriage from a down position with said carriage lowered and said outer tube completely surrounding said intermediate tube and said inner tube, an upper position with said carriage lifted and said tubes telescoped upwardly.

3,970,172

CLOSED-LOOP TYPE DISC BRAKE

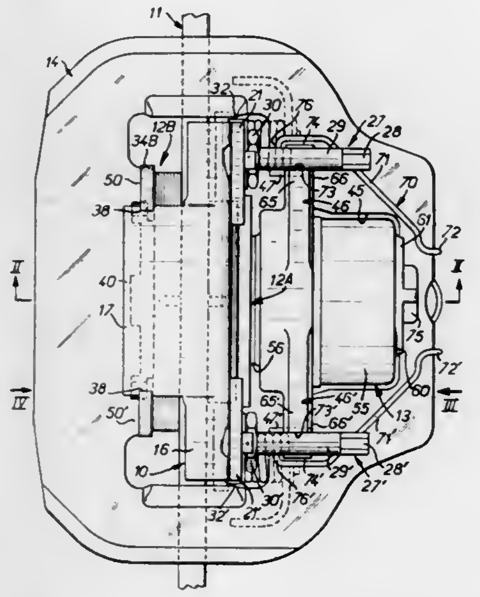
Gérard De Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 15, 1974, Ser. No. 524,342

Claims priority, application France, Nov. 16, 1973, 73.40831; Oct. 29, 1974, 74.36059

Int. Cl.² F16D *65/02*

U.S. Cl. 188—73.4 **37 Claims**



1. A disc brake comprising a fixed support, a disc adapted to be mounted for rotation on a shaft to be braked, a brake shoe disposed on each side of said disc and movable perpendicularly to the plane of said disc, a hydraulic operating unit disposed on one side of said disc and including a blind cylinder member and a piston slidably mounted in said cylinder member, said piston acting directly on one of said brake shoes adjacent thereto, a generally ring-like transfer member extending chordally of said disc and generally around said disc and said brake shoes and said hydraulic operating unit for acting on said other brake shoe in response to said cylinder member, resilient means secured to said fixed support and urging said transfer member radially outwardly relative to said disc, retention means for limiting the radial movement of said transfer member including two retaining and guiding pin means removably mounted on said fixed support and extending to said one side of said disc, both said pin means being substantially parallel to the axis of said disc, said cylinder member having at least one flat guiding surface thereon opposite each said pin means and in sliding line contact with said pin means.

3,970,173

DEVICE IN A FLUID PRESSURE ACTUATED BRAKE UNIT FOR ENABLING THE OUTGOING PUSH ROD TO BE BROUGHT BACK FROM THE OUTSIDE

Nils Borje Lennart Sander, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

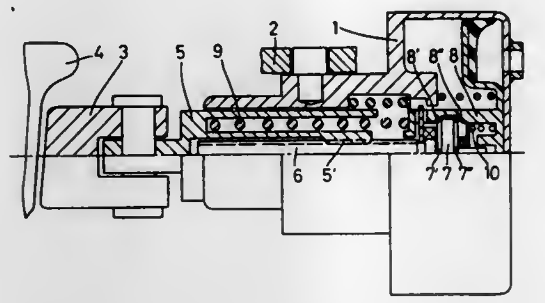
Filed June 11, 1975, Ser. No. 585,813

Claims priority, application Sweden, June 24, 1974, 7408249

Int. Cl.² F16D *65/56*

U.S. Cl. 188—203 **1 Claim**

1. In an automatic adjuster unit having a single acting slack adjuster and movable piston fluid brake unit coupled to move a push rod toward a braking position, means for enabling the push rod to be returned against the single action of said adjuster, comprising in combination, an axially disposed rotatable element, a non-rotatable element, threads between said two elements in non-self-locking engagement permitting the rotatable element to rotate, a clutch having two clutch surfaces positioned on said rotatable element to engage mating clutch surfaces in opposite axial positions of said rotatable element, the said mating clutch surfaces disposed for movement with said piston, a spring biased to hold one axial pair of clutch surfaces engaged by the push rod in the brake applying direction so that the clutch surfaces can become disengaged when the push rod is returned by a pressure exceeding the spring force, and an axially movable member placed along said push rod to engage the clutch at the fully retracted piston position and hold the clutch surfaces axially in a position with both clutch surfaces disengaged.



3,970,174

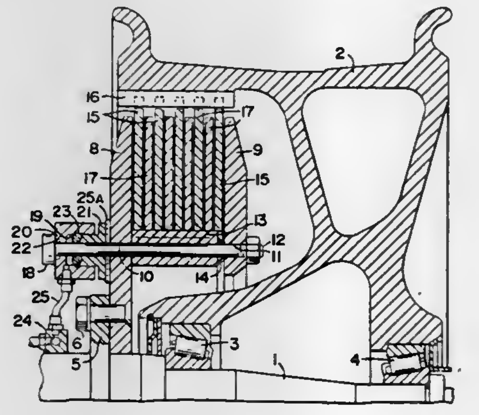
LOW WEAR DISK BRAKE ASSEMBLY

Fred P. Kirkhart, Atwater, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Continuation of Ser. No. 433,860, Jan. 16, 1974, abandoned. This application May 15, 1975, Ser. No. 577,914

Int. Cl.² F16D *69/02*

U.S. Cl. 188—251 A **10 Claims**



1. A low wear disk brake comprising:
a disk characterized by being made from a carbon base material,
a flexural strength of greater than 5,000 psi,
said disk having a density greater than 1.40 grams per cc, and impact strength greater than 5 inch pounds per inch, an amount of carbon or graphite of at least about 75 percent of the total disk volume, and
an average interlaminar spacing of crystalline and amorphous carbon of not more than 3.39 angstrom units at 15°C.

3,970,175

SUPPORT FOR AN ACTUATING ARM OF A CONTROL ELEMENT OF A SPRING CLUTCH

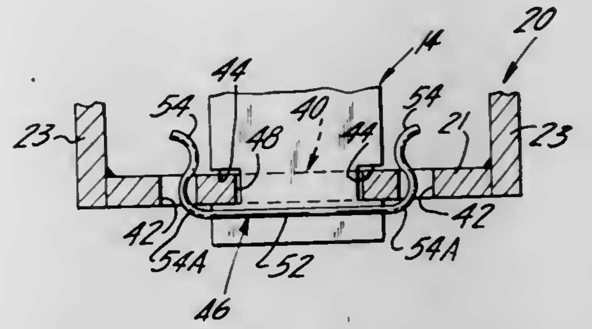
Donald J. Baxter, South Euclid, Ohio, assignor to Marquette Metal Products Company, Cleveland, Ohio

Filed Sept. 2, 1975, Ser. No. 609,689

Int. Cl.² F16D *11/02*

U.S. Cl. 192—22 **7 Claims**

1. In combination with an actuating arm movable into and out of engagement with a control spring element of a spring clutch mechanism, a support means for said actuating arm which comprises:
a. a frame having a first opening second openings adjacent to and on opposite sides of said first opening;
b. said actuating arm being slidably receivable in said first opening in the frame; and



c. a retaining member spanning said first opening and slidably receivable in said second openings to grip the frame and thereby engage and retain said actuating arm in said first opening.

3,970,176

SPEED-CHANGING SYSTEM WITH TWO FLUID-ACTUATED CLUTCHES

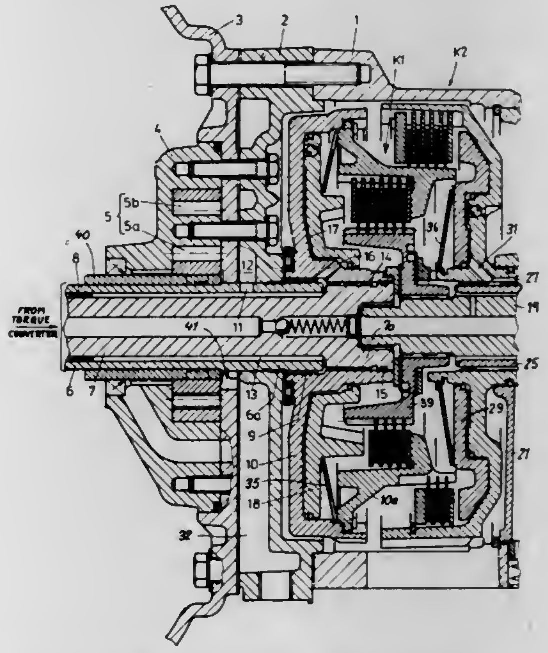
Manfred Bucksch, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Dec. 23, 1974, Ser. No. 535,701

Claims priority, application Germany, Dec. 24, 1973, 2364540

Int. Cl.² F16D *25/10*

U.S. Cl. 192—87.11 **8 Claims**



1. A speed-changing system comprising:
an engine-driven input shaft;
an inner output shaft and a surrounding outer output shaft coaxial with said input shaft;
planetary-gear means connecting said output shafts to a load;
a transmission housing surrounding parts of said input and output shafts;
a first clutch in said transmission housing including a first clutch housing positively connected with an extremity of said input shaft, first coacting annular friction elements in said clutch housing and on an extremity of said inner output shaft, and a first piston in said first clutch housing actuatable for making said first friction elements effective to couple said input shaft with said inner output shaft;
a second clutch in said transmission housing including a second clutch housing positively connected with an extremity of said outer output shaft, second coacting annular friction element on said first clutch housing and in said second clutch housing, and a second piston in said second

clutch housing actuatable for making said second friction elements effective to couple said input shaft with said outer output shaft;

a source of high-pressure fluid provided with valve means for selectively admitting said fluid to a first and second passage in said transmission housing respectively leading to said first and second clutch housings for selectively actuating said first and second pistons; and

a stationary member rigid with said transmission housing traversed by said output shafts, said member adjoining said second clutch housing and defining therewith a ring channel forming part of said second passage, said second housing being provided with a bore communicating with said ring channel and with the interior of said second clutch housing.

3,970,177
HYDRAULIC RELEASE MECHANISM FOR CLUTCHES

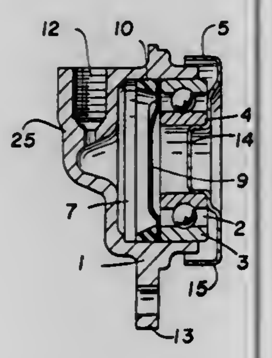
Roy Peter Garrett, Gothenburg, Sweden, and Derek Ray Parkins, Barton, England, assignors to SKF Trading and Development Co. B.V., Amsterdam, Netherlands

Continuation-in-part of Ser. No. 349,456, April 9, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,357

Claims priority, application United Kingdom, Apr. 13, 1971, 9244/71; Sept. 3, 1971, 41245/71; Germany, Apr. 13, 1972, 2217942

Int. Cl.² F16D *25/08*

U.S. Cl. 192—91 A **9 Claims**



1. A hydraulic release mechanism for automobile clutches and the like comprising a housing open at one end, a bearing located within said housing comprising a rotating race ring adapted to be connected to the operating member of said clutch, a non-rotating race ring and a plurality of rolling elements located therebetween, said non-rotating race ring being slidably arranged with respect to the housing, and including slidable seal means enclosing the space between the housing and the non-rotating race ring to permit said race ring to slide on introduction of pressurized fluid into said housing without loss of fluid, said rotating ring being the inner ring of said bearing and said operating element is a thin walled cup-shaped member secured to the inner race ring and covering the open end of the bearing and the release mechanism.

3,970,178
CHAIN SAW CLUTCH WITH ENGAGING AND RELEASING CENTRIFUGAL WEIGHTS

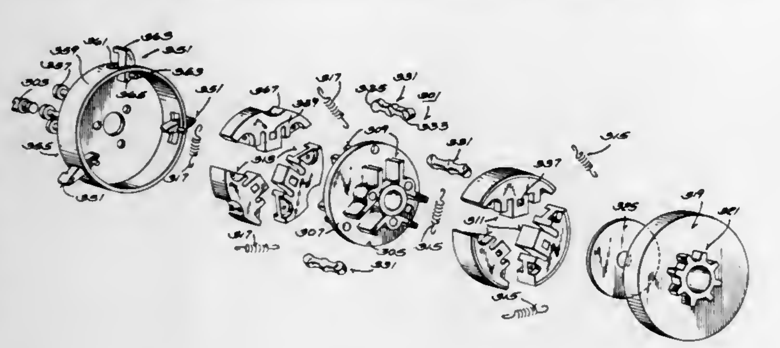
Ulrich O. Densow, Peterborough, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 4, 1973, Ser. No. 393,758

Int. Cl.² F16D *43/14;* **B27B** *17/00*

U.S. Cl. 192—105 BA **24 Claims**

1. A chain saw comprising a frame, an engine mounted on said frame, a drive shaft rotatably mounted on said frame and driven by said engine, a clutch driven by said drive shaft and including a rotatable clutch drum, a clutch shoe movable relative to a position of driving engagement with said clutch drum in response to clutch shoe rotation, and selectively operable counter weight means connected to said clutch shoe for preventing engagement of said clutch shoe with said clutch drum, a bar mounted on said frame for movement bebtween a first position and a second position spaced from said first position, and means operably connected to said bar and to said counter weight means for operating said counter weight means to prevent clutch shoe engagement when said bar is in said first position and to permit clutch shoe engagement when said bar is in said second position.



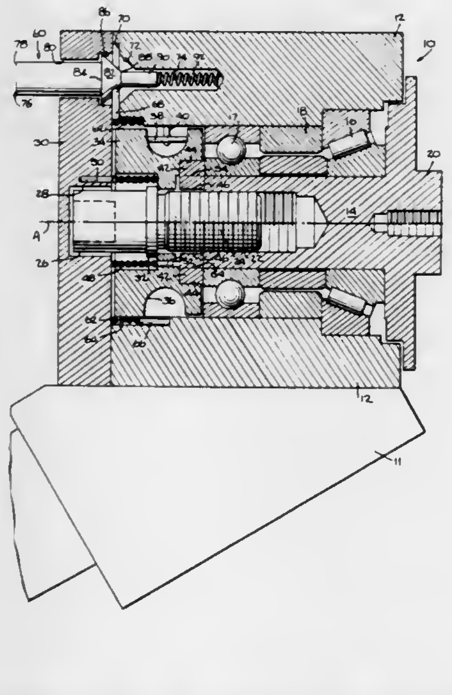
3,970,179
DIE HOLDER

Jerome Friedman, 39-39 29th St., Long Island City, N.Y. 11101

Filed June 10, 1975, Ser. No. 585,463

Int. Cl.² F16D *71/100*

U.S. Cl. 192—138 **12 Claims**



1. A die holder comprising: a housing; a spindle supported for rotation in and relative to said housing, said spindle terminating in a free end portion capable of supporting a die; position-referencing means operatively associated with said housing and spindle for governing an at-rest position of said spindle, said position-referencing means including respective abutment means operatively associated with said spindle and housing for limiting rotation of said spindle to less than 360° and resilient means for urging said spindle to a rotary position at which the respective abutment means of said spindle and housing are pressed against one another; collar means for carrying the respective abutment means of said spindle in a path and at a position engageable with the respective abutment means of said housing, said collar means including an inner annular flange, said spindle including annular flange means disposed axially beyond said inner annular flange at an end portion of said spindle opposite said free end portion of said spindle, said annular flange means pressing axially against said inner annular flange to prevent axial separation of said collar means from said spindle and frictionally resist turning of said spindle relative to said collar means; and shearable means for fixedly securing said collar means radially to said

spindle to prevent the latter from turning relative to said collar means, said shearable means having a shear-resistance less than the bending and fracture-resistance of said spindle, housing, collar means and abutment means; whereby, upon the application of an excessive torque to said spindle tending to rotate the latter to a position at which the respective abutment means of said spindle and housing contact one another substantially 360° beyond said at-rest position of said spindle, said shearable means will shear at a circumferential parting line between said collar means and spindle to rotatably free said spindle from said collar means and thereby obviate damage to said spindle, housing, collar means and abutment means.

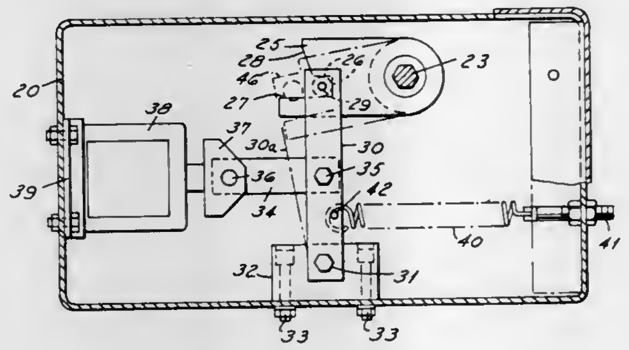
3,970,180
RETRACTABLE STOP

Herman Schlottmann, 2299 Rush Lake Road, Pinckney, Mich. 48169, and John G. Melchior, 2200 Scottwood No. 310, Toledo, Ohio 43620

Filed Oct. 22, 1974, Ser. No. 516,975

Int. Cl.² B65G *13/00*

U.S. Cl. 193—35 A **4 Claims**



1. A retractable stop mechanism for arresting article travel along a roller conveyor characterized by a stop arm pivotally mounted between adjacent rollers to extend above and below the upper support surface of the rollers in respective blocking and retracted passing positions, the geometry of said stop arm mounting causing forward article travel along said conveyor to move said stop arm from said blocking to said retracted position, a latch means for holding the stop arm in said blocking position, selectively operable means for releasing said latch mechanism to permit an article travelling on the roller conveyor to retract and pass over the stop arm, means for restoring said stop arm and latch means to said blocking position, and article weight responsive means for rendering said last means inoperative during the overpassing of any article begun prior to said restoration; said retractable stop mechanism including a cross shaft with pivotally mounted ends having said stop arm rigidly mounted thereon, said latch means comprising a latch plate secured to said cross shaft with means for engaging said latch plate to prevent its pivotal movement when said stop arm is in blocking position including a recess in said latch plate spaced from the shaft pivotal axis, a roller for engaging said recess in a direction opposing pivotal movement of said latch plate and cross shaft, and a retractable reactive mounting for said roller movable between operative blocking and inoperative nonblocking positions in response to said selectively operable means.

3,970,181
TWO-COIN-OPERATED DISPENSING MECHANISM

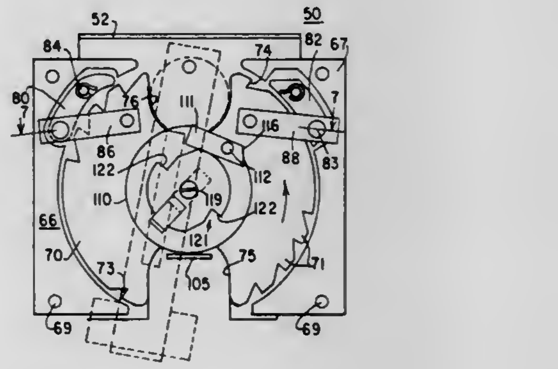
Alfred M. Rubio, Chicago, Ill., assignor to National Sanitary Laboratories, Inc., Chicago, Ill.

Filed Aug. 11, 1975, Ser. No. 603,516

Int. Cl.² G07F *5/04*

U.S. Cl. 194—63 **15 Claims**

1. Coin controlled apparatus comprising coin-enabled means operative upon receipt of a coin therein for undergoing a predetermined movement, actuating means movable for actuating an associated device, and clutch mechanism coupled to said coin-enabled means and movable between an engaged condition coupling said actuating means to said coin-enabled means for movement therewith and a disengaged condition decoupling said actuating means from said coin-enabled means, operation of said coin-enabled means upon receipt of a first coin therein effecting movement of said clutch mechanism to the disengaged condition thereof so that said actuating means is not moved with said coin-enabled means, further operation of said coin-enabled means upon receipt of a second coin therein effecting movement of said clutch mechanism to the engaged condition thereof for moving said actuating means with said coin-enabled means to perform said predetermined function, whereby said predetermined function is performed only after two coins are received in said apparatus.



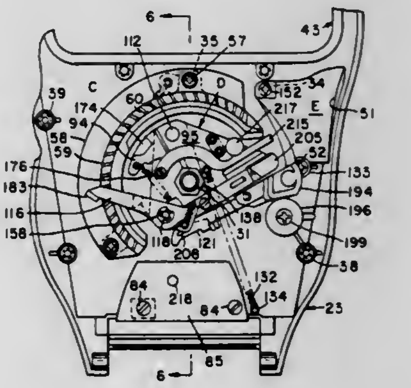
3,970,182
MULTIPLE COIN PARKING METER

William C. Kiehl; Thomas F. Moore, both of Russellville, and Jimmie C. Teague, Dover, all of Ark., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 540,129, Jan. 10, 1975, abandoned. This application Oct. 22, 1975, Ser. No. 624,673

Int. Cl.² G07F *5/00*

U.S. Cl. 194—84 **12 Claims**



1. In a time setting mechanism for setting time in accordance with the denomination of coin inserted therein, a housing, a coin opening in said housing for inserting a coin into said mechanism, coin carrying means having a receptacle for receiving a coin inserted into said meter mechanism and movable from an initial postion for receiving a coin into said receptacle through a time setting cycle, a plurality of parallel timesetting cam surfaces associated with said coin carrier extending adjacent to the path of movement of a coin in said coin carrier, at least two of said cam surfaces being displaced from each other in a direction perpendicular to the direction of movement of said coin carrying means, additional unitary fixed cam means within said housing responsive to the size of said coin to align said coin with a selected one of said time setting cam surfaces.

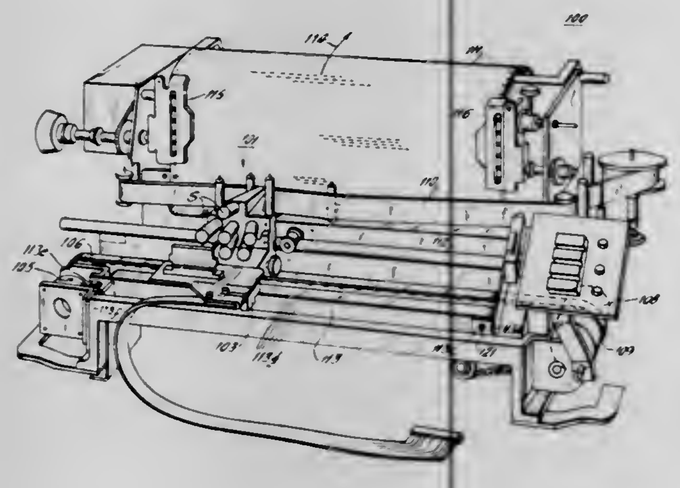
3,970,183
RANDOM ACCESS LINE PRINTER

Prentice Robinson, Pelham, and Paul S. Ramsden, Jr., Hudson, both of N.H., assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed June 5, 1974, Ser. No. 476,581

Int. Cl.^{2} B41J *3/04*

U.S. Cl. 197—1 R **27 Claims**



1. Registration apparatus for use with line printers having means for supporting and feeding a paper document;
- print head means for printing characters on said document;
- a carriage supporting said print head in close proximity to said document supporting means and means for moving said carriage relative to said document to effect printing of a line;
- said registration apparatus comprising:
- an elongated stationary registration strip positioned in spaced substantially parallel fashion relative to said supporting means, said strip having a plurality of uniformly spaced slits each separated from adjacent slits by opaque bars, said slits being adapted to pass light therethrough;
- housing means mounted on said carriage and movable therewith;
- said housing means having a slot for receiving said strip;
- first and second chambers being provided in said housing means on opposite sides of said slot;
- a light source being mounted in said first chamber;
- said first chamber having an opening communicating with said slot to cause light from said source to impinge on said strip;
- photodetector means mounted in said second chamber;
- said second chamber having a narrow rectangular opening communicating with said slot for passing light passing through only one slit in said strip at any given instant to activate said photodetector means for generating a pulse to actuate said print head means for printing characters at precise locations along said document;
- said paper document is being adapted to have a maximum number *n* of characters printed on each line;
- said strip having *n*/2 slits;
- said photodetector means being adapted to generate a pulse as said rectangular opening passes each slit whereby the leading edge of said pulse occurs as said opening passes one edge of a slit and wherein the trailing edge of the pulse occurs as the rectangular opening passes the opposite edge of the slit;
- circuit means coupled to said photodetector means for generating a first narrow pulse responsive to the leading edge of the pulse generated by said photodetector means and for generating a second narrow pulse responsive to the trailing edge of the pulse generated by said photodetector means, said first and second narrow pulses being of substantially equal pulse width and being of a pulse width which is substantially narrower than the pulse width of the pulse generated by said photodetector means;
- the output of said circuit means being coupled to said print head means to enable the print head means twice for each slit passed by said rectangular opening.

3,970,184
MOSAIC PRINTING HEAD FOR TYPEWRITERS OR SIMILAR MACHINES

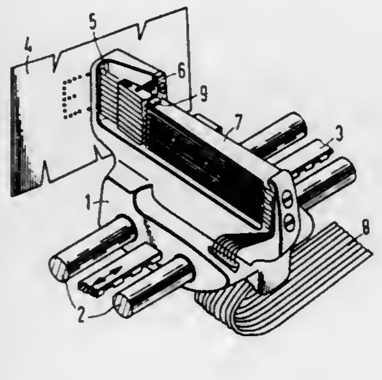
Hans Helmrich, Geisenbrunn, and Max Guntersdorfer, Zorneding, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,555

Claims priority, application Germany, Aug. 20, 1973, 2342021

Int. Cl.^{2} B41J *3/10*

U.S. Cl. 197—1 R **4 Claims**



1. A mosaic printing head for typewriters, data printers, teleprinters and the like utilizing dot-producing, pin-like elements for recording characters in the form of elements of a dot pattern upon a data carrier, comprising a plurality of like dot-producing printing elements disposed in adjacent parallel relation in a straight row extending transversely to the line of printing involved, and defining the maximum height of the characters to be formed with at least some of the characters comprising selected dots of a plurality of successively formed rows of dots produced by said elements, like piezoelectric transducers for the respective printing elements, each transducer comprising an elongated, flat, relatively thin piezoelectric member having opposite sides of relatively large area, and relatively small edge and end areas, the opposite sides of each member carrying respective electrode layers for applying electric fields to the member for effecting elongation and contraction thereof, said transducer members being disposed in stacked substantially parallel relation with corresponding ends and edges disposed substantially in respective common planes, and the electrode layers of adjacent members disposed in opposed relation, the respective transducer members having a thickness such that each of the latter are disposed in longitudinal alignment with its cooperable printing element, each printing element having an operational travel greater than the elongation-contraction dimension of the cooperable transducer member in such operational direction, and being relatively freely movable in said operational direction with respect to and independently of the cooperable transducer member, with the end of the latter disposed to transmit driving forces to the cooperable printing element in response to predetermined movement of such transducer member, as the result of the application of a corresponding field to such electrodes, whereby such printing element is accelerated toward such a data carrier, and resilient means for urging each printing element in a direction toward its cooperable transducer member, said resilient means exerting forces upon the printing elements which are considerably lower than the driving forces acting thereon by the action of the cooperable transducer members as a result of changes in the electric fields to which they may be subjected.

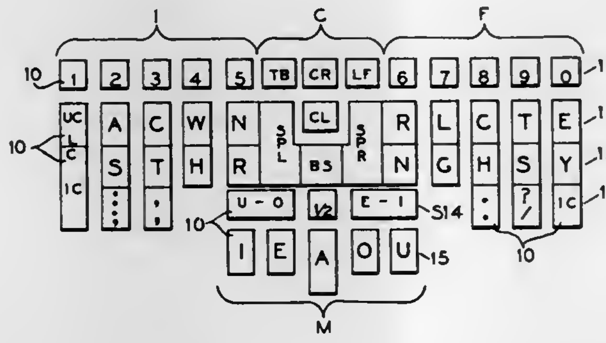
3,970,185
SYLLABIC TYPEWRITER

Dothan L. Shelton, Amarillo, Tex., assignor to Syllographic Machines, Inc.

Filed Dec. 30, 1971, Ser. No. 213,863

Int. Cl.^{2} B41J *3/26, 3/10*

U.S. Cl. 197—9 **16 Claims**



1. A syllabic keyboard for writing machines wherein the initial keys A C W N S T H R and the final keys R L C T E N G H S Y are arranged as follows: the initial keys are in a position to be operated with the fingers of the left hand; the A key is immediately back of the S key and the two keys are adjacent; there is a space between the A key and the C key; there is a space between the S key and the T key; there is a space between the C key and the W key; there is a space between the T key and the H key; the H key is immediately forward of the W key and there is a space between the H key and the R key; there is a space between the W key and the N key; the R key is immediately forward of the N key; and the final keys are in the position to be operated with the right hand, the R key is immediately behind the N key and adjacent thereto; there is a space between the R key and the L key; there is a space between the N key and the G key; the G key is immediately forward and adjacent to the L key; there is a space between the L key and the C key; there is a space between the G key and the H key; and the C key is immediately behind and adjacent to the H key; there is a space between the C key and the T key; there is a space between the H key and the S key, and the S key is immediately forward of the T key adjacent thereto; there is a space between the T key and the E key; and there is a space between the S key and the Y key, and the Y key is immediately forward of the E key and adjacent thereto.

3,970,186
DAMPER FOR A COMPOSITE PRINT WHEEL

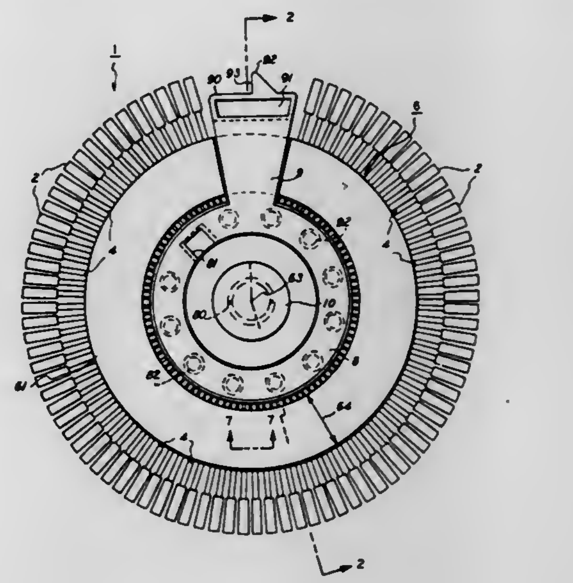
Gordon Sohl, Richardson; Svetislav Mitrovich, and Ernest L. Staples, both of Dallas, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 509,194

Int. Cl.^{2} B41J *1/32*

U.S. Cl. 197—54 **7 Claims**

1. A print wheel for an impact printer comprising
- an insert member having a plurality of beams extending radially outward from a generally circular center section in a substantially common plane with the beams being deflectible in a print direction generally normal to the common plane,
- character slugs near the outer ends of the beams having impact surfaces engageable by hammer means to deflect the slug in the print direction enabling print surfaces on the slugs shaped in the form of characters to cooperate in a process for marking a record medium,
- a first generally circular damper means adhesively coupled to one side of the beams, and
- a second generally circular damper means adhesively coupled to the other side of the beams, said first and second damper means being adhesively coupled to each other in the regions between the beams.



3,970,187
SAFETY DEVICE FOR PASSENGER CONVEYOR

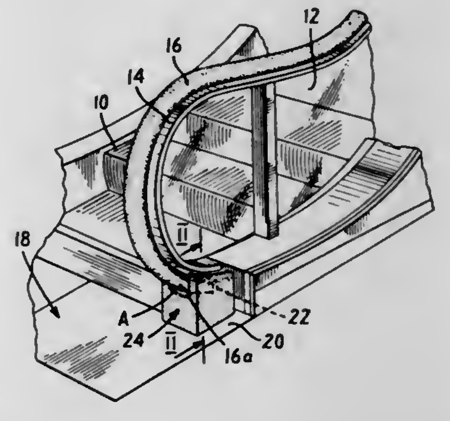
Shigeru Esaki; Shigeru Murata; Matsuhiko Ishida, and Katsumi Kito, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 11, 1974, Ser. No. 522,891

Claims priority, application Japan, Nov. 12, 1973, 48-130606[U]; Nov. 19, 1973, 48-133996[U]

Int. Cl.^{2} B66B *9/12*

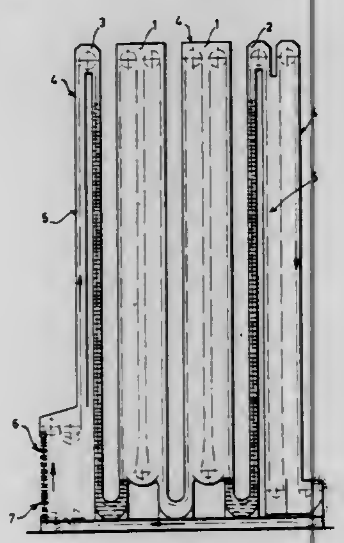
U.S. Cl. 198—16 R **4 Claims**



1. In a passenger conveyor comprising a balustrade, a movable handrail traveling in use along the periphery of the balustrade and turned in its direction of travel at a conveyor departure landing, and a guide port for introducing the handrail into the mechanical portion of the passenger conveyor after it has been turned; a safety guard for the balustrade comprising: a barrier member disposed in front of said guide port and formed of a breakable material capable of easily being broken upon the application of a very low pressure by a conveyor passenger inadvertently applying pressure thereto and which produces a sound when breaking; and means defining an open groove on said barrier member, said groove having an opening narrower than the width of said movable handrail and having an inner portion dimensioned to receive said movable handrail, said movable handrail being disposed within the inner portion of said groove, and wherein said barrier member is formed of at least two barrier sections divided at a sectional plane extending lengthwise of the groove and intersecting the groove, said barrier sections being connected together in use into a unitary structure.

3,970,188
CARRIER ELEMENT FOR A HYDRASTATIC COOKER

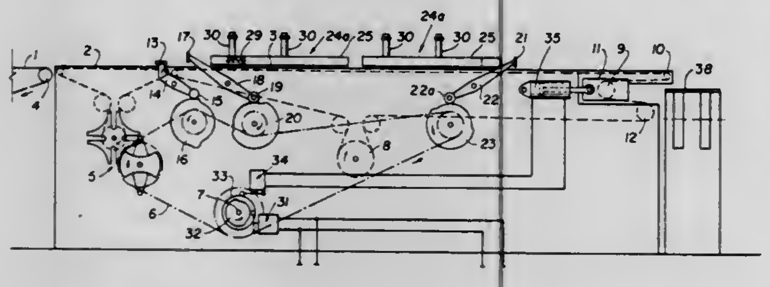
Johannes Jacobus Smorenburg, Abcoude, Netherlands, assignor to Stork-Amsterdam, B.V., Amstelveen, Netherlands
Filed Sept. 14, 1973, Ser. No. 397,588
Claims priority, application Netherlands, Sept. 19, 1972, 7212656; Sept. 19, 1972, 7212657; Sept. 19, 1972, 7212658; Oct. 26, 1972, 7214534
Int. Cl.² B65G *47/26*
U.S. Cl. 198—30 **11 Claims**



1. A device for conveying containers along a looped path in the treatment space of a thermal treatment apparatus and traversing a charging and discharging station outside of the treatment space, comprising a pair of spaced endless chains each comprising a plurality of links pivotally interconnected by pivot pins having portions thereof protruding outwardly of their respective chains, a plurality of carrier elements to receive containers to be treated disposed at regular intervals between said chains, each carrier element comprising two parallel carriers positioned in mirror-symmetrical relation to each other, each carrier having a substantially polygonal cross section, and a mounting plate on each end of said carrier element, each said mounting plate being attached to the protruding portions of a pair of successive pivot pins on a said endless chain.

3,970,189
CONVEYOR SYSTEM FOR MANUFACTURED ARTICLES, PARTICULARLY CONFECTIONS

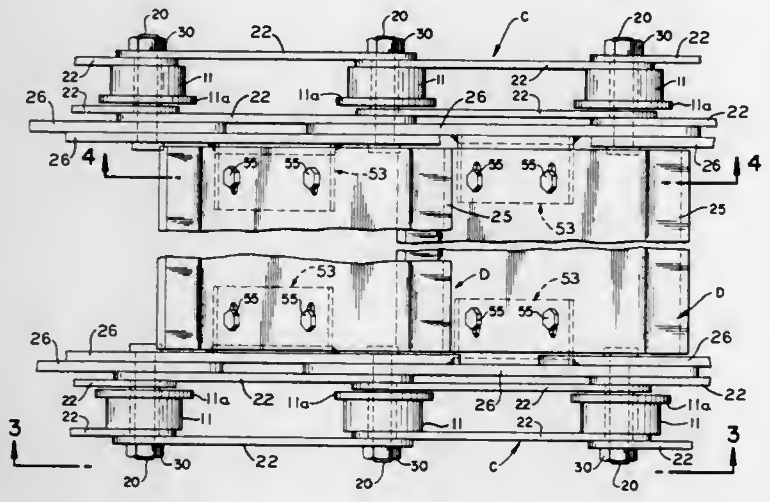
Gilbert Steinhart, Hannover, and Heinrich Bock, Ronnenberg, both of Germany, assignors to Nabisco, Inc., East Hanover, N.J.
Continuation-in-part of Ser. No. 308,428, Nov. 21, 1972, Pat. No. 3,854,569. This application Nov. 18, 1974, Ser. No. 524,624
Claims priority, application Germany, Feb. 9, 1972, 2206137
Int. Cl.² B65G *47/26*
U.S. Cl. 198—34 **5 Claims**



1. In a method for operating a conveyor system of the type having a first conveyor belt movable at a velocity v_1 and adapted to transport irregularly spaced articles, wherein means for aligning said articles include a second conveyor belt positioned to receive directly said articles from said first belt, and a third belt positioned for receiving articles from said second belt, as well as alignment rail means positioned above said third belt, and article holding means positioned above said second belt to extend transversely to the direction of movement of said belts, the steps comprising intermittently operating said second belt at a stepping frequency $F = (v_1/a)$ in steps per minute and an average velocity v_2 v_1 with equal duration periods of running time and rest, whereby v_{2run} is at least equal to $2v_1$, wherein v_1 is the velocity of the first belt, wherein a is the minimum longitudinal spacing between the leading edges of the two successive articles on the first belt, and wherein the length of each step of the second belt corresponds to a, continuously running said third belt at a velocity v_3 $2v_1$, periodically moving said alignment rail means to a first position to inhibit movement of said articles on said third belt and moving said rail means to a second position to permit movement of said articles on said third conveyor belt, positioning said article holding means at the end of said second belt toward said third belt, and raising and lowering said article holding means in synchronism with the intermittent movement of said second belt, said frequency $F = (v_1/a)$ assuring that said alignment rail will be positioned between successive articles.

3,970,190
ROLLER CHAIN CONVEYOR BELT

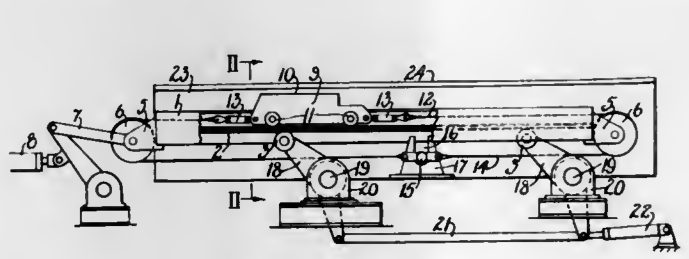
Lawrence H. G. Kovats, Mentor, Ohio, assignor to Mayfran Incorporated, Mayfield Village, Ohio
Filed Nov. 4, 1974, Ser. No. 520,499
Int. Cl.² B65G *17/00*
U.S. Cl. 198—189 **1 Claim**



1. A continuous roller chain type conveyor belt of the type to be supported on a pair of parallel extending supporting tracks, sprocket members at each end of each track, said belt including a pair of laterally spaced roller chains each comprised of a plurality of rollers and a row of chain links one on each side of said rollers and overlapping at the ends, roller shafts extending through said rollers and the overlapping ends of said chain links, a plurality of individual conveyor slats extending transversely between said roller chains; the improvement which comprises: a plurality of substantially flat slat links one affixed to each end of said slats and in continuous overlapping relationship at the ends, the vertical height of said slat links being substantially greater than the vertical height of said chain links in order to laterally retain material on said conveyor, said roller shafts extending through the overlapping portions of said slat links and holding same in pivoted relationship, the length between the pivot points of said chain and slat links being substantially equal so that longitudinal forces on said slats are transmitted through said slat links and said roller shafts.

3,970,191
TRANSFER APPARATUS

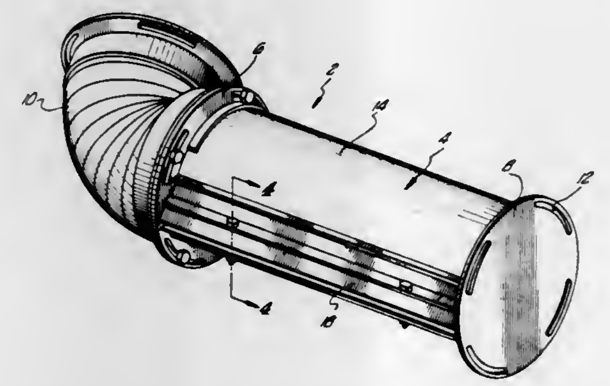
Derek Oldfield, Killamarsh, near Sheffield, and Dennis Postlethwaite, Rotherham, both of England, assignors to Wean United, Inc., Pittsburgh, Pa.
Filed Feb. 3, 1975, Ser. No. 546,662
Claims priority, application United Kingdom, Feb. 11, 1974, 6177/74
Int. Cl.² B65G *25/04*
U.S. Cl. 198—219 **6 Claims**



1. Transfer apparatus comprising:
an elongate beam arranged substantially horizontal on supports which permit the beam to be displaced in the direction of its length,
means for displacing the beam in the direction of its length,
a carriage providing a support for a workpiece,
said carriage being supported on the beam so as to be displaceable therealong,
an elongate flexible member connected at its ends to opposite ends of the carriage with a reach of the flexible member extending substantially parallel to the length of the beam, and
anchor means fixed relative to the beam and connected to said flexible member at a position intermediate the ends of said member, the apparatus being so constructed and arranged that displacement of the beam relative to the anchor means causes the carriage to be displaced along the beam in addition to its movement with the beam.

3,970,192
NOZZLE APPARATUS FOR A CONVEYOR BELT SYSTEM

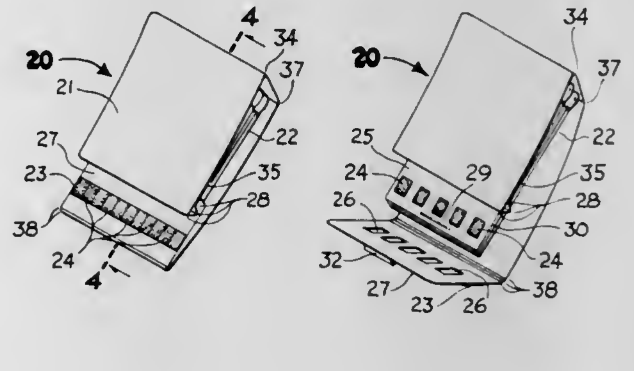
Carl von Wolffradt, San Marino, Calif., assignor to Carl von Wolffradt, San Marino, Calif.
Filed Sept. 16, 1974, Ser. No. 506,396
Int. Cl.² B65G *45/00*
U.S. Cl. 198—230 **11 Claims**



1. In a conveyor belt system having a continuous movable web member and means for moving the web member, the improvement including apparatus for removing material such as debris from the belt comprising:
a source of pressurized fluid;
a plenum member connected to the source of pressurized fluid having an elongated opening;
at least one first nozzle member, including a pair of relatively movable elongated blades capable of forming between the blades an elongated slot orifice extending adjacent and substantially across the width of the web member;
means on either side of the plenum member elongated opening for pivotally attaching a respective elongated blade, and
means for adjusting a flow area of the slot orifice by a pivoted displacement of at least one elongated blade whereby the impact of the pressurized fluid directed by the nozzle member against the web member removes material from the belt.

3,970,193
LATCHABLE MATCHBOOK WITH DIVIDING STRIKING STRIP

Donald Ragnvald Christensen, 21790 Ybarra Road, Woodland Hills, Calif. 91364
Filed Aug. 29, 1975, Ser. No. 609,085
Int. Cl.² A24F *27/00*
U.S. Cl. 206—104 **4 Claims**



1. In a matchbook containing detachable matches which require generation of friction between the head of each match and a slightly abrasive chemical coating in order to cause their ignition and burning, as a new feature of invention, improvements comprising:
an effective surface area for match-striking purposes produced by a plurality of appropriately placed, shaped and surfaced parts being joined in a common plane only when said matchbook is closed;
a division of the total such assemblage being an integral part of, or mounted on, a supporting base portion of the matchbook contents;
a complementary, mating division of the total such assemblage being a part of that portion of the sheetlike cover of said matchbook which is movable for purposes of opening and closing said matchbook.

4. In a matchbook containing detachable matches which require generation of friction between the head of each match and a slightly abrasive chemical coating in order to cause its ignition and burning, as a new feature of invention, improvements comprising:
unique structural features in a system of folds producing in the enclosure form of said matchbook cover a reinforced edge embodying an elongated ridge turned inwardly in facing opposition to a transverse plane, thereby creating an interior pocket in the otherwise sheetlike material structure of said matchbook cover;
an opening, a hole or aperture, located in an accessible portion of said elongated ridge;
an upraised member on the movable portion of said matchbook cover so located as to become trapped in said opening when the endmost edge of said movable portion is inserted to a position under and behind said elongated ridge; a sloping or rounded side of said member allowing its unresisted insertion, while an opposite vertical side, blocked by a restraining edge of said opening, prevents direct withdrawal of said upraised member of said movable portion.

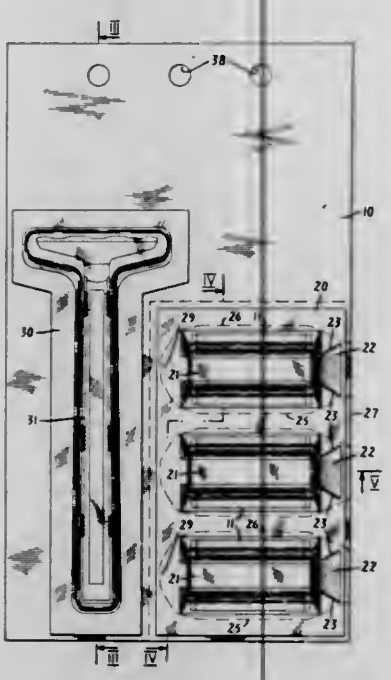
3,970,194
RAZOR BLADE CARTRIDGE AND DISPLAY ARTICLE

Clemens A. Iten, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,412

Int. Cl.² B65D *83/10;* **A45D** *27/22;* **B26B** *21/24*

U.S. Cl. 206—228 **6 Claims**



1. A display and dispenser article for razor blade cartridges of a type having at its rear face a dovetail slot for the endwise reception therein of a complemental razor handle key, said article comprising a main card, a blister secured to the front of the card having a pocket with an open rear face shaped to receive and having therein a said cartridge with its rear face with the dovetail slot at the rear, said blister having an outwardly extending channel portion registering with an end of said cartridge dovetail slot and having side walls diverging outwardly to a width larger than the end of the cartridge dovetail slot and a connecting wall between said side walls to guide readily the razor handle key into the slot, and said card having a section defined by weakened lines registering substantially with the open rear face of said pocket whereby removal of said section permits ready insertion of the handle key into engagement with and removal of the cartridge.

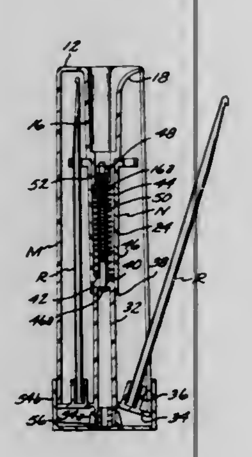
3,970,195
CROCHET NEEDLE STORAGE AND DISPENSING DEVICE

Veatrice Franklin, 1927 W. Harle, Anaheim, Calif. 92804

Filed Aug. 4, 1975, Ser. No. 601,414

Int. Cl.² B65D *85/24*

U.S. Cl. 206—380 **6 Claims**



1. A device for use in storing a plurality of needles of various sizes and selectively dispensing a desired one of said needles, said needles having first ends on which crochet hooks of different sizes are defined and second ends of different transverse cross sections, said needles being of substantially the same lengths, said device including:

a. a cylindrical housing that includes a first end portion and a second open end, said first end portion including an inwardly extending tubular member that defines both a longitudinally extending cam surface and a portion of circular transverse cross section which cam surface is radially aligned with a longitudinal slot in said housing, with said tubular member having a first inwardly extending body shoulder therein;
b. a needle-holding assembly that includes first and second generally circular members and tubular means having a second body shoulder intermediately disposed therein, with said first generally circular member including a plurality of circumferentially spaced resilient clips that removably engage longitudinal sections of said needles adjacent said first ends thereof and said second generally circular member including a plurality of circumferentially spaced sockets that are in longitudinal alignment with said clips and removably engage said second ends of said needles, with said assembly being disposed within said housing and said tubular means rotatably and slidably engaging said portion of said tubular member of circular transverse cross section;
c. compressed spring means that at all times tend to move said assembly away from said tubular member;
d. stop means that extend between said first and second body shoulders and allow said spring means to move said assembly and needles to a first position in said housing where said assembly may be rotated without said needles removably supported therein contacting said cam surface;
e. a cap that closes said second end of said housing and is rigidly secured to said tubular means; and
f. a plurality of indicia on said cap that visually indicates the size of a particular one of said needles that is aligned with said slot, and with said aligned needle being pivoted outwardly therethrough when said assembly and cap are manually forced towards said first end of said housing from a first position towards a second position where said needle is aligned with said slot and forced into sliding pressure contact with said cam surface, with said spring means automatically returning said assembly to said first position when said cap and assembly no longer have said manual force exerted thereon.

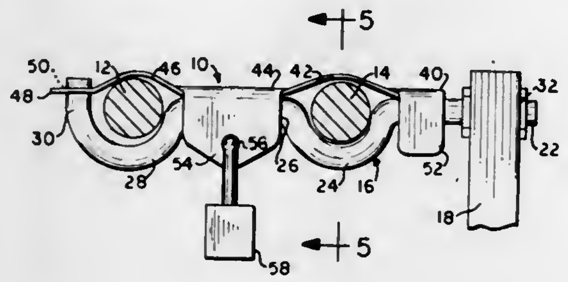
3,970,196
METHOD AND APPARATUS FOR SECURING A BICYCLE ON A BICYCLE RACK

Earl N. Legge, 11511 - 28th Ave. NE., Seattle, Wash. 98125

Filed May 23, 1974, Ser. No. 472,734

Int. Cl.² E05B *73/00*

U.S. Cl. 211—5 **5 Claims**



1. A combination of a bicycle mounting bar on a bicycle rack and a bicycle security retainer wherein said bicycle mounting bar comprises:

a. an inner end connecting with said bicycle rack;
b. a first positioning bend connecting with said inner end;
c. an upward bend connecting with said first positioning bend;

d. a second positioning bend connecting with said upward bend;
e. an upwardly directed bend connecting with said second positioning bend;
f. said bicycle security retainer comprises a first portion for fitting over said first positioning bend;
g. said bicycle security retainer comprises a central portion connecting with said first portion;
h. said bicycle security retainer comprises a second portion for fitting over said second positioning bend; and,
i. said bicycle security retainer comprises an end portion for cooperating with said upwardly directed bend to assist in positioning said bicycle security retainer on said bicycle mounting bar.

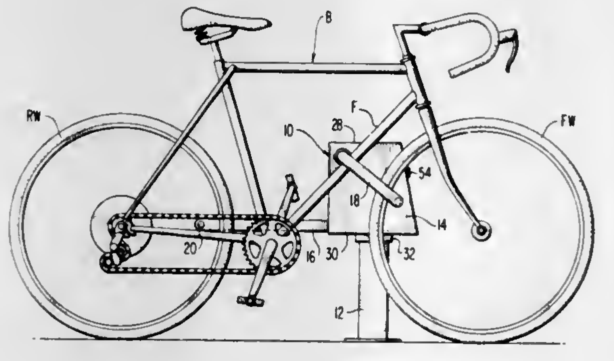
3,970,197
RACK AND BICYCLE LOCKING UNIT

Robert William Bale, Jr., 7305 Good Luck Road, New Carrolton, Md. 20784

Filed Nov. 5, 1974, Ser. No. 521,186

Int. Cl.² E05B *73/00*

U.S. Cl. 211—5 **11 Claims**



1. A bicycle rack and locking unit, comprising;

a. a generally vertically extending pedestal;
b. a lock box mounted to said pedestal; and
c. at least one arm member mounted to said lock box and extending in a direction substantially perpendicular to said pedestal, wherein,
  - said lock box includes mounting plate means, locking bar means pivotably mounted to said mounting plate means and displaceable relative thereto, and means within said lock box for locking said locking bar means to said mounting plate means, wherein,
  - said locking bar means comprising a generally cylindrical sleeve mounted to said mounting plate means, a generally U-shaped member which is displaceable relative to said sleeve with one leg of said U-shaped member being received within said sleeve, and means delimiting the relative axial and rotational displacement of said U-shaped member relative to said sleeve, said delimiting means comprising a generally U-shaped slotted track formed in said sleeve, with said one leg of said U-shaped member having a pin extension which engages said track, wherein,
  - said locking means are provided for locking said U-shaped member to said sleeve, and wherein,
  - said arm member includes a shaft which extends outwardly from said arm member in the displacement direction of said locking bar means.

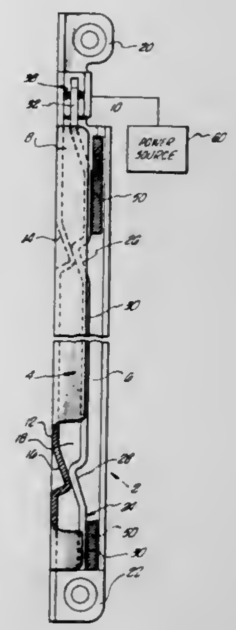
3,970,198
PRINTED CIRCUIT BOARD RETAINER

Earle Francis Prater, Long Beach, Calif., assignor to The Birtcher Corporation, Los Angeles, Calif.

Filed Feb. 3, 1975, Ser. No. 546,811

Int. Cl.² A47G *19/08*

U.S. Cl. 211—41 **16 Claims**



1. A printed circuit board retainer comprising:

activating means mounted on the housing member;
a housing member having a longitudinal axis;
a relatively rigid clamping member attached only at one end to the activating means, at least one of the housing member and the clamping member has at least one cam ramp while the other member has at least one complementarily follower adapted to operatively coact with the cam ramp to provide a transverse movement relative to the longitudinal axis of the clamping member, the other end of the clamping member being unrestrained relative to the housing member;
guide means maintaining one member in an operative relationship relative to the other member;
means for receiving a printed circuit board; and
means on said activating means for moving the entire rigid locking member in response to movement of the activating means relative to the housing member in the direction of the longitudinal axis whereby the clamping member exerts a lateral force for retaining the printed circuit board.

3,970,199
DISPLAY RACK

Howard J. Marschak, 865 W. North Ave., Chicago, Ill. 60622

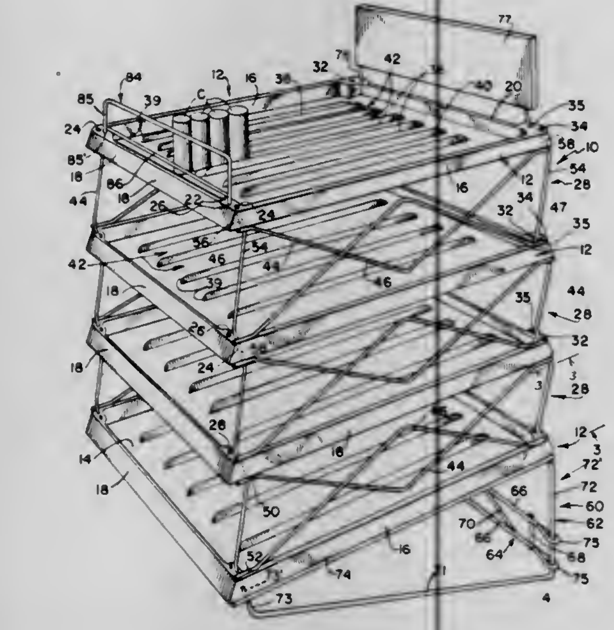
Filed Jan. 27, 1975, Ser. No. 544,335

Int. Cl.² A47F *3/14*

U.S. Cl. 211—128 **12 Claims**

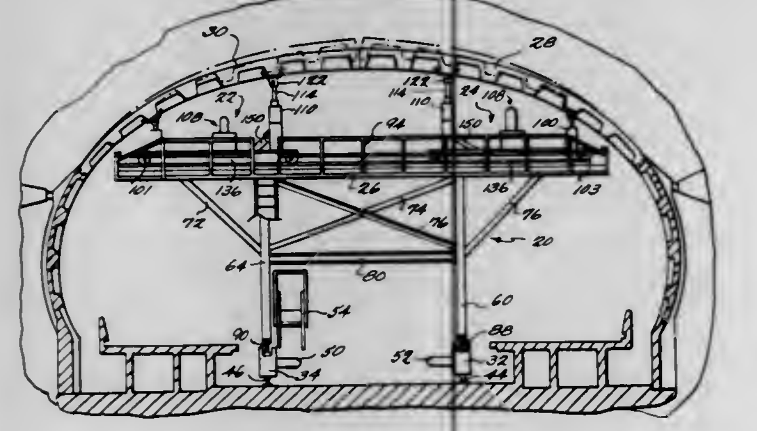
1. A display rack which is shipped and stored in a knockdown condition and is readily assembled without the use of extraneous fastening means, said rack comprising, a plurality of trays or shelves arranged to form a tier of same, each said tray or shelf having an opening adjacent each of the corners thereof, spacer side guard members between each pair of adjacent trays or shelves and extending substantially the length of said trays or shelves, each said spacer side guard member having an upwardly and downwardly extending end portion at the front and rear thereof which end portions are adapted to fit into the openings of two adjacent spaced trays or shelves one above the other to detachably support a plurality of trays or shelves in spaced relation one above the other, said spaced side guards having means adjacent said upwardly

and downwardly extending end portions which abut against the bottom and top of two adjacent spaced connected trays or shelves in a tier to limit and define the spaced distance between said two spaced connected trays or shelves, a base member on which the bottom tray or shelf is detachably secured, said base member having a rear member and spaced



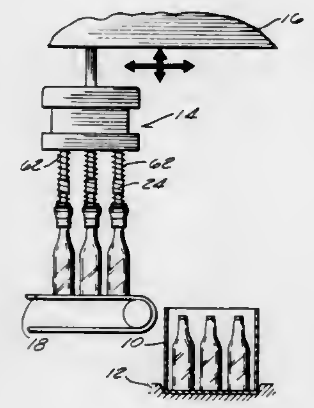
side members which are hingedly or pivotally secured to the rear member so that the side members can be hinged inwardly toward each other to a collapsed position, said side members being positioned perpendicular to said rear member so that the bottom tray or shelf rests on top of said side members and said rear member when said base member supports said trays or shelves.

3,970,200
GANTRY
Ted G. Goetjen, Silver Spring, Md., assignor to George Hyman Construction Co., Bethesda, Md.
Filed Jan. 16, 1975, Ser. No. 541,646
Int. Cl.² B25J *3/00*
U.S. Cl. 214—1 H **5 Claims**



1. A gantry for carrying out operations adjacent a ceiling structure comprising:
- an upright supporting framework having an upper deck facing the ceiling structure;
- wheel means carried by the framework below the deck for rendering the framework movable along a supporting surface;
- at least one trolley wheel-mounted on the upper surface of the deck for movement therealong;
- drive means for moving said trolley along the deck;
- two pairs of generally upright jack means carried by said trolley, each of said jack means having a free upper end adapted to engage a work piece;
- a platform mounting one of said pairs; means for moving said platform and the jacks mounted thereon in a horizontal direction transverse to the direction of movement of said trolley;
- said trolley including a base forming a channel in which said platform slides;
- said moving means including a hydraulic ram connected between said platform and said base of said trolley and a brace pivotably connected between said base and said platform.

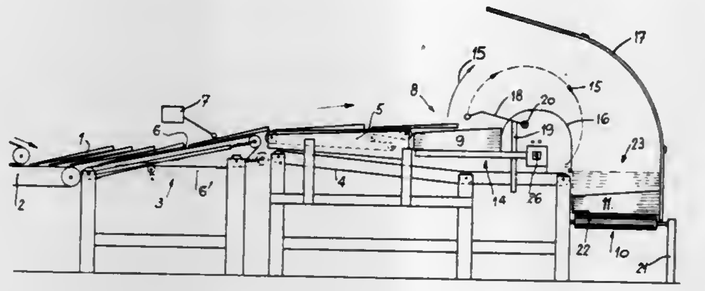
3,970,201
BOTTLE GRIPPER
Harold J. Keene, Milwaukee, Wis., assignor to Stowell Industries Inc., Milwaukee, Wis.
Filed June 23, 1975, Ser. No. 589,144
Int. Cl.² B65G *47/00*
U.S. Cl. 214—1 BT **3 Claims**



1. A gripper assembly comprising,
- a frame,
- a support member mounted in the frame for vertical and horizontal movement,
- a stem mounted in the support member for vertical motion relative to the support member and provided with means limiting the downward movement of the stem,
- a gripper head on the lower end of the stem,
- a spring biasing the stem downwardly,
- means mounted in the gripper head for engaging the neck of a bottle,
- means for actuating the last named means,
- said stem including a relatively short section of limited flexibility permitting the gripper head to be deflected laterally to accommodate misalignment of the gripper head with a bottle,
- said flexible section being sufficiently stiff to prevent appreciable swinging or pendulation of the bottle during rapid horizontal movement of the gripper head.

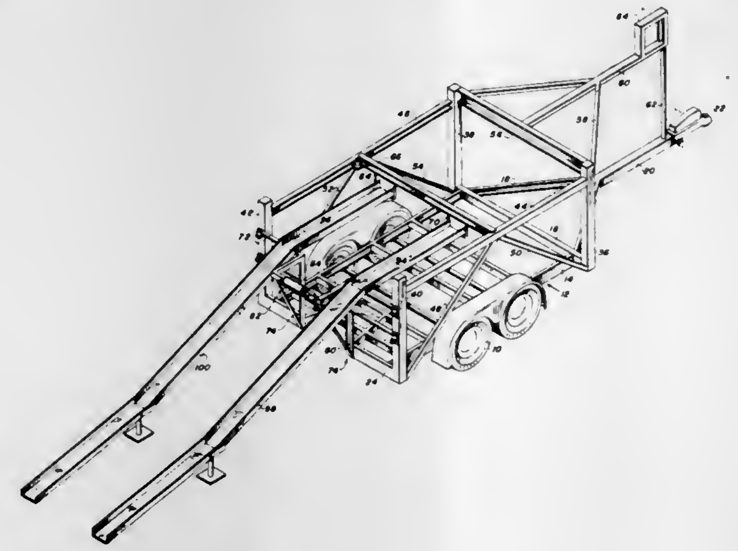
3,970,202
APPARATUS FOR STACKING FOLDED BOXES
Mariano Speggiorin, Renens, and Friedrich Wiedemann, Saint-Sulpice, both of Switzerland, assignors to J. Bobst & Fils S.A., Switzerland
Filed Sept. 27, 1974, Ser. No. 510,068
Claims priority, application Switzerland, Oct. 25, 1973, 15034/73
Int. Cl.² B65G *57/16, 57/08*
U.S. Cl. 214—6.5 **13 Claims**

1. Apparatus for receiving folded boxes at the output from a machine and stacking the folded boxes comprising:
- first and second laterally displaced box receiving stations for stacking folded boxes in first and second packs, respectively, said second station also functioning as a box sending station;
- folded box conveyor means adjustable to alternately deliver boxes to each of said first and second receiving stations;
- box turning over means for turning over said first pack of boxes at said first station and slowly moving said first pack of boxes in a vertical plane about a first axis to said second station while boxes are being stacked in said second station and placing the first pack on said second pack to form a balanced stack when stacking in said second station is completed; and



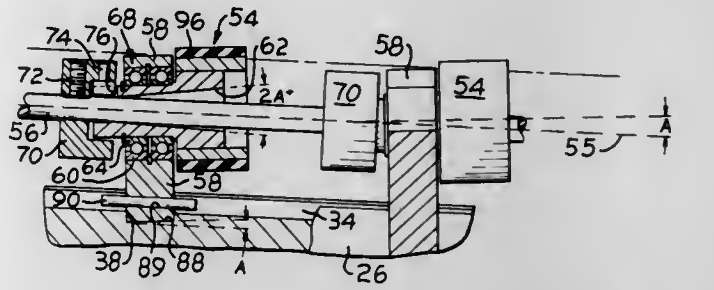
- means for removing said balanced stack from said second station.

3,970,203
COMBINATION TRAILER
Wilson D. Watson, Jr., 3112 W. Illinois, Midland, Tex. 79701
Filed Apr. 28, 1975, Ser. No. 572,150
Int. Cl.² B60P *3/08*
U.S. Cl. 214—85.1 **9 Claims**



1. A trailer comprising:
- a. a tandem running gear including ground engaging wheels,
- b. a frame mounted on said running gear, said frame having
  - i. a rectangular portion approximately centered over said running gear, and
  - ii. a V-nose portion extending forward,
- c. the frame positioned below the top of the ground engaging wheels of the running gear,
- cd. the frame having a motor cut-out in the rear thereof,
- d. a boat cradle mounted on said frame,
- e. a boat in said cradle,
- f. the bottom of said boat below the top of the wheels of the running gear,
- g. a winch located at the apex of the V-nose,
- h. said boat attached to the forward portion by said winch,
- j. four upward-extending stanchions at each of the corners of said rectangular portion of the frame,
- k. said stanchions located outward of said frame so the width of the frame at the stanchions is approximately equal to the width of the running gear at the wheels,
- m. side rails on each side of the vehicle attached at the top of the stanchions,
- n. a crossbar connecting the two front stanchions thereby forming a U-shaped opening,
- o. a V-nose on the front of the upper portion extending from the two front stanchions forward,
- p. an electrical winch on the upper V-nose,
- q. rear braces extending from the bottom of the rear stanchion to the midpoint of the side rail,
- r. forward brace extending from the bottom of the front stanchion to midpoint of the side rail,
- s. a middle crossbeam hinged to the side rail where two braces meet on one side,
- t. said mid-crossbeam latched to the side rail on the other side where two braces meet,
- u. a right back gate hinged to the right rear stanchion,
- v. a left back gate hinged to the left rear stanchion,
- w. each of said gates extending to the edge of the motor cut-out,
- x. each of said gates extending rearwardly at the edge of the cut-outs,
- y. the top of said two gates connected with a rear gate bar,
- z. a roller on the top of the rear gate bar,
- aa. the mid-crossbeam having a bracket on each side,
- bb. a track extending from each bracket to said rear gate,
- dd. a camper having wheels thereon,
- ee. the wheels of the camper vehicle in the track, and
- ff. a pair of ramps carried by the frame and adapted to be attached to said gates, each lined up with the track so the camper can be rolled by the electric winch on the front of the upper frame up and down the ramp.

3,970,204
SKEWED ROLLER CONVEYOR
Karl Treasure Lutz, Gardner, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 27, 1975, Ser. No. 544,160
Int. Cl.² B65H *51/26*
U.S. Cl. 214—339 **13 Claims**



1. A conveyor for transporting cylindrical work pieces along a longitudinal axis thereof at a controlled speed, comprising:
- a longitudinally extending frame;
- a pair of longitudinal way members mounted above said frame with their longitudinal axis in generally parallel relation to one another and to the longitudinal axis of said frame;
- a single shaft located generally above and with its axis generally parallel to the longitudinal axis of a respective one of said way members;
- a plurality of cylindrical surfaced driving rollers having said shaft passing therethrough in driving relation thereto;
- a first plurality of support fixtures upraised from said respective one of said way members with a first plurality of outer races of a first plurality of bearings supported one atop each of said first plurality of fixtures at an angle, A, from the axis of said shaft, said driving rollers being mounted to a first plurality of inner races of said first plurality of bearings, in a direction away from said respective one of said way members;
- a plurality of cylindrical surfaced non-driven support rollers in one to one relation with and spaced apart from said driving rollers rotatingly supported generally above a respective other of said way members;
- a second plurality of support fixtures upraised from said respective other of said way members with a second plurality of inner races of a second plurality of bearings supported by each of said second plurality of fixtures at an angle, A, from a line intersecting the axis of each of said support rollers and parallel to the axis of said shaft in a direction toward said respective other of said way

members, said support rollers being mounted to a second plurality of outer races of said second plurality of bearings;

means for adjustably moving said first plurality of bearings relative to said respective one of said way members and adjacent thereto;

means for adjustably moving said second plurality of bearings relative to said respective other of said way members and adjacent thereto; and

a motor drivingly coupled to said shaft.

3,970,205
APPARATUS FOR HANDLING LARGE AND HEAVY OBJECTS

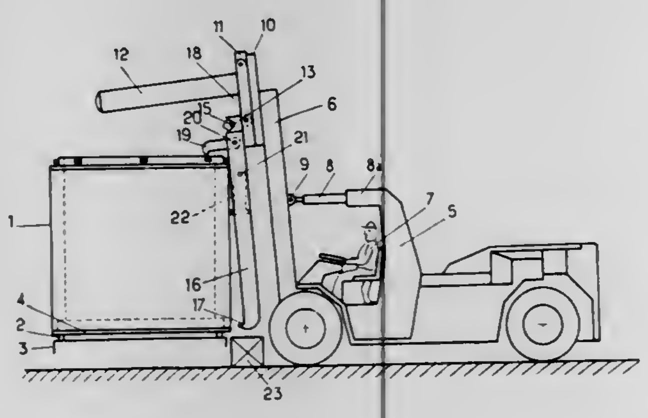
Louis Del Puppo, Saint-Genis-les-Ollieres, France, assignor to Societe Anonyme: SABLA, Dardilly, France

Filed Dec. 17, 1974, Ser. No. 533,629

Claims priority, application France, June 27, 1974, 74.23065

Int. Cl.² B66C ***1/42***

U.S. Cl. 214—652 **2 Claims**



1. Apparatus for moving a large heavy cylinder from an initial vertical position, wherein the cylinder rests on one end on a horizontal support surface, to a final horizontal position, said apparatus comprising,

a lift truck including an articulated generally vertically extending mast

a slide plate slidably mounted on said mast for movement in a generally vertical direction,

a chassis-cradle having upper and lower portions,

means for pivotally and removably connecting said chassis-cradle to said slide plate,

said lower end portion of the chassis-cradle including nipper means for engaging the lower edge of a vertically positioned cylinder and said upper end portion including releasable beak means for gripping the upper edge portion of a vertically positioned cylinder directly above and in alignment with said nipper means, whereby downward movement of said slide plate along said mast and rearward movement of said lift truck away from said cylinder, while the upper and lower edges of the cylinder are engaged by said nipper and beak means, causes said cradle to pivot about its pivotal connection with said slide plate, thereby to tip the cylinder adjacent its lower edge, from its vertical position towards the truck and into a horizontal position;

said slide plate including a generally horizontally extending projection and support member secured thereto dimensioned to penetrate into said cylinder through the upper edge thereof during tilting of the cylinder to its horizontal position, whereby movement of said slide plate vertically on said mast, after the cylinder is tilted to the horizontal position and the chassis-cradle is disconnected from the slide plate, will cause the projection to engage the interior sidewall of the cylinder and support the cylinder for transport by said lift truck in said horizontal position.

3,970,206
STACKABLE FEEDING ASSEMBLIES

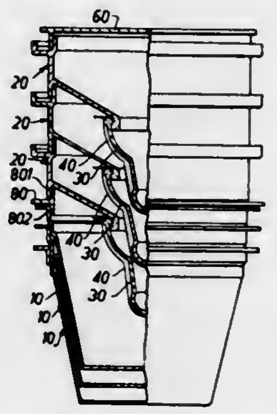
Paule Gisele Morash, 17, Avenue La Bruyere, 78 Marly-le-Roi, France

Continuation of Ser. No. 239,043, Feb. 29, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,661

Claims priority, application France, Apr. 19, 1971, 71.13672

Int. Cl.² A61J ***9/00***

U.S. Cl. 215—11 R **28 Claims**



1. A stackable arrangement for constructing a sterile single-use nursing bottle of the type having a container, a teat and a connecting means for fixing the teat to the container, said arrangement comprising:

a first plurality of first sub-assemblies arranged in stacked relationship, each of said first sub-assemblies including one of a container for a nursing bottle and a bottom stopper means, and

a second plurality of second sub-assemblies arranged in stacked relationship, each of said second sub-assemblies including one of a teat fixed to a connecting means and a teat fixed to a container of a nursing bottle,

wherein a sterile nursing bottle is constructed from one of a container of said first sub-assembly fixed to a teat and connecting means of said second sub-assembly and a bottom stopper means of said first sub-assembly fixed to a teat and container of said second sub-assembly.

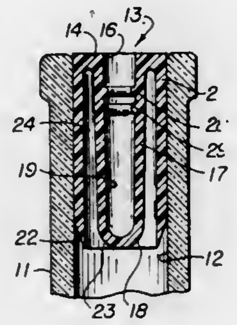
3,970,207
PLASTIC STOPPER FOR WINE BOTTLE OR THE LIKE

George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprises, San Carlos, Calif.

Filed May 27, 1975, Ser. No. 580,545

Int. Cl.² B65D ***39/00***

U.S. Cl. 215—296 **2 Claims**



1. A plastic stopper for a standard bottleneck adapted to be pulled with a standard cork screw comprising a top disc with a central hole, a pocket-forming portion below said disc having an inside diameter at the top coinciding with said hole, the interior of said pocket-forming portion being formed with a plurality of ridges, each ridge being transverse to the axis of said stopper to facilitate said cork screw being tightly received in said pocket, the interior of said pocket-forming portion tapering downwardly, said pocket-forming portion being air and liquid-tight at the bottom, and a peripheral smooth, exterior skirt below said disc having a substantially constant outside diameter such as to fit tightly within said bottleneck and of a length about equal to that of said pocket-forming portion, there being an annular space between the exterior of said pocket-forming portion and the interior of said skirt, said central hole and the interior of said pocketforming portion being dimensioned slightly less than the exterior of said standard cork screw, the bottom of said pocket-forming portion being rounded.

3,970,208
PROTECTIVE SHIELD FOR PRESSURE VESSELS

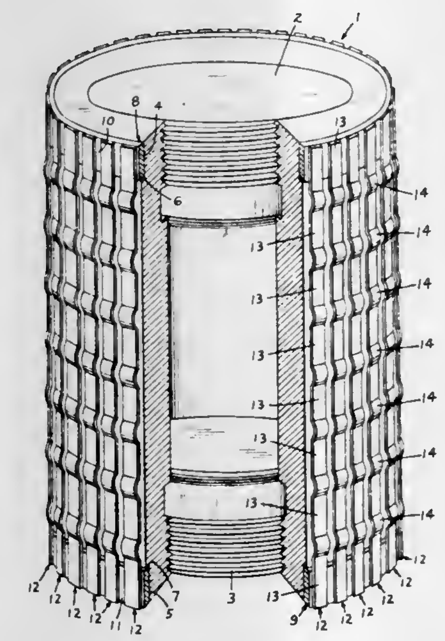
Herman Raes, Waasmunster, Belgium, assignor to National Forge Company, Irvine, Pa.

Filed Nov. 26, 1974, Ser. No. 527,195

Claims priority, application United Kingdom, Dec. 28, 1973, 59985/73

Int. Cl.² B65D ***7/44***

U.S. Cl. 220—3 **15 Claims**



1. A protective shield for a pressure vessel, comprising:

a ductile means for absorbing kinetic energy released if the pressure vessel fails by a portion of the pressure vessel breaking-off and tending to fly-away from the pressure vessel; said ductile means undergoing substantial deformation, but not breaking, when loaded by the portion of the pressure vessel tending to fly-away when the pressure vessel fails; and

means for attaching said ductile means to said pressure vessel so that if said pressure vessel fails, said ductile means will be loaded by said portion of the pressure vessel breaking-off and tending to fly-away;

said ductile means comprising a ductile arcuate segment of a strap; and said means for attaching said ductile means to said pressure vessel comprising a pair of rings, attached about opposite ends of the pressure vessel, and a pair of straight segments of said strap, each straight strap segment being connected to one of said rings and to an end of said ductile arcuate segment of said strap.

3,970,209
COLLAPSIBLE CONTAINER

Alan Raymond Baxter, 44 Karen Crescent, Hamilton 43, Ontario, Canada.

Filed Aug. 28, 1974, Ser. No. 501,403

Claims priority, application Canada, May 15, 1974, 199972

Int. Cl.² B65D ***7/24;*** **B65J** ***1/02;*** **E05C** ***1/04***

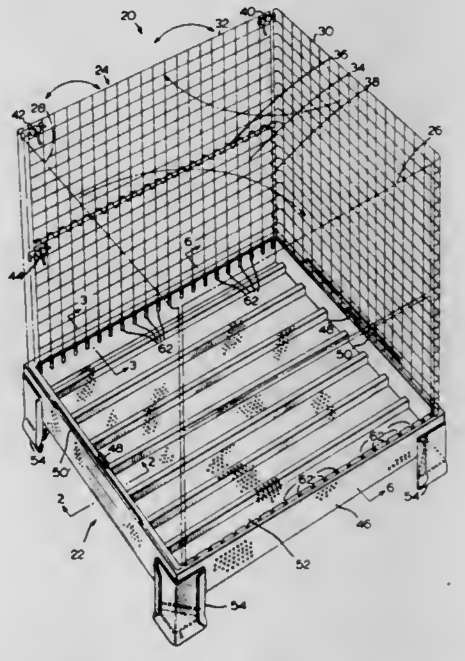
U.S. Cl. 220—6 **6 Claims**

1. A collapsible container comprising:

a rectangular base having four sided peripheral sill and a floor extending between sides of the sill, the floor being recessed below upper extremities of the sill to define a well and an opposed pair of the longer ones of said sill sides defining vertically extending slots facing inwardly of the base;

a pair of opposed side walls having vertical rods engaged in respective slots of the pair of sill sides and a respective one of a pair of horizontal rods attached to lower extremities of the respective vertical rods, each horizontal rod being housed within a respective one of the pair of sills to prevent withdrawal of the vertical rods from the pair of sills and to permit both angular movement of the pair of walls and limited translational movement of the walls vertically, said angular and translational movements combining to permit the side walls to enter the well whereby the walls are then in a disassembled condition in the well below the level of upper extremities of the sill; and

a pair of end walls releasably coupled to the side walls and adapted to stand on sides of the sill between said pair of sill sides with the container assembled and to fold relative to the side walls for disassembly of the container.



3,970,210
HEAT INSULATION LINED TANK FOR LOW TEMPERATURE LIQUIDS AND METHODS OF MANUFACTURING THE SAME

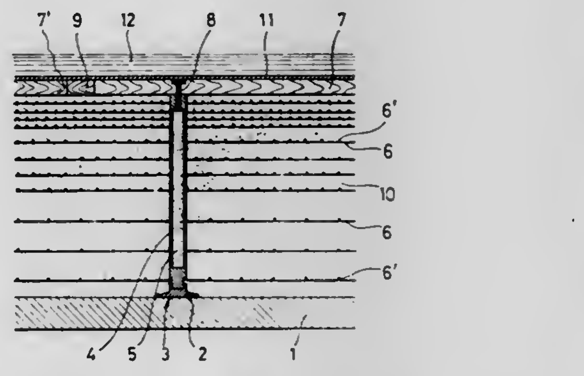
Kihei Katsuta, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed June 12, 1973, Ser. No. 369,135

Claims priority, application Japan, June 27, 1972, 47-64307; Apr. 23, 1973, 48-45974

Int. Cl.² B65D ***87/24;*** **B63B** ***25/08***

U.S. Cl. 220—9 LG **13 Claims**



1. A storage tank for a low-temperature liquid comprising an outer tank shell wall having an interior surface, a liquid-impervious layer spaced from said interior surface of said tank shell wall, a heat insulation layer between said tank shell wall and said liquid-impervious layer, a multiplicity of wire net

layers embedded in and extending across an insulation layer each being substantially parallel to and in spaced relation with said interior surface, said wire net layers each including crossing longitudinal and lateral wires defining mesh opening areas therebetween which decrease in size in a direction from said tank outer wall toward said liquid-impervious layer.

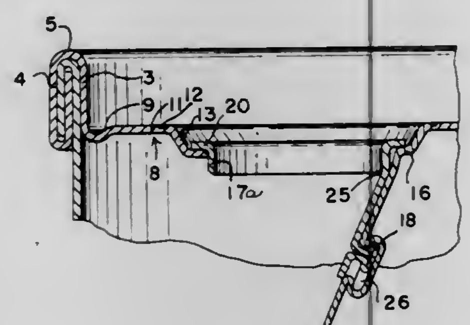
3,970,211
NON-REMOVABLE TAB CONNECTION

George D. LaCross, Burbank, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,711

Int. Cl.^{2} B65D *41/32*

U.S. Cl. 220—267 **8 Claims**



1. An improved non-detachable easy-opening end closure for a can or similar container comprising an end panel, a score formed in said end panel and defining therein a flap element adapted to be torn away from said end panel to provide an opening, a tab element superposed with respect to said flap, flap retention means for retaining said flap attached to said end closure subsequent to opening and tab attachment means attaching said tab to said flap, said attachment means providing a lost motion between said flap element and said tab element during opening of said end closure.

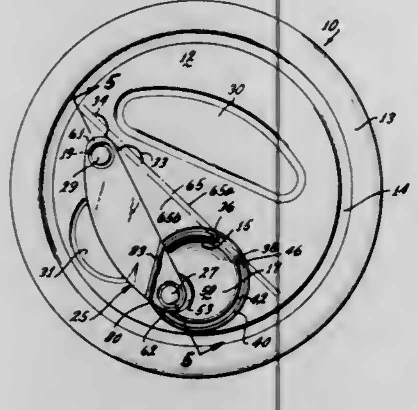
3,970,212
EASY OPENING ECOLOGY END WITH RETAINED TEAR STRIPS

Omar L. Brown, Dayton, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio

Filed June 10, 1974, Ser. No. 477,678

Int. Cl.^{2} B65D *17/20*

U.S. Cl. 220—269 **20 Claims**



1. An easy opening container wall comprising:

means forming an end wall,

a line of weakness in said end wall defining a tear portion at least partly removable from said end wall to form a pour opening,

a second line of weakness spaced from said line of weakness and defining a vent strip forming a vent opening smaller than the pour opening in a portion of said end wall other than in said tear portion,

tab means having end portions for attachment to each of said tear portion and said vent strip for rupturing said lines of weakness,

means attaching said tab means to each of said tear portion and said vent strip whereby manipulation of said tab means ruptures both score lines and forms an exposed edge on said tear portion and the portion of said end wall from which said tear portion was removed,

each of said first and second line of weakness including means to prevent complete separation of said tear portion and vent strip from said end wall and defining a hinge line whereby the ruptured but retained tear portion and vent strip may be folded against said end wall,

one of said end portions of said tab means being closer to said hinge line than the other of said end portions, and

protective means provided in each of said tear portion and the end wall from which said tear portion was removed for reducing the possibility of laceration by the user by the exposed edge of said tear portion and the exposed edge of the end wall from which said tear portion was removed.

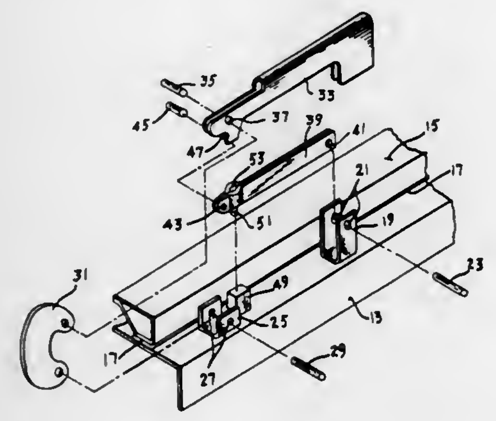
3,970,213
QUICK OPENING/CLOSING COMPRESSION LATCH

Charles L. Clay, 118 Third Ave., Fort Walton Beach, Fla. 32548

Filed Sept. 29, 1975, Ser. No. 617,776

Int. Cl.^{2} B65D *45/16;* **E05C** *19/12*

U.S. Cl. 220—324 **4 Claims**



1. In a compression latch positioned within the envelope of an ammunition shipping container including a lid and a walled body portion with a resilient gasket therebetween and operating in the same plane as the wall of the container, the improvement comprising a first U-shaped pivot clip fixedly attached to the wall of said body portion, said first pivot clip having aligned openings for receiving a pin therethrough, a second U-shaped pivot clip fixedly attached to the wall of said body portion in spaced alignment with said first pivot clip, said second pivot clip having aligned openings for receiving a pin therethrough, a C-clip having one end pivotally attached to said first U-shaped pivot clip, a handle having aligned openings in the forward end thereof, the other end of said C-clip being pivotally attached to the forward end of said handle with a pin member through the aligned openings therein, a cross bar having its rearward end pivotally connected to said second U-shaped pivot clip, a pin affixed in the forward end of said cross bar and extending outwardly beyond the walls thereof, a slot in the forward end of said handle for engaging the extending portions of the pin in said cross bar, and a tab fixedly attached to the lid of the container and extending outwardly therefrom into the area between said first and second U-shaped pivot clips whereby clockwise movement of said handle after engagement of the slot therein with the pin in said cross bar causes said cross bar to press against the top of said tab and force the lid against the gasket positioned on the wall of the body portion of the container.

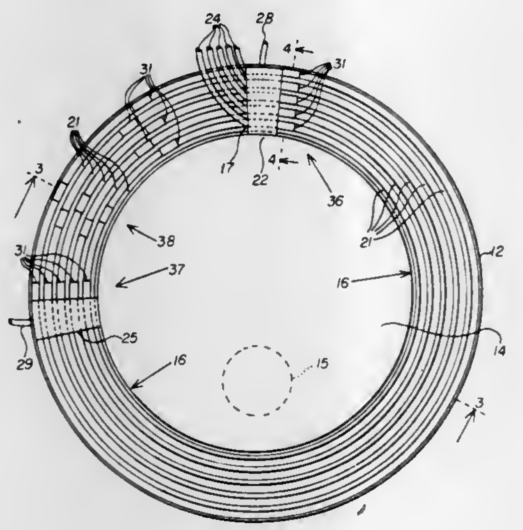
3,970,214
METHOD AND APPARATUS FOR HANDLING COILED SPRINGS

George W. Thimot, Marlboro, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed July 7, 1975, Ser. No. 593,211

Int. Cl.^{2} B23Q *7/12*

U.S. Cl. 221—1 **17 Claims**



1. Apparatus for feeding coiled springs and comprising:

source means for supplying coiled springs;

receiver means for sequentially receiving individual cylindrical coiled springs of a given coil diameter supplied by said source means;

ramp means for delivering the springs from said source means to said receiver means, said ramp means defining open channel means having a cylindrical surface curvature that conforms to the outer surfaces of the coils of given coil diameter so as to retain the springs in positions wherein their axes coincide with a given delivery line during their travel between said source means and said receiver means, said ramp means further defining removal means for removing from said channel means any moving entangled composite group of the springs having a center of gravity shifted horizontally from said given delivery line; and

drive means for moving the springs between said source means and said receiver means.

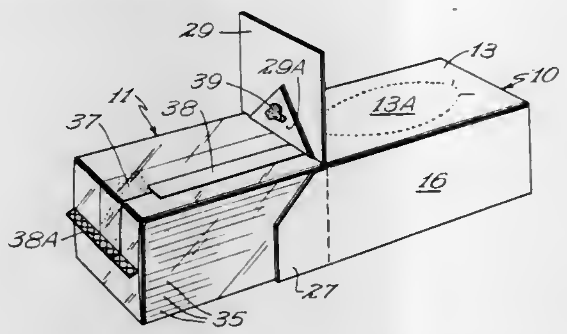
3,970,215
DISPENSING PACKAGE FOR MOISTENED TISSUES

Edwin C. McLaren, Apple Valley, and Howard R. Schneider, Minneapolis, both of Minn., assignors to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Jan. 24, 1975, Ser. No. 543,962

Int. Cl.^{2} A47K *10/20*

U.S. Cl. 221—45 **1 Claim**



1. A dispensing package for moistened tissues or the like, said tissues arranged in a folded stacked array, comprising:

a sheet of flexible moisture proof film surrounding said stacked array of tissues, said sheet having overlapping longitudinal edges arranged on the top of said stacked array to form an opening through which said tissues may be removed, said sheet also having sealed ends to complete the enclosure of said stacked array;

means sealing said overlapping edges and adapted to allow said edges to be opened for removal of the tissues;

an outer enclosure carton made from foldable paperboard or similar sheet-like material, said carton being substantially rectangular in cross section and having a top surface, a bottom surface, opposed lateral side panels and closed with opposed rectangular end panels;

said top surface having formed therein a panel defined by frangible edges adapted to be removed to provide access to said sealing means and said stacked array of tissues in said package;

said end panels comprising minor flaps hingedly connected to said side panels of said carton, said minor flaps inwardly foldable to lie flat against the sealed end of said film;

a major flap hingedly connected to said top surface of said outer carton and foldable downwardly to lie in overlapping relation with said minor flaps;

said minor flaps having cut-away portions at the upper end thereof, said cut-away portions thereby exposing a section of said major flap to the end of said film surrounding said stacked array;

said exposed section on said major flap overlapping said cut-away portions of said minor flaps being inwardly embossed, said embossed portion of said major flap thereby lying flush against the end of said film and stacked array in final closed position; and

a mass of adhesive positioned between and contacting both said embossed portion and said film wrapper to retain said film wrapper within said carton as the tissues are removed therefrom.

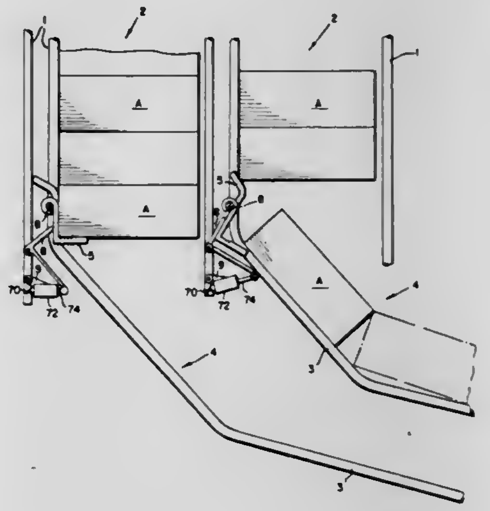
3,970,216
COIN CONTROLLED VENDING APPARATUS

Don E. Rainey, 456 S. Dixie Highway, East Pompano Beach, Fla. 33060

Continuation of Ser. No. 188,543, Oct. 12, 1971, abandoned, which is a division of Ser. No. 816,276, April 15, 1969, Pat. No. 3,702,655. This application Sept. 9, 1974, Ser. No. 504,158

Int. Cl.^{2} B65G *59/00*

U.S. Cl. 221—125 **8 Claims**



1. Vending apparatus for storing and dispensing articles which comprises:

i. a cabinet having a multiplicity of vertically arranged chutes for receiving the articles in stacked horizontal position;

ii. Transposer means pivotally supported at the lower ends of each chute to shift the lowermost articles in the chutes from horizontal position to downward discharge dispensing position; and,

iii. an hydraulic control system to activate said transposer means, said hydraulic control system comprising:
  a. a primary fluid body;
  b. a secondary fluid body;
  c. cylinder and reciprocating plunger means interposed between said bodies;
  d. means actuated by said secondary fluid; and,
  e. fluid limiting means for selectively limiting the volume of fluid available to said primary fluid body comprising a cylinder cooperating with said primary fluid body, and a cooperating piston reciprocable between retracted and extended positions within said cylinder and defining the volume limits of fluid available to said primary fluid body; whereby, said plunger means is operable in accordance with the available volume of fluid.

3,970,217

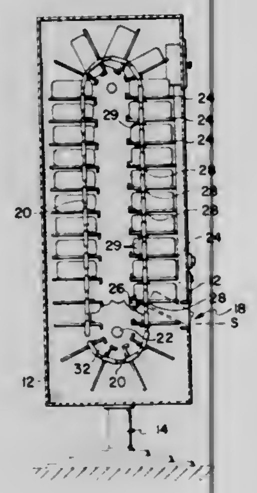
COIN-OPERABLE PACKAGED DIAPER DISPENSING MACHINE

William E. Culbertson, and Linda R. Culbertson, both of Aurora, Ill., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 23, 1975, Ser. No. 643,789

Int. Cl.^{2} B65G *47/38*

U.S. Cl. 221—80 **3 Claims**



1. A coin-operable automatic packaged diaper dispenser comprising:
  a housing having a packaged diaper delivery opening in one of the walls thereof;
  a plurality of endless conveyors drivable by a common shaft mounted rotatably within said housing;
  a plurality of diaper storage shelves pivotably carried by each of said conveyors in spaced relation;
  deflector means mounted fixedly within said housing above said delivery opening in the path of movement of said shelves and engageable serially with the rear of each of said shelves to thereby effect pivotal movement of the shelf and the discharge of the packaged diaper stored thereon to said delivery opening;
  spring means being operably connected with each of said shelves for returning the pivoted shelf to it original position;
  and a coin-actuable electric motor operably connected to said drive shaft for incrementally moving a selected conveyor to thereby move a shelf thereon to a diaper discharge station adjacent said delivery opening.

3,970,218

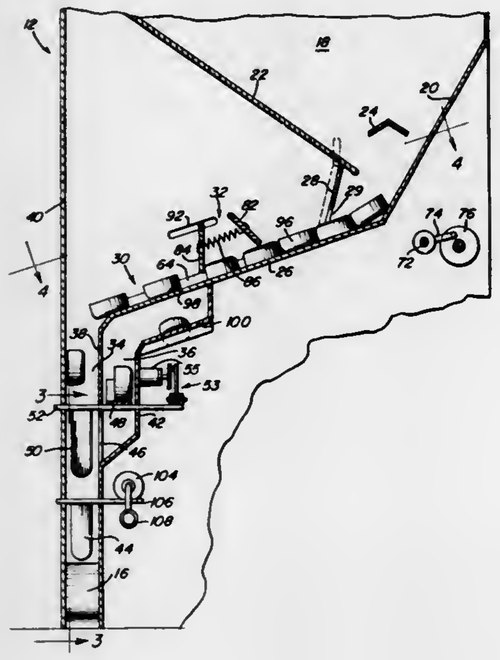
CAP SELECTING AND FEEDING MECHANISM

Wing J. Lee, 1322 Neck Road, Brooklyn, N.Y. 11229

Filed Feb. 20, 1975, Ser. No. 551,411

Int. Cl.^{2} B65H *9/00*

U.S. Cl. 221—157 **16 Claims**



1. Apparatus for storing and dispensing articles one at a time in a predetermined orientation, comprising a cabinet having a hopper, fixed channel means mounted within said cabinet for guiding movement of said articles from the hopper, a storage compartment into which the articles are deposited from the channel means, a delivery chute into which the articles are discharged from the storage compartment, guide means for reorientating articles during movement through the channel means to supply articles to the storage compartment in the same orientation, feed controlling gate means for respectively regulating infeed of the articles to the channel means from the hopper and outfeed of the articles from the storage compartment to the delivery chute, sensing means for detecting depletion of articles stored in the storage compartment by predetermined amount and control means connecting the sensing means to the feed controlling gate means for intermittently blocking infeed of articles to the storage compartment and outfeed therefrom in accordance with the effect of said reorientating operation on the supply of articles to the storage compartment.

3,970,219

AEROSOL CONTAINERS FOR FOAMING AND DELIVERING AEROSOLS AND PROCESS

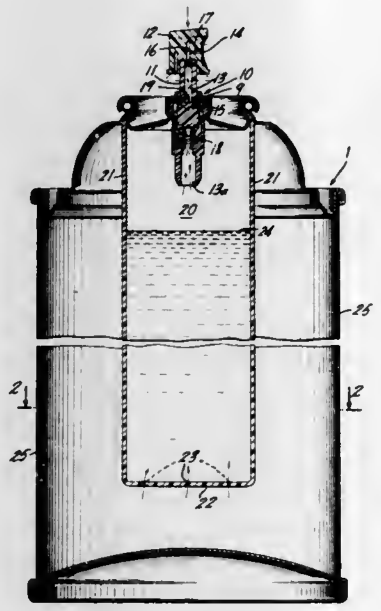
Joseph George Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Marvin Small, 1100 Park Ave., New York, N.Y. 10028; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011, and Dorothea C. Marra, 107 Fernwood Road, Summit, N.J. 07901

Filed Mar. 3, 1975, Ser. No. 554,388

Int. Cl.^{2} B65D *83/14, 83/00*

U.S. Cl. 222—1 **51 Claims**

15. A process for foaming a liquid aerosol composition within an aerosol container prior to expulsion from the container, with the result that a foamed aerosol composition is expelled from the container, comprising bubbling a propellant gas into liquid aerosol composition in the container at a sufficient pressure and in a sufficient amount to foam the liquid aerosol composition while under confinement within the container, and then expelling the resulting foamed aerosol composition under propellant gas pressure within the container.



3,970,220

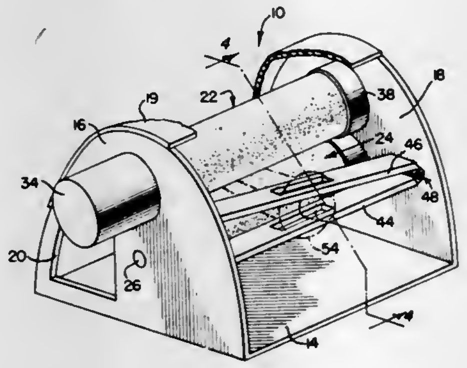
COLLAPSIBLE TUBE SQUEEZING DEVICE

Cecil Julius Spears, 112 McFarland Road, Enfield, N.C. 27823

Filed Aug. 26, 1974, Ser. No. 500,444

Int. Cl.^{2} B65D *35/28*

U.S. Cl. 222—102 **4 Claims**



1. A collapsible tube squeezing device comprising a frame having open sides, a bottom wall and a pair of sidewalls;
  first and second squeeze roller mounted for rotation in the sidewalls of the frame, one of said first and second squeeze rollers having roller rotating means connected thereto and extending normally from one of the sidewalls of the frame, and tube crown squeezing and holding means carried by said sidewalls of the frame in substantial alignment with the tube receiving space between the pair of squeeze rollers wherein said tube crown squeezing and holding means comprises a base member rigidly connected between the pair of sidewalls and a crusher bar pivotally mounted adjacent one end to one end of the base member.

3,970,221

APPLICATOR SYSTEM FOR FLUIDS

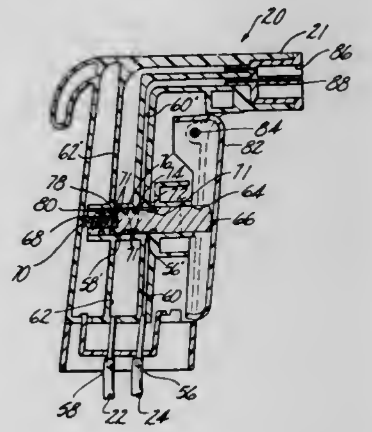
Barry Fleischer, 16170 Roanoke, Southfield, Mich. 48075

Division of Ser. No. 349,751, April 10, 1973, Pat. No. 3,880,333. This application Jan. 14, 1975, Ser. No. 540,791

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.^{2} B67D *5/60*

U.S. Cl. 222—145 **6 Claims**



1. An applicator for dispensing a fluid under pressure, comprising:
  a. a housing,
  b. a first channel for storing a pressurizing medium formed within the housing, the channel having an inlet and an outlet,
  c. an upper channel formed in the housing having an inlet thereinto and an outlet, the inlet of the upper channel being laterally displaced from the outlet of the first channel,
  d. a first chamber for storing a fluid formed within the housing, the chamber having an inlet and an outlet,
  e. an upper chamber formed in the housing having an inlet thereinto and an outlet, the inlet of the upper chamber being laterally displaced from the outlet of the first chamber,
  f. an internal transverse housing separating the first chamber from the upper chamber and their, respective, outlet and inlet,
  g. axially slidable means disposed in the internal transverse housing,
  h. a plurality of sealing means associated with the axially slidable means for normally sealing off fluid communications between the first chamber and the upper chamber through their respective outlets and inlets and the first channel and the upper channel through their respective outlet and inlet,
  i. quick action means including biasing means for pulsatingly regulating the flow out of the applicator such that there is a first flow of pressurizing medium, a second flow of fluid, and a final flow of pressurizing medium, said means for regulating being disposed in the internal transverse housing, and wherein movement of said sealing means provides fluid communication between the first chamber and the first channel and upper channel.

3,970,222

APPARATUS AND METHOD FOR INITIATING FORMATION OF A FILAMENT OF COATING LIQUID

Peter Leonard Duffield, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 4, 1972, Ser. No. 277,997

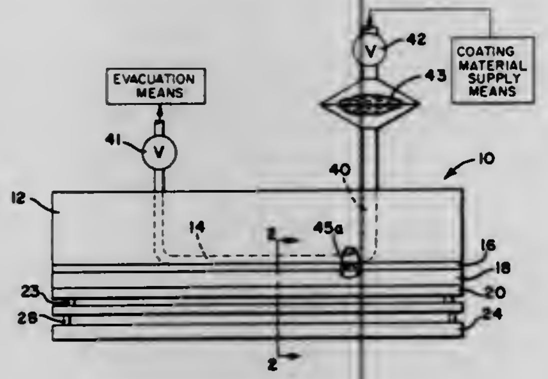
Int. Cl.^{2} B65D *83/14*

U.S. Cl. 222—148 **6 Claims**

1. In a jet drop coating system comprising a coating head provided with a plurality of orifices and a manifold for delivery of liquid coating material to said orifices, improved coating material supply apparatus comprising:
  a. means for supplying said coated material at a pressure greater than that required for liquid jet formation at the

exits of said orifices and at a volume rate greater than the rate of escape of air through all of said orifices at said liquid jet formation pressure, and

b. a compression chamber between said supply means and said manifold, said compression chamber having sufficient volume to enable incoming coating material to pressurize said manifold from atmospheric pressure to said liquid jet formation pressure while air is escaping from said orifices and prior to arrival of said coating material at any of said orifices.



3,970,223
MATERIAL METERING UNITS

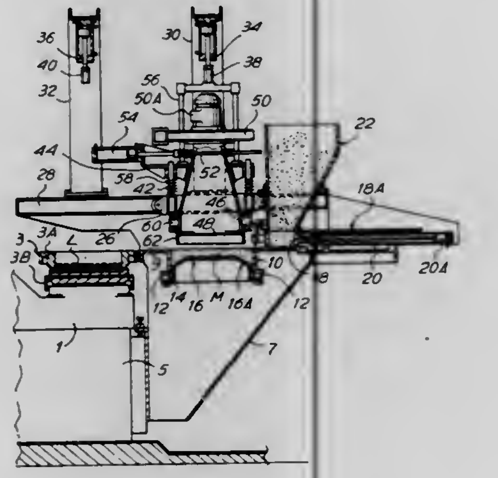
Enrico Longinotti, Florence, Italy, assignor to Longinotti S.p.A., Italy

Filed Mar. 24, 1975, Ser. No. 561,655

Claims priority, application Italy, Apr. 4, 1974, 9392/74

Int. Cl.² G01F ***11/18***

U.S. Cl. 222—306 **15 Claims**



1. A metering unit for semi-dry material, comprising means for delimiting a charge of semi-dry material of predetermined volume and shape and for transferring said charge to a discharge position beneath which a mold to be charged can pass, said means including a surface permeable to air but impermeable to the semi-dry material; and suction means for creating a suction effect through said permeable surface whereby semi-dry material of the charge can be held against said surface during transfer to the said discharge position; said means for delimiting and transferring the material charge further comprising an adjustable capacity dosage container within which the charge is delimited, the container including a grid bottom permeable to air but impermeable to the semi-dry material, and side walls extending from the bottom to define a material opening; a suction pick-up member carrying said permeable surface; and pick-up member transfer means for moving the suction pick-up member between a charge pick-up position, in which its permeable surface contacts through said material opening the material charge delimited within the dosage container, whereby to enable pick-up of charge, and a position in which the charge is in its discharge position.

3,970,224
SPOIL REMOVAL DEVICES FOR TUNNELLING MACHINES

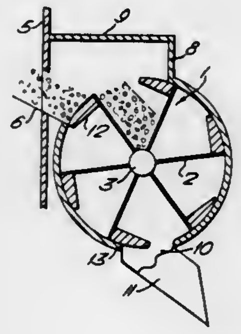
Cyril Gordon Chatham, Harpenden, and Kenneth Long, Petts Wood, both of England, assignors to National Research Development Corporation, London, England

Filed June 20, 1973, Ser. No. 371,878

Claims priority, application United Kingdom, June 22, 1972, 29348/72

Int. Cl.² G01F ***11/24***

U.S. Cl. 222—370 **5 Claims**



1. A spoil-removal device for use with a tunnelling shield in which excavating means operates within a substantially sealed-off and pressurised region and in which solid spoil has to be extracted from the excavating region, said spoil-removal device comprising:

a. a cylindrical chamber which has an inlet port open to the excavating region and a discharge port open to a position outside the region; and

b. a multi-compartment rotary member adapted to rotate in said chamber in sealed co-operation therewith, each compartment of said rotary member being arranged to pass said inlet port and said discharge port in turn and being arranged not to be open to both ports at the same time, said rotary member having an axis of rotation parallel to the longitudinal axis of the tunnel being formed by the tunnelling shield and comprising a multi-bladed helical screw, the said compartments being formed between consecutive blades, the arrangement being such that a charge of solid spoil enters each compartment in turn through said inlet port, is passed along the compartment as the member rotates, and is discharged from the compartment through said discharge port at the other end of the device; the amount of the charge entering each compartment being governed by the angle of slide of the spoil, the compartment being shaped to maintain the charge away from the outer edges of the compartment before said edges reach the seal between the rotary member and the edge of the inlet port, and when located in the vicinity of the discharge port, the compartment being arranged to attain an angle to the horizontal which is generally in excess of the said sliding angle of the spoil, whereby the compartment tends to empty itself while the compartment is open to the discharge port.

3,970,225
VALVE FOR A FLUID DISPENSER

Harvey Philip Jeal, Stevenage, and David John Sheffield, Hemel Hempstead, both of England, assignors to Avdel Limited, England

Filed Dec. 20, 1974, Ser. No. 534,762

Claims priority, application United Kingdom, Dec. 20, 1973, 59026/73

Int. Cl.² B67C ***3/28***

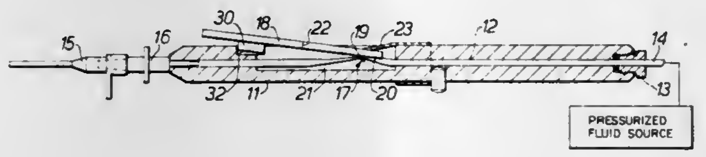
U.S. Cl. 222—529 **6 Claims**

1. A valve comprising:

a flexible tube of resilient material, said tube normally resiliently assuming a shape providing an open bore through which fluid can pass, said open bore having a cross-sectional shape which is continuously curved; and operating means for selectively squeezing a region of the tube in order to close said bore and for releasing said region of said tube in order to allow the bore to open,

said region of said tube which is squeezed and released having two diametrically opposed longitudinal folds whereby the cross sectional shape of said bore within said region is deformed so as to present two opposing sides which meet each other at sharply angled corners located within said folds,

whereby the force required to squeeze said opposing sides together and close said bore within said region is less than the force required to close said bore within the remainder of said tube.



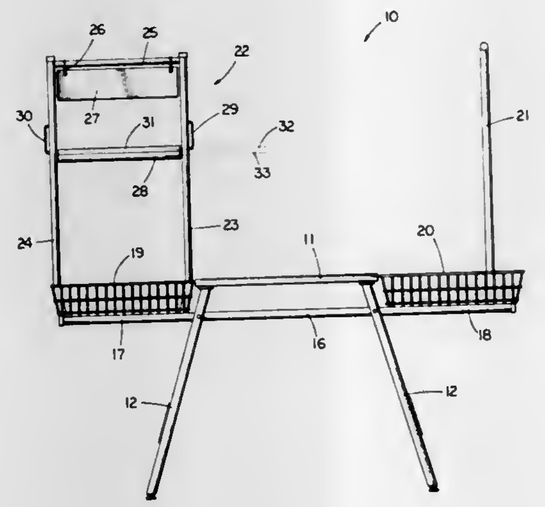
3,970,226
APPARATUS AND METHOD FOR HOLDING ONE END OF A SHEET TO BE FOLDED

John B. Lanagan, Indianapolis, and Stephen H. Tilson, Noblesville, both of Ind., assignors to The New Folding System Incorporated, Indianapolis, Ind.

Filed July 28, 1975, Ser. No. 599,627

Int. Cl.² A41H ***33/00***

U.S. Cl. 223—37 **8 Claims**



1. An apparatus for use in a sheet folding operation and for holding an end portion of a sheet to be folded comprising:

a frame;

a first bar with a longitudinal axis mounted to said frame;

a second bar swingably mounted to said frame in parallel relationship to said first bar, said second bar having a longitudinal axis above and to the side of said axis of said first bar; and,

means swingably mounting said second bar to said frame operable to allow said second bar to rest adjacent said first bar to grip a sheet therebetween when said end portion extends around said second bar and then between said first bar and said second bar to a position in contact with said sheet which is pulled taut horizontally away from said second bar past and beneath said first bar.

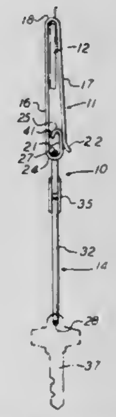
3,970,227
SPRING LOOP KEY RING AND BELT ATTACHMENT

Gilbert F. Hardy, 8191 Sterling Ave., Huntington Beach, Calif. 92646

Filed Feb. 21, 1975, Ser. No. 551,900

Int. Cl.² A45F ***5/02***

U.S. Cl. 224—5 R **2 Claims**



1. A key holder for use on a belt and comprising a belt hook formed by a pair of spaced flat legs joined by a shallow bend and adapted to retain the hook on the belt; a key keeper having a large half loop adapted to receive keys, a small half loop spaced from the large loop and engageable with the belt hook, a straight first keeper side rod connecting between said large and small keeper half loops, a discontinuous straight second keeper side rod connecting between the said large and small keeper half loops, and securing means for releasably securing together the discontinuous straight second keeper side rod, said securing means being fixedly attached to a portion of the discontinuous side near the small loop and further precluding passage of keys from the small loop at one end thereof; and means on the belt hook for retaining a key keeper including a flat loop extending from one spaced flat leg, a flat loop end bearing resiliently against said one spaced flat leg, and a flat leg extension on the other flat leg in contact with the outer surface of the loop and extending away from the shallow bend beyond the flat loop, whereby said key keeper is retained by said flat loop and said legs are resilient so as to spring apart to separate the flat loop and the leg for the insertion of a belt therebetween.

3,970,228
FLASHLIGHT AND FLASHLIGHT HOLDER

Donald A. Keller, Temecula, Calif., assignor to VSI Recreational Products, Fullerton, Calif.

Filed Feb. 26, 1975, Ser. No. 553,230

Int. Cl.² A45F ***5/00***

U.S. Cl. 224—5 H **2 Claims**

1. In combination with the flashlight of the type having a body, an on-off switch housing on the body extending a height therefrom, a head on the body having a diameter greater than the body, an improved flashlight holder comprising:

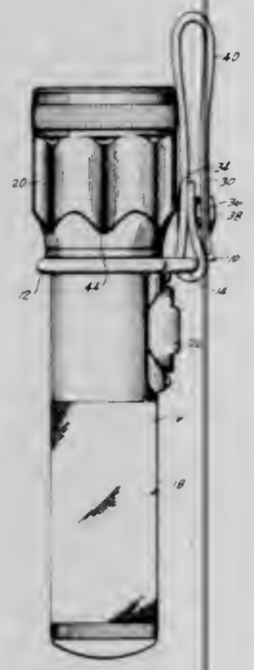
a. a ring having a diameter greater than the diameter of the body but less than the diameter of the head and less than the diameter of the body plus the height of the on-off switch housing;

b. a bridge of the ring defining a pair of generally parallel legs extending in a direction outwardly away from the center of the ring and merging into the balance of the ring, and a bight connecting the legs;

c. a strap for attaching a flashlight to a person having one end looped around the bight and attached to itself to define a closed loop loosely securing the strap to the ring and permitting the ring to rotate in the strap about the axis of the bight; and

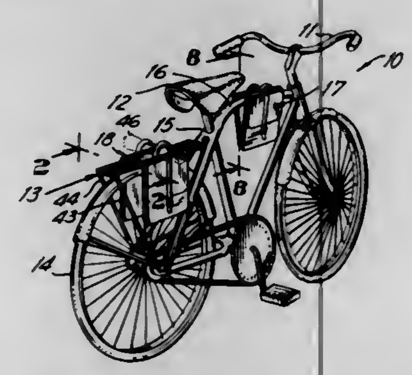
d. the distance measured from a point on the ring opposite the bight to the most proximate surface of the strap on the inside of the bight being greater than the diameter of the body of the flashlight and the height of the on-off switch housing, and the distance between the legs of the bight being greater than the width of the on-off switch housing;

whereby, the on-off switch housing can pass through the bridge for inserting and removing the flashlight from the holder and the holder interferes with the on-off switch housing when such housing is out of register with the bridge to lock the flashlight to the holder when the on-off switch housing is below the ring and hold without such locking the flashlight when the on-off switch housing is above the ring.



3,970,229
CONVERTIBLE SADDLE BRIEF CASE

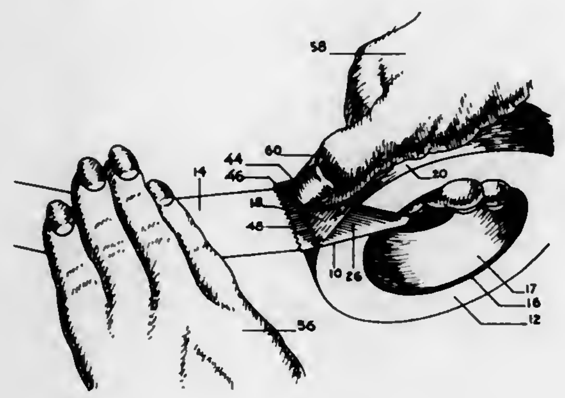
Sidney Norinsky, 110 West 96th St., New York, N.Y. 10025
Continuation-in-part of Ser. No. 547,655, Feb. 6, 1975. This application Feb. 6, 1975, Ser. No. 547,656
Int. Cl.² B62J *9/00*
U.S. Cl. 224—31 **1 Claim**



1. A convertible receptacle for use with wheeled vehicles having a support member, comprising, in combination: a first housing portion operationally defining a first receiving compartment therewithin; a second housing portion operationally defining a second receiving compartment therewithin; a web portion integral with and interconnecting said first and second housing portions; a first handle portion associated with and secured to said first housing portion; a second handle portion associated with and secured to said second housing portion; and snap means integral with said housing portions for removably holding said first and second housing portions in a proximate relationship with respect to one another; said first housing portion including front and rear walls interconnected by opposing side and bottom walls, said side and bottom walls being formed with a plurality of folded portions thereof to permit expansion of said front and rear walls away from one another, a flap member integral with said rear wall extending in overlapping relationship with respect to said front wall, thereby covering uppermost extremities of said front and side walls and an access opening defined thereby, a fastener member integral with said front wall and accessible to a user of the convertible receptacle, a fastener portion of said flap member extending to said fastener member, said fastener portion including fastening means cooperative with respect to said fastener member for enabling the user to secure said fastener member and said fastening means together, and a pair of guard means integral with and depending from opposite inside border surfaces of said flap member, said guard means comprising material capable of folding upon itself and expanding to cover paths of undesirable elements of the weather to inner portions of said first receiving compartment, said guard means covering upper extremities of said side walls, said second housing portion including front and rear walls interconnected by opposing side and bottom walls, said side and bottom walls being formed with a plurality of folded portions thereof to permit expansion of said front and rear walls away from one another, a flap member integral with said rear wall and extending in overlapping relationship with respect to said front wall, thereby covering uppermost extremities of said front and side walls and an access opening defined thereby, a fastener member integral with said front wall and accessible to a user of the convertible receptacle, a fastener portion of said flap member extending from said rear wall over said flap member to said fastener member, said fastener portion including a fastening means cooperative with respect to said fastener member for enabling the user to secure said fastener member and said fastening means together, and a pair of guard means integral with and depending from opposite inside border surfaces of said flap member, said guard means comprising material capable of folding upon itself and expanding to cover paths of undesirable elements of the weather to inner portions of said first receiving compartment, said guard means covering upper extremities of said side walls, said web portion being formed with handle openings therethrough adjacent said first and second housing portion rear walls, said first and second handle portions extending through said handle openings and being capable of movement between usable and retracted positions, said first and second handle means being shaped to permit their being comfortably and simultaneously grasped by one hand of the user, said web member being capable of supporting said housing portions from a wheeled vehicle support member and being further capable of folding from view to provide the user with an article having the appearance and characteristics of a briefcase.

3,970,230
TAPE TEARING DEVICE

Alexander Horn, 624 Hazelhurst Ave., Merion, Pa. 19066
Filed Feb. 5, 1975, Ser. No. 547,124
Int. Cl.² B26F *3/02*
U.S. Cl. 225—65 **4 Claims**



1. In a roll tape tearing device removably applied to a roll of tape having a thickness defined between an outer periphery and an inner core, the said tearing device including:

A. a web transversely overlying the outer periphery of the tape roll,

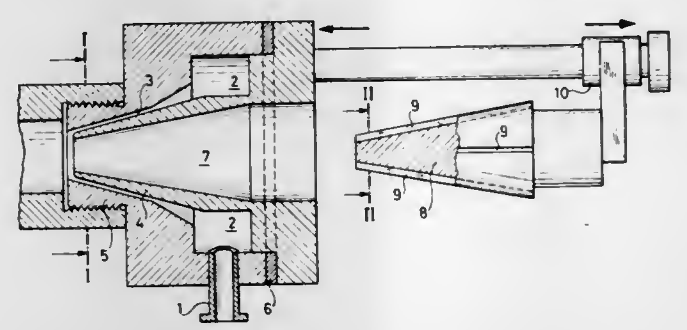
1. said web having a length slightly greater than the width of the tape roll;

B. a pair of spaced, generally parallel legs depending from the transverse edges of the web,
   1. said legs extending in length a distance that is greater than the thickness of the roll of tape,
   2. said legs terminating downwardly in a shoulder construction,
      a. said shoulder construction including inwardly projecting shoulders, the space between the shoulders normally being less than the width of the tape roll whereby the shoulders act to retain the dispenser in association with the tape roll at the said core thereof,
      b. the shoulder construction comprising an inwardly inclined planar surface the inwardly inclined planar surface contacting the outer periphery of the tape at an angle of less than 90° to spread a portion of the legs when the tearing device is applied to the roll of tape; and

C. cutter blade means carried by the web to sever the tape.

3,970,231
METHOD AND DEVICE FOR STARTING UP INJECTOR NOZZLES

Hans-Jürgen Strutz, and Ingolf Jacob, both of Bobingen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Aug. 5, 1974, Ser. No. 494,510
Claims priority, application Germany, Aug. 4, 1973, 2339603
Int. Cl.² B65H *17/32*
U.S. Cl. 226—7 **13 Claims**

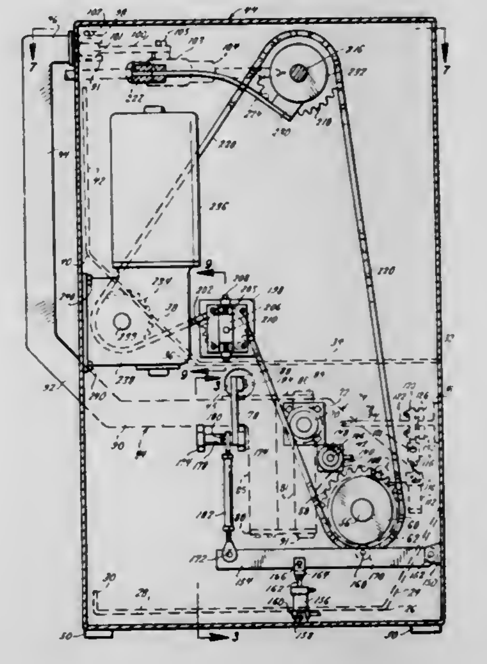


1. A process for introducing one or several threads into an injector nozzle, having a sucking inlet opening or openings through which a flow of motive fluid transports the threads, which comprises introducing the threads to the sucking inlet opening or openings, arranging the cross-sectional area of the sucking inlet opening or openings, a finite amount larger than the normal thread transporting size, causing the motive fluid to flow through the nozzle whereby the threads are sucked through the finitely larger sucking inlet opening or openings to insert them into the nozzle, and reducing the cross sectional area of said inlet opening or openings to their transporting size for transporting the threads through the nozzle.

3,970,232
WELDING MACHINE

Vernon L. Melton, 9209 Meadowbrook Lane, Overland, Mo. 63114
Filed Dec. 16, 1974, Ser. No. 532,898
Int. Cl.² B23K *37/02*
U.S. Cl. 228—7 **32 Claims**

1. A welding machine which has rotatable work-supporting means that can rotate work about a given axis while a welding operation is being performed on said work, a pivot, a movable mounting for said pivot which holds the axis of said pivot so it extends transversely of said given axis and which can be moved during said welding operation to dynamically move said axis of said pivot radially relative to said given axis, a position-changing member for said mounting for said pivot which is rotatable about a further axis, that extends transversely of said pivot, and which can move said pivot mounting during said welding operation, a support for a welding torch that is supported by and is rotatable about said pivot during said welding operation to dynamically rotate said welding torch about said pivot, said support for said welding torch moving with said pivot whenever said position-changing member for said pivot mounting causes said pivot mounting to move said pivot radially relative to said given axis, whereby said pivot mounting can hold said pivot, and hence said welding torch, adjacent rotating work held by said rotatable work-supporting means and also can change the radial position of said axis of said pivot, and hence of said welding torch, relative to said given axis during said welding operation, driving means to rotate said rotatable work-supporting means and thereby provide relative movement between said support for said welding torch and said rotatable work-supporting means and hence to provide relative movement between said welding torch and said rotating work, and thereby enable said welding torch to confront a predetermined relatively-moving surface of said rotating work, and support-moving means that includes a mechanical linkage connected to said support, said linkage engaged by a rotatable member which is rotatable during said welding operation to move said support for said welding torch about said pivot and thereby cause said welding torch to rotate about said pivot and hence to move angularly relative to said work-supporting means, said driving means also rotating said rotatable member of said support-moving means, said position-changing member for said pivot mounting being adapted to coact with said support-moving means, during the time said driving means is providing said relative movement between said welding torch and said rotating work, to dynamically vary the angular position of said support for said welding torch, and hence of said welding torch, relative to said predetermined surface of said rotating work and also to dynamically vary the radial position of said pivot, and hence of said welding torch, relative to said given axis in a predetermined manner, whereby a weld can be formed at said predetermined surface of said rotating work without undercutting any portion of said rotating work.

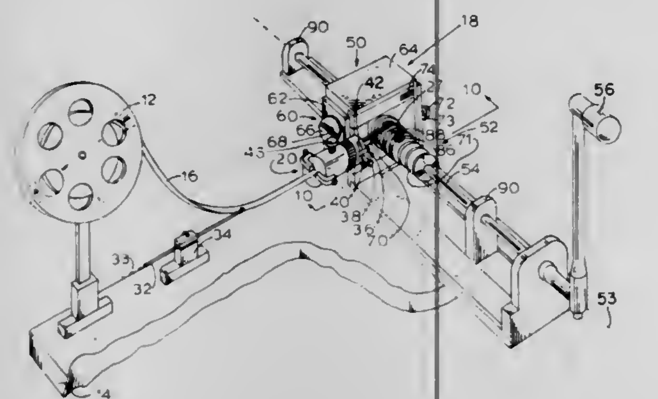


16. A welding machine which has work-supporting members that can hold and move a workpiece, a support for a welding torch that can hold said welding torch adjacent said workpiece while said workpiece is held and moved by said work-supporting members, driving members to move said work-supporting members and thereby provide movement of a predetermined surface of said workpiece relative to said welding torch, and support-moving members adapted to move said support for said welding torch relative to said work-supporting members, during the time said driving members are moving said workpiece relative to said welding torch, to vary the angular position of said welding torch relative to said

predetermined surface of said workpiece in a predetermined manner, whereby a weld can be formed at said predetermined surface of said workpiece without undercutting any portion of said workpiece, said support-moving members including a tiltable pivot mounting that pivotally holds said support for said welding torch, said tiltable pivot mounting being dynamically tiltable to tilt said suppport for said welding torch, and said support for said welding torch being dynamically pivotable relative to said tiltable pivot mounting, and said tiltable pivot mounting being shiftable sideways, whereby said support-moving members can dynamically provide universal movement of said support for said welding torch.

3,970,233
MACHINE AND A METHOD FOR FABRICATING A HELICOIDAL TUBE

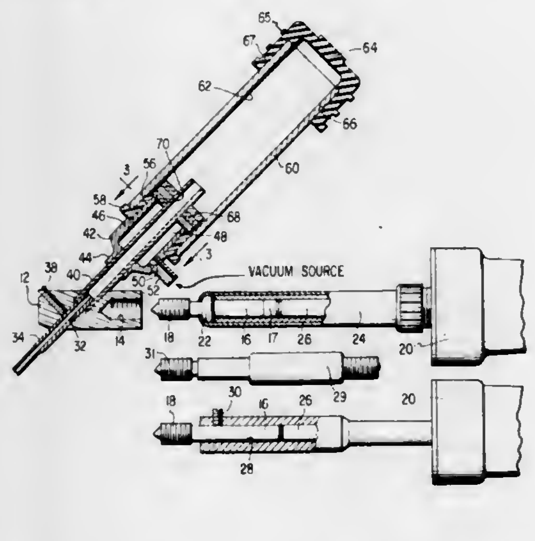
Josef Suchecki, 4, Sussex Lane, Bethpage, N.Y. 11714
Filed Nov. 5, 1975, Ser. No. 628,889
Int. Cl.^{2} A44C *27/00;* **B21C** *1/08;* **B21D** *5/10*
U.S. Cl. 228—17.5 **10 Claims**



1. A machine for fabricating a helicoidal tube from a longitudinal flat and bendable strip comprising:
- a frame;
- tube-forming means disposed on said frame for receiving the longitudinal flat strip and for the forming thereof into a tube having inner and outer dimensions and formed with a seam, said tube-forming means including:
  - a first element formed with a slit for receiving said strip;
  - a second element formed with a tapered opening and having widest and narrowest wall portions, said narrowest wall portion of said second element facing said slit, said widest wall portion of said second element having inner dimensions just exceeding the outer dimensions of said tube;
  - a holder for holding said first and second element in alignment so that said longitudinal strip is substantially centered with respect to the cross-section of said second element;
  - a hollow member interposed between said first and second elements;
  - a longitudinal guide member having a first longitudinal axis, clamped to said frame and passing through said first and second elements for guiding said strip around said guide member; and
  - adjustment means disposed on said holder for adjusting the position of said second element with respect to said first element; and
  - helicoid-forming means disposed on said frame for receiving said tube and for the forming of the latter into a helicoid.

3,970,234
VACUUM DESOLDERING DEVICE FOR SOLDERING IRONS

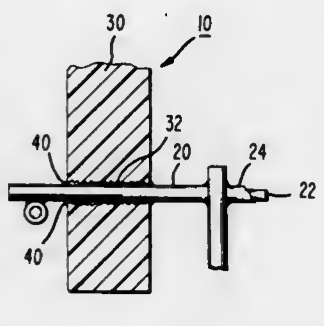
Kenneth C. Litt, and William J. Siegel, both of Silver Spring, Md., assignors to Pace, Incorporated, Silver Spring, Md.
Filed Aug. 23, 1974, Ser. No. 499,997
Int. Cl.^{2} B23K *37/00*
U.S. Cl. 228—20 **10 Claims**



1. Apparatus including a single desoldering device adaptable for use with a plurality of different soldering irons, each iron having a different recess for accomodating a removable soldering tip, said apparatus comprising:
- a. a plurality of adaptor means, each having a different and distinct fitting adapted to uniquely correspond to one of said plurality of different soldering irons so that each adaptor means is removably securable at one end thereof in the recess of its corresponding soldering iron, the other ends of all said adaptor means opposite said one ends thereof having the same configuration to permit the removable mounting thereon of said single desoldering device, one of said adaptor means being removably secured at said one end thereof in the recess of its corresponding soldering iron and its said other end outwardly extending therefrom; and
- b. means comprising said single desoldering device for effecting desoldering removably mounted on the outwardly extending other end of said one adaptor means.

3,970,235
METHOD OF ANCHORING METALLIC COATED LEADS TO CERAMIC BODIES AND LEAD-CERAMIC BODIES FORMED THEREBY

Henry Leo Blust, Marion, Ind.; Norman Lee Lindburg, Berkeley Heights, and Dale Vernon Henry, Union, both of N.J., assignors to RCA Corporation, New York, N.Y.
Division of Ser. No. 468,098, May 8, 1974, Pat. No. 3,929,426. This application Aug. 15, 1975, Ser. No. 605,121
Int. Cl.^{2} B23K *1/04*
U.S. Cl. 228—122 **5 Claims**

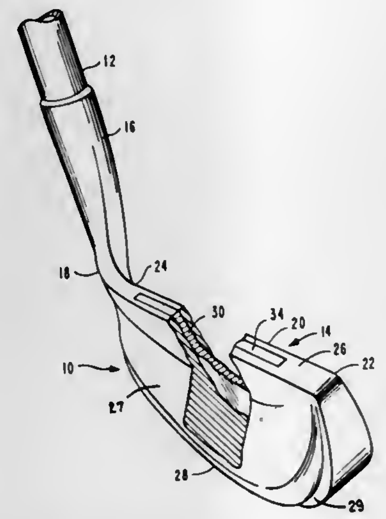


1. A method of anchoring a metallic coated lead within an opening of slightly larger cross-sectional dimension in a fired ceramic body, wherein the lead includes a core material of a first metallic composition and an outer coating of a second metallic composition, the melting temperature of which is lower than that of the said first metallic composition;

said first metallic composition being wettable by said second metallic composition and said ceramic body being substantially non-wettable by said second metallic composition; the opening of the ceramic body including interior surface irregularities; comprising the steps of:
- a. inserting the lead in the opening of the ceramic body to form an interstitial opening at a lead-ceramic interface;
- b. heating the lead and ceramic body as an integral assembly to a temperature above the melting temperature of the second metallic composition, but below the melting temperature of the first metallic composition and that of said ceramic body;
- c. maintaining the temperature of the heating step (b) for a period of time sufficient to form a charge of molten second metallic material, and to cast, substantially by capillary action, said charge of molten second metallic material within said interstitial opening substantially conterminous with the interior surface irregularities of said opening; and
- d. cooling said lead and ceramic body as an integral assembly below the melting temperature of said second metallic material whereby said lead is anchored within the opening of said ceramic body substantially by the casting action of said second metallic material within the interior surface irregularities of said opening.

3,970,236
GOLF IRON MANUFACTURE

Kenneth A. Rogers, Van Nuys, Calif., assignor to Shamrock Golf Company, Los Angeles, Calif.
Filed June 6, 1974, Ser. No. 476,851
Int. Cl.^{2} A63B *53/00*
U.S. Cl. 228—196 **12 Claims**



1. A method for the manufacture of a head of a golf club of the numbered catagory iron type having an improved weight distribution which comprises:
- forming a head blank having a hosel, neck and body dependent thereof of the shape and size generally characteristic of an iron head of numbered category while providing an open cavity in the face of said body which cavity extends from at least the top edge of said body across a substantial portion of said face and to a first depth therein below the center of percussion;
- forming faceplate land grooves along at least two opposite cavity edges to a second depth, less than the first depth therein;
- preparing a sheet metal plate having a thickness approximately equal to said second depth and exterior dimensions to seat in said land grooves;
- placing said metal plate in said grooves and thereby closing said face to said cavity;
- fusing said sheet metal plate about its periphery to said head body, thereby forming a homogenous head blank having an interior cavity open along said edge surface and extending across a substantial distance of said face;
- positioning a predetermined amount of high density weighted material in the bottom of said cavity below said center of percussion to impart the desired swing weight to said blank; and
- filling said cavity with a low density filler.

3,970,237
METHOD OF BRAZING ALUMINUM PARTS

Kostas F. Dockus, Cicero, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 304,457, Nov. 7, 1972, abandoned. This application June 24, 1975, Ser. No. 589,992
Int. Cl.^{2} B23K *35/28*
U.S. Cl. 228—208 **9 Claims**

1. The method of brazing an aluminum part to another metallic part with optimum fillet formation between the brazed parts wherein at least one part has a clad surface of brazing alloy, such as aluminum-silicon, thereon, or a filler material composed of a brazing alloy, such as aluminum-silicon, is used between the two parts, said brazing method comprising the steps of:
- depositing on the clad surface or filler material a bond-promoting alloy selected from the group consisting of nickel-lead, cobalt-lead, or combinations of these metals in an amount of from about 0.3% to about 7% by weight of the total brazing alloy-bond-promoting alloy composition and wherein the thickness of said bond-promoting alloy is no greater than 2.5% of the brazing alloy-bond-promoting alloy thickness, and the lead content ranging from about 0.25% to 10 weight per cent of the total bond-promoting alloy content;
- placing said parts in contact with each other, with or without pressure, in an inert atmosphere or vacuum and raising the temperature of the parts in said atmosphere or vacuum to between 1050° and 1150°F for a period long enough for melting and spreading of the brazing alloy.

3,970,238
SOLDERING OF STAINLESS STEELS

Lester Aronberg, Chicago, Ill., assignor to Lake Chemical Company, Chicago, Ill.
Continuation-in-part of Ser. No. 202,616, Nov. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 849,174, Aug. 11, 1969, Pat. No. 3,660,127. This application Jan. 31, 1973, Ser. No. 328,471
Int. Cl.^{2} B23K *35/36*
U.S. Cl. 228—207 **8 Claims**

1. In a method for the soldering of stainless steel in the form of sheets or strips and in which a soft solder and a soldering flux are utilized, the improvement which comprises utilizing as said flux a composition which is in the form of a liquid containing added water and which consists essentially of at least one phosphorus-containing acid selected from the group consisting of phosphoric acid and phosphorous acid, and at least one phosphate salt selected from the group of monoammonium phosphate, diammonium phosphate, and amine mono- and di-phosphates in which the amine contains from 1 to 6 carbon atoms, said composition containing at least 50% of free phosphorus-containing acid, said phosphate salt being in solution in said liquid, said salt constituting, by weight, from about 10% to 50% of the phosphorus-containing acid.

3,970,239
FLUXING TECHNIQUE FOR REMOVING LEAD OXIDE

Michael Hill, Tarrytown, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

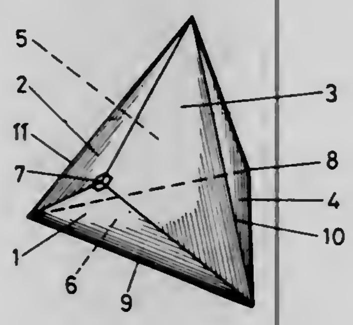
Filed Aug. 14, 1975, Ser. No. 604,723
Int. Cl.^{2} B23K *35/362*
U.S. Cl. 228—220 **8 Claims**

1. A process for removing lead oxide from the surface of the lead solder of a semiconductor assembly in the inert atmosphere of a joining furnace comprising the step of:
introducing into said joining furnace an acetate compound, said acetate compound being capable of reacting with said lead oxide at the temperature of said joining furnace to form at least one coordinated lead compound, said acetate compound and said coordinated lead compound both being gases at said joining furnace temperature.

3,970,240
CONTAINER FOR LIQUIDS

Oscar Jacques Van Leer, Amstelveen, Netherlands, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed June 16, 1975, Ser. No. 587,053
Claims priority, application Netherlands, June 17, 1974, 7408072
Int. Cl.^{2} B65D *5/02*
U.S. Cl. 229—22 **3 Claims**

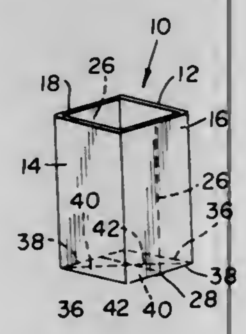


1. Container for liquids, such as pastes, powders, which container has the form of a spatial polygon, the sideplanes of which consisting of identical, in particular congruent triangles, characterized in that the container consists of six triangular planes which three by three meet with the top angles in two opposite points and placed with their bases against each other.

3,970,241
FLAT BOTTOM BAG

Violet M. Hanson, 14 Fairway Drive, Old Bethpage, N.Y. 11804

Division of Ser. No. 376,112, July 3, 1973, Pat. No. 3,916,770. This application July 31, 1975, Ser. No. 600,277
Int. Cl.^{2} B65D *33/00*
U.S. Cl. 229—58 **9 Claims**

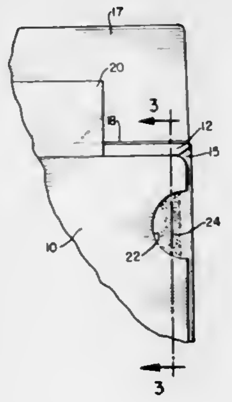


1. As an article of manufacture,
a double-sealed flat bottom bag of heat sealable material comprising a seam heat sealing closed the bag bottom and defining opposite inwardly gusseted sides,
said inwardly gusseted sides being sealed to the bag bottom by said sealing seam for automatically forming flaps in overlying relationship with said closed bottom when the bag bottom is pressed flat,
and said overlying flaps and closed bottom being heat sealed together in their flat overlying relationship by further sealing means extending across the width of the bag and said flaps.

3,970,242
HOSIERY ENVELOPE

Clifton S. Swafford; Thurman T. Caldwell, and William J. Dungan, all of Charlotte, N.C., assignors to Rexham Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,659
Int. Cl.^{2} B65D *27/14*
U.S. Cl. 229—80 **6 Claims**



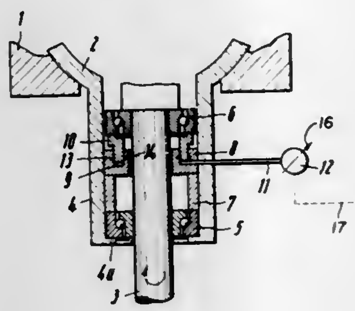
1. An improved envelope construction, comprising
a. juxtaposed parallel front and rear wall panels;
b. means joining said front and rear walls at bottom edges thereof;
c. a closing flap panel articulated to said front wall;
d. means joining said front and rear walls along the side edges thereof including glue flap panels;
e. said glue flap panels lapping the side edges of said rear wall panel;
f. said rear wall including an upper sealing zone adapted to be contacted by said closing flap;
g. a pair of sealing aperture means defined in the side edges of said rear wall panel within said sealing zone;
h. a bimodal adhesive layer deposited upon said glue flap panels and joining said glue flap panels with said rear panel;
i. portions of said adhesive layer being exposed through said sealing apertures, whereby said closing flap is adapted to be adhesively joined directly to the innermost one of said glue flap panels and said rear wall panel through said apertures to close said envelope.

3,970,243
SUPPORT STRUCTURE FOR A SUSPENSION CENTRIFUGE

Volkmar Hentschel, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed July 15, 1975, Ser. No. 596,181
Claims priority, application Germany, July 25, 1974, 2435733
Int. Cl.^{2} B04B *11/00*
U.S. Cl. 233—19 R **9 Claims**

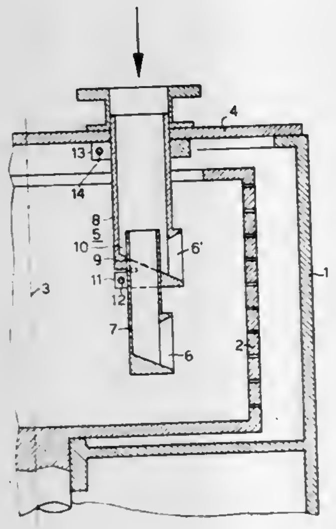
1. A support structure for a suspension centrifuge comprising rotational shaft means for suspending said centrifuge, ball socket means, ball head means supported for pivotal movement in said ball socket means, shaft bearing means operatively supported by said ball head means, said shaft bearing means comprising axial bearing means and radial bearing means, said axial bearing means including an outer race and an inner race, said bearing means further comprising support ring means held against axial displacement by said ball head means to surround with play said rotational shaft means, a ring groove in said support ring means facing toward said axial bearing means, ring piston means rigidly secured at one end thereof to said outer race of said axial bearing means, and surrounding said rotational shaft means to reach with its other piston end into said ring groove, pressure fluid in said ring groove, pressure responsive actuating means, and conduit means operatively connecting said pressure responsive actuating means to said pressure fluid in said ring groove, whereby said pressure responsive actuating means may monitor the filling of said centrifuge.



3,970,244
CLEARING CENTRIFUGE

Albert Bucher, Kriens, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed June 10, 1974, Ser. No. 477,970
Claims priority, application Switzerland, June 19, 1973, 8860/73
Int. Cl.^{2} B04B *11/02*
U.S. Cl. 233—22 **12 Claims**

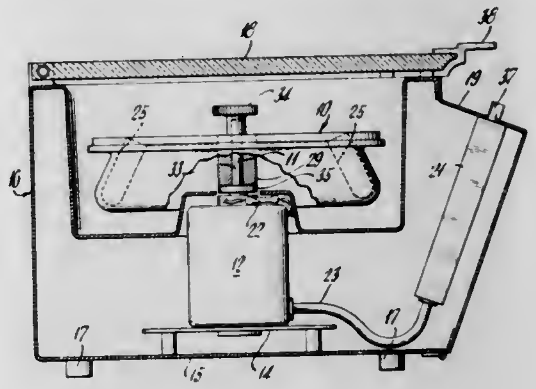


1. In a clearing centrifuge comprising a housing having a cover at one end, a centrifuge drum mounted for rotation in the housing, and an inlet tube for filling said drum with a material to be centrifuged; and wherein the inlet tube is mounted in said cover, extends into the drum in a direction parallel with the axis of drum rotation, and includes at least two outlet apertures which are directed radially with respect to said axis and deliver said material into the drum; the improvement that said inlet tube comprises two tubular part means which are formed to provide said outlet apertures and one of which is mounted at least partly within the other, the two tubular part means including means which seals the joint between them and being adjustable in at least one direction relatively to each other to permit changes in the orientation of at least one outlet aperture with respect to the drum.

3,970,245
UNIVERSAL CENTRIFUGE

Hans-Peter Aeschlimann, Kurpfalzring, Switzerland, assignor to Dr. Molter GmbH, Heidelberg, Germany

Filed May 21, 1975, Ser. No. 579,349
Int. Cl.^{2} B04B *9/10, 7/04*
U.S. Cl. 233—24 **6 Claims**

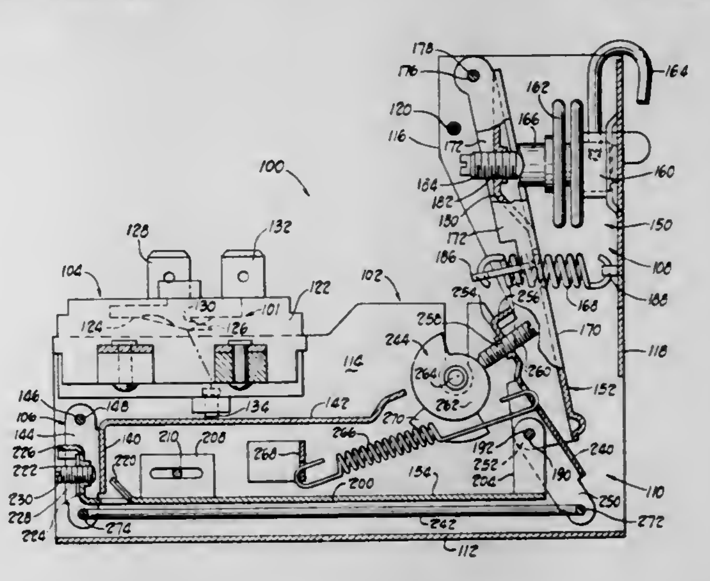


1. A centrifuge comprising a drive shaft, a rotation head detachably mounted on said shaft, drive means for rotating said shaft and said head mounted thereon at rotative speeds ranging from low speeds to high speeds, and control means for regulating the rotative speed of said drive means, said control means comprising means for pre-selecting both the rotative speed and the cycling time of said head, means for sensing the rotative speed of said head and timing means activated by said sensing means for timing the rotation cycle of said head when said head reaches the pre-selected rotative speed.

3,970,246
AIR CONDITIONING CONTROL SYSTEM

Russell G. Attridge, Jr., and Andrew Kulick, both of Columbus, Ohio, assignors to Ranco Incorporated, Columbus, Ohio

Division of Ser. No. 438,755, Feb. 1, 1974, Pat. No. 3,915,376. This application Aug. 19, 1975, Ser. No. 605,908
Int. Cl.^{2} G05D *22/00*
U.S. Cl. 236—44 C **9 Claims**



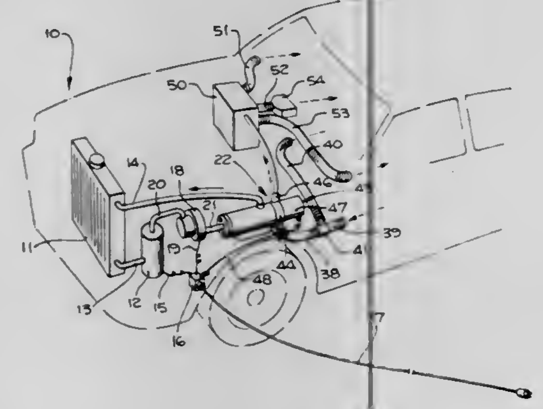
1. A control device responsive to ambient air temperature and moisture content levels comprising:
a. a control unit operable between first and second control conditions;
b. an operating member for said control unit, said operating member supported for movement between first and second positions in which said control unit is in said first and second conditions, respectively;
c. relative humidity responsive means for moving said operating member and comprising an elongated humidity sensing element comprised of a material which changes length in response to changes in relative humidity of air ambient said element and supporting structure for said element;

- d. air temperature responsive means cooperating with said relative humidity responsive means to prevent actuation of said operating member in response to changes in abmient air relative humidity occurring as a result of air temperature changes within a given range, said operating member being moved substantially only in response to sensed changes in moisture content of the air in said temperature range; and,
- e. said temperature responsive means comprising a link member movable to a first position in response to sensed air temperatuers above said range to prevent actuation of said operating member to its first position by said humidity responsive means, said link member movable to a second position in response to sensed air temperatures below said range to prevent actuation of said operating member to its second position by said humidity responsive means.

3,970,247
CONSERVATION OF ENERGY HEATER

Boyd E. Keeling, P.O. Box 4-1059, Anchorage, Alaska 99509, and Harold R. Hawkins, 6675 Holly Lane, Anchorage, Alaska 99502

Filed Nov. 7, 1974, Ser. No. 521,555
Int. Cl.² B60H *1/02*
U.S. Cl. 237—12.3 B **4 Claims**



1. An auxiliary air preheater means used in prewarming interiors of vehicles in combination with engine preheating means employing a heated liquid for prewarming the engine prior to operation of said vehicle engine and prior to operation of the conventionally provided engine associated vehicle interior heater, said auxiliary air preheater means comprising:

housing means mountable to said vehicle separate from said engine associated heater and having air inlet and air outlet means;

liquid conduit means connected to said engine preheating means and passed through said housing for carrying said heated liquid being used for preheating said engine through said housing, said liquid conduit means including a liquid conduit coil within said housing;

means for circulating air from within the interior of said vehicle through said housing about said liquid conduit coil including an air inlet conduit connected between the vehicle interior and said housing inlet means and an air conduit outlet means connecting between said vehicle interior and said housing outlet means; and

air blower means associated with said housing for drawing vehicle interior air through said air inlet conduit into said housing through said housing inlet means, for moving said air through said housing in contact with said liquid conduit coil in heat exchange relation to heat said air and then blowing said heated air out said housing outlet means through said air outlet conduit into said vehicle interior, whereby vehicle interior air is constantly recirculated through the housing of said auxiliary air preheater means independently of operation of the vehicle engine and independently of operation of the conventional engine associated vehicle heater.

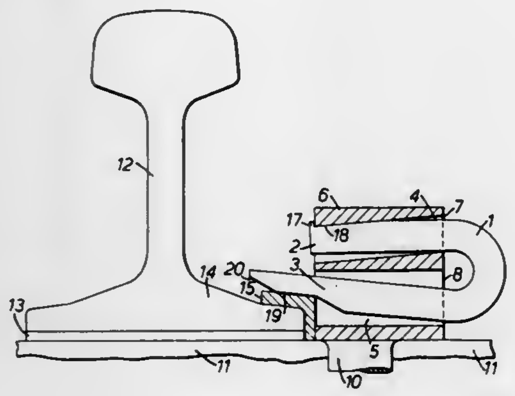
3,970,248
COMBINED RAIL CLIP AND ANCHORAGE

George Molyneux, Eastbrook Road, Gloucester, England

Continuation-in-part of Ser. No. 396,303, Sept. 11, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,605

Claims priority, application United Kingdom, Sept. 12, 1972, 42287/72

Int. Cl.² E01B *9/30*
U.S. Cl. 238—349 **23 Claims**



1. A combination of a rail clip and anchorage for holding down a flanged track rail onto a supporting surface, wherein said rail clip comprises a substantially U-shaped bar of resilient yet sturdy material providing two arms and said anchorage is provided with mounting means whereby it may be secured to said supporting surface and is formed to define a passageway to receive one arm of said bar and engaging both top and bottom surfaces of said arm at spaced positions in such a way that said one arm is restrained against tilting movement and both said arms will be directed towards said rail flange, such that a bearing surface of the other arm of said bar, situated below the one arm, will be caused to bear down onto the flange of said track rail, cooperating locking means being provided between said anchorage and said rail clip to resist withdrawal of said clip when said one arm of said bar is inserted into said passageway to a locking position and including means for restraining pivotal movement of said rail clip about the longitudinal axis of said passageway.

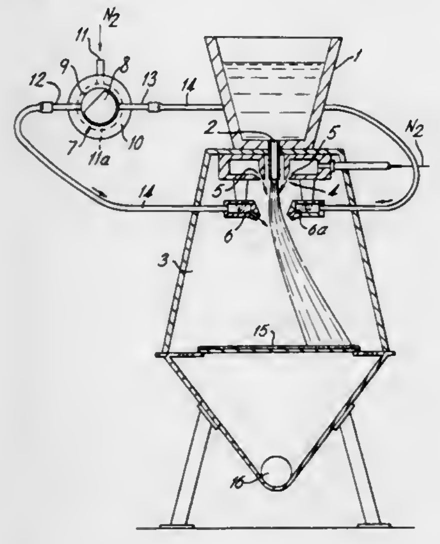
3,970,249
SPRAYING ATOMIZED PARTICLES

Alfred Richard Eric Singer, Swansea, Wales, assignor to National Research Development Corporation, London, England

Filed Nov. 6, 1974, Ser. No. 521,403

Claims priority, application United Kingdom, Nov. 6, 1973, 51437/73

Int. Cl.² B05B *3/14*
U.S. Cl. 239—102 **14 Claims**



1. Apparatus for the spraying of atomised particles, which comprises means for producing a coherent stream of gas

atomised particles, means for directing a secondary stream of gas against the stream of gas atomised particles and control means adapted for repeated cyclic operation for varying the flow of the secondary stream of gas in such a manner as, in operation, to deflect the stream of gas atomised particles and impart thereto an oscillation substantially in a single plane.

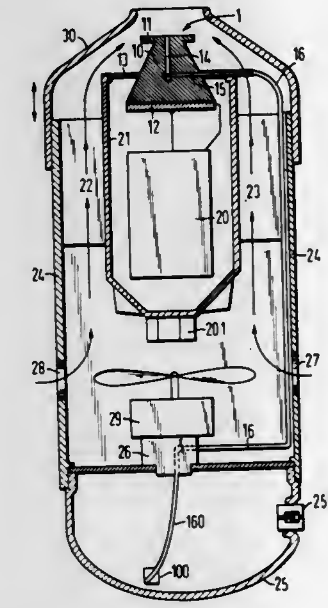
3,970,250
ULTRASONIC LIQUID ATOMIZER

Wolf-Dietrich Drews, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1975, Ser. No. 616,147

Claims priority, application Germany, Sept. 25, 1974, 2445791

Int. Cl.² B05B *3/14, 7/28*
U.S. Cl. 239—102 **11 Claims**

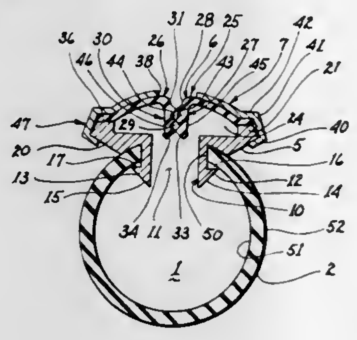


1. An ultrasonic liquid atomizer utilizing a piezoelectric vibratory system with the vibrations of an piezoelectric transducer transmitted to a liquid atomizer plate by a conical transformer comprising: a housing defining an air flow chamber having an outlet therefrom, an atomizer plate positioned in said housing means adjacent the outlet defining an air flow jet area around the atomizer plate and through the outlet and blower means inducing an air flow through the housing past the atomizer plate and thence through the outlet.

3,970,251
PIPE INSERTABLE EMITTER FOR IRRIGATION SYSTEMS

Richard C. Harmony, Tucson, Ariz., assignor to Harmony Emitter Company, Inc., Tucson, Ariz.

Filed Mar. 6, 1975, Ser. No. 555,945
Int. Cl.² B05B *15/02*
U.S. Cl. 239—107 **9 Claims**



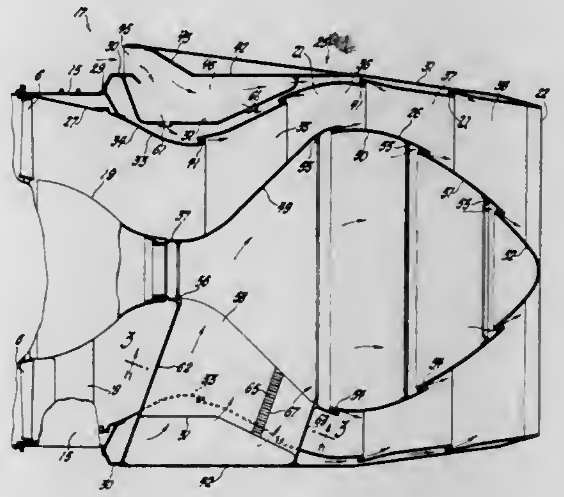
1. An emitter insertable within a water distribution line for discharging water from the water distribution line at a constant rate despite changes in water pressure within the water distribution line, said emitter comprising:

- a. a base for conveying water from within the water distribution line and through the wall of the water distribution line, said base having a depending hollow shroud for penetrating the wall of the water distribution line and conveying water therefrom;
- b. an apertured diaphragm mounted upon said base for establishing a water discharge outlet from said emitter;
- c. bias means for maintaining a constant rate of water flow through said water discharge outlet despite variations in water pressure within said shroud, said bias means comprising a pair of opposed surfaces separable from one another for defining a single passageway for the water flow; and
- d. a cap for securing said diaphragm to said base, said cap including a slot disposed in proximity to said outlet for accommodating the discharge of water from said emitter; whereby, a constant rate of water discharge from the water distribution line will occur wherever said emitter is inserted into the water distribution line despite variations in water pressure within the water distribution line.

3,970,252
COOLED EXHAUST DUCT

Charles H. Smale, Indianapolis, Ind., and James A. Pyne, Jr., Phoenix, Ariz., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1967, Ser. No. 672,678
Int. Cl.² B64D *33/04*
U.S. Cl. 239—127.3 **6 Claims**



1. A film cooled gas turbine exhaust duct comprising, in combination,

an outer body,

a bulbous hollow inner inner body,

the bodies defining between them an exhaust duct for hot gas,

the inner body comprising a plural number of radially spaced telescoped sections defining gaps spaced axially of the exhaust duct for flow of cooling gas between the sections,

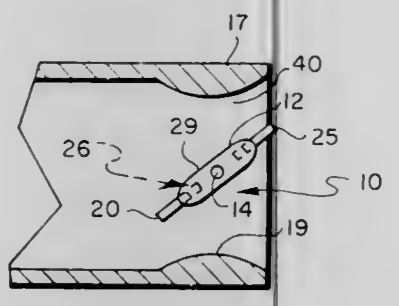
the gaps extending circumferentially of the exhaust duct and opening in the direction of flow through the exhaust duct so as to provide a film of cooling gas over the surface of the inner body,

ribs disposed circumferentially of the inside of the inner body adjacent the gaps so as to block direct transmission of radiation from within the inner body through the gaps,

and means for supplying a cooling gas into the inner body.

3,970,253
FLOW AREA MODULATOR AND FLOW DEFLECTOR

William M. Burkes, and William H. Miller, both of McGregor, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.
Division of Ser. No. 395,807, Sept. 10, 1973, abandoned. This application June 16, 1975, Ser. No. 587,022
Int. Cl.² B63H *11/10;* **B64C** *15/06;* **F16K** *1/228*
U.S. Cl. 239—265.19 **2 Claims**



1. A butterfly type flow area modulator and flow deflector for restriction and deflection of rocket engine exhaust products exiting a rocket engine nozzle comprising:

a rocket engine nozzle body;

a positionable disc body having a hinge pin therethrough so as to place said disc body perpendicular to the axis of said nozzle body, the boundary edge of said disc body being smaller than a throat region within said nozzle body so as to pass said exhaust products around said boundary edge of said disc, through said throat region when the planar surface of said positionable disc body is positioned substantially perpendicular to said axis of said nozzle;

means to rotate said positionable disc body about said hinge pin to vary flow around said disc, through said throat region in said nozzle;

said positionable disc body further having at least a pair of extendible portions within the boundary edge of said disc, said extendible portions, when extended, serving to further restrict said exhaust products exiting through said throat when said disc planar surface is positioned askew of said throat region in said nozzle by said means to rotate said disc body; and

actuating means to extend or retract said extendible portions to provide a finite variable control of said rocket engine exhaust products passing around the peripheral edge of said disc, through said throat in said rocket engine nozzle body.

3,970,254
METHOD FOR SEPARATING GLASS FROM HEAT RESISTANT MATERIALS

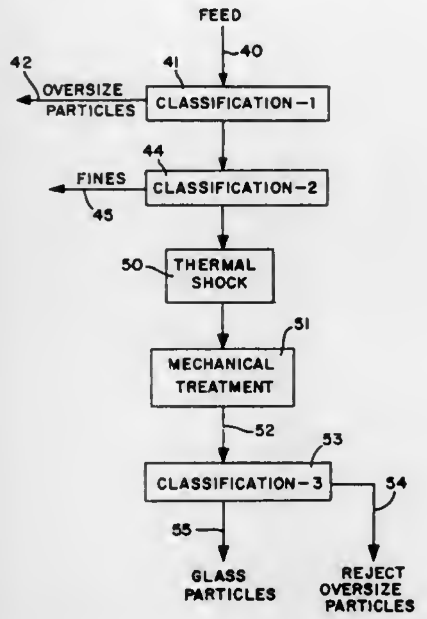
Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., Middletown, Ohio
Filed Aug. 19, 1974, Ser. No. 498,850
Int. Cl.² B02C *19/12*
U.S. Cl. 241—1 **13 Claims**

1. A method of recovering glass from a loose mixture of separate particles of glass and of heat resistant materials including metal, stone and ceramic materials, comprising:

a. thermally shocking the mixture by rapidly increasing or decreasing its temperature over a sufficiently wide range to shatter the glass,

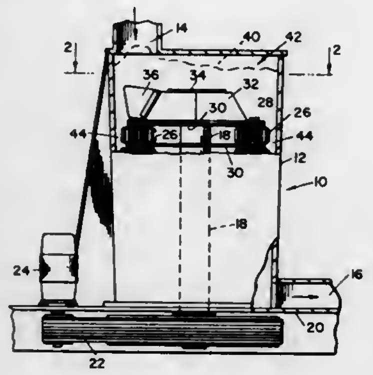
b. classifying said thermally shocked mixture to obtain a fine fraction consisting essentially of said shattered glass particles and a coarse fraction consisting of said heat resistant materials, and

c. said method also including the step of establishing a predetermined particle size range for said mixture prior to said thermal shock step.



3,970,255
SOLID WASTE SHREDDER

Harry C. Foster, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed Aug. 15, 1974, Ser. No. 497,590
Int. Cl.² B02C *13/18*
U.S. Cl. 241—186 R **6 Claims**

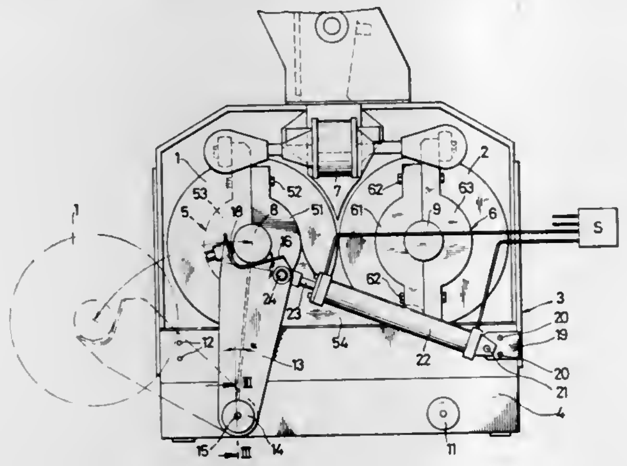


1. A solid waste shredder comprising a casing having an inlet adjacent a top thereof and an outlet adjacent a bottom thereof for passage of solid waste into and through said casing, shredding means disposed within said casing for shredding said solid waste as it passes therethrough, and inducer means associated with said casing for impelling said solid waste downwardly toward said outlet, said induce means being comprised of vane means and motor means for rotating said vane means for creating a pressure head which impels said solid waste toward said outlet.

3,970,256
GRINDING MILL

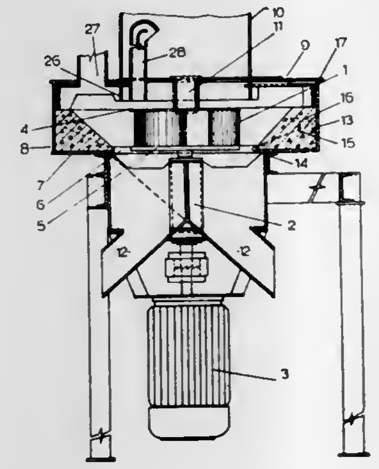
Edgar Rüegger, Arnegg, and Stefan Meister, St. Gallen, both of Switzerland, assignors to Buhler AG, Uzwill, Switzerland
Filed Jan. 16, 1975, Ser. No. 541,408
Claims priority, application Switzerland, Jan. 18, 1974, 688/74
Int. Cl.² B02C *4/34*
U.S. Cl. 241—231 **26 Claims**

1. A grinding mill, comprising support means; grinding rolls each having opposite axial ends provided with respective trunnions; open-and-shut journals for the respective trunnions; displacing means engageable with the trunnions of each grinding roll and pivotable between a first end position in which the trunnions of a respective grinding roll are located in their associated journals, and a second end position in which the grinding roll and the trunnions thereof are laterally displaced relative to said first position and supported by said displacing means, said displacing means comprising a pair of levers each having a first end portion, and a second end portion provided with a receiver for a respective trunnion, and mounting means mounting said first end portions on said support means so that said levers have freedom of pivoting movement for said second end portions to move to said first and second positions, respectively; and adjusting means for adjusting the position of a respective trunnion within the associated receiver.



3,970,257
APPARATUS FOR REDUCING THE SIZE OF DISCRETE MATERIAL

George James MacDonald, 8 Mathieson Ave., Khandallah, Wellington, and Bryan Allen Bartley, 625 Mount Eden Road, Auckland 3, both of New Zealand
Filed Oct. 2, 1973, Ser. No. 402,680
Claims priority, application New Zealand, Oct. 5, 1972, 168612
Int. Cl.² B02C *1/10*
U.S. Cl. 241—275 **4 Claims**



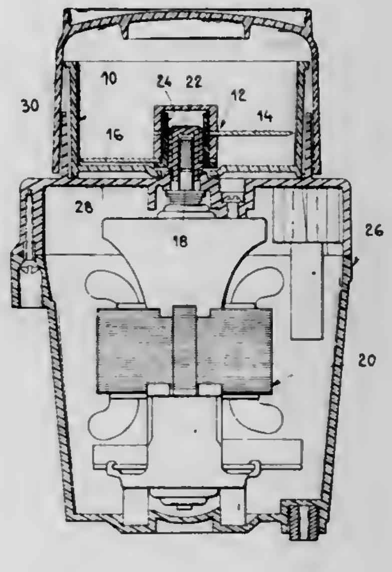
1. A centrifugal disintegrator for reducing the particle size of disintegratable material, said disintegrator comprising a housing symmetrical about a vertical axis said housing including a floor with vertical walls rising therefrom, a centrally located opening defined by said floor, a rotor with a vertical axis rotatably supported within said housing with the lower surface of said rotor being positioned within and substantially coplanar with said floor so that an annular opening is defined between the rotor and the floor, means for rotating said rotor about its axis, a material feed means above said rotor for supplying material axially to said rotor for acceleration and discharge from the periphery thereof, said floor in use supporting a bank of disintegratable material against the wall of said housing so that further material accelerated from the rotor is disintegrated against the bank of material prior to falling through the annular opening between the rotor and the floor,

said rotor in turn comprising upper and lower discs with the upper disc defining a central opening to receive material to be disintegrated, a peripheral wall between said discs, said peripheral wall having openings through which said material accelerated by said rotor is thrown and nonradial vertical walls defining, in combination with said discs, passageways shaped to retain in use on the advancing surfaces of the walls thereof a continuous layer of material to be reduced with further material to be reduced advanced from near the axis to the periphery of the rotor over retained material;

and wherein said non-radial vertical walls each comprise a tip blade adjacent the periphery of said rotor and having a hardened tip at the leading edge thereof, a main blade extending from the tip blade to a position where a line normal to the main blade passes adjacent the center of the rotor, and a trail blade extending beyond the inner end of the main blade for a distance sufficient to prevent wear.

3,970,258
MINCING MACHINE

Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed July 29, 1975, Ser. No. 600,184
Claims priority, application France, Oct. 1, 1974, 74.32977
Int. Cl.² B02C *18/12*
U.S. Cl. 241—282.1 **4 Claims**



1. An electrically driven domestic appliance comprising a rotatable tool mounted on the top end of a vertical motor-driven shaft by a detachable coupling device comprising a driving element rigidly fastened to the shaft and engageable in a sleeve rigidly fastened to the tool, the driving element and sleeve being provided respectively on the exterior and the interior thereof with complementary helical driving ramps which wind from bottom to top of said element and sleeve in the direction of rotation of the driving element and have active surfaces engageable one with the other during driving of the tool, and said driving element and sleeve being additionally provided respectively on the exterior and interior thereof with complementary helical retaining ramps which wind from bottom to top of said element and sleeve in the opposite direction to the direction of rotation of the driving element and have active surfaces engageable one with the other when the driving element stops rotating, the active surface of each driving element ramp facing downwards and the active surface of each sleeve ramp facing upwards.

3,970,259
DEVICE FOR APPLYING ADHESIVE TAPE TO A WIRE COIL

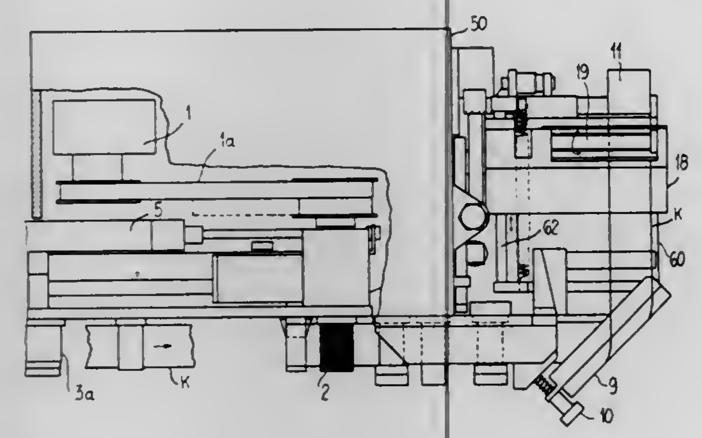
Hans Schmid, Ruschlikon, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland

Filed Apr. 16, 1975, Ser. No. 568,658

Claims priority, application Switzerland, Apr. 23, 1974, 5531/74

Int. Cl.² H01F *11/04*

U.S. Cl. 242—7.08 **8 Claims**



1. Device for applying adhesive tape to a wire coil comprising a support movable between an inoperative and an operative position; a pressure member on the support for urging adhesive tape against a wire coil in the operative position of the support; a slide slidable on the support between two limiting positions in a direction transverse to the direction of movement of the support; means on the slide for pulling adhesive tape towards the pressure member when said slide moves into one of said limiting positions; and cutting means movable on a path which extend transversely of the direction of movement of the slide between one of said limiting positions and said pressure member.

3,970,260
APPARATUS FOR BUILDING A ROTATIONALLY SYMMETRICALLY EVENED BOBBIN PACKAGE AND METHOD OF OPERATING THE APPARATUS

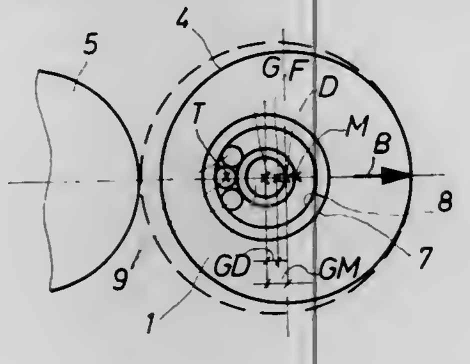
Klaus Bruggisser; Felix Graf; Gerhard Mandl, all of Winterthur, and Albert Rüegg, Pfaffikon, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sept. 16, 1974, Ser. No. 506,092

Claims priority, application Switzerland, Sept. 26, 1973, 13798/73

Int. Cl.² B65H *54/42*

U.S. Cl. 242—18 DD **17 Claims**



1. An apparatus for building a substantially rotationally symmetrically evened bobbin package with a bobbin chuck having a bobbin chuck axis and serving for supporting the bobbin and with a friction drive drum for driving the bobbin about an axis of rotation, the improvement comprising: said bobbin chuck being rotatable at speeds above a critical rotational speed, said bobbin chuck assuming a centered position when said bobbin chuck axis and said bobbin axis of rotation essentially coincide, a balancing element provided on the bobbin chuck, said balancing element serving for enabling the correction of incipient unbalances of the bobbin package which shifts the bobbin chuck axis away from the bobbin axis of rotation and out of the centered position of the bobbin chuck, said balancing element being equipped with a mass which is freely movable along a substantially circular path which is substantially concentric with the bobbin chuck axis, said mass in the centered position of the bobbin chuck being evenly and automatically distributable along said path, said mass acting upon the bobbin chuck upon the occurrence of incipient unbalances at the bobbin package, in order to move the bobbin chuck axis towards the bobbin axis of rotation, said friction drive drum then further winding the bobbin package to eliminate such unbalance by bringing the bobbin chuck axis and bobbin axis of rotation essentially into coincidence.

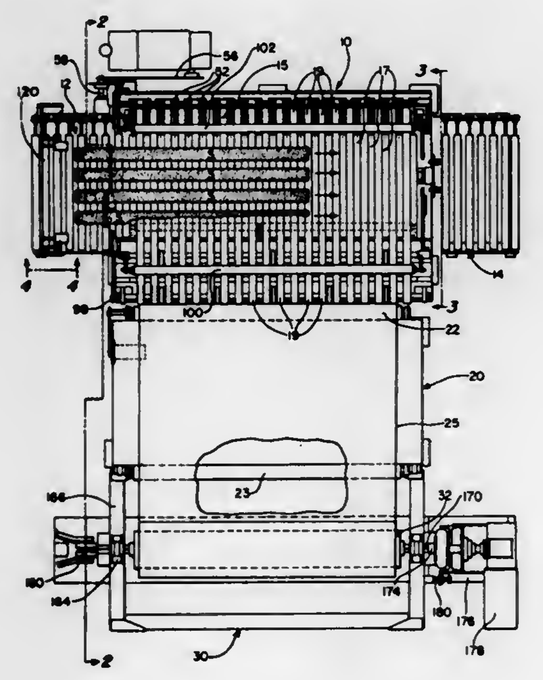
3,970,261
HANDLING TIRE MAKING MATERIALS

William McNenney, North Redington Beach, Fla., and John R. Sponseller, North Cantor, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 29, 1975, Ser. No. 617,909

Int. Cl.² B65H *75/02*

U.S. Cl. 242—55 **7 Claims**



1. The method of handling tire building components comprising moving cut pieces of gum stock in a direction parallel their lengths on first conveyor means, then lifting and moving said pieces perpendicular to said direction on second conveyor means while maintaining each piece parallel to said direction throughout its length, disposing said pieces seriatim on a winding cloth and winding said cloth and said pieces together about a core while maintaining said pieces parallel to each other and to said core.

3,970,262
QUICK-RELEASE HUB

Ralph A. Brown, and Wilford W. Snow, both of Bountiful, Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,013

Int. Cl.² B65H *17/02*

U.S. Cl. 242—68.3 **5 Claims**

1. A hub for mounting a reel, comprising in combination:

a first circular plate,

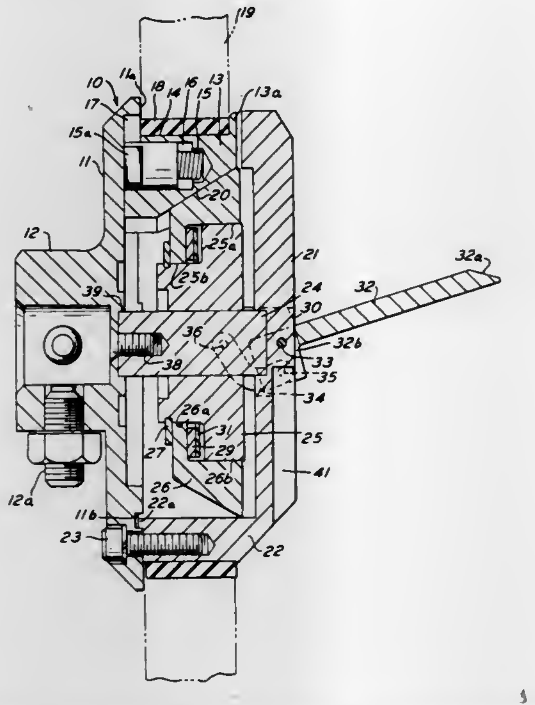
a plurality of arcuate shaped segments forming a circumferential surface,

an elastic band disposed around said circumferential surface for biasing said segments in an inwardly radial direction,

second means having a first position holding said segments in a radially outward extended position against the bias of said elastic band securing a reel about said circumferential surface,

said elastic band frictionally engaging the reel when said second means is in said first position,

said second means having a second position permitting said segments to be moved radially inward by said elastic band for releasing said reel,



third means connected to said second means for selectively moving said second means between said first and second positions,

each of said segments comprising a lip engaging said reel between said lips and said first plate when said segments are in said radially outward extended position and disengaging said reel to permit said reel to be removed from the hub when said segments are in the radially inward position,

said first means further comprising a spring laoded pin for each of said segments normally biasing said segments away from said plate causing each of said segments to move longitudinally away from said first plate when said second means is in said second position.

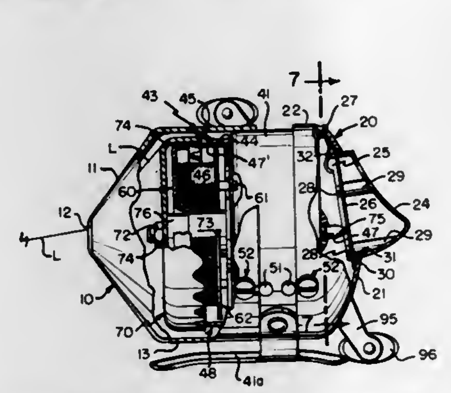
3,970,263
RUGGEDIZED CLOSED FACE SPINNING REEL

R. Dell Hull, 6101 E. Apache St., Tulsa, Okla. 74101

Filed Apr. 7, 1975, Ser. No. 565,407

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.2 A **6 Claims**



1. A ruggedized closed face spinning reel including a reel frame, a line spool supported on said frame, a main shaft extending axially through the center of said frame and mounted for limited axial movement therein between predetermined line casting and line retrieval positions, a crank drive mechanism mounted in said reel frame for rotating said main shaft, a rearwardly facing spinnerhead of predetermined diameter having a rearwardly facing notched peripheral edge and carried by the forward end of said main shaft, front and rear cover means closing off the front and rear faces of said reel frame, characterized in that

a. said reel frame is of all metal construction and includes a cylindrical body member having a transverse circular wall;

b. an inner annular ring having a diameter less than said predetermined spinnerhead diameter and including a radially inwardly extending circular flange connected to the front face of said circular wall;

c. an outer annular ring having rearwardly disposed portions of a diameter not substantially greater than the diameter of said inner annular ring is secured to said inner annular ring by a force fit connection;

d. the forwardmost peripheral portions of said outer ring are outwardly flared to a diameter greater than that of said spinnerhead;

e. said flared peripheral portions and said inner ring thereby cooperating to define an annular groove adapted to receive said notched spinnerhead when said main shaft is in said line retrieval position.

3,970,264
REEL FOR STORING AN ELONGATED PLIABLE MEMBER

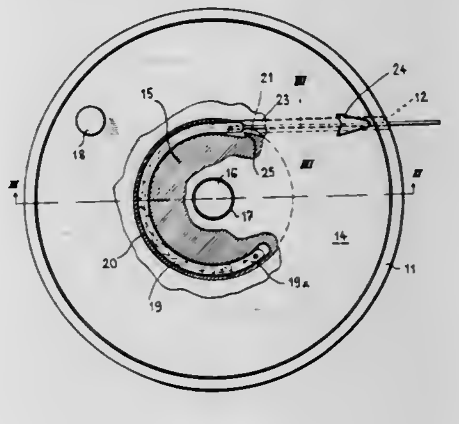
Henning Fredriksson, Angsgatan 24 B, and Sven Åke Helde, Dalvindsgatan 3, both of Kungsbacka, Sweden

Filed Apr. 22, 1975, Ser. No. 570,370

Claims priority, application Sweden, Apr. 24, 1974, 7405479

Int. Cl.² B65H *75/40*

U.S. Cl. 242—96 **4 Claims**



1. In a reel for storing an elongated, pliable member and including a bowl shaped main portion provided with a bottom, a side wall having an internal cylindrical face extending therefrom, a passage opening in said side wall, and a cover for mounting on and closing the main portion provided with a centrally located spigot having a cylindrical body, said spigot body extending towards the bottom of the main portion when said cover is in mounted position on said main portion and defining with said cylindrical face an annular space for storing said pliable member, the improvement comprising said spigot defining a first groove internally thereof for the reception of one end of the pliable member, said first groove communicating with said annular space through an opening defined in the outer wall of said spigot body and extending from said opening peripherally along said spigot wall over an angle of at least 180°but not exceeding 360°, and a mark coinciding with said opening in the face of the cover which is outwardly turned when said cover is mounted on said body portion.

3,970,265
SAFETY BELT WINDING DEVICE

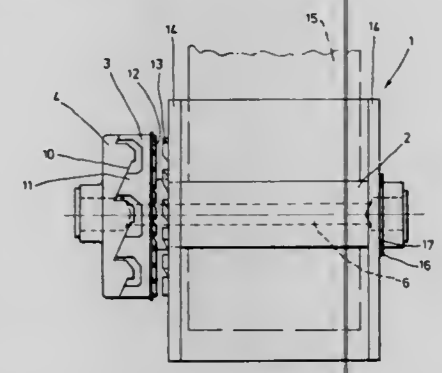
Wilfried Köpke, Sulfeld, and Günter Hoffmann, Gifhorn, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Mar. 6, 1975, Ser. No. 556,093

Claims priority, application Germany, Apr. 25, 1974, 2419937

Int. Cl.^{2} A62B *35/02*

U.S. Cl. 242—107.4 A **3 Claims**



1. A winding device for a vehicle safety belt comprising, in combination:

a. a housing;

b. a sleeve for supporting a wound-up safety belt, said sleeve being retained for rotation within said housing and being spring-biased in a direction tending to wind the safety belt;

c. a ratchet wheel arranged at one end of said sleeve and having ratchet teeth disposed thereon coaxially with said sleeve;

d. counter teeth disposed on said housing coaxially with said sleeve; a catch wheel arranged between said ratchet wheel and said housing and having catch teeth disposed for selective engagement with said ratchet teeth and said counter teeth, said catch wheel being displaceable into a locking position of simultaneous engagement with said ratchet teeth and said counter teeth;

f. safety belt tension limiting means connecting said ratchet wheel for rotation with said sleeve, said means including a torsion bar extending coaxially through said sleeve and connected at one end thereof for torsional movement with said sleeve and at the other end with said ratchet wheel; and

g. means for retaining said ratchet wheel at an end of said sleeve adjacent said ratchet wheel such that said ratchet wheel is held torsionally rotatable but not axially displaceable relative to said sleeve.

3,970,266
DEVICE FOR WINDING A SEAT BELT IN VEHICLES

Bernard J. Doin; Bernard E. Plantif, both of Saint Medard en Jalles, and Jean-Francois Tillac, Bordeaux Cauderan, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

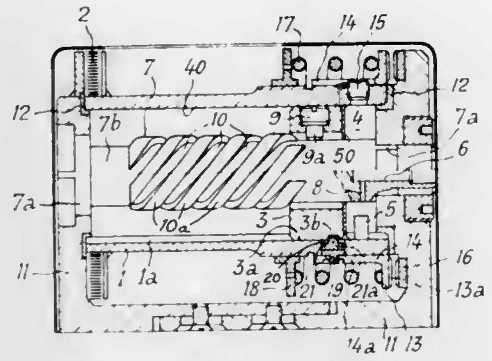
Filed Apr. 3, 1975, Ser. No. 564,730

Claims priority, application France, Apr. 25, 1974, 74.14504

Int. Cl.^{2} B65H *75/48*

U.S. Cl. 242—107.4 R **11 Claims**

1. A device for winding up an elongate flexible element, such as a vehicle safety belt, comprising a casing, an axle mounted in said casing and rotationally fast therewith, a hollow winding-drum rotatably mounted in said casing coaxial with and surrounding said axle, an annular piston positioned between said drum and axle and axially movable relative thereto between initial and final positions, an annular pressure chamber defined within said drum by said piston in said initial position thereof, a pyrotechnic charge for pressurising said pressure chamber with combustion gases therefrom to propel said piston axially along said drum and axle from said initial position, to said final position, first cooperable guide means on said piston and said drum, and second cooperable guide means on said piston and said axle, said first and second guide means being so arranged that said piston is rotationally fast with said drum or said axle and is movable along a helicoidal path relative to said axle when the piston is rotationally fast with said drum and is movable along a helicoidal path relative to said drum when the piston is rotationally fast with said axle, whereby axial displacement of the piston by the combustion gases causes said drum to be rotated for winding said flexible element on to said drum.



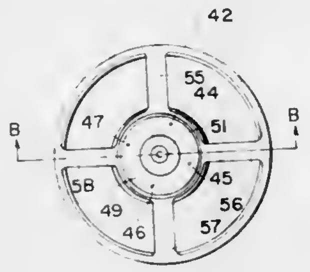
3,970,267
REEL WITH INTERCHANGEABLE PARTS

George A. Sheetz, Summerville, S.C., assignor to Larry Harold Kline, Charleston, S.C.

Filed Nov. 11, 1974, Ser. No. 522,573

Int. Cl.^{2} B65H *75/22, 75/14*

U.S. Cl. 242—115 **21 Claims**



1. A reel for storing cabled material comprising:

a. a first central section piece;

b. a second central section piece which may be pressed against, but is not mechanically fastened to, said first central section piece to form a center portion with two ends;

c. a first end piece to which one of said two ends of said center portion may be pressed, but is not mechanically fastened to;

d. a second end piece to which the other of said two ends of said center portion may be pressed, but is not mechanically fastened to;

e. holding means operative to hold said first central section piece, said second central section piece, said first end piece, and said second end piece, pressed together.

3,970,268
REEL COMPRISING REEL HALVES

George A. Sheetz, Summerville, S.C., assignor to Larry Harold Kline, Charleston, S.C.

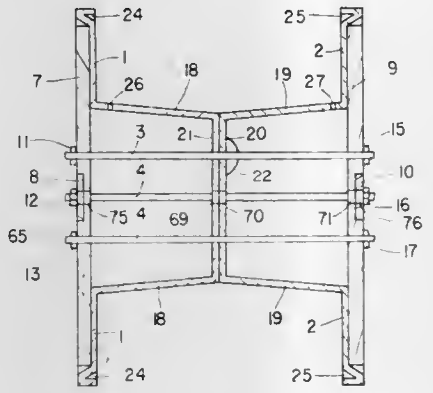
Filed Nov. 11, 1974, Ser. No. 522,572

Int. Cl.^{2} B65H *75/22, 75/14*

U.S. Cl. 242—115 **20 Claims**

1. A reel for storing cabled material comprising:

a. a first reel half comprising a first disk; a first cabled material holding section, attached to said first disk, wherein the outside diameter of the larger diameter portion of said first cabled material holding section is smaller than the diameter of said first disk, and wherein said first cabled material holding section has the shape of the frustum of a first cone with a larger diameter edge and a smaller diameter edge with said larger diameter edge of said frustum of a first cone attached to said first disk;



b. a second reel half comprising a second disk; and a second cabled material holding section, attached to said second disk, wherein the outside diameter of the larger diameter portion of said second cabled material holding section is smaller than the diameter of said second disk;

c. securing means holding said first reel half to said second reel half to form a reel operative to store said cabled material.

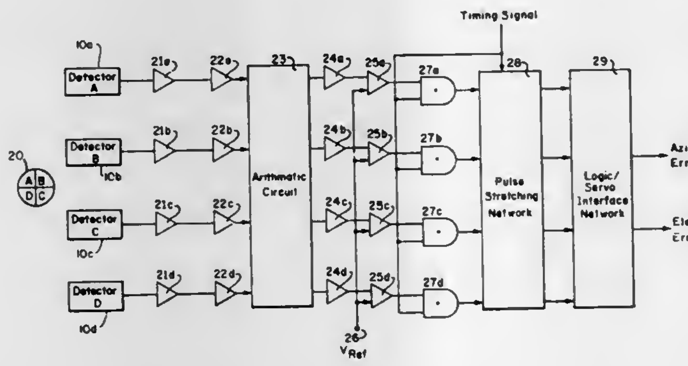
3,970,269
ARITHMATIC CIRCUIT FOR BANG-BANG SEEKERS

Robert F. Conforti, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 6, 1975, Ser. No. 538,841

Int. Cl.^{2} F41G *7/00*

U.S. Cl. 244—3.16 **2 Claims**



1. A missile guidance system comprising:

detector means having n detecting sections for receiving a signal from a target and generating output signals from any of said sections in response to said target signal;

arithmatic means coupled to said detector means said arithmatic means having *n* channels corresponding to said detector means sections, said arithmatic means for summing a signal of any channel with the average of signals on said other *n*-1 channels and providing an output signal from said channel having a signal greater than the average of said other signals; and

command generating means coupled to said arithmatic means for providing output signals to steer said missile to said target in response to said arithmatic means.

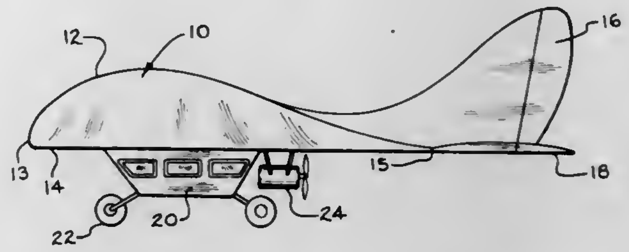
3,970,270
LOW SPEED AIRCRAFT

Rene E. Pittet, Jr., 537 N. Gordon St., Marshall, Mich. 49068

Filed Nov. 11, 1974, Ser. No. 522,606

Int. Cl.^{2} B64B *1/08*

U.S. Cl. 244—5 **4 Claims**



1. A low speed aircraft comprising, in combination, a gas envelope having an airfoil configuration including a leading edge and a trailing edge, said envelope having a geometrical vertical central axis, said envelope being defined by a plurality of interconnected pie-shaped segments each having lateral sides and an apex, trusses defining said segments lateral sides, means interconnecting said lateral trusses of adjacent segments together to define said envelope whereby said segment apexes are located adjacent said central axis, said segments each including a gas bag disposed between the associated trusses, a lighter-than-air gas within said gas bags, control surfaces affixed to said envelope, a passenger compartment mounted on said envelope, and motor means mounted on said envelope for propelling said envelope in the direction of said leading edge.

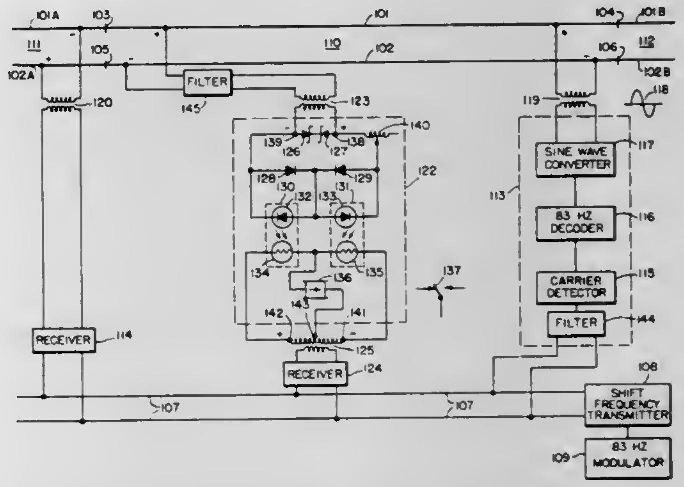
3,970,271
DUAL FREQUENCY TRACK CIRCUIT

John H. Auer, Fairport, N.Y., and Willis R. Smith, Johannesburg, South Africa, assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,725

Int. Cl.^{2} B61L *21/06*

U.S. Cl. 246—34 R **36 Claims**



1. A double rail track circuit for a railroad block system comprising in combination:

a. first and second adjacent blocks of said block system with each rail of said first block insulated from the corresponding rail of said second block by isolating joints;

b. a transmission line having terminals accessible at said first and second blocks for providing a reference signal which is transmitted by said transmission line as a modulated carrier signal;

c. first and second means for coupling said reference signal from said transmission line to the rails of said first and second blocks, respectively, with the coupling to said first block being near said isolating joints and with the coupling to said second block being at its end remote from said isolating joints and with approximately 180° phase difference therebetween; and

d. comparing means coupled between said transmission line and the rails of said second block near said isolating joints for comparing the phase relationship of the rail signal thereat with the phase of the reference signal on said transmission line, and to provide a signal indicative of the phase relationship.

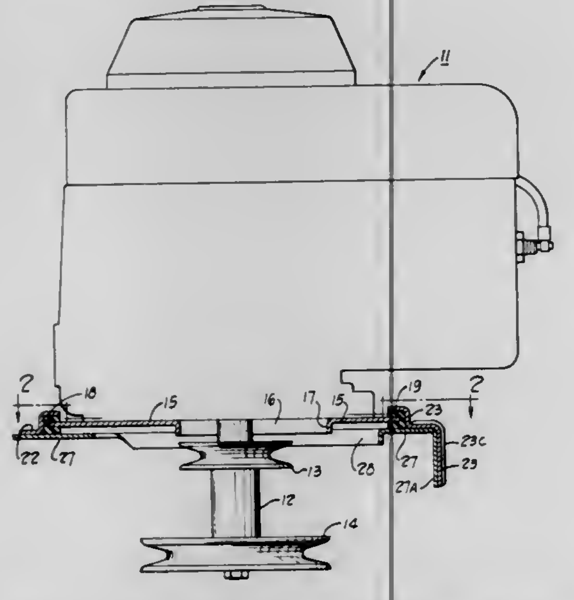
3,970,272
ENGINE MOUNTING

Juergen Kaesgen, Brunswick, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Apr. 18, 1975, Ser. No. 569,466

Int. Cl.² F16F *15/00*

U.S. Cl. 248—9 **9 Claims**



6. Mounting means for use in mounting an engine to a tractor or the like to minimize transmission of vibration therebetween, comprising a rigid plate member adapted to have a said engine secured thereto, said plate member having peripheral edge portions disposed along opposite spaced sides thereof longitudinally and laterally of said tractor, said peripheral edge portions projecting forwardly and rearwardly from the body of the plate member longitudinally of the tractor and projecting in opposite lateral directions from the body of the plate member laterally of the tractor, a plurality of resilient rubber-like pads, each pad engaging a said peripheral edge portion along the top surface, bottom surface and outer edge surface of a respective peripheral edge portion, each said peripheral edge portion being firmly embraced by a pad and the plate member being embraced between pads on opposed spaced sides thereof by opposed pads, and a plurality of clamping members secured to said tractor or the like, each said clamping member engaging a said pad along its upper and outer longitudinal surface thereof to clamp the pad to the tractor or the like holding the plate member embraced by the pad to the tractor or the like and for holding the plate member between the pads on opposite spaced sides of the plate member, opposed clamping members and the respective pads clamped thereby being disposed to firmly hold the plate member therebetween against longitudinal and lateral movement relative to said tractor, whereby the plate member is isolated from the tractor or the like and from said clamping member by said pads.

3,970,273
APPLIANCE FOOT WITH SECURE RESILIENT PAD

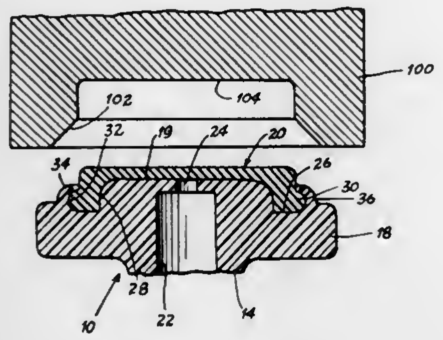
Jimmy D. Tanner, Des Peres, Mo., assignor to Arundale, Inc., St. Louis, Mo.

Filed Jan. 10, 1975, Ser. No. 540,117

Int. Cl.² F16F *15/00*; B29C *19/00*

U.S. Cl. 248—24 **10 Claims**

1. A unitary molded appliance foot of relatively rigid material having a weight bearing face, a longitudinal portion extending outwardly from adjacent the weight bearing face and a resilient pad on the face, the face having a relieved portion, the relieved portion of the face having an undercut, the resilient pad having a dependent rim with an outwardly extending lip, the dependent rim being received in the relieved portion of the face and the outwardly extending lip being engaged in the undercut, the undercut having means to retain the outwardly extending lip in the undercut, the longitudinal extension having integrally molded threads about its periphery adapted to threadingly engage with a cooperating portion on an appliance when mounted thereon.



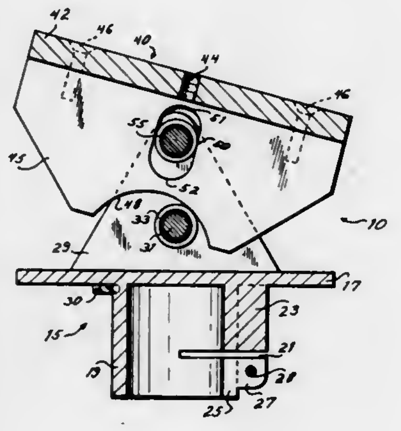
3,970,274
TILT MOUNTING

E. Edward Resk, 645 Pine Brook Blvd., New Rochelle, N.Y. 10804

Filed Oct. 30, 1974, Ser. No. 519,170

Int. Cl.² F16M *11/10*

U.S. Cl. 248—185 **9 Claims**



1. A tilt mounting for supporting equipment for selective tilting of the equipment, said mounting comprising:

a base frame having at least one upstanding arm,

a tilt table having at least one depending leg,

a downwardly facing arcuate cam surface carried by said tilt table leg,

a cam follower carried by said base frame arm and having a fixed axis with respect to said arm, said follower engaging said cam surface,

a slideway in said tilt table leg, and

a pivot journal, carried by said base frame arm, slidably arranged within said slot, said pivot journal being formed with a threaded stud extending therethrough, a manually rotatable knob secured to an outer end of said stud, a brake plate threaded on the free end of said stud, a clutch washer on said stud between said brake plate and the tilt table leg adjacent thereto, whereby upon turning said knob to thread said screw into said journal, said washer will frictionally engage said leg to prevent pivoting of said tilt table.

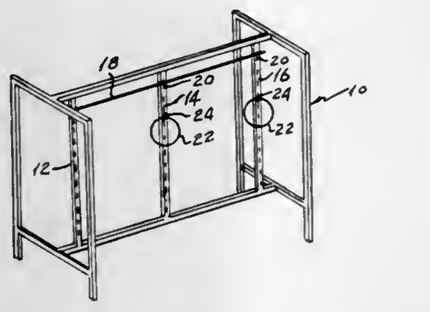
3,970,275
DISPLAY RACK HOOK

Steve Swandiak, Yonkers, N.Y., assignor to Artcraft Wire Goods, Inc., Bronx, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,551

Int. Cl.² A44B *21/00*; A47F *7/08*

U.S. Cl. 248—223 **3 Claims**



1. A hook for retaining a member on a display frame having a hollow upright formed with a plurality of vertically elongated and vertically spaced slots of a predetermined width including a unitary body, a first hook portion formed in said body with a downwardly opening mouth defined by a pair of legs, one of which is adapted to be received in one of said upright slots with said first hook portion supported on the lower edge of the slot, said first hook portion of said body being formed with a noncircular uniform cross section throughout its extent from the other leg through said one leg, said cross section having a minor dimension less than said slot width to permit said first hook portion to be inserted in said slot in a vertical orientation of the body and having a major dimension greater than said slot width to prevent twisting of said body around its longitudinal axis when said first hook portion is in said slot, a second hook portion formed in said body with an upwardly opening mouth defined by a pair of legs, and a portion of said body connecting the other leg of the first hook portion to one of the legs of the second portion, said mouths being generally aligned, the end of said one leg of said first hook portion facing the end of the other leg of the second hook portion, the distance between said leg ends being less than the space between adjacent upright slots, the space between the legs of the first hook portion and the lengths of said first hook portion legs being such as to inhibit removal of said hook from said upright by rotation with said first hook portion resting on said slot edge.

3,970,276
DEVICE FOR FIXING AN OBJECT

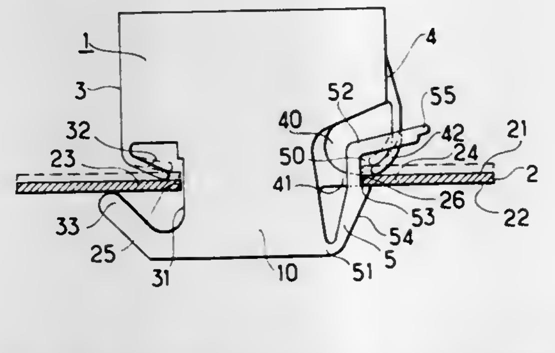
Jean Debaigt, Maisons-Laffitte, France, assignor to C.G.E.E.-Alsthom, Levallois-Perret, France

Filed Nov. 10, 1975, Ser. No. 630,125

Claims priority, application France, Nov. 25, 1974, 74.38587

Int. Cl.² H01R *9/22*

U.S. Cl. 248—223 **8 Claims**



1. In a device for fixing an object on a support formed by laterally spaced, parallel edges forming an insertion face for the insertion of the object between those edges, an opposite face to the insertion face and two rims each formed by a respective one of the edges, said object comprising two opposite sides each co-acting with one of the edges of the support, the improvement wherein: the object comprises, on each side a fixed lateral stop which presses against the rim facing the support and, on a first side, a first flexible tab pressing against the insertion face of a first edge of th support and a rigid tab which abuts the opposite face of that edge and, on the second side, a second flexible tab which presses against the insertion face of the second edge of the support and a ratching tab ratching on the opposite face of that second edge.

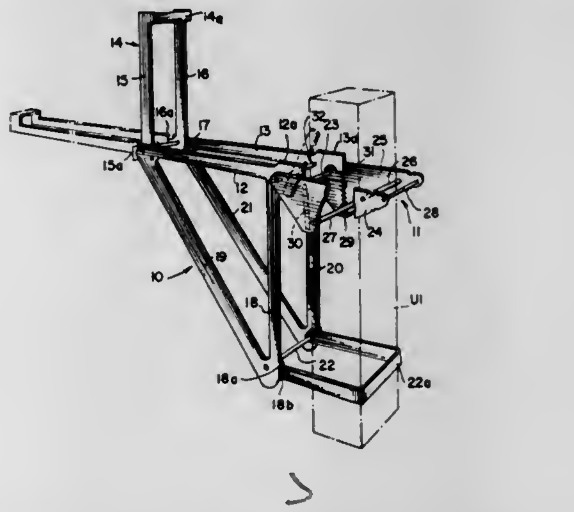
3,970,277
SCAFFOLD BRACKET

Henry J. Riblet, 87 Crescent Road, Needham, Mass. 02194

Filed Oct. 15, 1974, Ser. No. 514,583

Int. Cl.² A47B *47/00*

U.S. Cl. 248—246 **9 Claims**



1. In a scaffold bracket for use with an upright post,

said bracket being of the type employing a rigid frame for supporting a platform, and a lock having side members,

said rigid frame being supported by said side members in a manner permitting relative rotation only between said lock and said frame about a pivotal axis,

said side members carrying an inner jaw and an outer jaw in a manner permitting the upright to be received between said jaws and said side members and causing said jaws to clamp said upright when a downward, oblique force is exerted upon the pivotal axis,

said inner jaw being located between and below said pivotal axis and said outer jaw, when said lock is in the locked position,

the improvement comprising attachment means on said side members, said attachment means being situated between the pivoted axis and said inner jaw and said attachment means being adapted to be engaged by a hoisting mechanism.

3,970,278
JACK STAND

Altee C. Studer, 9818 Hawley Road, El Cajon, Calif. 92021

Continuation-in-part of Ser. No. 477,697, June 10, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,132

Int. Cl.² B60S *9/02*

U.S. Cl. 248—352 **6 Claims**

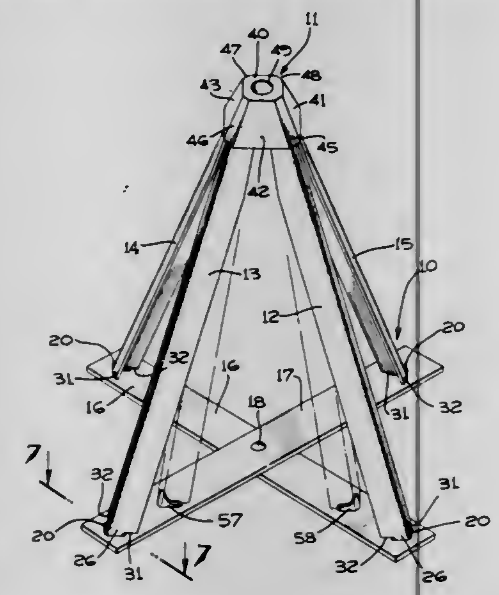
1. A stationary jack stand comprising a base having a plurality of upwardly open recesses equally spaced from each other at the perimeter,

a cap having an equivalent number of downwardly open pockets in a grouping closer together than said recesses in the base,

each pocket having two adjoining walls in right angular relationship relative to each other forming an angular corner with said angular corner facing laterally outwardly,

and fixed partitions integral with the cap separating each pocket from all of the other pockets,

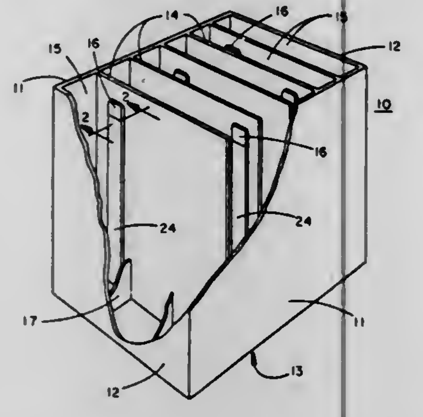
each pocket having a closed inner end and having a cross sectional shape diminishing progressively from an open outer end to said inner end,
and a set of struts equal in number to the number of recesses in the base,
the lower end of each strut having a projection adapted to fit slideably and releasably in the respective recess in the base and shoulder means adapted to overlie the base,



the upper end of each strut having a cross sectional shape diminishing progressively toward the upper end,
the uppermost end being larger than the innermost end of the respective pocket,
the upper end of the strut being slideably and releasably receivable in the respective pocket of the cap.

3,970,279
MOLD ASSEMBLY FOR PRODUCING MULTI-PARTITIONED CONTAINERS HAVING METAL CONNECTORS THROUGH THE PARTITIONS

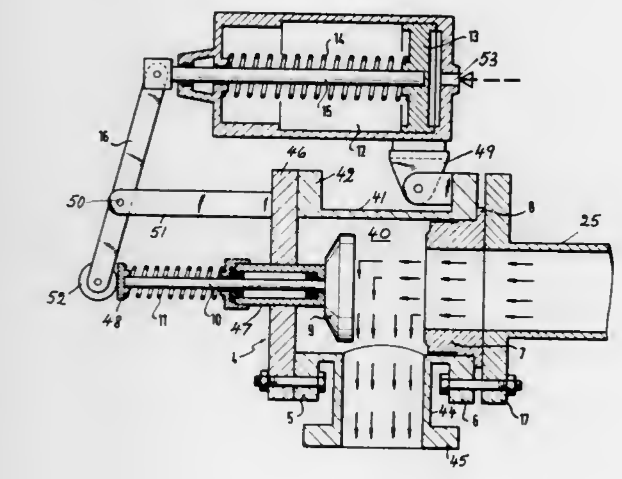
Salvador Silveyra, Monterrey, Mexico, assignor to Aislantes Leon, S.A., Monterrey, Mexico
Division of Ser. No. 376,867, July 5, 1973. This application July 14, 1975, Ser. No. 595,963
Int. Cl. B29c *6/00*
U.S. Cl. 249—96 **8 Claims**



1. A mold assembly adapted for molding mult-partitioned containers from a moldable material and having enclosing sides and bottom walls and at least one internal partition dividing the container into a plurality of independent compartments where such partition has a metal connector extending within and through the partition to provide electrical conduction between adjacent compartments of the container which comprises in combination a core member and a cavity member for receiving the core member, such core member having a plurality of depending core segments where at least one of the core segments has a elongated slot extending upwardly from the bottom of the core segment and adapted to receive and hold the metal connector during the molding of the container so that upon completion of the molding, the metal connector is lock molded into the desired position within and through the partition and providing a fluid tight seal about the metal connector.

3,970,280
VENTING VALVE FOR A STEAM DECORTICATOR

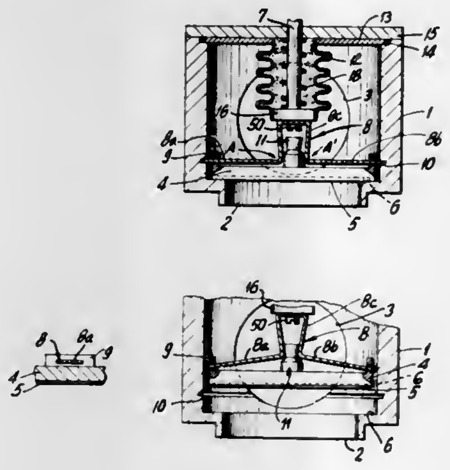
Paul Kunz, 5419 Doettesfeld, Germany
Filed May 22, 1974, Ser. No. 472,216
Claims priority, application Germany, May 24, 1973, 2326609
Int. Cl.^{2} F16K *31/163*
U.S. Cl. 251—58 **10 Claims**



1. A venting valve for a pressure vessel, comprising a housing defining a valve chamber, and having an inlet passage extending into said chamber for venting gas, and an outlet passage extending from said chamber at an angle to said inlet passage, replaceable valve seat means in said chamber, a valve closure member movably mounted in said chamber out of contact with the inner walls of said chamber to engage said valve seat for closing the valve, said valve closure member being movable to a position to deflect gases from said inlet passage to said outlet passage, means normally biasing said valve to its open position, said valve chamber comprising respective valve chamber walls, said inlet passage extending through one wall of said valve chamber, said outlet passage extending at an angle to said inlet passage through another wall of said valve chamber, said valve seat means comprising a tubular valve seat removably mounted in said inlet passage, a spindle, sealing means extending through a wall of said valve chamber opposite said one wall and aligned with said inlet passage, said spindle passing through said sealing means in a sealed manner, said valve closure member being mounted on said spindle within said valve chamber and aligned with said valve seat, and means coupled to said spindle externally of said valve housing for selectively urging said valve closure member against said valve seat, said means for selectively urging said valve closure member comprising a cylinder, a piston slideably mounted in said cylinder, a piston rod connected to said piston and extending externally of said cylinder, and a pivoted lever coupling the external end of said piston rod to said spindle, said cylinder having a pressure inlet opening, whereby application of pressure to said pressure inlet opening effects movement of said piston, piston rod, lever and spindle to move said valve closure member against said valve seat within said chamber.

3,970,281
VACUUM VALVE CONSTRUCTION

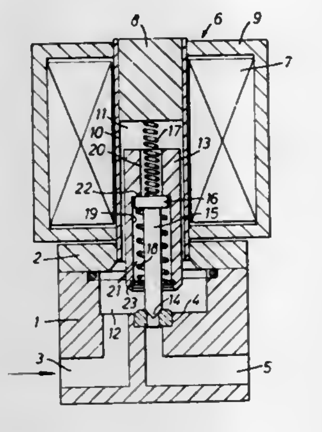
Anton Heeb, Mauren, Liechtenstein, assignor to Balzers Patent und Betelligungs AG, Liechtenstein
Filed Mar. 24, 1975, Ser. No. 561,621
Claims priority, application Switzerland, Mar. 29, 1974, 4387/74
Int. Cl.^{2} F16K *31/44*
U.S. Cl. 251—77 **9 Claims**



1. A valve construction comprising a valve housing having an inlet passage and a discharge passage, a valve seat defined within said housing between said inlet passage and said discharge passage, a valve disc engageable on said valve seat to close the communication between said valve inlet passage and said valve discharge passage, said valve disc having a top surface with opposite upright extensions adjacent its respective sides each with an opening therethrough, a drive member movable to move said valve disc toward and away from said seat, means defining a cam lever receiving groove spaced from said seat alongside the extension openings when said valve disc is engaged on said valve seat, a cam lever having a central portion connected to said drive member and disposed between said drive member and said valve disc and including a lever arm portion on each side extending through the respective openings of said each extension and being engageable in the receiving grooves during closing movement.

3,970,282
MAGNETIC VALVE

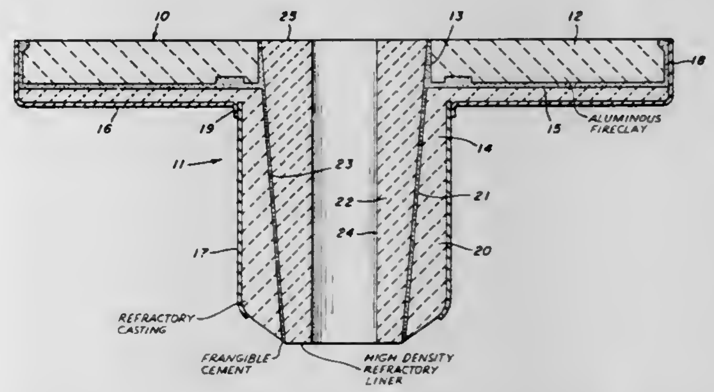
Egon Jorgen Hansen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed Dec. 9, 1974, Ser. No. 530,706
Claims priority, application Germany, Dec. 10, 1973, 2361398
Int. Cl.^{2} F16K *31/06*
U.S. Cl. 251—129 **2 Claims**



1. A magnetic valve assembly comprising casing means, a valve seat and a linearly movable closure member cooperable with said seat, an armature member connected to said closure member having an energized valve open position and a nonenergized valve closed position, a load spring having one end fixed relative to said casing for biasing said closure member to a closed position, said loan spring having a constant predetermined stress when said closure member is in its closed and open position, energy storing spring means between said closure member and said armature member resiliently resisting relative movement between said members, said load spring being stiffer than said energy storing spring means, said energy storing spring means being stressed to an extent equal to said predetermined stress prior to said armature member reaching the energized end of its stroke, said armature member having a stepped central bore forming a counter, said closure member entering said bore from one end and engaging said counter, said load spring entering said bore from the other end and engaging said closure member.

3,970,283
POURING OF MOLTEN METALS

Robert Duncan Hind, Rotherham, England, assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Jan. 9, 1975, Ser. No. 539,667
Claims priority, application United Kingdom, Jan. 15, 1974, 1913/74
Int. Cl.^{2} B65D *47/00;* B67D *3/02*
U.S. Cl. 251—144 **3 Claims**



1. In a sliding gate which includes a refractory sliding plate having an orifice, and a collector nozzle extending from said plate in line with said orifice,
the improvement in which said nozzle comprises:
an insulating tubular refractory member having a downwardly tapered bore;
a tubular liner of erosion-resistant refractory within said tapered bore and having a conforming downwardly tapered outer surface and a cylinderical bore; and
a layer of frangible refractory cement between the tapered surfaces of said tapered bore and said liner affixing said liner within said member;
said liner being readily removable from said member on breaking of said cement.

3,970,284
SAFETY DEVICE FOR USE WITH CHLORINE CYLINDER VALVES

George H. Cobbe, Jr., 3411 S. Camino Seco No. 46, Tucson, Ariz. 85730
Filed Apr. 7, 1975, Ser. No. 566,033
Int. Cl.^{2} F16L *29/00*
U.S. Cl. 251—149.9 **3 Claims**

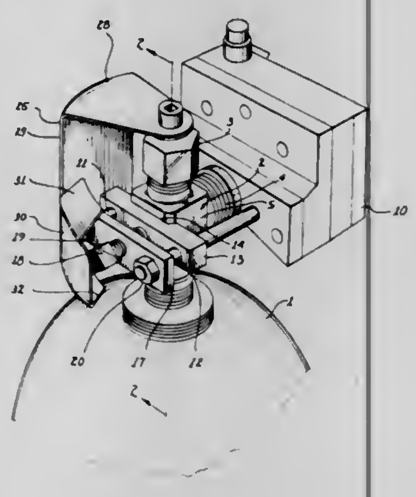
1. In a standard chlorine cylinder valve having attaching means for detachably engaging a receiving orifice to a valve outlet fitting, a valve stem mounted shroud for constraining detachment of the receiving orifice unless the valve stem is in the closed position, said shroud comprising in combination:
a. socket means for engaging the valve stem;
b. a downwardly extending shroud means depending from said socket means for partially circumscribing the valve, said shroud means being positionable about the valve

stem axis commensurate with the rotational position of the valve stem;

c. clutch means disposed intermediate said socket means and said shroud means for accommodating reorientation of the closed position of the valve stem due to wear while maintaining the position of said shroud means with respect to the valve stem to shield the attaching means whenever the valve stem is rotated from the closed position, said clutch means comprising an annular flange disposed about said socket means, a plate for maintaining said flange against a surface of said shroud means and compression means for frictionally retaining said flange intermediate said plate and said surface, whereby, rotation of said socket means independent of commensurate rotation of said shroud means is frictionally restrained; and

d. a skirt forming a part of said shroud means for shielding access to the attaching means upon rotation of the valve stem away from the closed position;

whereby, said shroud, by shielding the attaching means whenever the valve stem is rotated from the closed position, constrains disconnection of the outlet pipe from the outlet fitting whenever the valve is partially or fully open.



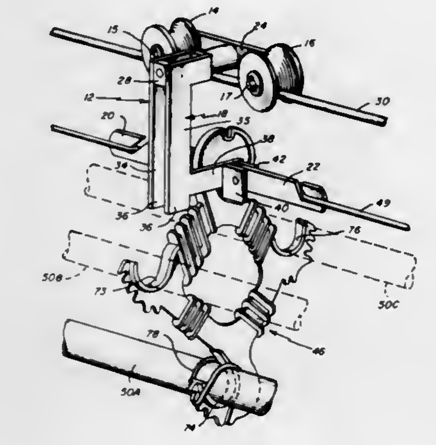
3,970,285
BALL VALVE ASSEMBLY

Harold J. Lonn, Lombard, Ill., assignor to Henry Valve Company, Melrose Park, Ill.
Filed Oct. 29, 1974, Ser. No. 518,489
Int. Cl.² F16K *31/44*
U.S. Cl. 251—214 **10 Claims**

1. A ball valve assembly comprising, in combination: a valve body member, a valve ball, a valve stem, and a cover member, said valve body member including a central chamber in which said valve ball is rotatably mounted, aligned inlet and outlet passageways, and a valve stem mounting aperture in communication with said chamber and oriented outwardly therefrom, said valve stem being rotatably received in said stem mounting aperture and extending outwardly therefrom including means at an inner end of said stem for fixed rotational connection to said valve ball, means maintaining a fixed axial relation between said stem and said mounting aperture, means for rotating said stem located at the portion of said stem extending from said mounting aperture, a cover member removably securable to said valve body member for covering the extending portion of said valve stem and the outer end of said mounting aperture, and an annular stem seal for further preventing the escape of fluid through said valve stem aperture, said annular stem seal retained between said cover member and said body member in an annular recess in one of said members encircling said valve stem in coaxial and spaced relation thereto, said annular seal being confined in said recess by an annular protuberance extending from the other of said members in mating relation to said recess.

3,970,286
APPARATUS FOR USE IN STRINGING POWER LINES

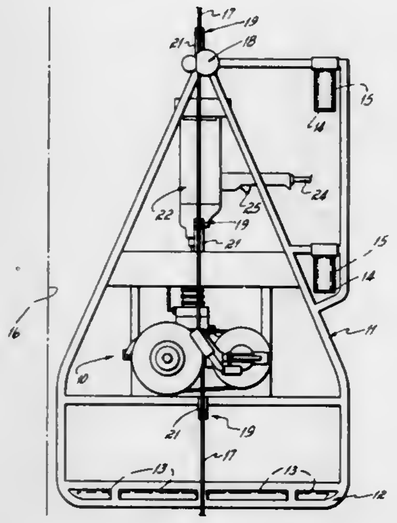
Arthur W. Ross, 94 Brimbal Ave., Boston, Mass. 01915
Continuation-in-part of Ser. No. 503,040, Sept. 3, 1974, Pat. No. 3,908,962. This application Apr. 18, 1975, Ser. No. 569,164
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **13 Claims**



1. An apparatus for installing a power distribution line having a plurality of individual wires including a supporting wire being installed between existing poles and wherein said wires are finally supported from said supporting wire by means of an insulating spacer, said apparatus comprising a pulley, means for supporting said pulley including a shaft extending through said pulley, a C-shaped support member having a top end for receiving said shaft and thereby supporting the pulley at the top end thereof, said C-shaped support member having opposing parallel walls defining a lower leg at the lower end of the support member and a post extending between said walls of said lower leg and for supporting said spacer.

3,970,287
GUIDE BLOCK FOR A CABLE

David S. Robards, Cincinnati, Ohio, assignor to Hi-Lo Powered Stirrups, Inc., Cincinnati, Ohio
Filed Jan. 28, 1975, Ser. No. 544,856
Int. Cl.² B66D *1/36*
U.S. Cl. 254—190 R **6 Claims**



1. A guide block for a cable, said guide block being of the open breach type comprising

two U-shaped hand plates fixed in position relative one to the other, said plates being separated one from the other a distance at least slightly greater than the diameter of that cable to be guided therethrough,

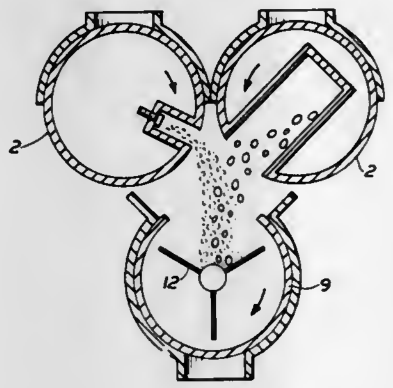
each hand plate being structured to provide a hole therethrough and a slot extending from that hole to one edge of said plate, each hole diameter being at least about 1.6 times greater than the cable diameter, and each slot width being not more than about 1.3 times the cable diameter,

each hand plate being oriented relative to the other so that said holes are concentrically disposed and such that said slots face in opposite directions one from the other, and

said hand plates being fixed relative one to the other so as to define a mouth to provide access to said slots for said cable intermediate the ends of said cable.

3,970,288
METERING DEVICE AND MIXING APPARATUS

Frank Brooks, 11, Lansdowne Road, Atherton, near Manchester, England
Continuation-in-part of Ser. No. 407,032, Oct. 16, 1972, Pat. No. 3,887,168. This application Jan. 24, 1975, Ser. No. 543,743
Int. Cl.² B01F *15/02*
U.S. Cl. 259—7 **8 Claims**



1. Apparatus for delivering to a receiver a mixture in predetermined proportions of particulate materials, comprising:

a source of each of the materials;

a shroud positioned below each source;

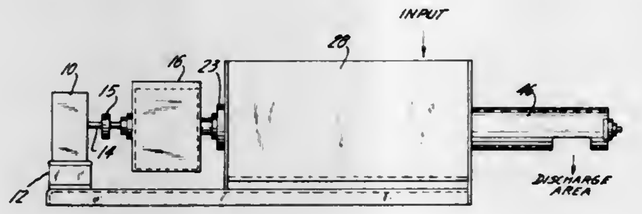
metering means interposed between the source and the shroud and adapted at each actuation of the metering means to feed a measured quantity of each materal from the respective source to the shroud;

the shroud serving to house mixing means, such that the feeding of material by said metering means is into said mixing means which rotates synchronously with the feeding motion of said metering means, said shroud also having discharge slots, such that said materials are discharged to a receiver;

and drive means for actuating the metering means, and for rotating the mixer means.

3,970,289
VARIABLE RATE OPPOSING ROTATIONAL MIXER AND FEEDER

Joel Dimas Vian, Passaic, N.J., assignor to Joseph Rich, Jr., East Rutherford and Adolf Alvarez, Passaic, both of, N.J., part interest to each
Filed Oct. 21, 1974, Ser. No. 516,652
Int. Cl.² B01F *7/02*
U.S. Cl. 259—103 **5 Claims**



1. A variable rate opposing rotational material mixer and feeder, comprising:

a. a mixing box having a longitudinal axis and containing a solid flight screw and a circumferential tumbler mixing element said solid flight screw being disposed along said longitudinal axis;

b. motor and gear drive means including means for axially rotating said flight screw in a given direction of angular rotation;

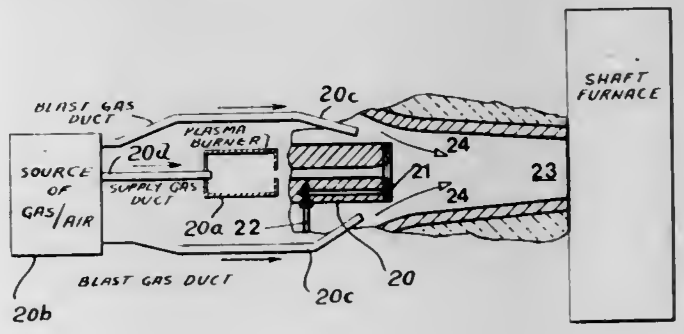
c. mid circumferential tumbler mixing element being disposed coaxially with and circumferentially about as said solid flight screw;

d. said motor and gear drive means for axially rotating said circumferential tumbler, in an angular direction opposite to the direction of rotation of said flight screw integrally surrounding said means for axially rotating said flight screw;

e. said flight screw serving to convey materials mixed in said mixing box by said mixing tumbler continuously through a communicating discharge cylinder extending coaxially from said mixing box to discharge outlet whereby the opposing rotations of said tumbler and said flight screw cause both an improved simultaneously mixing and discharging of said materials.

3,970,290
ARRANGEMENT FOR FEEDING

Sven Santen, Hofors, and Carl Erik Grip, Lulea, both of Sweden, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands and Norrbottens Jarnverk AB, Lulea, Sweden, part interest to each
Filed Mar. 11, 1974, Ser. No. 449,784
Claims priority, application Sweden, Mar. 26, 1973, 7343333
Int. Cl.² F27B *1/16*
U.S. Cl. 266—138 **5 Claims**



1. In a shaft furnace which includes a tuyere, the improvement in combination therewith comprising an apparatus operable with a source of supply gas and a source of additional fuel, for increasing the blast gas temperature and supplying and substantially completely burning said additional fuel at the tuyere level in said furnace, comprising:

a. plasma burner means for heating said gas, said plasma burner means having an inlet for receiving supply gas from said source of gas and an outlet for discharging said heated gas, and

b. means for conveying said heated gas from said plasma burner means outlet to said tuyere comprising a nozzle defining

   i. a first passage having an inlet communicating with said plasma burner means outlet, for receiving said heated gas therefrom, and an outlet opening,

   ii. a fuel passage having an inlet communicating with said source of additional fuel, and an outlet formed as substantially annular opening disposed around said first passage outlet opening, and

   iii. a blast gas passage having an inlet for receiving gas from said source of gas and an outlet formed as a second substantially annular opening surrounding said fuel passage outlet opening, whereby said additional fuel, blast gas, and heated gas mixed in said tuyere.

3,970,291

METHOD OF PREVENTING OCCURRENCE OF PULSATION IN A CIRCULATING LIQUID FOR EVAPORATIVE COOLING

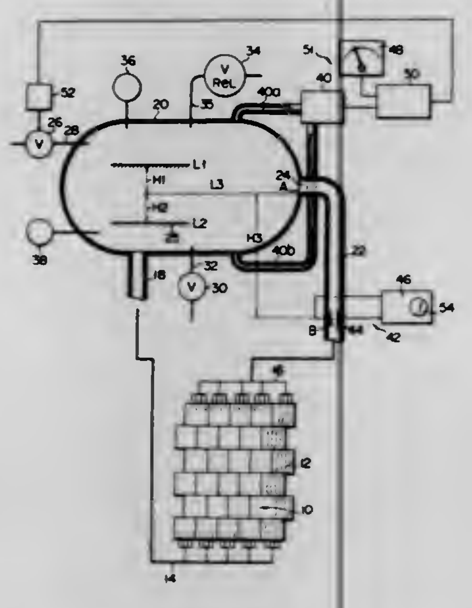
Takeo Yamada; Kazuo Kunioka, and Toyokazu Teramoto, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,481

Claims priority, application Japan, Dec. 28, 1973, 49-956

Int. Cl.^{2} C21B *7/10*

U.S. Cl. 266—193 **6 Claims**



1. A method of preventing occurrence of pulsation in circulating liquid for evaporative cooling flowing through a cooling stave of a blast furnace, comprising the first step of maintaining, where the circulating liquid within a discharge pipe is in a first condition in which the fraction dryness thereof is not greater than a prescribed value, the surface level of the circulating liquid within the steam separator to be at a position higher than an inlet of the separator connecting to the discharge pipe, and the second step of maintaining, where the circulating liquid within the discharge pipe is in a second condition in which the fraction dryness thereof exceeds said prescribed value, said surface level of the circulating liquid within the steam separator to be at a position lower than said inlet of the separator.

3,970,292

OIL AND AIR SUSPENSION DEVICES

Augustin Dachicourt, and René Krin, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

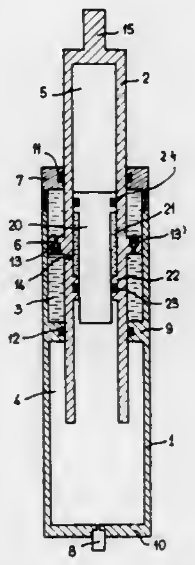
Filed Mar. 13, 1975, Ser. No. 557,972

Claims priority, application France, Mar. 14, 1974, 74.08650

Int. Cl.^{2} F16F *5/00*

U.S. Cl. 267—64 R **2 Claims**

1. A hydraulic oil and air suspension device for motor vehicles comprising, in combination, a first cylinder having an interior, means for dividing the interior of said first cylinder into a pair of axially spaced chambers, a gas in one of said first cylinder chambers and a hydraulic fluid in the other of said first cylinder chambers, a second cylinder having a side wall defining an interior and closed at each end arranged for sliding movement in the interior of said first cylinder, an immiscible hydraulic fluid and pressurized gas in the interior of said second cylinder, an annular flange on the outer surface of said second cylinder slidably engageable with the inner wall of said first cylinder for guidably positioning said second cylinder for said sliding movement, a plurality of check valves in said flange for controlling the flow of hydraulic fluid in opposite directions within said first cylinder other chamber, a piston having a head and a shank slidably positioned in the interior of said second cylinder, said head being arranged for sliding sealing engagement with the inner wall of said second cylinder to separate the hydraulic fluid from the pressurized gas in said second cylinder, sealing means in said second cylinder between said piston shank and the inner wall of said second cylinder for separating the hydraulic fluid in said second cylinder from the gas in said first cylinder one chamber, said second cylinder side wall having at least one opening on one side of said flange for balancing the pressure of the hydraulic fluid between the interior of said second cylinder and said first cylinder other chamber.



3,970,293

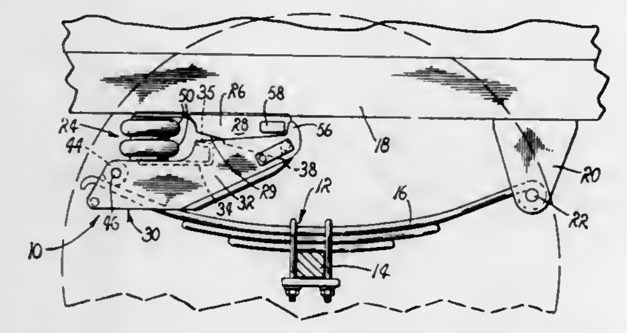
SUSPENSION SYSTEM

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Fresno, Calif.

Continuation-in-part of Ser. No. 401,241, Sept. 27, 1973, Pat. No. 3,866,894. This application Jan. 31, 1975, Ser. No. 546,189

Int. Cl.^{2} B60G *11/44*

U.S. Cl. 267—31 **1 Claim**



1. In a vehicle suspension system for a vehicle having a frame, an axle, a leaf spring assembly disposed beneath said frame and mounted on said axle in transverse relation therewith, and a collapsible air bag interposed between said leaf spring assembly and said frame, the improvement comprising:

A. a bracket of an inverted U-shaped cross sectional configuration disposed above said leaf spring assembly and rigidly affixed to said frame;

B. a pivotal arm of an elongated configuration arranged in substantially coplanar relation with said leaf spring assembly having a first end portion pivotally connected to said bracket and a second end portion interposed between the leaf spring assembly and said bracket;

C. means for connecting said air bag with the second end portion of said arm and with said frame;

D. bearing means affixed to the second end portion of said arm in spaced relation with the first end portion of said arm seated on said leaf spring assembly in a supported relationship therewith;

E. load supporting means including first stop means defining motion arresting surfaces on said bracket above said arm in spaced relation with the first end portion thereof, and second stop means defining a motion arresting surface on said arm in spaced relation with the first end portion thereof for engaging said first stop means in a load supporting relationship therewith in response to a collapse of said air bag; and

F. motion limiting means including a stop lug rigidly affixed to said bracket adjacent the first end portion of said arm, and an upstanding ear projected from the first end portion of said arm for engaging said stop lug for arresting pivotal motion of said arm in response to expansion of said air bag.

3,970,294

SYNCHRONOUS RING IN A SYNCHRONOUS DEVICE

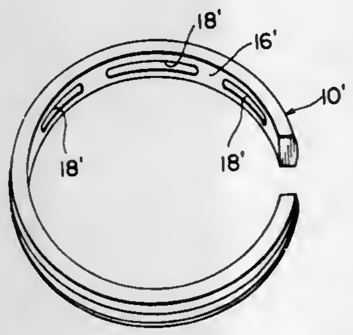
Tamio Kawamoto, Yokohama, and Mitugu Ii, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 20, 1974, Ser. No. 498,926

Claims priority, application Japan, Aug. 21, 1973, 48-93641

Int. Cl.^{2} F16F *1/34*

U.S. Cl. 267—161 **5 Claims**



1. In a synchronous device for changing speed gears of a motor vehicle, in which a slotted, springy, synchronous ring, which has an inner circumference, is affectable by servo action, the improvement comprising a plurality of grooves for reducing synchronous capacity of the synchronous device, said grooves being disposed in said inner circumference of said synchronous ring in spaced circumferential relationship with each other.

3,970,295

PIPE FITTING LOCATOR APPARATUS

Cleveland N. Cooper, Kirkwood, Mo., assignor to The Pandjiris Weldment Co., St. Louis, Mo.

Filed Feb. 3, 1975, Ser. No. 546,206

Int. Cl.^{2} B23Q *3/00*

U.S. Cl. 269—17 **5 Claims**

1. In a track-mounted, pipe fitting locator apparatus:

a. base means including a plurality of track-engaging wheels and a vertical pivot axis,

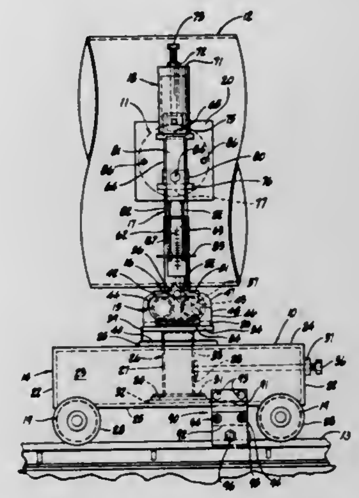
b. radially extending arm means mounted to the base means for swinging movement about the pivot axis of the base means,

c. first carriage means mounted to the arm means for adjustable longitudinal movement toward and away from the vertical pivot axis of the base means,

d. post carried by the first carriage means and having a longitudinal axis substantially parallel to the pivot axis of the base means,

e. second carriage means mounted to the post means for adjustable longitudinal and rotational movement relative toe the post means said second carriage means including support means for the pipe fitting,

f. horizontal adjustment means between the first carriage means and the arm means providing both coarse and fine adjustment of the radial distance of the carriage means from the pivot axis of the base means,



g. clamping means clamping said first carriage means to said arm means at a selected radial distance from said pivot axis of said base means, and

h. another clamping means clamping said arm means to said base means.

3,970,296

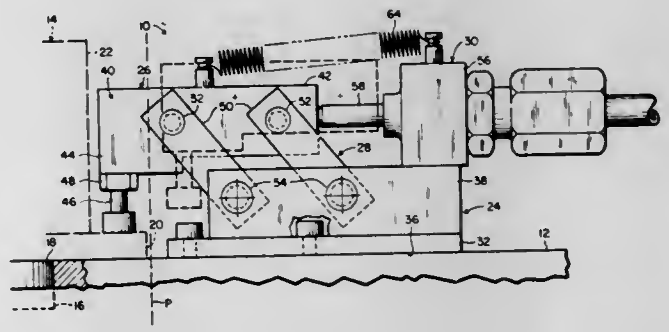
WORK HOLDING CLAMP

William Watson Rameson, Santa Monica, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 4, 1975, Ser. No. 601,948

Int. Cl.^{2} B23Q *3/08*

U.S. Cl. 269—32 **5 Claims**



1. A work clamp for clamping a workpiece to a work table comprising:

a base to be attached to the work table with a surface of the base seating against the table;

a generally L-shaped clamp member including a first leg overlying said base and a second transverse leg at one end of said first leg comprising a work engaging pressure foot facing the plane of said base surface;

parallel links pivotally attached to said base and first clamp member leg forming with said clamp member and base a parallelogram linkage arrangement supporting said clamp member on said base for extension and retraction relative to said base in a manner such that said extension movement occurs longitudinally of said first leg toward one end of said base and across a plane normal to said base surface plane and located a distance beyond said one base end and simultaneously laterally of said first leg toward said base surface plane to a clamping position wherein said pressure foot is located beyond said normal plane for clamping engagement with a workpiece located beyond said normal plane, and said retraction movement occurs laterally of said first leg away from said base surface plane and longitudinally of said first leg toward the other end of said base to a retracted position wherein said clamping member is located entirely at the base side of said plane to clear said workpiece for placement on and removal from said work table along a direction line normal to said table; and

fluid pressure actuator means for extending and retracting said clamp member.

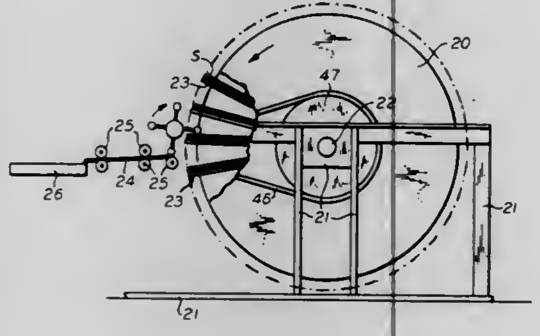
3,970,297
SHEET WITHDRAWING MECHANISM AND ITS COMBINATION WITH A COLLATOR

Frank C. Blowsky, Flushing, N.Y., assignor to Luis Mestre Development Corporation, Long Island City, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,900

Int. Cl.^{2} B65H *39/045*

U.S. Cl. 270—58 **41 Claims**



1. A sheet withdrawing mechanism for a collator having repeat cycles and a plurality of movable spaced partitions forming pockets a plurality of which each contain a pile of sheets comprising spider means to at least partially withdraw sheets from the pockets, the spider means including at least one spider, means mounting the spider means for rotation on an axis of rotation, each spider including a spider frame, arm means carried by the spider frame including at least one arm extending radially or approximately radially outwardly with respect to the axis, each arm having an inner end and an outer end, each arm projecting a substantial distance beyond the spider frame to enter between the spaced partitions of the collator far enough to at least partially withdraw a sheet from the pocket, arm pivot means spaced from and parallel to the axis of rotation and pivotally mounting the inner end of each arm on the spider frame, a stop for each arm located to limit pivoting of its arm to radial or approximately radial position with respect to the axis of the spider mounting means, arm spring means resiliently propelling each arm against its stop, a friction carried by the outer end of each arm to be projected into a pocket and rotating in one direction in the path of a circle around the axis of rotation, and the spacing between each successive friction member measured along its arc of rotation being greater than the spacing between partitions such that the friction member enters its pocket above the pile of sheets and engages the top sheet in the pile of sheets in the pocket.

3,970,298
MIXED THICKNESS SHEET SEPARATOR AND FEEDER

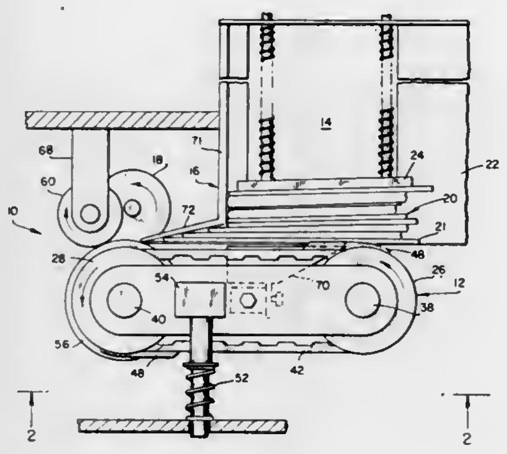
Robert Irvine, Riverside, and L. Neil Kanning, Darien, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 5, 1975, Ser. No. 584,002

Int. Cl.^{2} B65H *3/04*

U.S. Cl. 271—34 **1 Claim**

1. A sheet separator and feeder apparatus suitable for high speed mail handling and mechanical processing of unsorted mail articles comprising magazine feeding means for holding a plurality of mail articles, said magazine means further accommodating a range of different sizes and thicknesses of intermixed envelopes, a conveyor assembly having movable engagement means for frictionally contacting successive envelopes, said conveyor assembly including a drive gear, a spaced apart idler gear, and engagement means including at least one belt disposed between and driven by said gears, said belt having a feed pad integral therewith and projecting from the surface of the belt, said idler gear supporting two spaced apart discharge rollers thereon, two spaced apart idler rollers being in engagement with said discharge rollers, automatic wear compensating means for movably urging said discharge rollers into said engagement with said idler rollers, separator means co-operatively interacting with the conveyor assembly for controlling envelope output delivery by retarding passage of more than one envelope therebetween, said separator means including a separator roller, said separator roller being horizontally offset and vertically staggered between the two discharge rollers with an overlap of the respective peripheral surfaces of the discharge roller and the separator roller, the separator roller being further rotatably driven in reverse direction from the discharge rollers to effectively restrain passage of more than one envelope therebetween, the conveyor assembly being yieldably displaceable with respect to the separator means for accommodating different envelope thicknesses and thereby permitting sequential delivery of single envelopes, and a sheet limit stop, said sheet limit stop extending from the conveyor assembly and contacting the envelopes in the magazine means for spacing said envelopes away from the conveyor belt, whereby inter-envelope frictional force is reduced during contact of the envelopes by the engagement means and adhesion between adjacent envelopes is minimized.



3,970,299
SHEET REGISTRY DEVICE

Emil J. Berger, Jr., Hatfield, Pa., and John M. Mitchard, Cherry Hill, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Dec. 13, 1974, Ser. No. 532,648

Int. Cl.^{2} B65H *9/10*

U.S. Cl. 271—250 **1 Claim**

1. A sheet registry device in a sheet-handling machine for aligning a sheet in a cross-machine direction comprising:

means to support a sheet and convey such sheet aligned in a machine direction;

a side guide positioned to align a sheet in a cross-machine direction;

a constantly rotating brush having projecting bristles positioned in the path of the moving sheet and adapted to receive the sheet thereunder;

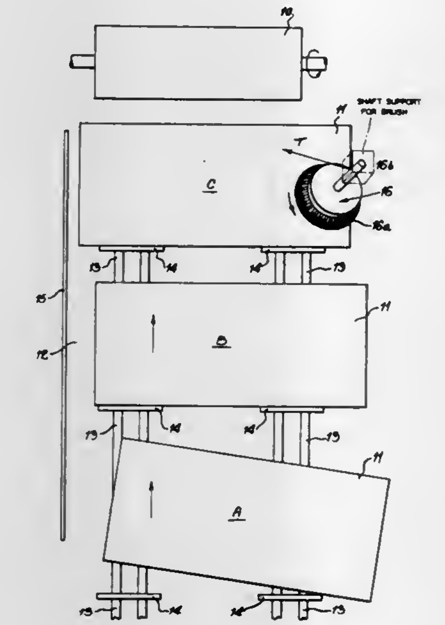
a shaft for said brush positioned above said sheet to provide an oblique direction of rotation of said brush with respect to the edge of said sheet;

supporting means to support said shaft;

said shaft being tilted within a range of 5° to 30° from the perpendicular to the plane of the sheet and being angularly positioned so that the bristles in the outer edge of said brush exert a force on the top surface of the sheet and move said sheet in the direction of the side guide solely by the rotation of said brush;

the ends of the bristles of the rotating brush exerting a force against the top surface of the sheet in a direction toward said side guide, the said force being sufficient to move the sheet from an edge thereof and still permit easy passage of the moving sheet through the bristles;

whereby the said sheet will be urged against the side guide and be aligned in a cross-machine direction.



3,970,300
RECREATIONAL FACILITY SLIDE

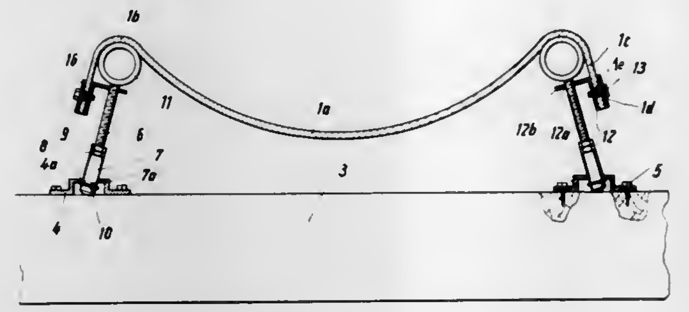
Karl Freiherr von Wendt, Gevelinghausen, and Klaus Becker, Wetter (Ruhr), both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Division of Ser. No. 341,903, March 16, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,456

Claims priority, application Germany, Mar. 18, 1972, 2213268

Int. Cl.^{2} A63G *21/00*

U.S. Cl. 272—56.5 R **7 Claims**



1. An artificial, downhill, snowless run including a meandering course running from an upper level to a lower level, characterized by

a. a plurality of prefabricated elongated slide segments;

b. said segments being placed in an end-to-end fashion to define said course, with a portion of said plurality of segments being curved and a portion being straight to define the meandering nature of said course;

c. each of said segments including integral flanges along each side edge thereof, with each flange being an inverted U-shape in cross section;

d. tube-shaped rail means extending longitudinally along each side edge of said course for supporting said U-shaped flanges;

e. a plurality of spaced apart strut means positioned along each side of said course;

f. one end of each slide segment being supported upon said strut means with the other end supported on the next succeeding slide segment;

g. said tube-shaped rails being positioned on the upper ends of said strut means;

h. integral depending flanges on each of said side flanges;

i. butt strap means removably connected to each of said depending flanges;

j. said butt strap means slidingly connected to said strut means;

k. a plurality of spaced apart ground supports positioned along said run;

l. the lower ends of said strut means positioned on said ground supports;

m. means securing said strut means to said ground supports; and

n. cable means extending between each ground support and the next succeeding strut means downhill thereof.

3,970,301
THREE-DIMENSIONAL NETWORK

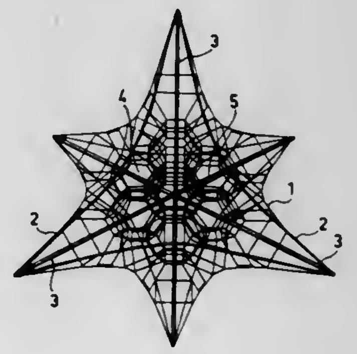
Conrad Roland Lehmann, Bismarckallee 4, 1 Berlin 33, Germany

Continuation-in-part of Ser. No. 456,124, March 29, 1974, abandoned. This application Aug. 15, 1974, Ser. No. 497,823

Claims priority, application Germany, Mar. 29, 1973, 2316141

Int. Cl.^{2} A63B *7/04, 17/04*

U.S. Cl. 272—113 **48 Claims**



1. A spatial network, in particular a climbing device for children, comprising a three-dimensional inner net of tensile members, and a three-dimensional outer net which serves to hold the inner net, said three-dimensional outer net comprises tensile members forming polyhedra and polygonally curved edges and doubly-curved faces, said polyhedra having no more than eight vertices and having their faces, in operation, at an angle to the vertical and said three-dimensional inner net comprises at least one tensile member forming a continuous ring, said ring forming several interlinked polygons having faces defined by its edges which consist of said tensile members.

3,970,302
EXERCISE STAIR DEVICE

Richard McFee, 852 Ostrom Ave., Syracuse, N.Y. 13210

Continuation-in-part of Ser. No. 483,539, June 27, 1974, abandoned. This application Jan. 8, 1975, Ser. No. 539,585

Int. Cl.^{2} A63B *21/00, 23/04*

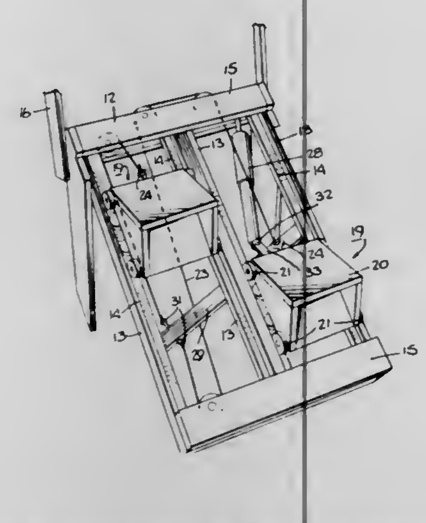
U.S. Cl. 272—130 **13 Claims**

1. An exercise stair device comprising

two foot supports, each said support being movable in a reciprocating manner,

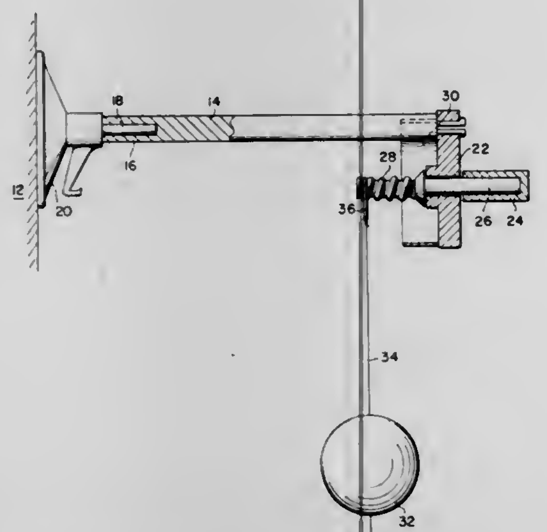
first means for guiding each of said foot supports along adjacent paths having vertical components, said first means including a pair of inclined tracks each said track having a respective one of said foot supports movably mounted thereon,

second means for coupling said foot supports together to move in opposite directions in said respective paths, and third means for causing said foot supports to descend at constant velocity under the weight of a user and for dissipating energy transmitted to said foot supports during use of the device by a simulated climbing activity of the user.



3,970,303
GAME AND TOY APPARATUS

Richard M. Levering, Bellmore, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed June 19, 1975, Ser. No. 588,490
Int. Cl.^{2} A63F *9/00;* **A63B** *67/00*
U.S. Cl. 273—1 R **8 Claims**

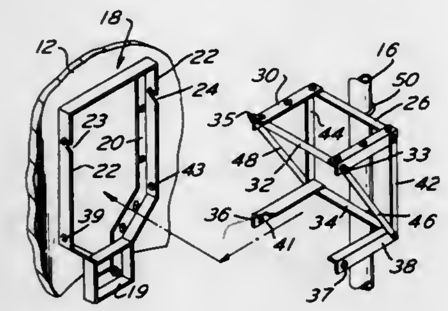


1. A toy and game apparatus comprising an elongated shaft, a first end of said shaft terminating in means to removable mount the same to a vertical support, the second end of said shaft terminating in an eccentrically mounted shield, said shield defining a substantially centrally disposed aperture therein, a second shaft disposed in said aperture and being journalled for rotational movement therein, a first end of said second shaft communicating with a knurled knob, a second end of said second shaft communicating with a threaded column, said column being operative for rotational movement upon the journal movement of said second shaft when said knob is rotated, a tether cord having a predetermined length and looped means on one end thereof, said looped means adapted to engage said threaded column, a weighted object slidably positioned along the length of said tether cord.

8. A method of playing the game as defined in claim 1 comprising horizontally mounting said apparatus on a vertical support above a floor at approximately the height of a player, positioning said tether cord including said object on said apparatus by engaging said column by said loop means, rotating said knurled knob until such time that the cord and object are released from said column and catching said object prior to the same reaching the floor with the hand used to rotate said knob.

3,970,304
BASKETBALL BACKBOARD AND SUPPORT

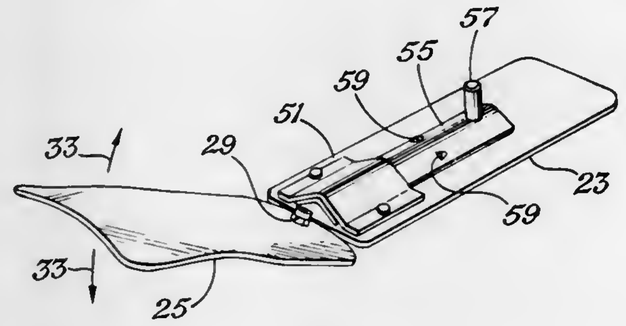
John W. Ebstein, Roslyn Heights, and Mario Cambardella, Manhasset, both of N.Y., assignors to Gabriel Industries, Inc., New York, N.Y.
Filed Mar. 17, 1975, Ser. No. 559,189
Int. Cl.^{2} A63B *63/02*
U.S. Cl. 273—1.5 R **10 Claims**



1. Apparatus comprising a basketball backboard adapted to have a net on one side, a mounting bracket for cooperation with the other side of said backboard for mounting the same on a support at a desired elevation above a playing surface, said backboard having a pair of upwardly inclined notches on a flange member projecting therefrom and generally perpendicular thereto, said bracket having a pair of fastener members lying in a generally horizontal plane and spaced a predetermined distance apart corresponding to the spacing of said notches so that each notch may receive one of said fastener members, a fastener for each fastener member for securing it in its associated notch, and additional means including an opening on said flange member for cooperation with mating structure on said bracket for removably securing said backboard to said bracket at an elevation below the elevation of said notches.

3,970,305
ATHLETIC WRIST SUPPORT

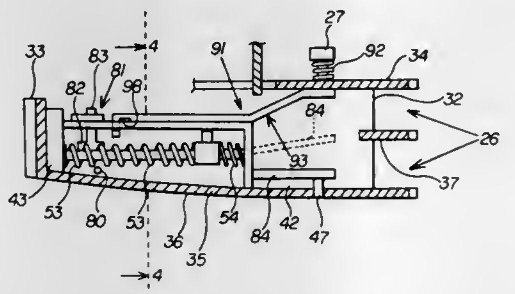
Luther M. Hawkins, 3625 Wilkie Way, Fort Worth, Tex. 76133
Filed May 6, 1975, Ser. No. 575,019
Int. Cl.^{2} A63B *71/14*
U.S. Cl. 273—54 B **7 Claims**



7. An athletic wrist support comprising:
arm means including arm plate means to be secured to the top of one's arm,
hand means including hand plate means to be secured to the top of one's hand,
hinge means having first and second members hinged together by a first pivot means,
said first member being secured to said arm plate means,
said second member being pivotally coupled to said hand plate means by a second pivot means,
said first pivot means allowing said hand means to pivot to positions above and below said arm means,
said second pivot means allowing said hand means to pivot to positions to the left and right of said arm means,
stop means secured to said arm plate means and having a portion extending above said hand plate means for allowing said hand means to pivot to positions to the left and right and below said arm means but restricting movement of said hand means above said arm means,
means for securing said arm means to the top of one's arm, and
means for securing said hand means to the top of one's hand.

3,970,306
HOCKEY GAME

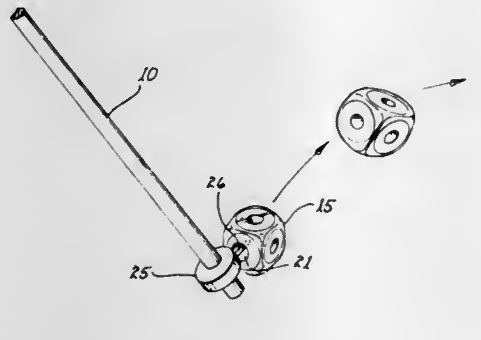
Carl E. Smith, Jr., 10 Hemenway Road, Framingham, Mass. 01701
Filed July 7, 1975, Ser. No. 593,213
Int. Cl.^{2} A63F *7/06, 7/10*
U.S. Cl. 273—85 F **5 Claims**



1. A hockey game comprising:
a miniature hockey goal for positioning on a playing surface;
a goalie member horizontally and vertically movable in front of said goal by a player attempting to intercept pucks shot on goal;
a miniature puck for shooting on goal;
a shooter having an actuator for receiving said puck, said actuator comprising a spring loaded firing mechanism manually energized and releasable to propel said puck in predetermined trajectories, said shooter being manually manipulatable by an opponent into selective orientations that establish said predetermined trajectories and comprising further vertical adjustment means for manually setting the vertical position of said actuator so as to establish the vertical component of said trajectories; and
a housing means for concealing said actuator from said player so as to keep secret therefrom the selected vertical trajectory of said puck.

3,970,307
TARGET, PROJECTILE AND CENTRIFUGAL PROJECTOR

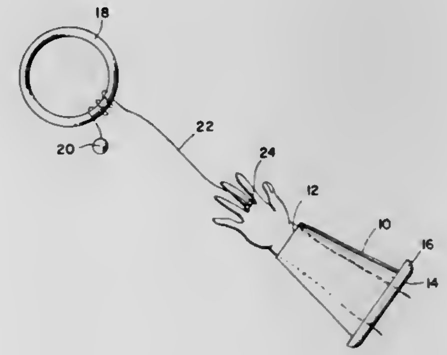
John E. Breglia, 818 E. Copper St., Tucson, Ariz. 85719
Continuation-in-part of Ser. No. 453,513, March 21, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,635
Int. Cl.^{2} A63B *71/02*
U.S. Cl. 273—95 R **5 Claims**



1. In a game apparatus for directing a projectile toward a goal by manual manipulation of a shaft to engage and sling said projectile, said game apparatus being useable upon an unprepared playing field located on terrain of any configuration and consistency, the improvement comprising:
a. a plurality of non-aligned planar surfaces disposed upon said projectile for insuring that at least one of said planar surfaces is accessible to one end of said shaft while said projectile is at rest upon the playing field;
b. a cavity disposed within each of at least two of said planar surfaces for slidably receiving said one end of said shaft;
c. a laterally extending spur for engaging said shaft with one of said cavities; and
d. said goal being non-penetratingly positionable upon the playing field for rendering said goal useable upon any type of playing field terrain; whereby, said game apparatus is playable upon both natural and man made terrain without initial demarcation of a playing field.

3,970,308
RING, BALL AND CONE RETRIEVAL APPARATUS

Donald M. Christie, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Dec. 10, 1975, Ser. No. 639,253
Int. Cl.^{2} A63B *71/02*
U.S. Cl. 273—95 A **2 Claims**



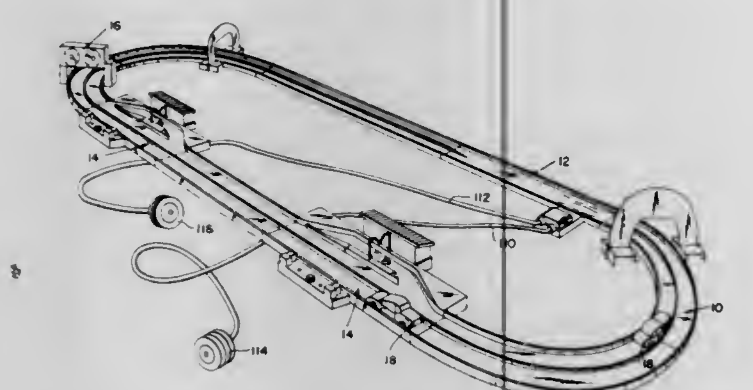
1. A game device and set comprising main base means adapted for being held by a player, first throwable token member means constructed for being thrown into the air from said main base means, second throwable token member means constructed for being thrown into the air by a player of the game, said main base means comprising a truncated cone body, and a brim portion formed at the wider end of said cone body and extending therefrom for being grasped by the hand of the player, said first throwable token member means comprising an annular ring member of light weight material having an inside diameter less than the widest diameter of said cone body so that in rest position on said cone body it rests above said brim portion, said second throwable token member means comprising a spherical ball, retaining string means secured at one end to said ball for returning said ball after being thrown, and finger ring holding means at the other end of said string means for engaging with a finger of the player's hand to be retained for retrieving said ball.

3,970,309
RACING GAME

Akihiro Sato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 7, 1975, Ser. No. 556,403
Int. Cl.^{2} A63F *9/14*
U.S. Cl. 273—86 B **12 Claims**

6. A racing game, comprising vehicles, a continuous trackway comprising inner and outer substantially separate paths along which the vehicles race, means permitting the vehicles to travel faster in the outside path than in the inside path, switching means normally diverting the vehicles from the faster, outer path to the slower, inner path and retaining the

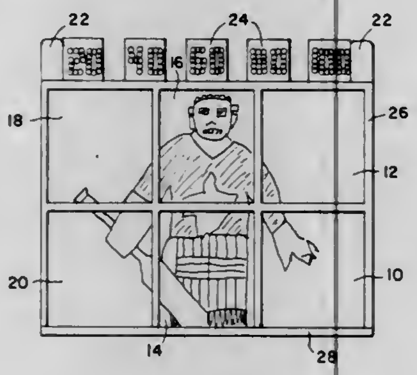
vehicles in the slower, inner path, and control means operative to actuate the switching means to divert the vehicles from the



slower, inner path to the faster, outer path and to retain the vehicles in the faster, outer path.

3,970,310
ELECTRICAL TARGETS IRREGULARLY ILLUMINATED

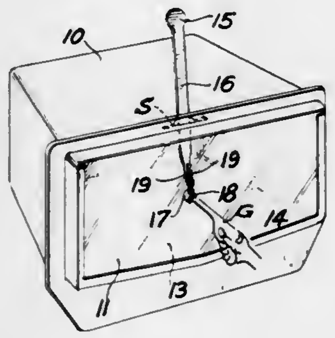
Danny Gryschuk, Rexdale, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Mar. 19, 1975, Ser. No. 559,682
Int. Cl.² A63F *9/02*
U.S. Cl. 273—102.2 R **4 Claims**



1. Game apparatus, which comprises:
a. a base;
b. a frame extending upwardly from said base, said frame having a back;
c. a plurality of front panels held in place by said frame;
d. a plurality of light means affixed to said frame for illumination of said panels;
e. one light spring disposed intermediate said back of said frame and each said front panel;
f. a ferrous plate affixed to an inside surface of each said front panel;
g. a plurality of electromagnets affixed to an inside surface of said back of said frame, one said ferrous plate aligned with each said electromagnet;
h. a plurality of stationery electrical contacts affixed to said inside surface of said back of said frame;
i. a spring electrical contact affixed to said inside of each said panel, each said spring contact aligned with one said stationery contact;
j. a battery means for powering said apparatus;
k. four contact wheels disposed in coaxial relationship on a common rod driven by means of a first pulley, belt, and a second pulley carried on a motor, each said contact wheel having separate contact points, said rod having four discrete rotor contacts, said rotor contacts in electrical contact respectively with said rotor wheels;
l. a plurality of brushes, each said brush respectively making contact with one said rotor contact causing selective illumination of one said light means upon rotation of one said contact wheel causing a closing of one of a plurality of switch means;
m. a goal light;
n. a buzzer, said goal light and said buzzer activated upon electrical contact between said stationery and said spring contacts;
o. each said contact wheel providing power to each said electromagnet holding stationery contact closed by supplying power through each said contact wheel, each said goal light, said buzzer and electromagnet wired in parallel;
p. a plurality of score lights wired in series to each said light means;
q. a plurality of sponge members, one said sponge member hitting one said panel at a time causing movement of said panel thereby causing electrical contact between one said stationery and one said spring electrical contact.

3,970,311
IMPACT GUN WITH PELLET POSITIONING LEVER

Raymond J. Lohr, 5043 Sterrettania Road, Erie, Pa. 16506
Filed Nov. 12, 1975, Ser. No. 631,105
Int. Cl.² A63F *9/02*
U.S. Cl. 273—101 **5 Claims**

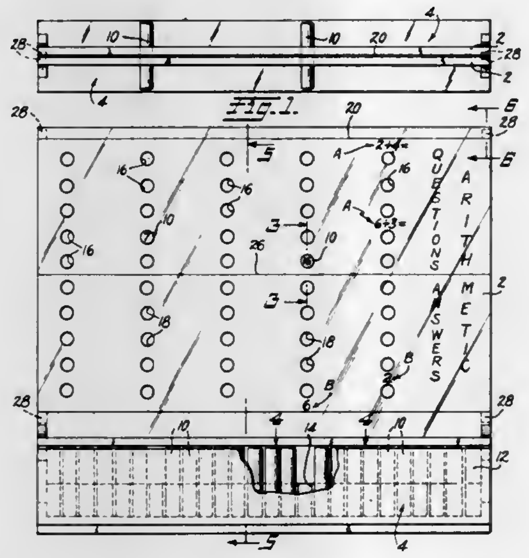


1. A target game comprising an enclosed container having a front wall,
said front wall comprising a resilient transparent sheet,
a rear wall on said container,
rotatable target means supported adjacent said rear wall, a pellet,
said pellet normally resting against said front wall adjacent the lower side thereof,
a top wall having an opening therethrough,
a lever,
said lever projecting through the opening in said top wall and being of sufficient length to extend down to the bottom of said container,
means on said lever for lifting and locating said pellet on the inner side of said front wall,
a gun means adapted to be supported against said front wall, opposite said pellet said gun means transmitting force through said front wall against said pellet, whereby said pellet can be projected toward said target upon firing said gun.

3,970,312
EDUCATIONAL GAME

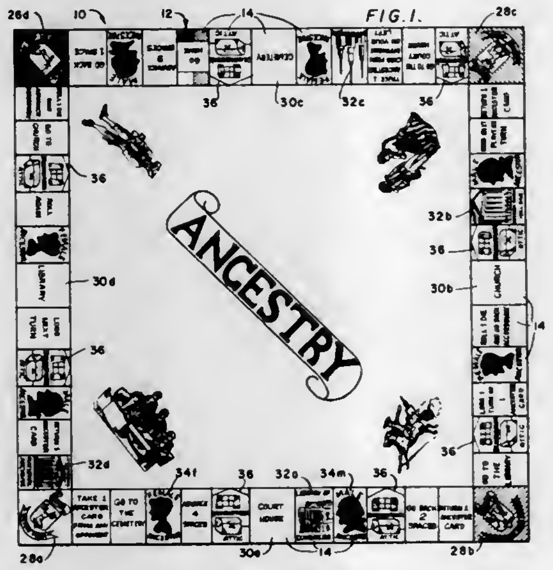
Herall G. Senn, 3815 War Memorial Drive 59B, Peoria, Ill. 61614
Filed July 14, 1975, Ser. No. 595,348
Int. Cl.² A63F *9/18*
U.S. Cl. 273—130 A **5 Claims**

1. An educational game apparatus comprising:
an upstanding game board and base means for holding the same in an upright position, said game board being defined by a pair of separable transparent panels, said panels being arranged in substantially face-to-face relation;
an opaque card removably positioned between said panels;
first and second groups of registering openings through said panels and card;
identical indicia means on each side of said card for each opening of said first group, each indicia constituting an incomplete statement of fact, the indicia at each opening being different from the indicia at any other opening;
identical indicia means on each side of said card for each opening of said second group, each constituting a completion of the incomplete statement of the indicia associated with one of the openings of said first group, the indicia at each opening being different from the indicia at any other opening;
the indicia of said first group being arranged in predetermined order and the corresponding indicia of the second group being arranged in a different order; and
a plurality of pegs adapted to be selectively inserted through any of said aligned holes from either side of said game board.



3,970,313
ANCESTRAL EDUCATIONAL GAME APPARATUS

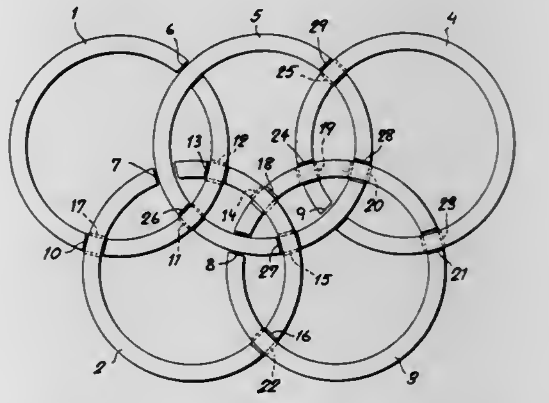
Ernest A. Montemayor, 4600 45th St. NW., Washington, D.C. 20016
Filed Oct. 31, 1974, Ser. No. 519,691
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AD **20 Claims**



1. Game apparatus for playing a game relating to and for educating players about genealogy, comprising in combination:
a. a playing board including an endless playing course having a plurality of serially connected playing spaces provided with indicia means for identifying respective spaces adapted to affect game play according to the indicia thereof; certain of said spaces having indicia means for identifying them generally as male and female ancestor spaces respectively;
b. a plurality of playing pieces for traversing said playing course by each player;
c. chance means operable by players in sequence for determining the number of spaces to be traversed per turn by a playing piece;
d. a genealogy type chart for each player, said charts each having horizontal parallel line indicia commencing at one side and disposed in a generally conventional ascending and descending step fashion, of which predetermined horizontal lines, subsequent to an initial single horizontal line at said one side, are vertically aligned to constitute a plurality of laterally adjacent successively preceding generation-recording means;
e. "Ancestor" card means including a deck of female ancestor cards and a deck of male ancestor cards, respectively bearing on one face thereof the name and other statistical indicia of female and male ancestors dating back over several hypothetical generations; said "Ancestor" cards adapted to be drawn during game play when a playing piece lands upon one of said ancestor spaces; and
f. said "Ancestor" cards and said parallel line indicia of said genealogy chart having correlative indicia means for correlating said "Ancestor" cards and said parallel lines to thereby record on said chart ancestors of each given generation in a predetermined manner.

3,970,314
INTERENGAGING RINGS PUZZLE

Gert Michael Mayr, Graz, and Wolfgang Schöfl, Linz, both of Austria, assignors to Hermann Hansmann, Vienna, Austria
Filed Feb. 24, 1975, Ser. No. 552,128
Claims priority, application Austria, Feb. 25, 1974, 1490/74
Int. Cl.² A63F *9/12*
U.S. Cl. 273—156 **5 Claims**



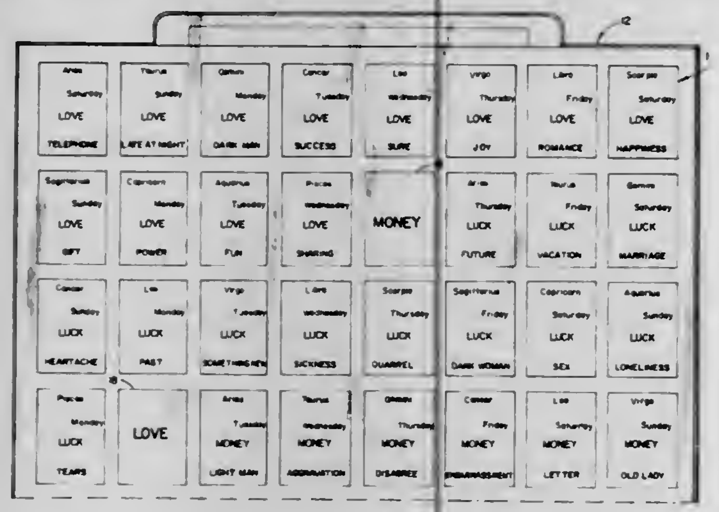
1. A puzzle comprising a plurality of rings of like width and diameter with substantially flat opposite faces, one of said rings being solid, each remaining ring being split by a peripheral slot accommodating said solid ring, each split ring being provided on each of said faces with at least one generally radial groove, said solid ring being provided with a generally radial groove for each split ring, oppositely facing grooves of different rings being interengageable for enabling assembly of said rings into an interfitting coplanar array with said solid ring passing through the slot of each split ring.

3,970,315
FORTUNE TELLING GAME

Sheldon Redner, New York, N.Y., assignor to Stephen Rothfeld, New York, N.Y.
Filed Jan. 24, 1975, Ser. No. 543,833
Int. Cl.² A63F *9/18*
U.S. Cl. 273—161 **5 Claims**

1. A fortune telling board game apparatus for determining astrological readings based on the twelve zodiac signs, said game being suitable for amusement and entertainment purposes and comprising astrology board means for defining a uniform pattern of zodiac stations with each station bearing

message intelligence, a plurality of accessory indexing cards, said cards being equal in number to the zodiac stations and adapted for compatible placement over each of the zodiac stations to conceal the message intelligence, selected indexing cards further containing identifying means for determining removal of cards from the board to expose message intelligence located on the respective zodiac stations, selected zodiac stations including identifying means, both identifying means being in the form of the twelve zodiac signs with the cards for removal bearing the zodiac sign corresponding to the player's astrological sign, said indexing cards further including information means conjunctive with the message intelligence and identifying means on those exposed zodiac stations for complemenatry intelligence conveyance to facilitate self interpretation in calculating readings of personal advice and guidance.



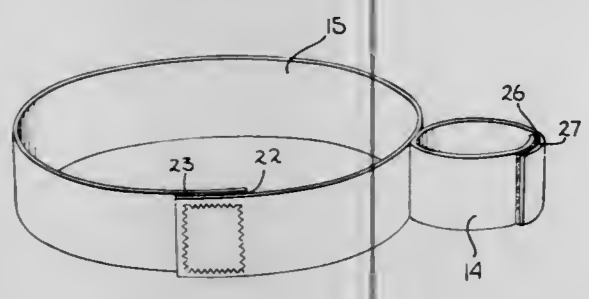
3,970,316
GOLF SWING RESTRICTOR

James P. Westmoreland, Jr., Los Angeles, Calif., assignor to Diversified Products, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 562,653, March 27, 1975, abandoned. This application June 30, 1975, Ser. No. 591,485

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—189 R **7 Claims**



1. An apparatus for controlling the swing of a golfer comprising:

an elongated, elastic chest encircling band for encircling a chest, said band including an inner surface for engaging such chest and an outer surface, and said band including fastening means for securing said chest encircling band about such chest; and

an elastic arm encircling band for encircling an arm, said arm encircling band including an inner surface for engaging such arm and an outer surface, said arm encircling band including fastening means for fastening said arm encircling band about such arm, said arm encircling band being directly joined to said chest encircling band such that a portion of said outer surface of said arm encircling band is in direct contact with a portion of said outer surface of said chest encircling band;

whereby the swing of a golfer is controlled and coordinated with the movement of the golfer's body since the upper portion of the golfer's arm is held by said arm encircling band adjacent to the golfer's chest.

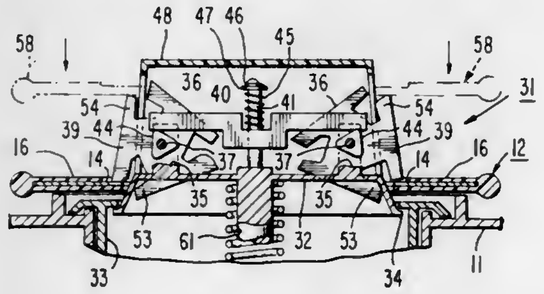
3,970,317
APPARATUS FOR INHIBITING A PLURALITY OF DISC RECORDS FROM BEING DISPOSED ON A TURNTABLE AND GROUNDING A DISC RECORD DISPOSED ON THE TURNTABLE

Thomas Francis Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,786

Int. Cl.^{2} G11B *17/04*

U.S. Cl. 274—105 **5 Claims**



1. In a playback system for recovering prerecorded signals from a grooved region of a centrally apertured disc record, said record having an ungrooved region disposed between said grooved region and the walls of said aperture; said playback system including a rotatable turntable; apparatus for inhibiting a plurality of disc records from being disposed on said turntable comprising:

a spindle supported on said turntable in a central location;

a rotatable member mounted within said spindle, said rotatable member having a plurality of record-engaging means disposed about its periphery, each of said plurality of record-engaging means having mutually oppositely directed first and second record-engaging ends;

biasing means cooperating with said rotatable member to establish a rotational position of said member in the absence of encirclement of said spindle by record aperture walls, the position established by said cooperation being any one of a limited plurality of rotational positions; each of said limited plurality of rotational positions locating a respectively different one of said record-engaging means in a location protruding from the periphery of said spindle, with an orientation directing the first record-engaging end of the protruding record-engaging means away from the turntable, and placing the first record-engaging end of said protruding record-engaging means in the path of travel of a record to a position of centered engagement with said turntable;

each of said record-engaging means being dimensioned so that passage of a record to a position of centered engagement with an otherwise unoccupied turntable results (1) initially in engagement of a turntable-facing surface of said passing record with the first recording-engaging end of the protruding record-engaging means, and (2) consequently in rotation of said member to a degree sufficient (*a*) to cause said biasing means to move the second record-engaging end of a record-engaging means adjacent to said protruding record-engaging means into engagement with a surface of said turntable-engaging record opposed to said turntable-facing surface, and (*b*) to intrude the first record-engaging end of said adjacent record-engaging means into said path to obstruct passage of any additional record to a position of centered engagement with the turntable-engaging record.

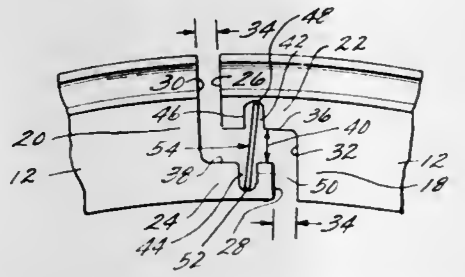
3,970,318
SEALING MEANS FOR A SEGMENTED RING

Eugene N. Tuley, Hamilton, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sept. 26, 1975, Ser. No. 617,072

Int. Cl.^{2} F01D *1/02, 9/00;* F16J *9/16*

U.S. Cl. 277—26 **6 Claims**



1. In a circumferentially segmented cylindrical flow confining apparatus, a fluidic seal arrangement between circumferential adjacent arcuate segments comprising:

a first circumferentially extending flange portion associated with one of said arcuate segments

a second circumferentially extending flange portion associated with an adjacent one of said arcuate segments, said second flange portion disposed radially outwardly and in overlapping spaced relationship with respect to said first flange portion so as to form a radial gap therebetween;

a first pocket in said first flange portion opening into said radial gap, said first pocket having a first radial end wall opposite said opening;

a second pocket in said second flange portion opening into said radial gap, said second pocket having a second radial end wall opposite said opening, said second pocket disposed radially outwardly and in a first overlapping spaced position with said first pocket,

a radially extending seal member residing in each of said first and second pockets and extending radially across said gap, said seal member having a first position for sealing engagement with a first portion of each of said first and second radial end walls.

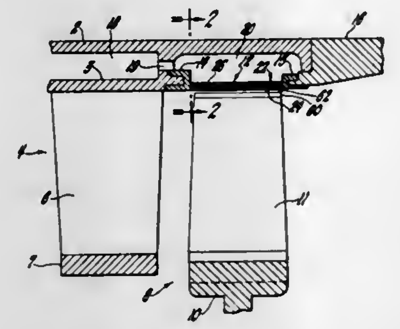
3,970,319
SEAL STRUCTURE

Charles D. Carroll, Greensburg, and George B. Meginnis, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 307,446, Nov. 17, 1972. This application May 3, 1974, Ser. No. 466,740

Int. Cl.^{2} F16J *15/44*

U.S. Cl. 277—53 **4 Claims**



1. A porous abradable seal structure adapted to provide one element of a two element fluid-cooled seal with relative movement between the two elements, the structure having a contact surface adapted to cooperate with the other element of the seal and having a rear surface, the seal structure comprising a plural number of strips, each strip having two faces and having two edges, the strips being stacked face-to-face and bonded together, with the lengthwise direction of the seal strips extending generally in the direction of relative movement of the seal elements; the strips being so disposed that the faces of the strips extend from the said contact surface to the said rear surface of the seal structure and that the edges of the stacked strips define the said contact surface and the said rear surface, and a large proportion of the strips having grooves in and extending completely across at least one face of the strip between the opposite edges thereof, to define with an abutting strip pores for flow of a fluid through the seal structure from the rear surface to the contact surface.

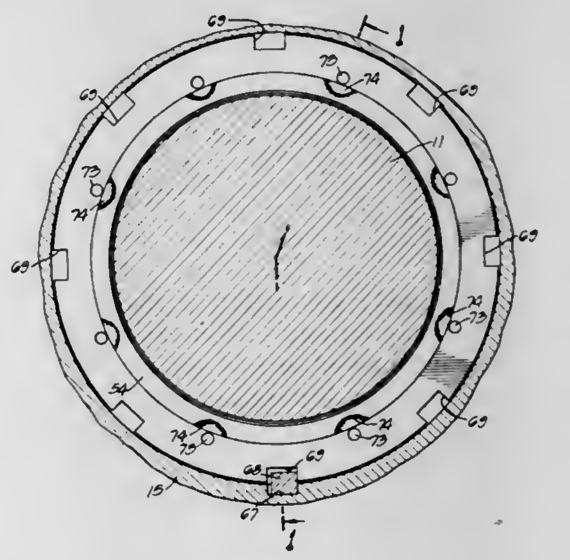
3,970,320
MECHANICAL SEAL WITH THERMO-COOLING

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 572,377

Int. Cl.^{2} F16J *15/34*

U.S. Cl. 277—74 **4 Claims**

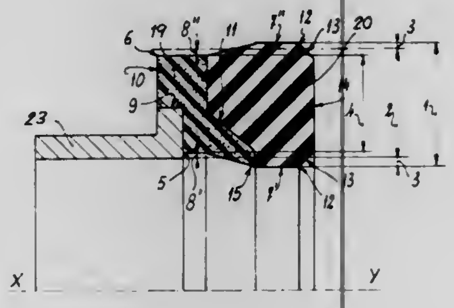


1. In a mechanical seal assembly for sealing a rotary shaft to a housing having a shaft opening through which the shaft extends, which mechanical seal comprises a rotatable sealing ring means mounted on the shaft for rotation therewith, said rotatable sealing ring means having limited movability axially of the shaft; nonrotatable or stationary sealing ring means; said rotatable and stationary sealing ring means having opposed, generally radial sealing surfaces disposed in relatively rotatable sealing relationship; said housing having a support flange surrounding the shaft which flange supports the stationary sealing ring means on its side opposite to its said generally radial sealing surface and along an annular surface spaced radially inward from its outer periphery; said flange and said stationary sealing ring means defining therebetween an annular cavity disposed radially outward from said annular surface; said stationary sealing ring means having a peripheral portion with a first generally radial annular surface contiguous to said cavity and exposed to pressure of fluid in said cavity, and a second generally radial surface on the opposite side of said peripheral portion exposed to the pressure of fluid within the housing, the improvement which comprises:

first fluid passage means extending through said stationary sealing ring means at the outer periphery thereof establishing fluid communication between said cavity and said housing and second fluid passage means through said stationary sealing ring means located radially inward in said first fluid passage means and also establishing fluid communication between said cavity and said housing, and second fluid passage means opening at its end adjacent to said rotatable sealing means at a location contiguous to said sealing surfaces whereby upon shaft rotation fluid flows from said housing through said first fluid passage means to said cavity and then through said second fluid passage means from said cavity to said housing, said fluid flowing through said second fluid passage providing cooling of said stationary sealing ring means and said sealing faces.

3,970,321
DYNAMIC-STATIC SHAFT SEAL

Jacques Dechavanne, 3 Boulevard de Jormadiere, Saint. Egreve, Isere, France
Filed Dec. 19, 1974, Ser. No. 534,164
Claims priority, application France, Dec. 19, 1973, 73.45529
Int. Cl.² F16J *15/24*
U.S. Cl. 277—188 A **6 Claims**

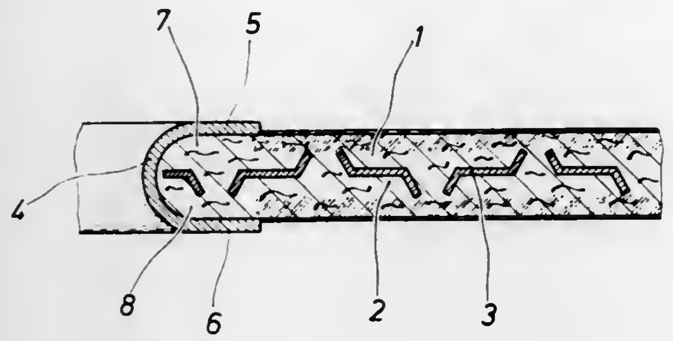


1. A sealing assembly comprising a shaft, a housing surrounding said shaft and formed with an inwardly open annular groove, and a seal received in said groove and surrounding said shaft, said seal being disposed in said housing between a high-pressure zone and a low-pressure zone formed therein, said seal comprising:
- a cup packing of asymmetrical section and formed with radially extending flange and with a frustoconical lip extending from one axial side of said flange toward said high-pressure zone and having an inner face resiliently engageable with the outer surface of said shaft;
- a supple pressure-distributing ring having an end surface bonded to said one side of said flange, an inner portion formed with a recess snugly receiving and bonded to the outer face of said lip, said recess having a frustoconical wall bonded to said outer face, a substantially cylindrical outer periphery resiliently engaging with and bottoming in the interior of said groove, and a substantially cylindrical inner periphery engaging said outer surface of said shaft, said lip having an inner face inclined inwardly toward said inner periphery and terminating flush therewith; and
- a nonresilient ring received in said packing at the other axial side thereof, said presssure-distributing ring retaining said packing out of engagement with the bottom of said groove and holding most of said lip out of engagement with said outer surface in the absence of a pressure differential across said zones.

3,970,322
CYLINDER HEAD GASKET FOR INTERNAL-COMBUSTION ENGINE

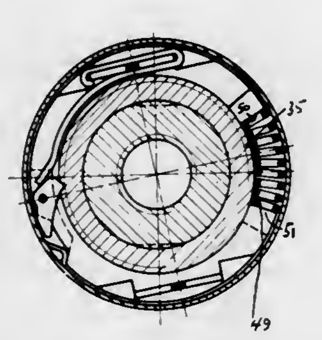
Friedhelm Stecher, Burscheid; Josef Fazekas, Wermelskirchen; Paul Jöhren, Dortmund-Horde, and Martin Morsbach, Hilgen, all of Germany, assignors to Goetzewerke-Friedrich Goetze AG, Burscheid, Germany
Filed Jan. 31, 1974, Ser. No. 438,356
Claims priority, application Germany, Jan. 31, 1973, 2304505
Int. Cl.² F16J *15/12*
U.S. Cl. 277—235 A **5 Claims**

1. Cylinder head gasket for internal-combustion engines comprising at least one fiber layer of a soft material having pores which are enriched with an impregnating agent to increase the cross-sectional density of the soft material and edges which are bordered by a casing wherein the fiber layer is impregnated only outside of the region of the casing so that the pores of said fiber layer underneath said casing are free of impregnating agent and the fiber layer underneath said casing is more compressible than the remainder of the fiber layer.



3,970,323
CHUCK FOR DRILL

Albrecht Schnizler, Jr., Nurtingen, Germany, assignor to Metabowerke KG Closs, Rauch, & Schnitzler, Nurtingen, Germany
Filed Aug. 5, 1974, Ser. No. 494,912
Claims priority, application Germany, Aug. 17, 1973, 2341642
Int. Cl.² B23B *31/10, 31/24*
U.S. Cl. 279—64 **14 Claims**



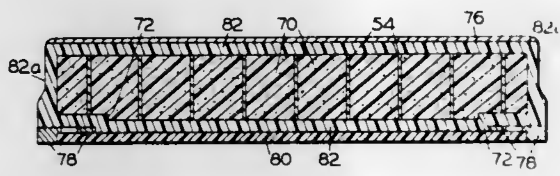
8. A drill chuck comprising; a chuck body adapted at one end for driving connection to a spindle, a clamping member rotatably supported on said body and having clamping jaws angularly displaceably mounted therein, rotation of said clamping member on said body actuating said jaws in opening and closing direction, a safety device for holding said clamping member in jaw closed position and including an element engageable with said clamping member, a spring bearing between said element and said body and biasing said element in a direction to urge said clamping member in clamping direction, and a cup-shaped housing rotatable on said body and having a dependent rim surrounding said safety device, said rim at the lower end being closed by a disc to which said element is pivoted.

3,970,324
FOAM-FILLED, CELLULAR STRUCTURAL PRODUCT

Eric F. Howat, Federal Way, Wash., assignor to American Marine Industries, Inc., Tacoma, Wash.
Division of Ser. No. 338,254, March 5, 1973, abandoned. This application Oct. 9, 1974, Ser. No. 513,412
Int. Cl.² A63C *5/00, 5/12;* **B32B** *3/12*
U.S. Cl. 280—610 **2 Claims**

1. A ski comprising in combination, body, tip and tail portions, the body portion being elongated and narrower in its central portion than at its ends and comprising
- a. a cellular core comprising a multiplicity of tubular laterally closed cells of structural material arranged side-by-side with their axes substantially parallel to each other and their ends open, the tubular cells being of progressively increasing density from the wider to the narrower lateral dimensions,

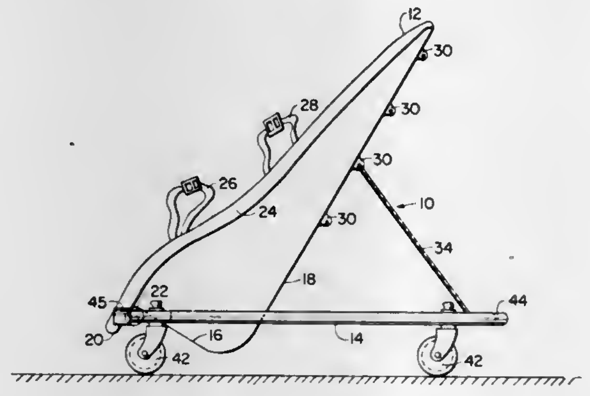
- b. a quantity of foamed plastic contained in the cells substantially filled the same and bonded to the walls thereof,
- c. a fiberglass sheet resin-bonded to and encasing the core and the tip and tail portions, and



- d. top and bottom surface sheets bonded respectively to the top and bottom surfaces of the fiberglass sheet, said surface sheets providing the top and bottom faces of the ski.

3,970,325
INFANT CREEPER

Ralph Wirsig, Kingston, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed May 15, 1975, Ser. No. 577,663
Int. Cl.² B62B *7/04*
U.S. Cl. 280—87.02 W **4 Claims**

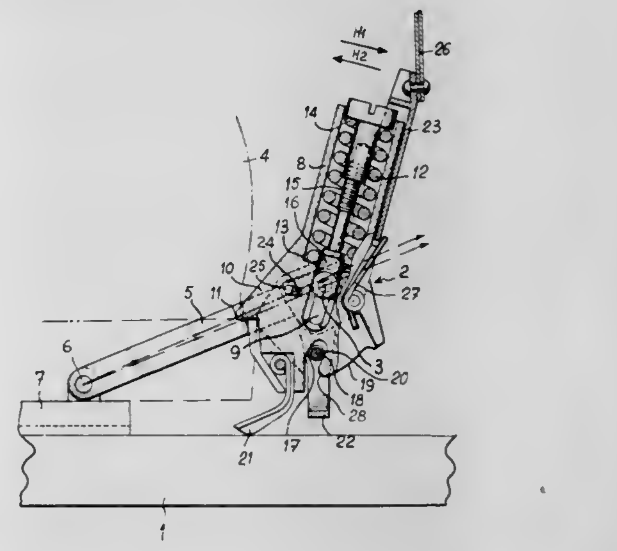


1. A baby creeper adapted to move on a support surface comprising a contoured body including a first generally rearwardly inclined planar surface having disposed at a point generally at right angles thereto an elongated back support for support of the spinal column of a baby, said point of right angle formation being disposed at a minimum height such that there is substantially no contact with the support surface, a lip depending from said first generally planar surface; a chassis for elevation and support of said creeper and having a plurality of wheels disposed thereabout, said chassis including an elongated generally rectilinear bar on one side thereof, means for carrying said seat on said chassis, said means including said lip resting on said bar, said means further including at least two bars engaging said back support and said chassis to support said body and a plurality of discrete attachment points for selectively engaging said bars to vary the angle between said chassis and said body, said point of right angle formation being at least as low to said support surface as the chassis, said first surface being disposed at a relative height above said support surface such that the baby's feet communicate with said support surface.

3,970,326
SAFETY SKI BINDING DEVICE

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France
Filed Jan. 15, 1975, Ser. No. 541,131
Claims priority, application France, Jan. 28, 1974, 74.2766
Int. Cl.² A63C *9/08*
U.S. Cl. 280—626 **16 Claims**

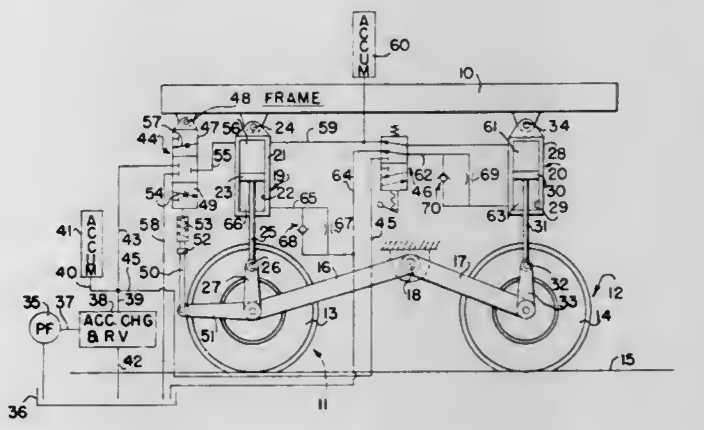
1. A safety binding for a ski boot designed to retain one of the ends of the boot and comprising:
- a. two lateral arms extending along each side of the boot and hinged at one end thereof, in relation to the ski, about a first pivoting means having a first pivoting axis parallel with the plane of the ski;
- b. a retaining element, pivotally mounted in relation to a second pivoting means uniting the other ends of said lateral arms; said second pivoting means having a second pivoting axis parallel with the plane of the ski; said retaining element comprising jaw means for holding the boot and being actuated by a resilient element;



- c. first locking means for temporarily interacting the three following elements: the boot, the lateral arms and the retaining elements, in relative motion against the action of said resilient element; said first locking means comprising a ramp and a stop temporarily interposed between two of said three elements in relative motion; and
- d. second locking means for preventing temporarily said retaining element from pivoting, said second locking means comprising a ramp and a stop temporarily interposed between two of the following three elements in relative motion: the boot, the lateral arms and the releasing element.

3,970,327
SUSPENSION AND LOAD LEVELING FOR AN URBAN HAULER

Joseph E. Dezelan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed June 4, 1975, Ser. No. 583,365
Int. Cl.² B06G *17/00*
U.S. Cl. 280—683 **8 Claims**



1. A suspension for a vehicle comprising the combinations of:
- a vehicle frame;
- first and second axles mounted in tandem beneath said frame;
- means for separately, pivotally connecting said axles to said frame for pivotal movement toward and away from said frame;

first and second fluid controlled resilient means respectively connected between each of said first and second axles and said frame for resiliently supporting said frame by said axles;

means for communicating a fluid to said resilient means for maintaining a predetermined relative height of said frame above said axles and an equal distribution of weight on said axles.

said resilient means comprises a double-acting piston and cylinder assembly connecting each of said axles to said frame;

a common source of pressurized fluid for supplying fluid to said cylinders for supporting said frame;

valve means responsive to a predetermined position of one of said axles with respect to said frame for communicating fluid from said source to said cylinders; and,

accumulator means for accumulating a quantity of said fluid and maintaining said fluid in open communication with both of said cylinders for resilient support of said frame by said axles.

3,970,328

METHOD AND BLANK FOR MANUFACTURING SHOCK-ABSORBING SAFETY DEVICES FOR VEHICLE PASSENGERS

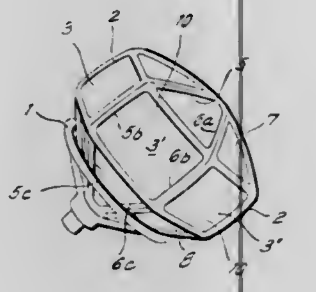
Hans Ivar Wallsten, Saffle, Sweden, assignor to AB Inventing, Saffle, Sweden

Filed July 19, 1973, Ser. No. 380,834

Claims priority, application Sweden, Feb. 12, 1973, 7301930

Int. Cl.² B60R *21/08*

U.S. Cl. 280—731 **3 Claims**



1. A method for manufacturing shock-absorbing safety devices for passengers in vehicles, comprising the steps of:

arranging a pair of sheets of a thin, flat, flexible, extensible and substantially gas tight material one upon the other;

joining the opposed longitudinal edges of the pair of sheets together to form a gas-tight inner wall of a channel;

arranging each of a pair of flexible, substantially inextensible flat sheets of material upon each of a pair of exterior surfaces of the channel inner wall;

joining adjacent edges of the outer sheets together to form an outer wall surrounding the inner channel wall;

forming an enclosure wall of a plurality of fields of flexible, substantially inextensible sheet material;

joining the outer wall around each channel to at least two of the flexible fields to form vertices at the boundaries between adjacent material fields;

connecting each channel of a plurality of channels to at least one of the remaining channels with their inner spaces being continuous and their respective sealed edges merging into and sealed to each other to form an enclosure expandable from a compact folded state to form a network of expandable and foldable channels connected to the enclosure wall; and

providing at least one gas receiving inlet communicating with the channel network for receiving a supply of compressed gas to cause the enclosure wall to assume a predetermined configuration.

3,970,329

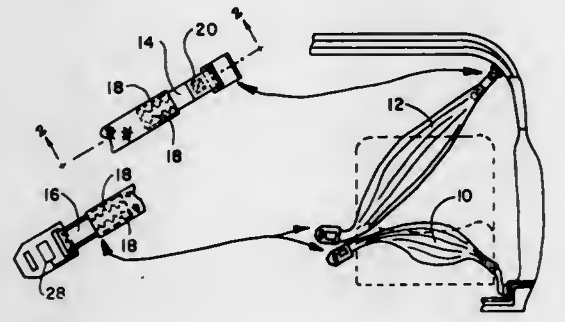
INFLATABLE BAND RESTRAINT STITCHING

Donald Joseph Lewis, Troy, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 322,593, Jan. 10, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,324

Int. Cl.² B60R *21/10*

U.S. Cl. 280—733 **1 Claim**



1. A vehicle safety system comprising an inflatable band restraint having an inflatable section with a longitudinal axis, said inflatable section being folded in an uninflated state and adapted to be positioned about a wearer when the wearer is seated in a seat within the vehicle; inflating means capable of inflating said inflatable section in response to a preselected condition of the vehicle; webbing for securing at least one end of said inflatable band restraint to said vehicle, zig-zag stitching joining said webbing to said inflatable band restraint, said stitching comprising at least two rows of zig-zag stitches, each of said rows longitudinally extending and longitudinally extendible in the same direction as the longitudinal axis of the inflatable section for a distance of at least two inches, whereby said stitching is capable of withstanding significant stress in at least two directions on inflatation.

3,970,330

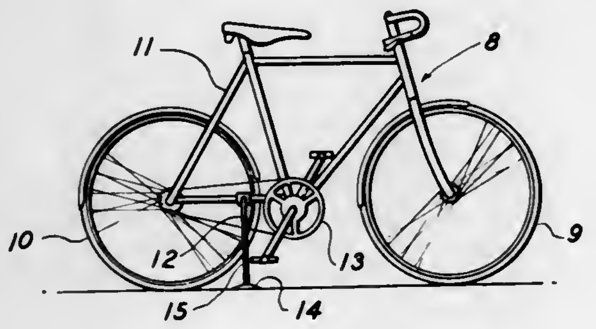
KICKSTAND BASE FOR TWO-WHEELED VEHICLES

Barry Norcross, West Hollywood, Calif., assignor to Larry K. Myers, Singapore, Singapore

Filed Sept. 20, 1974, Ser. No. 507,694

Int. Cl.² B62H *1/02*

U.S. Cl. 280—301 **1 Claim**



1. A support base for a vehicle having a pivoted or folding kickstand, the combination comprising a ground-contacting kickstand shank, a support base foot exceeding the contact area of the kickstand shank, said base foot having a faceted top defining a shallow hollow ground-contacting sole with reinforcing ribs extending across said hollow sole, a shank-receiving sleeve on the upper side of the foot having an entry axis at an angle to the ground-contacting sole of the base foot, said sleeve further having an inner wall making a removable friction fit with the outer wall of the shank.

3,970,331

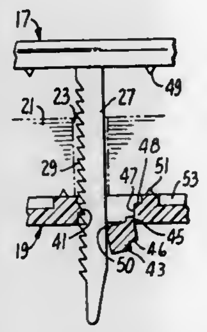
BINDER ELEMENT

Joe D. Giulie, Los Altos Hills, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 388,246, Aug. 13, 1973, abandoned. This application May 12, 1975, Ser. No. 576,787

Int. Cl.² B42D *1/00*

U.S. Cl. 281—21 R **10 Claims**



1. A binder element for an apertured book or the like, comprising in combination:

a. a first strip having a plurality of spaced studs extending therefrom, said studs having a plurality of ratchet teeth on at least one edge thereof,

b. a second mating strip having substantially the same length and width as said first strip with complementary spaced openings extending therethrough and having a size larger than the cross-section of the complementary stud to freely receive said stud, each of said openings being defined by a wall having at least one ratchet tooth thereon extending into said opening and adapted to engage in said opening the ratchet teeth on the complementary stud extending from the first strip, and

c. locking means adapted to move into said openings, said locking means consisting of a series of blocks each held by a thin web to said second mating strip along an edge of each of said openings, said blocks being located to be forced directly into said openings for holding said ratchet teeth of the two strips in engagement with each other.

3,970,332

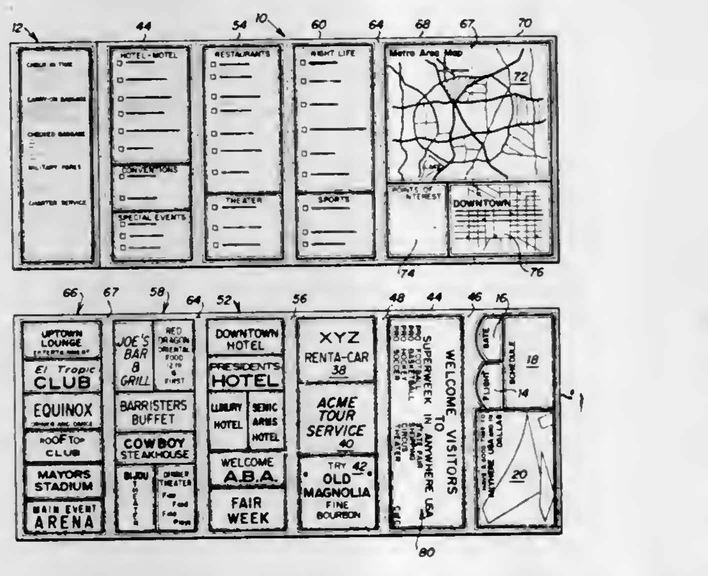
AIRLINE TICKET AND INFORMATION FOLDER

Lauritz Lauritzen Alford, Jr., Dallas, Tex., assignor to Ad-One, Inc., Dallas, Tex.

Filed Nov. 14, 1974, Ser. No. 523,906

Int. Cl.² B42D *15/00*

U.S. Cl. 281—31 **11 Claims**



1. An airplane ticket and information folder for use by an airplane passenger comprising:

a rectangular pocket portion formed by a pair of flexible paper sheets to enable the insertion of tickets and boarding passes therein,

a first paper panel integrally joined by a first paper fold to one edge of said pocket portion and including a first type of travel information regarding the destination of the passenger,

a plurality of additional paper fold panels, said panels having a first edge and a second edge opposite said first edge, the first panel of said additional paper fold panels being connected along its first edge by a fold to the edge of said first fold panel opposite said first fold with the remaining said fold panels being connected with the first edge of each said panel connected by a fold to the second side of an adjacent panel,

ones of said additional fold panels displaying on the back sides thereof advertisements regarding the travel information contained on the front side of the fold panel once removed from the panel adjacent thereto, such that said fold panels may be folded to place said advertisements on the back of said fold panels in a side-by-side relationship adjacent corresponding types of travel information on the front of said fold panels as said fold panels are sequentially folded one upon the other,

said fold panels being constructed to be folded beneath said pocket portion to form a compact folder for carrying, while being operable to be unfolded when the passenger desires to review travel information regarding the destination.

3,970,333

EXTENSION COMPENSATION AND EXPLOSION PROTECTION DEVICE

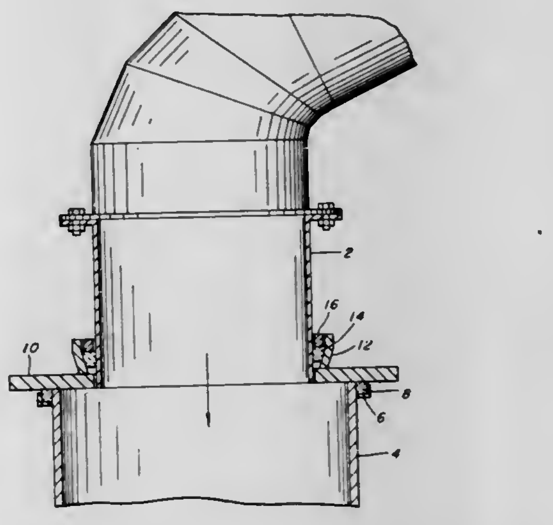
Franz Pelzer, Kirchheim, Germany, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1975, Ser. No. 621,461

Claims priority, application Germany, Oct. 16, 1974, 2449159

Int. Cl.² F16L *55/00*

U.S. Cl. 285—9 R **4 Claims**



1. Extension compensation and explosion protection device for pipelines for gaseous media, comprising:

upper and lower concentric conduit members, disposed on a common vertical axis, with the upper conduit member having a diameter less than the diameter of the lower conduit member;

a support ring attached to the outside of the lower conduit member;

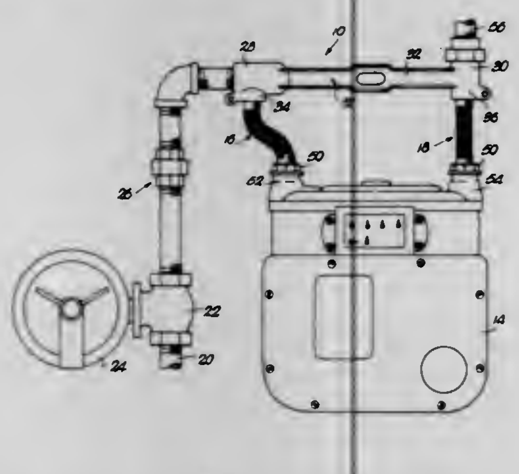
a first flexible, ring-shaped seal supported by the support ring;

an annular plate supported by the first flexible seal and surrounding the lower end of the upper conduit member, having an inside diameter greater than the outside diameter of the upper conduit member, and an outside diameter greater than the outside diameter of the first flexible seal;

a circular restraining member attached to the upper surface of the annular plate;
a second flexible, ring-shaped seal disposed between and contacting both the upper conduit member and the circular restraining member; and
a load ring, supported by the second flexible seal, and urging the second flexible seal into sealing contact with both the upper conduit member and the circular restraining member.

3,970,334
CONNECTORS FOR COUPLING METERS WITH METER BARS

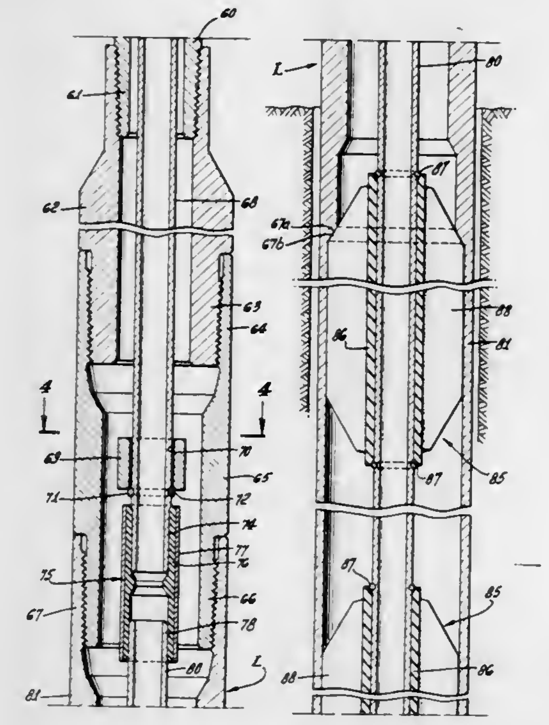
Max L. Campbell, Topeka, Kans., assignor to Hydro-Flex Corporation, Inc., Topeka, Kans.
Filed Mar. 14, 1975, Ser. No. 558,229
Int. Cl.² F16L *3/22, 51/02*
U.S. Cl. 285—30 **1 Claim**



1. In a gas meter installation assembly, the combination comprising;
a gas volume meter of specific weight and having a gas entry and a gas exit:
a meter bar adapted for mountng on a support and including an inlet adapted to interconnect with a gas source, an outlet spaced from said inlet for interconnection with a gas-delivering conduit and a rigid mounting beam extending between said inlet and outlet,
there being first and second gas meter threaded ports within said meter bar communicating respectively with said inlet and said outlet;
first and second elongated, one-piece, integral, open-ended, tubular members interconnecting said meter and said bar to support said meter and to establish fluid communication between the meter and said inlet and outlet respectively,
said tubular members each having a thin-walled central section disposed between a pair of opposed end sections, each of said sections having a wall thickness greater than the wall thickness of said central section;
said first tubular member having tapered threads on one of said end sections for engagement with said threads of the first meter port, and a shoulder on the other of said end sections for sealing against said gas entry on said meter;
said second tubular member having tapered threads on one of said end sections for engagement with said threads of the second meter port, and a shoulder on the other of said end sections for sealing against said gas exit on said meter;
nut members clamping said shoulder of each said tubular member in sealing engagement, with said meter;
each of said central sections containing a plurality of interconnected, axially aligned, annular corrugations along the length thereof operable to permit longitudinal and transverse flexure of said members yet preclude significant radial deformation of the same,
the internal diameter of said corrugations being substantially equal to the internal diameter of said end sections and the external diameter of said corrugations being substantially equal to the external diameter of said end sections;
said central sections having a wall thickness sufficient to provide a limited degree of rigidity of said flexible members such that the weight of said meter is supported without deformation of the members and further confines flexure and shock absorbing action to the central sections.

3,970,335
DUAL CONCENTRIC PIPES

Alfred R. Curington, and Theodore J. Roscoe, Jr., both of Houston, Tex., assignors to Bakerdrill, Inc., Spartanburg, S.C.
Division of Ser. No. 392,628, Aug. 29, 1973, Pat. No. 3,871,486. This application Oct. 24, 1974, Ser. No. 517,541
Int. Cl.² F16L *39/00;* **E21B** *1/06*
U.S. Cl. 285—133 A **9 Claims**

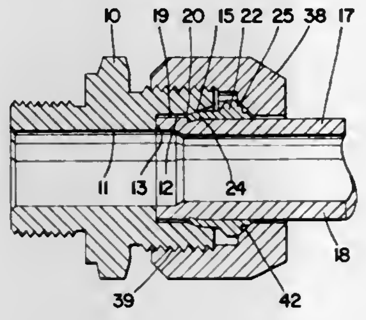


1. A dual concentric drill pipe for continuously taking core samples from the bottom of a bore hole while drilling progresses; comprising inner and outer pipe sections defining an annular space therebetween, said outer pipe section having opposite ends provided with tool joints adapted to be connected to adjacent corresponding outer pipe sections, said inner pipe section having at one end a cylindrical section and at the other end telescopic coupling means frictionally engageable with the cylindrical end of an adjacent inner pipe section, and means resiliently centralizing said inner pipe section in said outer pipe section; said centralizer means comprising an elastomeric element, said element including a cylindrical sleeve mounted on said inner pipe section and circumferentially spaced ribs extending from said sleeve and frictionally engaging said outer pipe section, and means engaging said inner pipe section and the ends of said sleeve to axially compress said sleeve and retain said sleeve in a compressed condition on said inner pipe section.

3,970,336
TUBE COUPLING JOINT

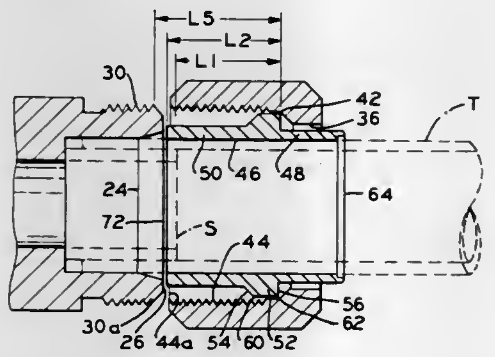
Lawrence B. O'Sickey, Cleveland Heights, and Jerry V. Koski, Parma, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Nov. 25, 1974, Ser. No. 526,701
Int. Cl.² F16L *19/08*
U.S. Cl. 285—341 **3 Claims**

1. A tube coupling joint comprising a body having an internal cam surface leading to a bore, a tube of predetermined outside diameter having an expanded terminal end portion in said bore and engaging a shoulder on said body, said end portion being of larger outside diameter than the predetermined diameter and being unsupported along its inside surface, a sleeve over said tube, said sleeve having a radially contracted forward portion whose inner diameter is less than said predetermined diameter whereby said contracted portion grips the tube immediately adjacent said expanded portion, said cam surface engaging said sleeve contracted portion to maintain the same in said contracted position, and a thrust member interengaged with said body and axially engaging the sleeve to maintain said sleeve contracted portion in engagement with said cam surface and said end portion in engagement with said shoulder, the inside and outside surfaces of said expanded end portion being substantially cylindrical and said outside surface is of greater diameter than the initial internal diameter of said sleeve contracted portion before contraction of the same.



3,970,337
CONDUIT COUPLING STRUCTURE

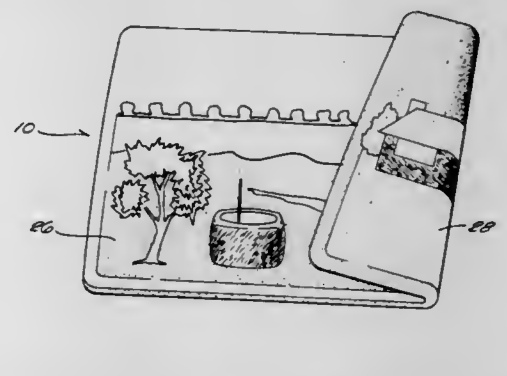
Robert W. Niemeyer, Avon Lake, Ohio, assignor to Alco Standard Corporation, Valley Forge, Pa.
Filed Feb. 18, 1975, Ser. No. 550,474
Int. Cl.² F16L *19/08*
U.S. Cl. 285—342 **7 Claims**



1. In a tube coupling device of the character including first and second coupling members having cooperably interengageable means for connecting the members together, an annular sleeve receiving the tube and having a contractible end portion, said first coupling member having a tube receiving bore and an annular cam wall extending radially and axially outwardly from said bore and receiving said contractible end portion of said sleeve, said sleeve including force receiving means spaced from said contractible end in the direction outwardly of said bore, and said second coupling member including means engaging said force receiving means when said first and second members are connected together forcing said contractible end portion against said cam wall and camming the contractible end portion against the tube, the improvement comprising: said sleeve having a second end portion extending in said direction from said force receiving means and having an end face spaced from said force receiving means in said direction, said cam wall having an axially outer edge having a given diameter, said first coupling member further including means defining a radial abutment surface facing in said direction and having an annular inner edge the diameter of which is at least equal to said given diameter, at least said end face of said second end portion of said sleeve having a diameter greater than said given diameter, whereby said end face abuts against said abutment surface when said sleeve is received on said tube with said second end portion facing said bore, and said sleeve having a length between said end face and said force receiving means, said length axially spacing said cooperably interengageable means on said first and second coupling members against interconnection when said end face abuts said abutment surface and said means on said second coupling member engages said force receiving means.

3,970,338
METHOD OF MAKING REVERSIBLE HOOKED ARTICLES

Lloyd L. Crowe, Milwaukee, Wis., assignor to Shirley L. Depke, Milwaukee, Wis.
Filed June 2, 1975, Ser. No. 583,088
Int. Cl.² B65H *69/04*
U.S. Cl. 289—1.5 **13 Claims**



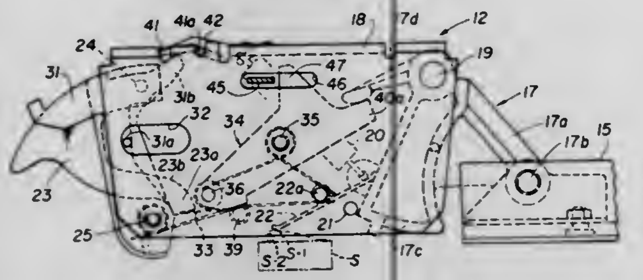
1. A method of making reversible hooked articles on a base comprising a foundation fabric having crossed strands with openings between adjacent crossed strands, comprising the steps of:
a. pulling a first looped tuft of yarn part way through one of said openings from one side of said foundation fabric;
b. pulling a second looped tuft of yarn part way through a proximate opening from the other side of said foundation fabric, the second yarn tuft passing through the loop of the first yarn tuft;
c. pulling the free ends of one yarn tuft through the loop of the other yarn tuft to form a square knot securing said yarn tufts to each other and to the foundation fabric strands separating said proximate openings;
d. tightening said square knot; and
e. repeating steps (a) through (d) over successive proximate openings in said foundation fabric to cover both surfaces of said fabric with symetrically disposed tufts to form piles on both sides of said foundation fabric.

3,970,339
DOUBLE SWINGING LATCHBOLT

Philip H. Haselton, Short Hills, and Frederick W. Geils, Fair Lawn, both of N.J., assignors to Detex Corporation, New York, N.Y.
Filed Jan. 15, 1975, Ser. No. 541,080
Int. Cl.² E05C *3/22*
U.S. Cl. 292—227 **14 Claims**

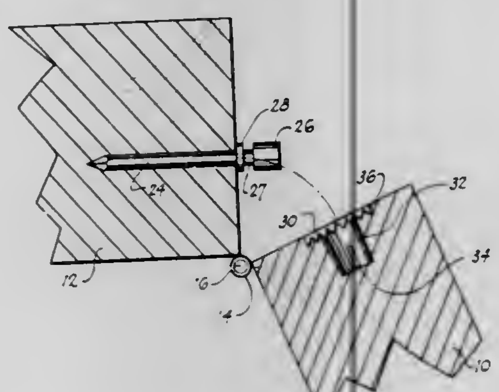
1. A latchbolt assembly for mounting on a door hinged to a door frame carrying a complementary latch keeper, comprising a housing for the assembly, a movable lachbolt mounted in the housing for swinging movement in both clockwise and counterclockwise directions from a centralized latching position and in which the axes of the hinged door and of the swinging movement of the latchbolt are substantially parallel, and releasable deadlatch means to secure the latchbolt against swinging movement in either direction when it is disposed in its centralized position in the latch keeper to secure

the door shut in its frame, whereby the swinging movement of the latchbolt in one direction frees the latchbolt from the keeper and the swinging movement in the other direction admits the latchbolt into the keeper as the door is shut.



3,970,340
HINGE PIN LOCKS

Kenneth E. Taft, Stuart, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed June 19, 1975, Ser. No. 588,476
Int. Cl.² E05C *19/00*
U.S. Cl. 292—300 9 Claims

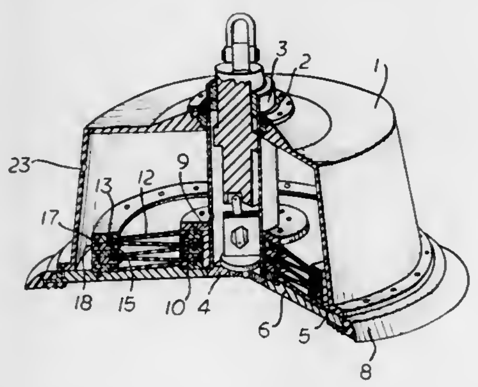


1. A hinge pin-lock comprising an elongated member and a sleeve member having one end blocked and adapted to releasably receive a portion of said elongated member, said elongated member defining a shaft terminating at one end in an enlarged annular head, said shaft defining a second head, said second head being disposed on shaft forward of said first head, said sleeve member having a depth about equal to the distance on said shaft from head to head and defining a substantially toroidal base portion, a side of said base portion being elongated and defining a substantially conically shaped protrusion, said base member being operative to slidably engage a portion of said elongated member, the distal end of said head adapted to abut said closed end of said sleeve whereby movement of said member is arrested.

3,970,341
VACUUM LIFTING UNIT INCLUDING A SUCTION CUP

Rudolf Glanemann, and Wolfgang Schlaupitz, both of Greven, Germany, assignors to Vacu-Lift Machinenbau GmbH, Emsdetten, Germany
Filed Nov. 27, 1974, Ser. No. 527,890
Claims priority, application Germany, Dec. 12, 1973, 2360575
Int. Cl.² B66C *1/02*
U.S. Cl. 294—64 R 1 Claim

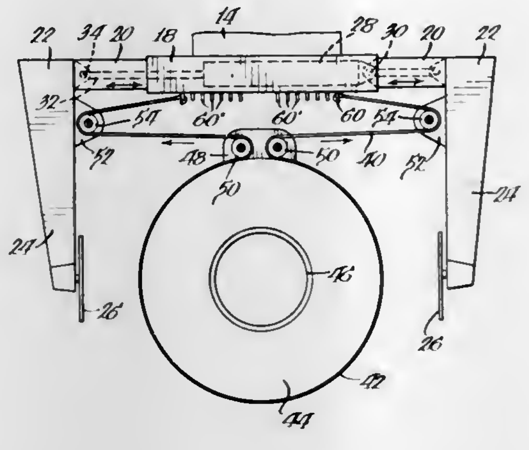
1. A vacuum lifting unit comprising a frame including an upper cover housing portion having a center opening, a hollow piston rod slidable in said center opening having its upper end connected to said frame, a piston disc connected to the lower end of said hollow piston rod, a suction disc connected to said housing cover portion and having a central aperture adapted to be selectively covered by said piston disc when the latter is lowered into its lowermost position, an encircling contacting gasket on said suction disc, a series of annular diaphragm sheets disposed in said housing cover portion having hollow central portions through which extends said piston rod, means connecting the lower one of said diaphragm sheets to said suction disc, means connecting the upper one of said diaphragm sheets to said hollow piston for movement therewith, said diaphragm sheets being extendable to form a bellows with lifting of said piston rod, said diaphragm sheets being in fluid communication with said suction disk through said aperture and providing an increased volume of rarified atmosphere with upward travel of said hollow piston rod and expansion of said bellows, said piston disc having hollow bores therein for fluid communication between the interior of said hollow piston rod and said suction disc, a selectively operable valve means within said hollow piston for closing said bores in said piston disc, a draw bar slidably mounted within said hollow piston, said valve switching means comprising a vertically movable valve element positioned within said hollow piston for selectively opening and closing said bore holes in said piston disc, an upstanding guide plate fixedly attached to said valve element, said guide plate having a polygonal-shaped opening with a pair of guide surfaces thereon converging in the direction of the axis of the piston rod, a strut suspended at its upper end on said draw bar, a pin means formed on the lower end of said strut and positionable in said polygonal opening, a deflector element pivotably mounted on said guide plate for shifting between two positions and having a pair of guide surfaces at an angle relative to each other, said pin means slidable to positions to engage said guide surfaces of said deflector element and said guide surfaces defining said polygonal opening, upward and downward movement of said strut and said pin means positioning said valve element to leave open said bore holes with said draw bar raised and positioning said valve element to close said bore holes when said draw bar is lowered.



3,970,342
TIRE SERVICING APPARATUS

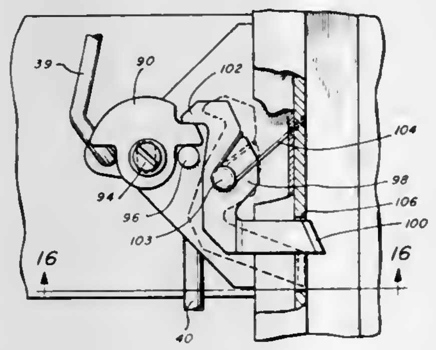
Larry G. Cotton, Clear Lake, Iowa, assignor to Iowa Mold Tooling Co., Inc., Garner, Iowa
Filed June 6, 1975, Ser. No. 584,588
Int. Cl.² B66C *1/16*
U.S. Cl. 294—86 R 8 Claims

1. Tire servicing apparatus comprising,
- a tire gripping tool base adapted to be mounted on a vehicle, a crane boom, or the like;
- a pair of opposed tire gripping members movably mounted on said base for movement towards and away from each other whereby a tire may be gripped or released for servicing purposes;
- motor means for moving said tire gripping members towards and away from each other; and
- an elongated, flexible strap operatively connected to both said tire gripping members, said strap having a length sufficient to define a loop of sufficient size to be circumferentially received about a tire;
- whereby when said loop is circumferentially disposed about a tire, said motor means may be operated to move said tire gripping members away from each other to diminish the size of said loop thereby squeezing the tire about its tread to seat the beads of the tire on a rim associated therewith.



3,970,343
SUNROOF STRUCTURE

Charles G. Horn, West Newton, Mass., assignor to Aro Manufacturing Co., Inc., West Newton, Mass.
Filed Sept. 16, 1974, Ser. No. 506,736
Int. Cl.² B60J *7/04*
U.S. Cl. 296—137 E 12 Claims

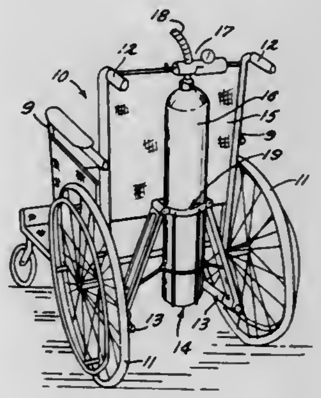


1. A sunroof structure for a vehicle having a roof opening beneath which the structure is disposed, said structure comprising;
- a yieldable plastic frame covering an area larger than the opening in the vehicle roof and extending rearwardly of the roof opening, said frame having a cross-sectional configuration defining guide channels extending rearwardly along at least the sides of the frame,
- a sunroof panel slidable within the frame and having means attached thereto for facilitating forward and rearward movement of the sunroof panel,
- means disposed in each guide channel and each including a lifter bar upon which the panel rests, means defining a pivot for the bar at one end, and means for lifting the other end of the lifter bar,
- said lifting means comprising a link pivoted at one end from the lifter bar,
- and means for actuating the lifting means including a rod means extending along the guide channels and means coupling the rod means to an other end of the link to cause the lifter bar to pivot upwardly and urge the sunroof panel against the roof to cover the opening.

12. For a sunroof structure for a vehicle wherein the structure has lifter assemblies at opposite sides for sealing a sunroof against the vehicle roof, an apparatus for securing and unsecuring the sunroof to permit the sunroof to be either in a sealed closed position or slideable to an open position, said apparatus comprising,
- a handle,
- means coupled from and operable by the handle for operating the lifter assemblies,
- cam means operable by the handle to permit only limited rotation of the handle,
- latch means engagable with the cam means and having integral therewith a sunroof engaging edge for rotating said latch means when the sunroof is closed to permit rotation of the cam means,
- biasing means and a means for supporting the biasing means independent of the latch means,
- said cam means including means for receiving said latch means to maintain said cam means non-rotatable unless the sunroof is closed,
- said biasing means for biasing the latch means to a position wherein the cam means is non-rotatable until the sunroof directly contacts the engaging edge of the latch means,
- said latch means being rotatable against the bias of the biasing means upon direct engagement of the sunroof with the engaging edge of the latch means to thereby permit rotation of the cam means.

3,970,344
OXYGEN TANK HOLDER FOR WHEELCHAIRS

Arthur V. Baumann, 1410 Wynneburne Drive, Cincinnati, Ohio 45238
Filed Dec. 11, 1975, Ser. No. 639,833
Int. Cl.² A47C *7/62*
U.S. Cl. 297—189 3 Claims



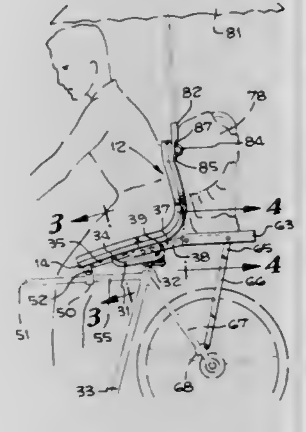
1. An oxygen tank holder for attachment to most foldable wheelchairs that have a pair of rearwardly extending foot levers, comprising a circular strap, a pair of depending struts of equal lengths, each having its upper end pivotally mounted on opposite sides of the strap, a sleeve bearing on the lower end of each strut adapted to detachably receive a foot lever of a wheelchair, a wire basket depending from the circular strap between the struts and adapted to receive the lower end portion of an oxygen tank, flexible cable means each connected to a mid-portion of the basket on opposite sides thereof, and an adjustable lock means on each strut and engagable with the terminal end portion of a flexible cable means.

3,970,345
CYCLE SEAT WITH ACCESSORY-BEARING ATTACHMENTS

Stephen A. Holcomb, 1369 N. Los Robles, Pasadena, Calif. 91104
Filed July 11, 1975, Ser. No. 595,071
Int. Cl.² B62J *1/00*
U.S. Cl. 297—195 11 Claims

1. A rider's cycle seat for adjustable attachment to a conventional cycle seat frame having a front yoke and a rear frame member, and comprising a seat base, a backrest at an angle to the seat base, a horizontal retainer strip on the seat base adapted to movably retain the seat base with respect to the front yoke on the cycle seat frame, a slide bar attached at each side of the seat frame, transversely spaced longitudinal

racks on the seat base, a removable lock bar adapted to extend through the racks and the slide bars so as to adjust the seat base and backrest longitudinally of the cycle, means for securing the front of the seat to the cycle frame, and means on the seat for securing a load to the seat other than the rider.



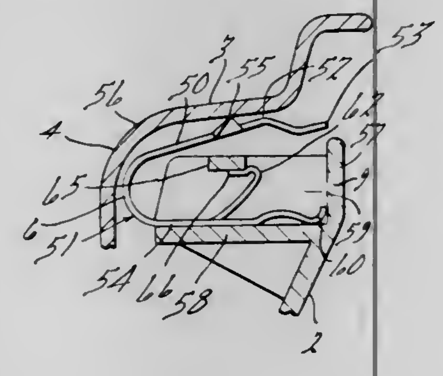
3,970,346
FASTENING ARRANGEMENT FOR DECORATIVE WHEEL TRIM

Paul Kretschmer, Waldaschaffe, Germany, assignor to Ymos-Mettalwerke, Germany

Continuation of Ser. No. 443,520, Feb. 19, 1974, abandoned. This application Jan. 24, 1975, Ser. No. 543,971

Int. Cl.² B60B *7/00*

U.S. Cl. 301—37 R **9 Claims**



1. In a fastening means for securing a decorative cover on the outer face of a vehicle wheel which has an outwardly diverging annular flange, said fastening means embodying an inwardly extending axial flange on said cover adapted to be aligned with and spaced from said wheel flange when the cover is applied to the wheel, means defining a plurality of spaced clip receiving recesses on said cover flange, each said recess being defined by an outer end wall and a pair of spaced side walls extending inwardly therefrom forming a recess which is open at its inner end, a bridge member having a plurality of walls engaging the side walls of the recess and spaced inwardly from the end wall providing an opening therebetween, a metal spring clip disposed within each of said recesses having a locking portion engaging the bottom of the recess and a wall of said bridge member with a lanced out finger extending into the opening having its end engaging the adjacent end of the bridge member to secure the locking portion of the clip within the recess with an end-to-end nonyielding abutment, and securing means supported by said locking portion for engagement with said wheel flange.

3,970,347
FLUID PRESSURE CONTROL DEVICE WITH A FAILURE ALARM FOR A VEHICLE BRAKE SYSTEM

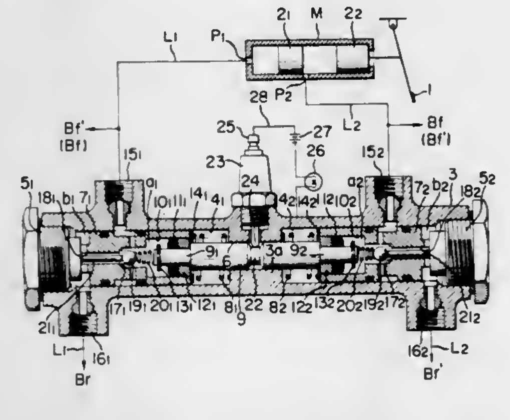
Mitsutoyo Mizusawa, Kawanishi, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Mar. 7, 1975, Ser. No. 556,536

Claims priority, application Japan, May 2, 1974, 49-49386

Int. Cl.² B60T *8/26*

U.S. Cl. 303—6 C **11 Claims**



1. In a vehicle brake system of the type including a dual brake master cylinder having a first and a second independent output port and a first and a second hydraulic fluid line extending from said respective first and second output ports of said brake master cylinder and connected to the respective hydraulic fluid chambers of a pair of left and right front wheel brakes, a fluid pressure control device with a failure alarm comprising: a casing arranged across said first and second hydraulic fluid lines midway thereof and defining a pair of aligned left and right cylinder bores, a pair of left and right differential pistons slidably fitted in said respective cylinder bores, a first and a second input hydraulic chamber defined on the axially inner side of said respective differential pistons and communicating with respective upstream portions of said first and second hydraulic fluid lines, a first and a second output hydraulic chamber defined on the axially outer side of said respective differential pistons and communicating with respective downstream portions of said first and second hydraulic fluid lines, said differential pistons each having one end face exposed to the adjacent input hydraulic chamber and the other end face exposed to the adjacent output hydraulic chamber and larger in area than said one end face, a fluid control valve provided for fluid communication between each of said input hydraulic chambers and the adjacent output hydraulic chamber, means secured to said casing for opening each said fluid control valve upon axial movement to the outermost position of the associated differential piston and to close said valve upon axially inward movement thereof, a balance piston slidably fitted at the opposite ends in said first and second input hydraulic chambers and slidable from a neutral position under a pressure differential occurring between said input hydraulic chambers, and a switch unit operable in response to the sliding movement of said balance piston from the neutral position to actuate an external alarm.

3,970,348
ELECTRICAL CONTROL SYSTEM FOR PNEUMATIC BRAKES

Arthur Maskery, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Filed Feb. 10, 1975, Ser. No. 548,801

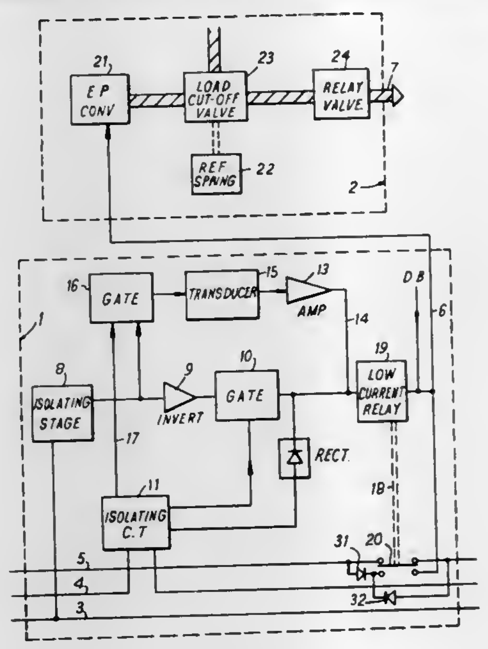
Claims priority, application United Kingdom, Feb. 14, 1974, 6811/74

Int. Cl.² B60T *8/20*

U.S. Cl. 303—22 R **10 Claims**

1. Brake control apparatus for a vehicle braking system which generates a brake control signal for controlling the vehicle brakes, said apparatus comprising a control signal input, an a.c. signal input, gating means responsive to a variable mark to space ratio signal when applied at the control

signal input for gating portions of an a.c. signal when such an a.c. signal is supplied at the said a.c. input and means responsive to the output of the gating means for controlling the magnitude of the brake control signal in dependence upon said mark to space ratio.



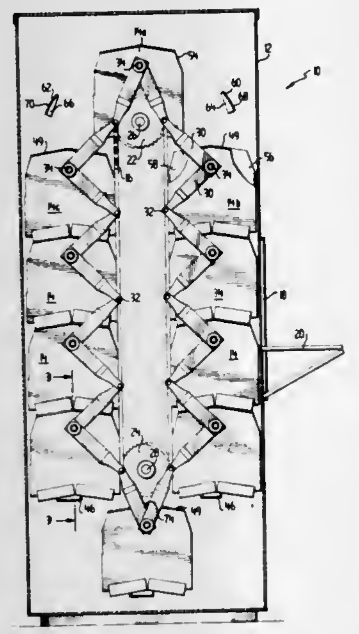
3,970,349
GRAVITY STABILIZED INTERNESTING CARRIER SYSTEM FOR MECHANIZED FILING AND STORAGE CABINETS

Algis R. Banys, Reno, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 466,823, May 3, 1974, abandoned. This application June 30, 1975, Ser. No. 591,855

Int. Cl.² A47B *49/00*

U.S. Cl. 312—268 **20 Claims**



1. An interesting carrier pan assembly comprising:
a plurality of carrier pans for holding and storing items;
an endless conveyor, said endless conveyor comprising a flexible endless member riding on, and extending between, at least two wheels, and suspension arms for suspending said carrier pans from said flexible endless member but for allowing said carrier pans freedom of rotation about suspension points, said flexible endless member and said suspension arms holding each of said carrier pans in contact with an adjacent carrier pan while transporting it along a straight, substantially vertical path but holding each of said carrier pans out of contact with adjacent carrier pans while transporting it along curved paths about said wheels;
wherein each of said carrier pans includes an end member having an upper camming surface on the top side thereof, a lower camming surface, complementary to said upper camming surface, on the lower side thereof, for meshing with said upper camming surface of an adjacent carrier pan when said endless conveyor moves these carrier pans into contact with one another to cause a previously free one of said carrier pans to assume a desired attitude relative to the other of these carrier pans; and,
a stationary camming means for allowing said carrier pans to freely rotate about said suspension points and thereby achieve attitudes as are determined by weight distributions in said carrier pans while said carrier pans are being transported along said curved paths but for contacting said carrier pans toward the end of at least one of said curved paths for correcting the rotational orientations of said carrier pans prior to their making contact with respective adjacent carrier pans by rotating the carrier pans back to acceptable angular positions only if they are tilted beyond predetermined degrees.

3,970,350
MATRIX PIN BOARD

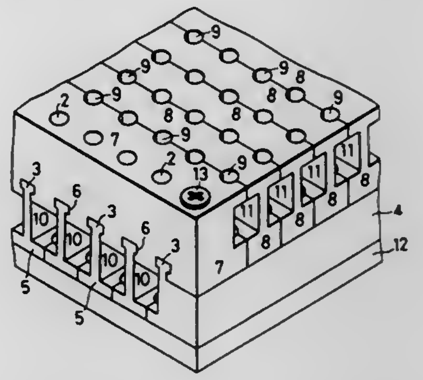
Tooru Takahashi, Yokohama, Japan, assignor to Yamaichi Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,773

Claims priority, application Japan, June 27, 1974, 49-75656

Int. Cl.² H01R *25/02, 9/22*

U.S. Cl. 339—18 P **3 Claims**



1. A matrix pin board comprising a plurality of transversely extending I-shaped elements having a bottom flange slightly wider than the top flange and having a plurality of semicircular recessed spaced at intervals along the edges thereof, said transversely extending I-shaped elements being side by side with the bottom flanges abutting to define holes at the recesses therein, a plurality of longitudinally extending I-shaped elements having a bottom flange slightly thicker than the top flange and each flange having a plurality of semicircular recesses spaced at intervals along the edges thereof, said bottom flange having a plurality of T-shaped transverse recesses therein at spaced intervals therealong, said longitudinally extending I-shaped elements being side by side with the flanges abutting to define longitudinally extending channels therebetween and holes at the recesses therein, and the top flanges on the transversely extending I-shaped elements extending through the T-shaped recesses in the bottom flanges of said longitudinally extending elements, the transversely extending I-shaped elements and the bottom flanges of said longitudinally extending I-shaped elements defining transversely extending channels therebetween, the holes defined by the flanges of said elements being aligned in vertical lines extending through said channels, means for holding said elements in engage relationship, conductor elements extending along said channels having holes therethrough aligned with said vertically aligned holes and individual contact portions adjacent each of said holes, and terminal means electrically connected to each of said conductor elements and extending

to a point outside of said board, whereby pin elements can be inserted into the aligned holes for electrically connecting the conductor element in one transversely extending channel with the conductor element in one of the longitudinally extending channels.

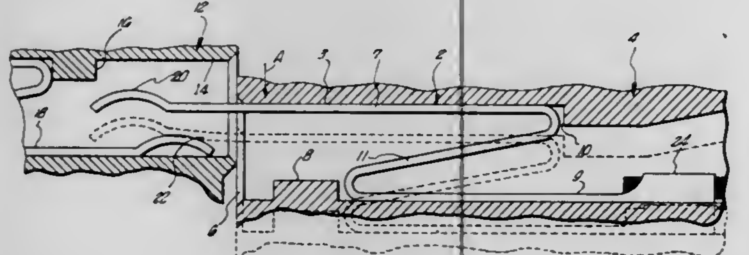
3,970,351
ELECTRICAL CONNECTOR AND CONTACT STRIP THEREFOR

Robert Allen Hollingsead, Yorba Linda, and Clyde Robert Pryor, Anaheim, both of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Sante Fe Springs, Calif.

Filed Dec. 23, 1974, Ser. No. 535,307

Int. Cl.² H01R *25/04*

U.S. Cl. 339—49 R **7 Claims**



1. An electrical connector assembly comprising: a male and female connector body member, each of the body members having a plurality of longitudinally bores therethrough extending from a front face to a rear portion thereof and movable traverse to the axis of their longitudinal bores;

- an identical elastically deformable contact strip of a solid flat conductive material positioned within at least one bore in each of the male and female body members, the contact strip being formed generally in a Z-shape and consisting of a diagonally intermediate section and a pair of parallel leg sections extending in each direction from the diagonal intermediate section, the respective parallel leg sections are connected to the intermediate section by curved bends, and one end of each leg section terminates in a contact portion, the contact strips are contracted during insertion into the respective bores;
- first stop means located within the bores in each male body member to position the contact strip therein with a contact portion of the strip extending beyond the face of the body member and to prevent longitudinal movement of the contact strip in each direction within the bore when the contact strip is in its expanded condition, the respective parallel leg sections extending along opposite surfaces of the male bore with the diagonal intermediate section extending between the parallel leg sections and across the bore; and
- second stop means located within the bores in each female body member to position the contact strip therein so that the leg section extending forward towards the face of the female body member and its contact portion remains within the respective bore and prevents longitudinal movement of the contact strip within the bore when the contact strip is in its expanded condition, the respective parallel leg sections extending along the opposite surfaces of the female bore with the diagonal intermediate section extending between the parallel leg sections and across the bore.

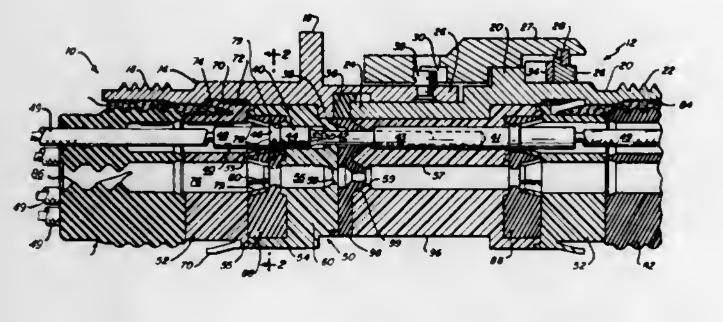
3,970,352
ELECTRICAL CONNECTOR HAVING IMPROVED CONTACT RETENTION SYSTEM

Robert Francis Dorrell, Des Plaines, and Joseph Janatka, La Grange Park, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 291,573, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 885,123, Dec. 15, 1969, abandoned. This application Dec. 9, 1974, Ser. No. 530,619

Int. Cl.² H01R *13/42*

U.S. Cl. 339—59 M **6 Claims**



1. In an electrical connector, in combination, a plurality of parallel conductive contacts, each having a terminal portion, a body portion and an enlarged shoulder between said body portion and said terminal portion; in combination with contact-supporting and isolation means consisting of one dielectric body member comprising a transverse wall of insulation material having a plurality of parallel contact-receiving cavities closely surrounding the body portions of said contacts with risers around each contact extending from the aforesaid dielectric body toward and in a contact positioning relationship with the aforesaid contact shoulder; a second dielectric body member comprising a transverse wall of insulating material having a plurality of parallel contact-receiving cavities surrounding the terminal portions of the individual contacts with risers extending from the said second dielectric body toward and in a contact positioning relationship with the aforesaid contact shoulder; together with a single isolation disc confined between said dielectric body members, each of said risers having an outer periphery, said isolation disc having a plurality of holes therethrough closely surrounding the risers and being disposed in a sealing relationship with at least a portion of the outer periphery of each riser, said isolation disc being imperforate between said holes to provide an effective seal around and between the individual contacts; the risers of at least one of the dielectric body members extending into engagement with said contact shoulders.

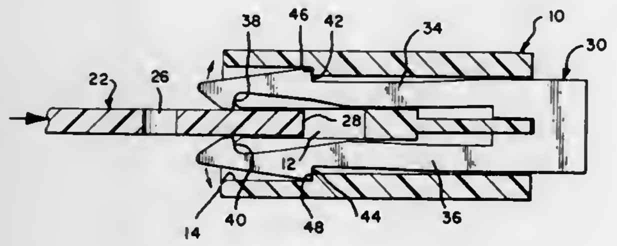
3,970,353
LOCKING CLIP

John Wilson Kaufman, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1974, Ser. No. 501,942

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 MP **2 Claims**



1. In combination with an edge board connector for printed circuit boards and the like, a locking clip substituted for a pair of contacts in said connector to secure a printed circuit board therein, said clip comprising:

- a body portion,
- a pair of spaced cantilever arms extending integrally from one side of said body portion, said arms having a normally diverging configuration outside said connector and being biased to a substantially parallel configuration inside said connector,
- a tine on the free end of each said arm directed inwardly towards the other of said arms, each said tine having an inclined surface directed toward the free end of said arms and a sharp shoulder directed toward said body;
- a locking shoulder projecting outwardly from each said arm intermediate the ends thereof, said shoulders engaging said connector to bias said arms to their parallel configuration and providing a fulcrum about which said arms pivot when a board is inserted therebetween, whereby said tines are biased for insertion into apertures in said printed circuit board to lock the board therein.

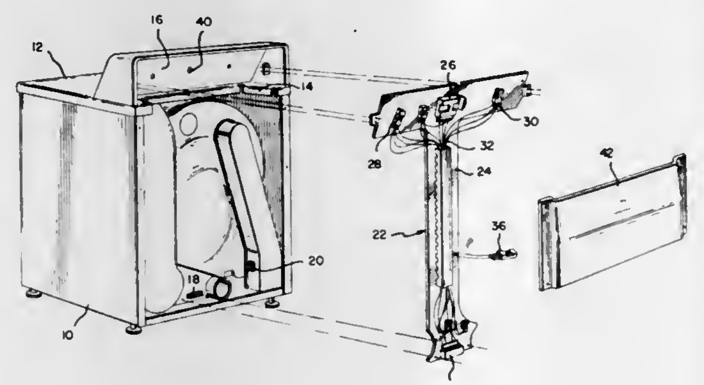
3,970,354
INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE FOR WIRING COMPONENTS INTO AN ELECTRICAL APPARATUS

John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1974, Ser. No. 520,399

Int. Cl.² H01R *3/00*

U.S. Cl. 339—113 R **7 Claims**



1. In a wiring system, means to provide a positive indication of the full mating of a connector member with an associated component member comprising:

- fixed indicia means on at least one of said members, said fixed indicia means interacting with the other of said members to provide a physical and visible indication only upon full and complete mating of said members.

7. A method to provide a positive indication of the full mating of a connector member with an associated component member comprising:

- providing fixed indicia means on at least one of said members, which indicia means interacts with the other of said members to provide a physical and visible indication only upon full and complete mating of said members.

3,970,355
COAXIAL CABLE FITTING

Franz Pitschi, Rottach-Egern, Germany, assignor to Spinner GmbH, Elektrotechnische Fabrik, Munich, Germany

Filed May 10, 1974, Ser. No. 468,921

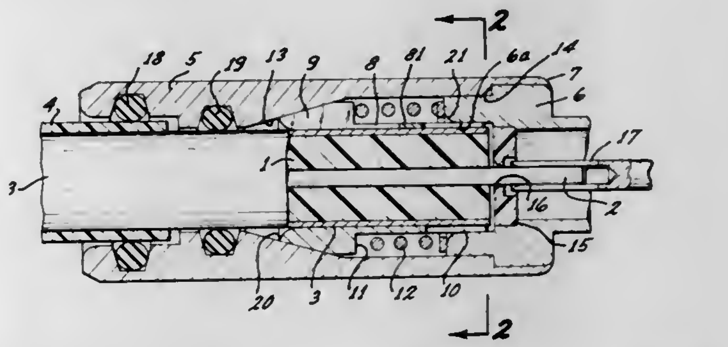
Claims priority, application Germany, May 15, 1973, 2324552

Int. Cl.² H01R *17/18*

U.S. Cl. 339—177 R **20 Claims**

1. Hf cable fitting for connection to the end of a coaxial cable;

- a sleeve member for slipping onto and over the end of a cable in axial direction and including an internal control surface;
- clamping means disposed in the sleeve member for axial movement therein and cooperating with said control surface to contract radially inwardly as a radially inwardly acting clamp when in axial forward positions, while permitting radial outward spreading when moved from the forward positions in a particular axial direction colinear with the axial direction of insertion of a cable in the sleeve;
- resilient means acting axially on the clamping means and causing the clamping means to assume one of said forward positions;



the clamping means constructed for engagement with the periphery of an axially inserted cable thereby causing the clamping means to be moved from the forward positions against the bias of the resilient means, upon cessation of the insertion of the cable the resilient means moving the clamping means back into one of the forward positions and holding it in one of the forward positions, whereby engagement of the clamping means with said control surface provides for the radially inwardly directed clamping action against and of the insert cable, the resilient means providing clamping force for obtaining said clamping action; and connecting means in the sleeve member to make contact with an exposed peripheral portion of said cable.

3,970,356
SOCKET FOR BUSBARS

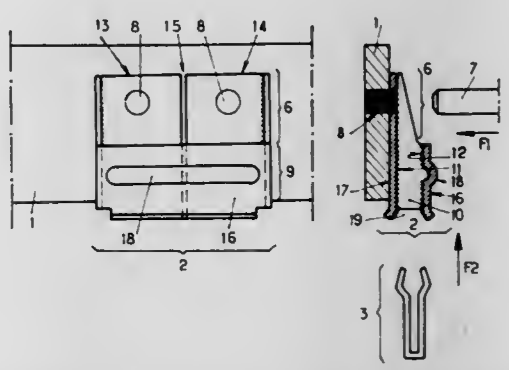
Jean Joly, Houilles, France, assignor to La Telemecanique Electrique, France

Filed Mar. 17, 1975, Ser. No. 559,359

Claims priority, application France, Apr. 22, 1974, 74.13917

Int. Cl.² H01R *13/06*

U.S. Cl. 339—252 P **10 Claims**



1. A socket, for securing in electrical connection on an aluminium busbar and adapted to receive in electrical connection a copper-faced plug, comprising a metal sheet constituted by a layer of aluminium bonded integrally with a layer of copper such that a first major face of the sheet is aluminium and a second major face of the sheet is copper, said sheet being bent along a number of fold lines so as to provide a first major wall, a second major wall opposite to and spaced transversely from the first major wall, and transverse walls extending between the first and second major walls, the respective surfaces of the first and second major walls which face each

other being those of the copper layer and the respective surfaces which lie at the exterior of the socket being those of the aluminium layer, the opposed portions of the first and second major walls forming a copper-surfaced sheath defining a direction of entry and withdrawal for a copper-faced plug, and the first major wall having a zone accessible for application of a spot-welding electrode to weld said zone, in aluminium-to-aluminium contact, to a busbar.

3,970,357
APPARATUS FOR HOLOGRAPHIC RECORDING

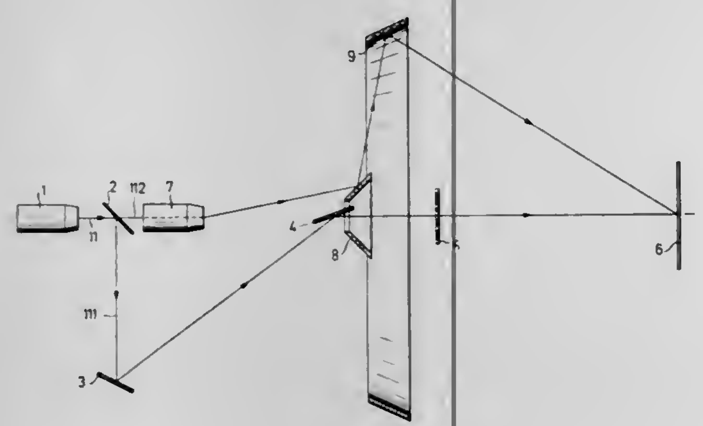
Roland Moraw; Günther Schädlich, both of Naurod, and Klaus Horn, Hochst, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 31, 1974, Ser. No. 519,585

Claims priority, application Germany, Nov. 5, 1973, 2355136

Int. Cl.^{2} G03H *1/28*

U.S. Cl. 350—3.5 **18 Claims**



1. Apparatus for recording a plurality of holographic images upon the same region of a recording medium comprising:
  - a. a coherent radiant energy source,
  - b. means for directing a radiation beam from said source along an optical axis of said apparatus,
  - c. beam splitting means positioned on said optical axis for producing a reference beam along said optical axis and a mutually coherent object beam off of said optical axis,
  - d. deflection means positioned on said optical axis for receiving said reference beam from said beam splitting means, and for deflecting said reference beam in a direction divergent with respect to said optical axis,
  - e. first reflecting means having a longitudinal symmetry axis substantially coincident with said optical axis and having an outer reflecting surface for reflecting said reference beam from said deflection means in a direction divergent with respect to said optical axis,
  - f. second reflecting means having an inner reflecting surface for reflecting said reference beam from said first reflecting means in a direction convergent with respect to said optical axis, said reference beam thereby impinging on said recording medium,
  - g. means for reflecting said object beam from an off-axis direction to a direction substantially along said optical axis and extending beyond said first and second reflecting means to an object to be recorded, whereby said object beam is altered by said object and said altered object beam and said reference beam interfere at the same region of said recording medium.

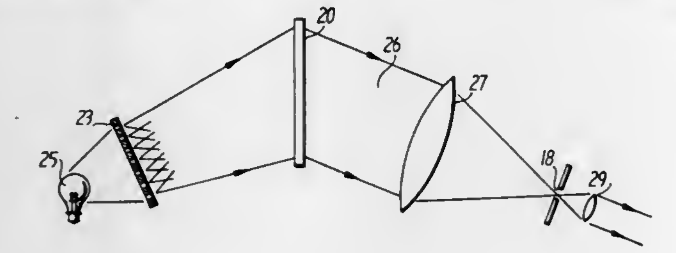
3,970,358
COHERENT, QUASI-MONOCHROMATIC LIGHT SOURCE

Adam Kozma, Ann Arbor, Mich., assignor to Harris Corporation, Cleveland, Ohio

Filed Jan. 20, 1975, Ser. No. 542,185

Int. Cl.^{2} G02B *5/32*

U.S. Cl. 350—3.5 **5 Claims**



1. A method of converting a broad light source into a spatially coherent, quasi-monochromatic light source, which comprises

recording a hologram in a thick recording medium as fringe planes of the interference pattern of a signal beam and a reference beam obtained from a coherent monochromatic light source, with an otherwise opaque matrix of pinholes disposed in the path of the wavefront of one of said signal and reference beams, and

reading out the hologram with a reconstructing beam obtained from a polychromatic incoherent light source and incident on the hologram at an angle substantially equal to the angle of incidence of one of said signal and reference beams, to form a spatially coherent, quasi-monochromatic wavefront emanating from the hologram and wherein a matrix of pinholes corresponding to said otherwise opaque matrix of pinholes is disposed in the path of the wave front of said reconstructing beam.

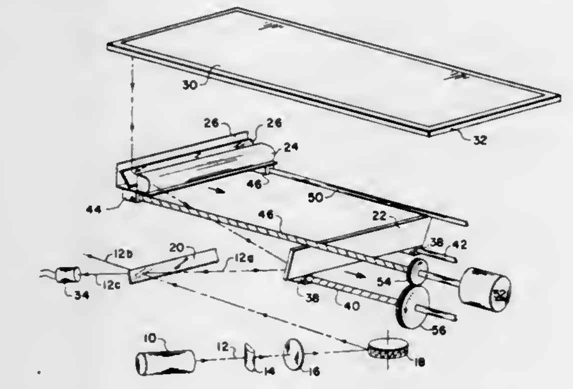
3,970,359
FLYING SPOT FLAT FIELD SCANNER

Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,477

Int. Cl.^{2} G02B *27/17;* **G03G** *15/28;* **G03B** *27/70;* **H04N** *3/00*

U.S. Cl. 350—7 **1 Claim**



1. A flying spot scanning system comprising: a laser generating a beam of collimated light; a generally planar document station; a first mirror; a second mirror; a beam splitter; optical means for imaging said beam to said document station; a rotatable polygon scanner located between said laser and said beam splitter and in the path of said beam for scanning said beam onto said beam splitter said beam splitter reflecting said beam to said first mirror; said first mirror reflecting said beam to said second mirror; said second mirror reflecting said beam to said document station; means for detecting reflections of said beam from said document station; said second mirror directing said beam to said document station at an angle to receive reflection of said beam from said document and direct the same to said first mirror which directs the same to said beam splitter whereby a portion thereof passes therethrough; said detecting means being positioned to detect the beam reflections passing through said beam splitter; said optical means including a cylinder lens, the power plane of which is substantially parallel to the axis of polygon rotation; said cylinder lens being located between said first and second mirrors, each of said mirrors and said cylinder lens extending across said document station in the direction of beam scan whereby the beam will be scanned across said document station in an *x* direction; means mounting said first and second mirrors and said cylinder lens for movement in *y* direction transverse to said *x* direction; means for moving said second mirror and said cylinder lens as a unit in said *y* direction across substantially the full length of said document station and for simultaneously moving said first mirror in the same direction as said second mirror and cylinder lens are moved a distance substantially less than the distance said second mirror and said cylinder lens are moved; the relative distance of and the relative rate of movement of said mirrors and cylinder lens being such to maintain the length of said beam between said laser and said document station and the optical conjugates substantially constant.

3,970,360
WAVE-GUIDE STRUCTURE WITH A MULTI-LAYER SYSTEM AND METHODS FOR PRODUCING SAME

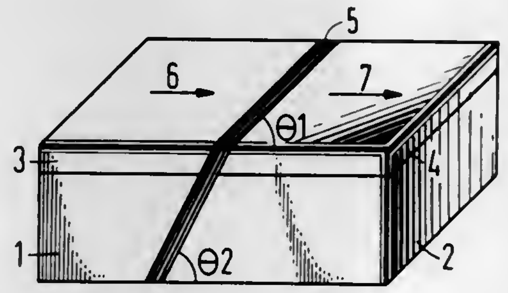
Ralf Kersten; Hans Mahlein, and Rudolf Oberbacher, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 17, 1975, Ser. No. 569,305

Claims priority, application Germany, Apr. 19, 1974, 2418994

Int. Cl.^{2} G02B *5/14, 5/20, 5/30*

U.S. Cl. 350—96 WG **9 Claims**



1. A wave-guide structure for use in optical communications comprising a substrate of a given index of refraction, a wave-guide layer having lateral edges and a different index of refraction disposed on a surface of the substrate, and a multi-layer system extending through the wave-guide layer between the lateral edges to separate the wave-guide layer into two wave-guide portions which are integral with the multi-layer system and in planar alignment with each other, said multi-layer system comprising a plurality of layers with different indexes of refraction, said multi-layer system extending at an angle to a surface of the wave-guide layer and at an angle to the lateral edges with at least one of the angles being an oblique angle so that radiation transported in one of the wave-guide portions has an angle of incidence with the multi-layer system.

3,970,361
THREE-DIMENSIONAL DISPLAY SYSTEM

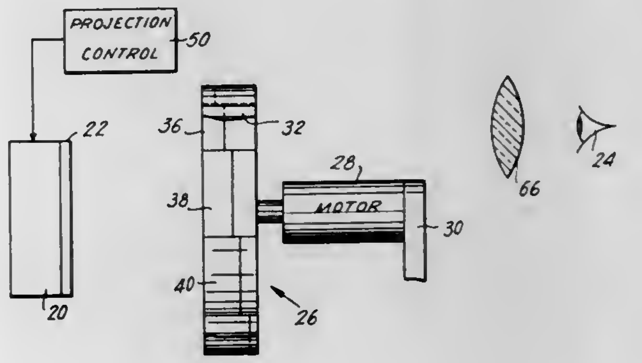
Paul L. Di Matteo, Huntington; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,146

Int. Cl.^{2} G02B *27/22*

U.S. Cl. 350—144 **17 Claims**

1. A three-dimensional display arrangement comprising, in combination, a display screen for displaying an image thereon; transparent means of varying thickness movable continuously at substantially high speed past said display screen along a predetermined path, said transparent means having varying thickness along said path for varying the refraction of light from said display screen so that the image displayed on the screen will appear at varying depths to a viewer; means for moving said transparent means continuously past said display screen at a speed exceeding a predetermined magnitude related to the visual persistence of the human eye so that said viewer observing said image displayed on the screen perceives said image to be in motion on the screen due to varying the refraction of light from said screen by movement of said transparent means, the perception of said viewer that said image is in motion being dependent on moving said transparent means continuously at relatively high speed, the optical path between said display screen and said viewer being free of reflections, said light from said display screen passing unfocused through said transparent means, said viewer perceiving said image to be in motion only by the refraction of said light from said display screen, the refracted light being substantially free of reflections.



3,970,362
PROCESS OF PRODUCING POLARIZING OPTICAL DEVICES AND PRODUCT THEREOF

Norman U. Laliberte, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 219,847, Jan. 21, 1972, abandoned, which is a division of Ser. No. 35,132, May 6, 1970, Pat. No. 3,674,587. This application July 3, 1974, Ser. No. 485,398

Int. Cl.^{2} G02B *1/08, 1/04;* **G02C** *7/12*

U.S. Cl. 350—155 **6 Claims**

1. A polarizing ophthalmic quality lens blank casting comprising:

a convex-concave polarizing film;

adhesive coatings on both sides of said film; and,

a continuous mass of optically clear thermoset resin, at least one component of which is of the class of allyl diglycol carbonates, cast in situ in contact with said adhesive coatings and forming a first layer adjacent the concave side of said film and a second layer adjacent the convex side of said film, said second layer being of a substantially uniform thickness in the range of one-fourth to one and one-half millimeters, said second layer being thinner than said first layer whereby said polarizing film is dispersed more closely adjacent the light entering convex side of said casting, said first and second layers being integrally formed and connected to each other.

3,970,363
LIQUID CRYSTAL CELL FOR A LIQUID CRYSTAL DISPLAY SCREEN

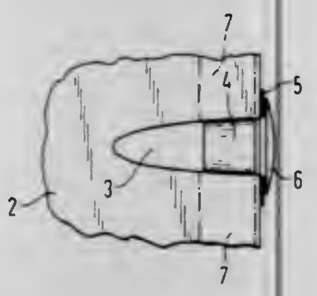
Hans Geyer, Baldham; Christoph Rotter, and Wolfgang Welsch, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 16, 1974, Ser. No. 497,878

Claims priority, application Germany, Aug. 20, 1973, 2342022

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **6 Claims**



1. In a liquid crystal cell for use as a display screen for a liquid crystal display device, said cell having a chamber containing a liquid crystal layer, said chamber being formed by facing parallel surfaces of a pair of carrier plates which surfaces are each provided with an electrode pattern thereon and are spaced by means forming a frame which means is hermetically sealed to the edges of each of the plates to hermetically seal the chamber from an exterior of the cell, each of the plates being of an electrical insulating material and at least one plate being transparent, and the cell having at least one closable access means foe enabling communication with the chamber from the exterior of the cell, the improvement comprising each of the closable access means comprising a passage extending between the interior of the chamber and the exterior of the cell, said passage comprising a groove on one of said facing surfaces of one of said pair of plates, said groove extending inwardly from an edge of the plate into the interior of the chamber and having a depth decreasing as the distance from the edge increases so that the groove terminates at a point spaced inward of the frame means, a plug formed of a ductile metal sealingly disposed in the passage, and a sealing coating covering the plug and a portion of the exterior of the cell surrounding the passage.

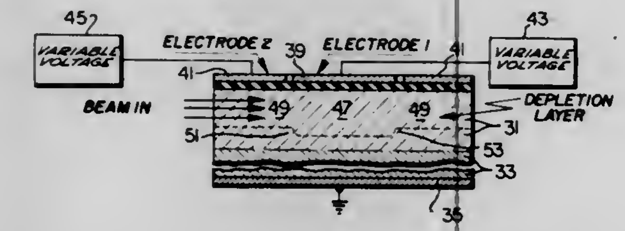
3,970,364
DEPLETION LAYER LASER BEAM MODULATOR AND DEFLECTOR

Robert Gerson, and Robert J. Bell, both of Rolla, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Aug. 20, 1974, Ser. No. 498,840

Int. Cl.² G02B *5/04, 5/14;* **H01L** *29/78*

U.S. Cl. 350—160 R **7 Claims**



4. Apparatus for deflecting a beam of radiation in a semiconductor device having a body of semiconductor material, conductive means being provided over said body but being seperated therefrom by insulating means, comprising:

a semiconductor device having a body of semiconductor material, conductive means being provided over said body but being separated therefrom by insulating means,

means for applying a first electric potential between said semiconductor body and a first portion of said conductive means to establish in the semiconductor body adjacent said first portion a first surface depletion layer of a first thickness,

means for applying a second electric potential between said semiconductor body and a second portion of said conductive means to establish in the semiconductor body adjacent said second portion a second surface depletion layer of a second thickness, said first and second portion being adjacent so that said second surface depletion layer is immediately adjecent said first surface depletion layer and forms a junction therewith, the difference in thickness between the first surface depletion layer and the second surface depletion layer resulting in a thickness discontinuity at the junction; and

means for coupling the beam of radiation directly into the first surface depletion layer of the semiconductor device, the radiation beam traveling through the first surface depletion layer at an oblique angle with respect to the junction of the first surface depletion layer and the second surface depletion layer to deflect the incident radiation beam in the second surface depletion layer relative to the direction of travel of the radiation beam in the first surface depletion layer, the relative thickness discontinuity determining the angle at which the radiation beam is deflected at the junction.

3,970,365
ADDITIVES THAT INCREASE THE STABILITY OF ELECTROCHROMIC FILMS IN ELECTROCHROMIC DEVICES

Robert Domenico Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,170

Int. Cl.² G02F *1/36*

U.S. Cl. 350—160 R **10 Claims**

1. A variable light transmission device which comprises a persistent electrochromic material as a light modulating material, a counter-electrode, and an electrolyte material in contact with said material and counter-electrode, said electrolyte containing as an additive a sulfate of a cation having an atomic weight between about 45 and 65.

3,970,366
HIGHLY VARIABLE MAGNIFICATION ZOOM LENS SYSTEM HAVING A DIAPHRAGM WITH ITS APERTURES DIAMETER VARIED IN RELATION WITH ZOOMING

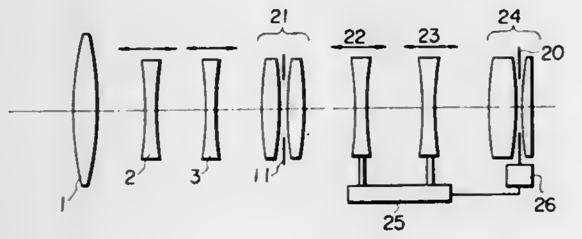
Takeshi Sekiguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 453,050

Claims priority, application Japan, Mar. 23, 1973, 48-33310

Int. Cl.² G02B *15/14*

U.S. Cl. 350—184 **6 Claims**



1. A highly variable magnification zoom lens system having a diaphragm with its aperture diameter varied in relation to zooming comprising;

a front zoom part and a rear zoom part arranged consecutively in order, said front zoom part containing a lens group for focusing an object and a plurality of movable lens groups, said rear zoom part containing a fixed lens group, a plurality of movable lens groups and a fixed imaging lens group disposed at an image plane side spaced from said movable group;

an aperture setting means interposed between the rearmost movable lens group of said front zoom part and the frontmost movable lens group of said rear zoom part for determining relative aperture of the total zoom lens system;

a shifting means for displacing each of the movable lens groups of said rear zoom part along the optical axis; and

a shielding means disposed at an image plane side spaced from the movable lens groups of said rear zoom part and being actuated by said shifting means independently of said aperture setting means, the aperture size of said shielding means becomes smaller as the focal distance of the total lens becomes longer.

3,970,367
ZOOM LENS SYSTEM

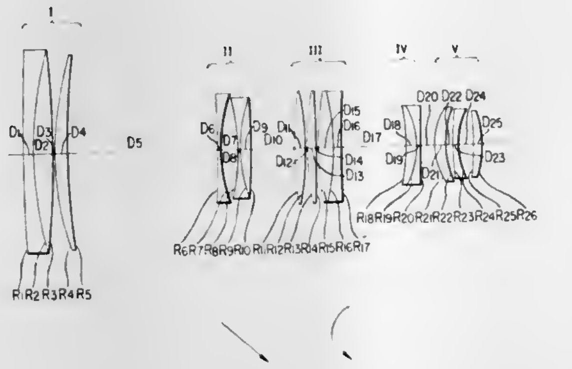
Sadahiko Tsuji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 372,000, June 21, 1973. This application Jan. 23, 1975, Ser. No. 543,276

Claims priority, application Japan, July 20, 1972, 47-12514

Int. Cl.² G02B *15/16, 15/18*

U.S. Cl. 350—184 **4 Claims**



1. An optical objective of the zoom type comprising five lens groups of which the first, third, and fifth groups are convergent, the second group is divergent, and the fourth group is a divergent doublet consisting of convergent and divergent elements cemented together, the cemented contact surface being concave toward the front, in which the second group is axially movable to effect magnification variation, and the third group is axially movable forward and then rearward when zooming the second group from one extreme focal length range to the other, said zoom lens system being characterized by the following simultaneously applied relationships:

(1) $0.6\, f_w < -f_2 < 0.8\, f_w$;

$$0.8\left(-f_2 + \frac{\sqrt{1/M}}{1+\sqrt{1/M}}\, e_{23}\right) < f_3 \leqq \left(f_2 + \frac{\sqrt{1/M}}{1+\sqrt{1/M}}\, e_{23}\right) \qquad 2.$$

(3); the Abbe number of the concave lens of the fourth group being larger than that of the convex lens of the fourth group.

(4) $0.01 < N_{4\,concave} - N_{4\,convex} < 0.08$;

(5) $0.3\, f_w < -R_{4H} < 0.4\, f_w$

where f_w is the shortest focal length; f_T is the longest focal length; M is the magnification ratio f_T/f_w; f_i is the focal length of the i^{th} lens group; e_{23} is the minimum principal point interval between the second and third groups; R_{4H} is the radius of curvature of the cemented contact surface in the fourth group; $N_{4\,convex}$ is the refractive index for the *d* line of the spectrum of concave lens in the fourth group; and $N_{4\,concave}$ is the refractive index for the *d* line of the spectrum of the concave lens in the fourth group; wherein the overall focal distance from the first group to the third group is a positive value and shorter than the focal distance of the entire system, wherein the overall focal distance between the fourth group and the fifth group is a negative value, and wherein a telephoto type optical system is formed with the whole groups.

3,970,368
OPTICAL ZOOMING LENS

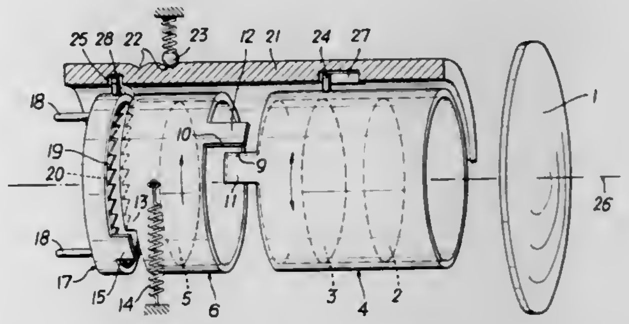
Peter Revy Von Belvárd, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed June 3, 1974, Ser. No. 475,941

Claims priority, application Austria, June 14, 1973, 5262/73

Int. Cl.² G02B *15/00*

U.S. Cl. 350—187 **11 Claims**



1. A varifocal optical system focusable at different object distances, comprising:

first and second lens means movable independently of each other along a common optical axis;

zooming means including a first control member coupled with said first lens means via camming formations effective in one part of a range of displacement of said first control member for axially moving said first lens means to vary the focal length of the system, said camming formations being ineffectual in another part of said range;

focusing means including a second control member coupled with said second lens means for axially moving same to shift the focal plane of the system between a normal-range position and a close-up position;

operating means for displacing said first control member; and

deactivable coupling means effective in said other part of said range fcr releasably interconnecting said control members to facilitate axial movement of said second lens means without said first lens means by said operating means.

3,970,369
CORRECTIVE MAKEUP AND EMPLOYING PRESCRIPTION LENSES

Phyllis Wachsman, 400 Rugby Road, Brooklyn, N.Y. 11226

Filed Feb. 26, 1975, Ser. No. 553,256

Int. Cl.² G02B *17/00, 7/02*

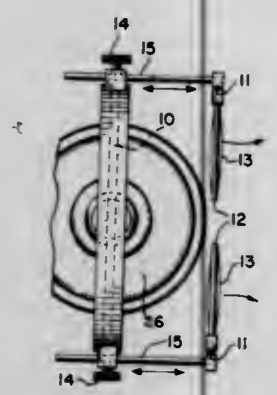
U.S. Cl. 350—202 **9 Claims**

1. A makeup mirror assembly adapted for use by an individual having a visual handicap, which handicap can be corrected by means of corrective lenses or the like, comprising:

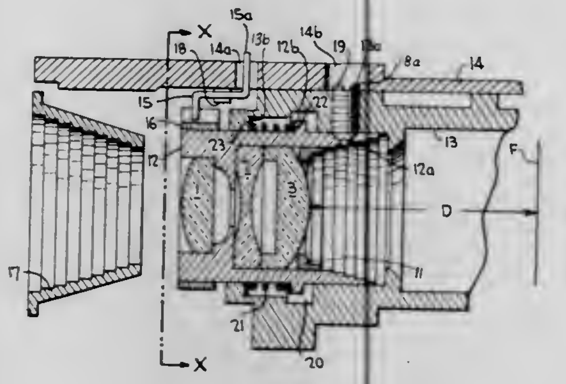
a. a mirror having a reflecting surface,

b. a first and second corrective lens assembly positioned in front of said reflecting surface, one at a right side and one at a left side, each of said first and second lens being pivotally mounted at a distance in front of said mirror to enable a user to view an image reflected from said surface with minimum distortion, and

c. adjustable means for coupling said first and second lens assembly to such mirror for adjusting said distance in front of said mirror at a predetermined distance selected in accordance with the vision of said user.

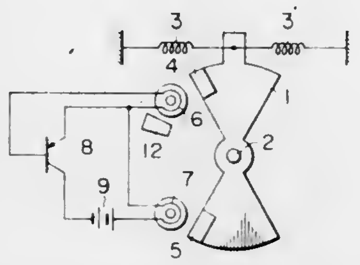


3,970,370
LENS BARREL FOR PHOTOGRAPHIC CAMERAS
Susumu Kawai, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan
Filed Aug. 6, 1975, Ser. No. 602,252
Claims priority, application Japan, Aug. 12, 1974, 49-96803[U]
Int. Cl.² G02B *7/04*
U.S. Cl. 350—255 **10 Claims**



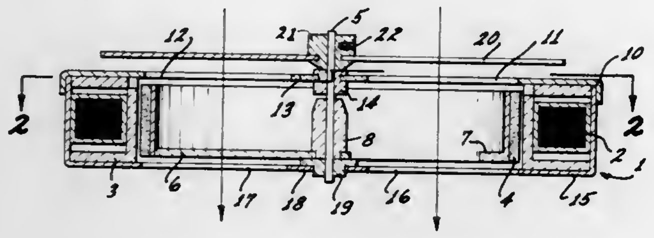
1. A lens barrel for a camera comprising: an objective lens unit;
- an outer sleeve adapted to be mounted on a camera;
- an inner sleeve integrally coupled with said objective lens unit and movably mounted within said outer sleeve;
- helical cam means provided at one end portion of said inner sleeve and assisting in adjusting the focus of said objective lens unit;
- a screw threadably fitted within said outer sleeve and having an end portion engageable with said helical cam means;
- biasing means for urging said inner sleeve so as to cause said helical cam means to engage said end portion of said screw, said inner sleeve being moved in an axial direction relative to said outer sleeve through the engagement between said end portion of said screw and said helical cam means when said screw is screwed inwardly; and
- manually operable means for rotating said inner sleeve relative to said outer sleeve, said inner sleeve, when rotated, being shifted relative to said outer sleeve in the axial direction for focus adjustment through the engagement between said end portion of said screw and said helical cam means.

3,970,371
APPARATUS FOR CHOPPING LIGHT BEAM
Yataro Kaiwa, Tokyo, and Hiroshi Saito, Hasuda, both of Japan, assignors to Japan Servo Co., Ltd., Tokyo, Japan
Filed Mar. 15, 1974, Ser. No. 451,683
Claims priority, application Japan, Mar. 16, 1973, 48-30067
Int. Cl.² G05D *25/00*
U.S. Cl. 350—273 **3 Claims**



1. A light beam intercepting apparatus which comprises a casing containing at least one transparent window for the passage of a light beam therethrough, a disk-shaped vibrating body rotatably disposed within said casing, said disk-shaped body having a partially cut-away portion, two magnets located at different portions of said disk-shaped body, a detection coil and an excitation coil disposed in the inner wall of the casing at locations opposite to said two magnets, respectively, a transistor circuit having said detection coil and excitation coil in its base side and collector side, respectively, for supplying said rotating, vibration force to said disk-shaped body, spring means attached to said disk-shaped body and to the casing to provide a repeating rotational cycle to the disk-shaped body, said light beam passing through the transparent window being repeatedly intercepted by the repeating cycle of said disk-shaped body, and an additional magnet for controlling the amplitude of the rotating vibration of the disk-shaped vibrating body to a constant value, said additional magnet being disposed on the inner wall of the casing in close proximity to the detection coil, thereby causing the light beam to be turned on and off based on said cycle.

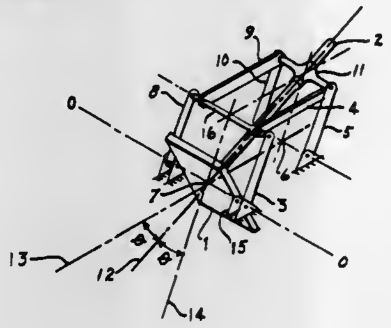
3,970,372
MOTOR DRIVEN LIGHT CHOPPER
Kurt Moldenhauer, Frankfurt am Main, and Heinrich Stolz, Muhlheim am Main, both of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 15, 1975, Ser. No. 541,135
Claims priority, application Germany, Jan. 22, 1974, 2402865
Int. Cl.² G05D *25/00*
U.S. Cl. 350—274 **3 Claims**



1. A motor-driven light chopper comprising:
- a flat motor casing with top and bottom end faces, each having at least one window, the windows being axially aligned and having axially aligned means for journalling a shaft;
- the shaft being journalled in said casing, but projecting from said casing;
- a light chopping diaphragm disposed outside of said casing and mounted on said shaft where projecting from said casing;

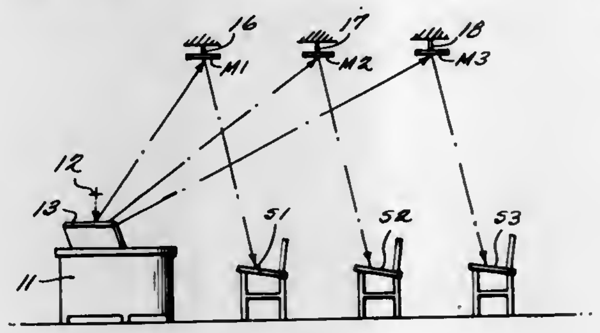
- an annular stator construction in said casing;
- an annular rotor in said casing having a central opening to permit passage of light as passing through said aligned windows; and
- having disposition to be shaded by the diaphragm at least one spoke element traversing said central opening for connecting said shaft to said annular rotor.

3,970,373
MIRROR STEERING SYSTEM
Richard Payne Pledger, Fort Worth, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 6, 1975, Ser. No. 547,855
Int. Cl.² G02B *27/17*
U.S. Cl. 350—285 **1 Claim**



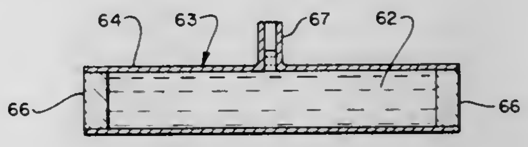
1. A mechanical mirror steering system comprising: a base; a first pair of trunnion bearings mounted on the base; a mirror pivotally mounted about an axis passing through said first trunnion bearings; steering rod means connected to the mirror for moving the mirror and extending in a direction normal thereto, along an axis intersecting the first trunnion axis; a second pair of trunnion bearings mounted on the base in a spaced parallel relationship to said first trunnion bearings; a first and second pair of links, pivotally attached to said first and second trunnion bearings, for movement in parallel planes; a third pair of links each pivotally connecting a first and second link in a common plane whereby said links and base form a pair of rhombic parallelograms in separate parallel planes; a first means for connecting the links in the parallel planes at a pivot point; a second means for connecting the parallel planes at a pivot point including, a slider bearing adapted to receive said steering rod means and thereby cause the mirror to move only within the range allowed by the pivotally connected links.

3,970,374
OPTICAL VISUAL COMMUNICATION SYSTEM
John C. Copp, P.O. Box 167, Strasburg, Va. 22657
Continuation-in-part of Ser. No. 446,508, Feb. 27, 1974, abandoned. This application May 15, 1975, Ser. No. 577,838
Int. Cl.² G02B *5/08;* **G09B** *1/00*
U.S. Cl. 350—301 **13 Claims**



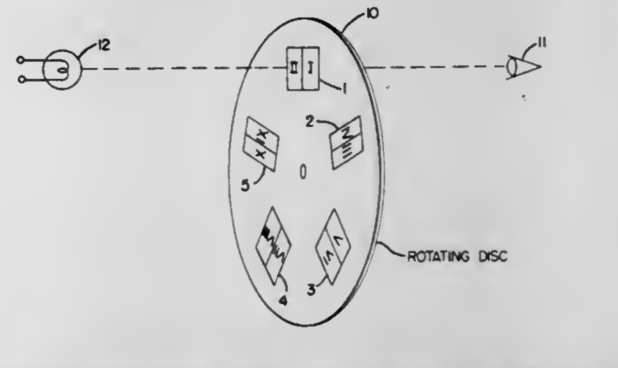
1. An optical system for use in a classroom having an instructor's desk and a plurality of student desks for providing visual communication between an instructor and a plurality of students comprising a plurality of first plane mirrors, mounting means for mounting each f said first plane mirros physically above one of the student desks, a second plane mirror, mounting means for mounting said second plane mirror in visual alignment with the position of an instructor at the instructor's desk, each of said first plane mirrors being oriented in a predetermined plane for reflecting a visual image of activity at its associated student desk to said second plane mirror, said second plane mirror being oriented to reflect the plurality of images of activity at the student desks into the visual field of and instructor at the instructor's desk.

3,970,375
LIGHT EQUALIZER
Henry H. Blau, Jr., Wayland, and Paul L. Kebabian, Somerville, both of Mass., assignors to Environmental Research & Technology, Inc., Concord, Mass.
Division of Ser. No. 458,124, April 5, 1974, Pat. No. 3,887,262. This application Dec. 9, 1974, Ser. No. 530,695
Int. Cl.² G02B *5/24, 5/14*
U.S. Cl. 350—312 **1 Claim**



1. A light equalizer for providing substantially uniform distribution of light within a spectral region of interest across an output aperture, said equalizer having
- an enclosure having opposite ends transparent to said light,
  - a body of fluid disposed in said enclosure and being transparent to said light,
- a plurality of minute particles distributed in said fluid and being transparent to said light, said particles and said fluid having different indices of refraction with respect to said light within said spectral region; and
- internally wholly reflective means disposed about the entire exterior of said enclosure except for said opposite ends.

3,970,376
DEVICE FOR TESTING COLOR VISION
Hanne-Lore Ledl, Munich, Germany, assignor to Optische Werke G. Rodenstock, Germany
Filed July 11, 1974, Ser. No. 487,758
Claims priority, application Germany, July 14, 1973, 2335909
Int. Cl.² A61B *3/06*
U.S. Cl. 351—35 **8 Claims**



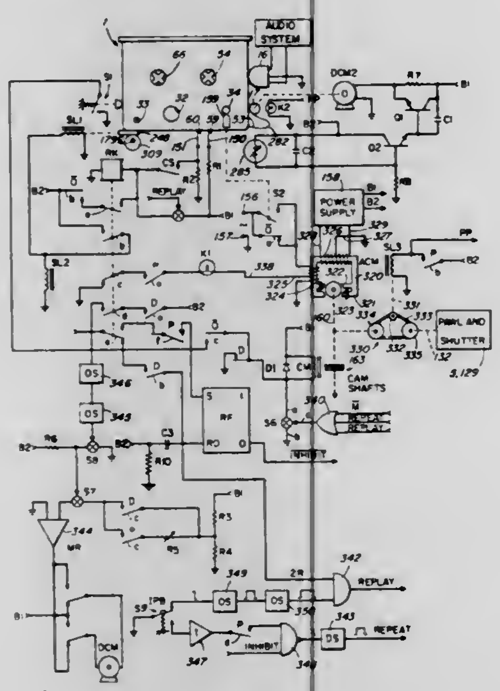
1. In an instrument for testing color vision in which a plurality of pairs of test panels of different colors are presented to a subject to be examined and are illuminated by a light source having a color temperature of about 2400°K, the improvement wherein said pairs of test panels comprise:
- a first pair of panels, a first of which has maximum emission values at wavelengths of 4100 A and 6800 A and a second of which has maximum emission values at 4400 A and 6800 A;
- a second pair of panels, a first of which has maximum emission values at 4400 A and 6800 A and a second of which has a more intense emission in the red range at 6700 A

as compared to the first panel of said second pair and has approximately the same maximum emission values as the first panel of the second pair; and
a third pair of test panels, a first of which has maximum emission values at 4100 A and 5800 A and a second of which has a maximum emission at 5000 A.

6. In a method of testing color vision of a subject to be examined wherein test panels of different colors are presented to the subject and are illuminated by a light source having a color temperature of about 2400°K, the improvement comprising the steps of:
- a. sequentially presenting to the subject plural pairs of test panels respectively including
  - a first pair of panels, a first of which has maximum emission values at wavelengths of 4100 A and 6800 A and a second of which has maximum emission values at 4400 A and 6800 A;
  - a second pair of panels, a first of which has maximum emission values at 4400 A and 6800 A and a second of which has a more intense emission in the red range at 6700 A as compared to the first panel of said second pair and has approximately the same maximum emission values as the first panel of the second pair;
  - a third pair of test panels, a first of which has maximum emission values at 4100 A and 5800 A and a second of which has a maximum emission at 5000 A;
- b. evaluating the degree of an existing anomaly in the color vision of the subject in accordance with the response of the subject to the respective sequential viewing presentation of said pairs of panels.

3,970,377
SOUND MOTION PICTURE PROCESSING AND PROJECTION SYSTEM

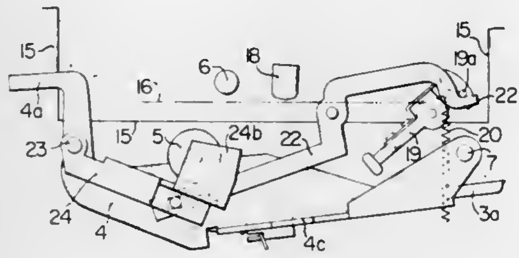
Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 374,639, June 28, 1973, Pat. No. 3,893,756. This application Dec. 12, 1974, Ser. No. 531,871
Int. Cl.² G03B ***31/02***
U.S. Cl. 352—14 **9 Claims**



2. In apparatus for processing and producing sound motion pictures in response to the insertion of a cassette containing a strip of motion picture film bearing a sound track, the combination comprising, incremental drive means for moving the film incrementally past a projection station, a sound transducer adapted to engage the sound track, capstan means for advancing the film continuously past the sound transducer, a servomechanism for driving said capstan means at a speed determined by the length of the film between said capstan and said incremental drive means to form and maintain a loop of film of constant average size, sound reproducing means, and switching means operative after a delay sufficient to permit the formation of said loop to connect said transducer to said sound reproducing means.

3,970,378
MOVIE CAMERA CAPABLE OF MAGNETIC RECORDING SIMULTANEOUSLY WITH FILMING

Katsuhide Takagi, Okaya, and Toshiro Fukasawa, Shimosuwa-cho, both of Japan, assignors to Sankyo Kogaku Kogyo Kabushiki-Kaisha, Suwa, Japan
Filed Apr. 25, 1975, Ser. No. 571,461
Claims priority, application Japan, Apr. 27, 1974, 49-47931
Int. Cl.² G03B ***23/02***
U.S. Cl. 352—30 **6 Claims**

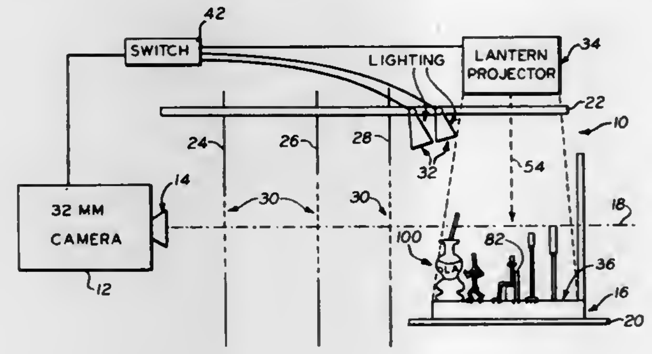


1. In a sound motion picture camera having a lateral opening through which a cartridge encasing a film is inserted and removed; a cover closing said opening; a sound recording transducer and a capstan driving said film, and a release mechanism for actuation upon initiation of a recording operation while filming; the improvement comprising:
- a pinch roller,
- a bracket pivoted in response to the closing and opening of said cover and locked in a predetermined position in response to the closing of said cover;
- a plate carrying said pinch roller, said plate being pivotally mounted on said bracket to permit said pinch roller to move relatively to said bracket;
- means responsive to the pivoting of said bracket to said predetermined position to move said pinch roller from a first normal position it assumes when said cover is open to a second position closely adjacent but not contacting said capstan,
- a spring resiliently connected between said plate and the release mechanism;
- a pad carried on said bracket for selectively urging the recording track of the film against said recording transducer,
- and means responsive to the actuation of said release mechanism for pivotally moving said plate against the force of said spring to thereby move said pinch roller to a third position in which it urges said film against said capstan.

3,970,379
ANIMATION METHOD AND SYSTEM

Tobe T. Fedder, 3531 85 St., Jackson Heights, Queens, N.Y. 11372
Filed July 2, 1974, Ser. No. 485,212
Int. Cl.² G03B ***19/18***
U.S. Cl. 352—52 **14 Claims**

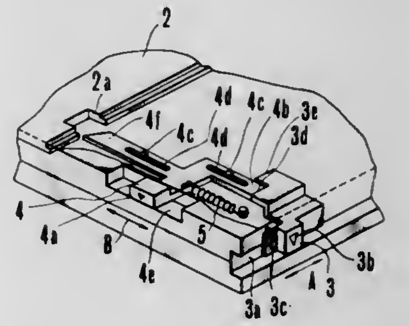
1. A system for producing an animated motion picture comprising photographic means for photographically recording a plurality of sequential picture frames comprising an animation sequence of a scene of said animated motion picture, a shooting surface means in optical alignment with said photographic means, said photographic means photographically recording the animation segment content of said shooting surface means for each picture frame comprising said animated scene sequence, said shooting surface means animation segment content sequentially varying for each frame in accordance with a predetermined animated scene sequence to provide said animated motion picture, said shooting surface means animation segment content comprising background means, set objects and character objects for each of said frame animation segments, said background means, set objects and character objects having a predetermined position on said shooting surface means for each given frame animation segment content, each of said positions being determined in accordance with said predetermined animated scene sequence, at least said character objects being three dimensionally sequentially variable in position with respect to said photographic means for each of said frame animation segments, at least some of said character objects comprising substantially two dimensional cartoon drawings which are three dimensionally variable in position, a scene registration layout projection having indicia thereon indicating each of the positions of at least said character objects and said scenic objects for all of said frame animation segments comprising said animated motion picture animation sequence to provide a projection of the complete scene layout and sequential character object movement for said predetermined animated motion picture animated scene sequence, and means for projecting said scene registration layout projection on to said shooting surface means only when said frame animation segment is not being photographically recorded, whereby the animation segment content for the next succeeding frame in said plurality of sequential picture frames comprising said animated scene sequence may be aligned with respect to the previous frame animation segment in said sequence prior to the photographic recording of said next succeeding frame animation segment and said registration layout for said sequence will be absent from each photographically recorded segment of said sequence.



3,970,380
FILM HANDLING SYSTEM EMPLOYING A COMMON CARTRIDGE

Akira Ashida, Tokyo; Kazuo Ishikawa, Kawasaki; Kiyoshi Takahashi, Kunitachi; Yoshio Komine, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1974, Ser. No. 474,156
Claims priority, application Japan, May 31, 1973, 48-61685; May 31, 1973, 48-61686; May 31, 1973, 48-61687; May 31, 1973, 48-61688
Int. Cl.² G03C ***11/00***
U.S. Cl. 352—130 **36 Claims**

1. A film handling system for use with a film cartridge housing a strip of film, comprising:
- a first means for selectively activating said film cartridge for placing said film in a state allowing exposure;
- a second means for selectively activating said film cartridge for placing said film in a state allowing processing; and
- a third means for selectively activating said film cartridge for placing said film in a state allowing projection;
- wherein said film cartridge is used sequentially by said first, second and third means in the recited order, said cartridge comprising:
  - a housing;
  - a processing means positioned within said housing to process said film, which is selectively activated by said second means and includes processing liquid to process said film, and a processing liquid, receiving the activating force of said second means so that said processing liquid can be selectively supplied to a film surface; and
  - an indication means to indicate which one of the said first, second and third means through which said film has passed, wherein said indication means is shiftable in turn to a first position to indicate that said film has not yet passed through the first means, a second position to indicate that the same film has passed through the first means, and a third position to indicate that it has passed through the second means; and
- a control means included in said system for detecting said indication means for controlling the action of said first, second, and third means, wherein said control means detects the position at which said indication means is placed when said film cartridge is mounted into said system to control the advancing and stopping of the film cartridge so that it proceeds through each step in a prescribed order.

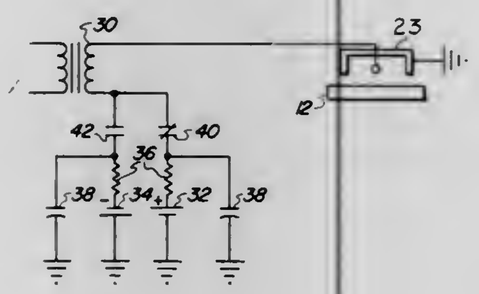


3,970,381
METHOD AND APPARATUS FOR XEROGRAPHIC REPRODUCTION

Thomas Meagher, West Webster, and Robert J. Michatek, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 335,967, Feb. 26, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 435,349
Int. Cl.² G03G ***15/00, 13/00***
U.S. Cl. 355—3 R **9 Claims**

4. A method to provide improved stripping of a transfer member from a photoconductive surface after transfer of a developed latent electrostatic image to the transfer member comprising the steps of:
- a. charging the lead edge of the transfer member to provide a charge of a first magnitude on the edge, and then

b. charging the image bearing portion of the transfer member without altering the charge on the lead edge to provide a charge of a second magnitude on the portion which is different from said first magnitude.



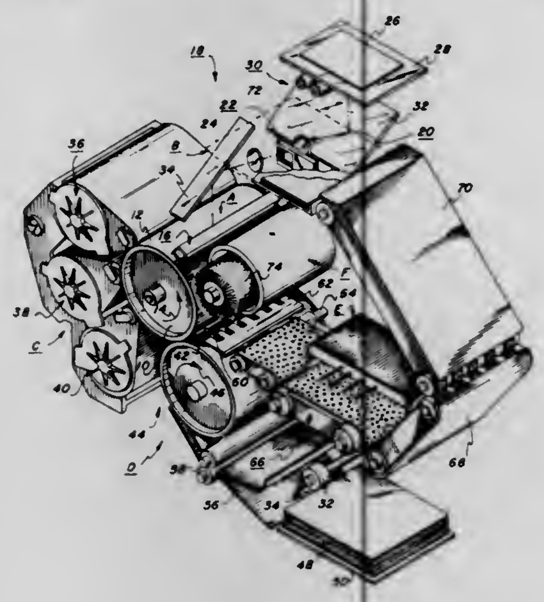
3,970,382
SPATIALLY SELECTIVE OPTICAL SYSTEM

Donald H. Fisher, Marion, and Vincent J. Crociata, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 375,276, June 29, 1973. This application Sept. 16, 1974, Ser. No. 506,653

Int. Cl.² G03G *15/052*

U.S. Cl. 355—4 **9 Claims**



5. An electrophotographic printing machine of the type having a photoconductive surface, including:
means for charging the photoconductive surface;
means for creating a light image of an original document;
means for filtering the light image to produce a single color light image; and
a normally transparent photochromic filter interposed between the photoconductive surface and said filtering means in the path of the single color light image, said photochromic filter, responsive to the intensity of the single color light image, darkening to automatically regulate the intensity of the single color light image transmitted therethrough for irradiating the charged photoconductive surface to selectively dissipate the charge thereon in accordance with the intensity of the single color light image passing through said photochromic filter, said photochromic filter attenuating the high intensity light rays transmitted through said filtering means to a greater extent than the low intensity light rays transmitted therethrough and returning to the normally transparent condition when the single color light image is not being transmitted therethrough.

3,970,383
APPARATUS FOR COLOR ELECTROPHOTOGRAPHY

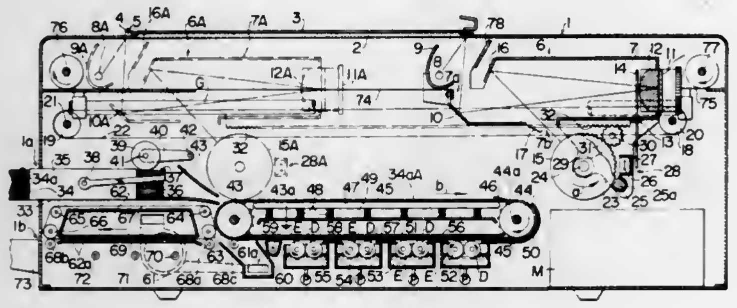
Saburo Honda, Tokyo; Kyoji Kunitomo, Koganei, and Yasumori Nagahara, Yokosuka, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,842

Claims priority, application Japan, Nov. 15, 1973, 48-128641

Int. Cl.² G03G *15/01, 15/30*

U.S. Cl. 355—4 **4 Claims**



1. An apparatus for colour electrophotography comprising:
movable optical scanning means for successively scanning a stationary original document by moving thereacross from one end to the other;
at least one drum-shaped photoreceptor means movable together with the scanning means and rotated in synchronism with its movement such that its peripheral surface is exposed to an optical image from the scanning means for forming an electrostatic image of said original document thereon;
a plurality of different colour filter means for successively filtering the optical image to said photoreceptor during successive scans;
means for holding a copy sheet stationary in the path of said rotating photoreceptor during each scan of the scanning means to permit each electrostatic latent image from the photoreceptor to be successively transferred thereto; and
means for successively developing each latent image on the copy sheet with a developer of a colour corresponding to that of the filter used during the preceding scan.

3,970,384
SAFETY DEVICE FOR PHOTOCOPYING MACHINE

Eisuke Yamamoto, Tokyo; Susumu Sugiura, and Osamu Sawamura, both of Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

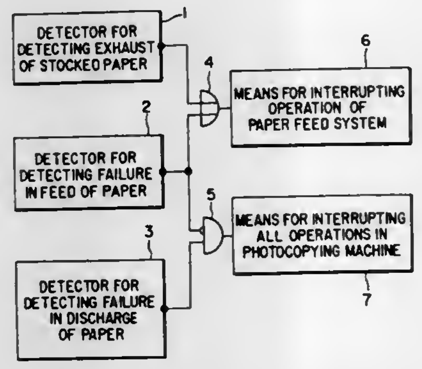
Continuation of Ser. No. 325,339, Jan. 22, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,788

Claims priority, application Japan, Jan. 25, 1972, 47-9339

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **1 Claim**

1. In a photocopying machine having a copy sheet stand for stocking copying paper to be sequentially fed into said machine, transporting means for picking up copying paper from said copy sheet stand and transporting said copying paper along a predetermined path through said machine, a driving system for driving said transporting means, heating means disposed along said predetermined path for processing said copying paper passing thereby, an electrical system for actuating at least said heating means, discharge means for discharging said copying paper from said machine after it has traveled along said predetermined path; a safety device comprising:
first detecting means for detecting when the stock of copying paper on said copy sheet stand is exhausted;
second detecting means for detecting a failure in feeding the copying paper from the copy sheet stand;
third detecting means for detecting a failure is discharging the copying paper from said discharge means;
means for interrupting said driving system in response to either said first detecting means detecting exhaustion of copy paper from the copy sheet stand or said second detecting means detecting a failure in feeding the copying paper from the copy sheet stand, in such a manner that the driving system can be restarted by actuating the power supply switch to off and then to on;
means for immediately interrupting said electrical system in response to said second detecting means not detecting a failure in feeding the copy paper from the copy stand and the third means detecting a failure in discharging the copying paper from said discharge means and said means for immediately interrupting said electrical system including means for retaining said electrical system in its interrupted mode regardless of the actuation of said power switch to off and then to on, until manually reset.


DETECTOR FOR DETECTING EXHAUST OF STOCKED PAPER
1
6
4
MEANS FOR INTERRUPTING OPERATION OF PAPER FEED SYSTEM
2
DETECTOR FOR DETECTING FAILURE IN FEED OF PAPER
5
MEANS FOR INTERRUPTING ALL OPERATIONS IN PHOTOCOPYING MACHINE
3
DETECTOR FOR DETECTING FAILURE IN DISCHARGE OF PAPER
7

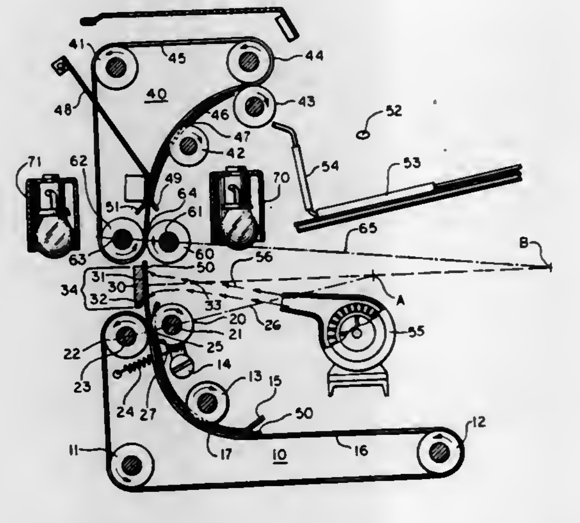
3,970,385
MICROFILM RECORDER DOCUMENT TRANSPORT SYSTEM

Robert L. Kearney, Northbrook, and Eugene Sather, Deerfield, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 15, 1974, Ser. No. 524,300

Int. Cl.² G03B *27/48, 27/50;* **B65H** *29/24*

U.S. Cl. 355—50 **8 Claims**



1. In a microfilm recording machine of the type which makes a photographic reproduction of documents processed therethrough and which includes a document input feed mechanism, a document exit and a scanning zone between the input feed mechanism and exit wherein each document is scanned and photographed, an improved document transport system for presenting each document in a predetermined focal plane within the scanning zone, said transport system comprising:
a transparent plate within the scanning zone having a longitudinal major surface portion lying substantially within the predetermined focal plane and having a transverse axis extending forward from said longitudinal major surface; and
a first pair of cooperating transport rollers between said plate and the document input feed mechanism rotatable about first axes of rotation to transport a document from the input feed mechanism into the scanning zone, said rollers forming a first nip to engage each document, said first nip being forward of said major surface and the plane embracing said axes of rotation converging upon said transverse axis; whereby,
each document transported through the first nip of said transport rollers is directed toward and against said longitudinal major surface of said plate as it is transported through the scanning zone to assure that each document is presented to the scanning zone substantially within the predetermined focal plane.

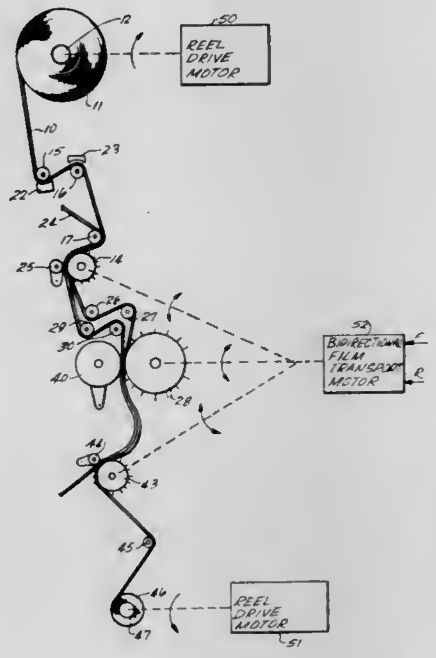
3,970,386
BIDIRECTIONAL TRANSPORT OF SPROCKETED FILM

Hans Chr. Wohlrab, North Hollywood, Calif., assignor to PSC Technology, Inc., Glendale, Calif.

Filed Mar. 17, 1975, Ser. No. 559,008

Int. Cl.² G03B *27/10*

U.S. Cl. 355—111 **11 Claims**



3. Film handling apparatus having an operating station past which sprocketed film is driven, a sprocket wheel with teeth that engage sprocket holes in the film, means for driving the sprocket wheel in one direction of rotation to transport the film past the operating station, and tensioning means over which the film passes before it reaches the sprocket wheel during transport to draw the film in the direction opposite to the direction of transport so as to index the film relative to the operating station while the sprocket wheel pulls the film past the operating station, the improvement comprising means for driving the sprocket wheel to transport the film in the direction opposite the one direction so the tensioning means pulls the film past the operating station.

3,970,387

NONDISPERSION, TWO BEAM, INFRARED GAS ANALYZER

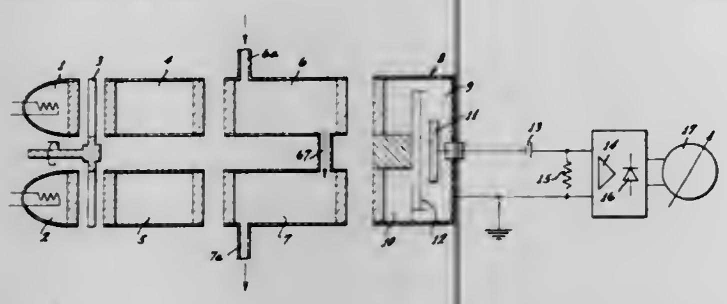
Reimar Faulhaber, Frankfurt am Main; Margareta Ascherfeld, Hattingen, and Walter Fabinski, Hattersheim, all of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 5, 1975, Ser. No. 547,273

Claims priority, application Germany, Feb. 5, 1974, 2405317

Int. Cl.^{2} G01N *21/36*

U.S. Cl. 356—51 **4 Claims**



1. In a non-dispersion, two infrared beam gas analyzer having first and second beam paths extending respectively between means for providing two beams of infrared radiation and a two-input detector, each beam path including a cell with test gas which includes a carrier gas and, possibly, traces of a gas to be detected, the improvement of a selectivity cell in one of the beam paths containing no carrier gas but exclusively gas of the same type as the gas to be detected and at a pressure below the pressure of the test gas.

3,970,388

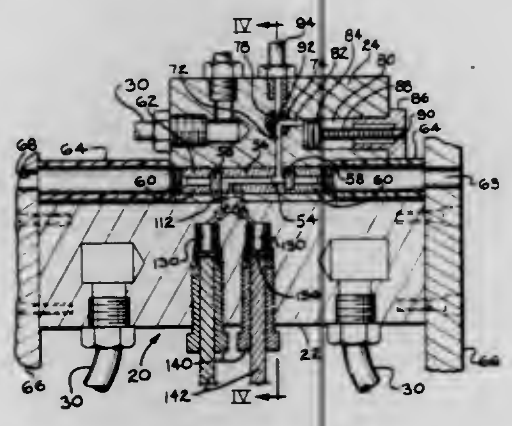
LIQUID STOPPED-FLOW APPARATUS

Charles L. Hacker, 2697 Parman Road, Dansville, Mich. 48819

Filed July 15, 1974, Ser. No. 488,567

Int. Cl.^{2} G01N *21/00*

U.S. Cl. 356—72 **5 Claims**



1. Apparatus for rapidly mixing fluids for evaluating the mixture while in a static condition comprising, in combination, an evaluation cell having an inlet and an outlet, fluid evaluation means directly associated with said cell, a fluid mixing chamber communicating with said cell inlet, a pair of injector chambers each having an inlet and an outlet and a piston slidably located therein, said chamber's outlets communicating with said mixing chamber and said inlets communicating with fluid supply means, a compression spring drivingly connected to said pistons for biasing said pistons into its associated injector chamber to force fluid therein into said mixing chamber and cell, an electric motor having a rotatable output drive shaft, a first cam mounted upon said drive shaft, a first cam follower engageable by said cam compressing said spring during partial rotation of said drive shaft, a valve within said cell outlet controlling exhausting of said cell, a second cam mounted upon said drive shaft, a second cam follower engaging said second cam controlling operation of said valve opening said valve after compression of said spring whereby opening of said valves causes said pistons to inject fluid into said mixing chamber and cell.

3,970,389

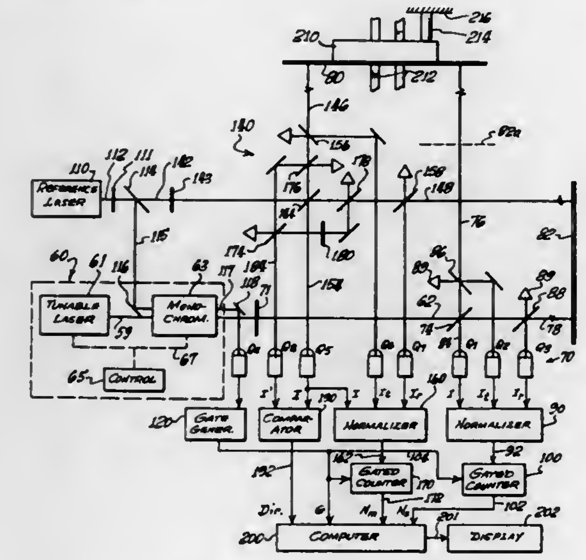
VARIABLE FREQUENCY INTERFEROMETER

Michael J. Mendrin, 425 Date St., Montebello, Calif. 90640, and Richard H. Taylor, 720 Mobile Ave., Los Angeles, Calif. 90022

Filed Feb. 14, 1974, Ser. No. 442,463

Int. Cl.^{2} G01B *9/02*

U.S. Cl. 356—106 R **18 Claims**



1. In combination with interferometric apparatus for dividing substantially coherent radiation between a reference component beam including a reference mirror and a target component beam including an adjustably movable target mirror, and for recombining the component beams to produce interference; means for measuring a selected position of the target mirror relative to a reference position corresponding to the virtual image of the reference mirror, comprising

means for causing the effective frequency of the interfering beams to vary monotonically over a predetermined frequency interval to produce a plurality of intensity cycles in the combined beam,

means for producing essentially monochromatic reference beams of the respective two end frequencies of said frequency interval,

means acting in response to radiation of said monotonically varying frequency and radiation of the respective reference beams for detecting frequency coincidence thereof and for generating respective gating signals,

and counting means acting under control of the gating signals for counting the number of intensity cycles during said frequency variation as a measure of said selected mirror position.

3,970,390

MULTIFREQUENCY LASER OSCILLATOR FOR HOLOGRAPHIC CONTOURING

Lee O. Heflinger, Torrance, and Ralph F. Wuerker, Palos Verdes Estates, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 310,859, Nov. 30, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,600

The portion of the term of this patent subsequent to Sept. 7, 1988, has been disclaimed.

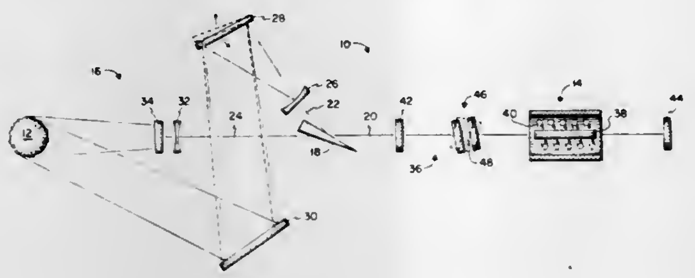
Int. Cl.^{2} G01B *9/025;* **H01S** *3/10;* **G02B** *27/00*

U.S. Cl. 356—109 **5 Claims**

1. Double exposure holographic contouring apparatus comprising:

a multifrequency laser oscillator comprising means forming an optical cavity including a rear end reflector and a front end output reflector, active lasing means in said cavity between said reflectors capable of lasing at two different optical frequencies; means for pumping said lasing means; frequency selecting means for causing said lasing means to lase at said frequencies in rapid succession comprising a transmission etalon in said cavity between said lasing means and one end reflector which is rotatable between first and second positions and is turned to select said first frequency in said first position and said second frequency in said second position;

a beam splitter for splitting the output beam from said laser oscillator into a reference beam and a scene beam;



light-sensitive means disposed in a predetermined plane for recording a hologram of an object;

first fixed optical means for directing said reference beam toward said light-sensitive means; and

second optical means for directing said scene beam onto the object to be recorded and thence onto said light-sensitive means, the difference in said frequencies being such that range contours of a predetermined spacing are produced on the object.

3,970,391

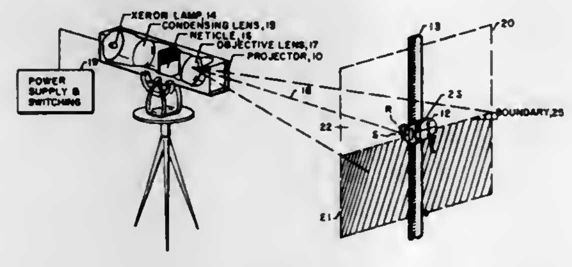
DIRECTION DETERMINING METHOD AND APPARATUS

Philip M. Johnson, Windham, and Richard M. Northrup, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed July 29, 1974, Ser. No. 492,633

Int. Cl.^{2} G01B *11/26*

U.S. Cl. 356—152 **49 Claims**



1. Apparatus for establishing at a first location a plane having a predetermined orientation and position and for locating a reference point on said plane at a second location comprising:

means for projecting to said second location an image having an illuminated and unilluminated portion separated by a boundary region which includes said reference point;

means at said second location for detecting said image at two detection points to produce first and second signals, each having an amplitude corresponding to the intensity of the image at a corresponding detection point; and

means for establishing said reference point from a predetermined comparison of said amplitudes, including means for indicating said reference point by the position of one of said two detection points when said predetermined comparison between the amplitudes of said two signals exists.

3,970,392

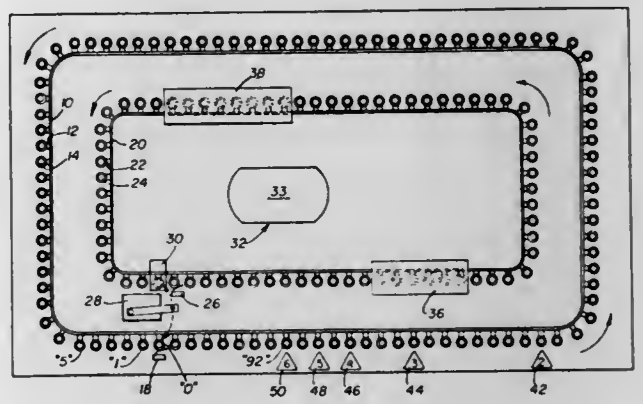
ANALOG TO DIGITAL TO ANALOG STORAGE AND RETRIEVAL FOR A PLURALITY OF PHOTOMETRIC BLANKING VALUES

David Richard Figueroa, Pembroke Pines, and Guenter Ginsberg, Miami, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 383,437, July 27, 1973. This application Oct. 17, 1974, Ser. No. 515,446

Int. Cl.^{2} G01J *3/46*

U.S. Cl. 356—179 **7 Claims**



1. A storage and retrieval arrangement for a plurality of blanking values for use in a photometric system having a plurality of colorimeters which test a plurality of aliquots from a single test sample, said storage and retrieval arrangement comprising: means for distinguishing between the presentation of a blanking serum and a test sample to the photometric system, said distinguishing means generating a first signal to said arrangement to enable it to transduce blanking aliquots, as contrasted from test sample aliquots, and to provide an analog output for the absorbance value of each blanking aliquot; an analog to digital converter coupled to receive each said analog absorbance blanking value and enabled by said distinguishing means to convert same into a digital value; memory means coupled to receive and enabled by said distinguishing means to store each blanking aliquot digital value; memory addressing means responsive to which colorimeter is providing the analog blanking value for addressing said memory address location; a digital to analog converter coupled to receive as inputs the digital value stored in said memory and under control of said memory addressing means to feed same back to the correlated colorimeter for utilization at the time that such colorimeter is measuring a test sample aliquot.

3,970,393

AUTOMATIC COMPENSATION FOR DENSITOMETER IMBALANCE

Algirdas J. Krygeris, Richmond Heights, and John M. Manring, Cleveland Heights, both of Ohio, assignors to Harris Corporation, Cleveland, Ohio

Filed July 23, 1974, Ser. No. 490,981

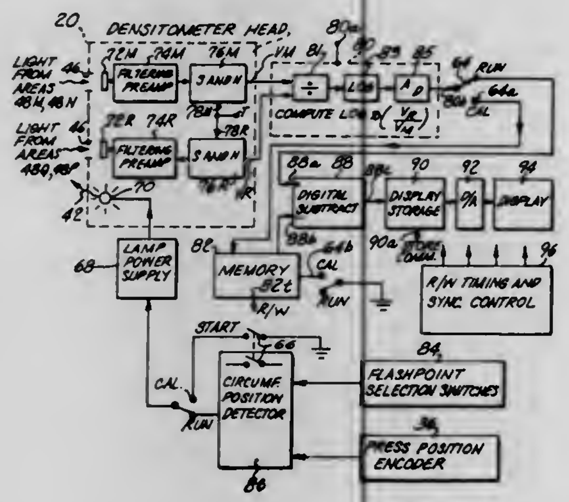
Int. Cl.^{2} G01J *3/46;* **G01N** *21/48*

U.S. Cl. 356—195 **4 Claims**

1. The method of compensating densitometer readings where the densitometer is used to measure the relative optical density of a printed area during a printing operation on material in which densitometer light is directed onto the printed area of said material and transmitted therefrom along a first optical path with a characteristic of the transmitted light varying in accordance with the optical density, and densitometer light is directed onto an unprinted area of said material and transmitted therefrom along a second optical path to provide a reference light value, with the light along said paths being sensed by different optical sensing means to provide separate electrical test signals from which the relative optical density of the printed area is derived comprising the steps of

substituting first and second calibration areas for the printed and unprinted areas when the press is not printing, second calibration area having the same light transmittting characteristics as said first calibration area, utilizing first and second optical sensing means for respectively sensing the light transmitted along said first and second paths to respectively provide first and second calibration signals in order to determine differences between said calibration signals, and deriving calibration data from said calibration signals,

storing said calibration data in a memory means,



measuring the apparent relative optical density of a printed area when the press is printed by transmitting light along said paths to a printed area and an unprinted area and utilizing said first and second sensing means for respectively sensing the light of said first and second paths to provide said separate electrical test signals, and deriving measurement data therefrom,

reading said calibration data from said memory means, and combining said measurement data and said calibration data to produce an indication of the actual relative optical density of said printed and unprinted areas.

3,970,394

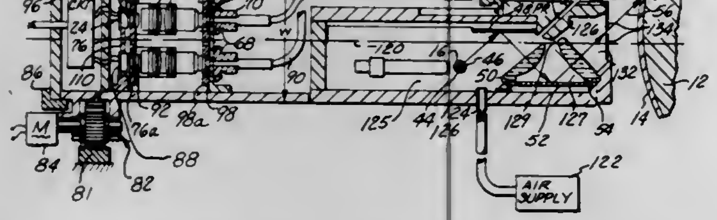
DENSITOMETER HEAD WITH FIBER OPTICS

Arthur J. Stanton, Warrensville Heights, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed July 22, 1974, Ser. No. 490,397

Int. Cl.^{2} G01J *3/46;* G01N *21/48*

U.S. Cl. 356—195 **9 Claims**



1. A densitometer head comprising a housing having first and second opposing walls, said first wall having apertures therein from which light is directed to a surface and reflected light received therefrom, a light source disposed in said housing for directing light therefrom onto the surface to be tested, first optical elements disposed between said light source and said first wall for directing the light onto the surface to be tested, second optical elements proximate said first wall for receiving light reflected from the surface, transducers for sensing the light received from the surface and disposed adjacent said second wall, light transmitting means comprising at least one fiber optics element per transducer for conducting light from said second optical elements to said transducers, said fiber optics elements extending from a location intermediate said first wall and said light source and extending to said transducers, and electrical circuit means for connecting said transducers to processing circuitry external of the head, each of the fiber optics elements in said head for conducting light to said transducers has first and second adjusting means connected respectively to the opposite ends of the fiber optics element to adjust the optical alignment transversely of the light received by and transmitted from the ends of the fiber optics elements, said fiber optics elements being flexible.

3,970,395

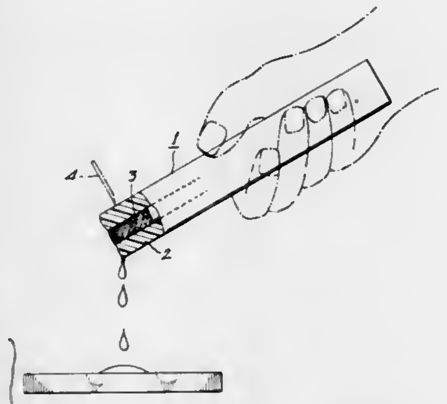
HOT-MELT ADHESIVE WITH SELF-MELTING CAPABILITY

Theodore R. Flint, Jug Hollow Road, Valley Forge, Pa. 19481

Filed July 2, 1975, Ser. No. 592,468

Int. Cl.^{2} B43M *1/02;* B67D *5/62*

U.S. Cl. 401—1 **2 Claims**



1. An organic hot-melt adhesive with controllable self-melting capability comprising an adhesive composition readily melted by moderate temperatures and a pyrotechnic composition, said adhesive composition and pyrotechnic composition being coextensively joined forming an integral self-supporting unit, combustion of the pyrotechnic composition providing sufficient heat to cause that portion of said adhesive composition coextensive with the burning pyrotechnic composition to melt and flow for application to a work piece, while extinguishing the process of combustion of said pyrotechnic composition leaves the remaining adhesive composition and pyrotechnic composition available for further use.

3,970,396

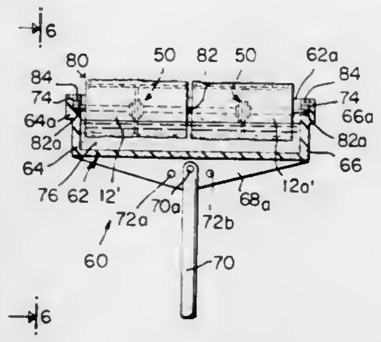
PAINT APPLICATOR

William J. Brady, 549 Riverside Drive, New York, N.Y. 10027

Filed June 18, 1975, Ser. No. 588,014

Int. Cl.^{2} B44D *3/28*

U.S. Cl. 401—208 **2 Claims**



1. A device for applying paint to the undersides of two mutually adjacent substantially flat ceiling portions divided from each other by a straight line, comprising a container adapted to receive paint, said container having a bottom wall, side walls and end walls, a shaft supported between said end walls, applicator means for transferring paint from the bottom of said container to said ceiling portions, said applicator means comprising in part two identical cylindrical rollers of substantially larger diameter than said shaft surrounding said shaft and spaced a short distance from each other, each of said rollers having a thin and somewhat flexible plastic disc inside thereof and secured thereto intermediate the length of the roller, said discs having central openings therethrough of slightly larger diameter than said shaft, a pair of opposed retainer washers of slightly larger diameter than said central openings secured to said shaft inside each of said rollers and clamping said discs, said applicator means consisting additionally of absorbent coatings surrounding said rollers, and elongated handle means extending from said container.

3,970,397

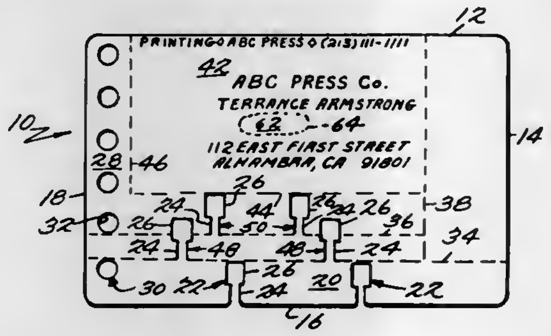
BUSINESS CARD SYSTEM

Terrance R. Armstrong, 3710 S. Grand Ave., Los Angeles, Calif. 90007

Filed Mar. 6, 1975, Ser. No. 555,816

Int. Cl.^{2} B42F *3/00*

U.S. Cl. 402—79 **5 Claims**



1. An apparatus of the Class described comprising a main rectangular card greater in size than the size of a standard business card and having a top edge, a side edge and a bottom edge, a first region of said main rectangular card defined by a first arrangement of tear lines forming a first rectangular area the size of a business card, the first rectangular area of the main rectangular card adapted to have information printed thereon, said first arrangement of tear lines permitting said first rectangular area to be torn away from said main rectangular card whereby the information printed on the first rectangular area can be filed in a first filing device adapted to hold cards the size of business cards, a second region of said main rectangular card including said first rectangular area defined by a second arrangement of tear lines and forming a second generally rectangular area, said second arrangement of tear lines permitting said second rectangular area to be torn from said main rectangular card and filed in a second filing device that is larger than the first filing device and which holds cards the size of said second rectangular area, a third region of said rectangular area including said second rectangular area defined by a third arrangement of tear lines and forming a third generally rectangular area, said third arrangement of tear lines permitting said third rectangular area to be torn from said main rectangular card and filed in a third filing device that is larger than the second filing device and which holds cards the size of said third rectangular area, said main rectangular card the size of cards filed in a fourth filing device, said fourth filing device larger than the third filing device, whereby said main rectangular card with said information printed on said first rectangular area can be filed therein, the bottom of said second rectangular area being defined by one tear line and the bottom of said third rectangular area being defined by a second tear line, said first and second tear lines parallel to each other and parallel to and below the bottom edge of said first rectangular area, openings associated with said first and second tear lines, said openings conforming to the shape of the perforations formed in cards filed in said second and third filing devices, the bottom edge of said main rectangular card parallel to and below said first and second tear lines and having openings formed therein, said openings conforming to the shape of the perforations formed in cards filed in said fourth filing devices so that the information printed on the first rectangular area can be filed in said second, third or fourth filing devices which have devices which penetrate said openings and which hold cards at their bottom edge, and a second group of holes, said second group of holes being disposed in a line parallel to the side edge of said main rectangular card, and shaped and positioned so the information printed on said first rectangular area and including said second or third rectangular areas or said main rectangular card can be filed in filing devices which have devices which penetrate said holes and which hold cards by the side edge.

3,970,398

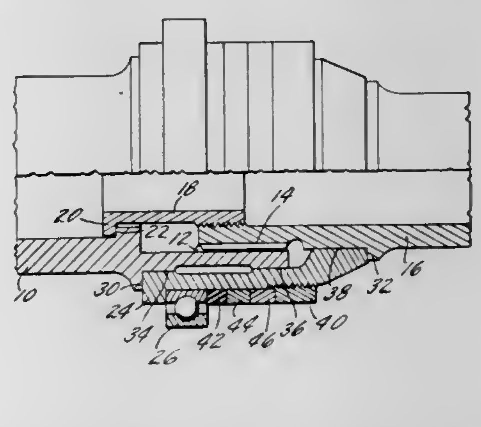
SHAFT COUPLING

Gregory S. Wilson, Fort Worth, Tex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1975, Ser. No. 601,814

Int. Cl.^{2} F16D *1/00;* F16C *9/00*

U.S. Cl. 403—26 **4 Claims**



1. A shaft coupling for joining axially aligned hollow shafts which shafts have mating splines, an internal nut threadably secured to one of said shafts and having an end flange engaging a shoulder formed on the other of said shafts, a hollow idle shaft surrounding said aligned axial shafts and their mating splines, bearing means supporting said idle shaft, shoulder means on the outer diameter of each of said axially aligned shafts engaging the opposite ends of said idle shaft and at least a pair of lands formed on the inner diameter of said idle shaft engaging a portion of each of said axially aligned shafts whereby each axially aligned shaft is supported independently of each other.

3,970,399

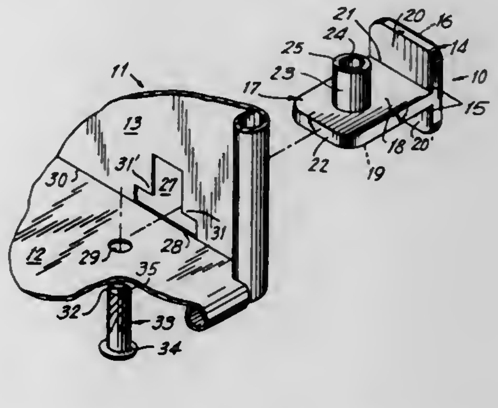
FASTENER ASSEMBLY AND FASTENER THEREOF

Nunzio J. Palumbo, Erie, Pa., assignor to Louis Marx & Co., Inc., Glen Dale, W. Va.

Filed Feb. 10, 1975, Ser. No. 548,721

Int. Cl.^{2} A47B *23/00*

U.S. Cl. 403—231 **1 Claim**

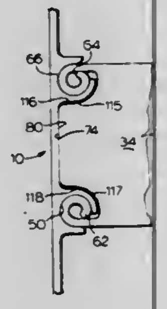


1. A fastener assembly for securing a pair of contiguous standards at substantially right-angles relative to each other including a fastener comprising first and second perpendicularly oriented webs, and means mounted on the second web for connecting a standard thereto; and including a first standard having a configured through slot, the second web being introduced through the slot until the first web abuts the first

standard; and a second standard abutting the second web and being contiguous with the first standard, the first web having an outer and an inner face, and the second web comprising a cantilever perpendicularly mounted on the inner face of the first web, the cantilever having an upper surface and a lower surface, and a through-hole proximate its free end, the second standard abutting the lower surface of the cantilever, the means mounted on the second web for connecting the second standard thereto comprising a collar upstanding on the upper surface of the cantilever, and the collar including a socket opening towards the lower surface of the cantilever which is registered with the through-hole provided in the cantilever, the second standard having an aperture therein respectively registerable with the through-hole provided in the cantilever and the socket formed in the collar mounted thereon, and a stud having a capped end and a free end, the free end thereof being introducible into the registered apertures respectively in the second standard and cantilever, and into the socket registered therewith, for thereby connecting the second standard to the second web of the fastener, the configured slot provided in the first standard having a T-shape.

3,970,400
DEFORMINGLY INTERLOCKED STRUCTURAL JOINT

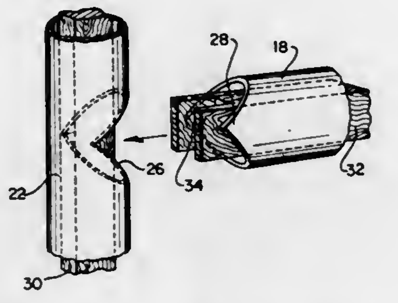
Robert John Reid, Willowdale, Canada, assignor to Robert John Reid, Mississauga, Canada
Division of Ser. No. 377,786, July 9, 1973, Pat. No. 3,854,185. This application Sept. 9, 1974, Ser. No. 504,178
Int. Cl.² B25G *3/00*; F16B *9/00*; F16L *41/00*
U.S. Cl. 403—242 4 Claims



1. A structural joint between first and second metallic elements, said first element having at least one substantially planar flange which is capable of being deformed into the shape of at least a portion of a coil which has a free outer end and which has a width substantially greater than its thickness, said second element having at least one longitudinally extending rigid groove which is substantially arcuate in cross-section, each said groove having opposing edges which define an elongate longitudinally extending opening, the distance between said opposing edges being substantially less than the largest cross-sectional width of said arcuate groove, said flange being deformed within said groove to form at least a portion of a coil in said groove, the inner surface of the coiled flange defining an opening in the coiled flange, the width of said elongate opening being less than the cross-sectional width of the coiled flange thereby precluding withdrawal of the coiled flange from the groove, the outer surface of the coiled flange contacting the arcuate surface of said groove and having a sufficient degree of resiliency so that the coiled flange is urged to spring outwardly and exert an outward frictional binding force on the arcuate surface of said groove whereby said coiled flange is secured in said groove, the thickness of the coiled flange at any point along its coiled length being substantially the same as the thickness at a corresponding point along the length of the flange prior to its deformation in the groove.

3,970,401
TUBULAR STRUCTURES

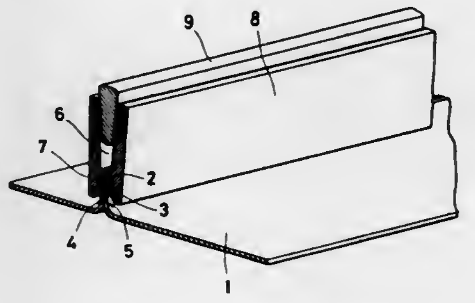
Donald Lubeck, 4 Ferry Lane, Barrington, R.I. 02806
Filed May 28, 1974, Ser. No. 474,073
Int. Cl.² F16B *12/04*; F16L *13/11*
U.S. Cl. 403—265 4 Claims



1. A free standing portable structure that is capable of supporting loads thereon, comprising a plurality of hollow tubular members that are interfitted to define a unitary construction, said members being formed of an oven baked resin impregnated paper, each of said members having a reinforcing core located therein that extends substantially the length thereof, the core of each member occupying less than the total volume therein to define an interior space therein, each member having portions of the core therein exposed at predetermined locations, the core of each member at an exposed location engaging an exposed core of an adjacent member for interengaging the members, a plurality of communicating channels being defined by the interior spaces of the members that are interengaged by the cores therein, and a polyurethane filler material extending throughout the interior of said members and occupying the spaces formed therein to positively interlock the members together in the unitary construction.

3,970,402
WEDGE-CLAMPED FLANGE JOINT

Mikio Yamashita, 1337 Sakonyama, Asahi, Yokohama, Japan
Filed Feb. 14, 1975, Ser. No. 549,927
Claims priority, application Japan, Aug. 7, 1974, 49-90580
Int. Cl.² F16D *1/00*; F16L *23/00*
U.S. Cl. 403—338 4 Claims



1. A device for jointing flanged members comprising in combination:

an H-shaped elongated beam body comprising a pair of parallel members and a transversely extending fulcrum member integrally connecting said parallel members together,

a first pair of substantially parallel legs of said H-shaped member, defining a first space for housing said flanged members, extending in a first direction away from said fulcrum member and upon one side thereof, and a second pair of substantially parallel legs of said H-shaped member, defining a second space for housing wedge means, extending in a second direction away from said fulcrum member and upon the opposite side thereof relative to said first pair of legs so as to be aligned with said first pair of legs,

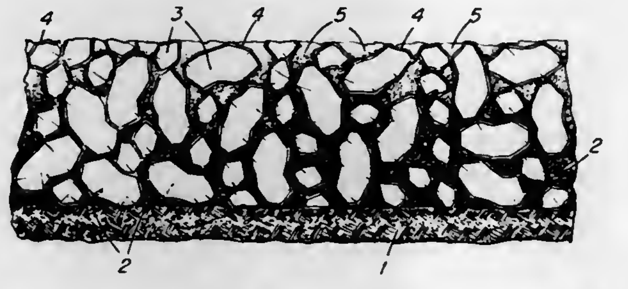
said second pair of legs being substantially longer than said first pair of legs so as to provide a lever action with respect to said first pair of legs, about said fulcrum when said wedge means is inserted within said second space, and said first and second spaces also being parallel to and encompassing the medial plane of symmetry of said H-shaped member, and

wedge means, having a length corresponding to that of said H-shaped elongated beam and adapted to be inserted into said second space, for pivoting and expanding both legs of said second pair of legs outwardly and away from each other about said fulcrum member and for simultaneously pivoting and converging both legs of said first pair of legs toward each other about said fulcrum member,

whereby both legs of said first pair of legs positively grip and joint said flanged members.

3,970,403
ANISOTROPIC ROAD SURFACE

André Goyer, Lillebonne, and René Smadja, Notre Dame de Gravenchon, both of France, assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 390,278, Aug. 21, 1973. This application Apr. 18, 1975, Ser. No. 569,415
Claims priority, application France, June 1, 1973, 73.20091
Int. Cl.² E01C *3/00*
U.S. Cl. 404—27 8 Claims



1. An anisotropic road surface comprising a road-bed, a mastic binder superimposed on said road-bed consisting essentially of asphalt containing from about 10 to about 60 percent by weight of an inert filler having particle dimensions not greater than about 100 microns and a layer of gravel particles characterized by a relationship R of between 60 and 80%, R being

$$\frac{\text{apparent density}}{\text{actual density}} \times 100,$$

superimposed on said mastic binder, said particles being coated with a material which serves to assure close contact between said particles, but wherein spaces between the particles are not entirely filled by said binder, the dimensions of said particles being from about 2 mm to about 25 mm with the difference between the smallest and largest particles being no more than about 8 mm, the quantity of coated particles employed being such that after compaction the mastic binder fills the interstitial spaces between the particles of gravel to a thickness of from about 50 to about 95 percent of the total thickness of the final road surface.

3,970,404
METHOD OF RECONSTRUCTING ASPHALT PAVEMENT

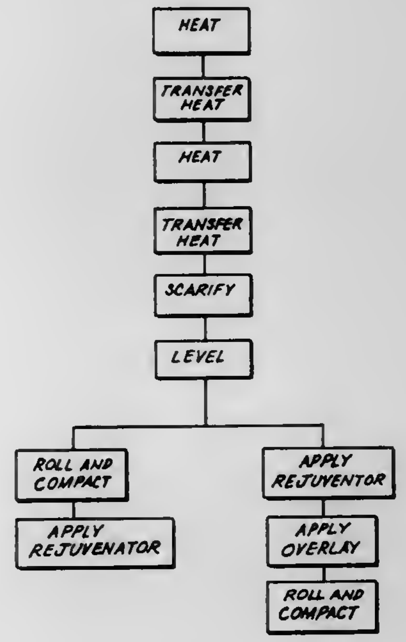
Angelo W. Benedetti, 94 First St., Bedford, Ohio 44146
Filed June 28, 1974, Ser. No. 484,070
Int. Cl.² E01C *7/06*
U.S. Cl. 404—77 14 Claims

1. A method of reconstructing asphalt pavement which comprises

a. heating the surface of the pavement with radiant energy until a temperature at the pavement surface within the range of about 225°F to about 325°F is attained, thereby softening said surface;

b. discontinuing the application of radiant energy;

c. subjecting the structurally undisturbed pavement to a heat soaking step during which heat previously applied to the pavement surface is conducted into the interior of the pavement, the soaking interval being of sufficient duration to elevate the temperature of the interior of the pavement to at least the softening temperature of the asphalt;



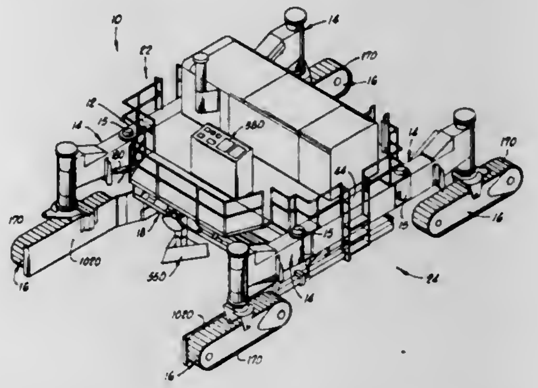
d. repeating steps (a) through (c) at least once, whereby the temperature of the interior of the pavement, to a depth of at least about one inch, is elevated to at least the softening temperature of the asphalt;

e. scarifying the asphalt pavement to a depth not exceeding the depth to which the asphalt has been heated to at least its softening temperature, and

f. providing said scarified asphalt pavement with a trafficable surface.

3,970,405
SLIPFORM PAVING APPARATUS

George William Swisher, Jr., Oklahoma City; Donald W. Smith, Edmond, and John F. Phillips, Oklahoma City, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.
Filed May 3, 1974, Ser. No. 466,686
Int. Cl.² E01C *19/12*
U.S. Cl. 404—105 50 Claims



1. A road building machine for forming finished grade concrete roads, comprising:

a frame assembly;

slipform means carried by the frame assembly for receiving the concrete and defining the sides of the road;

spreading means carried by the frame assembly for transversely equalizing the depth of the concrete initially received by the slipform means;

vibrator means carried by the frame assembly for vibrating and densifying the concrete being spread by the spreading means;
strike off assembly carried by the frame assembly disposed behind the vibrator means;
grout screed means carried by the frame assembly behind the strike off assembly for effecting an aggregate density gradient in the concrete; and
profile pan means connected to the frame assembly and held in spatial relationship therefrom for molding the concrete in cooperation with the slipform means.

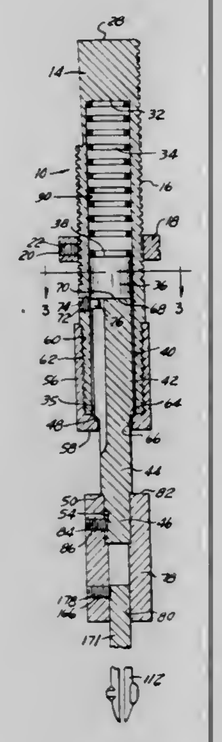
3,970,406
TOOL HOLDER WITH MISALIGNMENT COMPENSATING MEANS

Louis A. Kubicek, Ypsilanti, Mich., assignor to Burr-Ban Tool Service Company, Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 524,323

Int. Cl.^{2} B23B *51/16*

U.S. Cl. 408—127 **8 Claims**



1. The combination of a tool holder and a deburring tool comprising:
an elongated housing having a recess formed along its axis of elongation;
resilient means and a piston respectively disposed in said recess;
an elongated tool holding rod having a cross-sectional area smaller than the cross-sectional area of said recess disposed in said recess so that one end of said tool holding rod flatly abuts against said piston to bias said tool holding rod coaxial with said housing but to permit said tool holding rod to move to a position axially misaligned with respect to said housing;
a member secured to said housing and having a portion extending into said recess and received by a longitudinal slot formed along one side of said tool holding rod, wherein said member prevents rotation of said rod relative to said housing while permitting axial movement of said rod relative to said housing,
retaining means to retain said tool holding rod within said recess; and
means to attach said deburring tool to said tool holding rod so that said deburring tool is coaxial with said tool holding rod, whereby compression of said resilient means permits said deburring tool to retract relative to said housing.

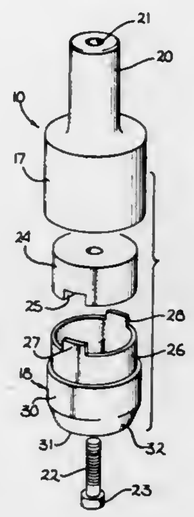
3,970,407
ROTARY CUTTER

Leroy E. Uffman, 5524 Elmer Ave., North Hollywood, Calif. 91601

Filed Nov. 25, 1974, Ser. No. 526,632

Int. Cl.^{2} B23B *31/28*

U.S. Cl. 408—204 **1 Claim**



1. A rotary cutter for operating by a power rotating means comprising the combination of:
a body having a hollow interior opening at one end thereof;
a magnetic material secured to said body within said hollow and occupying a portion of said hollow;
said magnetic material provided with a slot opening into the remaining portion of said hollow;
a circular cutter insertably received into said remaining hollow portion releasably engageable with said magnetic material for removably securing said cutter to said body;
means cooperatively disposed between said magnetic material and said cutter for imparting rotary movement from said body to said cutter;
said rotary imparting means includes a pair of projections carried on said cutter engaged with said slot;
said body includes an extension adapted to be coupled to the chuck of said power means;
said cutter comprises a collar of reduced diameter insertable within said hollow and a portion of larger diameter extending away from said body;
said cutter includes a circular cutting edge defined by a circular rearwardly and outwardly diverging sloping surface; and
a threaded bolt securing said magnetic material to said body.

3,970,408
APPARATUS FOR USE WITH DELICATE FLUIDS

Edson Howard Rafferty, Excelsior, and Harold D. Kletschka, Minneapolis, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

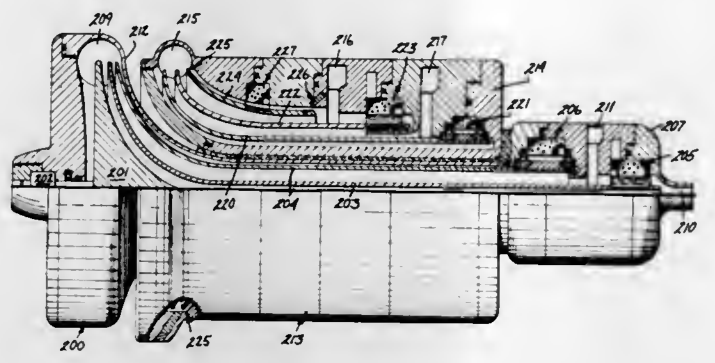
Continuation-in-part of Ser. No. 414,225, Nov. 9, 1974, which is a continuation-in-part of Ser. No. 204,980, Dec. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 886,137, Dec. 18, 1969, Pat. No. 3,647,324, which is a continuation-in-part of Ser. No. 678,265, Oct. 26, 1967, Pat. No. 3,487,784. This application Feb. 3, 1975, Ser. No. 546,347

Int. Cl.^{2} F01B *13/00, 1/36*

U.S. Cl. 415—60 **10 Claims**

1. In rotary pumping apparatus for generating flow with an axial component, in combination:

1. a first bladeless pump structure including means mounting and driving at least one elongated pumping member for rotation about a first axis to cause fluid flow along said axis;
2. a second, bladeless hollow pump structure including means mounting and driving at least one elongated pumping member for rotation about a second axis to cause fluid flow along said axis; and



3. means mounting said first pumping structure within said second pumping structure so that said first and second axes coincide and said fluid flows are in the same direction.

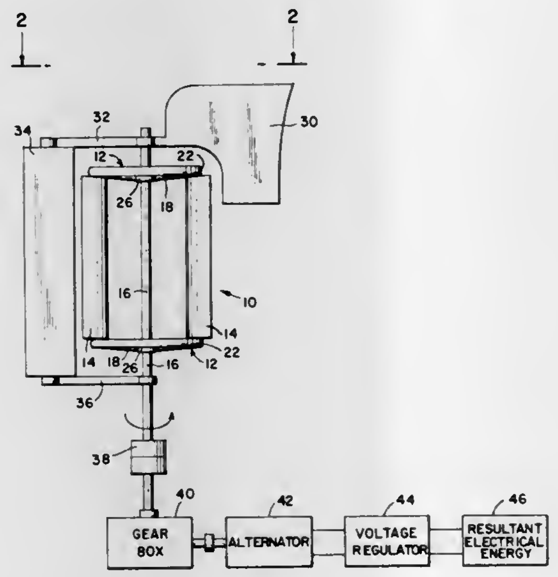
3,970,409
WIND POWER AND FLYWHEEL APPARATUS

George Luchuk, Millbrook, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 26, 1975, Ser. No. 562,187

Int. Cl.^{2} F03D *9/02*

U.S. Cl. 416—145 **3 Claims**



1. Flywheel apparatus having a variable moment of inertia comprising: a generally vertically directed elongated rotary shaft, an annular hub fixedly and coaxially carried about said shaft; a plurality of angularly spaced apart tubular spokes extending outward radially from said hub, said spokes being also upwardly inclined, making an angle of less than ninety degrees with the axis of said shaft, a toroidal hollow rim joined to the upper ends of said spokes in coaxial relationship about said hub in a manner enabling fluid communication between the interior of said spokes and the interior of said rim; the interiors of said spokes and said rim comprising a fluid-tight chamber; a heavy liquid in said chamber of a volulme for normally residing only in the interior of said spokes in the absence of rotation of said shaft; said liquid adapted to climb the interior walls of said upwardly inclined tubular spokes and reach the interior of said rim in response to the rate of rotation of said shaft exceeding a predetermined rate for increasing the moment of inertia of said flywheel apparatus.

3,970,410
ROTARY ACTUATORS SUITABLE FOR BLADED ROTORS

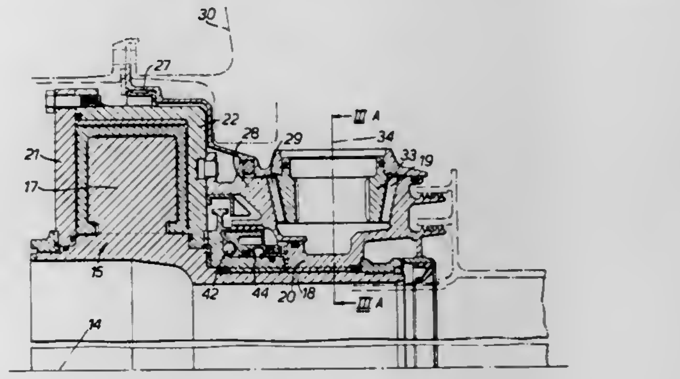
John Owen Hunt, Hucclecote, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Mar. 29, 1974, Ser. No. 456,209

Claims priority, application United Kingdom, Apr. 18, 1973, 18709/73

Int. Cl.^{2} B64C *11/40*

U.S. Cl. 416—154 **9 Claims**



1. A rotary actuator, suitable for use with rotors having flow-varying blading, for effecting adjustment of the blading, including two relatively-rotatable and co-axially-disposed main actuator components, abutment means carried by the first of said components and displaceable axially with respect to that component, further abutment means carried by and fast with respect to the second of said components, axially-displaceable holding means associated with said displaceable abutment means, anti-friction elements through the intermediary of which said holding means and said displaceable abutment means are together carried by said first component in a manner so as to permit the axial displacement thereof with respect to that component but to prevent relative rotation between those means and that component, said holding means being constructed so that in its operative position it holds the displaceable abutment means out of mechanical engagement with respect to said further abutment means whereby relative rotational movement between the two components occurs when one of them moves in either one of its two directions of rotation, and controlling means co-operable with said holding means and operative when said holding means is inoperative, for loading the displaceable abutment means into mechanical engagement with the further abutment means at any relative rotational position of said components, said engagement being such as to prevent relative rotational movement of the components as would otherwise occur with movement of said one component in one of its two directions of rotation, and being such as to permit relative rotational movement of the components arising from movement of said one component in the other of its said two directions.

3,970,411
IMPELLERS FOR CROSS-FLOW FANS

Knut Olof Lennart Wallman, Fergas AB, Oskarsgatan 10, S-582 21 Linkoping, Sweden

Continuation-in-part of Ser. No. 347,340, April 2, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,097

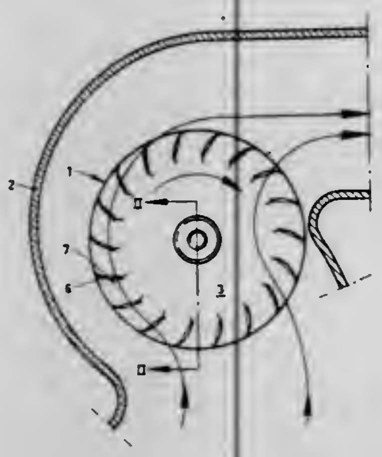
Int. Cl.^{2} F04D *29/28*

U.S. Cl. 416—178 **12 Claims**

1. A rotor for blowers, of the type comprising at least one disc that is normal and concentric to the rotor axis, and a number of elongated axially extending blades, each blade having a substantial curvature across its width that is uniform along most of its length and each blade being connected with said disc at a joint, said blades being disposed at uniform radial distances from the rotor axis and at equal angular distances from one another, each of said joints being characterized by:

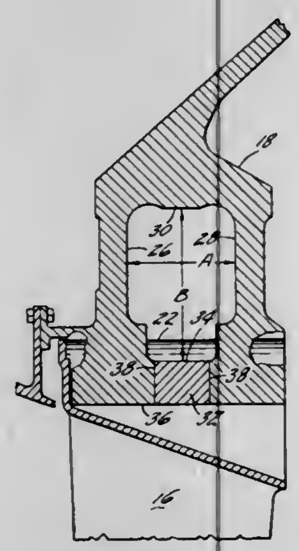
A. an indentation in the blade defining a mounting strip which is elongated transversely of the blade and which has a substantially lesser curvature along its length than said curvature of the remainder of the blade, the width of said strip being substantially equal to the thickness of the disc at the joint, and said strip being in flatwise offset relation to adjacent portions of the blade that have the first mentioned curvature; and

B. a slot in the disc opening to the periphery thereof and defining opposite spaced apart edges of the disc that overlie opposite faces of said strip and extend lengthwise along it, said edges on the disc being so configured and spaced apart, relative to the thickness of the strip and its profile in longitudinal section, that one face of the strip is engaged with one of said edges only at its opposite end portions and the other face of the strip is engaged with the other of said edges at a zone spaced from its opposite end portions, so that the blade is insertable edgewise into the slot and when received therein has the mounting strip flexed along its length to thus be held by said edges against movement relative to the disc.



3,970,412
CLOSED CHANNEL DISK FOR A GAS TURBINE ENGINE

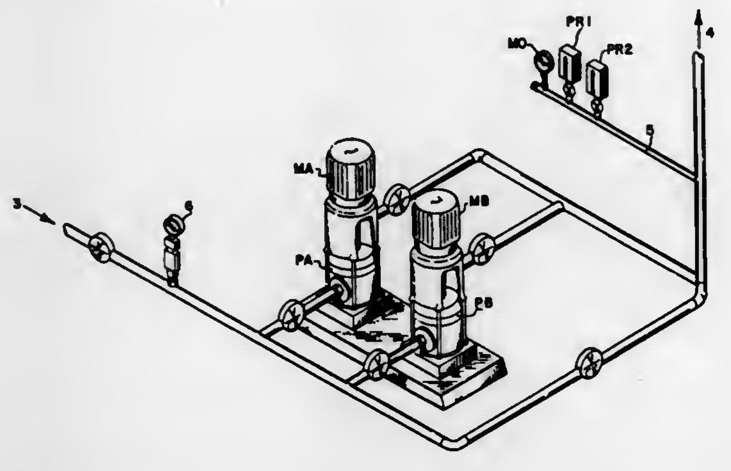
Cornelius V. Sundt, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Mar. 3, 1975, Ser. No. 554,806
Int. Cl.² F01D *5/30, 5/08*
U.S. Cl. 416—219 R **4 Claims**



1. A rotor assembly for a gas turbine engine comprising:
a blade support disk having an upstream web, a downstream web and an arcuate plug joining the upstream web to the downstream web at the periphery of the disk, and having a plurality of essentially axial slot machined into the outer periphery of the disk; and
a plurality of compressor blades, one blade extending a radially outward direction from each axial slot in the disk.

3,970,413
FLUID DISTRIBUTION APPARATUS AND METHOD

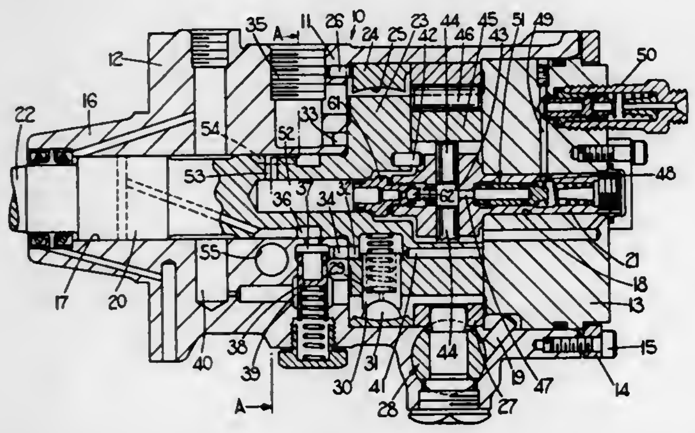
Francois Duveau, 74 Rue Michel Ange, Paris 16°, France
Continuation-in-part of Ser. No. 219,966, Jan. 24, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,090
Int. Cl.² F04B *41/06, 19/00, 37/00*
U.S. Cl. 417—7 **8 Claims**



1. In a fluid distribution system including a fluid source and a fluid distribution circuit the improvement comprising:
booster pump means, said pump means including at least a first motor-pump group, said motor-pump group comprising a centrifugal pump controlled by a reversible motor and connected between the source and distribution circuit; and
means for selectively controlling said motor for rotation in a first direction to provide a first flow rate and in the second direction to provide a second flow rate in response to a predetermined variation of flow in the distribution circuit.

3,970,414
LIQUID FUEL INJECTION PUMPING APPARATUS

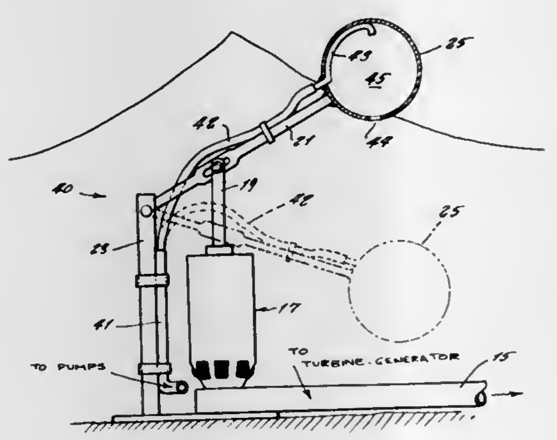
Dorian Farrar Mowbray, Burnham, England, assignor to C.A.V. Limited, Birmingham, England
Filed Dec. 30, 1974, Ser. No. 537,410
Claims priority, application United Kingdom, Nov. 11, 1974, 361/74
Int. Cl.² F04B *3/00, 19/02, 29/00*
U.S. Cl. 417—252 **15 Claims**



1. A liquid fuel pumping apparatus for supplying fuel at high pressure to a direct injection internal combustion engine, and comprising: a body part, a cylindrical rotor mounted within the body part and rotatable in synchronism with the engine, a transversely disposed bore formed in the rotor and a pair of pumping plungers housed in the bore, cam means for imparting inward movement to the plungers, first passage means in one part of the rotor communicating with said bore, inlet port means in said body part, a plurality of outlet ports formed in the body part and with which said first passage means registers in turn during successive delivery strokes of the plungers, whereby fuel at high pressure is supplied to the outlets, a fuel feed pump for supplying fuel at low pressure, second passage means in another part of the rotor for registration with said inlet port means, control means for controlling the fuel flow to the inlet port means for said feed pump when said second passage means is in register therewith, and a one way valve incorporated in said second passage means, said one way valve allowing flow of fuel only from the feed pump to said bore, said one part of the rotor having a smaller diameter than said another part of the rotor, whereby said outlet ports are disposed at a smaller radial distance from the axis of rotation of the rotor than said inlet port means.

3,970,415
ONE WAY VALVE PRESSURE PUMP TURBINE GENERATOR STATION

Kaj Widecrantz, P.O. Box 72, and William R. Gatton, P.O. Box 222, both of Port Republic, N.J. 08241
Filed Apr. 10, 1975, Ser. No. 566,794
Int. Cl.² F04B *17/00, 35/00*
U.S. Cl. 417—332 **2 Claims**

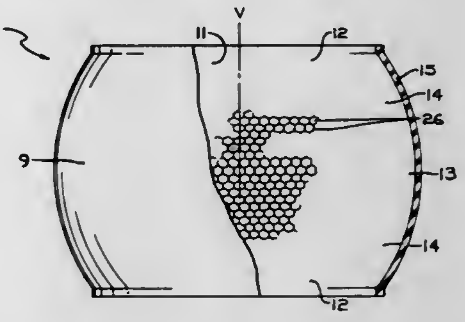


1. In a one way valve pressure pump turbine generator station assembly, the combination of an apparatus installed underwater in a sea, a power station ashore installed with turbine generators, and a duct between said apparatus and said generators, said apparatus comprising a plurality of units each of which consist of a cylinder having inlet ports for receiving sea water, an outlet port for delivering said sea water into said duct, a piston inside said cylinder, a piston rod of said piston being connected to an arm pivoted at one end about a pivot pin on a stationary post, an opposite end of said arm having a hollow ball filled with air for floating on a surface of said sea, wherein one way valves are installed at said inlet and outlet ports and along said duct, wherein an air line communicates between pumps upon a shore and an interior of said ball, and an opening in a lower end of said ball for said sea water entering or leaving said ball.

3,970,416
REINFORCED MEMBRANE

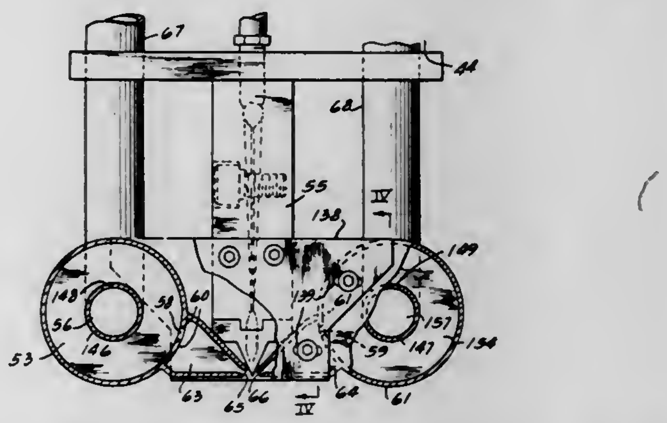
William F. Mattson, Hinckley, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed July 14, 1975, Ser. No. 595,880
Int. Cl. B29h *5/18*
U.S. Cl. 425—52 **8 Claims**

1. A curing membrane comprising:
a. a wall having an inside surface, and
b. a plurality of groups of adjoining ribs integrally molded to the inside surface of the wall wherein:
1. the groups of ribs collectively form a plurality of adjoining hexagons, and
2. each rib is a common side of two adjacent hexagons.



3,970,417
TWIN TRIPLE CHAMBERED GAS DISTRIBUTION SYSTEM FOR MELT BLOWN MICROFIBER PRODUCTION

Robert E. Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.
Filed Apr. 24, 1974, Ser. No. 463,461
Int. Cl.² B29D *7/20*
U.S. Cl. 425—72 S **9 Claims**



1. Apparatus adapted for melt blown microfiber production comprising:
A. a pair of elongated distribution conduit means in spaced relationship to each other, each such distribution conduit means defining therewithin an elongated first plenum chamber and having first input port means defined therein and a plurality of first output port means defined in longitudinally extending wall portions thereof,
B. a pair of elongated first plenum housing means in spaced relationship to each other, and to said pair of distribution conduit means, each one of said pair of first plenum housing being in a transversely spaced, adjacent, circumscribing associated relationship to a different one of each of said pair of distribution conduit means longitudinally therealong, each such first plenum housing means having second output port means defined in longitudinally extending wall portions thereof, and further having the opposed end regions thereof in fluid-tight engagement with the adjacent opposed end portions of the distribution conduit means so circumscribed thereby, each such so associated said distribution conduit and said first plenum housing means defining therebetween an elongated second plenum chamber,
C. a pair of elongated second plenum housing means, each one longitudinally extending along, and being interconnected in fluid-tight engagement with, a different one of said first plenum housing means, with opposed, longitudinally extending wall portions of each said second plenum housing means terminating on its associated respective first plenum housing means in laterally spaced relationship to at least one side of said second output port means thereof each one of said second plenum housing means

having a longitudinally elongated third plenum chamber defined therein and a longitudinally elongated output orifice defined therein, said second output port means communicating with said third plenum chamber, each one of said output orifices being in spaced, parallel relationship to the other thereof and oriented angularly so that cross sectionally the angle of inclination between respective center lines of said output orifices relative to each other ranges from about 90° to 180°, and an elongated separate die interposed in spaced relationship between said pair of output orifices, said die body —

1. having a forwardly located, elongated narrow planar die face,
2. having a pair of forwardly tapered, exterior, opposed side walls adjoining said die face,
3. having a plurality of die orifices defined in said die face and adapted for simultaneous extrusion therefrom of a plurality of spaced, aligned strands of a melt,
4. having a melt input port, and
5. being adapted to distribute therewithin generally uniformly a melt entering said input port and exiting from said orifice plurality,

said die body being interposed between each of distribution conduit means and in spaced relationship to each one of said pair of elongated second plenum housing means, said first, second, and third plenum chambers coacting with said die body so that during operation of said apparatus, gas streams issuing from respective ones of said output port means define a pair of angularly colliding elongated gas streams such that the colliding occurs downstream in spaced relationship to said plurality of orifices.

3,970,418

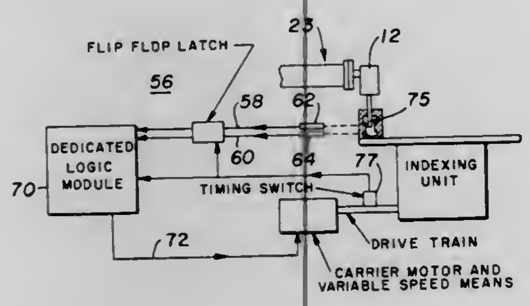
APPARATUS IMPROVEMENTS FOR CONTROLLING PARISON LENGTH

Michael H. Turek, Ledyard, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 495,627, Aug. 8, 1974, Pat. No. 3,943,214. This application Aug. 6, 1975, Ser. No. 602,270

Int. Cl.² B29D *23/03*

U.S. Cl. 425—140 **3 Claims**



1. In blow molding apparatus which includes:

a downwardly directed extrusion head having a vertically disposed annular orifice for shaping a freely pendant hollow thermoplastic parison therein;

a carrier supporting a plurality of molds generally adjacent said head;

drive means to move the carrier to consecutively position such molds beneath the head to receive portions of such parison for blow molding therein;

means responsive to a control signal for regulating the length of a parison section protruding beyond the cavity of successively presented molds; and

means for severing the parison from the orifice;

the improvement in said apparatus whereby the amount of said length is varied without causing a related change in the rheological properties of the thermoplastic forming the parison, which improvement comprises, in combination:

variable speed means for said drive means responsive to said control signal for changing the speed of said carrier to vary the rate at which consecutive molds are presented beneath the head.

3,970,419

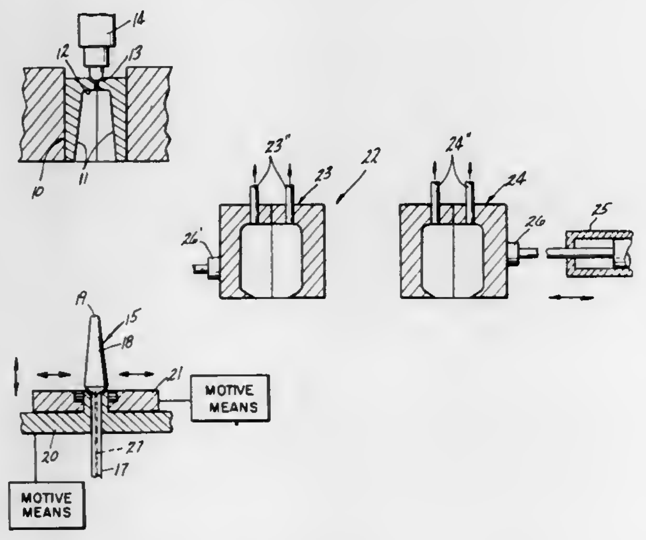
APPARATUS FOR CONTROLLED PROCESSING OF BLOWN PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 473,580, May 24, 1974. This application June 14, 1974, Ser. No. 479,287

Int. Cl.² B29C *1/00, 17/00*

U.S. Cl. 425—242 B **35 Claims**



1. An apparatus for forming objects of moldable organic plastic material which comprises: at least one core; means cooperating with said at least one core and aligned therewith for providing a parison thereon; a first mold spaced from said at least one core and engageable with said parison having a cavity therein; means associated with said at least one core and said first mold for bringing together and for separating said core and said first mold; means operatively connected to and carried by said at least one core for expanding said parison away from said core to form a hollow object within said first mold; at least one second mold in spaced relationship to said first mold for adjusting the temperature of said hollow object; and means associated with at least one core for transferring said hollow object from said first mold to said second mold and retaining same in said second mold free from said core for adjusting the temperature of said hollow object.

3,970,420

ACTUATING ARRANGEMENTS FOR A CIGARETTE LIGHTER

Kenjiro Goto, Saitama, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Oct. 16, 1974, Ser. No. 515,213

Claims priority, application Japan, Oct. 18, 1973, 48-120844; Dec. 28, 1973, 49-395

Int. Cl.² F23Q *2/16*

U.S. Cl. 431—255 **17 Claims**

1. A lighter comprising

a casing having a cylindrical shape;

a fuel tank disposed within said casing;

a fuel spout valve fixed on said fuel tank;

a burner connected to said fuel spout valve through a connecting tube;

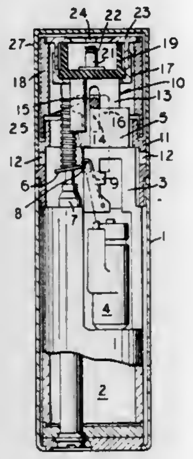
a valve opening member for controlling said fuel spout valve to issue fuel gas from said burner;

a spark gap provided around said burner;

an ignition mechanism housed in said casing for discharging a spark at the spark gap so as to ignite the fuel gas emitted by said burner;

an actuator supported to said casing and rotatable around a longitudinal axis of said casing;

means operatively associated with said actuator for transmitting the rotational movement of said actuator to said ignition mechanism and to said valve opening member whereby to operate said ignition mechanism and said valve opening member; and



a mounting block located on said fuel tank and supported on said actuator for mounting said actuator rotatably around a longitudinally central axis of said casing.

3,970,421

BLOW MOULDING METHOD

Lawrence A. Moore, King of Prussia, Pa., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 232,645, March 7, 1972, Pat. No. 3,852,398, which is a division of Ser. No. 3,003, Jan. 15, 1970, abandoned. This application Oct. 3, 1974, Ser. No. 512,062

Int. Cl.² F27D *3/00*

U.S. Cl. 432—11 **4 Claims**

1. A method for converting a tubular parison of thermoplastic material into a finished article comprising the steps of:

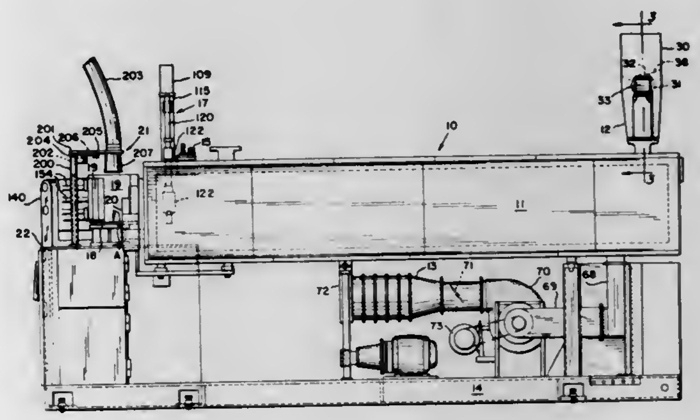
inserting said parison on a parison carrying device;

engaging the inner wall of said parison with said carrying device;

heating the parison to a forming temperature by moving the parison on the carrying device;

continuously conveying the parison and the carrying device through the oven to uniformly heat the parison;

inserting a transfer device into the oven;



moving the transfer device in the oven at the same velocity as the parison so that there is zero relative velocity between the transfer device and the parison;

grasping the parison with said transfer device

and lifting the parison from said carrying device during said period of zero relative velocity;

and removing the parison from the oven for transfer to said article forming means.

CHEMICAL

3,970,422

METHOD OF IMPROVEMENT IN COLORING GLASS FABRICS

Kozo Maeda, and Masakazu Date, both of Takatsuki, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan
Filed Nov. 5, 1974, Ser. No. 521,057
Claims priority, application Japan, Nov. 9, 1973, 48-126583
Int. Cl.^{2} D06P *3/80*

U.S. Cl. 8—8 **22 Claims**

1. A method for coloring a glass fabric which comprises treating the glass fabric with a combination of one or more sulfur-oxygen containing acids or peroxy acids or a water-soluble salt thereof and one or more organic or inorganic water-soluble salts of an inorganic acid or an organic acid with a metal of Group I or Group II of the Periodic Table and/or with an ammonium group, and then dyeing the treated glass fabric with a basic dye, whereby the resultant fabric has an improved dyeing property and loop strength.

3,970,423

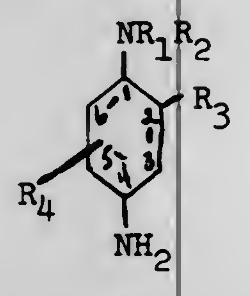
OXIDATIVE HAIR DYE COMPOSITIONS

Frederick Brody, New York, and Stanley Pohl, New Rochelle, both of N.Y., assignors to Clairol Incorporated, New York, N.Y.
Division of Ser. No. 186,475, Oct. 4, 1971, Pat. No. 3,884,627. This application Feb. 6, 1975, Ser. No. 547,675
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.^{2} A61K *7/12*

U.S. Cl. 8—10.2 **15 Claims**

1. A non-toxic oxidation hair dye composition comprising an aqueous carrier, as a para component from about .1% to 6% by weight based on the total weight of the composition of a compound of formula:

a.



or acid addition salts thereof and

- b. from about 0.1% to 8% by weight based on the total weight of the composition of an oxidatively couplable component comprising a phenol which couples with said para component to give blue or violet compounds wherein:

R_1 is hydroxyalkyl;
R_2 is hydrogen or hydroxyalkyl;
R_3 is hydrogen, alkyl, alkoxy or halogen; and
R_4 occupies any one of the remaining positions on the benzene ring and is hydrogen, alkyl, alkoxy or halogen;
and wherein the alkyl or alkoxy contains 1 to 6 carbon atoms and the hydroxyalkyl contains 2 to 6 carbon atoms;
providing that R_2 is hydrogen when R_3 is alkyl, alkoxy or halogen;
and providing that at least two of R_2, R_3 or R_4 are other than hydrogen.

3,970,424

DURABLE PRESS TREATMENT BY ADDITION OF SODIUM DIHYDROGEN PHOSPHATE TO ALUMINUM SULFATE CATALYST

Russell M. H. Kullman, Metairie, and Robert M. Reinhardt, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Aug. 14, 1975, Ser. No. 604,853
Int. Cl.^{2} D06M *13/40*

U.S. Cl. 8—185 **4 Claims**

1. In a process for producing durable press textiles comprising impregnating cellulose-containing fabric with aqueous formulations containing an N-methylol amide crosslinking agent and aluminum sulfate catalyst, drying, and curing the fabric, the improvement which consists of adding sodium dihydrogen phosphate to said formulations to give finished fabrics with increased strength and no coloration.

3,970,425

FLAME RETARDANT PROCESS FOR TEXTILE MATERIALS INCLUDING PHOSPHORUS, HALOGEN AND ANTIMONY OXIDE

Robert Bruce Leblanc, and Destin A. Leblanc, both of Wickford, R.I., assignors to Cotton Incorporated, New York, N.Y.
Filed Apr. 15, 1974, Ser. No. 461,212
Int. Cl.^{2} D06M *13/26, 13/44*

U.S. Cl. 8—195 **9 Claims**

1. In a process wherein durable flame retardant properties are imparted to a web of cellulosic or protein fiber material by treatment thereof with a phosphorus-containing flameproofing agent which is affixed to the fiber in an amount of from about 0.5 to about 5 percent phosphorus by weight of the fiber and which has ion exchange capability and thereafter applying to said treated web a titanyl sulfate solution to improve the durability of the flame retardant properties, the improvement which comprises applying said phosphorus-containing flameproofing agent in correlation with antimony oxide and a flame retardant polymeric halogen-containing material selected from the group consisting of halogenated vinyl and vinylidene polymers and copolymers to affix on the fiber an amount of from about 0.5 to about 10 percent of the total of (phosphorus plus antimony plus halogen) by weight of the fiber whereby said phosphorus-containing flameproofing agent is applied in reduced amounts as compared to the treatment without correlation with said antimony oxide and flame-retardant polymeric halogen-containing material without substantially adversely affecting the flame retardant properties of the treated web.

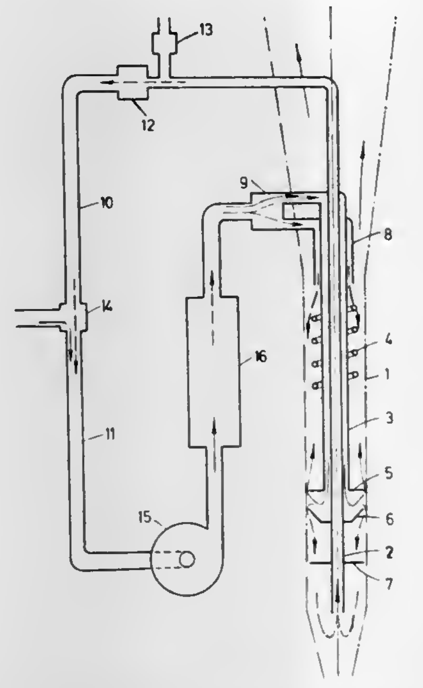
3,970,426

METHOD AND APPARATUS FOR THE PRESTERILIZATION OF PACKING MACHINES

Sven Olof Sören Stark, Rydsgard; Jan Axel Ingemar Rausér, and Irma Marita Rausér, both of Lomma, all of Sweden, assignors to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Mar. 11, 1975, Ser. No. 557,398
Claims priority, application Sweden, Mar. 18, 1974, 7435825
Int. Cl.^{2} A61L *3/00, 13/06*

U.S. Cl. 21—54 R **5 Claims**

1. A method to pre-sterilize a packaging machine which supplies a product through a filling tube into a web of paper and forms the web of paper into a succession of product filled packages comprising the steps of: providing a supply of air into the machine, converting a portion of the oxygen in the air to ozone by subjecting the air to radiation and recirculating the ozone produced through the filling tube of the machine for pre-determined length of time.



3,970,427

PROCESS FOR REDUCING STICKING OF BLOOD CELLS TO GLASS IN BLOOD TESTING PROCEDURES

Vito M. Esposito, and Stanley B. Weinstein, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Mar. 22, 1973, Ser. No. 343,973
Int. Cl.^{2} G01N *33/16, 31/00*

U.S. Cl. 23—230 B **3 Claims**

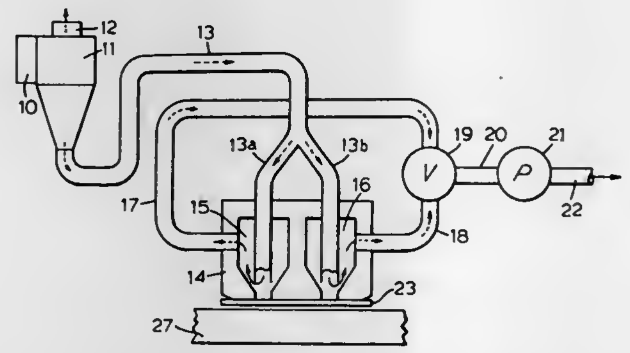
1. A blood testing procedure in which blood cells are disposed in close relation to glass surfaces, comprising the step of suspending said cells in a sterile physiological saline solution containing gelatin in a concentration range of approximately 0.001 to 2.0 percent, said gelatin being effective to reduce attraction forces between said blood cells and said glass surfaces.

3,970,428

METHOD AND APPARATUS FOR COLLECTING ATMOSPHERIC SAMPLES IN ATMOSPHERIC GEOCHEMICAL PROSPECTING

Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada
Filed Nov. 6, 1975, Ser. No. 629,264
Claims priority, application United Kingdom, Nov. 23, 1974, 50849/74
Int. Cl.^{2} G01N *33/24*

U.S. Cl. 23—230 EP **10 Claims**



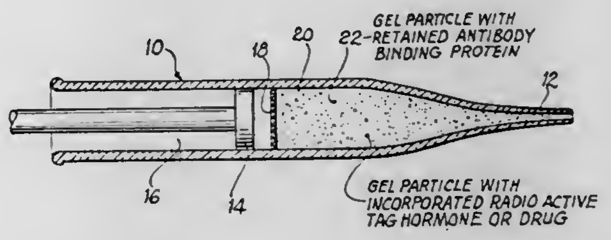
1. In a method of airborne geochemical prospecting wherein samples of atmospheric gases, vapours or particulates are collected and analyzed for content of predetermined elements or compounds, the improvement wherein contemporaneously with the collection of said samples, the atmosphere in the vicinity of the place of collection of said samples is monitored to determine whether the respective samples were uplifted by an updraft of air, and wherein samples respectively collected during periods of updrafts are separated from the remainder of said samples and are analyzed separately.

3,970,429

METHOD FOR IMMUNOLOGICAL DETERMINATIONS

Stuart J. Updike, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.
Continuation-in-part of Ser. No. 356,092, May 1, 1973. This application Jan. 28, 1974, Ser. No. 437,135
Int. Cl.^{2} G01N *31/06*

U.S. Cl. 23—230.6 **13 Claims**



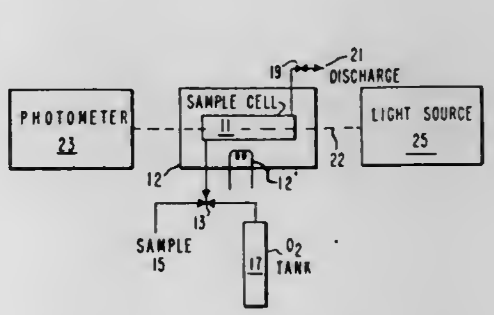
1. In a method for immunological determinations in which use is made of a volume of hydrophilic, insoluble, porous polyacrylamide gel particles containing proteins having binding sites, introducing a fluid to be tested into the volume whereby some of the binding sites become occupied, exposing the gel particles to radioactive tagged material, and then measuring the radioactivity of the unbound tagged material or bound tagged material, the improvement of regenerating the volume of gel particles for re-use in subsequent immunological determinations comprising the steps of exposing the volume of gel particles to acidic wash solution to effect detachment of material bound to the binding sites of the protein, washing the volume of gel particles to elute the unbonded material, washing the volume of gel particles with a highly volatile organic liquid which has an affinity for water for removal of aqueous medium, and then removing the organic liquid to return the gel particles to the dried and collapsed state for subsequent use in an immunological determination.

3,970,430

METHOD AND APPARATUS FOR NO$_x$ ANALYSIS

John R. Reader, Jr., Middletown; James L. Seago, Wilmington, and James A. Williamson, Jr., Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 17, 1974, Ser. No. 515,709
Int. Cl.^{2} G01N *21/24*; G01J *1/42*

U.S. Cl. 23—232 R **15 Claims**



9. A method for measuring the concentration of NO$_x$ in a sample gas comprising the following steps:

- a. introducing a known volume of the sample gas into a gas-tight sample cell;

- b. introducing at least about 2 atmospheres of an oxygen-containing gas into the cell to form a gas mixture with the sample gas;
- c. controlling the temperature and pressure of the gas mixture;
- d. passing detecting radiation of a wavelength between about 410 to about 600 nm. through the gas mixture in the cell, said detecting radiation being of a wavelength strongly absorbed by NO_2; and
- e. measuring, at the same given time, the absorbance and the time rate of change of absorbance of the detecting radiation passing through the cell by the gas mixture in the cell, the sum of the measured absorbance and the measured time rate of change of absorbance being indicative of the initial NO_x content of the sample gas.

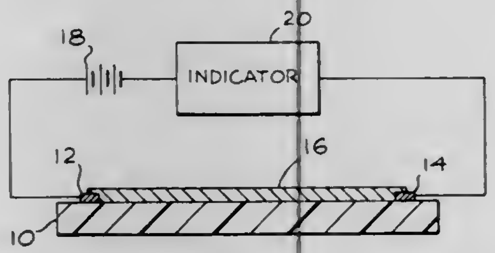
3,970,431
CARBON MONOXIDE GAS DETECTOR

Henry Wise, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 435,631, Jan. 23, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,481

Int. Cl.² G01N *27/12, 31/00*

U.S. Cl. 23—232 E **9 Claims**



1. A method of measuring the presence and the amount of carbon monoxide present in gases comprising
   exposing a body consisting of silver oxide to said gases, and
   measuring the change of electrical conductivity of said body of silver oxide in response to carbon monoxide in said gases.

3,970,432
MULTISTAGE VERTICAL EXTRACTOR FOR LIQUID-LIQUID COUNTERFLOW EXTRACTION

Hans-Martin Stönner, Schwalbach; Berthold Scholz, Oberursel, and Rainer Hartmann, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 6, 1974, Ser. No. 448,510

Claims priority, application Germany, Mar. 8, 1973, 2311358

Int. Cl.² B01D *11/04*

U.S. Cl. 23—270.5 T **1 Claim**

1. A multistage vertical extractor for liquid-liquid extraction with a heavy liquid phase and a light liquid phase, said extractor comprising:

means including a plurality of vertically spaced bottoms for defining a multiplicity of vertically superposed separation compartments, each forming a respective one of the stages and adapted to receive a layer of the heavy phase upon each bottom and a layer of the light phase above the layer of the heavy phase and defining an apparent interface therewith;

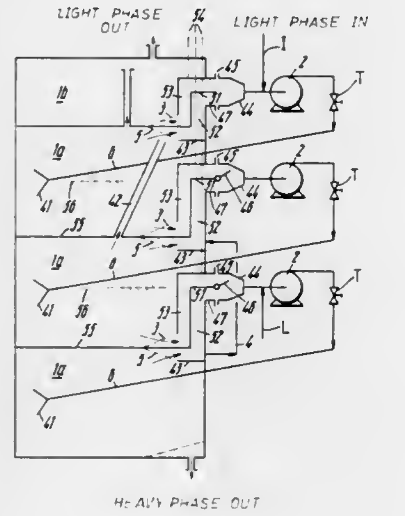
means defining a pair of horizontal lateral liquid outlets opening above and below each of said bottoms and directly adjacent same, each pair of outlets respectively communicating with the layer of said heavy phase of one stage above the respective bottom and with the layer of said light phase of the next lower stage below the respective bottom;

a respective mixing pump associated with each of said pairs of lateral liquid outlets and having an intake side and a discharge side, said discharge side of each pump communicating with one of the separation compartments into which an outlet of the respective pair opens, each such pump having its intake side disposed at a level intermediate the bottoms of a separation column immediately above the separation column into which its discharge side opens, said level corresponding to the level of the interface of the separation column intermediate the bottoms of which the respective pump is disposed;

respective pairs of upcomers each rising from one of the lateral liquid outlets of a respective pair substantially to said level;

respective pairs of lateral ducts extending horizontally from and communicating with respective upcomers of a respective pair, each pair of ducts merging into a common chamber at the level of an intake side of a respective pump, said ducts of each pair having a common wall at the latter level defining a respective discharge edge, each of said chambers communicating with a respective intake side of the respective pump at the said level thereof;

a respective hinged valve flap on each discharge edge in the respective chamber at the respective intermediate level for controlling the relative flows of liquid from the outlets of each pair to the respective pump intake side, each discharge edge being disposed at a distance above the bottom of a respective compartment at least equal to the height of a phase to be retained therein upon termination of operation of said pumps.



3,970,433
RECORDING SURFACE SUBSTRATE

Gary Paul Warmka, Minneapolis, and James Dan Hill, Bloomington, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 23, 1975, Ser. No. 589,101

Int. Cl.² B32B *15/00*

U.S. Cl. 29—194 **8 Claims**

1. An improved substrate providing an area on which a cobalt magnetic recording layer may be plated, comprising:
- a. an inner non-magnetic polished nickel layer on the area;
- b. a deposited gold layer on the inner nickel layer sufficiently thick to eliminate non-uniformity thereof and sufficiently thin to substantially maintain the smoothness of the inner nickel layer; and
- c. an outer non-magnetic deposited nickel layer on the gold layer sufficiently thick to eliminate porosity therein and sufficiently thin to substantially maintain the smoothness of the gold layer.

3,970,434
PROCESS FOR REDUCING SULFUR IN COAL CHAR

Stanley J. Gasior, Pittsburgh; Albert J. Forney, Coraopolis; William P. Haynes, Pittsburgh, and Richard F. Kenny, Venetia, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 7, 1974, Ser. No. 512,819

Int. Cl.² C10L *9/10;* **C10J** *3/00;* **C10B** *57/00*

U.S. Cl. 44—1 F **3 Claims**

1. A method of reducing sulfur emission in the combustion of coal char produced during gasification of coal and of enhancing carbon gasification conversion comprising mixing coal particles and particles of an additive in a proportion of 1 to 5 weight percent respecting said coal, said additive being selected from the group consisting of alkaline earth oxides, hydroxides, carbonates and mixtures thereof, and reacting said coal particles with steam and oxygen at a temperature of 800° to 1,050°C. at a pressure of about 600 psig within a fluidized bed of said coal particles and said additive particles to produce said coal char having an alkaline earth oxide in mixture therewith and product gas including carbon monoxide, carbon dioxide, hydrogen, hydrocarbon gases and gaseous sulfur compounds, said coal char with said alkaline earth oxide having reduced sulfur content in respect to that of said coal; and burning said coal char in mixture with said alkaline earth oxide whereby gaseous sulfur oxide emissions are at least partially captured.

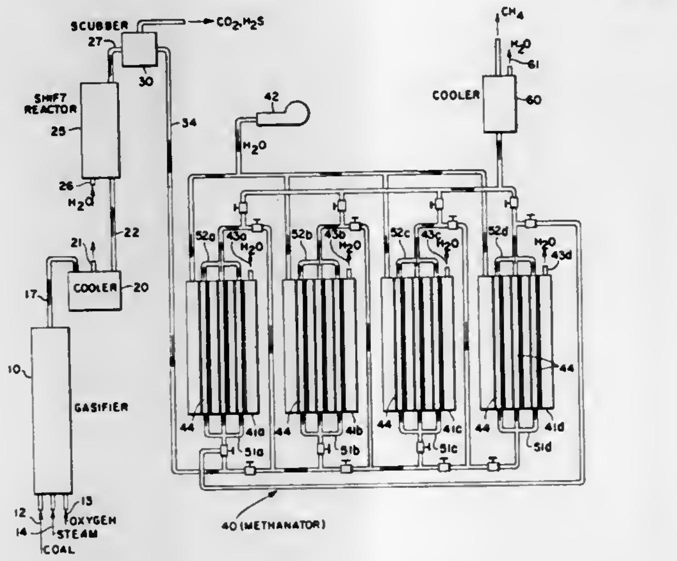
3,970,435
APPARATUS AND METHOD FOR METHANATION

Thomas J. Schultz, Toledo, and Klaus H. Hemsath, Sylvania, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 27, 1975, Ser. No. 562,796

Int. Cl.² B10J *7/00;* **C10J** *1/00*

U.S. Cl. 48—61 **9 Claims**



1. Apparatus for producing a synthetic gas from a feed gas in an exothermic reaction, said feed gas including reductants and synthetic gas, said apparatus comprising:

a first methanator vat;

a second methanator vat;

a first plurality of elongated heat exchange enclosures disposed within said first methanator vat;

a second plurality of elongated heat exchange enclosures disposed within said second methanator vat;

each heat exchange enclosure having an open inlet end, an open outlet end and a constant cross-section;

first conduit means connecting said feed gas to said inlet ends of said first plurality of heat exchange enclosures;

second conduit means connecting said outlet end of said first plurality of heat exchange enclosures with said inlet ends of said second plurality of heat exchange enclosures for transmitting said feed gas from said first plurality of heat exchange enclosures to said second plurality of heat exchange enclosures;

means for feeding said feed gas through said first conduit means at a temperature sufficient to react said reductants in an exothermic reaction and at a pressure sufficient to carry said feed gas through said first and second heat exchange enclosures at a predetermined velocity to produce said synthetic gas;

first catalytic insert means disposed within said first plurality of heat exchange enclosures dividing each enclosure into a plurality of ducts and having a first degree of reacitivity effective when said feed gas is contacted therewith to generate a generally constant quantity of heat throughout the length of said first plurality of heat exchange enclosures;

second catalytic insert means disposed within said second plurality of heat exchange enclosures dividing each second enclosure into a plurality of ducts and having a second degree of reactivity higher than said first degree of reactivity effective when said feed gas is contacted therewith to generate a generally constant quantity of heat throughout the length of said second plurality of heat exchange enclosures;

cooling means disposed only within each methanator vat and including a liquid surrounding the exterior of each heat exchange enclosure for dissipating a significant portion of said heat generated in said exothermic reaction.

3,970,436
GAS PRODUCER ARRANGEMENTS

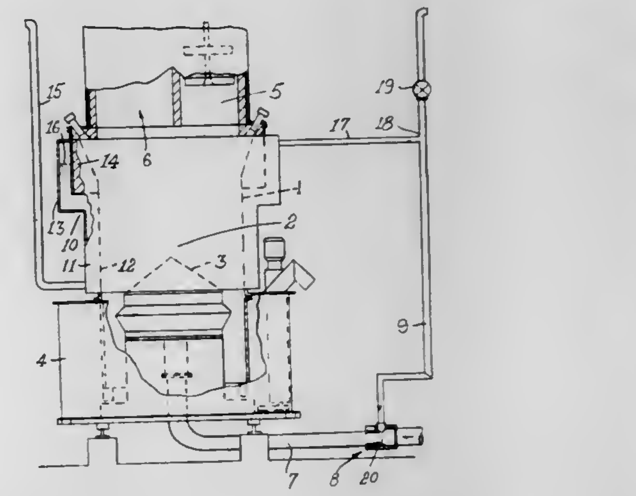
Gerald Sydney Victor Livemore, 71, 7th St., Parkmore, Sandton, Transvaal, South Africa

Filed Aug. 12, 1975, Ser. No. 603,971

Claims priority, application South Africa, Aug. 20, 1974, 74/5325

Int. Cl.² C10J *3/76, 3/68*

U.S. Cl. 48—76 **2 Claims**



1. In a steam generating system for gas producers of the type including a combustion chamber having a grate for the introduction of an air blast with steam entrapped therein and an annular water jacket surrounding the combustion chamber, the improvement comprising:

an open inwardly directed vent pipe communicating with the lower part of the water jacket;

a steam exhaust line communicating at one end with the upper part of the jacket;

an air blast conduit opening to the grate in the combustion chamber, said exhaust line being connected at its other end to a juncture with said conduit for entry and transmission of steam with the air blast to the grate, the air blast conduit immediately downstream from said juncture of said conduit with said exhaust line defining a venturi throat; and

a safety valve in said exhaust line adapted to respond to temperature changes in the air blast conduit at said juncture.

3,970,437
ELECTRIC DUST SEPARATOR

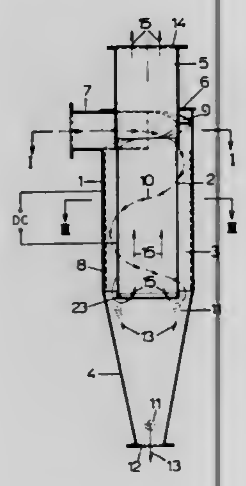
Alfred Erich Wibrandt Van Diepenbroek, Ermelo; Jan Hendrik Wormgoor, Amersfoort, and Cornelis Schilperoort, Ermelo, all of Netherlands, assignors to Bronswerk Apparatenbouw B.V., Nijkerk, Netherlands

Filed Mar. 4, 1974, Ser. No. 447,775

Claims priority, application Netherlands, Mar. 6, 1973, 7303156

Int. Cl.² B03C *3/14*

U.S. Cl. 55—127 **4 Claims**



1. An apparatus of the dipole separator type for removing dust particles from a gas stream, comprising a metallic cylindrical inner wall constituting a first electrode; a coaxial cylindrical outer wall formed of an electrically insulating material; a second electrode carried by said outer wall and comprising a plurality of parallel, axially directed, electrically interconnected electrodes formed of a conducting material coated with an electrically insulating material to prevent the formation of a corona discharge; a source of electrical potential connected to said first and second electrodes for generating a difference in electrical potential between said first and second electrodes so that a unidirectional electric field is formed between said first and second electrodes, the intensity of said electric field increasing from said inner wall toward said outer wall and being locally concentrated at said outer wall but homogeneous at said inner wall; said walls defining therebetween a separating space having a main axis, an inlet end and an outlet end; and means at said inlet end for introducing a gas stream into said space so that the same flows through said space in a helical path.

3,970,438
DEAERATING ARRANGEMENT FOR DIALYZER

Claudio Sama, Mirandola, Italy, assignor to Sandoz Ltd., Basel, Switzerland

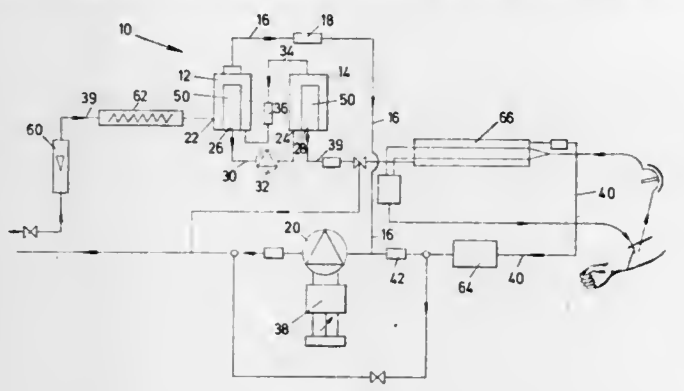
Filed Nov. 11, 1974, Ser. No. 522,896

Claims priority, application Italy, Nov. 15, 1973, 40103/73

Int. Cl.² B01D *19/00*

U.S. Cl. 55—190 **3 Claims**

1. A deaerating arrangement for deaerating dialysis liquid in dialysis equipment of the type comprising a dialysis liquid feed line leading to a dialysis device and a dialysis liquid take-off line leading from the dialysis device, wherein the deaerating arrangement comprises a pair of deaerating chambers provided in series in the dialysis liquid feed line, the dialysis liquid outlet of the deaerating chamber first in series then leading to the dialysis liquid inlet of the deaerating chamber second in series, a feed back line leading from the head of the deaerating chamber second in series back to the base end of the deaerating chamber first in series through a first liquid flow-rate restrictor then being provided a deaerating line which leads off from the head of the deaerating chamber first in series through a second liquid flow-rate restrictor to an evacuation pump which, in operation, creates a negative pressure in the deaerating chamber first in series and withdraws air or gas formed in said first in series deaerating chamber, whereby the negative pressure created in the deaerating chamber first in series is transferred to the deaerating chamber second in series and whereby air or gas formed in the deaerating chamber second in series is withdrawn into the deaerating chamber first in series, the deaerating chamber further comprising a cylindrical housing having a base end into and from which the dialysis liquid inlet and dialysis liquid outlet pass and having a head end from which the deaerating line leads, a cylindrical divider chamber dividing said dialysis liquid inlet from said dialysis liquid outlet mounted inside the cylindrical housing on said base end over said dialysis liquid outlet and terminating short of said head end, and a foraminous mass located in the volume defined between the cylindrical housing and the cylindrical divider chamber to encourage bubble formation under the negative pressure created by the evacuation pump as dialysis liquid passes through the dialysis liquid inlet into the deaerating chamber upwardly through the foraminous mass and then downwardly in the cylindrical divider chamber to the dialyser liquid outlet.



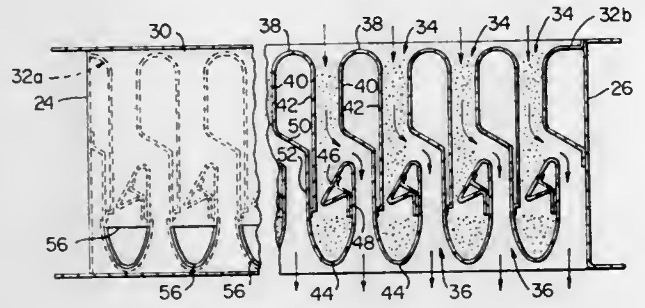
3,970,439
PARTICLE SEPARATOR

Joseph P. Murphy, Newtown, Conn., assignor to Avco Corporation, Stratford, Conn.

Continuation-in-part of Ser. No. 406,740, Oct. 15, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,243

Int. Cl.² B01D *45/04*

U.S. Cl. 55—306 **3 Claims**



1. A particle separator for separating and removing foreign particles from an airstream supplied to an engine air intake passage, said particle separator comprising:

an independent housing mounted adjacent said engine air intake passage, said housing being in communication with said engine air intake passage;

a plurality of channel assemblies mounted in parallel side-by-side relationship within said housing, adjacent assemblies defining separate tortuous passageways, each of said tortuous passageways including two turns each of less than 90°, each of said passageways being defined by said adjacent assemblies and having an air inlet and an air outlet, said air outlet being parallel to and displaced transversely from said air inlet, each of said channel assemblies comprising a curved forward wall portion at said air inlet and a reversely curved rear wall portion at said air outlet, one end of said curved forward wall portion and one end of said curved rear wall portion being joined by a generally planar intermediate wall portion positioned in substantially parallel arrangement with the inlet portion of said tortuous passageway, the other end of said curved forward wall portion extending toward the interior of said separator and defining in combination with the intermediate wall portion of an adjacent assembly the side walls of an air inlet passageway, said other end of the curved forward wall portion further extending with a bend of less than 90° as a transverse wall section which continues to and effectively joins said one end of said reversely curved rear wall portion making thereby a closed interior cavity, the other end of said reversely curved rear wall portion extending toward the interior of said separator and terminating with an inward directed structural bend, the location of said wall terminating bend being such as to form in combination with the transverse wall section of the next adjacent assembly an open slot through which air flows from said air inlet passageway to said air outlet;

a plurality of particle collection chambers generally aligned with said air inlet passageway, each of said chambers being comprised of the curved interior side of each of said reversely curved rear wall portion, and being defined by two sidewalls and a top wall, the first of said sidewalls being that portion of the intermediate wall immediately adjacent said reversely curved rear wall, the second of said sidewalls being the interior side of the other end of said curved rear wall portion, and the top of said chamber comprising a slanting wall portion forming a juncture along one end with the second of said sidewalls, the other end of said slanting wall portion terminating in a lip, the space between said lip and said first sidewall of said chamber forming a restrictive entrance throat therebetween, whereby particle laden air enters said particle collection chamber under generally turbulent conditions;

a plurality of apertures in one wall of said housing, said apertures having a shape complementary to the contour of said collection chambers, each of said apertures communicating with a collection chamber to provide particle passageways through said wall; and

a scavenge manifold in communication with all of said particle collection chambers.

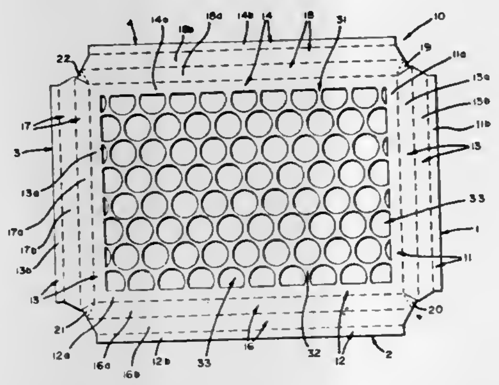
3,970,440
COMPACT AIR FILTER

John E. Copenhefer, Louisville, Ky., and Robert M. House, Wabash, Ind., assignors to United States Gypsum Company, Chicago, Ill.

Filed June 6, 1974, Ser. No. 476,957

Int. Cl.² B01D *46/10*

U.S. Cl. 55—501 **7 Claims**



1. A compact nestable air filter having a top surface and a bottom surface comprising:

- A. a generally rectangular frame formed of a one piece suitably cut and scored blank comprising a plurality of interconnected frame members each comprising:
  - 1. a coplanar flange having bottom and top coplanar flange members in juxtaposition, and
  - 2. a flared flange disposed at an angle of less than 180° with respect to said coplanar flange and comprising bottom and top flared flange members, said bottom flared flange members being hingedly connected to said bottom coplanar flange members, said top flared flange members being hingedly connected to said bottom flared flange members, said top coplanar flange members being hingedly connected to said top flared flange members,
- B. means connecting the ends of adjacent flared flanges together,
- C. said one piece blank including a perforated bottom cover extending from said bottom coplanar flange members, and
- D. a filter member retained by said coplanar flanges.

3,970,441
CASCADED REFRIGERATION CYCLES FOR LIQUEFYING LOW-BOILING GASEOUS MIXTURES

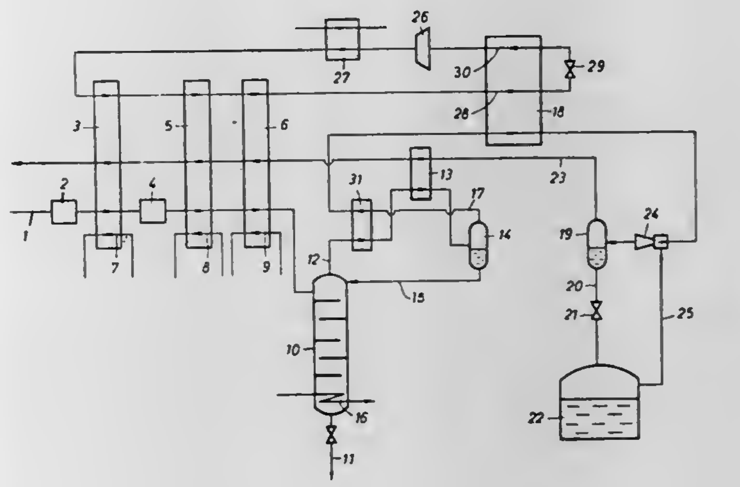
Volker Etzbach, Munich; Wolfgang Förg, Grunwald, and Peter Grimm, Munich, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation-in-part of Ser. No. 489,245, July 17, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,535

Claims priority, application Germany, July 17, 1973, 2336273

Int. Cl.² F25J *3/02*

U.S. Cl. 62—28 **16 Claims**



1. In a process for the at least partial liquefaction of a low-boiling gaseous mixture wherein the gaseous mixture under pressure is precooled in heat exchange with a vaporizing single-component refrigerant which flows in a first closed refrigeration cycle, purified during the course of the precooling step and, after the precooling step is subjected to a preliminary separation in a fractionating column to obtain a gaseous fraction, the improvement comprising:

precooling and partially liquefying to the extent of 40 to 65 volume % a closed cycle multicomponent gas refrigerant which flows in a second closed refrigeration cycle, in indirect heat exchange with said vaporizing single-component refrigerant,

completing the liquefying of said multicomponent gas refrigerant by cooling in one heat exchange stage, by expansion of resultant completely liquiefied multi-component refrigerant against itself, and

said expansion being conducted simultaneously in indirect heat exchange contact with the gaseous fraction obtained from said preliminary separation, to at least partially liquefy said gaseous fraction, said partial liquefaction being conducted at a temperature lower than the precooling step.

3,970,442

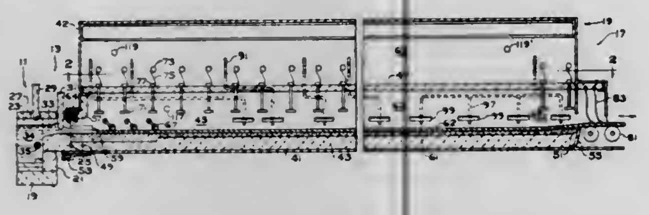
METHOD OF INTRODUCING PROTECTIVE ATMOSPHERE GASES INTO A GLASS FORMING CHAMBER

Joseph A. Gulotta, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 16, 1975, Ser. No. 596,495

Int. Cl.² C03B *18/02*

U.S. Cl. 65—32 **7 Claims**



1. In the method of making flat glass wherein molten glass is delivered onto the surface of a pool of molten metal comprising a substantial amount of tin in an enclosed chamber providing headspace extending directly over the pool of molten metal and a service space extending over the headspace and separated from it by a ceiling that is permeable to gas, wherein the delivered glass is cooled and formed into a dimensionally stable, continuous sheet of glass while being advanced along the surface of the pool of molten metal, wherein the formed dimensionally stable, continuous sheet of glass is withdrawn from the pool of molten metal and from the enclosed chamber, and wherein sufficient protective gases are introduced into the enclosed chamber to prevent the substantial oxidation of the molten metal, the improvement comprising

- a. introducing a first protective gas into the service space of the chamber at a sufficient rate to pressurize the service space with a pressure exceeding that of the outside environment, and
- b. introducing a second protective gas into the headspace of the chamber at a plurality of locations closely spaced from the advancing glass, which second protective gas is substantially more reducing than the fist protective gas.

3,970,443

CYCLOHEXIMIDE-CYANOBENZENE COMPOSITIONS AS FRUIT ABSCISSION

Robert E. Holm, Painesville, and Paul H. Schuldt, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 18, 1975, Ser. No. 550,525

Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 **3 Claims**

1. A method of harvesting mature fruit from a tree, which method comprises applying to the fruit locus an abscission-promoting amount of a composition consisting essentially of cycloheximide and tetrachloroisophthalonitrile and subsequently exerting a sufficient force on said fruit to remove same.

3,970,444

METHOD FOR POURING STEEL DURING CONTINUOUS CASTING

Karl Brotzmann; Hans Georg Fassbinder; Friedrich Karl Höfer, all of Sulzbach-Rosenberg, and Paul-Gerhard Mantey, Amberg, all of Germany, assignors to Eisenwerk-Gesellschaft Maximiliansnutte mbH, Sulzbac-Rosenberg, Germany

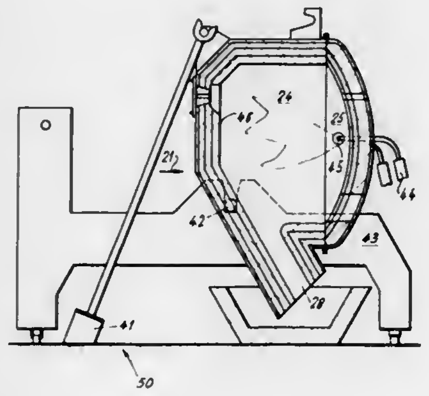
Filed Sept. 24, 1973, Ser. No. 400,423

Claims priority, application Germany, Sept. 27, 1972, 2247274

Int. Cl.² C21B *7/00*

U.S. Cl. 75—46 **10 Claims**

1. A method of casting steel, wherein the inner surface of a lined tundish is pre-heated, the tundish filled with steel, and the steel is poured into at least one mold, the improvement comprising the steps of providing the tundish with a lining possessing a heat conductivity resistance of at least 0.25 m².h.°C/Kcal, bringing a discharge spout of the tundish which opens above a reference level of the metal bath in the tundish, prior to casting and during pre-heating of the tundish, into a position which occupies the lowest point of the inner surface of the tundish, heating the inner surface of the tundish to a temperature approximately corresponding to the temperature of the steel to be poured into the tundish immediately prior to casting, continuing the heating of the tundish to establish an approximately stationary thermal gradient between the inner and the outer surfaces of the tundish to substantially minimize heat transfer from the metal bath to the tundish, and bringing the tundish into its casting position prior to pouring the steel into the tundish.



3,970,445

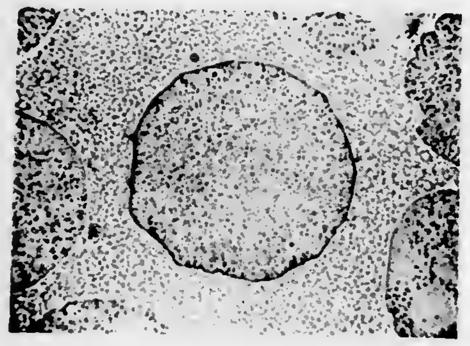
WEAR-RESISTANT ALLOY, AND METHOD OF MAKING SAME

Preston L. Gale, Chillicothe; Eugene L. Helton, Peoria, both of Ill., and Robert C. Mueller, Mentor, Ohio, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 2, 1974, Ser. No. 466,141

Int. Cl.² B22D *23/08*

U.S. Cl. 75—0.5 B **4 Claims**



1. A method for improving the hardness characteristics of an alloy consisting essentially of about 25 to about 61% by weight chromium, about 6 to about 12% by weight boron, and the balance iron comprising the steps of producing cast spheroidal particles thereof by streaming the molten alloy onto a hard surface thus breaking up the molten alloy into droplets and thereafter rapidly quenching and solidifying the molten alloy with a quench liquid while still in the droplet configuration.

3,970,446

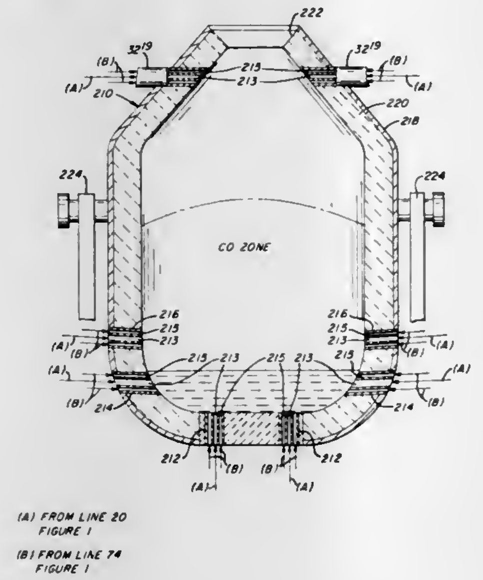
METHOD OF REFINING AN IRON BASE MELT

William A. Kolb, Forest Hills Borough, and Jack F. Sigh, Crafton Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 309,037, Nov. 24, 1972, Pat. No. 3,897,047, which is a continuation-in-part of Ser. No. 275,848, July 27, 1972, abandoned. This application Nov. 15, 1974, Ser. No. 524,104

Int. Cl.² C21C *5/32*, *5/34*

U.S. Cl. 75—60 **25 Claims**



1. A method of refining an iron base melt by blowing a gas stream at a predetermined flow rate and containing a suspended particulate solid into said iron base melt through a tuyere located beneath the surface of said iron base melt and having a tuyere inlet, said method including the steps of:

- a. supplying said gas stream from a gas supply source at super atmospheric pressure through a closed supply system to said tuyere inlet at said predetermined flow rate for refining said iron-base melt;
- b. maintaining the pressure of said gas stream so that the pressure of said gas stream at said tuyere inlet is less than the difference between said super atmospheric pressure of said gas supply source and the pressure drop in said gas stream resulting from the passage of said gas stream through said closed supply system;
- c. injecting said suspended particulate solid into and suspending said suspended particulate solid in said gas stream at a particulate injection point in said closed supply system prior to entry of said gas stream into said tuyere inlet thereby increasing said pressure drop of said gas stream from said gas supply source to said tuyere inlet as a result of the passage of said gas stream and said suspended particulate solid through said closed supply system; and
- d. increasing the pressure of said gas stream upstream of said particulate injection point to counteract said pressure drop in said closed supply system due to the injection and transport of said suspended particulae solid and thereby maintaining substantially constant said predetermined flow rate to said tuyere inlet.

3,970,447

FERRITIC STEEL WELDING MATERIAL

Francis Harold Lang, Oakland, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation of Ser. No. 11,298, Feb. 13, 1970, abandoned. This application Feb. 13, 1975, Ser. No. 549,530

Int. Cl.² C22C *38/06*, *38/08*

U.S. Cl. 75—124 **4 Claims**

1. An air meltable welding material particularly adapted for gas-shielded arc-welding of nickel alloy steels to produce welds having improved impact resistance at cryogenic temperatures, said welding material having a ferritic steel composition consisting essentially of about 7% to about 13% nickel, not more than about 0.3% manganese, not more than 0.09% carbon, not more than 0.15% silicon, not more than 0.05% aluminum, up to about 0.1% titanium, up to about 0.1% columbium, not more than 0.01% phosphorus, not more than 0.01% sulfur, not more than 0.05% oxygen, not more than 0.006% nitrogen, not more than 0.0003% hydrogen and the balance essentially iron.

3,970,448

LOW ALLOY DIE STEEL (TYPE F)

William Wilson, Jr., 3308 N. New England Ave., Chicago, Ill. 60634, and Charles W. Finkl, 2652 Sheridan Road, Evanston, Ill. 60436

Filed June 14, 1973, Ser. No. 369,922

Int. Cl.² C22C *38/40*

U.S. Cl. 75—129 **2 Claims**

1. In a method of making a die steel having a minimum required hardenability, and which requires

a. the following amounts of the following essential elements:

Element	Minimum
C	.50
Si	.15
Ni	.50
Cr	.50
Mo	.20

the steps of

- b. selecting the Ideal Critical Diameter (D_I) which corresponds to the minimum required hardenability of the die steel,
- c. melting a heat of steel from raw materials to yield at least alloy elements in the heat selected from the group consisting of carbon, nickel, chromium and molybdenum,
- d. thereafter chemically analyzing the melt to determine the amount of each of said essential alloy elements therein,
- e. thereafter making additions of carbon, silicon, nickel, chromium, and molybdenum to the heat as needed to ensure the presence in the heat of the minimum amount of each of said essential elements specified in step (a),
- f. converting the amounts of the essential alloy elements carbon, silicon, nickel, chromium, molybdenum, and all other elements, which contribute to hardenability, to their equivalent in accordance with the formula

$$\log D_I = \log F_C + \log F_{Si} + \log F_{Ni} + \log F_{Cr} + \log F_{Mo} + \log F_x;$$

- g. adding the D_I contributions for the individual alloy elements specified in step (f) to determine the total D_I value of the heat after the additions referred to in step (e) have been made to the steel, and, in the event the resultant D_I value is less than the required D_I value of step (b),
- h. adding a hardenability make-up element or elements to the melt until the required D_I of step (b) is reached, said hardenability make-up elements being added in the order of

firstly, manganese, in an amount up to a maximum of about 2%, and

secondly, from the group consisting essentially of chromium, nickel and manganese.

3,970,449
HEAT TREATABLE NICKEL-BASE ALLOYS

James A. McGurty, Shillington, and Paul J. Scherbner, Boyertown, both of Pa., assignors to Kawecki Berylco Industries, Inc., Reading, Pa.

Filed June 13, 1975, Ser. No. 586,709

Int. Cl.^{2} C22C *19/03*

U.S. Cl. 75—170 **3 Claims**

1. A heat treatable nickel-base alloy consisting essentially of between about 0.6 to 3.0 weight percent beryllium, between about 0.0 to 4.5 weight percent titanium, between about 0.0 to 4.5 weight percent zirconium, between about 0.0 to 4.5 weight percent hafnium, between about 0.01 to 1.0 weight percent of a rare earth element, and the balance nickel.

3,970,450
MODIFIED IRIDIUM-TUNGSTEN ALLOY

Chain T. Liu, and Henry Inouye, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 16, 1975, Ser. No. 596,553

Int. Cl.^{2} C22C *5/04*

U.S. Cl. 75—172 R **4 Claims**

1. An iridium base alloy composition having enhanced impact resistance comprising by weight

20 to 50 ppm aluminum;
20 to 100 ppm iron;
5 to 20 ppm nickel;
50 to 100 ppm rhodium;
15 to 50 ppm thorium; and iridium as the balance.

2. The alloy according to claim **1** further comprising 0.3 wt. percent tungsten.

3,970,451
ELECTRICAL CONTACT MATERIALS AND METHODS OF MAKING THE SAME

Terrence Ardern Davies, Horton, England, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 384,157, July 30, 1973, Pat. No. 3,857,706. This application Nov. 25, 1974, Ser. No. 526,563

Claims priority, application United Kingdom, Aug. 25, 1972, 39666/72

Int. Cl.^{2} C22C *5/06*

U.S. Cl. 75—173 R **7 Claims**

1. An electrical contact material which consists of a mixture of silver and not more than 3.0 weight per cent of mercury and which includes not more than 3.0 weight per cent of tellurium.

3,970,452
CHARGED PARTICLE MODULATOR DEVICE AND IMAGING METHODS

Alexander Chiang-Hsia Wu, Wayne, Mich., and Shou Ling Hou, Chagrin Falls, Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 30, 1974, Ser. No. 502,025

Int. Cl.^{2} G03G *13/00, 5/00*

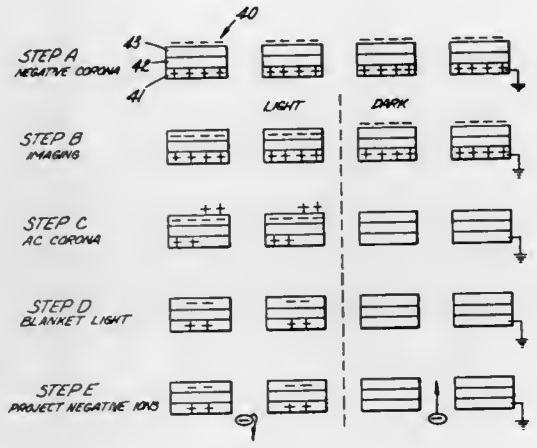
U.S. Cl. 96—1 R **21 Claims**

1. A process for producing copies from an original comprising the steps of applying an electrostatic charge to a photoconductive surface of an apertured ion modulator, exposing said modulator to a pattern of light and shadow corresponding to said original, apply an alternating current to said modulator in the absence of a blanket light, flooding said modulator with a blanket light, projecting ions upon a conductive surface of said modulator opposite from said photoconductive surface whereby said ions are transmitted through said modulator in a pattern corresponding to said original,

creating a latent electrostatic image corresponding to said pattern upon a dielectric surface in the path of said transmitted ions, and

developing said latent electrostatic image,

said modulator comprising a conductive apertured surface uniformly coated substantially only on one side with an insulator layer and overcoated with a photoconductor.



3,970,453
IMAGING BY SELECTIVE STRIPPING OUT AREAS OF LAYER

Frank G. Belli, Webster, N.Y., and Peter P. Augostini, Graham, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,956

Int. Cl.^{2} G03G *13/22, 13/14*

U.S. Cl. 96—1.4 **32 Claims**

1. An imaging method comprising:

a. providing a member comprising a first layer of electrically insulating softenable material overlying a second layer of electrically insulating softenable material first portions of said first layer having migration material dispersed throughout, second portions of said first layer containing migration material at a lower density than said first portions, said second layer portions adjacent said first portions of said first layer being essentially free of migration material and second layer portions adjacent said second portions of said first layer containing migration material;

b. applying a receiver sheet to the free surface of said first layer of softenable material with at least sufficient heat and pressure to adhere the receiver sufficient to the member to allow selective stripping of the member by step (c) below; and

c. separating the receiver sheet from the member thereby stripping out portions of the first layer of softenable material, said portions of said softenable material containing substantially the same density of migration material, wherein migration material particles in the second layer adjacent the second portion of the first layer were migrated there through the interface between the first layer and the second portion of the first layer.

3,970,454
PHOTOGRAPHIC DEVELOPING AGENTS

Claude Fernand Marcel Gerbal, Bonneuil-sur-Marne, France, assignor to Eastman Kodak Company, Rochester, N.Y.

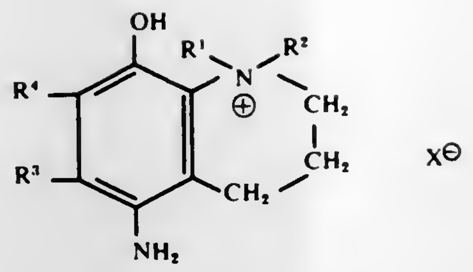
Filed Dec. 30, 1974, Ser. No. 537,221

Claims priority, application France, Jan. 10, 1974, 74.00770

Int. Cl.^{2} G03C *5/30;* **C07D** *215/00, 215/58, 215/12*

U.S. Cl. 96—29 D **8 Claims**

1. A compound of the formula:



wherein

R^1 is an alkyl group of 1 to 12 carbon atoms,

R^2 is an alkyl group of 1 to 12 carbon atoms or a sulfoalkyl group of 1 to 12 carbon atoms,

R^3 is a hydrogen atom or an alkyl group of 1 to 12 carbon atoms,

R^4 is a hydrogen atom or an alkyl group of 1 to 12 carbon atoms, and $X^{\ominus}$ is an anion with the proviso that when R^2 is a sulfoalkyl group then $X^{\ominus}$ is the sulfo radical of R^2.

3,970,455
ELECTROSTATIC LITHOGRAPHIC PRINTING PROCESS UTILIZING HYDROPHILIZING COMPOSITION

Raymond R. Nadeau, Natick, and John E. Wyman, Lexington, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed June 4, 1973, Ser. No. 366,953

Int. Cl.^{2} G03F *7/02;* **G03G** *5/08*

U.S. Cl. 96—33 **24 Claims**

1. In a process for producing a lithographic printing plate comprising the steps of forming a latent electrostatic image on a photoconductive insulating recording layer comprising photoconductive zinc oxide, and developing this image with a hydrophobic toner forming an imagewise deposit on the recording layer, the improvement of contacting the portions of the recording layer which are not covered with the hydrophobic deposit with a hydrophilizing composition comprising a first reaction product of (1) phosphoric acid or one of the anions derived from such acid, (2) an organic alkylene amine compound, and (3) a hydrophilic metal cation selected from the group consisting of aluminum, titanium, zirconium and tin cations, to form a second reaction product with zinc ions from the zinc oxide which second reaction product of zinc ions with said hydrophilizing composition is substantially insoluble in said hydrophilizing composition and is wetted by water thereby repelling lithographic inks wherein said second reaction product is an insoluble salt containing zinc ions, phosphoric acid or one of the anions derived from such acid, an organic amine compound, and said hydrophilic metal cation.

3,970,456
METHOD FOR PREPARING A VIEWING-SCREEN STRUCTURE FOR A CRT HAVING TEMPERATURE-COMPENSATED MASK-MOUNTING MEANS, INCLUDING COOLING MASK DURING EXPOSURE

Tom Wendell Branton, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,404

Int. Cl.^{2} G03C *5/00*

U.S. Cl. 96—36.1 **7 Claims**

1. In a method for preparing a mosaic viewing screen for a cathode-ray tube, said tube comprising a faceplate panel including a viewing window and peripheral sidewalls, a mosaic viewing screen on the inner surface of said window, and a mask assembly including an apertured mask spaced from said window and a temperature-compensating mounting means for mounting said mask assembly in said panel; said method comprising

a. coating said inner surface of said window with a layer including a light-hardenable material,

b. heating said panel to temperatures above 50°C to dry said coating,

c. mounting said mask assembly in said heated panel, said mask assembly being at about room temperature,

d. and then, before said panel has cooled below 40°C, exposing said layer to actinic light from a small-area light source projected through said mask;

the improvement comprising, while the temperature of said panel is above 40°C, cooling said mounting means below 40°C to provide a desired spacing between said mask and said inner surface of said window.

3,970,457
AUTOMATIC REPLENISHMENT METHOD AND APPARATUS FOR PHOTOGRAPHIC PROCESSES

Harry N. Parsonage, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 22, 1974, Ser. No. 462,663

Int. Cl.^{2} G03C *5/26, 5/24, 5/38*

U.S. Cl. 96—50 R **7 Claims**

1. A method for automatically replenishing chemical compositions in the developer tank, stop bath, hardener solution tank, bleach solution tank, and fix solution tank, which compositions are consumed at variable rates during a photographic process in which said compositions are used to develop photographic film, the compositions of said developer tank and bleach solution tank being image dependent by being consumed on the basis of how much imagery is being processed and the compositions of the stop bath, hardener solution tank, and fix solution tank being non-image and bulk dependent by being consumed on the basis of the amount of film being transported per unit time through the process, comprising:

a. extracting a sample from said bleach solution tank,

b. analyzing said sample from said bleach solution tank to determine the halogen concentration therein, whereby the variation of the imagery, which is directly proportional to the halogen concentration, is determined,

c. adjusting the rate of supply of said image dependent compositions in said developer tank and bleach solution tank in relation to said variation of the imagery and thereby maintain the desired concentration of said image dependent composition and, also during the processing,

d. extracting a sample from said fix solution tank,

e. analyzing said sample from said fix solution tank to determine the silver concentration therein, whereby the amount of film per unit time, which is directly proportional to said silver concentration, is determined, and

f. adjusting the rate of supply of said bulk dependent compositions in said stop bath, hardener solution tank, and fix solution tank in relation to said amount of film per unit tank and thereby maintain the desired concentrations of said bulk dependent compositions.

3,970,458
IMAGEWISE HARDENING WITH INERT TRANSITION METAL COMPLEX OXIDIZING AGENTS

Vernon Leon Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 189,289, Oct. 14, 1971, abandoned, and a continuation-in-part of Ser. No. 312,157, Dec. 4, 1972, Pat. No. 3,856,524. This application Nov. 28, 1973, Ser. No. 420,192

Int. Cl.^{2} G03C *7/00, 5/26, 5/24, 5/30*

U.S. Cl. 96—55 **28 Claims**

1. In a process of imagewise-hardening at least one layer of a photographic element which contains a crosslinkable colloid, the improvement comprising reacting an inert transition metal ion complex oxidizing agent having a coordination number of 6 and which is capable of existing in at least two valence states with a reducing agent in the presence of a catalytic metal material or catalytic activated carbon material in a processing solution which is substantially free of silver halide solvents, wherein said catalytic material is provided in an imagewise distribution and wherein said oxidizing agent and said reducing agent are chosen so that the reaction products thereof are essentially noncatalytic for an oxidation-reduction reaction with said oxidizing agent and said reducing agent, and said oxidizing agent and said reducing agent are essentially inert to oxidation-reduction reaction in the absence of said catalytic material.

3,970,459

PROCESS FOR DEVELOPING A DIRECT REVERSAL SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

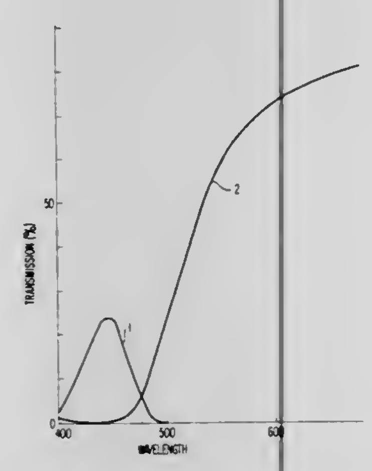
Tadaaki Tani, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation-in-part of Ser. No. 281,674, Aug. 18, 1972, abandoned. This application Sept. 10, 1974, Ser. No. 504,775

Claims priority, application Japan, Aug. 19, 1971, 46-63229

Int. Cl.^{2} G03C *5/24*

U.S. Cl. 96—64 **24 Claims**



1. A process of developing an image-wise exposed light-sensitive material which comprises processing a direct reversal silver halide photographic light-sensitive material comprising a support having coated thereon a light-sensitive layer formed by applying to said support a silver halide photographic emulsion comprising:

1. cubic silver halide grains having fogging nuclei therein provided by adding a strong reducing agent to said emulsion and ripening said emulsion, and
2. (a) an electron acceptor which is capable of receiving photoelectrons and also which is capable of acting as a development accelerator and bearing atoms capable of being positively charged in a developer solution; and
   b. (i) an electron acceptor capable of receiving photelectrons and (ii) a development accelerator containing atoms capable of being positively charged in a developer solution;

in an aqueous solution of a hydrophilic colloid; with a developer solution containing a developing agent having at least one phenolic hydroxy group, the pH of said developer solution being at least 11.

3,970,460

DIAZOTYPE COMPOSITION

Petar Jagrovic, Bern, Switzerland, assignor to Multitec AG, Switzerland

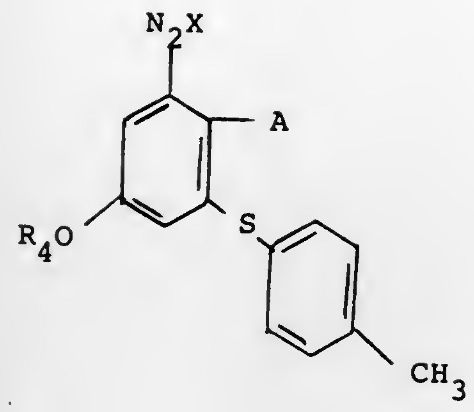
Filed Mar. 15, 1974, Ser. No. 451,556

Claims priority, application Switzerland, Mar. 28, 1973, 4459/73

Int. Cl.^{2} G03C *1/54*

U.S. Cl. 96—91 R **8 Claims**

1. A diazotype composition containing a 2-substituent-3-thio-5-alkoxybenzene diazonium compound of the formula:



wherein
A is $-OR_4$ or $-N(CH_3)COOR_5$;
R_4 is a lower alkyl radical and
R_5 is an alkyl radical having 1–8 carbon atoms, or a benzyl radical and
X is an anion.

3,970,461

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING CARBOCYANINE DYE HAVING INDOLENINE NUCLEUS

Keisuke Shiba; Masanao Hinata; Akira Sato; Akira Ogawa, and Hirotetu Kato, Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

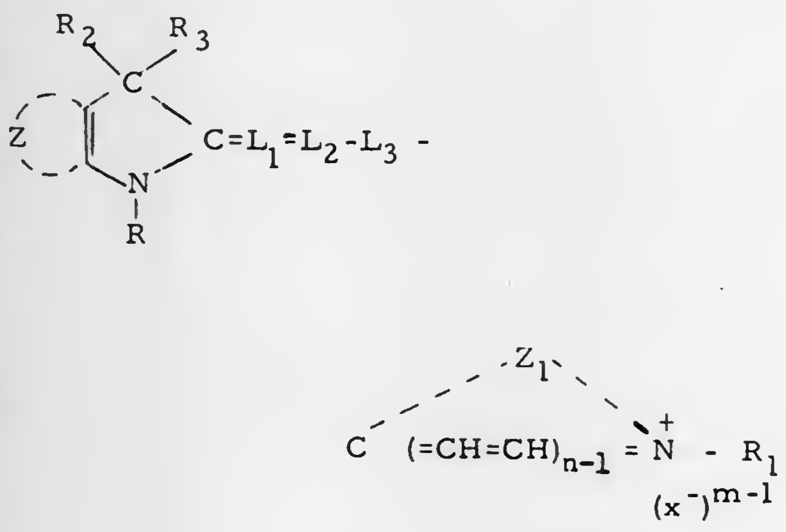
Continuation-in-part of Ser. No. 185,819, Oct. 1, 1971, abandoned. This application July 6, 1973, Ser. No. 376,997

Claims priority, application Japan, Oct. 1, 1970, 45-86241

Int. Cl.^{2} G03C *1/28, 1/36, 1/08*

U.S. Cl. 96—101 **14 Claims**

1. A direct positive silver halide photographic emulsion, in which the silver halide grains thereof have been fogged to maximum density, containing from one mg to 200 mg per Kg of said emulsion, of a dye represented by the following formula:



wherein R and R_1 are selected from the group consisting of an alkyl group, an allyl group, a substituted alkyl group selected from the group consisting of a 2-hydroxyethyl group, a 3-hydroxypropyl group, a 2-methoxyethyl group, a ketaacetoxyethyl group, a gamma- acetoxypropyl group, a carboxylalkyl group, a sulfoalkyl group, and a phenylethyl group, an aryl group, and a substituted aryl group selected from the group consisting of a methoxyphenyl group and a chlorophenyl group, at least one of said R and R_1 being a carboxylalkyl group or a sulfoalkyl group; R_2 and R_3 are selected from the group consisting of an alkyl group, an aralkyl group, and an allyl group; L_1 is selected from the group consisting of a methine group and an atomic group capable of combining with R,

R_2 or R_3 to form a 5- or 6-membered ring; R_2 represents a methine group; L_3 represents a member selected from the group consisting of a methine group and an atomic group capable of forming a 5- or 6 -membered ring with R_1, or with a 3,3-substituent of an indolenine ring, such that a ring may be formed by L_1 and L_3; X represents an anion; *n* and *m* each represents an integer of 1 and 2, respectively, such that when said dye forms an intramolecular salt, *m* is 1; Z represents an atomic group capable of completing an unsubstituted benzene ring, an unsubstituted naphthalene ring, or a lower alkyl-, lower alkoxy-, chloro-lower alkoxy- carbonyl- substituted benzene ring; and Z_1 represents a non-metallic atomic group capable of completing a 5- or 6-membered heterocyclic ring, said ring being a member selected from the group consisting of a 4-methylthiazole ring, a 4-phenylthiazole ring, a 5-methylthiazole ring, a 5-phenylthiazole ring, a 4,5-dimethylthiazole ring, a 4,5-diphenylthiazole ring, a 4-(2-thienyl)-thiazole ring, an unsubstituted thiazole ring, an unsubstituted benzothiazole ring, a 4-chlorobenzothiazole ring, a 5-chlorobenzothiazole ring, a 6-chlorobenzothiazole ring, a 7-chlorobenzothiazole ring, a 4 -methylbenzothiazole ring, a 5-methylbenzothiazole ring, a 6-methylbenzothiazole ring, a 5-bromobenzothiazole ring, a 6-bromobenzothiazole ring, a 5-phenylbenzothiazole ring, a 6-phenylbenzothiazole ring, a 4-methoxybenzothiazole ring, a 5-methoxybenzothiazole ring, a 6-methoxybenzothiazole ring, a 5-iodobenzothiazole ring, a 6-iodobenzothiazole ring, a 4-ethoxybenzothiazole ring, a 5-ethoxybenzothiazole ring, a tetrahydrobenzothiazole ring, a 5,6-dimethoxybenzothiazole ring, a 5,6-dimethylbenzothiazole ring, a 5-hydroxybenzothiazole ring, a 6-hydroxybenzothiazole ring, an unsubstituted alpha-naphthothiazole ring, an unsubstituted beta-naphthothiazole ring, an unsubstututed beta, beta-naphthothiazole ring, a 5-methoxy-beta, beta-naphthothiazole ring, a 5-ethoxy-beta-naphthothiazole ring, an 8-methoxy-alpha-naphthothiazole ring, a 7-methoxy-alpha-naphthothiazole ring, a 4′-methoxythionaphthene-7′, 6′, 4′, 5-thiazole ring, an unsubstituted oxazole ring, a 4-methyloxazole ring, a 5-methyloxazole ring, a 4-phenyl-oxazole ring, a 4,5-diphenyloxazole ring, 4,5-dimethyloxazole ring, 4-ethyloxazole ring, a 5-phenyloxazole ring, an unsubstituted benzoxazole ring, a 5-chlorobenzoxazole ring, a 5-methylbenzoxazole ring, a 5-phenylbenzoxazole ring, a 6-methylbenzoxazole ring, a 4,6-dimethylbenzoxazole ring, a 5-methoxybenzoxazole ring, a 5-ethoxybenzoxazole ring, a 5-bromobenzoxazole ring, a 5-iodobenzoxazole ring, a 6-methoxybenzoxazole ring, a 5-hydroxybenzoxazole ring, a 6-hydroxybenzoxazole ring, an unsubstituted selenazole ring, a 4-methylselenazole ring, a 4-phenylselenazole ring, a benzoselenazole ring, a 5-chlorobenzoselenazole ring, a 5-methoxybenzoselenazole ring, a 5-hydroxybenzoselenazole ring, a tetrahydrobenzoselenazole ring, an alpha-naphthoselenazole ring, a beta-naphthoselenazole ring, unsubstituted thiazoline ring, a 4-methylthiazoline ring, an unsubstituted oxazoline ring, an unsubstituted pyridine ring, an unsubstituted 2-pyridine ring, a 5-methyl-2-pyridine ring, an unsubstituted 4-pyridine ring, a 3-methyl-4-pyridine ring, an unsubstituted quinoline ring, an unsubstituted 2-quinoline ring, a 3-methyl-2-quinoline ring, a 5-ethyl-2-quinoline ring, a 6-chloro-2-quinoline ring, an 8-chloro-2-quinoline ring, a 6-methoxy-2-quinoline ring, an 8-hydroxy-2-quinoline ring, an 8-methyl-2-quinoline ring, an unsubstituted 4-quinoline ring, a 6-methoxy-4-quinoline ring, a 7-methyl-4-quinoline ring, an 8-chloro-4-quinoline ring, an unsubstituted 1-isoquinoline ring, a 3,4-dihydro-1isoquinoline ring, an unsubstituted 3-isoquinoline ring, a 3,3-dimethylidolenine ring, a 3,3,5-trimethylindolenine ring, a 3,3-dimethyl-5-methoxy-indoleneine ring, a 3,3-dimethyl-5-ethoxycarbonyl-indolenine ring, a 3,3,5,6-tetramethyl-indoleneine ring, a 3,3-diethyl-indolenine ring, a 3,3-dibenzylindolenine ring, a 3,3-diallylindolenine ring, a 3,3-dimethyl-5-cyanoindolenine ring, a 3,3-dimethyl-6-cyanoindolenine ring, a 3,3-dimethyl-5-chloroindolenine ring, a 3,3-dimethylbenzoindolenine ring, a 3,3-dimethylbenzoindolenine ring, an unsubstituted imidazole ring, a 1-alkyl-imidazole ring, a 1-alkyl-4-phenyl-imidazole, a 1-alkyl-4,5-dimethylimidazole ring, an unsubstituted benzimidazole ring, a 1-alkylbenzimidazole ring, a 1-aryl-5,6-dichlorobenzimidazole ring, a 1-alkyl-alpha-naphthoimidazole ring, a 1-aryl-beta-naphthiomidazole ring and a 1-alkyl-5-methoxy-alpha-naphthoimidazole ring wherein for Z_1 of oxazole or benzoxazole any benzoxazole moiety contains a greater number of aromatic rings than an oxazole moiety.

3,970,462

SELF SETTING MOLDING PROCESS

Neil W. Stillman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 355,879, April 30, 1973, abandoned. This application Feb. 25, 1974, Ser. No. 445,558

Int. Cl.^{2} B28B *7/34*

U.S. Cl. 106—38.35 **6 Claims**

1. In a process for the production of a mold which comprises forming a mixture of an aggregate with 1 to 10 percent by weight of a liquid alkali metal silicate having an SiO_2 to alkali metal oxide ratio of about 2.0:1 to 3.3:1, shaping the resulting mixture, and curing the resulting shape at room temperature, the improvement comprising adding to said mixture from about 20 percent to about 40 percent by weight of the silicate of a curing agent prepared by refluxing three moles of glycerin and one mole of glacial acetic acid and distilling off volatiles at reflux until the temperature in the still head drops.

3,970,463

GLASSES AND GLASS-CERAMICS AND PRODUCTS MADE THEREFROM

Jerry L. Planchock, Toledo; Daniel R. Stewart, Maumee, and Thomas W. Brock, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 229,959, Feb. 28, 1972, Pat. No. 3,841,950, which is a continuation-in-part of Ser. No. 146,664, May 25, 1971, abandoned. This application Apr. 26, 1974, Ser. No. 464,713

Int. Cl.^{2} C03C *3/22, 3/04*

U.S. Cl. 106—39.7 **35 Claims**

1. A thermally crystallizable glass capable of being thermally in situ crystallized to a glass-ceramic which is thermally stable at temperatures of about 1,500°F for at least 1000 hours and maintains its modulus of rupture of at least about 10,000 psi at such temperatures for said times, said glass consisting essentially of the following ingredients:

Ingredients	Weight Percent
SiO_2	55 – 80
Al_2O_3	12 – 27
Li_2O	3.2 – 7.6
Nucleating Agent	3 – 9

wherein said nucleating agent is a mixture of $TiO_2 + ZrO_2$, wherein the ZrO_2 does not exceed 3 weight percent, but is at least 0.5 weight percent, wherein the SiO_2/Al_2O_3 molar ratio is from 4 to 10 and wherein

a. when the SiO_2/Al_2O_3 molar ratio is from 4 to less than 5, the Li_2O/Al_2O_3 molar ratio is from 0.75 to 0.97; and
b. when the SiO_2/Al_2O_3 molar ratio is from 5 to 7.5, the Li_2O/Al_2O_3 molar ratio is from 0.65 to 0.97; and
c. when the SiO_2/Al_2O_3 molar ratio is more than 7.5 and less than 9, the Li_2O/Al_2O_3 molar ratio is from 0.8 to 0.97; and
d. when the SiO_2/Al_2O_3 molar ratio is more than 9 and up to 10, the Li_2O/Al_2O_3 molar ratio is from 0.87 to 0.97.

3,970,464
SILICA-FREE, ALKALI METAL-FREE AND LEAD-FREE SEALING GLASSES

James Allen Shell, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 10, 1975, Ser. No. 548,265

Int. Cl.^{2} C03C *3/14, 3/12, 3/30*

U.S. Cl. 106—47 R **12 Claims**

1. A sealing glass composition that is lead free, alkali metal free and free of silica which consists essentially of the following components in the indicated mole percent ranges based upon the total composition:

Component	Mole Percent
ZnO	50–55
B_2O_3	35–45

the total mole percent amount of ZnO and B_2O_3 being not greater than about 95 mole percent and the balance of said composition alternatively consisting of (a) about 5 mole percent of GeO_2, or (b) about 5 mole percent of Al_2O_3 together with at least one of the following:

Component	Mole Percent
CaO	0–5
CuO	0–5
GeO_2	0–5
V_2O_5	0–2.5
MgO	0–5.

3,970,465
METHOD OF COMPOSING A MIXTURE FOR LEAD GLASS

Mathijs Maria Hendrikus Houben, Eersel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,189

Claims priority, application Netherlands, May 7, 1974, 7406083

Int. Cl.^{2} C03C *3/10, 3/04*

U.S. Cl. 106—53 **2 Claims**

1. A method of manufacturing a glass mixture intended for the manufacture of lead glass, comprising the steps of:

providing a mixture of glass-making ingredients comprising quartz sand, felspar, and other components consisting essentially of the following in percentage by weight:

SiO_2	20–65		ZnO	0–12
B_2O_3	0–25		PbO	12–60
Na_2O	0–16	combined	Al_2O_3	0.5–5
K_2O	0–16	>1.5	As_2O_3 and/or	0–1
CaO	0–4		Sb_2O_3	
BaO	0–8		MnO	0–1

wherein said quartz sand has a particle size no more than 100 μm and said felspars have a particle size no more than 100 μm;

producing a glass melt from said mixture substantially free from gas inclusions.

3,970,466
CHEMICALLY STABLE OPTICAL GLASS

Marga Faulstich, Mainz, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed July 18, 1975, Ser. No. 597,092

Claims priority, application Germany, July 24, 1974, 2435555

Int. Cl.^{2} C03C *3/10, 3/08, 3/04*

U.S. Cl. 106—54 **6 Claims**

1. Optical glass, $nd = 1.650 \pm 2 \times 10^{-3}$ and $vd = 55.5 \pm 1.0$, having a high chemical stability and a sufficiently low tendency toward crystallization that it can be manufactured in a continuous tank melting process into gobs, pressed components, and other formed articles as a mass-produced glass, said glass consisting essentially of, in percent by weight:

SiO_2	33.0 ± 0.5
B_2O_3	11.6 ± 0.5
BaO	36.6 ± 1.0
La_2O_3	14.0 ± 2.5
ZrO_2	4.0 ± 2.5
As_2O_3 or Sb_2O_3	0 – 0.5.

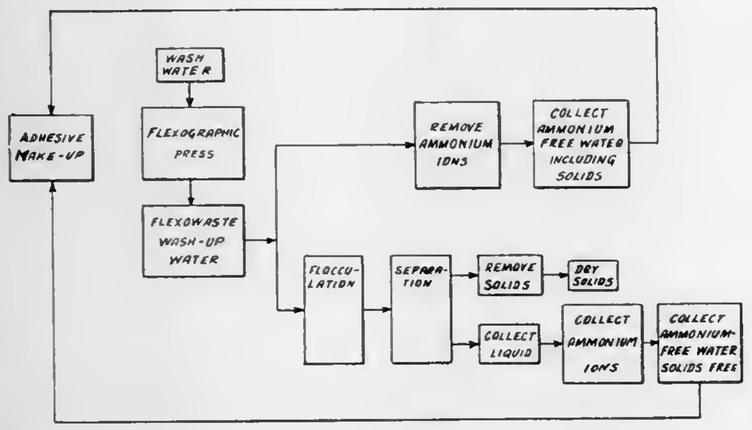
3,970,467
METHOD FOR MAKING CORRUGATING ADHESIVES WITH FLEXOGRAPHIC PRESS WASTE WATER

John E. Voight, Fenton; Edward M. Bovier, Dellwood, and Clarence J. Liebman, St. Louis County, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation of Ser. No. 358,540, May 9, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,243

Int. Cl.^{2} C08L *3/00;* **C02B** *1/40*

U.S. Cl. 106—213 **5 Claims**



1. In a method for preparing starch-based corrugating adhesives comprising mixing a carrier portion containing an aqueous slurry of cooked starch with a secondary portion containing an aqueous slurry of raw starch, the improvement comprising, as the water in said secondary portion, flexographic press water prepared by the steps of

A. washing a flexographic printing press with water,
B. collecting the wash water, and
C. removing ammonium ions from the wash water.

3,970,468
SULFUR EMULSION IN BITUMINOUS MATERIAL

Claude Garrigues, Noisy-le-Grand; Jean Baptiste Signouret, and Claude Chambu, both of Billere, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed May 14, 1974, Ser. No. 469,769

Claims priority, application France, May 24, 1973, 73.18842

Int. Cl.^{2} C08L *95/00;* **E01C** *5/12*

U.S. Cl. 106—274 **12 Claims**

1. The method of producing a stable emulsion of sulfur in a material selected from the group consisting of bitumens, asphalts, pitches and tars, wherein 15 to 45 parts by weight of molten sulfur are mixed at about 125°C to about 160°C with 100 parts by weight of said material under stirring, the stirring being carried out so as to disperse the molten sulfur, throughout said material, in the form of droplets the dimensions of which are between about 0.5 and 10 microns, the fluid mass thus obtained being then formed to a required shape and allowed to cool until it becomes solid.

3,970,469
EXTRACTION TOWER

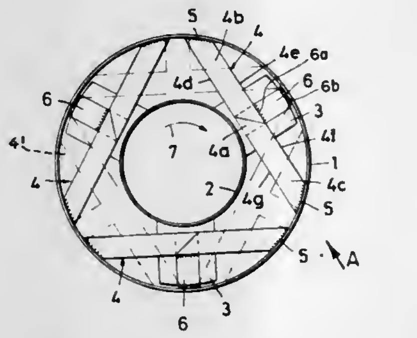
Siegfried Matusch, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Nov. 7, 1975, Ser. No. 629,846

Claims priority, application Germany, Nov. 30, 1974, 2456774

Int. Cl.^{2} C13D *1/12*

U.S. Cl. 127—5 **6 Claims**



1. An extraction tower comprising a tower housing, a central shaft rotatably supported in said housing, feed advance means secured to said central shaft and spaced along the length of the shaft to provide spacings between adjacent feed advance means, and baffle means secured to said tower housing inside thereof at such locations that the baffle means reach into said spacings between adjacent feed advance means, said baffle means comprising a plurality of elongated baffle elements, means securing each of said elongated baffle elements to said tower housing at a plurality of points inside of the tower housing to reinforce the latter, said elongated baffle elements being distributed about the inside of the tower to substantially surround said central shaft, said baffle elements having a longitudinal axis and two sections twisted in opposite directions relative to said longitudinal axis.

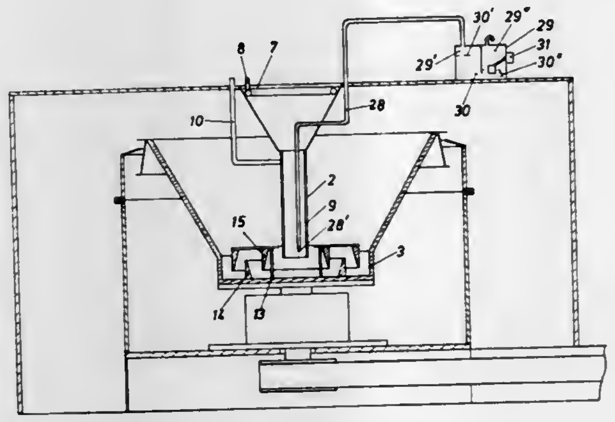
3,970,470
CENTRIFUGE

Günter Trojan, Wattenscheid, and Richard Böhm, Herne, both of Germany, assignors to Hein, Lehmann A.G., Dusseldorf, Germany

Filed Oct. 18, 1974, Ser. No. 516,001

Int. Cl.^{2} B04B *3/00;* **C13F** *1/10*

U.S. Cl. 127—19 **16 Claims**



1. A sugar centrifuge for viscous fillmasses, comprising a conical sieve basket rotatable about a vertical axis and having an upwardly directed outlet, an unperforated accelerating cup connected to said sieve basket at the smallest diameter thereof, said accelerating cup comprising at least one lower deflecting ring fastened coaxially on the bottom of said accelerating cup, a plate concentrically covering the bottom of said accelerating cup, a coaxial upper deflecting ring fastened to said plate, distancing rods connected to said plate to provide variable spacing, a box rotatable along with said cup, a coaxially double walled feed pipe having a lower open end communicating with the space between the upper and lower deflecting rings, a gas conducting pipe extending into the space between the two walls of the double walled feed pipe, another conducting pipe extending into the interior of said double walled feed pipe, a container having the shape of communicating tubes and connected with said other conducting pipe, said container being adapted to be filled with a liquid, a float switch in said container and means connected with said pipes for regulating the amount and temperature of water and steam supplied thereto.

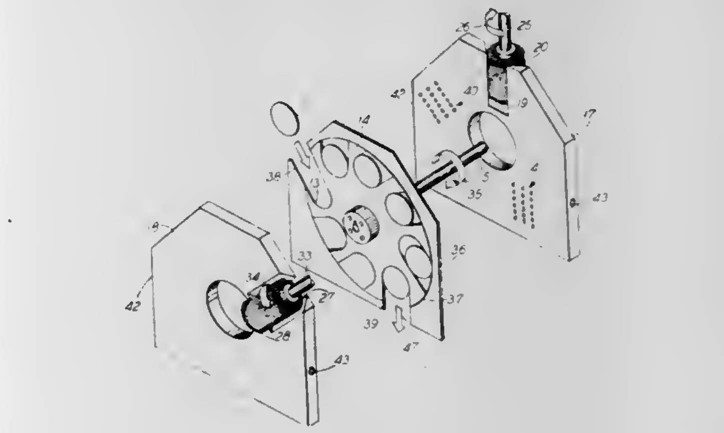
3,970,471
METHODS AND APPARATUS FOR TREATING WAFER-LIKE ARTICLES

Robert B. Bankes, Reading, and Walter W. Gladney, Kutztown, both of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,690

Int. Cl.^{2} B08B *1/04*

U.S. Cl. 134—6 **17 Claims**



13. A method for treating wafer-like articles comprising:

inserting the articles into article-receiving slots in a substantially planar article-conveying member;

conveying the articles between a pair of opposed, substantially parallel immobile plates disposed sufficiently close to the member to laterally retain the articles in the slots;

exposing the entire extent of one face of each of the articles, in succession, through a first aperture in one of said plates to a first treating operation while the article is supported by the other of said plates; and

exposing the entire extend of the opposite face of each of the articles, in succession, to a second treating operation through a second aperture in said other of said plates disposed at a different position than the first aperture along the path of conveyance while the article is supported by said one of said plates.

3,970,472
RECHARGEABLE BATTERY WITH ZINC NEGATIVE AND DENDRITE BARRIER

John Steffensen, West Caldwell, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

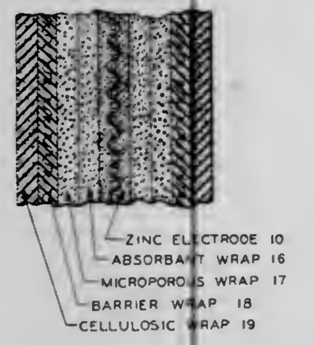
Filed July 8, 1975, Ser. No. 593,965

Int. Cl.^{2} H01M *43/02, 3/00*

U.S. Cl. 136—3 **12 Claims**

1. In a rechargeable battery having an alkaline electrolyte, and zinc-negative and positive electrodes wherein dendrite growths from the zinc electrode during charge tend to short the battery: a dendrite barrier across the entire face of the zinc electrode including a porous absorbent layer between the zinc electrode and the barrier and a confining separator layer across the outer face of the barrier capable of diffusing the electrolyte but not the dissolved zinc, said barrier comprising a cloth substrate of a porous flexible material, and porous

metal deposited on and through said substrate of a low hydrogen over-voltage which on contact with a zinc dendrite reacts with the same to dissolve the dendrite and prevent the same from shorting the adjacent electrode.



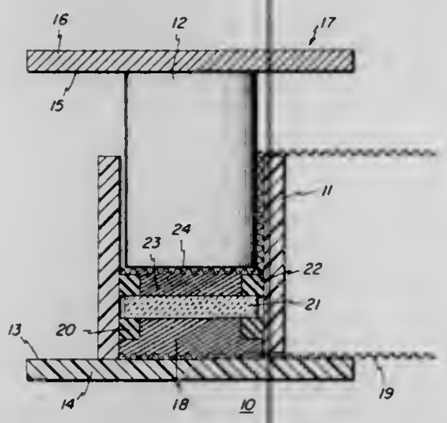
3,970,473
SOLID STATE ELECTROCHEMICAL CELL

Walter L. Roth, Schenectady, and Gregory C. Farrington, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 12, 1975, Ser. No. 586,220

Int. Cl.² H01M *4/36*

U.S. Cl. 136—83 R **3 Claims**



1. A solid state electrochemical cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam or alloys of lithium with indium or thallium, a cathode positioned within the casing, the cathode comprising a non-stoichiometric lithium compound in which the composition can be expressed by the formula $Li_xM_yO_z$ wherein the subscript x is in the range $0<x<1$, M is a cation which can change its oxidation state in accordance with the value of x, the subscript y is in the range $0<y \lesssim 3$, and z has a value such that electrical neutrality of the compound is established, and a solid lithium-sodium aluminated electrolyte positioned within the casing between the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of LiNaO. $9Al_2O_3$ of which 1.3 to 85.0 percent of the total alkali ion content is lithium.

3,970,474
METHOD AND APPARATUS FOR ELECTROCHEMICAL GENERATION OF POWER FROM CARBONACEOUS FUELS

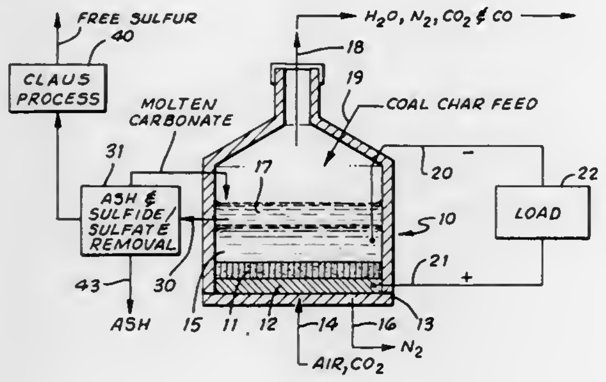
Michael Anbar, Palo Alto; Donald F. McMillen, Menlo Park; Robert D. Weaver, Palo Alto, and Paul J. Jorgensen, Cupertino, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Aug. 11, 1975, Ser. No. 603,591

Int. Cl.² H01M *8/18*

U.S. Cl. 136—86 A **3 Claims**

1. In a method of generating electromotive force wherein a supply of a coal, charcoal, coal char or CO carbonaceous fuel is maintained in contact with the electrolyte of a first electrochemical cell having (1) a molten metal anode made up of lead, antimony or bismuth, (2) an electrolyte made up of a molten salt maintained at temperatures above the melting point of the anode metal, and (3) a cathode adapted to receive an oxygen-containing gas and supply the oxygen to the electrolyte in reduced form, thereby generating the desired electromotive force, wherein during operation of the cell the molten anode metal is oxidized with the oxygen in the molten electrolyte as the carbonaceous fuel simultaneously reduces the formed metal oxide back to the molten metal condition, and wherein the gases discharged from the cell comprise CO, CO_2, water vapor and any nitrogen supplied along with the oxygen, the improvement which comprises maintaining an excess of the carbonaceous fuel in the molten electrolyte such that, of the discharged CO and CO_2 gases, the CO predominates, recovering the CO gas so discharged and employing the same as the carbonaceous fuel supplied to a second electrochemical cell generally operated in the general fashion as the first cell except that the supply of CO to the second cell is so regulated that of the discharged CO and CO_2 gases, the CO_2 predominates.



3,970,475
PRIMARY CELL, IN WHICH THE POSITIVE ACTIVE MATERIAL IS SILVER CHROMATE

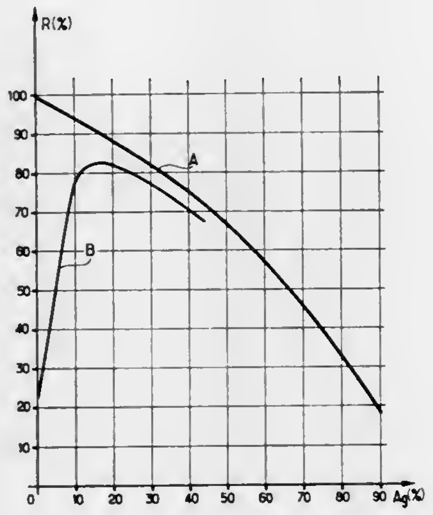
Gerard Gerbier, and Jean-Paul Rivault, both of Poitiers, France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Oct. 22, 1974, Ser. No. 516,962

Claims priority, application France, Oct. 29, 1973, 73.38506

Int. Cl.² H01M *6/00*

U.S. Cl. 136—100 R **7 Claims**



1. Primary non-aqueous electrolyte cell having high efficiency of discharge at high temperatures above 70° to at least 90°C. in which the positive active mass is silver chromate, characterized in that the positive active mass contains between 5% and 30% by weight of silver powder.

3,970,476
ELECTROCHEMICAL CELL CONTAINING CORROSION INHIBITOR

Pierre Cerfon, Freneuse, France, assignor to Compagnie Industrielle des Piles Electriques "Cipel", Levallois-Perret, France

Continuation of Ser. No. 436,095, Jan. 24, 1974, abandoned. This application June 26, 1975, Ser. No. 590,711

Claims priority, application France, Jan. 30, 1973, 73.03235

Int. Cl.² H01M *17/00*

U.S. Cl. 136—103 **3 Claims**

1. An electric cell comprising a zinc negative electrode, a manganese dioxide positive electrode and saline electrolyte, said electrolyte comprising a mixture of starch, zinc chloride solution, ammonium chloride solution and ascorbic acid, said ascorbic acid serving as a corrosion inhibitor, and wherein said ascorbic acid is present in said mixture in a concentration ranging from 700–900 mg/l.

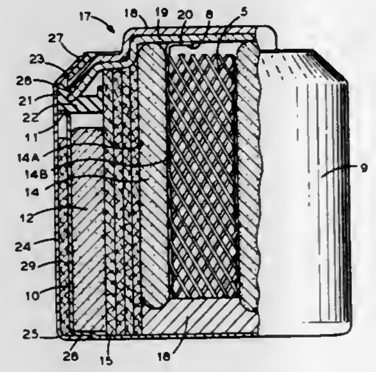
3,970,477
MERCURY TRAP AND CONTACT

Frank Ciliberti, Ossining, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Dec. 7, 1971, Ser. No. 205,582

Int. Cl.² H01M *6/06*

U.S. Cl. 136—107 **2 Claims**



1. An electrochemical cell comprising positive and negative terminal means connected respectively to a cathode and an amalgamated anode wherein said amalgamated anode comprises a hollow cylinder of amalgamated metal, with an alkaline electrolyte disposed therebetween, wherein said anode is provided with an active surface which comprises the outer surface of said cylinder and which is juxtaposed to said cathode and a collector surface on the opposite side of said anode from said active surface which is the inner surface of said cylinder, means for isolating and segrating mercury droplets formed during the electrochemical consumption of said amalgamated anode, said means comprising a grid of amalgamable metal substantially coextensive with and in electrical conductive contact with the inner surface of said cylinder.

3,970,478
VENTING OF ELECTROCHEMICAL CELL

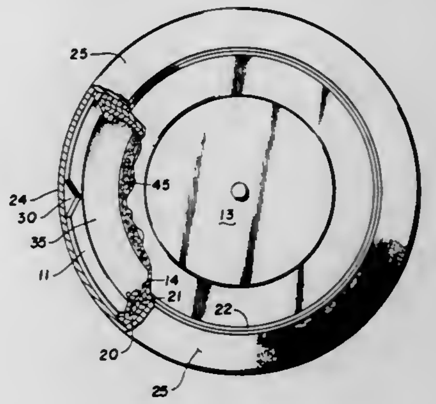
Edsel O. Jurva, Brooklyn Center, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 14, 1975, Ser. No. 558,418

Int. Cl.² H01M *2/04*

U.S. Cl. 136—133 **8 Claims**

1. An electrochemical cell comprising, an inner cup shaped electrode terminal having side walls and an upper lip, a disc shaped electrode terminal having edges, sealing means made of a liquid impervious material positioned in part between the cup shaped terminal and the disc shaped terminal separating the same in an insulating manner from one another, said sealing means including a body portion and a sleeve portion with the body portion positioned between the upper lip of the cup shaped terminal and the edges of the disc shaped terminal, an outer cup shaped cover member having a lip and side walls, said outer cup shaped cover member being fitted over the inner cup shaped electrode terminal and with the lip thereof bearing against the sleeve portion of the sealing member and clamping the disc shaped terminal and the inner cup shaped terminal together in an assembled and sealed relationship, and a series of openings in said inner cup shaped electrode terminal adjacent the body portion of the sealing member to provide a shortened path for hydrogen gas generated by the cell under severe load conditions of the cell by displacement of the sealing member from the inner cup shaped electrode terminal and permitting passage of the gas around the sealing member from the interior of the cell with the displacement of the sealing member by said gas.



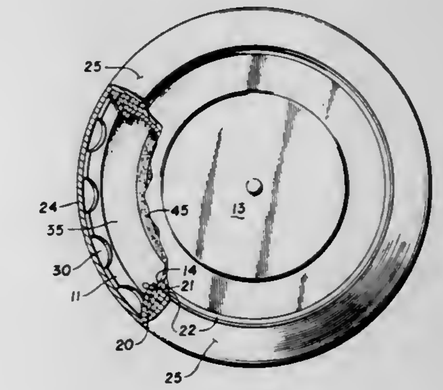
3,970,479
ELECTROCHEMICAL CELL

Wendell L. King, Isanti, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 485,960, July 5, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,754

Int. Cl.² H01M *2/04*

U.S. Cl. 136—133 **8 Claims**



1. An electrochemical cell comprising an inner cup shaped electrode terminal having side walls and an upper lip, a disc shaped electrode terminal, sealing means being made of a liquid impervious and gas permeable material positioned in part between the cup shaped terminal and the disc shaped terminal separating the same in an insulating manner from one another, said sealing means including a body portion and sleeve portion with the body portion positioned between the upper lip and side walls, an outer cup shaped cover member fitted over the inner cup shaped electrode terminal and having a lip bearing against the sleeve portion of the sealing member and clamping the disc shaped terminal and the inner cup shaped terminal together in an assembled and sealed relationship, and an opening in said inner cup shaped electrode terminal extending to the atmosphere and covered by said sealing means having a surface area sufficient to provide a shortened path for hydrogen gas generated by the cell under the most severe load conditions of the cell through the sealing member from the interior of the cell.

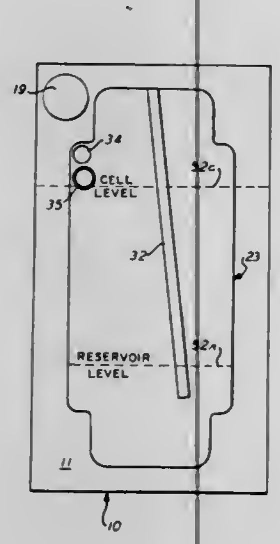
3,970,480
AIR-VENTED LEAKPROOF BATTERY CELL

Jacob E. Schmidt, Little Falls, N.J., assignor to McGraw-Edison Company, Elgin, Ill.

Continuation-in-part of Ser. No. 376,328, July 5, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 550,981

Int. Cl.^{2} H01M *10/36*

U.S. Cl. 136—177 **8 Claims**



1. A vented battery cell having a liquid electrolyte and cathode and anode elements, said cell being capable of being tilted in any direction from a vertical to a horizontal position without leakage of electrolyte, comprising a container for said elements and electrolyte, a cover sealed to said container, a vent reservoir mounted on said cover and having a capacity less than that required to hold all the electrolyte in said cell, said reservoir having an opening between it and said cover at a corner of the reservoir, and a vent tube in said reservoir extending through one end wall thereof adjacent said corner and from said wall approximately to a diagonal corner of the reservoir opposite said one corner, said container and reservoir being hermetically sealed except for said vent tube.

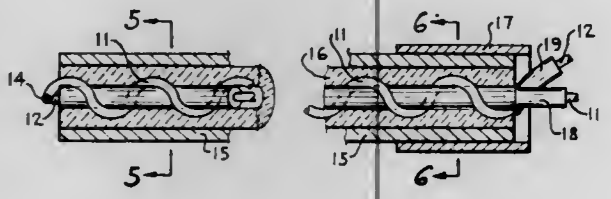
3,970,481
THERMOCOUPLE

Edward R. Stroik, Holland, Pa., assignor to Tudor Technology, Inc., Horsham, Pa.

Filed Nov. 12, 1975, Ser. No. 631,222

Int. Cl.^{2} H01V *1/00, 1/02*

U.S. Cl. 136—230 **6 Claims**



1. A temperature responsive device comprising
a pair of elongated dissimilar metallic wires having an inner measuring terminal portion at which said wires are in contact providing a signal at elevated temperatures,
one of said wires having an insulating covering thereon and one of said wires being helically wound onto the other,
a surrounding enclosure extending along said wires of compacted self-sustaining normally non-electrically conductive material, and
an exterior cover of readily combustible material extending along said enclosure.

3,970,482
SIMPLIFIED METAL TREATING COMPOSITIONS FORMED FROM PRECURSOR COMPONENTS

Walter H. Gunn, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 298,646, Oct. 18, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,383

Int. Cl.^{2} C23F *7/26*

U.S. Cl. 148—6.2 **10 Claims**

1. The method of preparing a pulverulent-zinc-containing coating composition, having enhanced compositional stability at a pH below about 5.6 and above about 4.5, which composition is adapted for treating metal substrates and providing corrosion resistance thereto, wherein said coating composition is prepared to contain hexavalent chromium from a pulverulent-zinc-free chromic acid component (A), and to further contain zinc from a pulverulent zinc component (B), which method comprises:

1. preparing said chromic acid component (A) at a pH of from 3 to below about 5 and with reduced forms of chromium, if such exist, being substantially below 5 percent of the component hexavalent chromium, by:
   a. establishing an aqueous composition containing chromic acid in solution, said chromic acid being present in amount sufficient to provide for a pH in water of below 3.0;
   b. adjusting the pH of said aqueous composition to from 3 to about 5, inclusive, with basic, compatible and acid soluble pH adjustment agent, wherein compatibility of said pH adjustment agent provides cured coatings from said coating composition of enhanced water insolubility; and,
   c. admixing xanthan gum hydrophilic colloid to the composition of adjusted pH and after said pH adjustment, for preparing the chromic acid component (A);
2. preparing said pulverulent zinc component (B) to contain zinc in an amount sufficient to supply above about 50 grams per liter of pulverulent zinc to said coating composition; and
3. blending components together to prepare said coating composition of enhanced stability at a pH of below about 5.6 and above about 4.5.

5. The method of preparing a corrosion resistant coated metal substrate having an adherent coating from a pulverulent-zinc-containing coating composition exhibiting enhanced compositional stability at a pH below about 5.6 and above about 4.5, which composition is adapted for treating metal substrates and providing corrosion resistance thereto, and is prepared to contain hexavalent chromium from a pulverulent-zinc-free chromic acid component (A), and to further contain zinc from a pulverulent zinc component (B), which method comprises:

I. formulating the coating composition of enhanced stability by:
   1. preparing said chromic acid component (A) at a pH of from 3 to below about 5 and with reduced forms of chromium, if such exist, being substantially below 5 percent of the component hexavalent chromium, by:
      a. establishing an aqueous composition containing chromic acid in solution, said chromic acid being present in amount sufficient to provide for a pH in water of below 3.0;
      b. adjusting the pH of said aqueous composition to from 3 to about 5, inclusive, with basic, compatible and acid soluble pH adjustment agent, wherein compatibility of said pH adjustment agent provides cured coatings from said coating composition of enhanced water insolubility; and,
      c. admixing xanthan gum hydrophilic colloid to the composition of adjusted pH and after said pH adjustment, for preparing the chromic acid component (A);
   2. preparing said pulverulent zinc component (B) to contain zinc in an amount sufficient to supply above about 50 grams per liter of pulverulent zinc to said coating composition; and
   3. blending components together to prepare said coating composition of enhanced stability at a pH of below about 5.6 and above about 4.5; and thereinafter
II. applying the resulting coating composition to a metal substrate; and
III. permitting evaporation of volatile coating substituents thereby obtaining an adherent and corrosion resistant coating on said metal substrate.

3,970,483
NORMALIZED ALLOY STEEL FOR USE AT ELEVATED TEMPERATURE

Gerald J. Spaeder, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 23, 1975, Ser. No. 598,299

Int. Cl.^{2} C22C *38/22, 38/24, 38/26*

U.S. Cl. 148—36 **2 Claims**

1. A silicon-killed alloy steel suitable for high temperature applications up to about 1000°F consisting of:
0.15 to 0.21% carbon
0.70 to 1.0% manganese
0.15 to 0.30% silicon
0.40 to 0.65% chromium
0.45 to 0.60% molybdenum
0.05 to 0.10% vanadium
0.01 to 0.10% columbium and a balance essentially of iron and normal residual impurities, said steel normalized at a temperature of from 1550° to 1800°F and having a two-phase microstructure of ferrite and bainite.

3,970,484
SINTERING METHODS FOR COBALT-RARE EARTH ALLOYS

Manfred Doser, Edmore, and Frederick G. Jones, Alma, both of Mich., assignors to Hitachi Magnetics Corporation, Edmore, Mich.

Filed Jan. 20, 1975, Ser. No. 542,190

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—103 **11 Claims**

1. A process for producing a high-density cobalt-rare earth intermetallic product having a high magnetic moment and having substantially stable permanent magnet properties which comprises providing an alloy of cobalt and rare earth metal in particulate form, said cobalt and rare earth metal being used in proportions substantially corresponding to those desired in a final sintered product, pressing said particulate alloy into a green body, sintering said green body in an atmosphere containing at least one percent hydrogen by volume to produce a closed-pore structure, and cooling said green body in an atmosphere which is changed from hydrogen-containing to inert at a temperature above about 300°C.

3,970,485
BINDER AND LUBRICANT REMOVAL FROM COBALT-RARE EARTH ALLOYS

Manfred Doser, Edmore, Mich., assignor to Hitachi Magnetics Corporation, Edmore, Mich.

Filed Jan. 20, 1975, Ser. No. 542,189

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—103 **8 Claims**

1. A process for producing a cobalt-rare earth intermetallic product having substantially stable permanent magnet properties which comprises providing an alloy of cobalt and rare earth metal in particulate form, said cobalt and rare earth metal being used in proportions substantially corresponding to those desired in a final sintered product, mixing an organic binder material with said particulate alloy, pressing said particulate alloy into a green body, subjecting said green body to a bake cycle in an atmosphere containing 1 to 100% by volume hydrogen at an intermediate temperature of between 100° and 500°C for about a half-hour whereby the hydrogen reacts with the molecules forming the organic binder and the resulting molecules volatilize from the green body, and thereafter sintering said body.

3,970,486
METHODS OF PRODUCING A SEMICONDUCTOR DEVICE AND A SEMICONDUCTOR DEVICE PRODUCED BY SAID METHOD

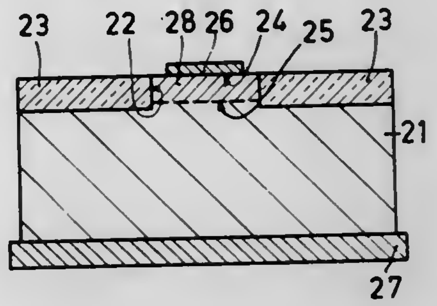
Else Kooi, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 672,622, Oct. 3, 1967, abandoned. This application Feb. 14, 1975, Ser. No. 549,936

Claims priority, application Netherlands, Oct. 5, 1966, 6614016

Int. Cl.^{2} H01L *21/22*

U.S. Cl. 148—187 **38 Claims**



1. A method for the fabrication of a semiconductor device comprising the steps of:
a. forming on one surface of a substrate comprising monocrystalline silicon a masking layer comprising masking material other than silicon oxide which is effective to prevent oxidation of the underlying silicon during a thermal oxidation treatment;
b. removing a selected portion of said masking layer, thereby selectively exposing a portion of the surface of said substrate;
c. selectively removing a thin layer of silicon adjacent said exposed surface by thermally oxidizing silicon adjacent said exposed surface and then removing at least part of the thickness of the oxide layer thus formed without removing the remainder of said masking layer, thereby leaving a portion of said substrate beneath the masking layer in the form of a mesa;
d. selectively oxidizing the surface of said substrate remaining after removal of said thin layer to form a second oxide layer having an upper surface substantially coplanar with the top of said mesa;
e. removing the remainder of said masking layer thereby leaving the surface of said mesa exposed, said mesa being surrounded by the coplanar second oxide layer produced by the latter oxidizing step.

3,970,487
METHOD OF MANUFACTURING A POWER TRANSISTOR

Manfred Dahmen, Gaeufelden-Oeschelbronn; Anneliese Ritzhaupt, Boeblingen, and Manfred Zurheide, Gaeufelden-Oeschelbronn, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 16, 1975, Ser. No. 589,276

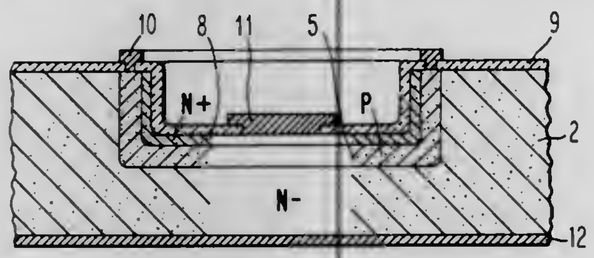
Claims priority, application Germany, Sept. 24, 1974, 2445480

Int. Cl.^{2} H01L *21/302*

U.S. Cl. 148—187 **8 Claims**

1. The method of manufacturing a planar power transistor having a highly doped emitter zone, a base zone with a flat doping profile, and a collector zone in a first conductivity type substrate, wherein the improvement comprises:
forming said base zone by introducing a second opposite conductivity type impurity into said substrate,

etching said base zone down to a shell-shaped remainder, forming said highly doped emitter zone by introducing first



conductivity type impurity into said base zone remainder and forming contacts to the individual zones of said transistor.

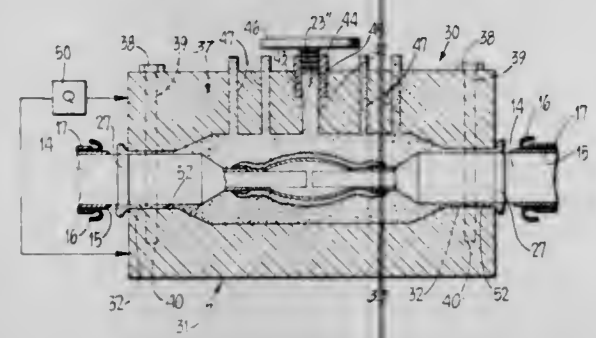
3,970,488
METHOD AND APPARATUS FOR MOLDING SPLICES IN CABLES

Arthur L. Nelson, La Jolla, Calif., assignor to Townsend and Townsend, San Francisco, Calif.

Filed Mar. 7, 1975, Ser. No. 556,519

Int. Cl.^{2} B21F *15/02*

U.S. Cl. 156—49 **13 Claims**



1. A method for forming a cable splice between two cable ends of a pair of cables having a radius r, said cables including an electrically conductive central core and a surrounding layer of electrically insulative material having a radial thickness W, said method comprising the steps of:

a. removing portion of said electrically insulative material from each of said cable ends to expose said electrically conductive central core:

b. joining the ends of said central cores to form a joint;

c. surrounding said joint and a portion of said insulative material with an insulative molding compound;

d. placing the surrounded joint in a mold having a central cavity and a pair of opposing end clamp portions, each end clamp portion having an inner surface with a radius

$$R = \sqrt{\frac{2rX}{\pi} + r^2}$$

where X is a numerical quantity lying in the range from about 0.20 to about 1.00; and

e. applying heat to said mold to soften said insulative molding compound so that a molded splice is formed about said joint.

10. In a mold for use in forming a cable splice between two cable ends of a pair of cables of a type associated with said mold, each said cable having a predetermined radius r, said cables including an electrically conductive core and a surrounding layer of electrically insulative material having a radial thickness W, said mold comprising first and second mating portions having opposing wall surfaces forming an enlarged central cavity and a pair of opposing end clamp regions each with an inner surface of radius R when said mating portions are mated, means for supplying an insulative molding compound to said central cavity, and means for heating said mold, the improvement wherein the radius R of the inner surface of each of said end clamp regions is dimensioned in accordance with the relationship

$$R = \sqrt{\frac{2rX}{\pi} + r^2}$$

where X is a numerical quantity lying in the range from about 0.20 to about 1.00.

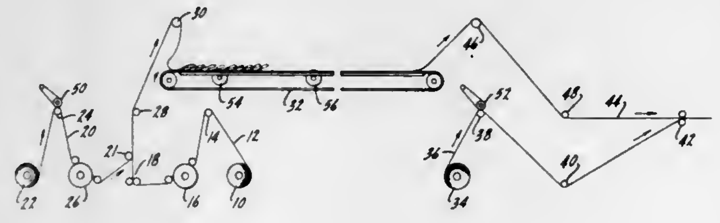
3,970,489
CORRUGATOR CONTROL SYSTEM

Robert W. Schmidt, Oak Lawn; John R. Gallet, Hickory Hills, and Thomas L. Czyz, Palos Hills, all of Ill., assignors to Copar Corporation, Oak Lawn, Ill.

Continuation-in-part of Ser. No. 445,579, Feb. 25, 1974, abandoned. This application July 14, 1975, Ser. No. 595,769

Int. Cl.^{2} B65H *25/00*

U.S. Cl. 156—64 **19 Claims**



1. A system for controlling the amount of single face material in a storage area ahead of the double face operation including:

means for providing a signal representative of the difference between single face drive speed and double face drive speed,

means for sensing the amount of single face material moving into said storage area, means for sensing the amount of single face material leaving said storage area, comparison means connected to said sensing means for providing an output signal proportional to their difference,

means for sensing the speed of material moving adjacent the storage area input and means for sensing the speed of material moving adjacent the storage area output, means for comparing said storage area input and output material speeds, and means for applying the comparison from said storage area input and output speeds to said material comparison means,

speed control means for automatically increasing or decreasing the speed of said single face drive to maintain a predetermined level of single face material in said storage area, said signal representative of the speed difference and said material comparison proportional output signal being connected to said speed control means and providing the input signals therefor.

16. A method of controlling the amount of single face material in a storage area ahead of the double face operation including the steps of:

sensing the difference between single face drive speed and double face drive speed and providing a signal proportional to that difference,

sensing the amount of single face material moving into the storage area and sensing the amount of single face material leaving the storage area and providing a signal proportional to their difference,

measuring the speed of single face material adjacent the input to the storage area and measuring the speed of single face material adjacent the output of the storage area, comparing said speeds and applying the resultant comparison to the signal proportional to the difference between material entering and leaving the storage area,

and using the signal proportional to the difference in single face and double face drive speeds and the material proportional signal to automatically increase or decrease the speed of the single face drive to maintain a predetermined level of single face material in the storage area.

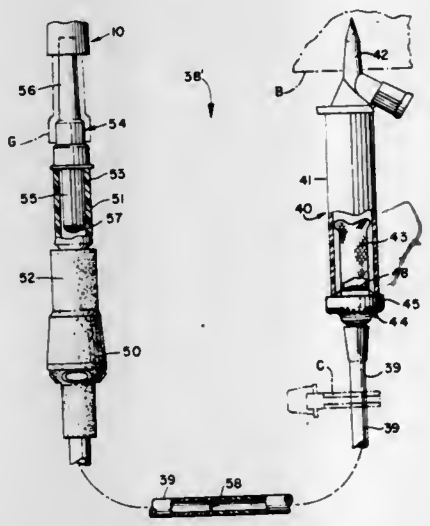
3,970,490
INTRAVENOUS INJECTION APPARATUS AND NEEDLE ADAPTER WITH FILTER AND METHOD OF MAKING SAME

Kenneth Raines, and George K. Burke, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Division of Ser. No. 423,682, Dec. 11, 1973, which is a continuation-in-part of Ser. No. 299,268, Oct. 20, 1972, abandoned. This application May 20, 1975, Ser. No. 579,198

Int. Cl.^{2} B32B *31/18, 31/20*

U.S. Cl. 156—73.1 **3 Claims**



1. A method of making a needle adapter and filter therefor from flat filter material to increase the filter area comprising the steps of:

providing a hollow tubular filter housing having a bore therethrough and a marginal edge at one end thereof surrounding said bore;

positioning the other end of said housing on a support;

orienting a web of flat filter material over said filter housing one end;

cutting a section of flat filter material from said flat web;

engaging a sealing element with said filter material and producing a dome-shaped filter of increased filtering area by pressing said flat filter material onto said housing marginal edge rapidly enough to cause air located between said filter material and said bore to become trapped therebetween and to deform that filter material located adjacent said bore into a dome-shaped configuration, and simultaneously sealing said deformed filter material to said housing marginal edge so that the filter material remains in said dome-shaped configuration to thereby increase the amount of filtering area associated with said filter housing, and completely sealing said deformed filter to said housing so that all of a solution passing through said bore passes through said dome-shaped filter material and leakage therearound is effectively prevented;

removing said tubular filter housing with said dome-shaped filter secured thereto from said support; and

securing said filter housing with said dome-shaped filter sealed thereon in the bore of a hollow needle adapter housing.

3,970,491
METHOD FOR MUTUALLY CONNECTING TWO STRIPS OF A THERMOPLASTIC MATERIAL

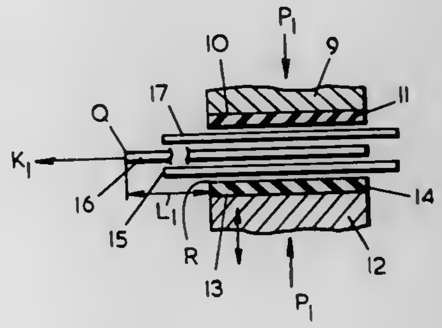
Salomon Pezarro, Pijnacker, Netherlands, assignor to N.V. Technische Maatschappij Marchand-Andriessen, Rijswijk, Netherlands

Filed Dec. 19, 1974, Ser. No. 535,046

Claims priority, application Netherlands, Dec. 21, 1973, 7317632

Int. Cl.^{2} B32B *31/20*

U.S. Cl. 156—73.5 **4 Claims**



1. The method of connecting two strips of thermoplastic material which comprises

positioning the ends of said strips in overlapping relation,

interposing a third strip of similar thermoplastic material between the overlapping ends of said two strips,

applying a pressure force to the outer surfaces of said two strips in a direction transverse to the lengths thereof to force said strips toward one another with said third strip therebetween,

applying a tractive force longitudinally to said third strip at a point remote from the overlapping ends,

continuing said gripping force to maintain said ends of said two strips stationary and continuing said tractive force such that the third strip is moved rapidly in a direction longitudinally of said two strips creating heat until said third strip is completely removed from between said two strips and said two strips are fused to one another.

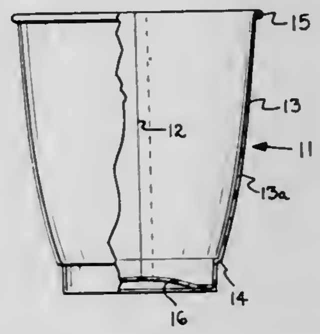
3,970,492
METHOD AND APPARATUS FOR FORMING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, Toledo, Ohio, and Thomas E. Doherty, Setauket, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 354,305, April 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,259, Dec. 23, 1971, Pat. No. 3,854,583. This application June 14, 1974, Ser. No. 479,421

Int. Cl.^{2} B29C *27/28*

U.S. Cl. 156—85 **12 Claims**



1. The method of fabricating a sidewall of a nestable cup-like container comprising, the steps of: providing a rectangular blank of an expanded, heat-shrinkable thermoplastic material; forming said blank into a tubular sleeve having facing ends; joining the ends of the sleeve to one another in a liquid-tight seam extending completely of said ends; providing a mandrel having a generally frusto-conically shaped outer

surface which conforms with the configuration of the inner surface of the sidewall of a nestable cup-like body; placing the sleeve around the mandrel; exposing the sleeve to heat while it is in position around the mandrel to cause the sleeve to shrink so as to conform to the outer surface of the mandrel while maintaining the liquid-tight character of the seam; and removing the shrunken sleeve from the mandrel by moving the sleeve axially relative to the mandrel.

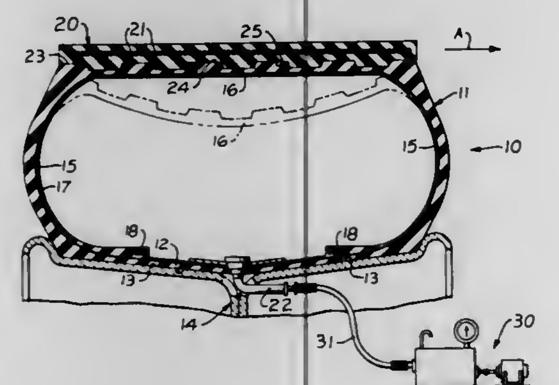
3,970,493
BELT REPLACEMENT METHOD FOR TUBE TIRES

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 309,237, Nov. 24, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,420

Int. Cl.² B29H *5/04*

U.S. Cl. 156—96 **3 Claims**



1. A method of placing replaceable tread and track belt having inextensible circumferential reinforcing members with a diametrical interference fit on a rim suspended pneumatic radially reinforced oval tube-tire carcass having a substantially flat belt mounting crown connected between the tops of its side walls wherein the crown and belt include interlocking circular ribs and grooves comprising the steps of:

a. positioning said rim suspended oval tube-tire carcass above the ground, and without removing said tube-tire carcass from said rim;
b. evacuating said tube-tire carcass until a partial inward collapse of its flat crown has occurred sufficient to convert said tube-tire carcass into a polygonal carcass configuration with more than three lobes and having portions of said flat crown inwardly curved with respect to chord lines joining apexes of adjacent lobes;
c. draping a belt on said apexes of said lobes and aligning said belt with said interlocking circular ribs and grooves of said belt and said crown of said tube-tire carcass in registry at said lobes; and
d. releasing said vacuum to allow said tube-tire carcass to expand into said belt as it returns to a circular configuration.

3,970,494
METHOD FOR ADHERING ONE SURFACE TO ANOTHER

Edwin J. Pritchard, Coopersburg, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

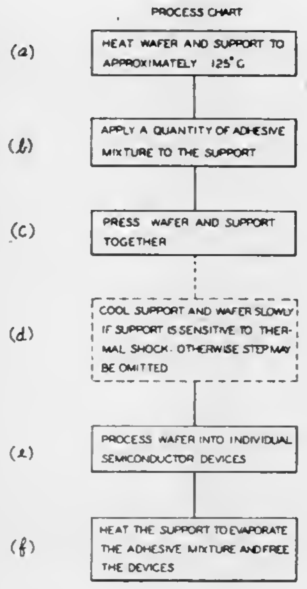
Filed Apr. 18, 1975, Ser. No. 569,529

Int. Cl.² B32B *31/00;* **C08L** *91/06;* **C09D** *3/387*

U.S. Cl. 156—155 **11 Claims**

7. A method for handling a semiconductor wafer, which comprises the steps of:

a. heating the wafer and support therefor;
b. applying a mixture of chloronaphthalene and 8–15% p-terphenyl to the support, said chloronaphthalene comprising the tetra, penta, and hexa isomers of chloronaphthalene;
c. pressing the wafer and support together to temporarily mount the wafer on the support;


PROCESS CHART
(a)
HEAT WAFER AND SUPPORT TO APPROXIMATELY 125°C
(b)
APPLY A QUANTITY OF ADHESIVE MIXTURE TO THE SUPPORT
(c)
PRESS WAFER AND SUPPORT TOGETHER
(d)
COOL SUPPORT AND WAFER SLOWLY IF SUPPORT IS SENSITIVE TO THERMAL SHOCK. OTHERWISE STEP MAY BE OMITTED
(e)
PROCESS WAFER INTO INDIVIDUAL SEMICONDUCTOR DEVICES
(f)
HEAT THE SUPPORT TO EVAPORATE THE ADHESIVE MIXTURE AND FREE THE DEVICES

d. processing the wafer into individual semiconductor devices; and
e. heating the support and devices to evaporate the mixture.

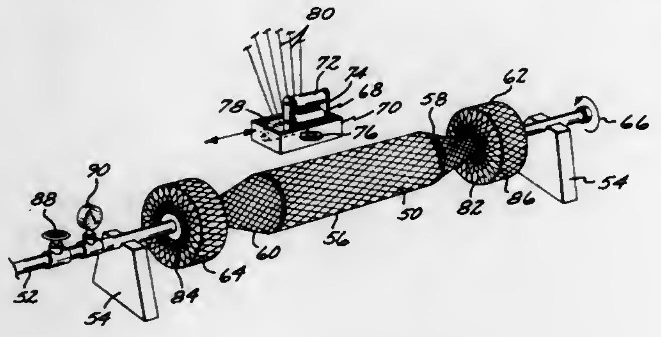
3,970,495
METHOD OF MAKING A TUBULAR SHAFT OF HELICALLY WOUND FILAMENTS

Larry J. Ashton, Long Beach, and Dale P. Abildskov, San Pedro, both of Calif., assignors to Fiber Science, Inc., Gardena, Calif.

Filed July 24, 1974, Ser. No. 491,302

Int. Cl.² B32B *31/18;* **B65H** *81/00;* **B29C** *17/04;* **F16L** *9/16*

U.S. Cl. 156—162 **12 Claims**



1. The method for the fabrication of a tubular shaft having a cylindrical center section and opposite radial end flanges secured thereto by frusto-conical fillet sections which comprises:

forming a sheathing of continuous filament wrapping about a mandrel having a cylindrical center section and tapered end sections with removable flange portions by winding filaments of fibrous reinforcing material in a helical path about said mandrel and guiding said filaments in mandrel end-to-end traversing paths to form said sheathing about the mandrel cylindrical center section in a plurality of layers of helically wound filaments thereon at a first helix angle and guiding said windings radially inwardly about the mandrel tapered end sections to form said frusto-conical fillet sections of said sheathing at a greater helix angle and radially outwardly in a chordal path about said flange portions, thereafter reversing the path of said filaments about said flange portions so that said filaments are applied in layers comprising two adjacent thicknesses of filaments in parallel alignment in each thickness and in diagonal orientation between thicknesses;
embedding said layers of wound filaments in a bonding resin;

curing said bonding resin to cement said sheathing into a rigid shaft member;
cutting said cured sheathing about said flange portions of said mandrel; and
removing said flange portions to form a tubular shaft having a cylindrical center section and opposite end flanges secured thereto by said frusto-conical fillet sections.

3,970,496
MANUFACTURE OF LAMINATES OF SHEET METAL, POLYTHENE AND ALUMINUM FOIL

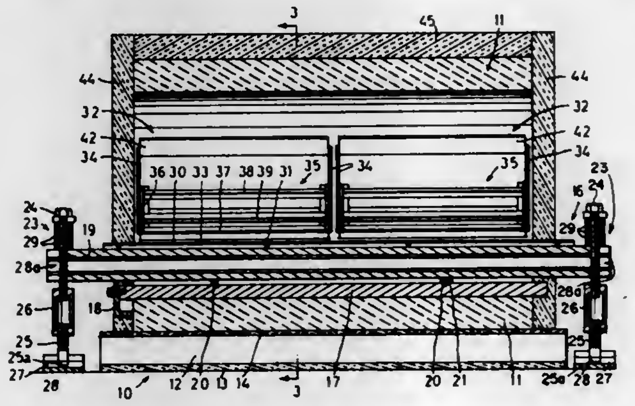
John Ian Menzies, Brisbane, Australia, assignor to Heatshield Research and Development Pty. Ltd., Oxley, Australia

Filed Oct. 10, 1974, Ser. No. 513,722

Claims priority, application Australia, Oct. 10, 1973, 5167/73

Int. Cl.² B31C *13/00*

U.S. Cl. 156—162 **9 Claims**



1. A method for increasing the bond strength of a bonded laminate of two metallic layers joined by a thermal plastic adhesive, comprising the steps of

continuously interleaving a web of thermal plastic adhesive between two metal sheets;
heating at least one of said metal sheets sufficiently to melt said thermal plastic adhesive;
applying pressure to said heated laminate so as to cause said metal sheets to adhere;
subsequently coiling said laminate on a mandrel under tension of not less than one thousand pounds per square inch of laminate cross-section;
removing said coiled laminate from said mandrel and clamping said coiled laminate radially to prevent relative movement of the coil convolutions;
applying sufficient heat to the interior of said coil to maintain the coolest convolution of said coil at a predetermined temperature for a predetermined period, thereby effecting curing of said laminate; and
at the end of said predetermined period terminating the application of said heat to the interior of said coil and permitting said coil to cool progressively to ambient temperature from the outer coil layers inwards, whereby bonding strength between said metallic layers is optimized.

3,970,497
END TRIM PLYWOOD PROCESS

Clinton G. Glover, Clarkston, Wash.; Jack H. Markley, and Patrick J. Young, both of Lewiston, Idaho, assignors to Potlatch Corporation, San Francisco, Calif.

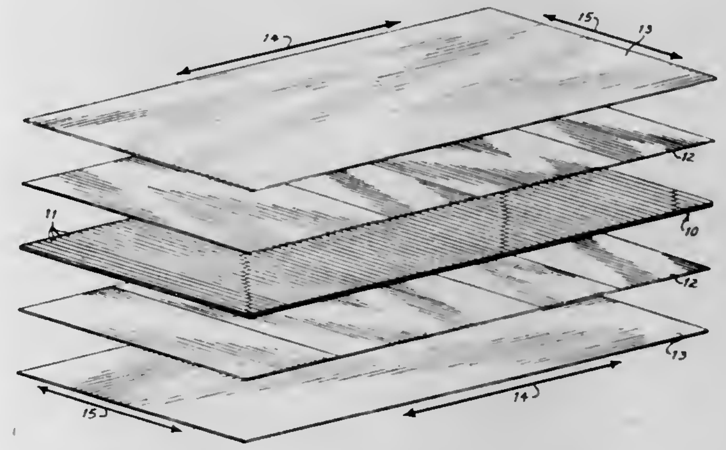
Division of Ser. No. 351,544, April 16, 1973. This application Dec. 30, 1974, Ser. No. 537,342

Int. Cl.² B27D *1/04;* **B32B** *31/18, 31/20*

U.S. Cl. 156—182 **7 Claims**

1. A process for producing a laminated plywood panel, comprising the following steps in sequence:

a. trimming sides and ends of conventional plywood panels to form standard size rectangular plywood sheets and salvaging end trim strips therefrom that are of a predetermined minimum width and have face veneers with wood grain thereof running perpendicular to the length of the end trim strip;
b. sawing each salvaged end trim strip along a line parallel to its trimmed edge to produce a rectangular strip;
c. assembling a solid central core from a plurality of the rectangular end trim strips of common thickness by arranging the strips in a coplanar panel configuration with the strips parallel to one another and to one edge of the core, with side edges of adjacent strips being in abutment with one another and the face veneer surfaces of the plywood strips presenting oppositely facing planar core surfaces;
d. placing a first layer of wood veneer over the face veneer surfaces of the plywood strips at each side of the core with a layer of adhesive between the first layers of wood veneer and the core;
e. and curing the layers of adhesive by application of heat thereto while under surface pressure perpendicular to the layers of adhesive.



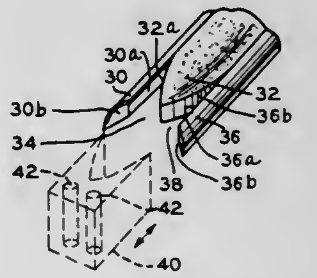
3,970,498
METHOD OF MAKING TRIM STRIP END FINISHES

Theodore Loew, Schenectady, N.Y., assignor to The Standard Products Company, Cleveland, Ohio

Continuation of Ser. No. 213,435, Dec. 29, 1971, abandoned. This application July 21, 1975, Ser. No. 597,565

Int. Cl.² B31F *3/00;* **B60R** *19/00;* **C09J** *5/00*

U.S. Cl. 156—211 **8 Claims**



1. A method of forming an end finish on at least one of the opposite ends of an elongated, thin and laterally narrow plastic trim strip mountable on an underlying support surface, said trim strip in transverse cross-section being thinner than it is wide and including laterally spaced apart side portions and an intermediate portion therebetween and integral therewith, said side and intermediate portions being longitudinally continuous between said opposite ends and having a common bottom surface and corresponding outer surfaces spaced above said botton surface, the outer surfaces of said side portions being of identical contour and dimension transversely of said strip and having laterally spaced apart inner and outer edges, the inner edges of said outer surfaces of said side portions being laterally spaced apart and intersecting the outer

surface of said intermediate portion at an angle to provide laterally spaced apart visible lines of junction between said side portions and said intermediate portion, said lines of juncture extending parallel to one another between said opposite ends of said trim strip, the method comprising the steps of: cutting said trim strip longitudinally along a first cut line on at least one of said lines of juncture and from said one end of said trim strip to a first location on said one line of juncture between said opposite ends and spaced from said one end, said first cut line being completely through said strip in the direction perpendicular to said bottom surface, cutting said intermediate portion completely through said trim strip in said perpendicular directon and along a second cut line extending from said first location laterally across said intermediate portion and terminating at a second location on the other of said lines of juncture to define a laterally extending end face for said intermediate portion, cutting said trim strip longitudinally along a third cut line on said other line of juncture and from said second location to said one end, removing the material of the intermediate portion of said strip between said second cut line said lines of juncture and said one end of the strip, cutting each of said side portions in said perpendicular direction to provide end faces therefor intersecting the corresponding line of juncture and to provide lengths of said side portions along said lines of juncture from the corresponding one of said first and second locations to the corresponding one of said side portion end faces, said lengths of said side portions together being equal to the length of said laterally extending end face of said intermediate portion between said first and second locations, displacing at least one of said lengths of said side portions laterally inwardly of said strip into juxtaposed and covering relationship with a corresponding length of said end face of said intermediate portion and to bring said end faces of said side portions into juxtaposed facial relationship, and bonding said displaced length of said side portions and said intermediate portion to maintain said juxtaposed relationships, whereby said side portions together define a continuous border longitudinally of said intermediate portion and laterally about said end face thereof.

3,970,499

METHOD FOR THE APPLICATION OF GLUED LABELS TO BOTTLES OR THE LIKE

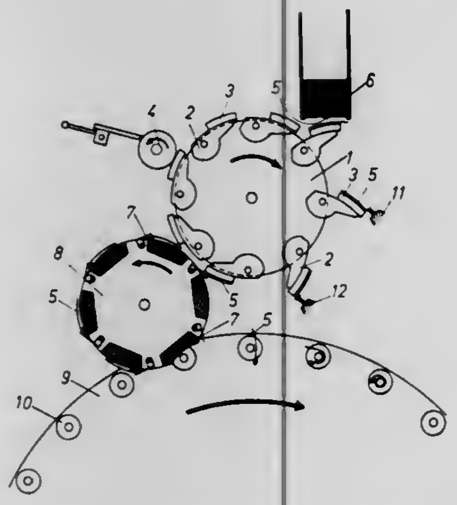
Willi Bommes, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed May 15, 1974, Ser. No. 469,716

Claims priority, application Germany, May 15, 1973, 2324412

Int. Cl.² B65B *45/00*; B65C *9/08*

U.S. Cl. 156—227 **2 Claims**



1. In the method of applying glued thin foil-like labels to continuously advancing bottles or the like, wherein a pickup member is successively brought into contact with a glue applying means, the topmost label of a stack thin foil-like labels and a gripper carried by a cylinder for receiving a glued label and placing it on the bottle, the improvement which comprises folding over by 180° that marginal area of each label which is later to be gripped by the gripper, folding being effected while the label is carried by the pickup member.

3,970,500

PROCESS FOR SEPARATING A NUMBER OF SHEETS INTO GROUPS

Akio Ishizuka, and Yasuhiro Ogata, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 11, 1974, Ser. No. 531,501

Claims priority, application Japan, Feb. 19, 1974, 49-19761

Int. Cl.² B41L *1/24*

U.S. Cl. 156—305 **18 Claims**

1. A process for separating a number of pressure sensitive copying papers into groups which comprises (1) coating an adhesive composition comprising a naphthalene sulfonic acid-formaldehyde condensation product and at least one member selected from the group consisting of an organic acid and an alkali metal salt thereof, on an edge of a stack assembly of said copying papers and then (2) fanning said copying papers; said naphthalene sulfonic acid-formaldehyde condensation produce comprising about 5 to 40% by weight of the adhesive composition, said organic acid or alkali metal salt thereof being present in an amount of about 1 to 100% by weight of said naphthalene sulfonic acid-formaldehyde condensation product, and said organic acid is selected from the group consisting of a mono- or poly-basic carboxylic acid, a sulfonic acid, and a heterocyclic carboxylic acid compound containing at least one nitrogen atom in the heterocyclic nucleus.

3,970,501

PROCESS FOR SEPARATING A NUMBER OF SHEETS INTO GROUPS

Akio Miyamoto, and Keiso Saeki, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 11, 1974, Ser. No. 531,503

Claims priority, application Japan, Dec. 11, 1973, 48-139419

Int. Cl.² B41L *1/24*

U.S. Cl. 156—305 **11 Claims**

1. A process for separating a number of pressure sensitive copying papers into groups which comprises (1) coating an adhesive composition comprising a naphthalene sulfonic acid-formaldehyde condensation product and a water-soluble polymer on an edge of a stack assembly of said copying papers and then (2) fanning said copying papers; said naphthalene sulfonic acid-formaldehyde condensation product comprising about 5 to 40% by weight of the adhesive composition and said water-soluble polymer, which is selected from the group consisting of natural polymer, a semi-synthetic polymer and a synthetic polymer, comprising about 0.1 to 20% by weight of the adhesive composition.

3,970,502

BUILDING PANEL AND PROCESS FOR MANUFACTURING SAME

Hamish Turner, 576 Otis Blvd., Spartanburg, S.C. 29302

Division of Ser. No. 214,538, Jan. 3, 1972, Pat. No. 3,785,103. This application Dec. 10, 1973, Ser. No. 423,266

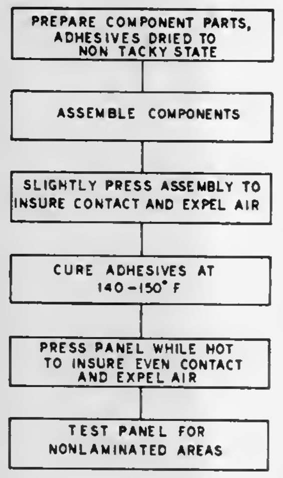
Int. Cl.² B32B *7/00*

U.S. Cl. 156—310 **8 Claims**

1. A process for producing a building panel comprising the steps of:

a. preparing outer skins and edge members and applying a solvent based adhesive to selected portions thereof;
b. preparing a foam core and applying a water dispersed adhesive thereto;
c. drying said adhesives to a substantially non tacky state;

d. assembling the outer skins, edge members and foam core to provide a panel;
e. applying pressure to said assembled panel, said pressure being sufficient to expel air therefrom;


PREPARE COMPONENT PARTS, ADHESIVES DRIED TO NON TACKY STATE
ASSEMBLE COMPONENTS
SLIGHTLY PRESS ASSEMBLY TO INSURE CONTACT AND EXPEL AIR
CURE ADHESIVES AT 140–150° F
PRESS PANEL WHILE HOT TO INSURE EVEN CONTACT AND EXPEL AIR
TEST PANEL FOR NONLAMINATED AREAS

f. heating said panel to occure the adhesive compositions; and
g. applying further pressure said panel while said panel is hot to insure complete bonding and expel further air therefrom.

3,970,503

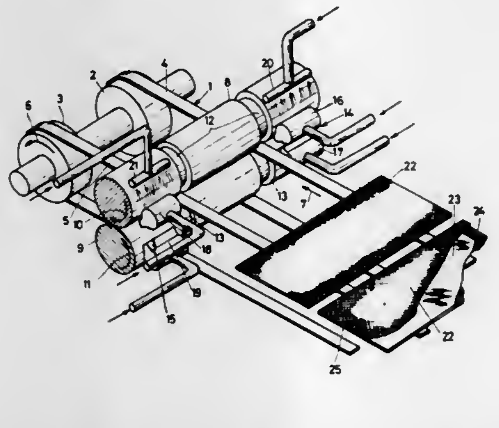
METHOD OF MANUFACTURING A BAG

Takehisa Yoshimura, Suita, Japan, assignor to Ruby Net Hosoki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1974, Ser. No. 536,915

Int. Cl.² C09J *5/10*

U.S. Cl. 156—323 **6 Claims**



1. A method of manufacturing a plurality of bags from a single cylindrical net-like bag blank consisting of synthetic fibers or synthetic resin comprising the steps of:

inserting into said bag blank a plurality of resilient plates each having a length at least equal to the depth of the bags to be manufactured and a width substantially equal to the circumferential length of said bag blank in such a way that the plates are not overlapped with the related bag bottom forming portions of said bag blank, but are overlapped with the related bag mouth forming portions of said bag blank;

applying a molten polyethylene resin in the form of at least one filament or strip extending widthwise of the bags to be manufactured to the opposite outer surfaces of said bag blank in said bag mouth forming portions and to at least one outer surface of said bag blank in said bag bottom forming portions; and

immediately after applying said resin, cooling under pressure said applied molten polyethylene resin to embed the synthetic fibers or synthetic resin of said bag blank into said applied polyethylene resin and to solidify the latter; and

severing the thus processed bag blank into individual bags.

3,970,504

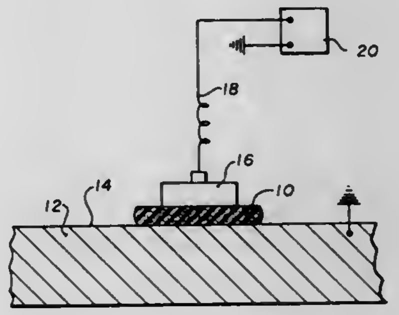
ULTRASONIC COUPLING METHOD

David Nelson Palmer, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 25, 1974, Ser. No. 517,972

Int. Cl.² C09J *3/14*

U.S. Cl. 156—329 **5 Claims**



1. A method of adhering and ultrasonicly and electrically coupling an ultrasonic transducer to a surface wherein said coupling will be subject to high temperature and radiation comprising the steps of applying a layer of electrically conductive room temperature vulcanizing material between said transducer and said surface and curing said room temperature vulcanizing material to cause said transducer to be adhered and coupled to said surface, said room temperature vulcanizing material comprising:

a. a matrix selected from the group consisting of vinylmethyl siloxane and polyphenyl siloxane;
b. an iron oxide binder-filler;
c. a catalyst capable of causing cross-linking of said matrix; and
d. a finely divided homogenously dispersed conductive material selected from the group consisting of palladium and graphite.

3,970,505

ANAEROBIC COMPOSITIONS AND SURFACE ACTIVATOR THEREFOR

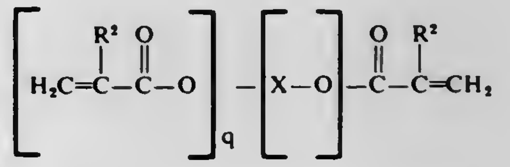
Martin Hauser, West Hartford, and Bernard M. Malofsky, Bloomfield, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 323,689, Jan. 15, 1973, abandoned. This application Aug. 20, 1974, Ser. No. 498,904

Int. Cl.² C08F *18/24*, *218/00*, *216/02*, *220/00*

U.S. Cl. 156—331 **11 Claims**

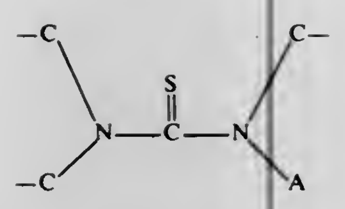
1. A polymerizable composition, curable through gaps of twenty mils or more, comprising a polymerizable acrylate ester monomer selected from the group consisting of monofunctional acrylate esters and polyacrylate esters having the formula



$$\left[H_2C=C(R^2)-C(=O)-O\right]_q-\left[X-O\right]-C(=O)-C(R^2)=CH_2$$

wherein R² is a radical selected from the group consisting of hydrogen, halogen and alkyl of from 1 to about 4 carbon atoms; *q* is an integer equal to at least 1; and X is an organic radical containing at least two carbon atoms and having a total bonding capacity of *q* plus 1; at least 0.1% of a hydroperoxide polymerization initiator capable of polymerizing said monomer in the substantial absence of oxygen, a cure-through-gap agent consisting of a combination of;

a. a substituted thiourea of the formula



wherein A is hydrogen or

C—;

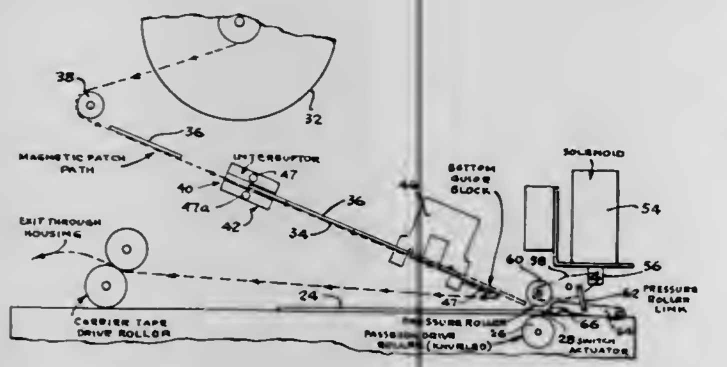
and

b. about 0.1% to about 5% by weight of the composition of an acid having a pKA of less than about 6 and soluble in the mixture of acrylate ester monomer and hydroperoxide initiator.

3,970,506
MAGNETIC PATCH ARRANGEMENT APPARATUS

Okum Kwan, Trumbull, and William A. Ottersen, Norwalk, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 23, 1974, Ser. No. 491,022
Int. Cl.^{2} B32B *31/04*
U.S. Cl. 156—351 **12 Claims**



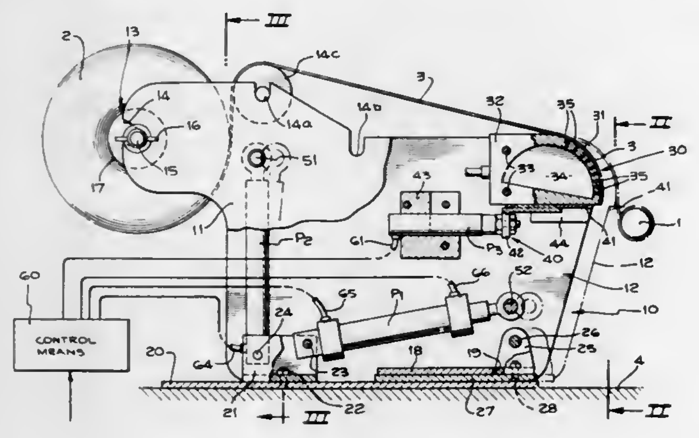
1. Applicator apparatus for applying one label of a plurality of labels each carried in a successive position on a tape to a flat article moving in one direction, the improvement comprising:

Mechanical stop means operable for engaging said article to stop said article in a first position when said article is moved in said one direction toward said stop means;
drive means operable for thereafter moving said article in said one direction and for simultaneously moving said tape carrying said labels at substantially the same velocity;
sensing means operated responsive to said one label being moved to a second position having a predetermined spacial relationship to said first position to disable said drive means and stop said one label in said second position;
positioning means, operated by said sensing means, for positioning said stop means to engage and stop said article at said first position in response to the position of a label at a second predetermined position having a predetermined spacial relationship to said first position;
control means operated by said article in said first position for retracting said stop means from engagement with said article and for operating said drive means to simultaneously move said tape and said article at substantially the same velocity, said article moved by said drive means in said one direction from said first position past said stop means and said one label moved by said drive means from said second position toward said article and
means for separating said moving one label from said tape to apply said one label to said moving article while said tape and article are moved at said same velocity.

3,970,507
TAPE DISPENSER AND METHOD OF DISPENSING TAPE

Chester G. Dalzell, and Burton D. Pace, both of Ogallala, Nebr., assignors to TRW Inc., Ogallala, Nebr.

Filed Oct. 17, 1974, Ser. No. 515,707
Int. Cl.^{2} B65C *3/12*
U.S. Cl. 156—446 **9 Claims**



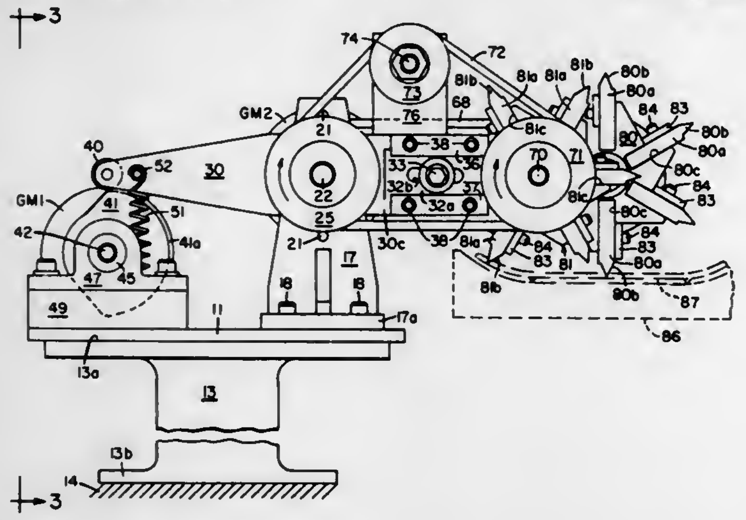
1. In a tape dispenser for dispensing tape to be wound around a rotating part including supporting means for supporting the rotation of a reel of tape and holding means for holding a portion of the tape at a position remote from the reel and cutting means to sever the tape after a predetermined length has been wound around the rotating part, said holding means and cutting means being mounted on a frame, displacement means to move the holding means from an initial position to a dispensing position in close proximity to the rotating part so that the adhesive on the tape at said remote position contacts said rotating part, and the tape is gripped thereby so that the rotation of the rotating part causess tape to be wound around the part, the improvement comprising the provision of:

said displacement means including first driving means primarily for pivoting said frame about a pivot so that the holding means moves to said disensing position and for pivoting said frame back to said initial position, and second driving means for translating said frame after said first driving means pivots said frame to said dispensing position, said second driving means translating said frame to a position such that the holding means is in a cutting position proximate to the rotating part so that a free end of tape on the holding means would not contact the rotating part after the tape is cut by said cutting means.

3,970,508
DECAL SMOOTHING APPARATUS

Mijo A. Gossie, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,176
Int. Cl.^{2} B65C *9/36*
U.S. Cl. 156—477 R **4 Claims**



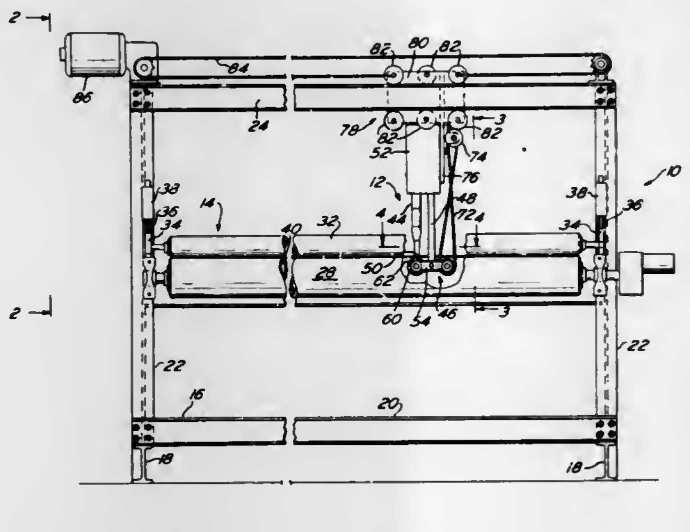
1. In an apparatus for automatically applying transfer films of decals to upwardly facing surfaces of pieces of dish-like pottery ware, glass or glass-ceramic ware, or the like, as each piece of ware is intermittently conveyed through a path of travel comprising a plurality of dwell stations including a film smoothing station, an assembly for smoothing and removing any air or solvent which is entrapped between said transfer films and said surfaces of said pieces of ware during the applying of said films, such assembly being disposed at said smoothing station and comprising, in combination,

A. a lever arm pivotally supported adjacent its center for vertical reciprocative movement of the ends thereof,
B. a cam follower rotatably supported on said arm adjacent a first end thereof,
C. a stellate wheel including a plurality of radial fingers of a resilient material, such wheel being rotatably supported by said arm adjacent the second end thereof and above each piece of ware conveyed to and dwelling at said smoothing station so that said wheel can be periodically actuated downwardly and rotated to cause the tips of said radial fingers to contact and move with a wiping squeegee-like action across the transfer film on said upwardly facing surface of each piece of ware dwelling at the smoothing station, such movement of such fingers being in a direction extending generally radially from adjacent the center of each respective piece of ware towards the outer rim thereof,
D. a rotary cam having a peripheral rim including thereon high and low regions at selected maximum and minimum distances from the pivotal center of the cam, such cam rotatably mounted on said assembly below said cam follower,
E. spring means for forcing said first end of said lever arm in a direction to maintain the peripheral rim of said cam follower in contact with said peripheral rim of said cam,
F. means for imparting rotation to said cam for periodic actuation of said second end of said lever arm and, thereby, said stellate wheel to a downward position and the tips of said radial fingers thereof into contact with the transfer film on each respective piece of ware dwelling at the smoothing station and being rotated thereat, and
G. means for imparting rotation to said wheel to provide said wiping squeegee-like action of said tips of said radial fingers when such wheel is in its said downward position.

3,970,509
APPARATUS FOR SIMULTANEOUSLY CUTTING, SEALING AND STITCHING THERMOPLASTIC MATERIAL

Joseph Vitale, Charlotte, N.C., assignor to Perfect Fit Industries, Inc., Monroe, N.C.

Filed Nov. 18, 1974, Ser. No. 524,690
Int. Cl.^{2} B29C *27/08;* B32B *31/16*
U.S. Cl. 156—580 **3 Claims**



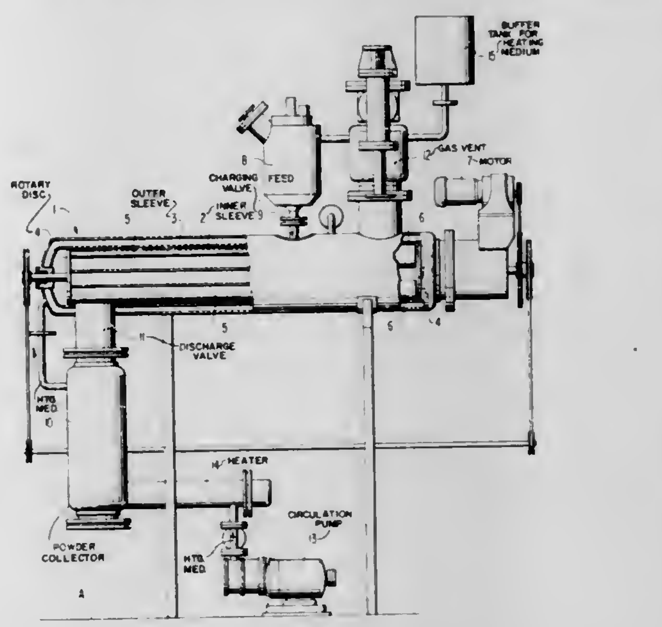
1. A machine for simultaneously cutting, sealing and stitching thermoplastic material, comprising:

A frame assembly;
means mounted on said frame assembly for advancing the material through the machine and for positioning the section of material to be cut along a predetermined cutting plane;
a frame member mounted on said frame assembly transversely to the direction in which the said material is advanced-- was inserted; and in a plane parallel to the cutting plane;
a cutting assembly including a sonic horn having a flat cutting head, a plurality of wheels for pressing the material against said cutting head, and wheel support means biasing the working edges of said wheels against said cutting head;
reciprocating means slidably mounted on said frame member for alternately placing said cutting assembly in a first position wherein said cutting plane is situated between said cutting head and said wheels, and a second position wherein said cutting head and said wheels are disposed from said cutting plane in a direction perpendicular to said cutting plane; and
means for moving said reciprocating means and said cutting assembly along said frame member.

3,970,510
METHOD AND APPARATUS FOR CONVERTING A LIQUID MATERIAL INTO A POWDER

Muneaki Nakai, Osaka, Japan, assignor to Yashima Chemical Engineering Co., Ltd., Osaka, Japan

Filed Sept. 3, 1974, Ser. No. 502,318
Claims priority, application Japan, Sept. 3, 1973, 48-99397
Int. Cl.^{2} B01D *1/22, 1/24;* B01F *7/02*
U.S. Cl. 159—6 WH **2 Claims**



1. A method of converting a solution or slurry into a powder comprising:

feeding said solution or slurry comprising a material dissolved or dispersed in a liquid into a horizontally elongated fixed drum closed at both ends,
heating and stirring the solution or slurry within said drum to evaporate and separate the liquid from the dissolved or dispersed material with the now solidified and dispersed material in semi-solid form adhering to the inner wall of the drum,
moving at least one scraper extending longitudinally within said drum parallel to said drum axis and adjacent said drum inner wall about a circular path defined by the drum axis to scrape accumulated solidified and dispersed material from said drum wall, and causing at least one loosely supported roller extending parallel to the scrapers and adjacent thereto to move along a similar proximate circular path and to periodically contact said scraper to transfer solidified and dispersed material from said scraper to

the roller periphery and to periodically contact the inner wall of drum to press said transferred solidified and dispersed material on said roller periphery against the inner wall of said drum to dry the same into powdered form, and

collecting the thus formed powder.

3,970,511

PROCESS AND INSTALLATION FOR CONCENTRATING DILUTE SOLUTIONS OF CORROSIVE PRODUCTS

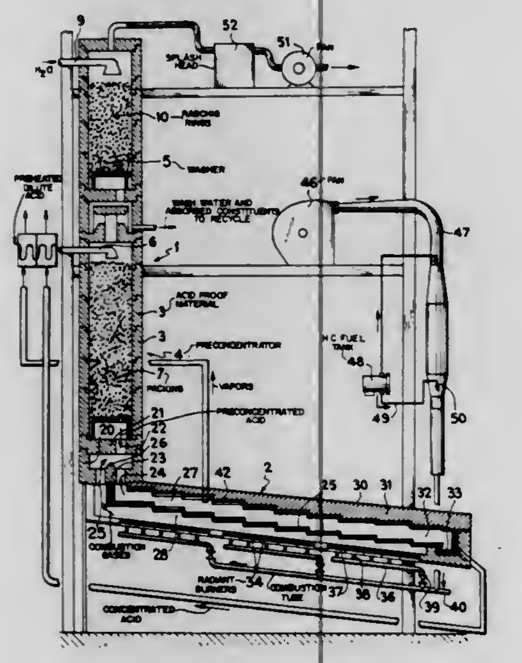
Roger M. Rat, Saint-Medard-en-Jalles; Francois A. Pollozec, Bergerac, and Jean J. Patouillet, Paris, all of France, assignors to Societe Nationale des Poudres et Expolsifs, Antar Petroles de l'Atlantique: Antargaz, France

Filed Dec. 18, 1973, Ser. No. 425,922

Claims priority, application France, Dec. 19, 1972, 72.45228

Int. Cl.² B01D *1/14*, *1/22*, *1/02*; C01B *17/90*

U.S. Cl. 159—13 C **19 Claims**



1. A process for concentrating a dilute solution of a corrosive product by heating, which comprises the steps of

1. pre-concentrating the dilute solution, and
2. introducing the pre-concentrated solution into a tunnel in which it flows in a thin layer over successive cascades while being heated whereby the desired final degree of concentration is obtained, and generating the required heat by burning a combustible gas mixture inside a burner material with a high radiating power located sufficiently close to said tunnel in which the solution flows to heat said solution and volatile materials are vaporized while being isolated from the combustion gases.

3,970,512

FALLING FILM EVAPORATOR

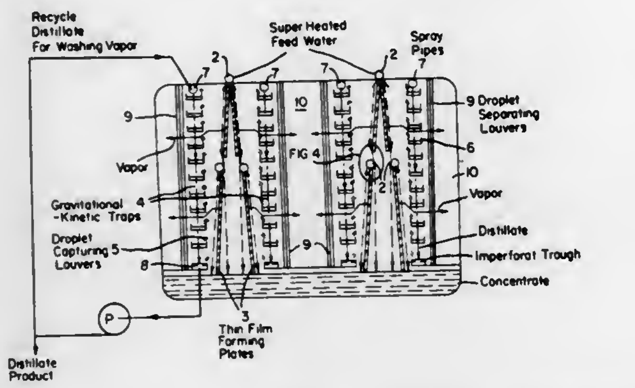
Ismail Zulfugarovich Makinsky, ulitsa Saratovtsa-Efima, 3/5, kv. 8, and Samuil Petrovich Baksht, ulitsa Nizami, 129, kv. 13, both of Baku, U.S.S.R.

Continuation of Ser. No. 170,151, Aug. 9, 1971, abandoned. This application Oct. 8, 1974, Ser. No. 513,172

Int. Cl.² B01D *1/22*, *1/00*

U.S. Cl. 159—13 R **4 Claims**

1. An evaporator, substantially for a distiller, comprising in combination: a housing accomodating horizontal pipelines having nozzle openings on their undersides for feeding superheated water to be treated therethrough; an evaporating surface including a plurality of inclined plates disposed within said housing and defining an acute angle to the longitudinal vertical plane thereof, the superheated water being fed through the nozzle openings onto the upper edges of said plates through the nozzle openings of said pipeline for being subjected to film evaporation from the surfaces of said plates; and gravitational-kinetic traps comprising a plurality of horizontal, superposed parallel perforated troughs with perforate undersides mounted in said housing in the path of the horizontal movement of the vapor produced due to later withdrawal of same from said film evaporation of the superheated water, said traps providing for catching the entrained liquid particles carried away by the vapor.



3,970,513

STEAM SUPPLYING STRUCTURE FOR OPPOSING BUILD-UP OF MATTER IN HEADBOXES

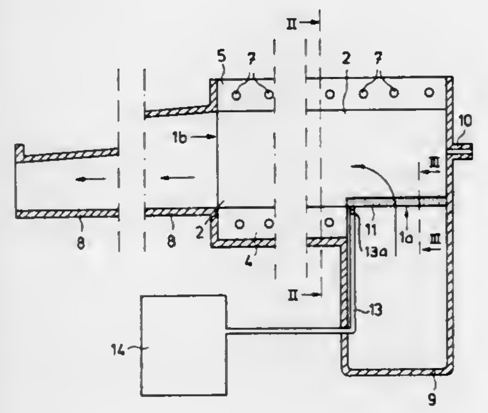
Antti Lehtinen, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 529,113, Dec. 3, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,328

Claims priority, application Finland, Apr. 10, 1974, 1101/71

Int. Cl.² D21F *1/02*

U.S. Cl. 162—272 **3 Claims**



1. In a paper machine, a headbox having in its interior a location where there is a tendency for accumulation and build-up of matter such as fibers, fillers, slime and the like, and means situated in the region of said location for introducing steam into stock flowing through the headbox so as to oppose the tendency of said matter to accumulate and build-up at said location, said means including at the region of said location a plurality of hollow bodies each having a wall surrounding a hollow interior space and formed at least in part with passages through which steam can flow from the interior space to the exterior of each hollow body, and steam-supply means communicating with the hollow interior of each body for supplying thereto steam to flow through said passages to the exterior of each body into stock situated at the exterior of said body, said headbox having in its interior a plurality of flow-equalizing lamellae which define between themselves spaces through which the stock flows, and said lamellae respectively having leading edge regions toward which the stock flows and trailing edge regions away from which the stock flows, and said plurality of hollow bodies, respectively being connected with said lamellae and extending along one of said edge regions thereof for introducing steam into the stock at the region of said one of said edge regions of said lamellae.

3,970,514

COMBINATION-PAPER MACHINE

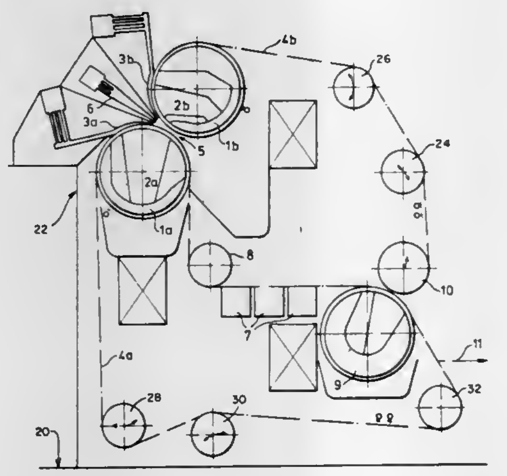
Erik Albert Nykopp, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Feb. 4, 1975, Ser. No. 547,021

Claims priority, application Finland, Feb. 15, 1974, 447/74

Int. Cl.² D21F *1/00*

U.S. Cl. 162—303 **4 Claims**



1. A combination-paper machine for the continuous manufacture of a fibrous web comprising:

a base;

a frame on the base;

a pair of perforated cylinders rotatably supported on the frame with parallel axes at such distance from each other that the width of a slit formed therebetween is slightly greater than the thickness of the finished web;

two endless wires each separately guided along the surface of a different one of the perforated cylinders a distance extending from a pulp suspension feeding point to at least the slit;

means attached to the frame for guiding the wires along the surface of the respective perforated cylinder from the suspension feeding point to the slit and then along the surface of only one of the cylinders from the slit to a position further along the surface of said one of the cylinders;

means attached to the frame at the pulp suspension feeding point for feeding pulp suspension onto the wire-covered surface of each perforated cylinder on which the initial formation of the web takes place and including two mutually separate and independent roof-like upper lips each covering at least part of each one of the wire-covered cylinder surfaces;

suction means, attached to the frame, for drawing water from the web while the web proceeds along the surface of said one of the cylinders from the slit to a position further along the surface of said one of the cylinders; and

means for detaching the finished web from one of the wires.

3,970,515

CONTROLLED SEQUENCE PRESSURE NIP

Leroy H. Busker, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 412,578, Nov. 5, 1973, abandoned, which is a continuation of Ser. No. 241,710, April 6, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,427

Int. Cl.² D21F *3/06*

U.S. Cl. 162—360 R **2 Claims**

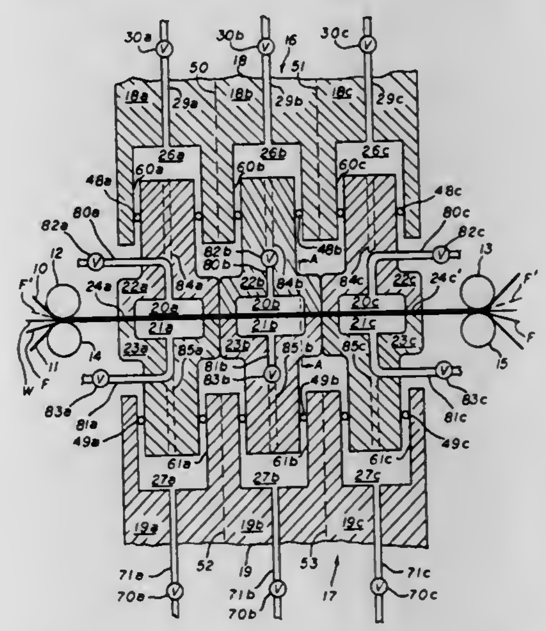
1. A press structure for performing a dewatering operation in the process of formation of a traveling fibrous web, comprising:

at least one felt for traveling with the web in water receiving contact therewith;

a pair of looped, fluid impervious belts for traveling with the web for carrying the web and felt therebetween;

first hydraulic pressure means for applying a uniform first pressure to a first area along the travel of the belts to force water from the web at a high rate of speed, said rate being less than that at which fiber crushing occurs;

second successive hydraulic pressure means immediately adjacent the first hydraulic pressure means for applying a uniform second pressure to a second area along the travel of the belts, said second pressure being greater than the first pressure and sufficient to cause additional water to flow from the web at a second rate less than the rate at which fiber crushing occurs so that the water can flow from the web without excess water flow velocity building up within the web;



said first and second hydraulic pressure means each including a beam and a chamber housing arranged to define a hydraulic supporting chamber therebetween;

each chamber housing including a pressure chamber exposed to the traveling belts, so that pressurized fluid supplied to the supporting chamber urges the chamber housing against the traveling web and pressurized fluid applied to the pressure chamber provides water expressing force against the web; and

each beam and chamber housing being linked by a flexible diaphragm to define the peripheral walls of the supporting chamber.

3,970,516

MULTIPLE FILTER PRESS DIAPHRAGM FORMER

Barry M. Barkel, Saline; Stephen M. Collins, and William M. Herring, both of Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,237

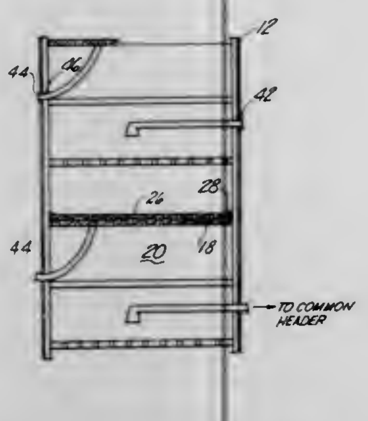
Int. Cl.² D21J *3/12*

U.S. Cl. 162—382 **6 Claims**

1. A multiple filter press diaphragm former, comprising:

a. a housing,
b. at least one slurry inlet chamber disposed in the housing for issuing a slurry onto a diaphragm support base,
c. a rigid support screen spaced apart from and provided beneath the slurry inlet chamber, such that a diaphragm support base is accomodated between the slurry inlet chamber and the support screen,
d. at least one evacuation chamber disposed beneath the support screen,
e. means for introducing a slurry into the inlet chamber,
f. vacuum means for applying varying vacuums across the support screen through the evacuation chamber to densify the slurry issuing onto a diaphragm support base, and

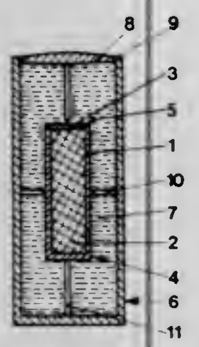
g. a sealing gasket abutting the support screen and disposed between the support screen and the inlet chamber, the



gasket defining a track for slidingly receiving a diaphragm support base.

3,970,517
PROCESS OF SAFELY COMPACTING A RADIO-ACTIVE MATERIAL INTO A SOLID BODY

Hans Bertil Van Nederveen, Bosch en Duin, Netherlands, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands
Filed Jan. 2, 1974, Ser. No. 430,011
Claims priority, application Netherlands, Jan. 15, 1973, 7300552
Int. Cl.² G21C *3/02*
U.S. Cl. 176—66 **9 Claims**



1. A process carried out in a hot-cell which includes therein a chamber and means for drawing a partial vacuum within said chamber and an electronic-beam welding apparatus, comprising the steps carried out within said chamber and under partial vacuum conditions, of (a) filling a compressible inner container with granulated radio-active material, (b) applying said vacuum pressure to said material within said container, (c) with said welding apparatus, welding a first lid onto said container to seal same against radio-active leakage, and (d) placing said sealed inner container within a compressible outer container with a space defined between said containers and surrounding said inner container, (e) filling said space with liquid metal, and (f) welding a second lid onto said outer container to seal same, thus providing a container assembly and performing compaction on said container assembly, by applying a pressure upon said sealed outer container which being compressible applies pressure onto said liquid metal which transmits said pressure equally in all directions onto said inner container which being compressible compacts said radio-active material therein.

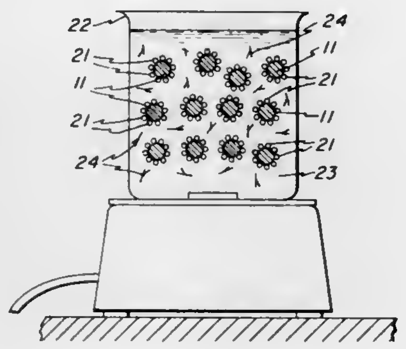
3,970,518
MAGNETIC SEPARATION OF BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed July 1, 1975, Ser. No. 592,195
Int. Cl.² G01N *27/00, 33/16*
U.S. Cl. 195—1.5 **8 Claims**

1. A method for the separation of a select population of cells, bacteria or viruses from a mixed population comprising the steps of:

contacting a solution of said mixed population containing members of said select population with a plurality of small magnetic particles each of which is coated with a layer of antibodies to the select population bonded thereto,

magnetically separating said magnetic particles from said solution, said magnetic particles having on surface area



thereof members of said select population affixed as a complex to said layer of antibodies,

contacting these coated magnetic particles with said members affixed thereto with a cleaving agent solution to detach said members of the select populaton from said antibody-coated magnetic particles and

magnetically separating the antibody-coated magnetic particles from the cleaving agent solution now containing said members of the select population.

3,970,519
PROCESS FOR PRODUCING L-LEUCINE

Takayasu Tsuchida, Kawasaki; Haruo Momose, Kamakura, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Mar. 4, 1975, Ser. No. 555,114
Claims priority, application Japan, Mar. 15, 1974, 49-29645
Int. Cl.² C12D *13/06*
U.S. Cl. 195—29 **3 Claims**

1. A process for producing L-leucine which comprises cultivating a microorganism selected from the group consisting of *Brevibacterium lactofermentum* FERM-P 2516, 2517 and 1965 and *Corynebacterium glutamicum* FERM-P 1966, 1968 and 2518 in an aqueous medium containing a source of assimilable carbon and nitrogen, inorganic salts and nutriments at a pH of 5 to 9 until L-leucine accumulates in the medium, and recovering the accumulated L-leucine.

3,970,520
NUTRITIONALLY IMPROVED FOODSTUFFS

Jacob Richard Feldman, New City, N.Y.; Gerhard Julius Haas, Woodcliff Lake, N.J., and Joaquin Castro Lugay, Thornwood, N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Continuation-in-part of Ser. No. 398,291, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 126,261, March 19, 1971, abandoned. This application July 28, 1975, Ser. No. 599,754
Int. Cl.² A23J *3/00*
U.S. Cl. 195—29 **8 Claims**

1. An improved process for preparing a bland, enzymatically hydrolyzed, soluble, nutritious, proteinaceous material comprising:

a. obtaining a protein isolate;
b. washing the isolate sufficiently to substantially remove off flavors and odors;
c. preparing a slurry of the protein isolate and water;

d. adjusting the slurry pH to between about 6 to 7;
e. adding to the slurry a proteolytic enzyme mixture of ficin, papain, and neutral protease from B. Subtilis;
f. incubating the resulting mixture for a period of time to hydrolyze the protein and solubilize from 50 to 90 percent of the protein to provide a soluble fraction having a molecular weight of from 200 to 2900;
g. terminating the incubation by heating the mixture to a temperature sufficient to inactivate the enzymes and precipitate heat-insoluble fractions of the isolate;
h. recovering the soluble protein fraction having a molecular weight from 200 to 2900; and
i. drying the soluble protein fraction.

3,970,521
IMMOBILIZED GLYCOENZYMES

Oskar R. Zaborsky, Watchung, N.J., and Allen I. Laskin, New York, N.Y., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed Aug. 7, 1974, Ser. No. 495,339
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 **11 Claims**

1. A water-insoluble enzyme-polymer conjugate, comprising a glycoenzyme covalently bound to an amino-containing water-insoluble polymer through a hydrazone linkage between a carbonyl group on the enzyme and an amino group on the amino-containing water insoluble polymer.

5. A method for immobilizing a glycoenzyme which comprises oxidizing the carbohydrate portion of the glycoenzyme at conditions whereby at least one carbonyl group or acetal group is formed and coupling the oxidized glycoenzyme to an amino-containing water-insoluble material by reacting a carbonyl group of the glycoenzyme with an amino group of the water-insoluble material to cause coupling of the glycoenzyme to the water-insoluble material through a hydrazone or imine linkage to produce a water-insoluble immobilized glycoenzyme-amino conjugate.

3,970,522
METHOD FOR THE PRODUCTION OF D-RIBOSE

Ken-ichi Sasajima, Hyogo; Muneharu Doi; Teruo Fukuhara, both of Osaka; Akira Yokota, Kyoto; Yoshio Nakao, Osaka, and Masahiko Yoneda, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Nov. 25, 1974, Ser. No. 527,145
Claims priority, application Japan, Nov. 23, 1973, 48-131955; Mar. 18, 1974, 49-31357
Int. Cl.² C12D *13/02*
U.S. Cl. 195—112 **13 Claims**

1. A method of producing D-ribose, which comprises cultivating a microorganism belonging to the genus Bacillus in a culture medium containing assimilable carbon and nitrogen sources and factors necessary for growth of the microorganism, causing the microorganism to elaborate and accumulate D-ribose, and recovering the D-ribose thus accumulated from the resultant culture broth, said microogranism having at least one property selected from the group consisting of (1) a sporulation frequency not more than 10^{-4} and (2) a 2-deoxy-D-glucose-oxidizing activity within the range from 0.05 to 1.00 μ mole/min./mg. protein, and said microorganism also having at least one property selected from the group consisting of (3) a transketolase activity of not more than 0.01 μ mole/min./mg. protein and (4) a D-ribulose phosphate 3-epimerase activity of not more than 0.01 μ mole/min./mg. protein.

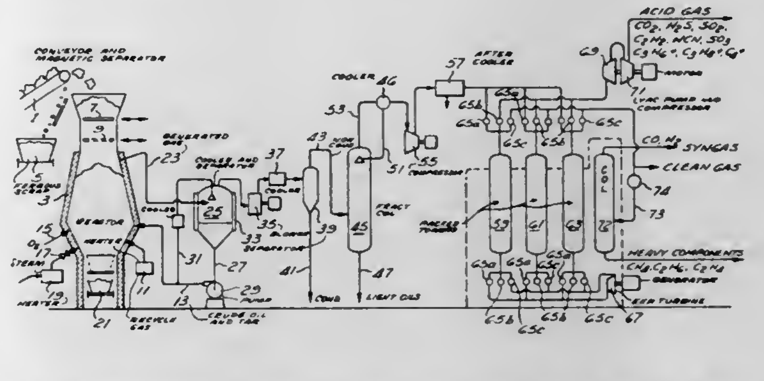
3,970,523
PROCESSES OF PRODUCING COKES OF LARGE LUMP SIZE AND IMPROVED STRENGTH FROM BITUMINOUS COALS

Kurt-Günther Beck; Wolfgang Rohde; Heinrich Echterhoff, all of Essen, and Gerd Nashan, Oberhausen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany
Continuation of Ser. No. 350,466, April 12, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,897
Claims priority, application Germany, Nov. 24, 1972, 2257668
Int. Cl.² C10B *57/02*
U.S. Cl. 201—1 **10 Claims**

1. A process for the production of coke from coal, particularly from bituminous coal, comprising the steps of preliminarily heating coal having a plastic temperature range of about 350° to 550°C to a temperature in the range of approximately 160° to 250°C; and coking the preliminarily heated coal in a substantially horizonatally oriented chamber of an oven by additionally heating the preliminarily heated coal, the coking being effected at a mean coking rate between about 1.2 and 2.8 inches per hour, and the additional heating comprising maintaining the rate of temperature increase as measured in the region of the center of the chamber between about 1.6° and 3.3° centigrade per minute in the plastic temperature range of the coal.

3,970,524
TREATING WASTE MATERIALS TO PRODUCE USABLE GASES

Harald F. Funk, 68 Elm St., Murray Hill, N.J. 07974
Continuation-in-part of Ser. No. 486,562, July 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 252,610, May 12, 1972, abandoned. This application Apr. 4, 1975, Ser. No. 565,045
Int. Cl.² C10B *31/02, 51/00, 21/18, 57/12*
U.S. Cl. 201—2.5 **12 Claims**



1. The process of converting solid waste into useful fluids while preventing substantial air and water pollution which comprises the steps of:

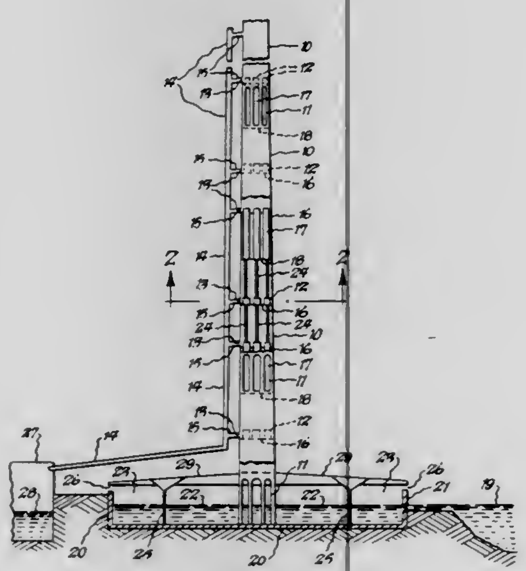
a. maintaining a retort, constituting part of a closed system, partly filled with shredded solid waste by charging such waste into the retort through an opening in the upper part thereof while preventing escape of gases through said opening,
b. partially oxidizing and combusting said shredded solid waste in a combustion zone in the lower part of the retort and adjusting the heating value and composition of the resulting gases by controlling the temperature in said zone and by varying the volume and temperature of fuel and oxygen brought into said zone,
c. volatilizing and distilling moisture and fluids on and in the shredded solid waste by conducting said gases from said zone up through and in intimate contact with said shredded solid waste thereabove,
d. withdrawing from the upper part of the retort mixed gases including the gases resulting from the said oxidizing and combusting of said shredded solid waste and the volatilized and distilled moisture and fluids of the shredded waste,

e. compressing gases withdrawn from said retort to about 50 psig and cooling them to an ambient temperature of about 20°C.,

f. passing the thus compressed and cooled gases through a chamber in intimate contact with heat absorbing means and separating them into their condensable and non-condensable components, and

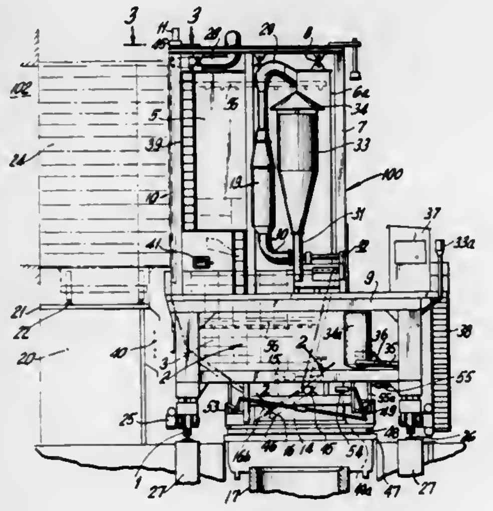
g. separating and removing the non-condensable component and revaporizing the condensed component.

3,970,525
ATMOSPHERIC EFFECTS STILL
John A. Kurek, 138 James St., Buffalo, N.Y. 14210
Filed Nov. 27, 1974, Ser. No. 524,244
Int. Cl.² B01D *3/02*
U.S. Cl. 202—174 **1 Claim**



1. An atmospheric effects still, comprising:
a fluid holding tank provided with a supply opening;
a top cover of translucent material supported above said tank in vertically-spaced relation thereto; and
a vertically-positioned tapered hollow tower member having an outer shell, having its base positioned on the floor of said tank, and having an intermediate portion of its vertical extent penetrating said cover, said shell having openings adjacent said base to permit fluid in said tank to enter said tower member, said tower member also having a plurality of vertically-spaced sections of decreasing cross-sectional area, each of said sections including a lower horizontal closure plate, an upper horizontal closure plate, and a plurality of vertically-positioned open tubes having their outer surfaces exposed to atmospheric temperature, each of said tubes having its lower end arranged to penetrate said closure plate and having a marginal portion adjacent its upper end extending beyond said upper collector plate to define a liquid trap chamber above said collector plate, said tower member also having a drain arranged to direct a flow of condensed water accumulating on said collector plates away from said tower member, and a plurality of vertically-disposed condenser tubes arranged in said tower member;
whereby solar energy may pass through said top cover to heat fluid in said tank, to cause heated moisture-laden air to rise upwardly through said tower member, and to cause water to condense within said tubes and on said condenser tubes and flow from said tower member through said drain.

3,970,526
CLOSED TANK COKE CAR CONSTRUCTION
Martin Bender, Dusseldorf; Johannes Knappstein, and Josef Stratmann, both of Recklinghausen, all of Germany, assignors to Firma Carl Still, Firma Hartung, Kuhn & Co. GmbH; both of Germany
Filed Aug. 6, 1974, Ser. No. 495,204
Claims priority, application Germany, Aug. 9, 1973, 2340256
Int. Cl.² C10B *39/14*
U.S. Cl. 202—227 **10 Claims**



1. A closed tank car for receiving and transporting incandescent coke through a coke guide car from the oven chambers of horizontal coke oven batteries to a quenching station, comprising a tank having a hood portion with a lateral coke entrance opening capable of being closed, said entrance opening having the height and width of the coke cake to be received, and adapted to be connected to the coke guide car, said tank having a closeable bottom outlet opening for the coke adapted to be connected to the quenching station, and suction, washing, and separating means for the dusts, gases and fumes produced during the discharge from the oven chambers into the tank car and during the discharge from the tank car into the quenching station connected to said tank, a movable undercarriage, said tank being supported on said movable undercarriage, a tank support frame on said undercarriage, said tank having walls of heat-resistant metal plates which are suspended from said support frame in loosely adjacent layers and overlap one another on all sides, said hood portion comprising a heat-resistant framed steel structure in which said heat-resistant metal plates are arranged in layers and overlapping one another, and strips carried by said support frame secured to said plates.

3,970,527
ELECTROFORMATION OF THE RUNNING TRACK OF A ROTARY INTERNAL COMBUSTION ENGINE
Henry Brown, Sarasota, Fla., assignor to Oxy Metal Industries Corporation, Warren, Mich.
Continuation-in-part of Ser. No. 316,207, Dec. 18, 1972, Pat. No. 3,856,635, which is a continuation of Ser. No. 421,302, Dec. 3, 1973. This application Mar. 27, 1975, Ser. No. 562,609
Int. Cl.² C25D *1/02, 1/20*
U.S. Cl. 204—9 **15 Claims**

1. A method for forming a housing comprised essentially of aluminum for the running track of a rotary internal combustion engine which comprises the steps of:

1. electrodepositing a first layer on to a mandrel of the shape of the running track of the rotor, said mandrel having a chromium surface, and said first layer deposited thereon being a metal selected from the group consisting essentially of nickel, cobalt, iron and their alloys and being separable from the mandrel during subsequent steps;

2. electrodepositing a wear-resistant layer on to said first layer
3. then casting a housing comprised essentially of aluminum; and
4. separating the housing from the mandrel with a chromium surface.

3,970,528
PROCESS FOR THE PURIFICATION OF ELECTROLYSIS BRINE
Eberhard Zirngiebl, Cologne, and Alfred Irlenkäuser, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 20, 1975, Ser. No. 624,213
Claims priority, application Germany, Oct. 23, 1974, 2450259
Int. Cl.² C25B *1/16, 1/26;* C01F *5/22*
U.S. Cl. 204—98 **7 Claims**

1. A process for purifying electrolysis brine comprising dividing the electrolysis brine into first and second streams, adding calcium chloride to the second stream thereby substantially quantitatively to obtain a first precipitate comprising calcium sulfate in the form of $CaSO_4 . 2 H_2O$ with some magnesium compound admixed therewith, separating off the first precipitate, combining the second stream freed from the first precipitate with the first stream, adding sodium carbonate and alkali hydroxide to the re-combined streams thereby substantially quantitatively to obtain a second precipitate comprising calcium and any magnesium present therein, the calcium being present as $CaCO_3$ in said second precipitate and any magnesium being present as $Mg(OH)_2$, separating off the second precipitate to leave a purified brine, introducing the purified brine into the electrolysis cell, reacting the $CaSO_4 . 2 H_2O$ first precipitate under pressure with sodium hydroxide and CO_2 to form $CaCO_3$ and $Na_2SO_4 . 10 H_2O$, removing the $Na_2SO_4 . 10 H_2O$, reacting the $CaCO_3$ with hydrochloric acid to form CO_2 and a solution of $CaCl_2$ having some magnesium compound dissolved therein, and recycling the $CaCl_2$ to react with a further quantity of said second stream.

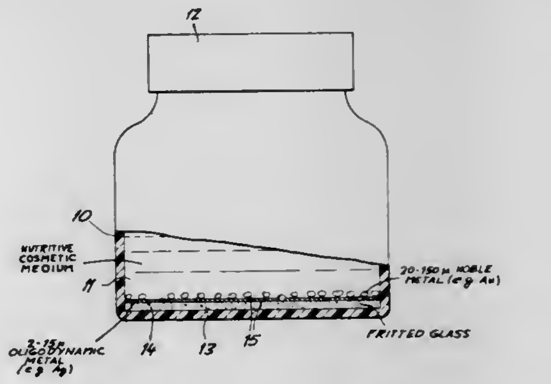
3,970,529
ELECTROPOLISHING ALUMINUM AND ALUMINUM ALLOYS
Sylvia Martin, Detroit, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.
Filed Apr. 30, 1975, Ser. No. 573,186
Int. Cl.² C25F *3/00*
U.S. Cl. 204—129.9 **8 Claims**

1. In a method of anodically electropolishing articles formed of aluminum and aluminum alloys to obtain a full bright, polish surface, which comprises the steps of:

a. immersing the article as the anode in a bath comprising from about 95% to about 30% by volume concentrated phosphoric acid and from about 5% to about 70% by volume of a polymer selected from the group consisting of poly (alkylene ether) having at least four ether groups and derivatives thereof, and

b. operating the bath at a temperature of from about 150° to about 200°F at a current density of from about 30 a.s.f. to about 150 a.s.f. and at about 15 to about 100 volts, until the surface of said article is polished.

3,970,530
METHOD OF AND SYSTEM FOR THE DESTRUCTION AND/OR LIMITATION OF THE REPRODUCTION OF MICRO-ORGANISMS IN NUTRITIVE MEDIA
Bohdan Maslowski, Chene-Bougeries, Geneva, and Dimitri Tzanos, Grand-Lancy, Geneva, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland
Filed Aug. 6, 1974, Ser. No. 495,257
Claims priority, application Switzerland, Aug. 6, 1973, 11350/73
Int. Cl.² A23B *7/00*
U.S. Cl. 426—237 **9 Claims**


12
10
NUTRITIVE COSMETIC MEDIUM
11
20-150μ NOBLE METAL (e.g. Au)
2-15μ OLIGODYNAMIC METAL (e.g. Ag)
14
13
15
FRITTED GLASS

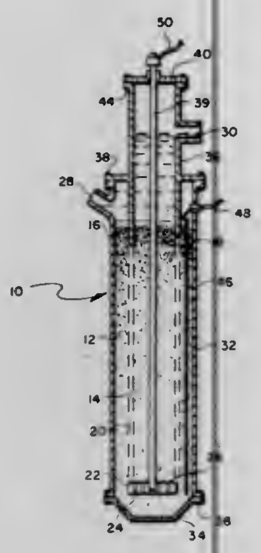
1. A method of checking the growth of micro-organisms in an electrically conductive medium contaning nutrients conductive to the proliferation of such micro-organisms, comprising the steps of:
placing said medium in a container for prolonged storage; and
contacting said medium in said container with an anodic and a cathodic material constituting electrical couples for the autosolubilization in said medium of an oligodynamic transistion metal forming part of said anodic material, said cathodic material consisting of at least one metal more noble than said oligodynamic metal, said anodic and cathodic materials adhering to a rough surface of a substrate with a multiplicity of cavities whose mean size in all dimensions lies in a range of 50 to 2000 microns, said surface forming a multiplicity of triple-contact points between said anodic material, said cathodic material and said medium, at least one of said materials being in granular form.

3,970,531
DECREASING THE CYANIDE AND HEAVY METAL CONTENT OF AN AQUEOUS SOLUTION
Howard L. Recht, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Division of Ser. No. 503,198, Sept. 4, 1974. This application Nov. 28, 1975, Ser. No. 635,813
Int. Cl.² C02B *1/82;* C25F *7/00, 7/02*
U.S. Cl. 204—149 **4 Claims**

1. A method of concurrently reducing the heavy metal and cyanide content of an aqueous solution containing the same comprising:

a. passing the aqueous solution sequentially through a bed of electrically conductive particles contained in a first compartment and then through a bed of electrically conductive particles contained in a second compartment of an electrolytic cell, said first compartment being separated from said second compartment by an electronically nonconductive foraminous member, said foraminous member having a plurality of openings, said openings having a median size within the range of from about 10^{-6} to 10^{-14} square centimeters;

b. maintaining an applied potential of from about 1.0 to 10 volts between said first and second compartments whereby a direct electrical current flows between said compartments through said foraminous member and the heavy metal is deposited upon the electrically conductive particles in one of said compartments and the cyanide is oxidized in the other of said compartments, and



c. discharging the aqueous solution of substantially reduced heavy metal and cyanide content.

3,970,532
2-HYDROXYETHYLPHOSPHINES

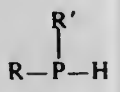
Ingenuin Hechenbleikner, West Cornwall, and William Palmer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 16, 1975, Ser. No. 541,542

Int. Cl.^{2} B01J *1/10, 1/12*

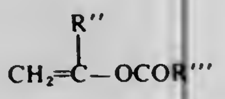
U.S. Cl. 204—158 R **8 Claims**

1. A process for the preparation of 2-hydroxyalkylphosphines comprising the steps of (1) the reaction of a phosphine having the structural formula



$$R-\overset{R'}{\overset{|}{P}}-H$$

where R and R′ are hydrogen, alkyl, aryl, cycloalkyl or aralkyl, with an alkenyl carboxylate having the structural formula



$$CH_2=\overset{R''}{\overset{|}{C}}-OCOR'''$$

where R″ is hydrogen or methyl, and R‴ is a saturated aliphatic hydrocarbon group of 1–17 carbon atoms, in the presence of (a) from about 0.01% to about 5.0% of a non-oxidizing aliphatic initiator having less than 30 carbon atoms, and (b) light having a wave length between 2000A. and 4000A., at a temperature which ranges from 10°C to about 50°C, to form a 2-acyloxyphosphine, and (2) the subsequent alcoholysis or hydrolysis of said 2-acyloxyalkylphosphine to the corresponding 2-hydroxyalkylphosphine.

3,970,533
PROCESS FOR CONVERSION OF ELASTOMERIC PHOSPHAZENE

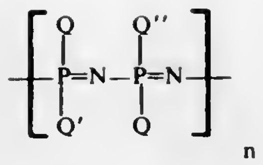
Gary Stephen Kyker, Uniontown; Thomas Anthony Antkowiak, Rittman, and Adel Farhan Halasa, Bath, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 405,236, Oct. 10, 1973, abandoned. This application June 30, 1975, Ser. No. 592,005

Int. Cl.^{2} C08F *8/00;* **C08G** *33/16*

U.S. Cl. 204—159.14 **17 Claims**

1. Phosphonitrilic fluoroelastomer represented by the general formula:



$$\left[-\overset{Q}{\underset{Q'}{P}}=N-\overset{Q''}{\underset{Q}{P}}=N-\right]_n$$

wherein each of Q and Q′ represent a fluoroalkoxy group represented by the formula $-OCH_2C_nF_{2n}Z$ in which n is an integer from 1 to 10 and Z represents H or F; and Q and Q′ are not required to be the same and there may be more than two such groups;

and Q″ represents an o-allylphenoxy group;

the groups Q, Q′ and Q″ being randomly distributed along the —P=N—P=N— chain.

3,970,534
GRAFT COPOLYMER AND PROCESS FOR PREPARATION THEREOF

Hiroshi Fujiwara; Koichi Asano; Akio Sugishita, all of Soka, and Asao Takahashi, Saitama, all of Japan, assignors to Maruzen Oil Co. Ltd., Osaka, Japan

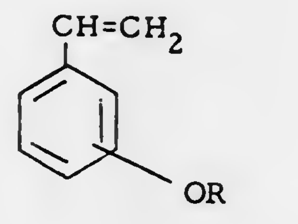
Filed Jan. 13, 1975, Ser. No. 540,789

Claims priority, application Japan, Jan. 11, 1974, 49-6373; Jan. 11, 1974, 49-6374

Int. Cl.^{2} C08F *2/46, 255/00, 257/02*

U.S. Cl. 204—159.17 **25 Claims**

1. A graft copolymer comprising a hydrocarbon polymer main chain and a side chain composed mainly of a styrene compound of the following general formula (I)



(I)

wherein R is a hydrogen atom or an R′CO group, in which R′ is a hydrocarbon group having 1 to 20 carbon atoms,

and a polyene compound containing at least two polymerizable double bonds in the molecule grafted to the hydrocarbon polymer main chain, the grafting ratio of said styrene compound being about 0.1 to 500% and the grafting ratio of said polyene compound being about 0.1 to 100% based on the weight of the hydrocarbon polymer.

3,970,535
PHOTOPOLYMERIZATION PROCESS UTILIZING A 2-METHYL-SUBSTITUTED BENZIMIDAZOLE AS A PHOTOSENSITIZER

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed June 12, 1974, Ser. No. 478,572

Int. Cl.^{2} C08F *8/18, 8/34*

U.S. Cl. 204—159.18 **8 Claims**

1. In a process for photopolymerizing a polymerizable ethylenically unsaturated vehicle, wherein said vehicle is photosensitized by incorporating thereinto a photosensitizer and exposing the photosensitized vehicle to a source of ultraviolet radiation, the improvement which comprises incorporating as a photosensitizer into said vehicle a substituted 2-methyl benzimidazole compound wherein the substituent is attached to the 2-methyl carbon, said photosensitizer is the amount of about 0.5 to about 10% by weight, based on the weight of the vehicle.

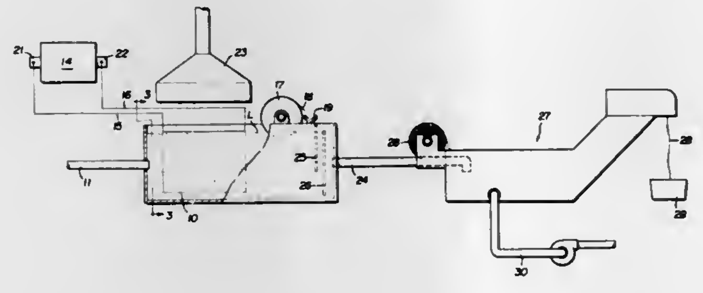
3,970,536
LIQUID TREATING METHOD AND APPARATUS

Don L. Shettel, Bloomfield Hills, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Aug. 22, 1974, Ser. No. 499,670

Int. Cl.^{2} C25B *7/00*

U.S. Cl. 204—180 R **9 Claims**



1. In a method of separating an electrically conductive liquid from contaminants suspended therein, comprising the steps of:

1. flowing an electrically conductive liquid contaminated by suspended contaminants having electrical surface charges, between an electrically charged cell comprised of a plurality of generally vertical, substantially parallel, relatively inert spaced surfaces, the alternate surfaces constituting a first set of surfaces for receiving an electrical charge and the other surfaces constituting a second set of surfaces for receiving an opposite electrical charge;
2. electrically interconnecting the cell to a substantially constant DC power source to establish an identical, substantially constant positive electrical charge on each surface in one of said sets of surfaces and an identical, substantially constant negative electrical charge on each surface of the other of said surfaces;
3. electrophoretically attracting at least a portion of the contaminants in said liquid generally horizontally toward one set of said vertically arranged charged surfaces to effect a contaminant migration;
4. agglomerating at least a portion of the attracted contaminants between the vertically arranged first and second sets of surfaces as a result of the migration in Step (3);
5. simultaneously with Steps (3) and (4) electrolytically generating minute gaseous bubbles with surfaces of the cell and floating said bubbles vertically between the surfaces through the agglomerated contaminants toward the surface of the liquid; and
6. entraining at least a portion of the agglomerated contaminants in the bubble flotation.

3,970,537
ELECTROLYTIC TREATING APPARATUS

Griff W. Froman, St. John, and Albert Ray Mullins, Portage, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 378,206, July 11, 1973, Pat. No. 3,901,771. This application Apr. 14, 1975, Ser. No. 567,703

Int. Cl.^{2} C25D *5/02, 7/06, 17/12*

U.S. Cl. 204—211 **5 Claims**

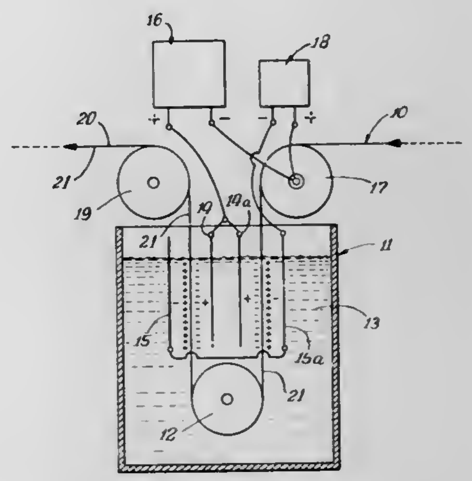
1. In an apparatus for continuously electrolytically treating an endless wide strip of an electrically conductive material including an electrolytic tank adapted to hold an electrolyte bath and having associated therewith guide means for guiding the said strip continuously into and out of the interior of the tank between spaced anodic and cathodic electrodes, the improvement comprising;

a. all said anodic electrodes being disposed within said tank directly facing only one wide surface of said endless strip,

b. all said cathodic electrodes being disposed within said tank directly facing only the opposite wide surface of said endless strip,

c. each said anodic electrode being connected with the positive terminal of a first source of direct current,

d. each said cathodic electrode being connected with the negative terminal of a second source of direct current which is independent of said first source of direct current,



e. each said source of direct current having the respective negative and positive electrical terminals thereof electrically connected with said endless strip, and

f. each said source of direct current having means for independently regulating the magnitude of the direct currents supplied to said electrodes and strip.

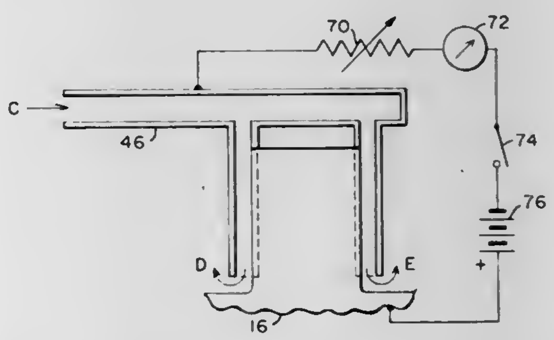
3,970,538
APPARATUS FOR ELECTRO-CHEMICAL MILLING OF TURBINE BLADE EDGES

Joseph G. Lucas, Trumbull, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Mar. 19, 1975, Ser. No. 559,749

Int. Cl.^{2} C25F *3/02, 3/14, 7/00*

U.S. Cl. 204—224 M **3 Claims**



1. Apparatus for electro-chemical milling of the edges of integrally cast blades used in turbine engines, comprising:

an electrically insulated tool casing body having a slot formed in one end thereof, said slot sized to allow insertion of one of said blades therein;

two hollow electrically-conductive metallic tubes positioned within said tool casing body along each lengthwise edge of said slot, each of said tubes having a slit through its inward facing side wall to provide communication between the center of said tubes and said slot;

indexing means for centering said blade within the slits in the metallic tubing at said slot edges;

means for accurately positioning each of said integrally cast blades in said tool casing body, said means comprising the forming of spaced apart reference slots and surfaces in the tool casing body, the shape of said slots and said surfaces being complementary to the contour of adjacent blade elements of said integrally cast blade assembly whereby close dimensional and blade-to-blade pitch tolerance can be maintained during electro-chemical milling;

clamping means for holding said blade in its indexed position within said tool casing body;

means for supplying a flow of electrolyte to each of said tubes; and

voltage supply means for establishing a current flow between each of said metallic tubes and said blade.

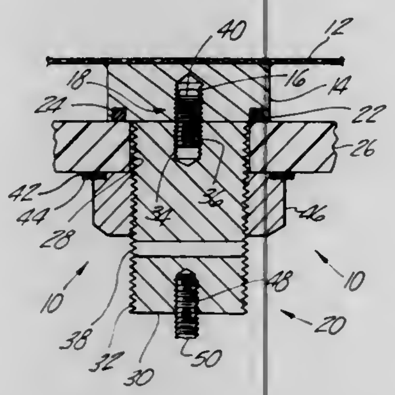
3,970,539
END CONNECTOR FOR FILTER PRESS CELL

Stephen M. Collins, Trenton, and Albert J. Schweickart, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,325

Int. Cl.^{2} C25B *11/00*, *1/00*

U.S. Cl. 204—254 **8 Claims**



1. In a bipolar electrolytic filter press cell of the type having an anode and a cathode, each electrode having a boss member associated therewith and a central web interposed between the anode and cathode, an improved end connector therefor, comprising:

a. a boss extension member which matingly engages the surface of the boss member remote from an associated electrode,

b. a pressure collar mounted on the boss extension member, and

c. means interconnecting the boss member and the boss extension member,

such that the connector defines a liquid-gas seal independent of an electrical connection.

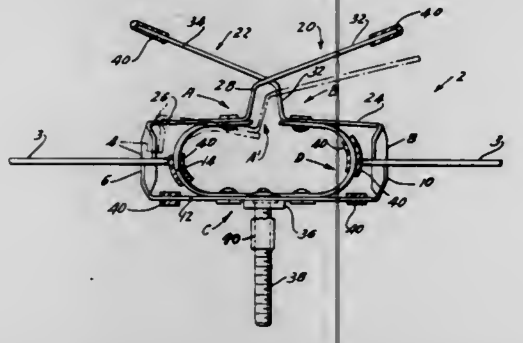
3,970,540
CLAMPING DEVICE FOR USE IN ELECTROPLATING

William Lander McBain, Oakville, Conn., assignor to The Mitchell-Bate Company, Waterbury, Conn.

Filed Mar. 26, 1975, Ser. No. 562,147

Int. Cl.^{2} C25D *17/04*

U.S. Cl. 204—297 W **12 Claims**



1. A clamping device for gripping an object, comprising:

a. a support;

b. two elements on said support each having an object-engaging portion comprising a section having an elongated edge surface, said respective edge surfaces facing and at least partially registering with each other in substantially parallel horizontal planes and being in relatively skewed vertical planes;

c. resilient means operatively connected to said elements for biasing said object-engaging portions toward and into engagement with each other; and

d. means operatively connected to at least one of said elements for deforming said resilient means to separate said object-engaging portions.

3,970,541
GAS EXTRACTION OF COAL

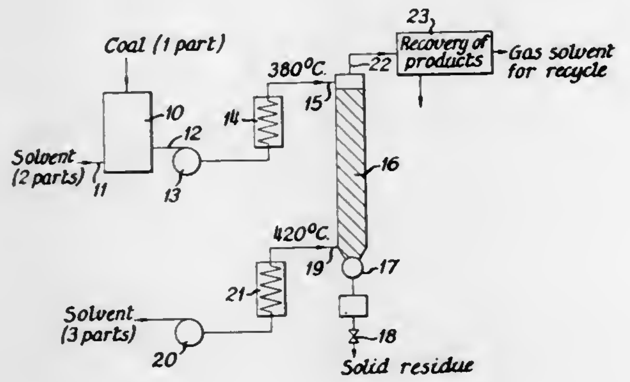
Derek Farnham Williams, and John Charles Whitehead, both of London, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Nov. 26, 1974, Ser. No. 527,249

Claims priority, application United Kingdom, Dec. 17, 1973, 58350/73; Aug. 9, 1974, 35243/74

Int. Cl.^{2} C10B *57/00*; C10G *1/04*

U.S. Cl. 208—8 **11 Claims**



1. A process for the gas extraction of soluble constituents of coal which process comprises the steps of heating the coal in the presence of an extraction solvent at an initial rate of at least 20°C. per minute to an intermediate temperature of 370°–390°C., thereafter heating said heated solvent-coal mixture at a second rate of less than 20°C. per minute to a terminal temperature range of 400°C. to 550°C., said second rate of heating minimizing secondary polymerization reactions; said solvent at the terminal temperature range being in the gaseous phase, separating the extractant from the residue and thereafter recovering the extract from the extractant.

3,970,542
METHOD OF PREPARING ELECTRODE PITCHES

Pieter Jan Willem Bongertman, Uithoorn, Netherlands, assignor to Cindu N.V., Yithoorn, Netherlands

Continuation of Ser. No. 286,907, Sept. 7, 1972, abandoned. This application Nov. 15, 1974, Ser. No. 524,147

Claims priority, application Netherlands, Sept. 10, 1971, 7112518

Int. Cl.^{2} C10C *3/00*

U.S. Cl. 208—22 **9 Claims**

1. A method of preparing electrode pitch consisting essentially of mixing

a. a highly aromatic residual fraction produced by steam cracking a gas oil or naphtha at a temperature in excess of 750°C and fractionating to separate said residual fractions with

b. a coal tar pitch in a weight ratio of 1:9 to 9:1 and

heating said mixture at a temperature of above 350° to 400°C for about 5½ hours to about 17 hours.

3,970,543
PRODUCTION OF LUBRICATING OILS

Herbert A. McIntosh, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 302,166, Oct. 30, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,132

Int. Cl.^{2} C10G *21/00*, *23/00*

U.S. Cl. 208—86 **8 Claims**

1. A process for the production of a lube blend of improved viscosity index which comprises subjecting a crude petroleum oil to distillation to produce a light lube oil distillate having an initial boiling point between about 600° and 650°F. and an end point between about 800° and 850°F. and a residual fraction having an initial boiling point between about 800° and 850°F., separating said residual fraction into a heavy crude distillate and a vacuum residuum, deasphalting said vacuum residuum, passing a member of the group consisting of said heavy crude distillate and said deasphalted residuum into contact with a hydrorefining catalyst at a temperature between about 600° and 900°F., a pressure between about 800 and 5000 psig and a space velocity between about 0.1 and 5 v/v/hr. in the presence of added hydrogen, separating the hydrorefining zone effluent into a gas rich in hydrogen, a fraction having an end point between about 600° and 650°F. and a hydrorefined lube oil fraction having an initial boiling point between about 600° and 650°F., separating from said hydrorefined lube oil fraction a light hydrorefined fraction having an initial boiling point between 600° and 650°F. and an end point between about 800° and 850°F. and blending with said hydrorefined lube oil fraction having an initial boiling point between about 800° and 850°F. said light lube oil distillate in an amount between 50 and 200 percent by volume of said light hydrorefined fraction to produce a lube oil blend having a viscosity index higher than either said hydrorefined lube oil fraction or said light lube oil distillate.

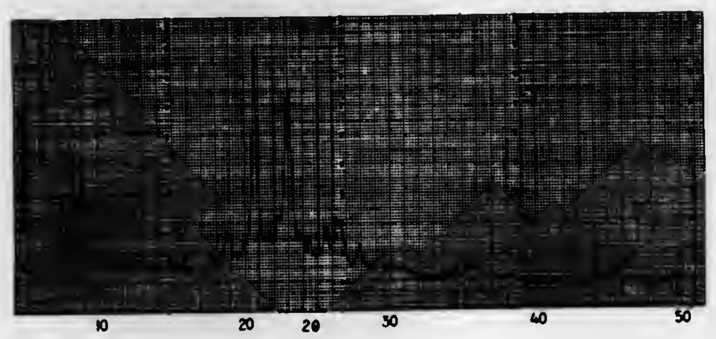
3,970,544
HYDROCARBON CONVERSION WITH ZSM-12

Edward Joseph Rosinski, Pedricktown, N.J., and Mae Koenig Rubin, Bala Cynwyd, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 467,334, May 6, 1974, abandoned, which is a division of Ser. No. 125,749, March 18, 1971, Pat. No. 3,832,449. This application Feb. 28, 1975, Ser. No. 553,950

Int. Cl.^{2} C10G *13/02*, *11/04*; B01J *29/28*

U.S. Cl. 208—111 **7 Claims**



1. A process for conversion of a hydrocarbon charge which comprises contacting said charge under conversion conditions with a catalyst comprising a zeolite the X-ray powder diffraction pattern of which manifests the interplanar spacings set forth in Table 1 of the specification when the zeolite is in the sodium-tetraethylammonium cationic form, said zeolite having, in terms of mole ratios of oxides, the formula:

$$1 \pm 0.4\ M_{2/n}O:\ W_2O_3:\ 20\text{–}200YO_2:\ zH_2O$$

wherein M is at least one cation having a valance *n*, *z* is between 0 and 60, W is aluminum or gallium and Y is silicon or germanium.

3,970,545
HYDROCARBON DESULFURIZATION UTILIZING A NON-CATALYTIC HYDROGEN DONOR STEP AND AN OXIDATION STEP

Jin S. Yoo, and Andrew P. Voss, both of South Holland, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 305,595, Nov. 10, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,891

Int. Cl.^{2} C10G *23/02*, *27/04*

U.S. Cl. 208—212 **16 Claims**

1. In a desulfurization process for producing a hydrocarbon product of reduced sulfur content from a sulfur-containing hydrocarbon feedstock a major portion of which boils above about 550°F., wherein a portion of said contained sulfur is preferentially oxidized and said oxidized sulfur-containing hydrocarbon feedstock is treated to remove at least a portion of the oxidized sulfur and wherein said hydrocarbon product of reduced sulfur content is recovered, the improvement which comprises heating said sulfur-containing hydrocarbon feedstock prior to the oxidation step with at least one liquid hydrocarbon compound capable of transferring hydrogen to said sulfur-containing hydrocarbon feedstock without the presence of a catalyst under conditions such that hydrogen which is transferred from at least a portion of said liquid hydrocarbon compound is reacted with said sulfur-containing hydrocarbon feedstock to form hydrogen sulfide, said heating being conducted at a ratio of 100 parts by weight of said sulfur-containing hydrocarbon feedstock to from about 5 parts to about 2000 parts by weight of said hydrocarbon compound, and said heating being conducted at a temperature in the range from about 500°F. to about 1350°F.

3,970,546
METHOD AND APPARATUS FOR SEPARATING NON-FERROUS METAL FROM WASTE MATERIAL

Clyde B. Webb, and Frank S. Knoll, both of Jacksonville, Fla., assignors to Carpco, Inc., Jacksonville, Fla.

Filed June 4, 1974, Ser. No. 476,281

Int. Cl.^{2} B03B *1/00*; B03C *7/04*

U.S. Cl. 209—3 **25 Claims**

1. A method for separating non-ferrous metal from waste material comprising non-ferrous metal and low conductivity conductive material; said method comprising the steps of:

a. sizing the waste material to a particle size not more than about 4 inches;

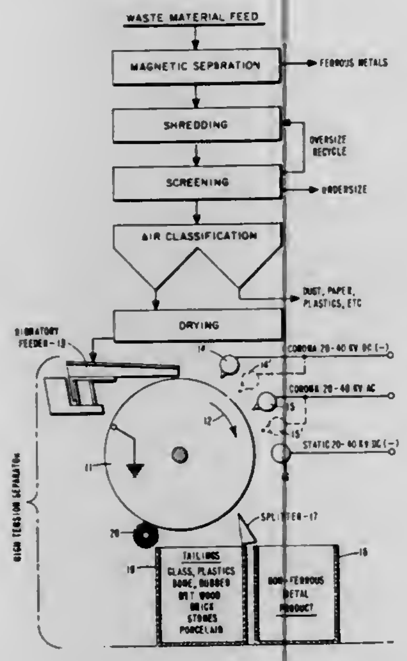
b. feeding the sized waste material particles to a grounded electrode;

c. pinning the waste material particles to said grounded electrode by subjecting the waste material particles to ion bombardment from a D.C. corona discharge electrode;

d. maintaining the low conductivity conductive particles pinned to said grounded electrode by subjecting the waste material particles to discharge from an A.C. corona discharge electrode;

e. inducing a charge, opposite in polarity to said D.C. corona discharge electrode, on the non-ferrous metal particles and attracting the non-ferrous metal particles away from said grounded electrode by subjecting the waste material particles to an electrostatic field imposed between a static D.C. electrode and said grounded electrode; said static D.C. electrode having the same polarity as said D.C. corona discharge electrode; and

f. collecting the non-ferrous metal particles.



3,970,547

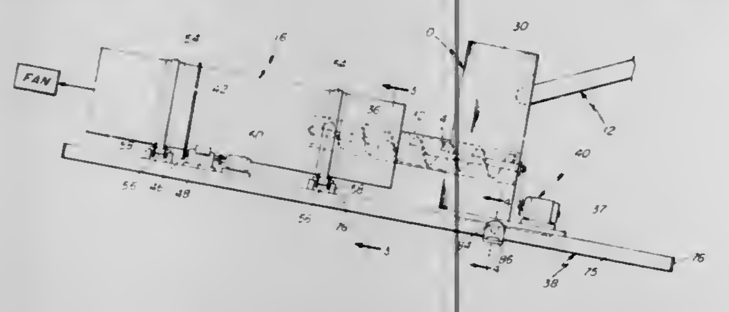
AIR CLASSIFICATION APPARATUS

Michael J. Theodore, Weston, Mass.; Malcolm M. Paterson, Atkinson, N.H., and Vernon L. Schrimper, Cedar Rapids, Iowa, assignors to Raytheon Company, Lexington, Mass.

Filed May 22, 1975, Ser. No. 580,374

Int. Cl.² B07B *4/06*

U.S. Cl. 209—136 **12 Claims**



1. A rotary drum classifier means for separating materials comprising a base, an open-ended drum mounted on said base for rotation about its axis, a hopper mounted on said base in spaced relation to one end of the drum and adapted to receive mixed materials to be separated, conveying means having one end attached to said hopper and the other end disposed within the drum for transporting materials from the hopper into the drum, and means for moving said conveying means longitudinally of the drum for adjusting the position of the end of the conveying means within the drum.

3,970,548

APPARATUS FOR SCREENING PAPER FIBER STOCK

Peter Seifert, and David E. Chupka, both of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Continuation-in-part of Ser. No. 391,574, Aug. 27, 1973, abandoned. This application June 2, 1975, Ser. No. 582,867

Int. Cl.² B07B *1/20*

U.S. Cl. 209—240 **6 Claims**

1. Screening apparatus for fiber suspensions comprising:

a. a housing,

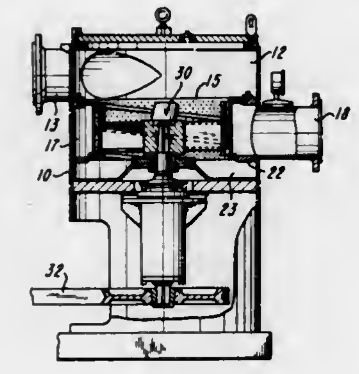
b. a cylindrical screen member within said housing having perforations therethrough and separating the interior thereof into a supply chamber and an accepts chamber on the inside and outside respectively of said screen member,

c. inlet means for supplying the suspension to one end of said supply chamber for flow therethrough and screening passage of some thereof through said perforations to said accepts chamber,

d. reject outlet means for continuously withdrawing a portion of the suspension from the other end of said supply chamber,

e. rotor means including a hub and vanes movable in said supply chamber along a cylindrical path concentric with said screen member,

f. means for supporting each of said vanes on said rotor hub in radially inwardly spaced relation with the inner surface of said screen member whereby rotation of said rotor means causes said vanes to define with said screen member an annular space adapted to be filled with suspension,



g. means for driving said rotor means to cause said vanes to travel along said path and thereby to cause the suspension in said annular space between said vanes and said screen member to circulate along the surface of said screen member,

h. said supporting means for each said vane including only arm means rigidly secured to said vane and said hub,

i. each said arm means being an essentially imperforate member of sufficiently greater axial extent than the length of any stringy material which can normally be expected to be present in the suspension to minimize the possibility of stringy material folding thereover, and

j. each said arm member presenting a leading surface functioning as a blade causing continuous circulation of the suspension about the center of said supply chamber in the annular space between said vanes and said hub.

3,970,549

SCREEN ASSEMBLY AND DEWATERING TECHNIQUE

Robert E. Ennis, West Simsbury, Conn., and Robert G. Derrick, Buffalo, N.Y., assignors to Linatex Corporation of America, Stafford Springs, Conn. and Derrick Manufacturing Corporation, Buffalo, N.Y.

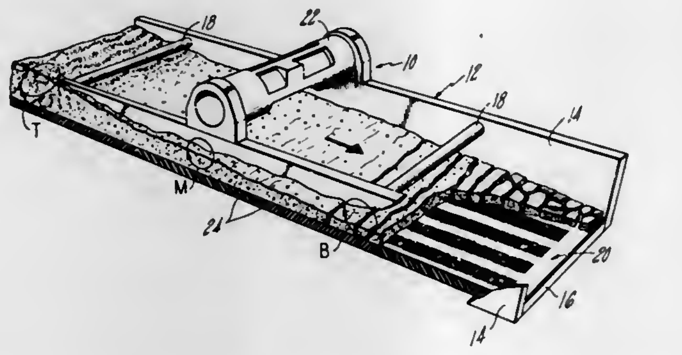
Continuation-in-part of Ser. No. 371,170, June 18, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,023

Int. Cl.² C10G *5/00*

U.S. Cl. 209—341 **17 Claims**

1. A nonadjustable self-cleaning dewatering screen panel assembly for vibratory dewatering of fine granular material passing across the assembly in a first direction, said assembly being comprised of a rigid frame member and a substantially planar screen panel mounted on and rigidly secured to the frame for nonadjustable retention within the plane of the frame during vibration of the assembly, said panel being a unitary one piece member composed of elastomeric material throughout its depth and consisting essentially of a plurality of pulsator columns and integral stabilizer portions bordering the pulsator columns, said pulsator columns and stabilizer portions extending substantially parallel to said first direction, said stabilizer portions being secured to the frame to prevent relative movement therebetween, said pulsator columns being comprised of a multitude of substantially identical diaphragm

elements arranged in intimate aligned confronting relationship so as to present a smooth top screening and dewatering surface, said elements extending through the full depth of the panel and defining a column of spaced parallel slits between individual abutting elements to permit limited and random pulsating motion of the diaphram elements within the plane of the screen assembly in response to vibratory motion of the assembly, said elements extending transversely to said first direction, said panel being uniformly tensioned within its plane in both said first direction and transversely of said first direction to effect a taut condition and uniformity of slit opening within the panel while maintaining the rigidity required to support the load passing thereacross, said panel being mounted within said rigid frame in its taut bidirectionally tensioned condition and being fixedly and positively secured to the frame about its entire periphery in its taut condition to prevent movement of the panel out of the plane of the frame during vibratory motion of the assembly.



3,970,550

MOULDED ELASTOMERIC SCREEN MAT FOR SIEVING DEVICES

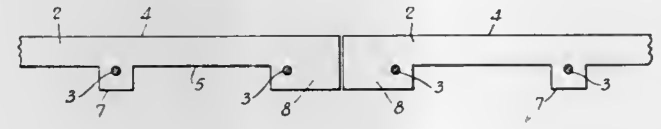
Sidney Fry, Cleckheaton; Terence Edward Crabtree, Brighouse, and Brian Rothery, Queensbury, all of England, assignors to BBA Group Limited, Checkheaton, England

Continuation of Ser. No. 327,448, Jan. 29, 1974, abandoned. This application June 7, 1974, Ser. No. 477,263

Claims priority, application United Kingdom, Jan. 28, 1972, 4161/72

Int. Cl.² B07B *1/49*

U.S. Cl. 209—399 **6 Claims**



1. A screen mat having a moulded elastomeric body and an elongated substantially inextendable tensioning member extending through said body along a path remote from the side edges of the body, said member being intended to tension the screen mat in use to restrain flexibility of the body, and in which the body comprises a screen part having an upper screening surface and a lower underside surface which is substantially parallel with said screening surface; said screen part having an apertured portion in which are located an array of apertures which communicate between said surfaces, and said screen part carrying a rib which is integrally moulded therewith and is located on said underside surface of the screen part, and wherein said tensioning member extends through the body substantially parallel with said surfaces and is located in the material of the rib and is substantially parallel therewith, said tensioning member being immediately below the underside surface of the screen part, the underside surface of the screen part being substantially tangential to the peripheral surface of the tensioning member, and the tensioning member is, for its longitudinal extent which passes through the rib, substantially enclosed over its peripheral surface by the material of the rib, said rib being co-extensive with at least said apertured portion of said screen part.

3,970,551

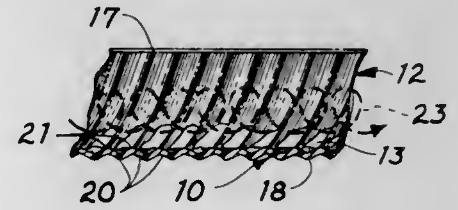
GOLD SEPARATOR

Mynie L. Wright, and Theodore H. Wright, both of 5617 E. Commerce, Spokane, Wash. 99206

Filed Apr. 23, 1975, Ser. No. 570,756

Int. Cl.² B03B *5/26*

U.S. Cl. 209—458 **3 Claims**



1. A gold sluice, comprising:

an upwardly open elongated trough having an elongated open ended water passageway formed therein of generally semicylindrical configuration extending from an open intake end along a longitudinal central axis to an open outlet end within said trough; and

corrugations disposed angularly along said axis in a spiral configuration within the passageway and comprised of ridges and interspersed grooves formed integrally with said trough for imparting longitudinal spiral turbulence to water moving along said passageway and for progressively collecting gold sediment in the grooves from a placer material placed at the intake end.

3,970,552

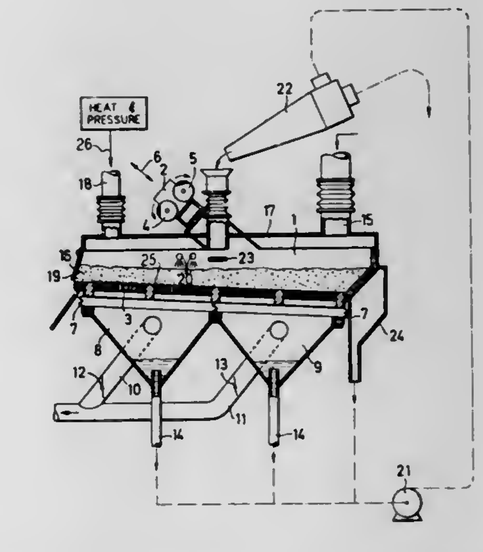
METHOD AND MEANS FOR SEPARATION OF LIQUIDS FROM A MIXTURE OF SOLIDS AND LIQUIDS

Wilhelm Bongert, Bochum, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Aug. 30, 1974, Ser. No. 501,894

Int. Cl.² B01D *33/00*

U.S. Cl. 210—19 **8 Claims**



1. A method for the separation of liquids from a solid liquid mixture comprising the steps:

depositing a solids liquid mixture on a separating oscillating conveyor surface permeable to the liquid with the material moving in a conveying direction;

applying a vacuum on the undersurface of the separating surface;

and increasing the vacuum in the conveying direction of material movement on the separating surface.

3,970,553
HEAVY METAL ADSORBENT PROCESS

Kazuki Terajima; Shigeru Tomita; Yoshindo Matsuda, all of Tokyo, and Keiji Abe, Ohmiya, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 400,645, Sept. 25, 1973, Pat. No. 3,900,422. This application Nov. 20, 1974, Ser. No. 525,513

Claims priority, application Japan, Sept. 26, 1972, 45-95762; Oct. 27, 1972, 45-107101

Int. Cl.^{2} B01D *15/00;* **C02B** *1/52*

U.S. Cl. 210—36 **6 Claims**

1. A process of removing heavy metal ions from aqueous solutions which comprises contacting said solution with a porous mass of a generally homogeneous mixture comprising nitrohumic acid and a carboxyl group-containing polymeric binder selected from the group consisting of carboxymethylcellulose, carboxymethylstarch, alginic acid, pectinic acid, proteins, polyacrylic acid, polymethacrylic acid, partially hydrolyzed polyacrylamide, partially hydrolyzed N-methylolated polyacrylamide or polymethacrylamide and water insoluble salts thereof, said binder being present in the amount of about 5–50 parts by weight per 100 parts of said nitrohumic acid, said mixture being heated to about 120°–200°C for about 0.5–5 hours before being contacted with said solution to insolubilize the same.

3,970,554
PROCESS FOR DETOXIFICATION OF CYANIDES AND NITRILES WITH PEROXYGEN COMPOUNDS

Joachim Fischer, Grossauheim; Helmut Knorre, Seligenstadt, and Gerhard Pohl, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Oct. 16, 1974, Ser. No. 515,253

Claims priority, application Germany, Oct. 22, 1973, 2352856

Int. Cl.^{2} C02B *1/36*

U.S. Cl. 210—62 **15 Claims**

1. In a process for the detoxification of waste water containing a member of the group consisting of inorganic cyanides, organic unsubstituted nitriles and organic cyanohydrins by the addition of a peroxygen compound the improvement comprising carrying out the detoxification in the presence of an iodine source selected from the group consisting of iodine, iodide ions and a mixture of iodine and iodide ions.

3,970,555
GAS REMOVAL FROM DEEP-BED FILTERS

Elton Stuart Savage, Wexford, and Jeffrey J. Chen, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 584,945, June 9, 1975, abandoned, which is a continuation of Ser. No. 444,887, Feb. 22, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,346

Int. Cl.^{2} B01D *23/24;* **C02C** *11/14*

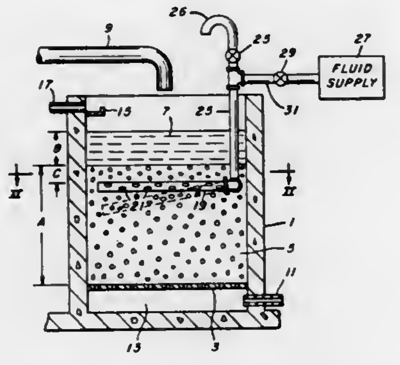
U.S. Cl. 210—80 **13 Claims**

1. In a deep-bed filter having influent means, effluent discharge means and a bed of filter media through which media liquids are passed and in the interstices of which media gas bubbles become entrapped, including improved means for removing said entrapped gas bubbles while the filter is in service, the gas removal means comprising:

an entrapped gas collecting means disposed within the filter bed, and located between the influent means and the effluent discharge means, at a level therein spaced from the influent end of the filter a distance, in the direction of fluid flow, of between about 5 to about 50 percent of the bed depth; and

conduit means connected to the gas collecting means, said conduit means having a discharge end located at a height above the head of liquid passing through the bed to vent the entrapped gas bubbles to the atmosphere.

8. In a wastewater treatment process wherein wastewater is charged through an influent means to the influent end of a deep-bed filter containing a bed of filter media and discharged through an effluent means at the effluent end thereof and wherein gas bubbles become entrapped in the interstices of the filter media, a method of removing said entrapped gas bubbles, while the filter is in operation, comprising:



collecting said gas bubbles in an entrapped gas bubbles collection means disposed within the filter bed, between the influent means and the effluent means, at a level therein spaced from the influent end of the filter a distance, in the direction of wastewater flow, of between about 5 to about 50 percent of the bed depth; and

venting said collected gas bubbles to the atmosphere through conduit means connected to the gas collecting means, said conduit means having a discharge end located at a height above the head of liquid passing through the bed.

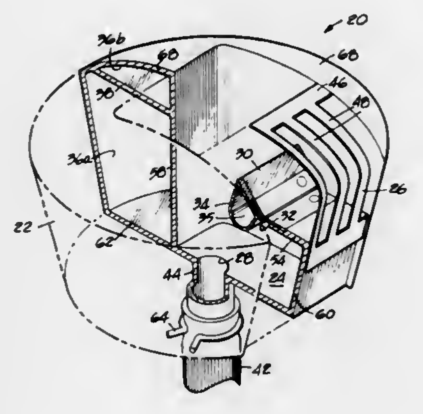
3,970,556
FLOATING SKIMMER FOR CLEANING THE SURFACE OF A BODY OF LIQUID, METHOD AND APPARATUS

Douglas John Gore, 5168 Brookside Lane, Concord, Calif. 94521

Filed Sept. 23, 1974, Ser. No. 508,446

Int. Cl.^{2} B01D *21/00;* **E02B** *15/04*

U.S. Cl. 210—83 **20 Claims**



1. A floating skimmer for skimming the surface of a body of liquid surrounding the skimmer while providing a self-compensating positioning of a weir for maintaining efficient skimming flow over the weir during varying conditions of operation, said skimmer comprising,

an outer body having an inner, generally centrally disposed cavity,

first flotation means in the outer body for regulating the level of flotation of the skimmer at rest before start-up of skimming operation,

an opening in one peripheral part of the outer body for admitting a flow of liquid into the central cavity,

drain means associated with the central cavity for draining liquid from the cavity and for conducting the drained liquid effluent away from the cavity during skimming operation,

a movable weir extending across the width of said opening for regulating the quantity and velocity of liquid flow through the opening and into the central cavity,

weir-positioning means for adjusting the height of the weir with respect to the surface of the body of liquid surrounding the skimmer to cause a cascade of liquid in a waterfall off the upper edge of the weir and a skimming of the surface of the liquid by the cascade action,

said weir-positioning means including second flotation means on the underside of the weir for supporting the weir above the level of the liquid in the cavity during skimming operation,

said second flotation means having sufficient excess buoyancy to keep an upper portion of the flotation means and the weir always high enough above the level of the liquid in the central cavity to prevent collapse of the weir and to insure dynamic weir action and a waterfall off the upper edge of the weir during operation of the skimmer,

said outer body having inner wall means which coact with the weir and second flotation means during skimming operation to form an air-filled chamber behind the weir within the cavity and below the surface level of the surrounding liquid body and which air chamber provides a positive buoyancy acting in a direction to lift the outer body upwardly,

said inner wall means also coacting with the outer body to form a ballast chamber having a rear chamber in back of the air-filled chamber, as viewed in the direction of fluid flow through said opening and over the weir, and two side chambers extending along the two sides of the air-filled chamber,

said weir-positioning means including ballast in the ballast chamber, a portion of which ballast is raised above the surface level of the surrounding liquid body by the positive buoyance of said air chamber,

the amount and location of the raised ballast being so located with respect to the air chamber as to provide a negative buoyancy vertically balancing the positive buoyancy of the air chamber, and wherein the rear chamber contains an amount of ballast behind the air chamber sufficient to counter balance the amount of liquid within the skimmer in front of the weir and above the level of the liquid in the air chamber to maintain front-to-back equilibrium and to prevent front-to-back tilting of the skimmer, whereby the amount and location of the ballast coacts with the second flotation means to provide a self-compensating position of the weir for maintaining efficient skimming flow over the weir during varying conditions of operation of the skimmer, such as variations in the amount of effluent leaving the drain means and agitation of the surface of the surrounding liquid body.

3,970,557
IMPINGEMENT BAFFLE EQUIPPED OIL FILTER

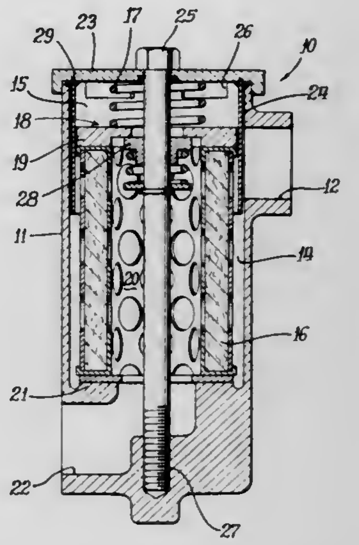
Stephen G. Shoup, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 428,390, Dec. 26, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,672

Int. Cl.^{2} B01D *27/10*

U.S. Cl. 210—130 **5 Claims**

1. A filter assembly having a housing, a fluid inlet and a fluid outlet in said housing, filter element means disposed within said housing for filtering fluid passing from said inlet to said outlet, impingement baffle means disposed within said housing directly across from said fluid inlet and in the direct path of said fluid entering said housing through said inlet for shielding said filter element from direct impingement of said fluid entering said housing, said baffle means include a rigid cylindrical member, said rigid cylindrical member has notch means therein remote from said inlet for passage of fluid from the exterior to the interior of said cylindrical member by passage through said cylindrical member, separate removable cover means for said housing, said separate cover means not being a part of said housing and not containing said fluid inlet and fluid outlet, said impingement baffle means being integral with



and removable with said cover means, said cover means including an annular cover member and bolt means for fastening said annular cover member to said housing.

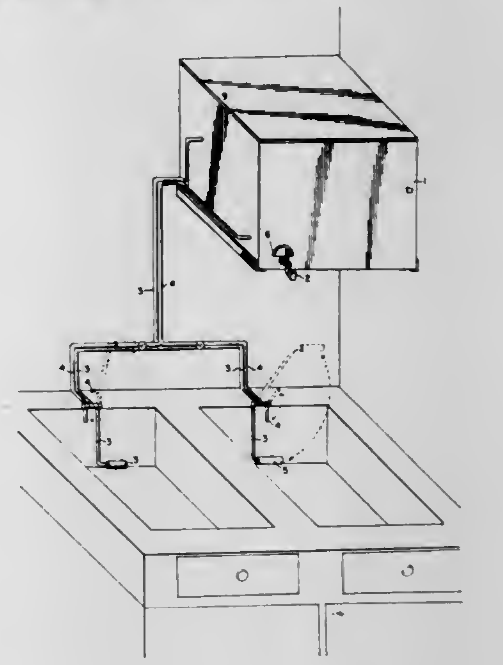
3,970,558
FRYING GREASE RECLAIMER

Kai Sing Lee, 1912 Edgemont St., San Diego, Calif. 92102

Filed Feb. 21, 1974, Ser. No. 444,641

Int. Cl.^{2} B01J *29/36*

U.S. Cl. 210—138 **5 Claims**



1. A fluid filtering device for filtering fluid type oil or the like in a container comprising:

a filter tank for receiving oil to be filtered,

pump means for pumping oil from the container to said filter tank,

reservoir means for priming said pump means,

said pump means having first and second valve means,

said first valve means being operable to channel oil through said pump means to the reservoir means and through said reservoir means to said filter tank,

said second valve means being operable to pass oil from said filter tank to the container,

means in the filter tank for filtering the oil passing therethrough,

a second tank positioned above said pump means,

a first oil line passing from the container to said second tank and a second oil line passing from said second tank to said first and second valve means,

- said reservoir means comprising a reservoir tank positioned above said second tank means,
- a third oil line passing from said reservoir tank to said second tank,
- a fourth oil line passing from the first and second valve means to said reservoir tank,
- a fifth oil line passing from the reservoir tank to the filter tank,
- said first and second valve means being operable to pass fluid from said second tank to said reservoir tank and from said reservoir tank to said filter tank,
- said pump means pumping fluid from said second tank and container through said reservoir tank to said filter tank,
- said fourth and fifth lines being connected to the upper portion of said reservoir tank, wherein said reservoir tank is filled before oil passes through said fifth line to said filter tank,
- and third valve means in said third line between said reservoir tank and said second tank that is selectively openable to pass reservoir oil from said reservoir tank to said second tank and through said second tank to said valve means and pump means providing priming oil to said pump means.

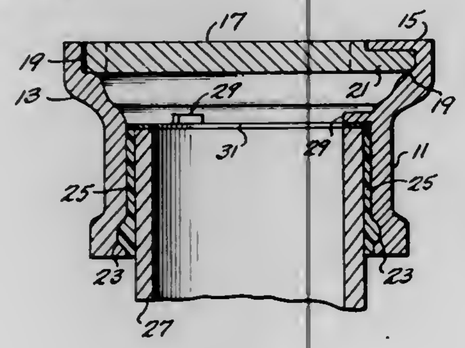
3,970,559
DRAIN GUARD

Thomas Cannon; Frances G. H. Cannon, both of 3557 Hamlet Place, Chevy Chase, Md. 20015; Jane E. H. Cowan, 10277 Gainsborough Road, Potomac, Md. 20854, and Bernard McCarthy, 8918 Simpson Lane, Clinton, Md. 20735

Filed Dec. 19, 1974, Ser. No. 534,586

Int. Cl.^{2} E03F *1/00*

U.S. Cl. 210—166 **8 Claims**



1. A drain guard comprising:
- a tubular body having a funnel-shaped portion at its upper end, said tubular body having an annular recess extending about the inside periphery thereof proximate the bottom end thereof, said recess receiving a sealing grommet therein for sealing the space between a pipe on which said guard is positioned and the inner periphery of said tubular portion of said guard,
- means for limiting the upward movement of said pipe in said guard and a fluid permeable seat positioned on said funnel end portion of said drain, said means for limiting the upward movement of said pipe in said guard comprises a plurality of limiting members integrally formed with said guard and extending inwardly from the inner periphery thereof at the junction of the tubular and funnel portions thereof.

3,970,560
PARTS WASHER

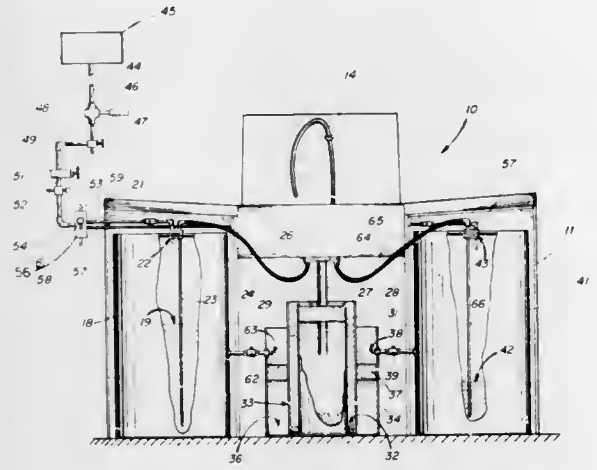
Herman U. Metzger, R.R. No. 4, Box 18, Goshen, Ind. 46526

Filed Sept. 20, 1974, Ser. No. 507,941

Int. Cl.^{2} B01D *33/40*

U.S. Cl. 210—167 **8 Claims**

1. Parts washing apparatus comprising:
- a sealed first container, for washing fluid, having a washing fluid outlet;
- a sealed second container for washing fluid having a washing fluid outlet;
- means to selectively provide simultaneous air pressure within said first container and a vent to atmosphere of said second container and simultaneous air pressure within said second container and a vent to atmosphere of said first container;
- first conduit means constructed and arranged to deliver fluid from the outlet of the first container to a parts washing area comprising a sink with a drain when the pressure inside the first container is increased;



- a filter apparatus for the washing fluid having an inlet end coupled to the sink drain and having an outlet end;
- second conduit means coupling fluid from the filter apparatus outlet end to the second container;
- third conduit means constructed and arranged to deliver fluid from the outlet of the second container to the parts washing area when the pressure inside the second container is increased; and
- fourth conduit means coupling fluid from the filter apparatus outlet end to the first container.

3,970,561
SEPARATION OF COMPOUNDS DIFFERING IN ISOTOPIC COMPOSITION

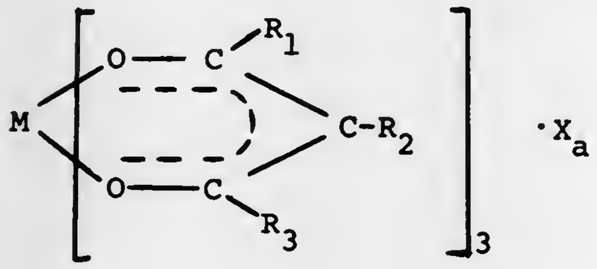
Robert E. Sievers, 2628 N. Emerald Drive, Fairborn, Ohio 45324, and Joseph J. Brooks, 1631 Beaver Ridge Drive, Kettering, Ohio 45429

Division of Ser. No. 476,179, June 4, 1974, Pat. No. 3,891,413. This application Mar. 11, 1975, Ser. No. 557,568

Int. Cl.^{2} B01V *15/08*

U.S. Cl. 210—198 C **17 Claims**

1. A composition consisting essentially of a particulate support material and a solution of a lanthanide chelate coated thereon, the lanthanide chelate having the following structural formula:



wherein M is a rare earth element of the lanthanide series; R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen, deuterium, alkyl and fluoroalkyl; R_1 and R_2 together are d-camphor and R_3 is fluoroalkyl; X is water or an organic compound containing a donor group; and *a* is a numeral from zero to 4, inclusive.

3,970,562
AGGREGATION TREATMENT APPARATUS FOR WASTE WATER

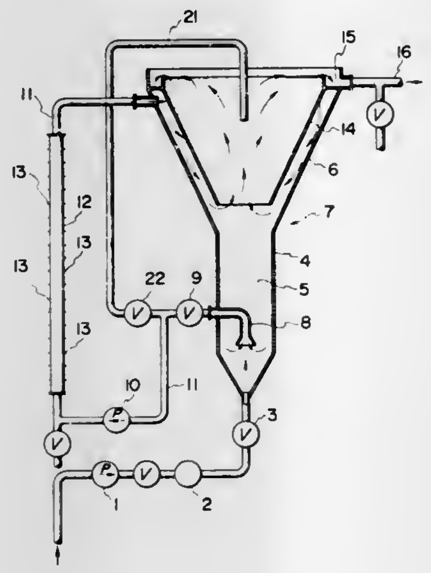
Saburo Motozawa; Hiroyoshi Itoga; Hirobumi Wada, and Hiromasa Marukawa, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (TDK Electronics Co., Ltd.), Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,367

Claims priority, application Japan, Jan. 11, 1974, 49-6063

Int. Cl.^{2} B01D *21/26;* **C02B** *1/10*

U.S. Cl. 210—205 **7 Claims**



1. In a continuous apparatus for aggregating suspended colloidal solids in waste water comprising a suspending stage in which metallic particles of metal, metal oxide or sintered metal oxide carrying an electrical charge opposite to that on said solids are suspended in a feed flow of said waste water; an electrical aggregating stage in which said feed flow with said particles suspended therein is passed between oppositely charged electrodes to flocculate said oppositely charged particles and colloidal solids; and a separating stage in which the metallic particles are separated from said flocculent-containing water flow; the improvement wherein said suspending and separating stages are formed as an integral unit having an inverted conical upper section with means for introducing the flocculent containing flow from said aggregating stage in a tangential direction adjacent the upper end thereof to centrifugally collect flocculated matter and separate said metallic particles therefrom, and means for removing the collected flocculated matter and effluent water from an interior point within said conical section; and a tubular section extending downwardly from the lower end of said conical section to receive the separated metallic particles therefrom with means for introducing said waste water feed flow into said tubular section to resuspend said separated particles in said feed flow; and said electrical aggregating section comprises an elongated chamber separate from said integral unit, said chamber having a plurality of oppositely charged electrode pairs arranged at intervals along the interior walls thereof, said electrodes being formed of insoluble electrically conductive material, conduit means for delivering said particle-containing feed flow from said tubular section to one end of said elongated chamber and conduit means for delivering the flocculent containing water flow from the opposite end of said elongated chamber to said introducing means for said inverted conical section.

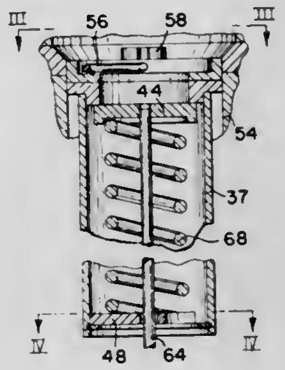
3,970,563
FILTER AND BYPASS VALVE ARRANGEMENT

Edward A. Codo, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 334,090, Feb. 20, 1973, Pat. No. 3,883,430. This application Jan. 15, 1975, Ser. No. 541,327

Int. Cl.^{2} B01D *35/16;* **F16K** *51/00*

U.S. Cl. 210—237 **2 Claims**



1. In a fluid supply system, a readily removable valve assembly comprising:
- a housing member, said housing member having a pair of recesses therein, valve means mounted within and removable from said housing member, bail means attached to said valve means and movable between a first position out of the fluid flow path and a second position, said bail means having two end portions each of which being constructed and arranged for engagement with one of said recesses, lug means associated with said valve means for coacting with said bail means to cause the retraction of said end portions from said recesses in said housing member upon movement of said bail means from said first position to said second position to allow removal of said bail means and said valve means from said housing member.

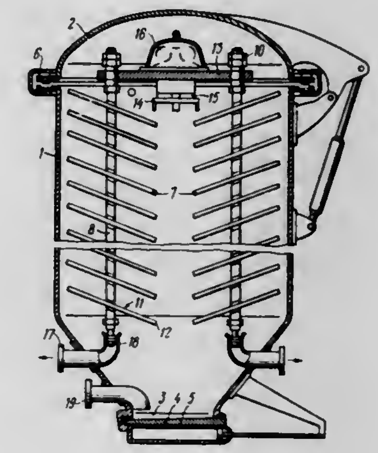
3,970,564
VERTICAL VIBRATORY LIQUID FILTER

Ural Gilyazitdinovich Shamsutdinov, ulitsa Obraztsova, 8a, kv. 99; Jury Viktorovich Gutin, ulitsa Karla Marxa, 20, kv. 38, and Alexandr Sergeevich Kupriyanov, Dmitrovskoe shosse, 45, kv. 65, all of Moscow, U.S.S.R.

Filed Dec. 3, 1974, Ser. No. 529,114

Int. Cl.^{2} B01D *29/04, 35/20*

U.S. Cl. 210—323 R **6 Claims**

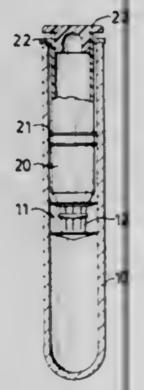


1. A vertical vibratory liquid filter comprising a vertical shell; a feed manifold for feeding the suspension to be filtered into said shell; a cake-discharge hole located in the lower part of said shell; at least one upright drain pipe inside said shell, said drain pipe remaining upright inside said shell at all times; a filtrate-discharge manifold communicating with said drain pipe; filter elements secured on said drain pipe and accommodating spaces which communicate with said pipe, said filter

elements being situated one above the other and spaced from each other along said pipe; said filter elements respectively having upper filtering surfaces inclined downwardly towards said discharge hole and having lower edges arranged above said discharge hole and situated on one side of said pipe while having opposite upper edges situated on the other side of said pipe; and a vibrator operatively connected with said filter elements for setting said filter elements in vibration for the removal of cake, whereby the orientation of said drain pipe and filter elements remains unchanged both during filtering operations and during cake-removal operations.

3,970,565
SEPARATING AND FILTERING DEVICE

Bengt Erik Ahlstrand, Djursholm, and Rune Henry Carlsson, Sjuntorp, both of Sweden, assignors to Aktiebolaget Stille-Werner, Sweden
Filed Nov. 26, 1974, Ser. No. 527,374
Claims priority, application Sweden, Nov. 27, 1973, 7316030
Int. Cl.^{2} B01D *33/00*
U.S. Cl. 210—359 **7 Claims**



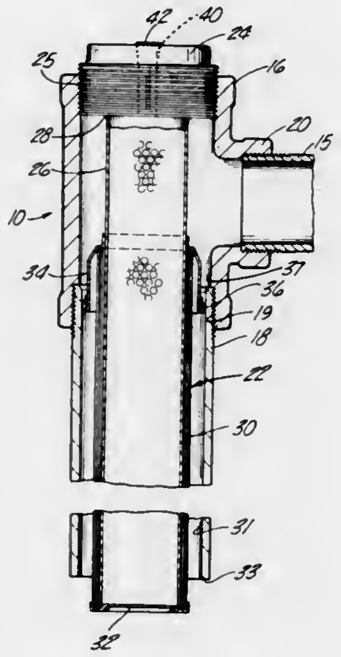
1. A separating and filtering device for effecting sealed separation of a fluid, such as blood, into a light phase and a heavy phase, comprising:

a. a tubular container for receiving a sample of the fluid having both phases;
b. a cup-shaped hollow piston disposed in said container and having a closed bottom and a radially permeable side wall; and
c. a first and a second circumferential sealing lip extending radially from said piston and axially spaced apart by said permeable side wall, said lips normally sealingly engaging the inner surface of said tubular container, said first lip being adjacent to said closed bottom and being deflectable to enable only the light phase to pass by in response to any downward movement of said piston.

3,970,566
FLUID FILTERING DEVICE

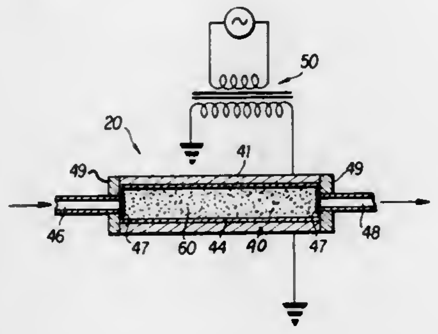
Borje O. Rosaen, Ann Arbor, Mich., assignor to Dale P. Fosdick, Ann Arbor, Mich., a part interest
Filed Nov. 20, 1974, Ser. No. 525,739
Int. Cl.^{2} B01D *27/00*
U.S. Cl. 210—452 **3 Claims**

1. In combination with a conventional tee fitting, said tee fitting having internally threaded openings at each end and an internally threaded side opening intermediate said end openings, a first conventional pipe having an externally threaded end received by one of said end openings, a second conventional pipe having an externally threaded end received by said side opening, a filter device to be mounted in said conventional tee fitting comprising a cap member adapted to be mounted to the free end opening of said tee fitting, a perforated, tubular member secured at one end to said cap member so that said tubular member extends axially through said tee fitting, and across said side opening so that the free end of said tubular member is positioned on the opposite transverse side of said side opening from the cap member, a hollow filter element secured to the free end of said perforated tubular member below said side opening wherein said filter element is in axial alignment with said tubular member so that said filter element extends axially into said first pipe and wherein said filter element is spaced radially inward from said first pipe, so that fluid flows from the exterior of said filter element to the interior of said filter element, up through said perforated tubular member and into said tee fitting, whereby said filter element is removed from said first pipe through said tee fitting in unison with the removal of said cap member and said perforated, tubular member.



3,970,567
OZONIZER WITH ABSORPTION OF OZONE

Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., Columbia, Md.
Filed Apr. 17, 1975, Ser. No. 568,934
Int. Cl.^{2} C01B *13/11*
U.S. Cl. 250—533 **6 Claims**



1. An ozone generator comprising a plurality of spaced-apart metallic electrodes and at least one thin dielectric layer between the electrodes thereby defining a corona chamber;

electrical means for imposing a silent discharge potential in the corona chamber;
supply means for passing an oxygen-containing gas through the corona chamber;
a bed of silica gel adsorbent and means for maintaining said bed of silica gel adsorbent particles in the corona chamber for adsorbing ozone generated therein; and
means for desorbing the ozone from the silica gel.

6. In an ozone generator having at least one dielectric layer between spaced-apart electrodes and having a corona chamber, the improvement which comprises: dielectric solid adsorbent particles disposed in the corona chamber for selectively adsorbing ozone.

3,970,568
ALIPHATIC SULFURIZED ESTER LUBRICANT

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 500,235, Sept. 5, 1974, abandoned. This application July 3, 1975, Ser. No. 592,934
Int. Cl.^{2} C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—48.6 **9 Claims**

1. A lubricating oil composition comprising:

A. a major amount of an oil of lubricating viscosity, and
B. an amount effective to impart extreme-pressure and/or antiwear lubricating properties to said oil of an aliphatic sulfurized ester of an olefinic mono- or dicarboxylic acid which does not contain any allylic hydrogen atoms.

3,970,569
WATER SOLUBLE TRIGLYCERIDE COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio
Division of Ser. No. 438,283, Jan. 31, 1974, Pat. No. 3,928,401. This application Aug. 28, 1975, Ser. No. 608,764
Int. Cl.^{2} C10M *1/06*
U.S. Cl. 252—49.3 **4 Claims**

1. An aqueous lubricating composition comprising an aqueous solution of a water soluble mixed ester product obtained by the single-step transesterification of:

a. a triglyceride selected from the group consisting of animal oils, animal fats, drying vegetable oils, semi-drying vegetable oils and non-drying vegetable oils;
b. a polyoxyethylene glycol having an average molecular weight of from about 400 to 800; and
c. a hydrocarbyl carboxylic acid containing one or two carboxyl groups and from 2 to 12 carbon atoms; said reactants (a), (b) and (c) respectively comprising 5 to 35%, 60 to 85% and 1 to 20by weight of the total charge, said solution being clear at room temperature but having a distinct cloud point above 95°F.

3,970,570
ANTIWEAR ADDITIVE MIXTURE

Robert Eugene Pratt, San Marino, and John Habzansky, North Hollywood, both of Calif., assignors to Bray Oil Company, Los Angeles, Calif.
Filed Dec. 8, 1975, Ser. No. 638,468
Int. Cl.^{2} C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—49.9 **6 Claims**

1. An ashless lubricating composition with good oxidation stability above 300°F., said composition comprising a base oil of lubricating viscosity containing as an antiwear additive combination a mixture of from about 0.25 to 3% tricresyl phosphate and from about 0.25 to 2% pentaerythritol monooleate.

3,970,571
METHOD FOR PRODUCING IMPROVED ELECTROGRAPHIC DEVELOPER

James R. Olson, Rochester, and Robert C. Storey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 20, 1974, Ser. No. 535,001
Int. Cl.^{2} G03G *9/10*
U.S. Cl. 252—62.1 P **12 Claims**

1. A method for preconditioning a dry electrographic developer incorporating free toner particles prior to using such developer to develop images in an electrographic process, said method comprising the steps of:

a. intimately mixing together
   i. an unconsolidated mass of carrier particles, and
   ii. an unconsolidated mass of resin-based toner particles containing charge control agent in greater concentration than desired in free toner particles of the developer after preconditioning and for developing images in an electrographic process,

to form a resulting mixture which includes at least some free toner particles but in a concentration which is less than desired in the developer after preconditioning and for developing images in an electrographic process, such mixing being for a sufficient length of time and in such a way as to pack any pores of said carrier particles with toner particles, to scum the surfaces of said carrier particles with charge control agent, and to abrade the surfaces of said carrier particles; and

b. introducing into and intimately mixing with said resulting mixture an additional quantity of resin-based toner particles containing charge control agent to increase the concentration of free toner particles up to that desired in the developer after preconditioning and up to that desired for developing images in an electrographic process, the concentration of charge control agent in the additional quantity of toner particles being about the same as desired in the free toner particles of the developer after preconditioning and about the same as desired for developing images in an electrographic process; the total concentration of toner particles in the developer after preconditioning being in the range of about 1 to about 10% based on the weight of the carrier particles and the total amount of charge agent in the toner particles after preconditioning the developer being in the range of about 0.1 to about 6.0% based on the weight of the resin in the toner particles.

3,970,572
FERROELECTRIC CERAMIC COMPOSITION

Toshio Ogawa; Mutsuo Munekata; Kenji Ozawa, and Kiichi Minai, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Dec. 12, 1974, Ser. No. 532,160
Claims priority, application Japan, Dec. 12, 1973, 48-140994; Oct. 1, 1974, 49-113584
Int. Cl.^{2} C04B *35/46, 35/48*
U.S. Cl. 252—62.9 **5 Claims**

1. A ferroelectric ceramic composition of the ternary system $Pb(Sn_{\alpha}Sb_{1-\alpha})O_3—PbTiO_3—PbZrO_3$ comprising a solid solution represented by the general formula:

$$xPb(Sn_{\alpha}Sb_{1-\alpha}O_3)\text{-}yPbTiO_3\text{-}zPbZrO_3$$

wherein

$x + y + z = 1.00$ and
$\frac{1}{2} \leqq \alpha \leqq \frac{3}{4}$,

said composition being in a polygonal area defined by the points A, B, C, D, E and F in FIG. 1, the sets of mole fractions of the three components at said points being as follows:

x	y	z
0.01	0.60	0.39
0.01	0.30	0.69
0.15	0.25	0.60
0.25	0.25	0.50
0.25	0.50	0.25
0.15	0.60	0.25

5. A ferroelectric ceramic composition of the ternary system $Pb(Sn_{\alpha}Sb_{1-\alpha})O_3—PbTiO_3—PbZrO_3$ comprising a solid solution represented by the general formula:

$$xPb(Sn\ Sb\ O_3)—yPbTiO_3—zPbZrO_3$$

wherein $x + y + z = 1.00$, said composition being in a polygonal area defined by the points A, B, C, D_2, E_2 and F in FIG. 1, the sets of mole fractions of the three components at said points being as follows:

x	y	z
0.01	0.60	0.39
0.01	0.30	0.69
0.15	0.25	0.60
0.15	0.35	0.50
0.15	0.50	0.35
0.15	0.60	0.25

3,970,573
ELECTROVISCOUS FLUIDS

James W. Westhaver, Box No. 2, Mount Holly, Va. 22524
Filed Aug. 25, 1975, Ser. No. 607,217
Int. Cl.² C09K *3/00*
U.S. Cl. 252—73 **5 Claims**

1. An electroviscous fluid consisting of a dielectric oil of relatively low viscosity and particles composed essentially of starch dispersed in said oil to a volume concentration of from 40 to 60 percent, said particles including an electrolyte in amount from 1 to 10 weight percent and including water in amount from 1 to 5 weight percent.

3,970,574
HYDRAULIC BRAKE FLUID COMPOSITION

Edmund Luke Niedzielski, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Co., Wilmington, Del.
Filed June 16, 1975, Ser. No. 587,226
Int. Cl.² C10M *3/20;* **C09K** *3/00*
U.S. Cl. 252—79 **7 Claims**

1. A hydraulic fluid consisting essentially of a random equilibrium mixture of triethylene glycol diesters of acetic acid and propionic acid wherein the molar ratio of acetyl groups to propionyl groups in the diester mixture is from about 40:60 to about 50:50.

5. A process for preparing a hydraulic fluid, the process comprising reacting triethylene glycol and a mixture of acetic acid and propionic acid in the presence of an acid catalyst and removing the water of condensation, the amount of acid mixture used being in the range of the stoichiometric amount needed to completely esterify the glycol to a 10 percent excess of that amount, and the molar ratio of acetic acid to propionic acid being from about 40:60 to about 50:50.

3,970,575
LIQUID PEROXYGEN BLEACH

John H. Barrett, Jr., La Mirada, Calif., assignor to Purex Corporation, Lakewood, Calif.
Filed Feb. 21, 1974, Ser. No. 444,466
Int. Cl.² C11D *3/40, 7/54*
U.S. Cl. 252—95 **9 Claims**

1. An acidic stabilized aqueous bleach product consisting essentially of about:

a. 1.0 to 8.0 percent by weight stabilized hydrogen peroxide;

b. 0.5 to 10 percent by weight of a water soluble non-ionic surfactant which is a polyethylene oxide condensate having an HLB value from about 10 to 15, said condensate being of polyethylene oxide and a member from the group consisting of alkyl phenols having alkyl groups of 6 to 12 carbon atoms, secondary alcohols having from 8 to 22 carbons, linear primary alcohols having from 8 to 22 carbon atoms, polyoxypropylene glycols having molecular weights of at least 900, fatty alcohols having from 8 to 22 carbons, and fatty acid partial esters of polyhydric alcohols having at least 4 moles of polyoxyethylene and derived from fatty acids having from 8 to 28 carbons; and

c. 0.0002 to 0.002 percent by weight color stable phthalocyanine blue dye pigment powder, said product having a clear blue appearance.

3,970,576
BACTERIOSTATIC TOILET BOWL CLEANER COMPOSITIONS

Robert Carmello, Dumont; Barry A. Salka, Clifton, and Garland G. Corey, Milltown, all of N.J., assignors to American Home Products Corporation, New York, N.Y.
Division of Ser. No. 312,767, Dec. 6, 1972, Pat. No. 3,897,357. This application Mar. 21, 1975, Ser. No. 560,898
Int. Cl.² C11D *1/72, 3/48*
U.S. Cl. 252—106 **6 Claims**

1. An anti-bacterial solid composition consisting essentially of:

Component	% By Weight
5-Chloro-2-(2,4 dichlorophenoxy)phenol	1–3
Ethoxylated alcohol adduct	20–90
Alkoxylated primary fatty alcohol	0.1–10
Polyethylene glycol	0.1–10
Sodium sulfate, perfume, dye	Sufficient to make up to 100%

wherein 5-chloro-2-(2,4-dichlorophenoxy)phenol is present at a use dilution of about 0.1 parts per million to less than 1.0 parts per million, wherein the alkyl chain length of the alkoxylated primary alcohol is from about 12 carbon atoms to 15 carbon atoms and the alkyl chain length of the ethoxylated alcohol adduct is from 16 carbon atoms to about 20 carbon atoms.

6. A method for preventing the growth or multiplication of *S. aureus, P. mirabilis* and *E. coli* in toilet bowls which comprises dispensing the composition of claim 1 into the water of a toilet to prevent such growth.

3,970,577
WATER-DISPERSIBLE ALUMINIUM PASTES

Wolfgang Glück, and Lothar Benek, both of Haus, Germany, assignors to Messrs. Eckart-Werke Standard-Bronzepulver-Werke Carl Eckart, Fuerth, Bayern, Germany
Filed Jan. 13, 1975, Ser. No. 540,608
Claims priority, application Germany, Jan. 17, 1974, 2402073
Int. Cl.² C09K *3/00*
U.S. Cl. 252—182 **8 Claims**

1. A method for producing a dispersion of aluminium particles in water which comprises preparing an aluminium containing paste by grinding aluminum into finely divided particles in the presence of a hydrophilic polymer dispersed in a water-immiscible inert organic liquid, mixing the paste with water and separating the phase of the water-immiscible organic liquid.

3,970,578
ADDITIVE COMPOSITION FOR TEXTILE BLEACHING BATHS

Bernard J. Datlow, Elizabeth, N.J., assignor to Bernard J. Datlow, Elizabeth, N.J.
Filed Apr. 15, 1974, Ser. No. 460,777
Int. Cl.² D06L *3/12, 3/08, 3/02*
U.S. Cl. 252—186 **4 Claims**

1. An aqueous additive composition for textile bleaching baths wherein the relative amounts of ingredients of said additive constituent comprises from 85.0% to 90.0% sodium zinc hexametaphosphate, 1.0% to 1.4% zinc borate and 8.3% to 14.0% urea, all by weight.

3,970,579
LOW MELTING LIQUID-CRYSTAL MIXTURES

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 2, 1971, Ser. No. 168,447
Int. Cl.² C09K *3/34;* **G02F** *1/13*
U.S. Cl. 252—299 **22 Claims**

1. A process for preparing in situ a mixture of at least two liquid-crystal compounds which comprises the steps of

a. forming a mixture of at least two monofunctional reactants having the same functional group and at least one difunctional reactant having functional groups suitably reactive with the common reactive group of the first two monofunctional reactants, and

b. reacting said reactants in situ to form a product mixture having liquid-crystal properties and comprising a mixture of at least two components.

3,970,580
METHOD OF MAKING SPHERICAL METALLIC OXIDE AND METALLIC CARBIDE PARTICLES

Erich Zimmer, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany
Filed May 7, 1974, Ser. No. 467,728
Claims priority, application Germany, May 8, 1973, 2323010
Int. Cl.² C09K *3/00*
U.S. Cl. 252—301.1 S **2 Claims**

1. A method of making spherical metallic oxide and metallic carbide particles of fuels and breeding material for nuclear reactors, such as oxide or carbide compounds which have a diameter of from 0.1 to 1.5 millimeters, which includes in combination the steps of: dropwise adding to an organic phase above an aqueous solution of ammonia a substance selected from the group consisting of an aqueous solution of a metallic nitrate, a metallic chloride, a mixture of metallic nitrates, a mixture of metallic chlorides or a sol containing said metal oxides, the molarity of said metallic ions being between 0.4 and 1.5, and said carbides being formed by adding carbon in colloidal form to said aqueous solution or sol and then sintering the carbon containing oxide particles, while employing as organic phase a substance selected from the group consisting of a ketone or a ketone mixture which at room temperature has a solubility for water up to about 4% by weight and has a viscosity between one half and twice that of water, washing the drops formed from said aqueous solution after they have congealed in an aqueous solution containing ammonia and from 0.001% to 0.1% of a non-ionic surface active agent, such as an ethylene oxide condensate which envelops said particles and prevents them from clumping during the drying step, drying the particles in an air current having a temperature of from 150° to 300°C and an atmospheric moisture content corresponding to the degree of saturation of the air at a temperature of about from 20° to 50°C, and sintering the thus dried particles at about 1300°C.

3,970,581
MULTIPLE GAS STREAMS IN THE POST OXIDATION STEP IN A PROCESS FOR CONVERTING URANIUM HEXAFLUORIDE TO URANIUM OXIDE RICH COMPOSITIONS

Donald Wayne Jeter, and Walter Gill Keith, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.
Filed May 12, 1975, Ser. No. 576,699
Int. Cl.² C01G *43/02*
U.S. Cl. 252—301.1 R **28 Claims**

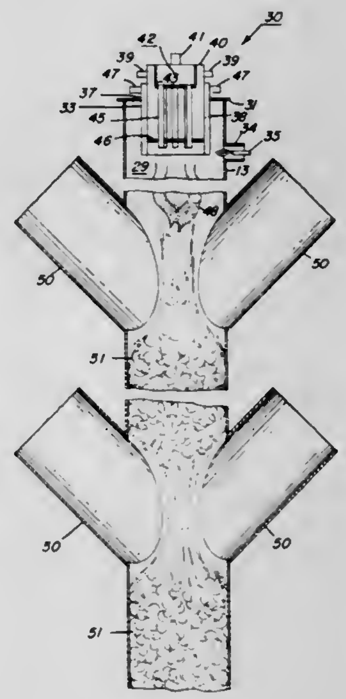
1. A method of preparing a uranium oxide rich composition from uranium hexafluoride in a reaction zone in the presence of an active flame having the steps of:

a. introducing a first gaseous reactant comprising a mixture of uranium hexafluoride and an oxygen-containing gas into the reaction zone,

b. introducing a second gaseous reactant comprising a reducing gas into the reaction zone,

c. separately introducing a shielding gas in the reaction zone between the first gaseous reactant and the second gaseous reactant which temporarily prevents substantially mixing and reaction between the first and second gaseous reactants until sufficient cross diffusion of the reactants occurs as the reactants pass through the reaction zone resulting in a reaction producing a particulate uranium dioxide rich composition and gaseous reaction products, and

d. introducing a third gaseous reactant comprising an oxygen-containing gas into contact with the particulate uranium dioxide rich composition and the gaseous reaction products in the form of multiple streams thereby converting the residual reducing gas in the reaction zone to an oxidized form and oxidizing the uranium dioxide rich composition to a higher oxide of uranium, with at least one of the multiple streams being positioned downstream from the other so that the heat of reaction is dispersed in the reaction zone.



3,970,582
ALPHA BARIUM ZINC CADMIUM SULFIDE PHOSPHORS AND METHOD

Albert K. Fan, Hackettstown, and Melvin Tecotzky, Mendham, both of N.J., assignors to United States Radium Corporation, Morristown, N.J.
Continuation-in-part of Ser. No. 448,621, March 6, 1974, abandoned. This application Dec. 4, 1975, Ser. No. 637,840
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.6 S **9 Claims**

1. A phosphor having an alpha crystal structure isostructural with Ba_2MnS_3 and the chemical composition

$$Ba_2Zn_{1-y}Cd_yS_3 : A_w \cdot zZnS$$

wherein A is an activator element selected from the group consisting of manganese, europium, cerium, lead and terbium, *y* is a numerical value in the range from 0 to 1, *z* is a numerical value in the range from 0 to 20, and *w* is a numerical value in the range from 0.00001 to 0.1.

8. The method of making an alpha crystal structure phosphor composition that is isostructural with Ba_2MnS_3 which comprises preparing a mixture of a host compound comprising

alpha $Ba_2Zn_{1-y}Cd_y S_3$.

wherein *y* is a numerical value from 0 to 1, and an activator compound selected from the class consisting of carbonates, oxides, nitrates, sulfates, acetates, halides and sulfides of an activator element selected from the class consisting of manganese, europium, cerium, lead and terbium, in proportions of one atom part host compound to an amount of activator compound containing from 0.00001 to 0.1 atom part activator element, heating such mixture in a non-oxidizing atmosphere at a temperature in the range from 600° to 1000°C. for a time between 0.5 and 30 hours, and then cooling the product to room temperature.

3,970,583

ISOTOPE GENERATOR PROVIDED WITH A CARRIER MATERIAL WHICH IN ADDITION TO AL_2O_3 CONTAINS FULLY OR PARTLY HYDRATED MNO_2

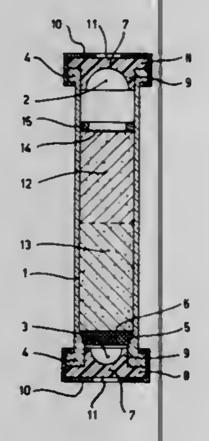
Helena Panek-Finda, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,473

Claims priority, application Netherlands, Feb. 20, 1973, 7302304

Int. Cl.² G21G *4/04*

U.S. Cl. 252—301.15 8 Claims



1. In an isotope generator for the production of liquids containing 99 mTc which generator is provided with a reservoir having an inlet opening and an outlet opening and a parent isotope 99 mMo in the form of a molybdate on a carrier material located in said reservoir the improvement wherein the carrier material contains Al_2O_3 and at least partially hydrated manganese dioxide.

3,970,584

AEROSOL PACKAGE CONTAINING A FOAM-FORMING EMULSION AND PROPELLANT SYSTEM

John W. Hart, and Thomas C. Rolfson, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 14, 1973, Ser. No. 332,534

Int. Cl.² C09K *3/30*

U.S. Cl. 252—305 5 Claims

1. An aerosol package containing a foam-forming, oil-in-water emulsion and a propellant system consisting essentially of nitrous oxide and isobutane, the weight ratio of nitrous oxide to isobutane being from about 2:1 to about 1:1.5.

3. A propellant system for use in an aerosol package containing a foam-forming, oil-in-water emulsion, said propellant system consisting essentially of nitrous oxide and isobutane, the weight ratio of nitrous oxide to isobutane being from about 2:1 to about 1:1.5.

3,970,585

PROCESS FOR PREPARING OIL-CONTAINING MICROCAPSULES

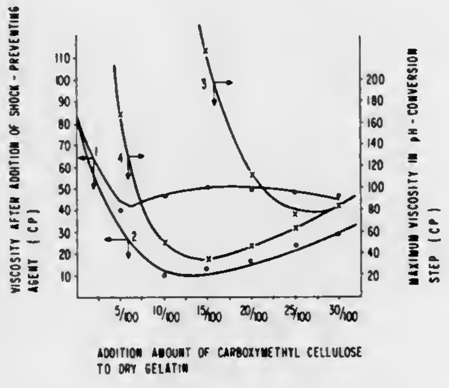
Hiroharu Matsukawa; Shizuo Katayama, and Masataka Kiritani, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 295,329, Oct. 5, 1972, abandoned, which is a continuation of Ser. No. 43,868, June 5, 1970, abandoned. This application Apr. 24, 1973, Ser. No. 354,050

Claims priority, application Japan, June 5, 1969, 44-43597

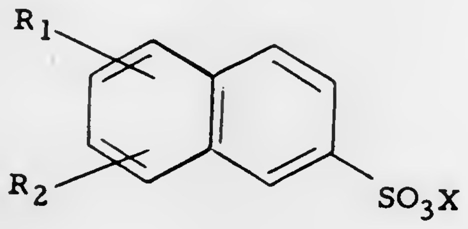
Int. Cl.² B01J *13/02*

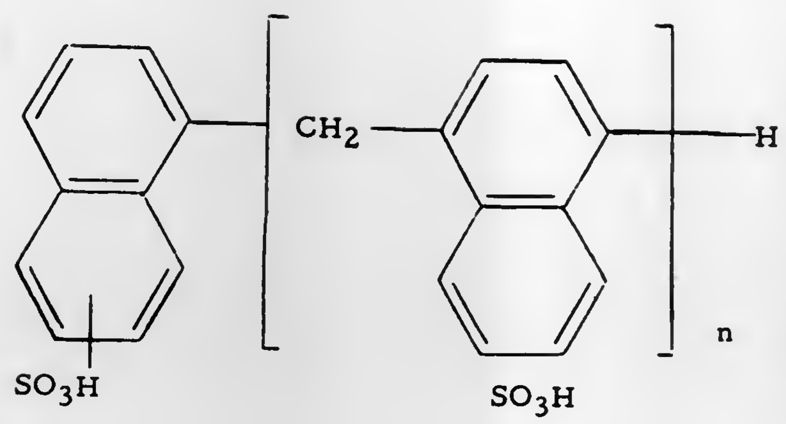
U.S. Cl. 252—316 7 Claims



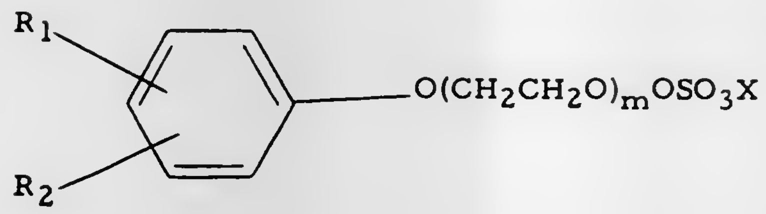
1. In a process for preparing oil-containing microcapsules comprising:

1. cooling a coacervate dispersion comprising a complex gelatin-containing colloid deposited around individual oil droplets to cause gelation of the colloid;
2. thereafter adding to the dispersion an aqueous solution of a shock-preventing agent comprising an anionic high molecular weight electrolyte; and
3. subsequently hardening the gelled colloid by adding to the dispersion a hardening agent and adjusting the pH toward the alkaline region to promote hardening; the improvement comprising adding to the dispersion, after said step (1) and prior to said step (3), a combination of said aqueous solution of said shock-preventing agent consisting essentially of an anionic high molecular weight electrolyte selected from the group consisting of a sodium salt of a sulfuric acid ester of cellulose, a sodium salt of a phosphoric acid ester of cellulose; a sodium salt of a carboxymethyl ether of starch; a sodium salt of a carboxymethyl ether of hydroxy ethyl cellulose; a sulfuric acid ester of hydroxyethyl cellulose; a phosphoric acid ester of hydroxyethyl cellulose; pectin; pectic acid; a potassium salt of a copolymer of vinylbenzene sulfonate and acryloylmorpholine; and a sodium salt of a copolymer of acrylic acid and acryloylmorpholine, and an aqueous solution of an anionic surface active agent selected from the group consisting of:

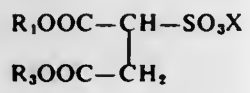




$R(CH_2CH_2O)_mSO_3X$



and



$$\begin{array}{l} R_1OOC-CH-SO_3X \\ \qquad\qquad\;\, | \\ R_3OOC-CH_2 \end{array}$$

wherein R_1 and R_3 are selected from the group consisting of a hydrogen atom and an alkyl group having from 1 to 18 carbon atoms; wherein R_2 is selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, and an alkoxy group having from 1 to 18 carbon atoms; where R is selected from the group consisting of an alkyl group having from 1 to 18 carbon atoms, an aryl group and an alkoxy group having from 1 to 18 carbon atoms, wherein X is selected from the group consisting of a hydrogen atom and an alkali metal atom; wherein *n* is an integer ranging from 1 to 9; and wherein *m* is an integer ranging from 5 to 25, said anionic surface active agent and said anionic high molecular weight electrolyte being different substances, and said electrolyte being used in an amount of at least one-twentieth and said anionic surface active agent being used in an amount of one-fiftieth to one-fifth of the amount by weight of the gelatin of the complex colloid.

3,970,586

PERFLUOROALKANE SULFONAMIDO-ALKANE PHOSPHONIC AND PHOSPHONIC ACID DERIVATIVES

Reinhard Schliebs, Cologne; Manfred Wechsberg, Opladen, and Johann Nikolaus Meussdoerffer, Blecher, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

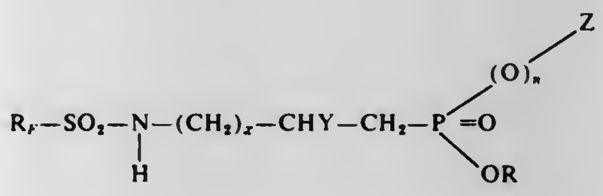
Filed May 7, 1975, Ser. No. 575,097

Claims priority, application Germany, May 18, 1974, 2424243

Int. Cl.² B01F *17/14;* C07F *9/09*

U.S. Cl. 252—355 7 Claims

1. An ω-perfluoroalkane sulfonamido-alkane phosphonic or phosphinic acid or salt of the formula



in which

R_f is a perfluoroalkyl radical with from 1 to 12 carbon atoms,

x and *n* each independently is 0 or 1,

Y is hydrogen or a lower aliphatic radical with up to 5 carbon atoms,

Z is an aliphatic radical with up to 5 carbon atoms, a cycloaliphatic, araliphatic or aromatic radical, and

R is hydrogen, an alkali metal, alkaline earth metal, ammonium radical or substituted ammonium radical.

3,970,587

COMBUSTION REGENERATION OF HYDROCARBON CONVERSION CATALYST WITH RECYCLE OF HIGH TEMPERATURE REGENERATED CATALYST

Reuel Shinnar, Great Neck, N.Y.; Paul W. Snyder, Jr., Pitman, and Vern W. Weekman, Jr., Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 18, 1973, Ser. No. 380,172

Int. Cl.² B01J *29/38, 37/14;* C10G *11/18*

U.S. Cl. 252—417 6 Claims

1. A method for regenerating a hydrocarbon conversion catalyst to remove deposited carbonaceous material which comprises,

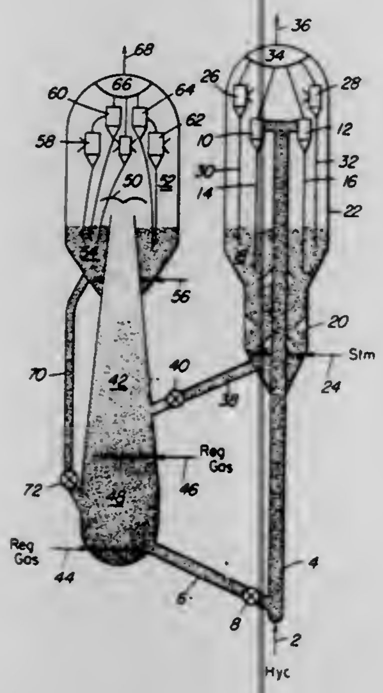
maintaining a first dense fluid bed of regenerated catalyst in the lower portion of an elongated regeneration zone,

introducing a first oxygen containing regeneration gas stream to an upper portion of said first fluid bed of catalyst and introducing a second oxygen containing regeneration gas stream to a lower bottom portion of said first fluid bed of catalyst,

causing catalyst particles to move continuously upwardly through said first fluid bed into a less dense fluid phase of suspended catalyst particles in regeneration gas traversing an upflow catalyst regeneration zone, wherein the density of suspended catalyst decreases in the direction of flow,

introducing spent catalyst particles with carbonaceous deposits into an upper portion of said first fluid bed of upflowing regenerated catalyst particles above said first oxygen containing gas stream in a ratio of spent catalyst with deposited carbon to regenerated catalyst providing a mix temperature of at least 1200°F., separating catalyst particles from regeneration flue gases after traverse of said less dense upflow catalyst regeneration zone and collecting the separated catalyst as a second separate dense fluid bed of regenerated catalyst above said first bed of catalyst,

passing regenerated catalyst from said second catalyst bed to a lower portion of said first bed of catalyst above said



second regeneration gas stream and below said first regeneration gas stream and

withdrawing regenerated catalyst from a lower portion of said first bed for hydrocarbon conversion.

4. The method of claim 1 wherein sufficient oxygen containing regeneration gas is combined with the upflowing suspension of contaminated and regenerated catalyst to assure the conversion of CO to CO_2.

3,970,588
CATALYST FOR HYDRAZINE DECOMPOSITION

William F. Taylor, Scotch Plains, and Martin Lieberman, Newark, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 23, 1969, Ser. No. 3,608

Int. Cl.^{2} B01J *29/10*

U.S. Cl. 252—459 **9 Claims**

1. A catalyst capable of initiating the spontaneous decomposition of hydrazine, hydrazine nitrate, and mixtures thereof into gaseous products, which consists essentially of a minor proportion of ruthenium supported on a major proportion of a stabilized substrate selected from the group consisting of silica, alumina, and silica-alumina, together with a minor proportion of a promoter selected from the group consisting of an oxide of an element of Group IA having an atomic number in the range of 3 to 55, an oxide of an element of Group IIA having an atomic number in the range of 4 to 56, an oxide of a transition element of Group IIIB having an atomic number in the range of 21 to 57, and an oxide of an element of the Lanthanide series having an atomic number in the range of 58 to 71, of the Periodic Table;

the content of ruthenium in said catalyst being within the range of 7.5 to 35 wt. percent of the total catalyst mass,

and the content of said promoter in said catalyst being within the range of from 2 to 10 wt. percent, based on the total catalyst mass.

3,970,589
ACTIVATION AND TREATMENT DURING COOLING OF PLATINUM/ALUMINA CATALYST WITH HCl

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 8, 1974, Ser. No. 458,700

Int. Cl.^{2} B01J *21/04, 37/08*

U.S. Cl. 252—466 PT **9 Claims**

1. A method for activating an active alumina supported platinum catalyst which comprises contacting said catalyst at a temperature within the range of 600° to 1500°F with a dry activating gas comprising 30 to 100 volume percent anhydrous hydrogen chloride for at least 0.1 hour;

and thereafter cooling said thus activated catalyst for a time of at least 0.5 hour in the presence of a dry carrier gas containing 1 to 20 volume percent anhydrous hydrogen chloride.

3,970,590
GOLD CONDUCTOR COMPOSITIONS

Lewis Charles Hoffman, Hockessin; Charles William McMunn, New Castle; Arthur Harvey Mones, Wilmington, all of Del., and Oliver Alton Short, Hemel Hempstead, England, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 23, 1975, Ser. No. 588,131

Int. Cl.^{2} H01B *1/06*

U.S. Cl. 252—514 **4 Claims**

1. In a conductor composition of finely divided gold particles and finely divided inorganic binder particles dispersed in an inert liquid vehicle, the improvement comprising, by weight, 95.0–98.1 percent gold particles and, complementally, 1.9–5.0 percent inorganic binder particles, the binder consisting essentially of, by total weight of gold and binder,

0.3–1.5 percent crystalline PbF_2
0.06–0.32 percent crystalline Cu_2O
0.2–1.5 percent crystalline CdO and
0.5–1.95 percent glass,

the glass having the composition

45–52 percent PbO
3–6 percent B_2O_3
30–35 percent SiO_2
4–6 percent TiO_2
2–4 percent ZrO_2
0–1 percent ZnO
1–4 percent Na_2O
0–4 percent CdO and
0–2 percent Li_2O.

3,970,591
ELECTRICAL DISCHARGE DEVICE COMPRISING AN INSULATOR BODY HAVING AN ELECTRICALLY SEMI-CONDUCTING COATING FORMED THEREON

Robert C. Harris, Unadilla, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 480,199, June 17, 1974. This application Dec. 9, 1974, Ser. No. 530,921

Int. Cl.^{2} H01B *1/06;* **H01C** *1/06*

U.S. Cl. 252—521 **2 Claims**

1. An electrically semi-conducting coating composition suitable for coating beryllium oxide electric insulators, said coating composition consisting essentially of a mixture of from 25 to 90 percent by weight of lanthanum oxide, from 5 to 75 percent by weight of cuprous oxide and from 0 to 25 percent by weight of ferric oxide.

3,970,592
UNSATURATED HYDROCARBONS AND PROCESS FOR MAKING SAME

Klaus-Jürgen Ploner, Essen-Werden, Germany, assignor to Givaudan Corporation, Clifton, N.J.

Filed Jan. 22, 1975, Ser. No. 543,200

Claims priority, application Switzerland, Nov. 13, 1974, 1259/74

Int. Cl.^{2} A61K *7/46;* **C11B** *9/00;* **C07C** *11/00*

U.S. Cl. 252—522 **2 Claims**

1. 2,7-Dimethyl-1,4,6-octatriene.

2. An odorant composition which contains an olfactorilyeffective amount of 2,7-dimethyl-1,4,6-octatriene and at least one other olfactory agent.

3,970,593
TRICYCLIC HYDROCARBON AND PROCESS FOR PRODUCING THE SAME

Akira Nagakura, Kawaguchi; Susumu Akutagawa, Yokohama, and Haruki Kurihara, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

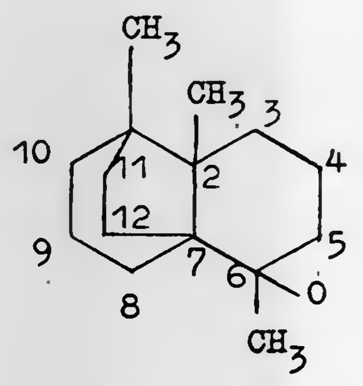
Filed Dec. 27, 1974, Ser. No. 537,039

Claims priority, application Japan, Jan. 11, 1974, 49-6388

Int. Cl.^{2} C07D *303/06*

U.S. Cl. 252—522 **2 Claims**

1. 5,6-Epoxy-1,2,6-trimethyltricyclo[5,3,2,$0^{2,7}$]dodecane having the formula (I)



(I)

2. A perfume composition having an amber-like odor comprising an olfactory amount of 5,6-epoxy-1,2,6-trimethyltricyclo[5,3,2,$0^{2,7}$]dodecane according to claim 1.

3,970,594
HARD SURFACE CLEANING COMPOSITIONS

Gene W. Claybaugh, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 18, 1975, Ser. No. 559,461

Int. Cl.^{2} C11D *3/37*

U.S. Cl. 252—524 **10 Claims**

1. A hard surface cleaning composition comprising:

a. from about .05% to about 15% by weight of a surfactant selected from the group consisting of anionic, nonionic, ampholytic, and zwitterionic surfactants and mixtures thereof;

b. from about 0.5% to about 99% by weight of a builder selected from the group consisting of organic and inorganic builders and mixtures thereof; and

c. from about 0.03% to about 5.0% by weight of a soil removal improvement mixture comprising

1. a water-soluble or dispersible nonionizing primary polymeric material selected from the group consisting of

i. polyvinyl alcohols having a degree of hydrolysis from about 60% to about 100% and a degree of polymerization of from about 100 to about 7000;

ii. polyvinyl pyrrolidones having a degree of polymerization of from about 50 to about 6000; and

iii. mixtures thereof; and

2. an ionizing polysaccharide salt selected from the group consisting of seaweed extracts, plant exudates, seed gums, plant extracts, animal extracts, and biosynthetic gums; the weight ratio of primary polymeric material to polysaccharide salt ranging from about 4:1 to about 1:4.

3,970,595
HEAVY DUTY ALKALINE LIQUID SURFACTANT CONCENTRATE

Martin E. Ginn, Park Forrest, and Irwin Liebman, Oak Park, both of Ill., assignors to Alberto Culver Company, Melrose Park, Ill.

Filed Nov. 27, 1974, Ser. No. 527,545

Int. Cl.^{2} C11D *1/83*

U.S. Cl. 252—545 **11 Claims**

1. A heavy duty alkaline liquid surfactant concentrate, comprising a stable homogeneous mixture containing a total of not over 10% water by weight and consisting essentially of the following ingredients as an unreacted mixture thereof in their stated relative proportions:

a. a liquid water-soluble non-ionic surfactant being the reaction product of ethylene oxide with a hydrophobe selected from the group consisting of the aliphatic monohydric alcohols and the alkyl phenols;

b. a liquid water-soluble ethanolamine salt of an anionic surfactant selected from the group consisting of the alkyl phenol polyethylenoxy alkylene carboxylic acids and the aliphatic hydrogen phosphates, from 10 to 50 parts by weight of said anionic surfactant ethanolamine salt being present per each 100 parts said non-ionic surfactant; and

c. from 2 to 10 parts by weight of aqueous alkali solution per each 100 total parts of said non-ionic and anionic surfactants, said aqueous alkali solution being selected from the group consisting of aqueous solutions of potassium hydroxide and ammonium hydroxide having hydroxyl concentrations of at least 8% by weight based on the alkali solution.

3,970,596
NON-GELLING ALPHA-OLEFIN SULFONATE LIQUID DETERGENT

Stephen Cajetan Klisch, Somerset, and Charles Andrew Martin, Morris Plains, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 26, 1973, Ser. No. 419,161

Int. Cl.^{2} C11D *1/12, 3/20, 3/30, 3/34*

U.S. Cl. 252—546 **30 Claims**

1. A liquid detergent consisting essentially of a detersive proportion of about 12 to 22% of water soluble olefin sulfonate salt of a carbon content in the range of 10 to 20, 10–20% of water soluble alcohol ethoxylate sulfate in which the alcohol is of a carbon atom content in the range of 10 to 20 and which contains about 1 to 20 ethoxy groups, a foam stabilizing proportion of at least one foam stabilizer, an anti-gelling proportion, in combination, of at least one halide and at least one nitrate, with the proportion of halide being from 2 to 8% and the proportion of nitrate being from 1 to 15% and with the proportion of nitrate salt being sufficient to inhibit corrosion of ferrous metals and ferrous metal alloys which are brought into contact with the liquid detergent, and an aqueous medium.

3,970,597

NOVEL SUBSTITUTED POLYAMIDES AND PROCESS FOR PRODUCING THEM

Mordechai Sokolovsky, 10 Rav Ashi St., Tel Aviv; Amihay Freeman, 21 Kiriath Sefer St., Rishon Lezion, and Leon Goldstein, 21 Javits St., Rehovoth, all of Israel

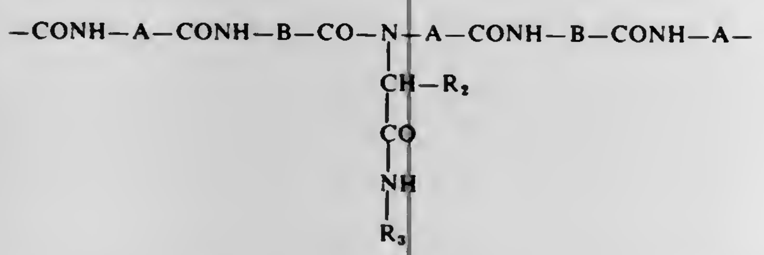
Filed June 4, 1974, Ser. No. 476,320

Claims priority, application Israel, June 15, 1973, 42516

Int. Cl.² C08G *69/50, 18/00*

U.S. Cl. 260—72 N **4 Claims**

1. A process for preparing substituted polyamides of the general formula



$$-CONH-A-CONH-B-CO-\underset{\substack{|\\ CH-R_2\\ |\\ CO\\ |\\ NH\\ |\\ R_3}}{N}-A-CONH-B-CONH-A-$$

wherein A and B, which may be identical or different, are the hydrocarbon backbone groups of the general formula $—(CH_2)_n—$, where n is an integer, R_2 and R_3 are residues of an aldehyde R_2-CHO or an isocyanide R_3-N ≡ C, where said aldehyde is an aliphatic aldehyde and said isocyanide is a diisocyanoalkane, which comprises:

a. partially hydrolyzing the amide bonds on the surface of a polyamide; and

b. resealing the carboxy- and amino- groups formed by said hydrolysis by reacting with said aldehyde, R_2-CHO, and with said isocyanide, R_3-N ≡ C,

resulting in a polyamide of a molecular weight substantially identical with that of the starting material before the partial hydrolysis, substituted by side-chains on the nitrogen of the newly formed peptide bond.

3,970,598

FLAME RETARDANT COMPOSITIONS DERIVED FROM DIFUNCTIONAL CARBOXYLIC ACIDS CONTAINING A HALOGENATED THIOPHERE RING AND METHODS FOR THEIR PREPARATION

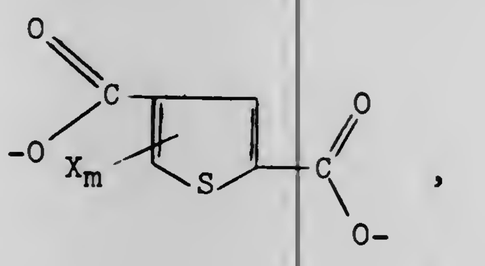
Edwin L. Sukman, Fanwood, and Irving Touval, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 316,706, Dec. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 192,562, Oct. 26, 1971, abandoned. This application July 29, 1974, Ser. No. 492,759

Int. Cl.² C08G *63/12*

U.S. Cl. 260—75 S **5 Claims**

1. A flame-retardant synthetic polyester wherein a portion of said polyester consists of repeating units selected from the group consisting of



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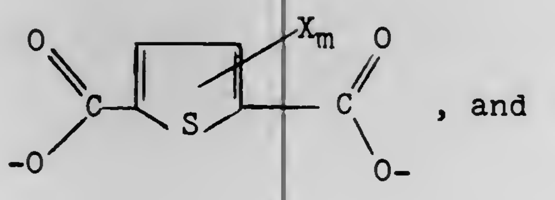
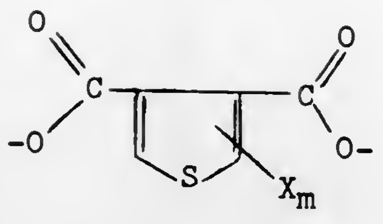


, and



wherein X represents a bromine or chlorine atom and m is the integer 1 or 2, the concentration of said repeating units being equivalent to between 6 and about 15% of said X radical, based on the weight of polyester, when X represents bromine or between 12 and about 20% of said X radical when X represents chlorine, the remaining repeating units being selected from the group consisting of

a. residues of aliphatic and aromatic dicarboxylic acids containing between 2 and 18 carbon atoms, and

b. residues of alkyl, aralkyl and cycloalkyl diols containing between 2 and 12 carbon atoms, wherein said polyester contains at least one member from each of said groups (a) and (b).

3,970,599

RELEASE AGENTS SUITABLE FOR USE WITH PRESSURE-SENSITIVE ADHESIVE TAPES

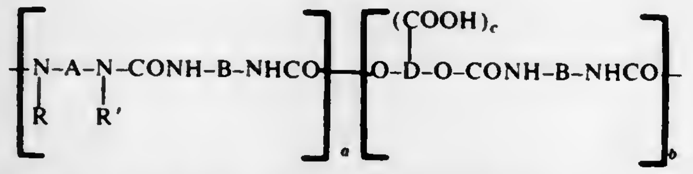
Andor Schwarcz, Niskayuna, N.Y., assignor to Nashua Corporation, Nashua, N.H.

Division of Ser. No. 292,905, Sept. 28, 1972, Pat. No. 3,851,761. This application July 1, 1974, Ser. No. 484,792

Int. Cl.² C08G *18/30*

U.S. Cl. 260—77.5 CH **10 Claims**

1. A release liner comprising a backing member and on at least one side thereof a polymeric composition having the general recurring formula:



$$\left[-\underset{\substack{|\\ R}}{N}-A-\underset{\substack{|\\ R'}}{N}-CONH-B-NHCO-\right]_a\left[-O-\overset{\substack{(COOH)_c\\ |}}{D}-O-CONH-B-NHCO-\right]_b$$

wherein A is an alkylene radical containing about 2 to 6 carbon atoms, B is an arylene radical containing about 6 to 16 carbon atoms, D is an aliphatic organic radical containing about 2 to 6 carbon atoms, R is an alkyl radical containing about 12 to 25 carbon atoms, R′ is hydrogen or an alkyl radical containing about 1 to 25 carbon atoms, *a* and *b* represent the number of recurring units and the ratio of *b/a* varies from 0 to 2, and *c* is 0, 1 or 2.

3,970,600

STABLE, LIQUID SOLUTIONS OF ISOCYANURATE-POLYISOCYANATES CONTAINING AMIDE AND/OR ACYLUREA GROUPS

Georg Falkenstein, Neustadt; Richard Palm, Ludwigshafen, and Dietrich Wolff, Schwetzingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1975, Ser. No. 541,639

Claims priority, application Germany, Jan. 28, 1974, 2403858

Int. Cl.² C08G *18/79, 18/71, 18/20*

U.S. Cl. 260—77.5 NC **7 Claims**

1. Stable, liquid solutions of isocyanurate-polyisocyanates containing amide and/or acylurea groups, which solutions contain:

A. From 5 to 40% by weight, based on the total weight of solution, of an isocyanurate-polyisocyanate with amide and/or acylurea groups, containing from 26 to 0.25% by weight of amide and/or acylurea groups, from 29 to 5% by weight of isocyanurate groups and from 40 to 20% by weight of free isocyanate groups, in each case based on the weight of the isocyanurate-polyisocyanate containing amide and/or acylurea groups, and

B. from 95 to 60% by weight, based on the total weight of the solution, of a monomeric diisocyanate and/or polyisocyanate which is free from isocyanurate groups.

3,970,601

COLORED POLY (URETHANE) UREA POWDERS

Karl-Arnold Weber, Leverkusen, Germany; Helmut Reiff, New Martinsville, W. Va., and Dieter Dieterich, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1975, Ser. No. 573,491

Claims priority, application Germany, May 28, 1974, 2425810

Int. Cl.² C08G *18/00*

U.S. Cl. 260—77.5 Q **5 Claims**

1. In a process of producing direct or reverse coatings on substrates by the dry knife coating or screening process, the improvement wherein the coating material comprises thermoplastic polyurea powders characterized by

a. a smooth, substantially spherical or lenticular surface,

b. an average particle diameter of 5 to 1000 μ,

c. a urea group content of from 8 to 30 percent by weight,

d. an ionic group content of 0.01 to 0.15 milliequivalents per gram, said ionic group capable of salt formation, and

e. from 0.1 to 10 percent by weight of an organic dye built into the polymer molecule by way of at least one urethane and/or urea group.

3,970,602

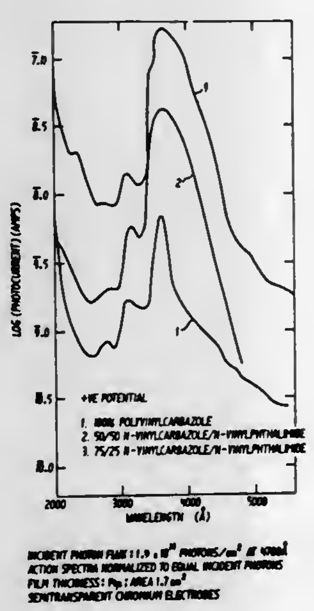
COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF

William W. Limburg, 66 Clearview Drive, Penfield, N.Y. 14526, and Donald A. Seanor, 264 Garnsey Road, Pittsford, N.Y. 14534

Division of Ser. No. 342,646, March 19, 1973, Pat. No. 3,877,936. This application Oct. 23, 1974, Ser. No. 517,122

Int. Cl.² C08G *63/68;* C08F *126/12*

U.S. Cl. 260—78.41 **13 Claims**



1. A copolymer which comprises structural units from N-vinylcarbazole and N-vinylphthalimide.

4. A photoconductive copolymer comprising structural units from (i) N-vinylcarbazole and (ii) N-vinylphthalimide.

3,970,603

AMINO ACID DERIVATIVES OF CHLOROMETHYLATED POLYMERS AND METHODS OF MAKING THE SAME

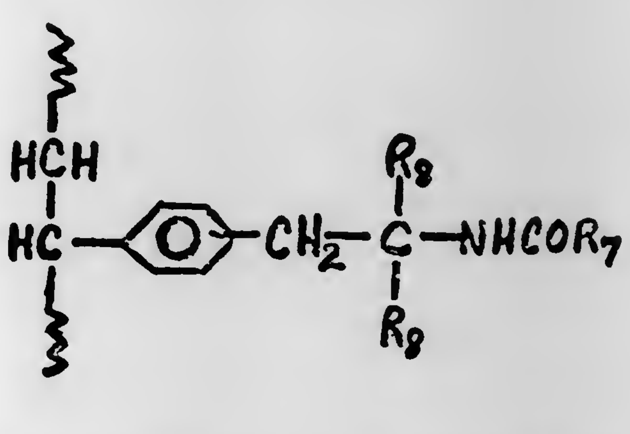
Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 363,377, May 24, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 512,760

Int. Cl.² C08F *222/08*

U.S. Cl. 526—12 **9 Claims**

1. A resinous polymer consisting essentially of recurring units in its molecular formula as follows:



wherein R_8 is a COOH group or a precursor, and R_7 is an alkyl group of 1 – 5 carbon atoms.

3,970,604

METHOD FOR RECOVERING VINYL SULFONATE MONOMERS

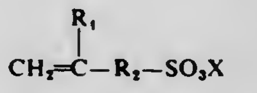
Gary Wentworth, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1974, Ser. No. 533,898

Int. Cl.² B01D *15/00, 53/14;* C08F *28/02;* C08L *33/20*

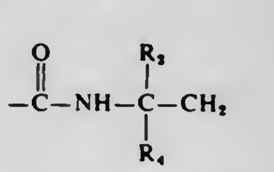
U.S. Cl. 260—79.3 M **6 Claims**

4. The method of recovering unreacted sulfonate monomers from slurries produced by the polymerization of acrylonitrile with said sulfonate monomers and other mono-olefinic monomers copolymerizable with acrylonitrile, said sulfonate monomers having the formula



$$CH_2=\overset{\substack{R_1\\ |}}{C}-R_2-SO_3X$$

where R_1 is $—H$ or $—CH_3$, R_2 is $—CH_2$ or



$$-\overset{\substack{O\\ \|}}{C}-NH-\underset{\substack{|\\ R_4}}{\overset{\substack{R_3\\ |}}{C}}-CH_2$$

in which R_3 and R_4 are $—H$ or $—CH_3$, and X is Na, H or K comprising

a. filtering the slurry to remove polymer solids therefrom to leave a filtrate containing about 0.01 to 1.0 weight percent of said sulfonate monomers,

b. removing said other mono-olefinic monomers from said filtrate,

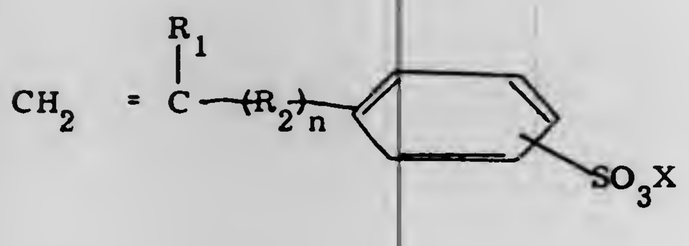
c. passing the filtrate through activated carbon to remove said sulfonate monomers from the filtrate by adsorption by said carbon, and

d. washing the carbon with an aqueous washing solution containing about 0.1 to 8.0 weight percent acrylonitrile to desorb said sulfonate monomers from the carbon into said washing solution.

3,970,605
METHOD FOR RECOVERING VINYL SULFONATE MONOMERS

Gary Wentworth, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 18, 1974, Ser. No. 533,899
Int. Cl.² B01D *15/00, 53/14;* **C08F** *28/02;* **C08L** *33/20*
U.S. Cl. 260—79.3 M **7 Claims**

5. The method of recovering unreacted sulfonate monomers from slurries produced by the polymerization of acrylonitrile with said sulfonate monomers and other mono-olefinic monomers copolymerizable with acrylonitrile, said sulfonate monomers having the formula



where R_1 is $-H$ or $-CH_3$, R_2 is $-CH_2O-$, $-O-$, or $-CH_2-$, n is 0 or 1 and X is Na, K or H comprising

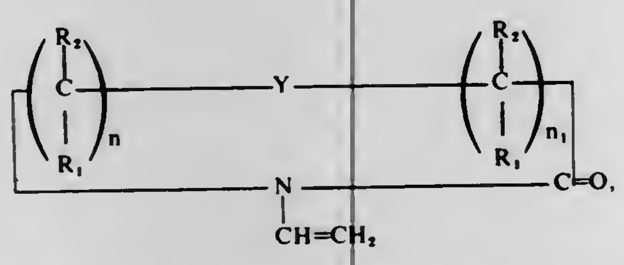
a. filtering the slurry to remove polymer solids therefrom to leave a filtrate containing about 0.01 to 1.0 weight percent of said sulfonate monomers,
b. removing said other mono-olefinic monomers from said filtrate,
c. passing the filtrate through activated carbon to remove said sulfonate monomers from the filtrate by adsorption by said carbon, and
d. washing the carbon with an aqueous washing solution containing about 0.1 to 8.0 weight percent acrylonitrile to desorb said sulfonate monomers from the carbon into said washing solution.

3,970,606
N-VINYL LACTAM INTERPOLYMERS USEFUL AS THICKENING AGENTS

Nathan D. Field, Allentown, and Earl P. Williams, Pen Argyl, both of Pa., assignors to GAF Corporation, New York, N.Y.
Division of Ser. No. 190,653, Oct. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 7,241, Jan. 30, 1970, abandoned. This application Aug. 31, 1973, Ser. No. 393,663
Int. Cl.² C08F *15/00, 19/00*
U.S. Cl. 526—260 **13 Claims**

1. A composition comprising an interpolymer consisting of components A, B and C:

COMPONENT A

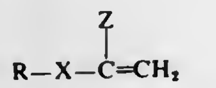


wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl containing 1 to 2 carbon atoms; Y is

$R_2—C—R_1$;

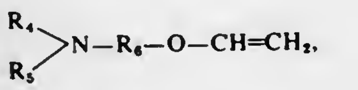
wherein not more than two of R_1 and R_2 are alkyl; and n and n_1 have a value of from 0 to 5, with the proviso that only one of n and n_1 are O;

COMPONENT B



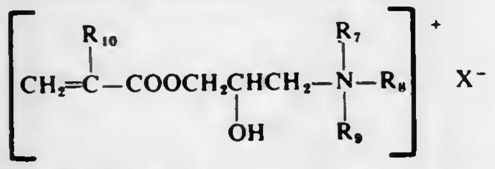
$$R{-}X{-}\overset{Z}{\overset{|}{C}}{=}CH_2$$

wherein Z is selected from the group consisting of hydrogen, lower alkyl, and phenyl; X is selected from the group consisting of oxygen and carboxy; and R represents the same or different hydrocarbon groups containing from about 6 to 36 carbon atoms selected from the group consisting of normal-chain alkyl, branched-chain alkyl, cycloalkyl and alkylaryl; and containing a member selected from the group consisting of



$$\begin{matrix}R_4\\R_5\end{matrix}\!\!>\!N{-}R_6{-}O{-}CH{=}CH_2, \qquad (1)$$

$$CH_2{=}CHOCH_2CH_2N^{+}(CH_3)_3X^{-}, \text{ and} \qquad (2)$$



$$\left[CH_2{=}\overset{R_{10}}{\overset{|}{C}}{-}COOCH_2\underset{OH}{\underset{|}{C}}HCH_2{-}\overset{R_7}{\overset{|}{\underset{R_9}{\underset{|}{N}}}}{-}R_8\right]^{+} X^{-} \qquad (3)$$

wherein R_4 and R_5 each designate a hydrocarbon radical having 1 to 4 carbon atoms and, when taken together with a nitrogen atom to which they are attached, a ring containing not more than 6 carbon atoms, and R_6 represents a hydrocarbon group having from 2 to 4 carbon atoms; X in member (2) represents halogen; R_7, R_8, and R_9 each designate methyl, ethyl, or hydroxyethyl radicals, R_{10} is hydrogen or methyl, and X in member (3) is halogen; said interpolymer comprising from about 20 to about 99 mole % of Component A, from about 0.5 to about 10 mole % of Component B, and from about 0.5 to about 79.5 mole % of Component C.

3,970,607
CONTROLLED HIGH TEMPERATURE POLYMERIZATION OF BUTADIENE

Thomas C. Bouton, Akron, and Shingo Futamura, Munroe Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 308,062, Nov. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 132,189, April 7, 1971, abandoned. This application July 29, 1974, Ser. No. 492,573
Int. Cl.² C08F *136/04*
U.S. Cl. 526—335 **8 Claims**

1. Process of subjecting

(I)	a polymerization charge substantially free of diluents and consisting essentially of		
(a)	1,3-butadiene	60–100%	Based on the weight of (a)+(b)+(c)
(b)	compounds copolymerizable with 1,3-butadiene selected from the group consisting of styrene, alpha-alkyl styrenes such as alpha-methyl styrene, ring-alkylated styrenes such as 1-, 2- and 3-methyl and ethyl styrenes, other conjugated diolefins such as isoprene, 2,3-dimethyl-1,3-butadiene, piperylene and the like	40–0%	
(c)	inert hydrocarbons together with	0–10%	
(d)	a 1,2-diene	200–3000	parts by weight per million parts by weight of 1,3-butadiene

(x) said 1,2-diene having the formula $CH_2{=}C{=}CH{-}R$ wherein R is hydrogen or an alkyl group containing 1–3 carbon atoms
(II) in a reactor of a capacity of at least 68 liters, the polymerization charge being sufficient in amount to occupy at least about 35% of the capacity of the reactor, and said reactor being provided with a cooling jacket, and rotary agitator and also being provided with an overhead reflux condenser and with liquid disengagement space to assist in removal of heat, the ratio of the surface of said cooling jacket and vapor disengagement space to the mass of the contents being inadequate, in the absence of said 1,2-diene, to curb the temperature surge as specified at (IV) (c) hereinbelow
(III) in the presence of a lithium hydrocarbon of up to 40 carbons
(IV) to temperatures initially in the range 27° – 66°C.
(a) the temperatures being maintained in this range at least until conversion has reached about 35%
(b) the temperatures thereafter being permitted to undergo a surge
(c) the presence of the 1,2-diene referred to at (I) (d) acting to curb said surge to a peak not greater than about 204°C.
(V) whereby to produce polymers of desirable branched microstructure reflected in

(a)	freedom from cold flow	—in unvulcanized —state
(b)	good tensile strength	
(c)	good tear strength and	
(d)	good processing characteristics	

3,970,608
EPOXIDIZED ACETYLENE-CONJUGATED DIENE RANDOM COPOLYMER AND THE CURABLE COMPOSITION COMPRISING THE SAME

Junji Furukawa, Kyoto; Eiichi Kobayashi, Uji, and Takahiro Kawagoe, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Mar. 31, 1975, Ser. No. 563,826
Claims priority, application Japan, Apr. 5, 1974, 49-37993; Apr. 5, 1974, 49-37994
Int. Cl.² C08F *236/04, 236/06, 236/08, 238/02*
U.S. Cl. 526—19 **6 Claims**

1. An epoxidized acetylene-conjugated diene random copolymer of which epoxy equivalent is within the range of from 50 to 1,000, produced by epoxidizing an acetylene-conjugated diene random copolymer, in which acetylene and conjugated diene are bonded linearly and randomly, the block character P is within the range of from 0.8 to 1.2 and the acetylene content is less than 60 mol% with an organic peracid.

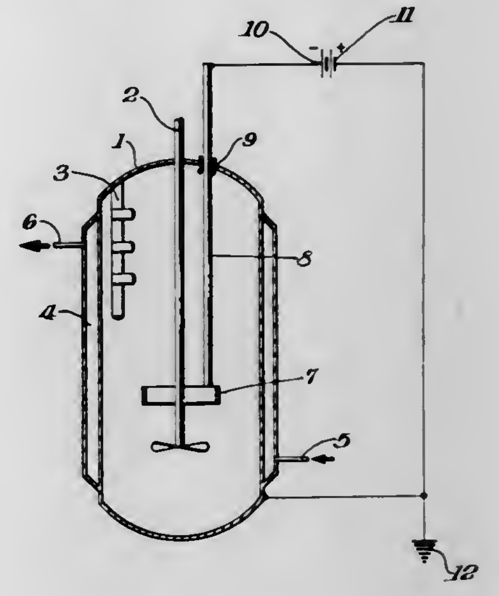
3,970,609
METHOD FOR PREPARATION OF POLYMETHACRYLATES BY THE ANIONIC POLYMERIZATION

Lubomír Lochman; Miroslava Rodová, and Jiří Trekoval, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia
Filed May 6, 1974, Ser. No. 467,575
Claims priority, application Czechoslovakia, May 7, 1973, 3228-73
Int. Cl.² C08F *120/14*
U.S. Cl. 526—89 **8 Claims**

1. Method for the preparation of polymers of methacrylate esters by anionic polymerization wherein said polymer consists essentially of said esters, comprising the steps of polymerizing at least a methacrylate monomer in the presence of an initiator and a solvent, said initiator being an α-lithio ester of carboxylic acid containing from 2 to 30 carbon atoms in a straight or branched chain and 1 to 6 alkyl ester groups bound to different carbon atoms, and said solvent being an aromatic or aliphatic hydrocarbon or organic ether, said polymerization being carried out at a temperature in the range from between −70° to +50° for a time sufficient to form said polymers.

3,970,610
POLYMERIZATION PROCESS

Kasimir Ruchlak, Burgkirchen, Alz; Ernst-August Albers, Bobingen, and Walter Fester, Konigstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany
Filed Oct. 8, 1974, Ser. No. 513,146
Claims priority, application Germany, Oct. 10, 1973, 2350720
Int. Cl.² C08F *2/18, 14/06*
U.S. Cl. 526—62 **9 Claims**



1. In the process of suspension polymerization of vinyl chloride in a liquid polymerization mixture within a reactor with from 0 to 20 percent by weight of at least one monomer polymerizable therewith in the presence of activators, stabilizers and auxiliary stabilizers normally used in the suspension polymerization of vinylchloride, the improvement comprising minimizing deposits formed on the walls of the reactor during polymerization by conducting the polymerization in a reactor having inner stainless steel or noble metal surfaces in contact with the polymerization mixture, said stainless steel or noble metal surfaces being connected as an anode, said liquid polymerization medium being in contact with at least one cathode insoluble therein and spaced from said anode, said cathode and anode being connected by an external source of current, applying external voltage to said anode and cathode during polymerization thereby electrolytically generating hydrogen and oxygen in the liquid polymerization mixture at said surfaces, the external voltage being of such magnitude that sub-

stantial dissolution of the stainless steel or noble metal surfaces does not occur.

3,970,611
MELT FINISHING PROCESS FOR POLYMERS PRODUCED BY VAPOR STATE POLYMERIZATION PROCESSES

James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 533,022

Int. Cl.² C08F *2/34, 6/00, 10/00, 14/06*

U.S. Cl. 526—65 **22 Claims**

1. A process for treating polymer made by the polymerization of at least one polymerizable monomer in a vapor state reactor comprising removing without substantial pressure letdown solid polymer from said vapor state reactor together with reactor off-gases into a post polymerization zone into which a controlled amount of said monomer is introduced and wherein a controlled amount of essentially adiabatic polymerization occurs and said polymer is melted by heat from said adiabatic polymerization and externally added heat to form efficiently transferable, molten polymer.

3,970,612
PROCESS FOR MOLECULAR WEIGHT LOWERING OF POLYVINYL HALIDES

Gilbert Witschard, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,518

Int. Cl.² C08F *2/02, 2/40, 14/06, 259/04*

U.S. Cl. 526—86 **13 Claims**

1. In the bulk process for preparation of a vinyl halide homopolymer, vinyl halide copolymer or vinyl halide graft polymer containing up to about 50% by weight of comonomer and/or a compatible back-bone polymer which comprises

1. polymerizing in liquid phase vinyl halide monomer or vinyl halide monomer in the presence of up to about 50% by weight of said comonomer and/or said back-bone polymer,
2. recovering vinyl halide power from said monomer or monomers, the improvement which comprises carrying out at least part of the polymerization in the presence of a molecular weight-lowering amount of an organotin mercaptide ester of the formula:

$$R_n\text{-}Sn(\text{-}S\text{-}R'\text{-}COOR'')_{4\text{-}n}$$

wherein *n* is an integer 1 to 3, R and R'' are univalent organic radicals selected independently from the group consisting of alkyl, aryl, alkaryl, and aralkyl radicals, and R' is a divalent organic radical selected from the group consisting of alkylene and aralkylene radicals, with the polymerization being carried out in the presence of an effectively amount of organic azo initiator whereby the polymerization is effetively initiated, said organotin mercaptide ester being added to the polymerization reaction when 0 to no more than about 15 weight percent of said monomer or monomers is converted to polymer, said polymerization being continued in the presence of said organo-tin mercaptide ester to obtain the vinyl halide polymer product in a conversion of at least about 30 weight percent, whereby the molecular weight of the vinyl halide polymer product is substantially lower than the molecular weight of the corresponding polymer obtained by polymerization in the absence of said mercaptide ester.

3,970,613
POLYMERIZATION PROCESS

Brian Peter Forsyth Goldie, Cheam, England; Kenneth Clark Kirkwood, and Alan William Lightbody, both of Larbert, Scotland, assignors to BP Chemicals International Limited, London, England

Filed Mar. 5, 1975, Ser. No. 555,378

Claims priority, application United Kingdom, Mar. 8, 1974, 10598/74

Int. Cl.² C08F *4/24, 10/02, 10/04, 10/14*

U.S. Cl. 526—104 **12 Claims**

1. A process for polymerizing ethylene or a mixture of ethylene and one or more other 1-olefins or 1,3-diolefins comprising contacting a titanium modified heat activated catalyst comprising chromium oxide and a difficulty reducible inorganic oxide support material wherein at least part of the chromium is present in a valency state suitable for polymerization with a first liquid hydrocarbon and then contacting the monomeric material or materials with said catalyst in the presence of a second different liquid hydrocarbon diluent.

3,970,614
NUTRIENT PROTEIN FROM KERATINACEOUS MATERIAL SOLUBILIZED WITH N,N,-DIMETHYLFORMAMIDE

William D. Goodwin, Atlanta, Ga., assignor to The Athlon Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 397,625, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 167,856, July 30, 1971, Pat. No. 3,773,745. This application Dec. 13, 1974, Ser. No. 532,731

The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl.² A23J *1/10*

U.S. Cl. 260—123.7 **6 Claims**

1. A protein composition comprising avian keratinaceous material solubilized by refluxing or boiling with N,N-dimethylformamide at boiling temperature and from which a composition consisting essentially of protein is recovered.

3,970,615
UNSYMMETRICAL MONO-SULFO CONTAINING CHROMIUM COMPLEXES OF AZO DYES

Hans Ulrich Schütz, Basel, Switzerland; Gerhard Back, Lorrach, Germany, and Fabio Beffa, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

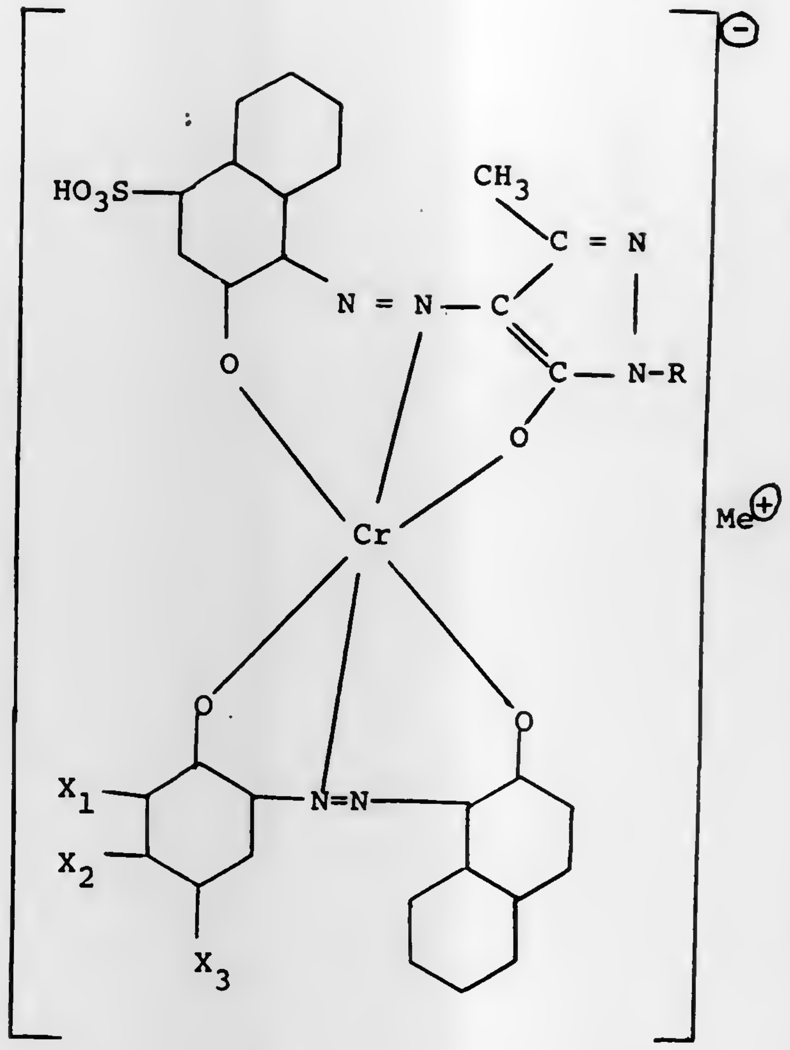
Filed Dec. 24, 1974, Ser. No. 536,059

Claims priority, application Switzerland, Jan. 10, 1974, 287/74

Int. Cl.² C09B *45/06, 45/16, 45/48;* **D06P** *3/24*

U.S. Cl. 260—145 B **5 Claims**

1. A chromium complex dye of the formula



(1)

wherein one of the symbols X_1, X_2 and X_3 is hydrogen and each of the others is hydrogen, chloro, nitro or methyl

R is phenyl or phenyl substituted by chloro, lower alkyl or nitro and $Me^{\oplus}$ is a cation.

3,970,616
SYNTHESIS OF CHROME-COMPLEXED DYE DEVELOPERS IN THE PRESENCE OF WEAKLY BASIC ANION EXCHANGE RESINS

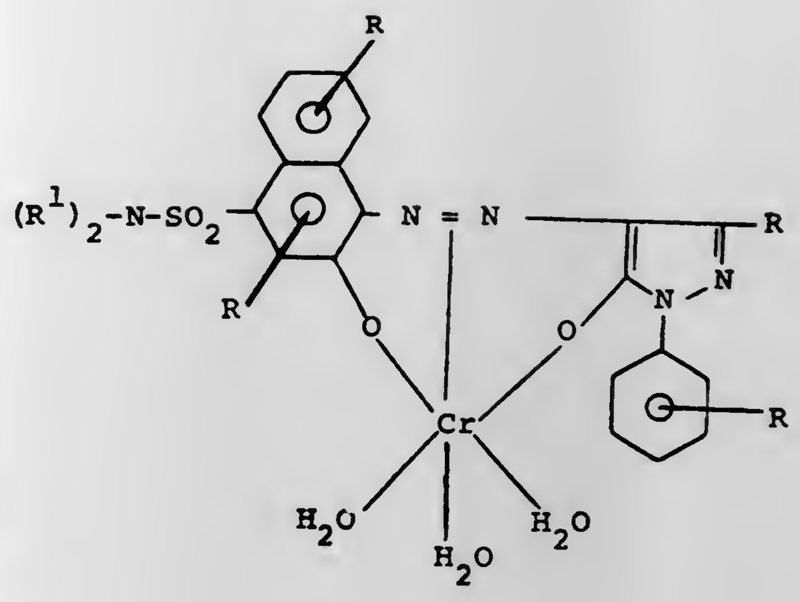
Henry Bader, Newton Center, and Michael H. Feingold, Woburn, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 211,708, Dec. 23, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,059

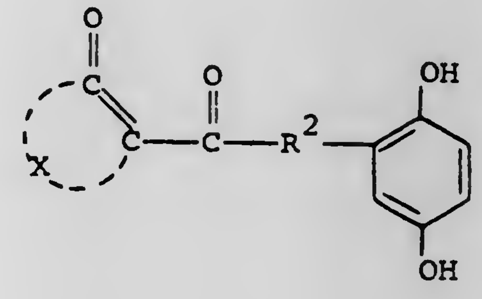
Int. Cl.² C09B *45/00, 45/06, 45/16, 45/26*

U.S. Cl. 260—147 **4 Claims**

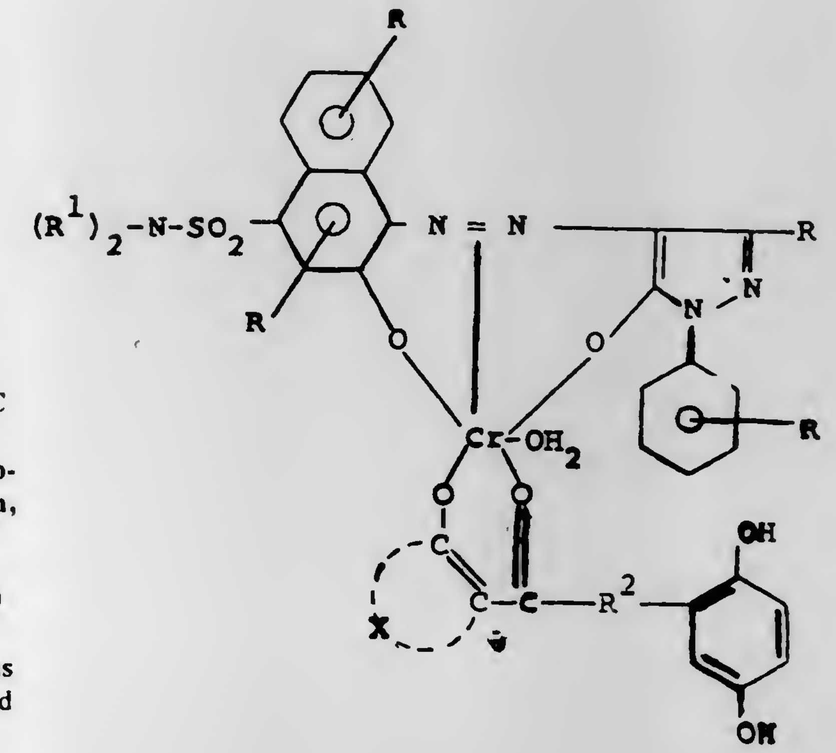
1. In a process comprising the step of reacting a compound of the formula:



with a compound of the formula:



to provide a compound of the formula



where each R is the same or different substituent chosen from the group consisting of hydrogen, alkyl having from 1–6 carbon atoms or alkoxy having from 1–6 carbon atoms, each R^1 is hydrogen, alkyl having 1–6 carbon atoms or alkanol having 1–6 carbon atoms, R^2 is alkylene having 1–6 carbon atoms and X represents the atoms to complete cyclopentyl or cyclohexyl:

the improvement wherein said reaction is performed in the presence of a weakly basic anion exchange resin.

3,970,617
NAVY-BLUE NITROPHENYLAZONAPHTHYLAMINO DYES

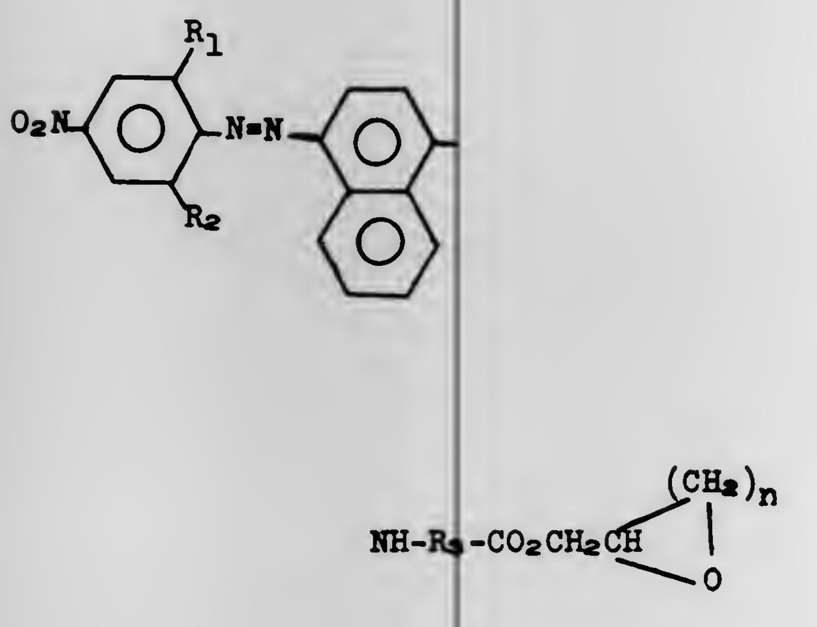
Salvatore A. Bruno, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1974, Ser. No. 449,064

Int. Cl.² C09B *29/36;* D06P *3/54*

U.S. Cl. 260—152 **5 Claims**

1. Disperse monoazo dye of the formula:



wherein R_1 is Br, Cl or CN; R_2 is CN or NO_2; R_3 is C_{1-4} branched or straight-chain alkylene; and n is 3 or 4.

3,970,618
PROCESS FOR THE PRODUCTION OF POLYURETHANE FOAMS

Gert Jabs, Schildgen; Günther Loew, Leichlingen, and Johannes Niggemann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 30, 1974, Ser. No. 438,052

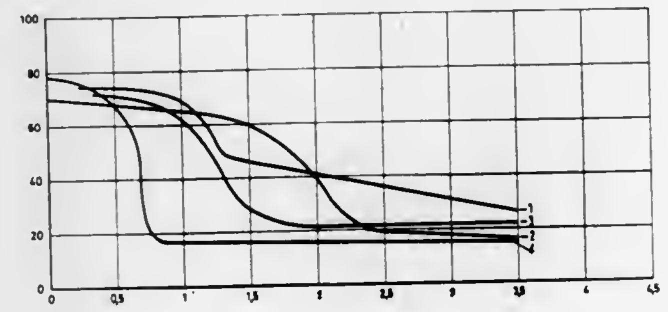
Claims priority, application Germany, Feb. 1, 1973, 2304892

Int. Cl.² C08G *18/14, 18/77, 18/48*

U.S. Cl. 260—2.5 AD **3 Claims**

1. A proces for the production of open-celled hydrophilic polyurethane foam having a density of from about 6 to about 30 kg/m³ which, after saturation with water an application of a suction potential of 30 cm water column, has a water retention capacity of at least 25 volume % which process comprises reacting organic polyisocyanates and polyhydroxyl compounds, while in the presence of a blowing agent and an emulsifier, characterized in that:

A. the polyhydroxyl compound is selected from the group consisting of
  i. compounds having a hydroxyl number from about 900 to about 1800, and
  ii. mixtures of compounds having a hydroxyl number from about 900 to about 1800, and compounds having hydroxyl numbers from about 300 to about 900, said mixtures having average hydroxyl numbers from about 900 to about 1800,



B. the organic polyisocyanate have at least one aromatically bound isocyanate group containing at least one group selected from the class consisting of urethane, urea, carbodiimide, allophanate, isocyanurate and biuret groups, wherein said polyisocyanates comprise from 5 to 80% by weight of said polyisocyanate containing at least one of said groups and the balance being the monomeric polyisocyanate which is used for the preparation of said polyisocyanates and,

C. said organic polyisocyanates being used in a quantity corresponding to from about 20 to about 60% of the quantity theoretically required for reacting all the hydrogen atoms present in the reaction mixture which are reactive with isocyanate groups.

3,970,619
POLYMERIC HYDROXYLATED POLYESTERETHERS AND POLYURETHANE FLEXIBLE FOAM PREPARED THEREFROM

Thomas C. Snapp, Jr.; Alden E. Blood, and Sam H. Johnson, Jr., all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,527

Int. Cl.² C08G *4/00, 18/14, 18/42*

U.S. Cl. 260—2.5 AN **18 Claims**

1. A foamed polyurethane prepared by reacting a polyisocyanate and a foamable composition containing a hydroxylated polyesterether prepared from p-dioxanone, diol and dicarboxylic acid, said hydroxylated polyesterether having an acid number of 1–5 and a hydroxyl number of 30–200.

3,970,620
POLYVINYLCHLORIDE COMPOSITIONS FOR FROTHING

Frederick J. Ihde, Jr., Mountain Lakes, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 437,054, Jan. 28, 1974, abandoned. This application June 24, 1975, Ser. No. 589,758

Int. Cl.² C08V *9/30*

U.S. Cl. 260—2.5 P **14 Claims**

1. A composition for producing a foam by mechanically whipping comprising:

a. a plastisol which is a mixture of
  1. a particulate resin selected from the group consisting of a vinyl chloride homopolymer and a resinous copolymer of a major portion of said vinyl chloride and a minor portion of a copolymerizable monomer, and
  2. a high boiling organic liquid plasticizer which is substantially a non-solvent for said particulate resin at room temperature but is capable of dissolving said particulate resin at elevated temperature to form a single phase material which upon cooling to room temperature is a solid material,

b. from about 1 to about 5 phr of a silicone frothing agent, and

c. from about 5 to about 10 phr of an oleophilic frothing aid selected from at least one member of the group consisting of a free acid of a phosphate ester, a free acid of a phosphite ester, a borate ester, an organic nitrogen compound which is selected from the group consisting of amine, aminoamide, alkanolamide, imidazoline and quaternary and organic nitrogen-sulfur compound which is selected from the group consisting of an amine salt of a sulfonic acid, an aromatic sulfonamide and an aminomercaptan wherein the ester moiety is alkyl, alkenyl, aryl, substituted alkyl, substituted alkenyl, substituted aryl or an alkoxylate thereof.

3,970,621
POWDER COATING COMPOSITION FOR ELECTRODEPOSITION

Taizo Kondo; Komaharu Matsui, and Kunio Yamamoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Continuation-in-part of Ser. No. 211,660, Dec. 23, 1971, abandoned. This application Sept. 11, 1974, Ser. No. 505,033

Claims priority, application Japan, Dec. 26, 1970, 45-118724

Int. Cl.² C08L *63/02;* C25D *13/06, 13/10*

U.S. Cl. 260—18 EP **9 Claims**

1. An aqueous powder coating composition for electrodeposition which comprises powdery particles of an epoxy resin from bisphenol and epichlorohydrin powder coating composition having 0.1 to 50 microns particle size wet with an organic liquid which does not dissolve the powdery particles and is essentially insoluble in the aqueous composition and which has a boiling point of 50°–250°C. in an amount of 5–100 parts of organic liquid by weight per 100 parts by weight of the powdery particles, said wet powdery particles dispersed in an aqueous medium containing 0.05–5 parts by weight per 100 parts by weight of the powdery particles of an ionic surface active agent.

3,970,622
HEAT STABILIZERS FOR POLYVINYL CHLORIDE (β-AMINO-β-ARYLACRYLONITRILES)

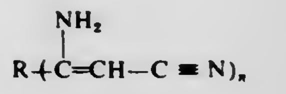
William Baptist Hardy, Bound Brook, and Christos Savides, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,946

Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 XA **12 Claims**

1. A composition comprising a vinyl chloride polymer containing an amount, effective to improve the thermal stability of said polymer, of a compound of the formula:



$$R\!-\!\!\left(\overset{\displaystyle NH_2}{\overset{|}{C}}\!=\!CH\!-\!C\equiv N\right)_n$$

wherein n is 1 or 2 and R is alkyl, alkylene, aryl, arylene, lower alkyl-substituted aryl or arylene, or fluoro-substituted aryl or arylene.

5. A composition as defined in claim 4 additionally containing a divalent metal salt of a fatty acid or mixture of fatty acids of 12–20 carbon atoms, the weight ratio of said salt to said compound being between 1:2 and 2:1.

3,970,623
ADHESIVE COMPOSITION CONTAINING A COPOLYMER OF BUTADIENE, STYRENE, AND ACRYLONITRILE, PLUS A TACKIFYING RESIN

George W. Feeney, Akron, and Gary L. Burroway, Doylestown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 29, 1974, Ser. No. 528,299

Int. Cl.² C08L *7/00, 51/00, 53/00, 9/00*

U.S. Cl. 260—27 BB **5 Claims**

1. An adhesive composition which comprises an admixture of 100 parts by weight of the copolymer of butadiene, styrene and, optionally, acrylonitrile and about 50 to about 150 parts by weight of a tackifier resin selected from rosin esters and diolefin/olefin copolymers containing about 5 to about 35 weight percent aromatic units, where said copolymer is characterized by having an ultimate tensile strength in the range of about 50 to about 100 pounds per square inch and an ultimate elongation in the range of about 600 to about 1200 percent at 25°C, and is prepared by the method which comprises (1) aqueous emulsion free radical polymerizing in the presence of a modifier composed of primary and/or tertiary mercaptans, a monomer mixture comprising a total of 100 weight percent monomers comprised about 3 to about 8 weight percent styrene, about 97 to about 92 weight percent 1,3-butadiene and about 1 to about 4 weight percent acrylonitrile, if used, to a conversion of about 50 to about 75 weight percent of said monomers to a copolymer thereof, and (2) reacting an additional amount of about 2 to about 5 weight percent styrene, based on the total monomers used, with said copolymer to an extent of about 80 to about 98 weight percent conversion of the total monomers to a copolymer thereof, with additional mercaptan modifier.

3,970,624
COATING COMPOSITION

Walter Brotz, Gersthofen; Manfred Engelmann, Augsburg, and Klaus Rieger, Gersthofen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 5, 1974, Ser. No. 529,696

Claims priority, application Germany, Dec. 11, 1973, 2361506

Int. Cl.² C08L *91/06*

U.S. Cl. 260—28.5 A **2 Claims**

1. A coating composition for molten film coating of supporting webs consisting essentially of

70 to 90% by weight of a polypropylene having a crystalline portion of 20 to 60% by weight and a melt viscosity at 170°C of from 5,000 to 200,000 cP and
10 to 30% by weight of a hydrocarbon wax.

3,970,625
PRODUCTION OF UREA-FORMALDEHYDE CONCENTRATES

William Percy Moore, Hopewell; James Earl Sansing, Chester, and Harold Daniel Williamson, Hopewell, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.
Continuation of Ser. No. 341,192, March 14, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,622
Int. Cl.^{2} C08L *61/24*
U.S. Cl. 260—29.4 R **1 Claim**

1. In a process for the production of a stable, aqueous solution of urea-formaldehyde reaction products which comprises incorporating an aqueous formaldehyde solution containing from 30 to 50% by weight formaldehyde and no more than 0.02% by weight of formic acid based on the formaldehyde, with urea containing no more than 0.015% by weight of ammonia, in amount such that the resulting mixture contains a mol ratio of 4.4 to 7.3 mols of formaldehyde for every mol of urea, adjusting the pH of the reaction mixture thus prepared to within the range pH 8.8 to 9.5, thereafter heating said reaction mixture at temperatures in the range 50° to 60°C. for 30 to 60 minutes, and thereafter rapidly evaporating water from said mixture by distillation at temperatures in the range of about 45° to 60°C. under reduced pressure below atmopsheric, at which water is vaporized from the mixture until the liquid residue of the evaporation contains 60 to 90% by weight total solids calculated as formaldehyde and urea, the improvement which comprises:

a. heat-treating a portion of said liquid residue of the evaporation for about 48 hours at a temperature of 45° to 50°C., thereby producing a urea-formaldehyde concentrate particularly suitable for manufacture of solid complete fertilizers containing water-insoluble, slow-release nitrogen; and
b. cooling another portion of said liquid residue of the evaporation to ambient temperature and adding sufficient ammonia to said liquid residue to increase the buffer capacity to 12 to 16, thereby producing a urea-formaldehyde concentrate particularly suitable for manufacture of adhesives.

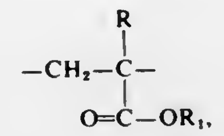
3,970,626
ETHYLENE INTERPOLYMER COMPOSITIONS AND PROCESS

Jack Hurst, Shawnee, Kans., and Harry D. Anspon, Kansas City, Mo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.
Filed Aug. 14, 1961, Ser. No. 131,108
Int. Cl.^{2} C08F *210/02*
U.S. Cl. 260—29.6 WB **17 Claims**

1. Ethylene copolymers selected from the group consisting of:

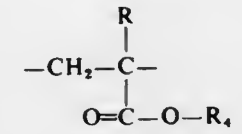
1. Polymers containing 67–99 mol % of units (a) and, correspondingly, 33–1 mol % of units (b),
2. Polymers containing 67–99 mol % of units (a) and, correspondingly, 33–1 mol % of a mixture of units (b) and (d), and
3. Mixtures of (1) and (2):

Said units (a) having the structure $—CH_2—CH_2—$,
Said units (b) having the structure



$$-CH_2-\underset{\underset{O=C-OR_1,}{|}}{\overset{\overset{R}{|}}{C}}-$$

and said units (d) having the structure



$$-CH_2-\underset{\underset{O=C-O-R_4}{|}}{\overset{\overset{R}{|}}{C}}-$$

where R is selected from the group consisting of hydrogen and a methyl group, R_1 is an alkali metal cation, and R_4 is an alkyl group, said ethylene polymers being further characterized in:
(i) having the units (a), (b) and (d) substantially uniformly distributed throughout the polymer chains, and
(ii) being sufficiently thermoplastic that they can be extruded and molded.

3,970,627
FLUOROCARBON POLYMER COATING COMPOSITIONS CONTAINING MICA PARTICLES

Herman Ernest Seymus, Lint, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 24, 1973, Ser. No. 400,040
Int. Cl.^{2} C08L *27/18*
U.S. Cl. 260—29.6 F **5 Claims**

1. An aqueous coating composition consisting essentially of:
a. 40–93%, by weight of the total of (a), (b) and (c) solids, of a particulate fluoropolymer,
b. 5–35%, by weight of the total of (a), (b) and (c) solids, of colloidal silica stabilized with sodium ions, or a mixture of said silica with a water-soluble alkali metal silicate, in a ratio in the range between 25:75 and 90:10 respectively,
c. 2–25%, by weight of the total of (a), (b) and (c) solids, of mica particles coated with a pigment, and
d. water as a carrier.

3,970,628
AQUEOUS DISPERSIONS OF THERMOSETTABLE SYNTHETIC ADDITION POLYMERS WITH 1,2-EPOXY RESIN PLASTICIZER

William Connelly, Willowdale; Hamid Iqbal Khan, Toronto, and Ian Hugh McEwan, Kleinburg, all of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada
Continuation-in-part of Ser. No. 378,598, July 12, 1973, abandoned. This application Jan. 30, 1974, Ser. No. 437,960
Claims priority, application United Kingdom, July 14, 1972, 33084/72; July 14, 1972, 33085/72; July 14, 1972, 33086/72
Int. Cl.^{2} C08L *63/10*
U.S. Cl. 260—29.6 NR **14 Claims**

1. A process for producing an aqueous dispersion of a thermosettable, solid, water insoluble, synthetic addition polymer consisting essentially of copolymerizing in water
a. from about 98.49 to about 32.5% by weight based on the weight of total monomer solids of at least one α,β-ethylenically unsaturated main monomer selected from the group consisting of styrene, lower alkyl methacrylate, lower alkyl acrylates, lower alkyl itaconates, lower alkyl maleates and lower alkyl fumarates with
b. from about 1% to about 10% by weight based on the weight of total monomer solids of at least one α,β-ethylenically unsaturated monomer containing a reactive group selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid, acrylamide, lower alkyl acrylamides, N-alkoxy modified acrylamides, diacetone acrylamide, maleamic acid, maleamide, fumaride, N-mono-lower alkyl amides, N-monophenylamides, hydroxyethyl methacrylate and hydroxypropyl methacrylate, said polymerization taking place in the presence of
c. from about 0.5% to about 50.0% by weight based on the weight of total monomer solids of a plasticizer which is a 1,2-epoxy resin and of
d. from about 0.01% to about 7.5% by weight based on the weight of total monomer solids of a stabilizing material selected from the group consisting of, alone or in combinations thereof, surface active agents, suspension agents, and water soluble, copolymerizable ionic monomers selected from the group consisting of vinyl sulphonate, allyl sulphonate and sulphoesters of the formula:-

$R—CO_2 — Q — SO_3M$

wherein R is selected from the group consisting of vinyl and α-chloro-or α-alkyl-substituted vinyl, Q is a divalent hydrocarbon radical having its valence bonds on different carbon atoms and M is a cation selected from the group consisting of sodium, potassium, lithium, moropholinium, lower alkyl substituted morpholinium, ammonium, substituted ammonium of the formula NR'_4, wherein R_1 is selected from the group consisting of hydrogen, lower alkyl and lower alkanolamino.

3,970,629
COMPOSITION FOR PAPER COATING

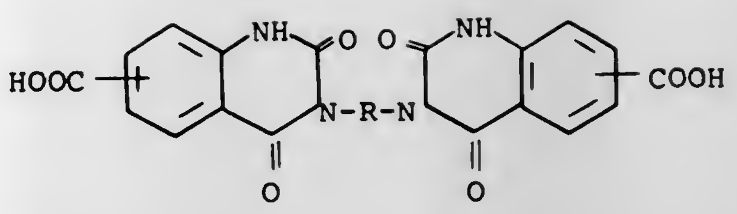
Nobujiro Izaki, Niihama; Masashi Nakayama, Osaka; Saburo Mishiba, and Sadao Sekiguchi, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan
Continuation of Ser. No. 386,289, Aug. 7, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 531,199
Claims priority, application Japan, Aug. 7, 1972, 47-78936
Int. Cl.^{2} C08L *1/02, 3/04, 9/08*
U.S. Cl. 260—29.7 T **13 Claims**

1. A paper coating composition having improved blister-preventing, ink transferability, water-resistant and pick-resistant properties which comprises a pigment and, as a pigment binder, a synthetic copolymer latex consisting essentially of from 24.5 to 50 parts by weight of at least one aliphatic conjugated diolefin, from 0.5 to 10 parts by weight of at least one ethylenically unsaturated carboxylic acid and from 40 to 75 parts by weight of at least one monoolefinic monomer copolymerizable with the aliphatic conjugated diolefin and the ethylenically unsaturated carboxylic acid, the gel content of said copolymer being not more than 40% by weight based on the weight of the synthetic copolymer.

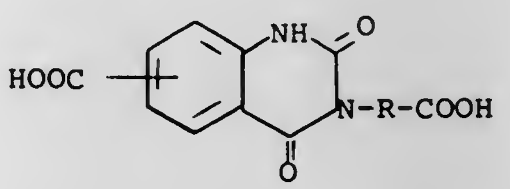
3,970,630
2,4-QUINAZOLINE DIONE-POLYAMIDE-ESTER RESINS

Choua Cohen, Grenoble; Durif Durif Varambon, Eybens; Robert Salle, and Bernard Sillion, both of Grenoble, all of France, assignors to Institut Francais du Petrole, es Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petroliers Elf, Rueil-Malmaison, France
Filed Mar. 18, 1974, Ser. No. 452,258
Claims priority, application France, Mar. 21, 1973, 73.10225
Int. Cl.^{2} C08G *63/68, 69/44, 73/06*
U.S. Cl. 260—30.2 **24 Claims**

1. A condensation polyamide-ester resin of a polycarboxylic component, a polyamine component and a polyhydroxy component, said resin being characterized in that:
said polycarboxylic component comprises a proportion of 5 to 100%, calculated as carboxylic equivalents, of at least one dicarboxylic compound containing one or two 2,4-quinazoline dione rings, and selected from the dicarboxylic acids of the general formulae:



and

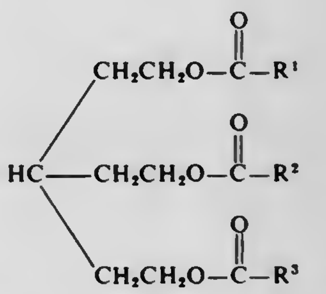


in which R is a divalent radical selected from the aliphatic, alicyclic and aromatic radicals and their lower alkyl esters, and a proportion of 0–95%, calculated as carboxylic acid equivalents, of at least one polycarboxylic compound selected from the aromatic polycarboxylic acids (other than aromatic polycarboxylic acids having 2 carboxylic groups in either the ortho or peri positions relative to each other) and their lower alkyl esters,
said polyamine component comprising a proportion of 70 to 100%, calculated as amine equivalents, of at least one aromatic primary diamine and a proportion of 0 to 30%, calculated as amine equivalents, of an amine selected from the aliphatic primary diamines, melamine and piperazine,
and said polyhydroxy component comprises a proportion of 50 to 100% of hydroxy equivalents of at least one polyol containing at least 3 hydroxy groups, and a proportion of 0 to 50%, as hydroxy equivalents, of at least one diol selected from the aliphatic and cycloaliphatic diols,
said polyamine component and said polyhydroxy component being used in proportions corresponding to a ratio of the sum of the amine and hydroxy groups to the sum of the carboxylic groups higher than 1 and a ratio of the sum of the amine groups to the sum of the carboxylic groups in the range of 0.1 –0.4.

3,970,631
TRIESTERS OF TRIETHANOLMETHANE AND MONOCARBOXYLIC ACIDS AS PLASTICIZERS FOR POLYVINYL CHLORIDE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Division of Ser. No. 414,584, Nov. 9, 1973, Pat. No. 3,939,201. This application Aug. 25, 1975, Ser. No. 607,632
Int. Cl.^{2} C08K *5/10*
U.S. Cl. 260—31.6 **5 Claims**

1. Polyvinyl chloride containing a triester of the following formula:



wherein R^1, R^2 and R^3 are alkyl or hydrocarbyl aryl groups having from 2 to 14 carbon atoms.

3,970,632

PIGMENT CONTAINING POLYOLEFIN COMPOSITION

Hirohisa Yoshiura; Toshiharu Arai; Masao Miyake, and Kiyoshi Enriki, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,651

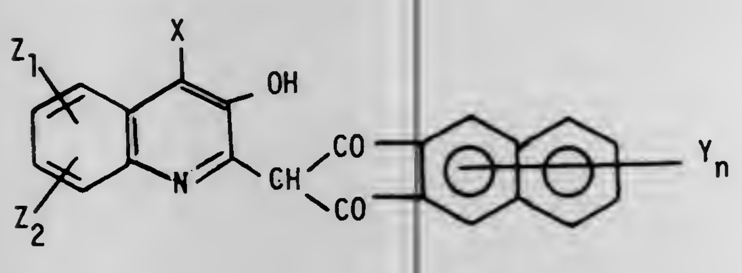
Claims priority, application Japan, Nov. 27, 1973, 48-132912

Int. Cl.^{2} C08J *3/20*

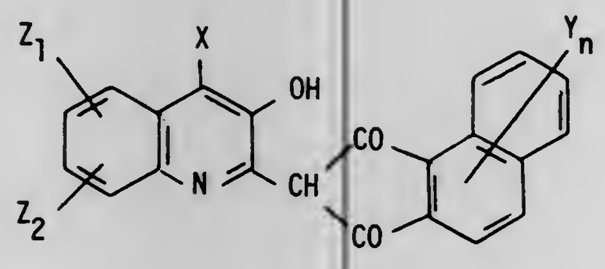
U.S. Cl. 260—42.21 **3 Claims**

1. A polymer composition which comprises:

a polyolefin polymer containing from 0.01–2 weight percent based on said polymer of a quinophthalone pigment having the formula

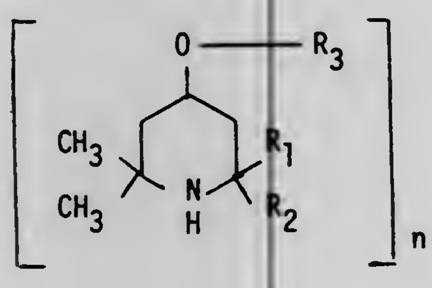


or



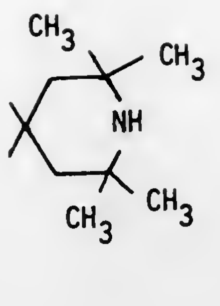
wherein X represents hydrogen or halogen, Y represents halogen, Z_1 represents hydrogen, halogen, lower alkyl or lower alkoxy, Z_2 represents hydrogen, or halogen and *n* represents 0 or an integer of 1–4; and 0.005–5% by weight of an ultraviolet light absorbing imidazolidine compound or an ultraviolet light absorbing piperidine compound selected from the group consisting of

a piperidine compound having the formula:

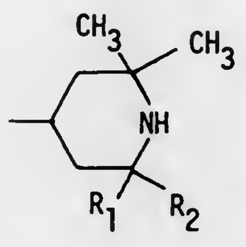


(1)

wherein R_1 and R_2 are the same or different and each represents an alkyl group or both form a saturated alicyclic ring having 5–7 carbon atoms while sharing a common carbon atom, or form a ring having the formula

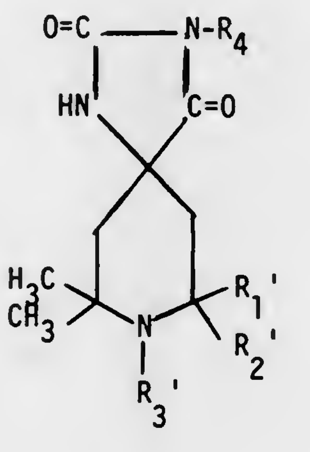


n' is an integer of 1, 2 or 3; and R_3 represents, when $n' = 1$, a monovalent acyl group, an N-substituted carbamoyl group, an N-substituted thiocarbamoyl group, a monovalent group formed by removing one hydroxyl from an oxyacid; alkyl, cycloalkyl, aralkyl, aryl or a group having the formula

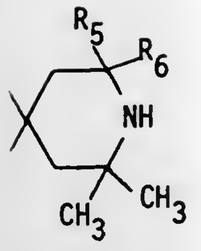


wherein R_1 and R_2 are as defined above; R_3 represents, when $n' = 2$, a diacyl, a dicarbamoyl, a bisthiocarbamoyl, a carbonyl group, or a divalent group formed by removing two hydroxyl groups from an oxyacid; an alkylene, an arylene, or an arylenedialkylene group; or R_3 represents, when $n' = 3$, a triacyl group, a tricarbamoyl group, a tristhiocarbamoyl group, a trivalent group formed by removing three hydroxyl groups from an oxyacid; an alkanetolyl group, an arylinetolyl group or an arylinetolyl trialkylene group;

piperidine-4-spiro-hydantoin derivatives having the formula:

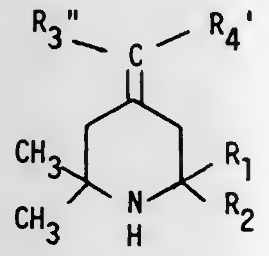


wherein R_1' and R_2' are the same or different and each represent an alkyl group or both form a saturated alicyclic ring having 5–7 carbon atoms while sharing a common carbon atom, or form a ring having the formula



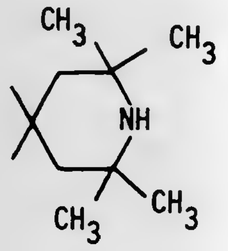
wherein R_5 and R_6 are the same or different and each represents an alkyl group or both form a saturated alicyclic ring having 5–7 carbon atoms while sharing a common carbon atom; R_3' and R_4' are the same or different and each represents hydrogen, an alkyl group, a cycloalkyl group or an aryl group and can have an oxirane oxygen;

a piperidine derivative or organic acid salt thereof having the formula



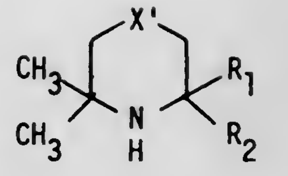
(3)

wherein R_1 and R_2 are the same or different and each represents an alkyl group or both form a saturated alicyclic ring having 5–7 carbon atoms while sharing a common carbon atom, or form a ring having the formula



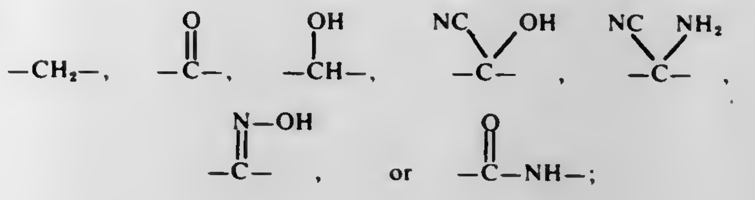
and R_3'' and R_4' are the same or different and each represents cyano, aryl, alkoxycarbonyl, acyl or carbamoyl;

a piperidine derivative or organic acid salt thereof having the formula



(4)

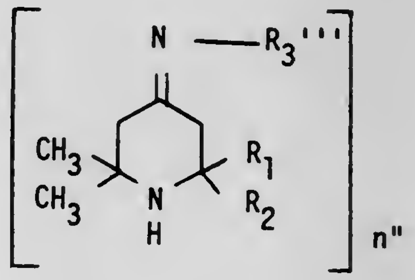
wherein R_1 and R_2 are as defined in formula (3) and X' represents



$$-CH_2-,\quad -\overset{\overset{\displaystyle O}{\|}}{C}-,\quad -\overset{\overset{\displaystyle OH}{|}}{CH}-,\quad -\overset{NC\ \ OH}{\overset{\diagdown\ \diagup}{C}}-\ ,\quad -\overset{NC\ \ NH_2}{\overset{\diagdown\ \diagup}{C}}-\ ,\quad -\overset{\overset{\displaystyle N-OH}{\|}}{C}-\ ,\quad \text{or}\quad -\overset{\overset{\displaystyle O}{\|}}{C}-NH-;$$

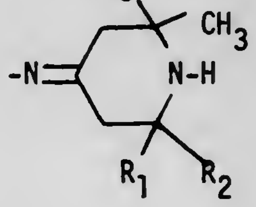
and

an iminopiperidine derivative or organic acid salt thereof having the formula:

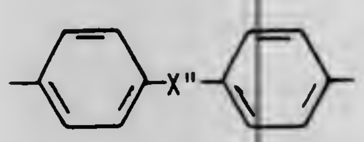


(5)

wherein R_1 and R_2 are as defined in formula (3), n'' represents an integer of 1 or 2, and R_3''' represents, when $n'' = 1$, alkyl, aralkyl, cycloalkyl, aryl, arylamino, ureido, thioureido, or a group having the formula:



wherein R_1 and R_2 are defined in formula (3), or R_3''' represents, when $n'' = 2$, a straight chain or a branched chain alkylene, cycloalkylene, arylene, or a group having the formula:



wherein X'' represents —O—, —S—, —S—S—, —NH— or $-(CH_2)_m-$ and m represents 0 or an integer from 1–6.

3,970,633

THERMOSETTING POWDER COATINGS COMPOSITION

John J. Miller; Richard E. Baus, both of Warminster, and Sheldon N. Lewis, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 360,856, May 16, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,561

Int. Cl.^{2} C08K *3/10;* **C08F** *236/04, 226/00, 216/02*

U.S. Cl. 260—42.29 **12 Claims**

1. As a composition of matter, a thermosetting powder addition copolymer salt composition, the polymer having units derived from:

1. about 1 to about 30% by weight of at least one (C_2-C_8)-hydroxyalkyl ester of acrylic acid or methacrylic acid or a mixture of said hydroxyalkyl esters ;

2. about 1 to about 30% by weight of at least one monoethylenically α,β-unsaturated carboxylic acid or a mixture of said acids; and

3. about 55 to about 98% by weight of at least one (C_1-C_{18}) alkyl ester of acrylic acid or methacrylic acid, or a mixture of said alkyl esters or an admixture containing said mixtures and up to about 60% by weight of the admixture of an additional copolymerizable α,β-ethylenically unsaturated monomer or monomers, wherein about 7 to about 95% of the carboxylic acid groups of the polymeric material have been neutralized to carboxylate groups, the carboxylate groups thus being partially neutralized, and having been derived from a liquid composition having an alkaline pH, said salt groups being selected from sodium, potassium and barium, any crosslinking of the polymer being by way of functional groups supplied by the monomers which make up said polymer.

3,970,634

POLYHEXAMETHYLENE ADIPAMIDE MOLDING COMPOSITIONS NOT SUBJECT TO DISCOLORATION WHEN CONDITIONED WITH WATER

Peter Horn, Ludwigshafen; Claus Cordes, Weisenheim, and Richard Pflueger, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Claims priority, application Germany, June 14, 1974, Ser. No. 2428759

Filed May 12, 1975, Ser. No. 576,355

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—45.7 S **4 Claims**

1. A molding composition comprising:

1. polyhexamethylene adipamide,

2. a phenolic antioxidant, and

3. from 0.001 to 0.5% by weight based on the weight of said polyhexamethylene adipamide of a chain transfer agent having a chain transfer constant for styrene at 100°C which is greater than 1.5.

3,970,635

FIRE RETARDANT POLYESTER FIBERS

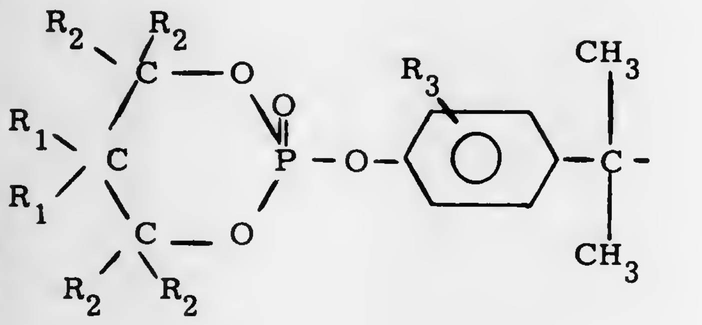
Ernest L. Lawton, Durham, and Eugene L. Ringwald, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

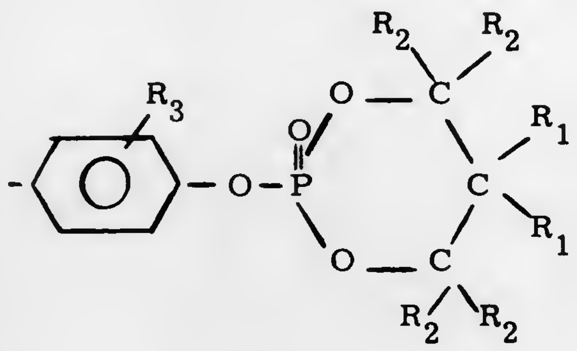
Filed Jan. 28, 1974, Ser. No. 437,412

Int. Cl.^{2} C08K *5/52;* **C08L** *67/02*

U.S. Cl. 260—45.8 R **12 Claims**

1. The method of imparting fire retardancy to synthetic fibers in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of an ester of a dihydric alcohol and terephthalic acid comprising adding to the polymer prior to spinning not more than about 20%, based on the weight of the polymer, of a compound having the general formula:





Wherein R_1 is an alkyl group containing 1–5 carbon atoms; R_2 is a radical selected from the group consisting of H and an alkyl group containing 1–5 carbon atoms; and R_3 is a radical selected from the group consisting of hydrogen or a 1–5 carbon alkyl group.

3,970,636

TETRAMETHYLPIPERIDINYLPHOSPHINE OXIDES AS LIGHT STABILIZERS FOR POLYMERS

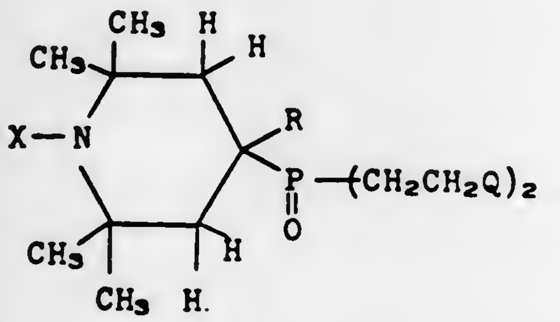
William Baptist Hardy, Bound Brook, and Peter Vincent Susi, Middlesex, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 15, 1975, Ser. No. 568,331

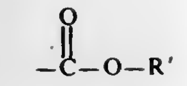
Int. Cl.^{2} C08K *5/50;* **C07D** *211/44, 211/94*

U.S. Cl. 260—45.8 NE **17 Claims**

1. A compound of the formula:



wherein X is —H, —OH, or —O·; R is —H or —OH; and Q is —C ≡ N or



$$-\overset{\displaystyle O}{\overset{\|}{C}}-O-R'$$

where R' is alkyl of 1 to 18 carbon atoms or hydrogen.

12. A polymer composition containing an amount of a compound as defined in claim 1 effective to stabilize said polymer against degradation by ultraviolet radiation.

3,970,637

STABILIZED POLYMERIC COMPOSITION AND PRODUCT USING SAME

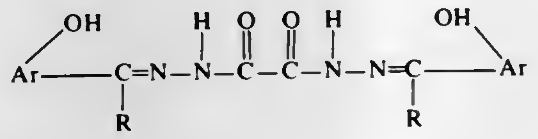
Ray Lawson Hartless, Lopatcong Township, Warren County, and Anthony Marion Trozzolo, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1974, Ser. No. 500,958

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—45.9 NC **7 Claims**

1. Article including at least one metallic portion in intimate contact with a plastic portion, said metallic portion including at least one element which accelerates the oxidative degradation of at least a component of the said plastic portion, the said plastic portion including a polymeric composition which is at least 90 percent by weight nominally ethylenically saturated polymer, exclusive of filler, the said plastic portion containing a metal deactivator to lessen the acceleration of oxidation degradation due to the said metallic portion said metal deactivator being contained within the range of from 0.01 percent to 5.0 percent by weight based on the said polymeric composition; characterized in that the said metal deactivator is of the structure



in which R is a methyl grouping or higher homologue alkyl grouping, in which Ar is a single aryl ring or fused aryl ring structure, in which the indicated hydroxy substituent is in a position ortho to the

$$\underset{\displaystyle R}{\overset{\displaystyle C}{|}}$$

grouping and is the only hydroxy substituent ortho to the said

$$\underset{\displaystyle R}{\overset{\displaystyle C}{|}}$$

grouping, in which there are permitted additional substituents on any ring position of the said Ar grouping other than that occupied by the said hydroxy grouping provided that such additional substituents do not include substituents which impair activity of hydroxy substituents.

3,970,638

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer Douglas Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 10, 1975, Ser. No. 639,272

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—45.75 N **12 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCrO_4$, NiO and $Ni_3(PO_4)_2$ and (B) at least one antimony compound selected from the group consisting of antimony metal, $SbCl_3$, Sb_2S_3, $Sb_2(SO_4)_3$, sodium meta-antimonate and antimony triacetate, said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

3,970,639

ETHYL α-CYANO β-(N-METHYL-N-CYCLOHEXYLAMINO) ACRYLATE STABILIZER

William F. Cordes, III, East Brunswick, and Robert E. Diehl, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,871

Int. Cl.^{2} C08J *3/20;* **C07C** *121/00*

U.S. Cl. 260—45.85 A **3 Claims**

1. Polycarbonate stabilized against the deteriorating effects of ultraviolet radiation by an effective amount of a stabilizer which is ethyl α-cyano-β-(N-methyl-N-cyclohexylamino)acrylate.

3. α-Cyano-β-(N-methyl-N-cyclohexylamino)acrylate.

3,970,640

PROCESS FOR THE PRODUCTION OF POLYPHENYLENE ETHERS HAVING A DESIRED POLYMERIZATION DEGREE

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Tokyo; Takao Kawaki, Tokyo; Akihiko Konishi, Tokyo, and Zempei Mizutani, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

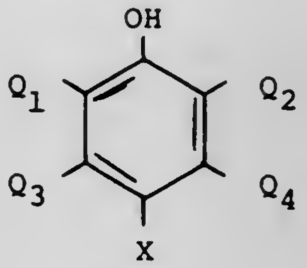
Filed June 26, 1974, Ser. No. 483,329

Claims priority, application Japan, June 26, 1973, 48-72084

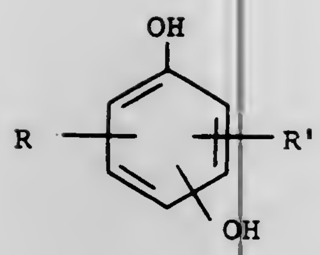
Int. Cl.^{2} C08G *63/62*

U.S. Cl. 260—47 ET **9 Claims**

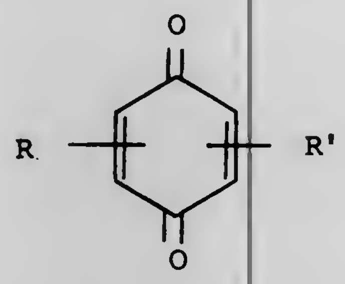
1. In a process for the production of polyphenylene ethers by oxidative polycondensation phenols, represented by a formula



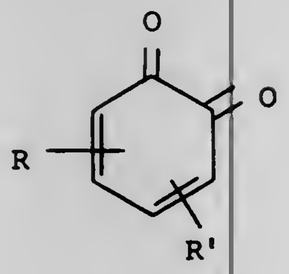
wherein X represents a substituent selected from the class consisting of hydrogen, chlorine, bromine and iodine atoms, Q_1 represents a monovalent substituents selected from the class consisting of hydrogen, alkyl, haloalkyl having at least two carbon atoms between the halogen atom and the phenyl nucleus, alkoxy and haloalkoxy having at least two carbon atoms between the halogen atom and the phenyl nucleus, Q_2, Q_3 and Q_4 are the same as Q_1 or halogen atom, provided that Q_1, Q_2, Q_3 and Q_4 are each free from a tertiary α-carbon atom, in the presence of a complex catalyst compound composed of a copper, manganese or cobalt salt as well as a primary, secondary or tertiary mono- or diamine as ligand, the method for producing polyphenylene ethers having any desired polymerization degree the improvement which comprises terminating the oxidative polycondensation-reaction by adding a reducing agent and simultaneously at least one member selected from the class consisting of dioxybenzenes and benzoquinones to the reaction medium at the stage of the desired polymerization degree, said dioxybenzenes being represented by the formula



and said benzoquinones being represented by the formula



or by the formula



wherein R and R′ represents each a hydrogen atom or a substituent selected from the class consisting of alkyl and alkoxy having at most 4 carbon atoms.

3,970,641
ANTIBIOTIC 27,706 RP AND SALT THEREOF

Georges Jolles, and Gérard Ponsinet, both of Sceaux, France, assignors to Rhone-Poulenc S.A., Paris, France

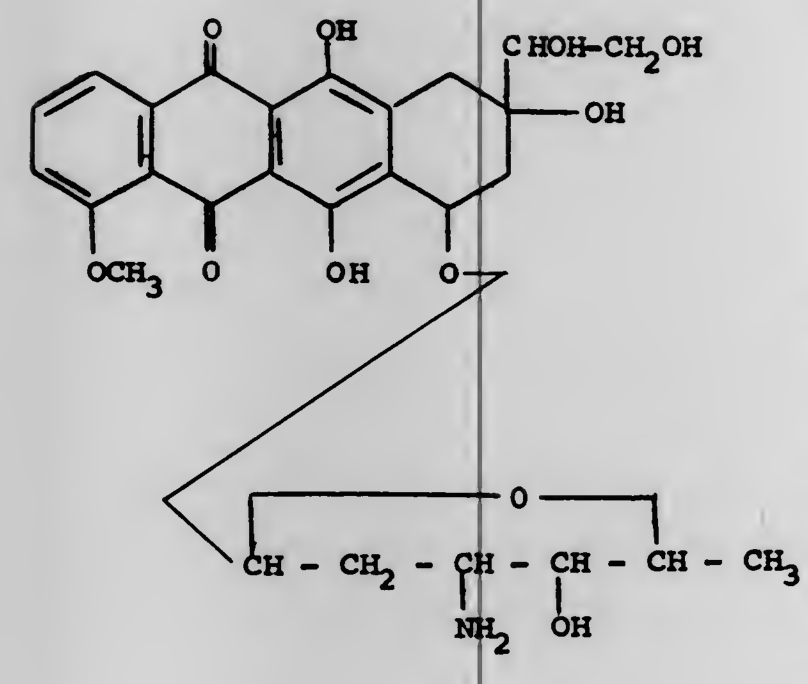
Filed Jan. 19, 1972, Ser. No. 219,065

Claims priority, application France, Jan. 20, 1971, 71.01793; Nov. 23, 1971, 71.41849

Int. Cl.² C07H *15/00*

U.S. Cl. 536—17 **2 Claims**

1. The antibiotic herein designated 27,706 RP of the formula:



and non-toxic acid addition salts thereof.

3,970,642
PROCESS FOR THE CONVERSION OF NIDDAMYCIN TO LEUCOMYCIN A₁, LEUCOMYCIN A₃, CARBOMYCIN B AND OTHER ANTIBIOTICS AND RELATED 3-O-ESTERS

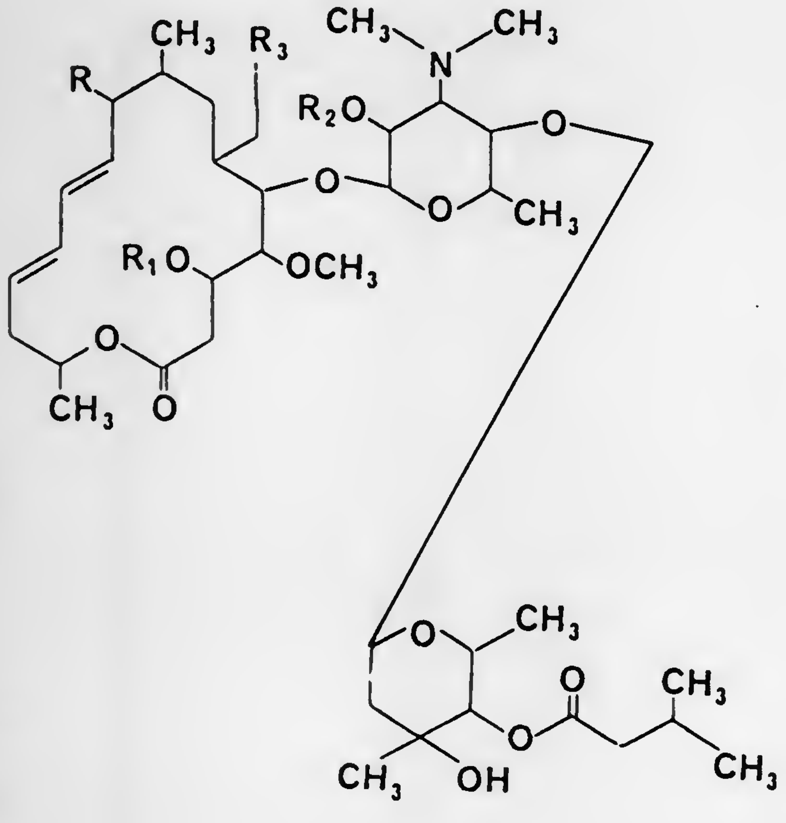
Leslie Alan Freiberg, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed June 3, 1974, Ser. No. 476,016

Int. Cl.² C07H *15/04*

U.S. Cl. 536—17 **25 Claims**

1. A compound having the structural formula



wherein R is oxygen, R_1 is hydrogen, HCO, CH_3CO, CH_3CH_2CO or $CH_3CH_2CH_2CO$; where R_2 is hydrogen or equivalent to R_1 and R_3 is $CH(OCH_3)_2$.

3,970,643
5″-AMINO-3′,5″-DIDEOXYBUTIROSIN A AND DERIVATIVES

Peter Wing Kee Woo, and Theodore Herbert Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Joseph Campau at the River, Mich.

Filed Apr. 17, 1975, Ser. No. 569,129

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **2 Claims**

1. A member of the class consisting of O-2,6-diamino-2,3,6-trideoxy-α-D-ribo-hexopyranosyl-(1 → 4)-O-[5-amino-5-deoxy-β-D-xylofuranosyl-(1 → 5)]-N^1-[(S)-4-amino-2-hydroxy-1-oxobutyl]-2-deoxystreptamine and pharmaceutically acceptable acid addition salts thereof.

3,970,644
HEAT STABILIZERS FOR POLYVINYL CHLORIDE (β-AMINO-β-ARYLACRYLAMIDES)

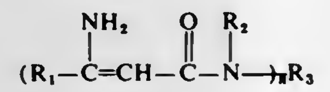
William Baptist Hardy, Bound Brook, and Christos Savides, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,947

Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 XA **15 Claims**

1. A composition comprising a vinyl chloride polymer containing an amount, effective to improve the thermal stability of said polymer, of a compound of the formula:



$$(R_1-\overset{\overset{NH_2}{|}}{C}=CH-\overset{\overset{O}{\|}}{C}-\overset{\overset{R_2}{|}}{N}-)_nR_3$$

wherein R_1 is aryl or lower alkyl-substituted aryl; R_2 is hydrogen or lower alkyl; n is 1 or 2; and R_3 is hydrogen or lower alkyl when n is 1 and is alkylene of 1 to 4 carbon atoms or thiodiethylene when n is 2.

4. A composition as defined in claim 1 wherein, in said compound, R_1 is phenyl, lower alkyl-substituted phenyl, or naphthyl; R_2 is hydrogen; n is 1; and R_3 is hydrogen or lower alkyl.

5. A composition as defined in claim 4 additionally containing a divalent metal salt of a fatty acid or mixture of fatty acids of 12–20 carbon atoms, the weight ratio of said salt to said compound being between 1:2 and 2:1.

3,970,645
1,4-BENZODIAZEPINE DERIVATIVE

Poul Nedenskov, Birkerod, Denmark, assignor to Aktieselskabet Grindstedvaerket, Arhus, Denmark

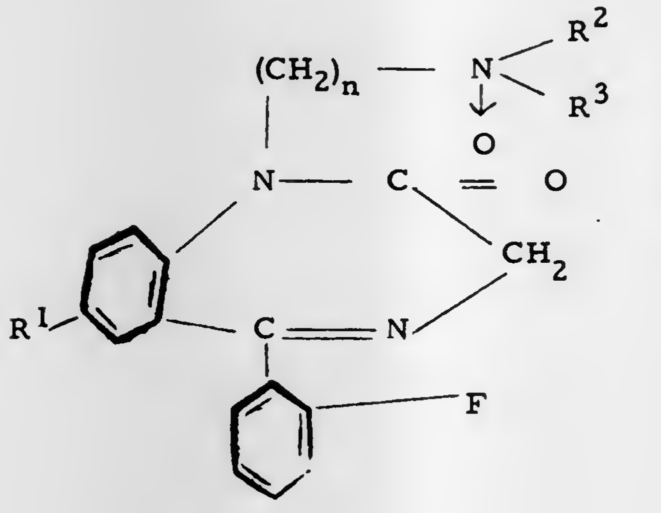
Filed Aug. 15, 1974, Ser. No. 497,771

Claims priority, application United Kingdom, Aug. 24, 1973, 40259/73

Int. Cl.² C07D *243/24*

U.S. Cl. 260—239.3 D **1 Claim**

1. A compound of the formula:



(I)

wherein R¹ is chloro, R² and R³ are ethyl, and n is 2.

3,970,646
HALO-STEROIDAL THIOKETALS

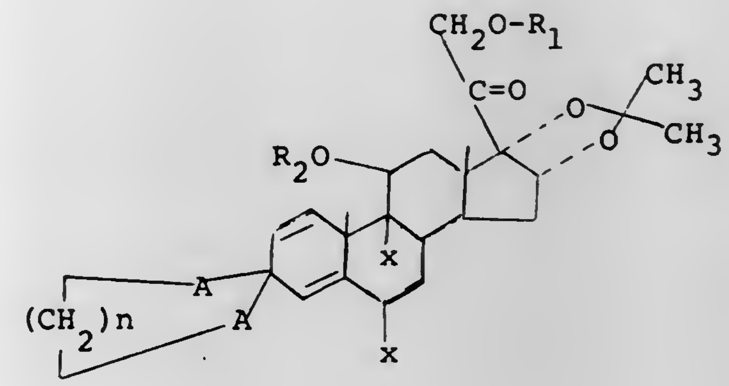
Robert A. Mallory, and Joseph A. Settepani, both of Somerville, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Apr. 24, 1974, Ser. No. 463,707

Int. Cl.² C07J *5/00*

U.S. Cl. 260—239.55 D **13 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, lower acyl having 2–5 carbon atoms, tetrahydropyranyl or lower alkyl; R_2 is hydrogen or lower acyl having 2–5 carbon atoms; A is sulfur or oxygen, provided that at least one of A is sulfur; x is fluoro, chloro or bromo; and n is an integer from 0–3.

3,970,647
BIS-(TRIAZINYLAMINO)STILBENE COMPOUNDS

Hans Balzer, Munchenstein; Fritz Fleck, Bottmingen, and Hans-Rudolf Schmid, Riehen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

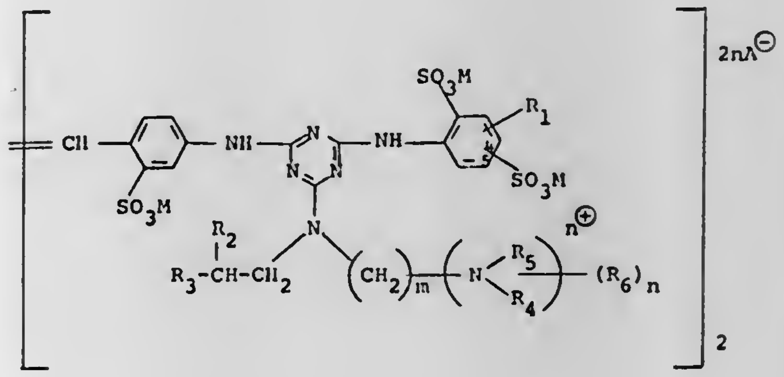
Filed Feb. 11, 1974, Ser. No. 441,376

Claims priority, application Switzerland, Feb. 16, 1973, 2326/73

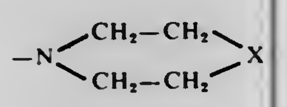
Int. Cl.² C07D *251/04*

U.S. Cl. 260—240 B **26 Claims**

1. A compound of formula I,



wherein
- R_1 is hydrogen, chlorine or C_{1-4} alkyl,
- R_2 is hydrogen or methyl,
- R_3 is cyano or $-CONR_7R_8$, in which either R_7 and R_8, independently, each is hydrogen, C_{1-4} alkyl or C_{2-4} hydroxyalkyl, or R_7 and R_8, together with the nitrogen atom to which they are attached, are a pyrrolidine, piperidine or morpholine radical,
- either R_4 and R_5, independently, each is C_{2-4} alkyl or C_{2-4} hydroxyalkyl,
- or R_4 and R_5, together with the nitrogen atom, form a radical of formula (a),



(a)

in which $-X-$ is $-CH_2-$, $-O-$, $-S-$, a direct bond, or $-NR_9-$, in which R_9 is C_{1-3} alkyl or C_{2-3} hydroxyalkyl,
- R_6 is hydrogen, C_{1-6} alkyl or C_{2-4} alkyl substituted by hydroxy, cyano or carbamoyl,
- M is hydrogen or a non-chromophoric cation,
- A^- is a non-chromophoric anion,
- *m* is 2 or 3, and
- *n* is 0 or 1,

the $-SO_3M$ group, shown floating, being bound to the 4- or 5-position of the benzene ring and, when *n* is 1, R_6 being bound either to the nitrogen or, when NR_4R_5 is a thiomorpholino ring, to the nitrogen or to the sulfur thereof or, when NR_4R_5 is a piperazine ring, to one or the other of the nitrogens thereof.

3,970,648
2-[2-(5-NITRO-2-FURYL)VINYL]-4-(ANILINO)-QUINAZOLINES

Herman Horn, Staten Island, N.Y.; Sheldon B. Greenbaum, Livingston; Charles M. Ely, Berkeley Heights, both of N.J.; Walter Hacke, New York, N.Y., and David A. Olle, North Arlington, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Sept. 6, 1974, Ser. No. 503,854

Int. Cl.² C07D *405/06*

U.S. Cl. 260—240 A **2 Claims**

1. 2-[2-(5-nitro-2-furyl)vinyl]-4-(p-hydroxyanilino)-quinazoline.

2. The process of producing the compound of claim 1 comprising reacting 2-[2-(5-nitro-2-furyl)vinyl]-4-chloroquinazoline with p-aminophenol.

3,970,649
BISAZOMETHINE METAL COMPLEXES

Hans Bohler, Rheinfelden, and Rolf Griesser, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

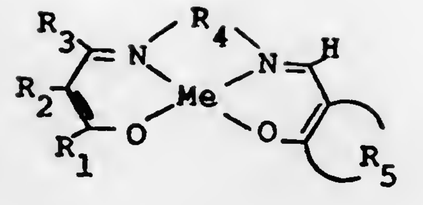
Filed May 30, 1975, Ser. No. 582,100

Claims priority, application Sweden, June 5, 1974, 747663

Int. Cl.² C07F *3/06, 1/06, 15/04, 15/06*

U.S. Cl. 260—240 G **22 Claims**

1. A compound of formula I,



I

in which
- R_1 is alkyl,
- R_2 is alkylcarbonyl, alkoxycarbonyl or $-CONR_6R_7$,
- R_3 is hydrogen or alkyl
- R_4 is an aromatic carbo- or heterocyclic bivalent radical bound through ortho or peri-positions
- R_5, together with the >C=C< group, signifies an aromatic carbo- or heterocyclic ring,
- R_6 is hydrogen or alkyl,
- R_7 is hydrogen, alkyl or a mono- or bi-nuclear aromatic carbo- or heterocyclic ring, and
- Me is a bivalent transition metal atom or zinc.

3,970,650
DERIVATIVES OF TETRALONE AND THE PREPARATION THEREOF

Pierre M. Vanhoof, Brussels, Belgium, assignor to A. Christiaens Societe Anonyme, Brussels, Belgium

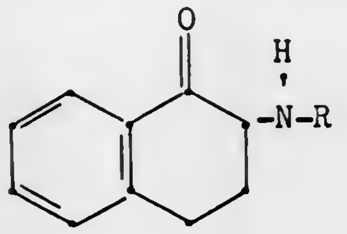
Filed Sept. 16, 1975, Ser. No. 613,828

Claims priority, application United Kingdom, Sept. 16, 1974, 40296/74

Int. Cl.² C07D *213/50*

U.S. Cl. 260—240 B **3 Claims**

1. 2-R-amino-tetraline-1-ones of the formula:



(I)

in which R represents a pyridyl or phenyl radical which may be substituted, in the ortho, meta or para position, by a methoxy group, as well as the acid addition salts thereof.

3,970,651
CRYSTALLINE CEPHALOSPORIN DERIVATIVE

Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York City, N.Y.

Continuation-in-part of Ser. No. 431,251, Jan. 7, 1974, abandoned. This application Dec. 18, 1974, Ser. No. 534,114

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **9 Claims**

1. Crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-(1,2,3-triazole-5-ylthiomethyl)-3-cephem-4-carboxylic acid 1,2-propylene glycolate.

3,970,652
SELECTIVELY HERBICIDAL 2-SUBSTITUTED-4H-3,1-BENZOXAZIN-4-ONES

William C. Doyle, Jr., Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 886,403, Dec. 18, 1969, Pat. No. 3,914,121. This application June 2, 1972, Ser. No. 259,241

Int. Cl.² C07D *265/22*

U.S. Cl. 260—244 R **4 Claims**

1. 2-(m-Trifluoromethylphenyl)-4H-3,1-benzoxazin-4-one.

3,970,653
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

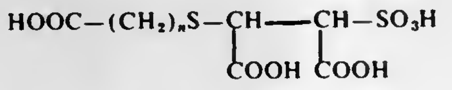
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, Pat. No. 3,925,375, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application June 24, 1975, Ser. No. 589,960

Int. Cl.² C07D *295/00;* **C07C** *143/00*

U.S. Cl. 260—247.1 E **3 Claims**

1. An α-carboxyalkylthio-β-sulfosuccinic acid having the formula:



$$HOOC-(CH_2)_nS-\underset{COOH}{\underset{|}{CH}}-\underset{COOH}{\underset{|}{CH}}-SO_3H$$

or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salt thereof, wherein *n* is 1 or 2.

3,970,654
ANTIVIRAL 2(1H)-QUINAZOLINONE DERIVATIVES

Michihiro Yamamoto; Shigeaki Morooka, both of Nishinomiya; Masao Koshiba, Amagasaki; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

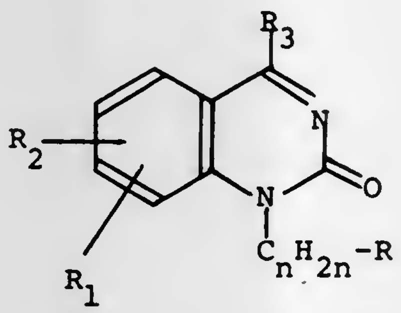
Filed July 30, 1974, Ser. No. 493,240

Claims priority, application Japan, Aug. 14, 1973, 48-91590

Int. Cl.² C07D *239/82*

U.S. Cl. 260—251 QB **5 Claims**

1. A quinazolinone of the formula,



[I]

wherein R is bicyclic or tricyclic saturated alicyclic C_{7-10} hydrocarbon radical; R_1 is hydrogen; R_2 is nitro; R_3 is phenyl; and *n* is 0, 1 or 2.

3,970,655
PREPARATION OF PYRIDINE

Anthony B. Baylis, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 80,175, Oct. 12, 1970, abandoned. This application July 29, 1974, Ser. No. 492,559

Int. Cl.² C07D *213/10*

U.S. Cl. 260—290 P **4 Claims**

1. A method of preparing pyridine which consists essentially of reacting acetaldehyde, ammonia and oxygen in the presence of an aldehyde-ammonia condensation catalyst said catalyst being selected from the group consisting of alumina, silica, silica-alumina and silica-alumina metal oxides said metal oxides being selected from the group consisting of ZrO_2, MgO, TiO_2, ThO_2, CuO, ZnO, and PbO at a temperature of from about 300° to about 550°C, ammonia being present in an amount of from 0.2 to about 15.0 mols/mol of acetaldehyde, and oxygen being present in an amount of from 0.1 to about 5.0 mols/mol of acetaldehyde.

3,970,656
1-ALKYL-4-M-HYDROXYPHENYL-4-PROPIONYL PIPERIDINES

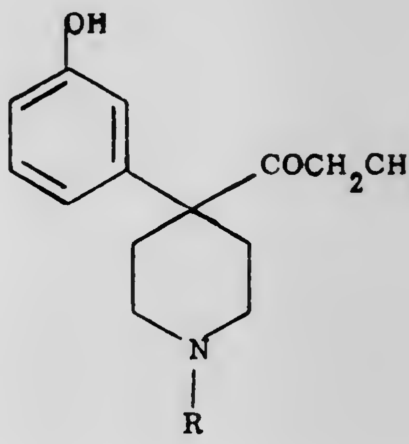
Everette Lee May, Bethesda, Md., assignor to Government of the United States, Washington, D.C.

Filed June 11, 1974, Ser. No. 478,547

Int. Cl.² C07D *211/32*

U.S. Cl. 260—293.8 **5 Claims**

1. A compound of the formula



wherein R is alkyl of 4 to 7 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

3,970,657
PREPARATION OF CYANOPYRIDINES

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 18, 1975, Ser. No. 633,055

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **5 Claims**

1. A process for the production of cyanopyridines from alkyl pyridines which comprises passing as a reactant stream a gaseous mixture comprising:
   1. an alkyl substituted pyridine;
   2. ammonia;
   3. steam; and
   4. oxygen

wherein the mole ratios of said reactants are:

ammonia:alkyl pyridine, 1:1 to 10:1;
steam:alkyl pyridine, 0.01:1 to 10:1;
oxygen:alkyl pyridine, 2:1 to 50:1;

the improvement being passing said reactant stream over a fixed bed ammoxidation catalyst at a temperature of about 280° to 400°C. and wherein said catalyst consists essentially of $(V_2O_5+MoO_3+P_2O_5+MnSO_4)/TiO_2$ in a molar ratio of 2.9:1.0:0.15:1.2/12.0.

3,970,658
NITRILE PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed May 15, 1975, Ser. No. 577,684

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **5 Claims**

1. A decarboxylation process for substituting cyano radicals for silver carboxylate radicals which comprises reacting the silver salt of a carboxylic acid with silver cyanide under decarboxylation conditions at a temperature of at least 320°C–450°C, the said silver carboxylate salt being selected from the group consisting of silver salts of benzene compounds, biphenyl compounds, naphthalene compounds, phenanthrene compounds, anthracene compounds, thiophene

compounds, pyridine compounds, quinoline compounds, isoquinoline compounds, benzothiophene compounds, dibenzothiophene compounds and phenanthridine compounds; said silver carboxylate radicals are from 1 to 4 in number.

3,970,659
PREPARATION OF CYANOPYRIDINES

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Nov. 18, 1975, Ser. No. 632,935
Int. Cl.^{2} C07D *213/57*

U.S. Cl. 260—294.9 **5 Claims**

1. A process for the production of cyanopyridines from alkyl pyridines which comprises passing as a reactant stream a gaseous mixture comprising:
  1. an alkyl substituted pyridine;
  2. ammonia;
  3. steam; and
  4. oxygen

wherein the mole ratios of said reactants are:
  ammonia:alkyl pyridine, 1:1 to 10:1;
  steam:alkyl pyridine, 0.01:1 to 10:1;
  oxygen:alkyl pyridine, 2:1 to 50:1;

the improvement being passing said reactant stream over a fixed bed ammoxidation catalyst at a temperature of about 280° to 400°C. and wherein said catalyst consists essentially of $(V_2O_5+MoO_3+P_2O_5)/(TiO_2+Al_2O_3)$ in a molar ratio of 2.5:1.0:0.01/21.8:5.7.

3,970,660
CHEMILUMINESCENCE

Laszlo Joseph Bollyky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 211,807, Dec. 23, 1971, abandoned, which is a division of Ser. No. 844,657, July 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 547,782, May 5, 1966, abandoned. This application July 22, 1974, Ser. No. 490,427
Int. Cl.^{2} C07D *211/86*

U.S. Cl. 260—295 L **1 Claim**

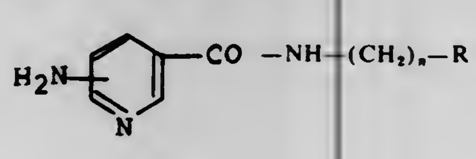
1. Bis(1,2-dihydro-2-oxo-1-pyridyl)glyoxal.

3,970,661
2-AMINO, 5-CARBAMOYL PYRIDINE COMPOUNDS

Gilbert Regnier, Chatenay Malabry; Roger Canevari, Villebon-sur-Yvette, and Xavier Pascaud, Paris, all of France, assignors to Science Union et Cie, Societe Francaise de Racherche Medical, Suresnes, France
Filed May 1, 1974, Ser. No. 465,931
Claims priority, application United Kingdom, May 2, 1973, 73/20842
Int. Cl.^{2} C07D *213/75*

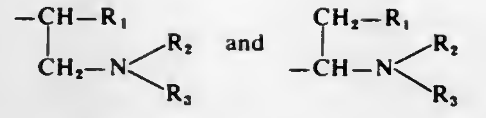
U.S. Cl. 260—295.5 A **4 Claims**

1. A compound selected from the group consisting of:
(A) Heterocyclic amides of the formula I:



(1)

wherein:
  n is selected from 0 and 1, and
  R is selected from the group consisting of:



wherein:
  R_1 is selected from the group consisting of hydrogen and methyl, and
  R_2 and R_3 which are the same, are selected from the group consisting of linear and branched alkyl having from 1 to 6 carbon atoms inclusive, and
(B) physiologically tolerable acid addition salts thereof.

3,970,662
4-(3-NITROPHENYL)-2,3,5,6-PYRIDINETETRACARBOXYLIC ACID AND INTERMEDIATES

Philip M. Carabateas, and Gordon L. Williams, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.
Filed June 19, 1975, Ser. No. 588,380
Int. Cl.^{2} C07D *213/55*

U.S. Cl. 260—295.5 R **3 Claims**

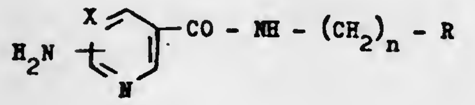
1. Tetra-(lower-alkyl) 4-(3-nitrophenyl)-2,3,5,6-pyridinetetracarboxylate.

3,970,663
CERTAIN AMINO-NICOTINAMIDE DERIVATIVES

Gilbert Regnier, Chatenay Malabry; Roger Canevari, Villebon-sur-Yvette, and Xavier Pascaud, Paris, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, Suresnes, France
Division of Ser. No. 465,931, May 1, 1974. This application Sept. 22, 1975, Ser. No. 615,452
Claims priority, application United Kingdom, May 2, 1973, 20842/73
Int. Cl.^{2} C07D *213/56*

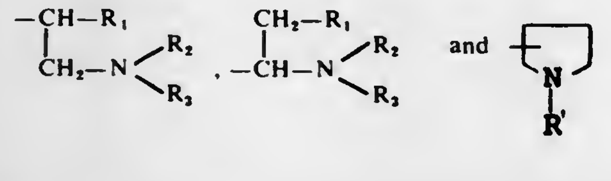
U.S. Cl. 260—295.5 A **7 Claims**

1. A compound selected from the group consisting of :
A. Heterocyclic amides of the general formula I :

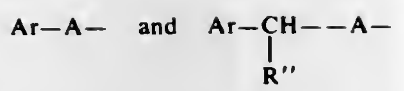


I

wherein:
  X is CH ;
  n is selected from 0 and 1, and
  R is selected from the group consisting of :



wherein :
  R_1 is selected from the group consisting of hydrogen and methyl, $R_2$and R_3 joined together represent a polymethylenic chain of the formula — $(CH_2)_p$— wherein *p* is an integer from 4 to 7 inclusive and
  R′ is selected from the group consisting of saturated and unsaturated acyclic hydrocarbon radicals having from 1 to 6 carbon atoms inclusive in linear and branched chains, cycloalkyl having from 3 to 7 carbon atoms, and radicals of the formula :



$$Ar{-}A{-} \quad \text{and} \quad Ar{-}\underset{R''}{\underset{|}{C}}H{-}{-}A{-}$$

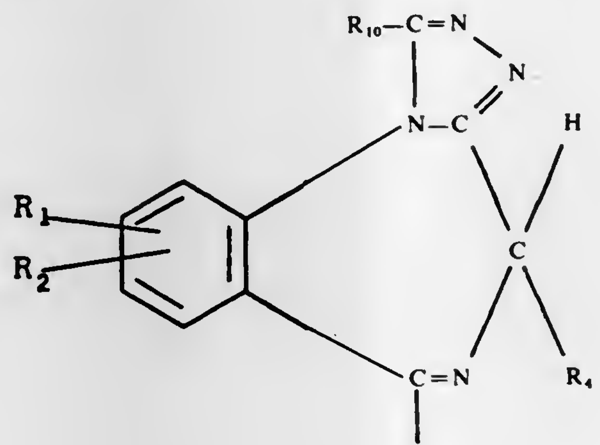
wherein :
  A is selected from the group consisting of a single bond and saturated and unsaturated acyclic hydrocarbon radicals having from 1 to 6 carbon atoms inclusive in linear and branched chains, and
  Ar and R″, which are the same or different, are selected from the group consisting of unsubstituted phenyl or phenyl substituted by one or more radicals selected from the group consisting of linear and branched alkoxy having from 1 to 6 carbon atoms inclusive, methylenedioxy, ethylenedioxy and trimethylenedioxy ; and
B. physiologically tolerable acid addition salts thereof.

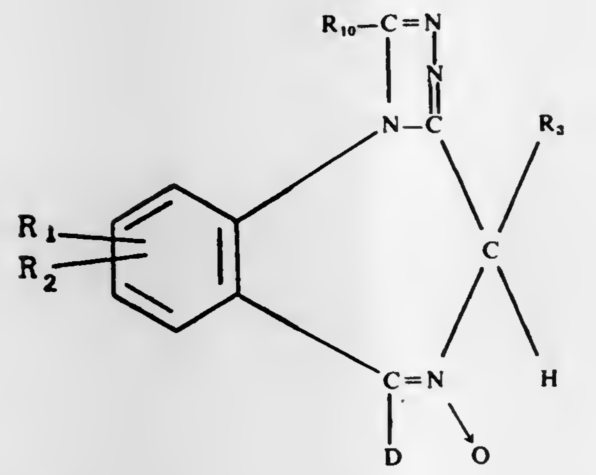
3,970,664
PREPARATION OF TRIAZOLO BENZODIAZEPINES

Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 271,434, July 13, 1972, Pat. No. 3,879,406. This application Jan. 13, 1975, Ser. No. 540,626
Int. Cl.^{2} C07D *487/04*

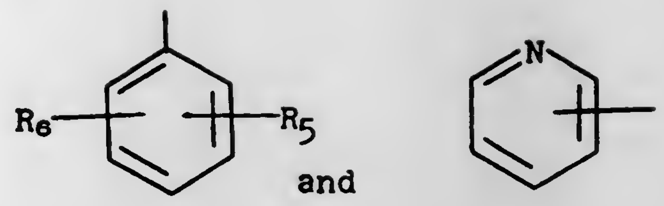
U.S. Cl. 260—296 T **2 Claims**

1. A process for the preparation of a compound selected from the group



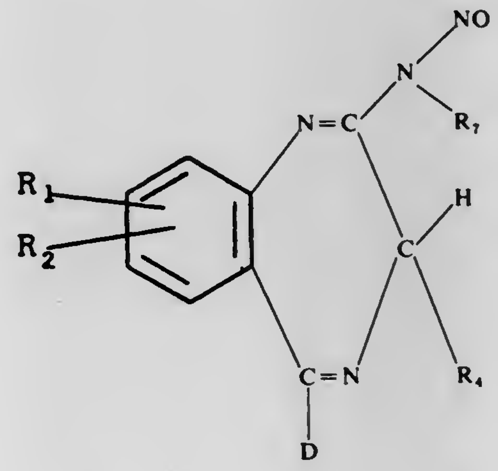


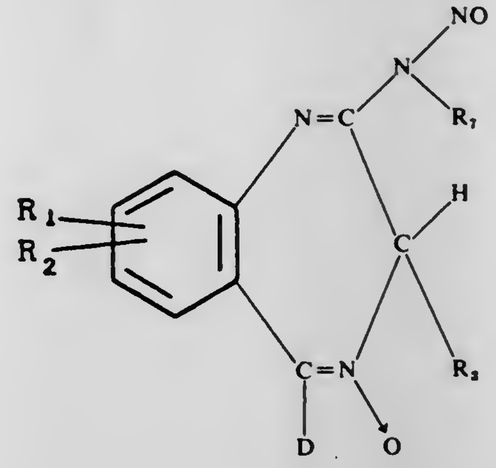
wherein
  D is selected from the group consisting of



  R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl; R_3 is selected from the group consisting of hydrogen and lower alkyl; R_4 is selected from the group consisting of hydrogen and lower alkyl;
  R_5 and R_6 are selected from the group consisting of hydrogen, trifluoromethyl and halogen and
  R_{10} is selected from C_1-C_6 lower alkyl and hydrogen,

which comprises treating a compound selected from the group consisting of





wherein
  D, R_1, R_2, R_3 and R_4 are as above, and R_7 is lower alkyl, with a C_1-C_7 lower alkanoyl hydrazide.

3,970,665
BENZISOXAZOLO (THIONO)PHOSPHORIC(PHOSPHONIC)ACID ESTERS

Walter Lorenz, Wuppertal, Cronenberg; Horst Boshagen, Haan, Rhineland; Ingeborg Hammann, and Wolfgang Behrenz, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Continuation of Ser. No. 169,498, Aug. 5, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,319
Claims priority, application Germany, Aug. 14, 1970, 2040410
The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl.^{2} C07D *261/20*

U.S. Cl. 260—307 DA **5 Claims**

1. A benzisoxazolo(thiono)phosphoric acid ester selected from the group consisting of:

0,0-diethyl-0-[5-chloro-7-methylbenzisoxazol(3)yl]-thionophosphoric acid ester,
0-ethyl-0-[7-methylbenzisoxazol(3)yl]-thiono-ethane phosphonic acid ester,
0,0-diethyl-0-[7-methylbenzisoxazol(3)yl]-thionophosphoric acid ester, and
0-ethyl-0-[5-methylbenzisoxazol(3)yl]-thiono-ethane phosphonic acid ester.

3,970,666
3,5-DISUBSTITUTED-4-(α-AMINO-α-PHENYL-O-TOLYL)-4H-1,2,4-TRIAZOLES

Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 3, 1974, Ser. No. 475,459

Int. Cl.^{2} C07D *233/56, 233/64, 249/08*

U.S. Cl. 260—308 R **12 Claims**

1. 4-]α-amino-4-chloro-α-(o-chlorophenyl)-o-tolyl]-3-cyclopropyl-5-methyl-4H-1,2,4-triazole.

3,970,667
PROCESS FOR THE PREPARATION OF PURE TOLUTRIAZOLES

Kurt Gengnagel, Offenbach, Main, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 8, 1974, Ser. No. 513,125

Claims priority, application Germany, Oct. 13, 1973, 2351595

Int. Cl.^{2} C07D *249/16*

U.S. Cl. 260—308 B **4 Claims**

1. In a process for the preparation of a tolutriazole by diazotation of a toluylene-o-diamine by means of an alkali nitrite and an organic acid, subsequent ring closure to form the tolutriazole and subsequent purification of the tolutriazole obtained, the improvement comprising carrying out the purification by diluting the reaction mixture with water, then making it alkaline with alkali, adding charcoal, kieselguhr and sodium dithionite, filtering it, adjusting it to a pH-value of about 4.5 to 6.5 by addition of a mineral acid, and separating the precipitated tolutriazole.

3,970,668
DIALKYL 1,1'-(OPTIONALLY SUBSTITUTED HYDROCARBYLENEBISCARBAMOYL)BIS(2-BENZIMIDAZOLECARBAMATES)

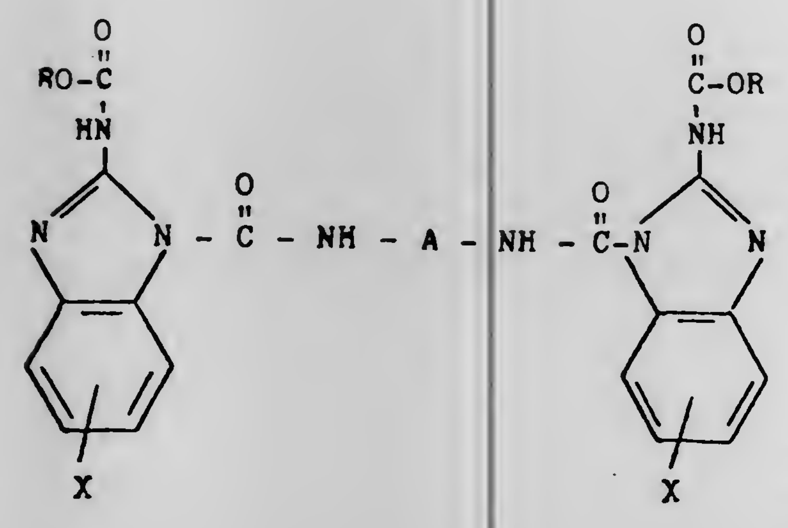
Bruce Ivor Dittmar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 841,987, July 15, 1969, abandoned. This application Feb. 25, 1972, Ser. No. 229,559

Int. Cl.^{2} C07D *235/32*

U.S. Cl. 260—309.2 **6 Claims**

1. A compound of the formula:



wherein
- the R's can be the same or different and are methyl, ethyl, isopropyl or sec-butyl;
- X is hydrogen, halogen, methyl or methoxy;
- A is a difunctional group of 1 to 18 carbon atoms selected from
  - alkylene;
  - alkylene substituted by oxa, N-methylaza or thia;
  - alkenylene;
  - cycloalkylene;
  - cycloalkenylene;
  - bis(cyclohexylene)methylene;
  - alkylenated alkylcyclohexylene;
  - alkylated cyclohexylene;
  - alkylenated cyclohexylene;
  - bicycloalkylene;
  - phenylene;
  - methylated phenylene; and
  - bis(phenylene)methylene.

3,970,669
N-HETEROCYCLIC PERFLUOROALKYLOARBOXYLIC ACID ESTERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Armin Hiestand, Binningen, and Horst Jager, Bettingen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

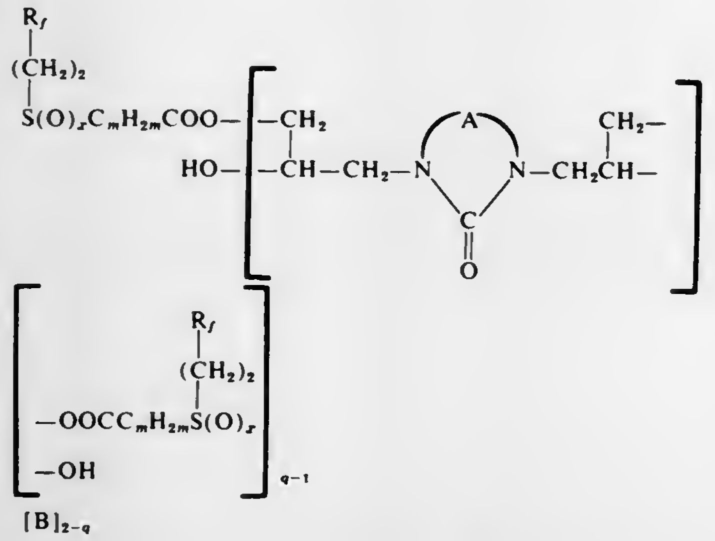
Division of Ser. No. 436,553, Jan. 25, 1974, Pat. No. 3,914,225. This application June 11, 1975, Ser. No. 585,997

Claims priority, application Switzerland, Feb. 2, 1973, 1562/73

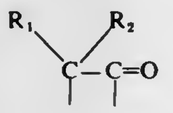
Int. Cl.^{2} C07D *49/32*

U.S. Cl. 260—309.5 **11 Claims**

1. Perfluoroalkylcarboxylic acid esters of the formula



wherein R$_f$ represents a perfluoroalkyl radical with 4 to 18 carbon atoms, A represents a radical of the formula



$$\overset{R_1}{C}-\overset{R_2}{C}=O$$

wherein R$_1$ and R$_2$ represent hydrogen or methyl, B is [—O—] or [—OH Cl—], *m* is a whole number from 1 to 3, *q* is 1 or 2 and *x* is 0, 1 or 2, with *x* being 0 or 1 if *m* is 1.

3,970,670
9-THIAPROSTAGLANDINS

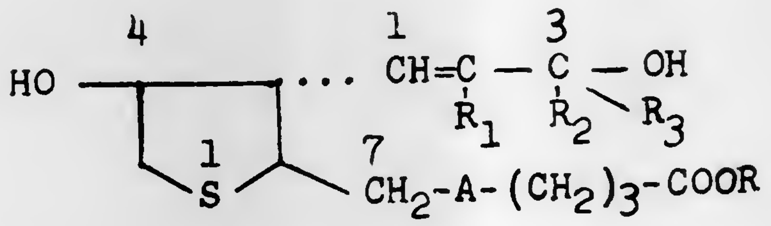
Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 460,837, April 15, 1974, which is a continuation-in-part of Ser. No. 361,752, May 18, 1973, Pat. No. 3,881,017. This application Oct. 21, 1974, Ser. No. 516,293

Int. Cl.^{2} C07D *333/24*

U.S. Cl. 260—332.2 A **7 Claims**

1. A 7-[3α-(3-hydroxy-3-hydrocarbylpropyl or -1-propen- or ynyl)-4-hydroxy-tetrahydro-2β-thienyl]-heptanoic or 5-heptenoic acid of the formula



wherein R is hydrogen, an alkli metal, one equivalent of an alkaline earth metal, ammonium, mono,-, di or tri-lower alkylammonium, alkyl with up to 12 carbon atoms, lower akenyl, lower alkynyl, Ph or Ph-C$_n$H$_{2n}$, wherein Ph is phenyl, (lower alkyl)phenyl, (halo)-phenyl or (trifluromethyl)-phenyl, *n* is an integer from 1 to 4, A is ethylene or ethenylene, each of R$_1$ and R$_2$ is hydrogen or lower alkyl, and R$_3$ is alkyl with up to 12 carbon atoms, lower alkenyl or lower alkynyl, or the 1,2-dihydro-derivatives or 1,2-dehydro-derivatives thereof.

3,970,671
CHROMOGENIC COMPOUNDS AND METHOD FOR PREPARATION THEREOF

Mitsuru Kondo, Kawanishi; Makoto Miyake, Nishinomiya, and Hiroshi Iwasaki, Takatsuki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

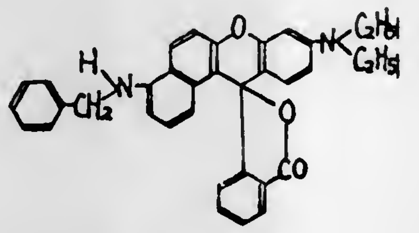
Continuation-in-part of Ser. No. 282,055, Aug. 21, 1972, abandoned. This application July 23, 1974, Ser. No. 491,133

Claims priority, application Japan, Aug. 21, 1971, 46-63830; Nov. 16, 1971, 46-92047

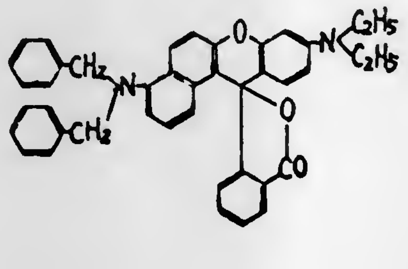
Int. Cl.^{2} C07D *493/10*

U.S. Cl. 260—335 **2 Claims**

1. The compound of the formula,



2. The compound of the formula,



3,970,672
2,2 DISUBSTITUTED-BENZODIOXOLES

Elso Manghisi, Monza; Aldo Salimbeni, Milan, and Pietro Menella, Como, all of Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

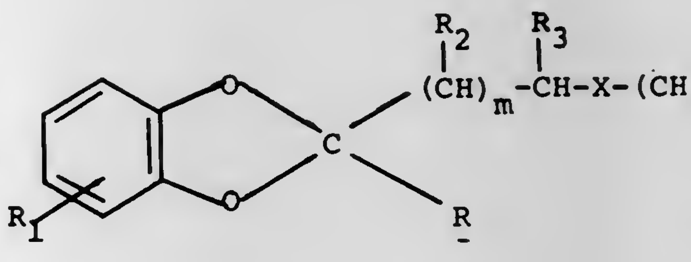
Filed Aug. 6, 1974, Ser. No. 495,147

Claims priority, application Italy, Aug. 9, 1973, 27736/73; July 4, 1974, 24811/74

Int. Cl.^{2} C07D *317/44*

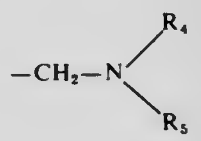
U.S. Cl. 260—340.5 **12 Claims**

1. A 1,3-benzodioxole of the formula



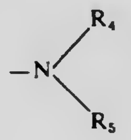
(I)

and its optical isomers, stereoisomers and pharmaceutically acceptable salts, in which R represents hydrogen, lower alkyl, halogeno(lower alkyl), hydroxy(lower alkyl), aryl, arylalkyl, or aryl or arylalkyl substituted in the aromatic ring by halogen, alkyl, hydroxyl or alkoxyl; R$_1$ represents hydrogen, one or more halogen atoms, lower alkyl, halogeno(lower alkyl), a



$$-CH_2-N\begin{matrix}R_4\\R_5\end{matrix}$$

group
wherein R$_4$ and R$_5$ are as defined below, hydroxyl, alkoxyl, a sulphonic acid group, sulphamido, N,N-dialkylsulphamido, nitro, amino, substituted amino, or alkylsulphonylamino, or R$_1$ is a benzene ring condensed on the benzodioxole nucleus; R$_2$ represents hydrogen, alkyl, aryl or hydroxyl; *m* represents 0, 1 or 2; R$_3$ represents hydrogen, lower alkyl, aryl, hydroxyl or cyano; *n* represents 0, 1, 2 or 3; X represents O or S; and Y represents hydrogen, aryl (substituted or unsubstituted in the aromatic ring by halogen, alkyl, hydroxyl or alkoxyl), a X—CH$_2$—CH$_2$—Y group, or a



$$-N\begin{matrix}R_4\\R_5\end{matrix}$$

group,
wherein R$_4$ and R$_5$ are hydrogen, lower alkyl, monocyclic carbocyclic aryl, or lower monocarbocyclic arylalkyl.

3,970,673

PROCESS FOR PREPARING BICYCLIC γ-LACTONE

Kiyosi Kondo, Yamato; Masakatsu Matsumoto, Sagamihara, and Fumio Mori, Kurashiki, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

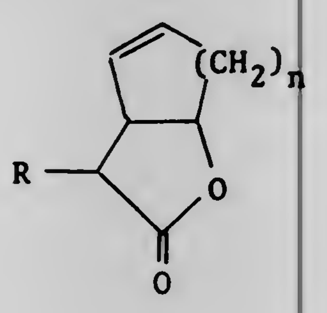
Filed May 29, 1975, Ser. No. 582,002

Claims priority, application Japan, May 29, 1974, 49-59637; Sept. 26, 1974, 49-109977

Int. Cl.² C07D *307/77, 307/93*

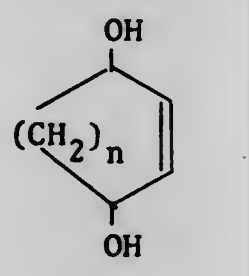
U.S. Cl. 260—343.3 R **7 Claims**

1. A process for preparing a bicyclic γ-lactone represented by the formula (I)



(I)

wherein R represents a hydrogen atom or a straight or branched chain alkyl group having 1 to 4 carbon atoms and *n* is an integer of 1 to 6, which comprises condensing a cycloalkene diol compound represented by the formula (II)



(II)

wherein *n* is as defined above, with an orthocarboxylic acid ester represented by the formula (III)

$$R-CH_2-C(OR^1)_3 \qquad (III)$$

wherein R is as defined above and R¹ represents a straight or branched chain alkyl group having 1 to 4 carbon atoms, in the presence of an acidic catalyst at a temperature of about 120°C to about 170°C in a molar ratio of about 1 to about 5 moles of said orthocarboxylic acid ester per mole of said cycloalkene diol compound.

3,970,674

CERTAIN HEXAHYDRO-2-LOWERALKOXY-5-OXYCYCLOPENTA [b] FURANS CONTAINING AN OLEFINIC SUBSTITUENT IN THE 4-POSITION

Hans Johann Mayer, Fullinsdorf; Albert Eduard Fischli, Basel, both of Switzerland; Michael Josef Klaus, Weil am Rhein, Germany, and Alexander Eduard Wick, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

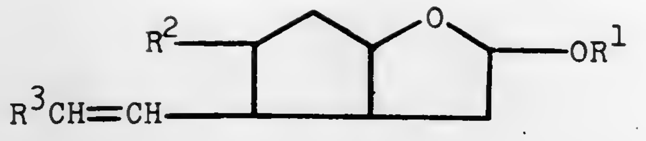
Division of Ser. No. 374,850, June 9, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,068

Claims priority, application Switzerland, July 6, 1972, 10120/72

Int. Cl.² C07D *307/93*

U.S. Cl. 260—346.2 R **5 Claims**

1. A compound of the formula:



wherein R¹ is lower alkyl; R² is selected from the group consisting of hydroxy, tetrahydro-pyranyloxy, 4-methoxy-5,6-dihydro-2-H-pyranyloxy, benzyloxy, trityloxy, benzhydryloxy, alphaloweralkoxyloweralkoxy, trimethylsilyloxy, and hydroxy-protected as its ester, said ester being hydrolyzable and derived from phosphoric acid,
lower alkanoic acid,
aryl lower alkanoic acid,
carbonic acid,
and lower alkane dicarboxylic acid;
R³ is hydrogen, an alkyl group of from 1–10 carbon atoms, a cycloalkyl group of 3–7 carbon atoms, an alkenyl group of from 2–10 carbon atoms, phenyl, (lower alkyl)-phenyl or nitrophenyl.

3,970,675

DISPERSE DYESTUFFS

Siegfried Dengler, Choex; Peter Loew, Munchenstein; Christian Zickendraht, Binningen, and Hansrudolf Schwander, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

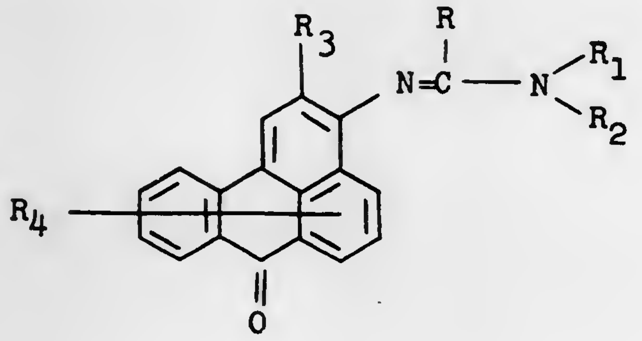
Filed June 17, 1974, Ser. No. 480,085

Claims priority, application Switzerland, June 29, 1973, 9503/73

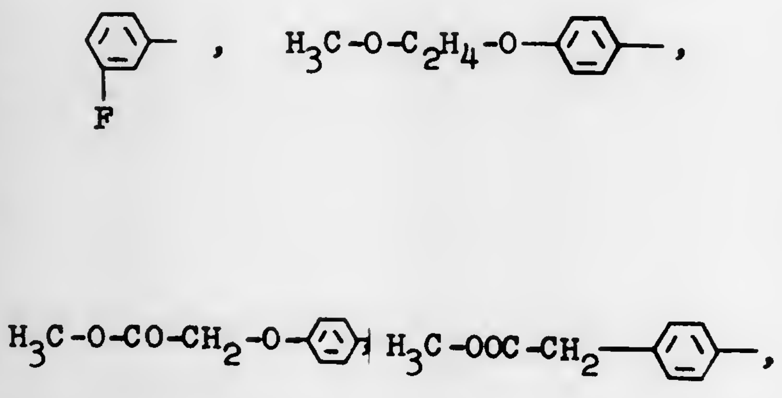
Int. Cl.² C09B *3/02*

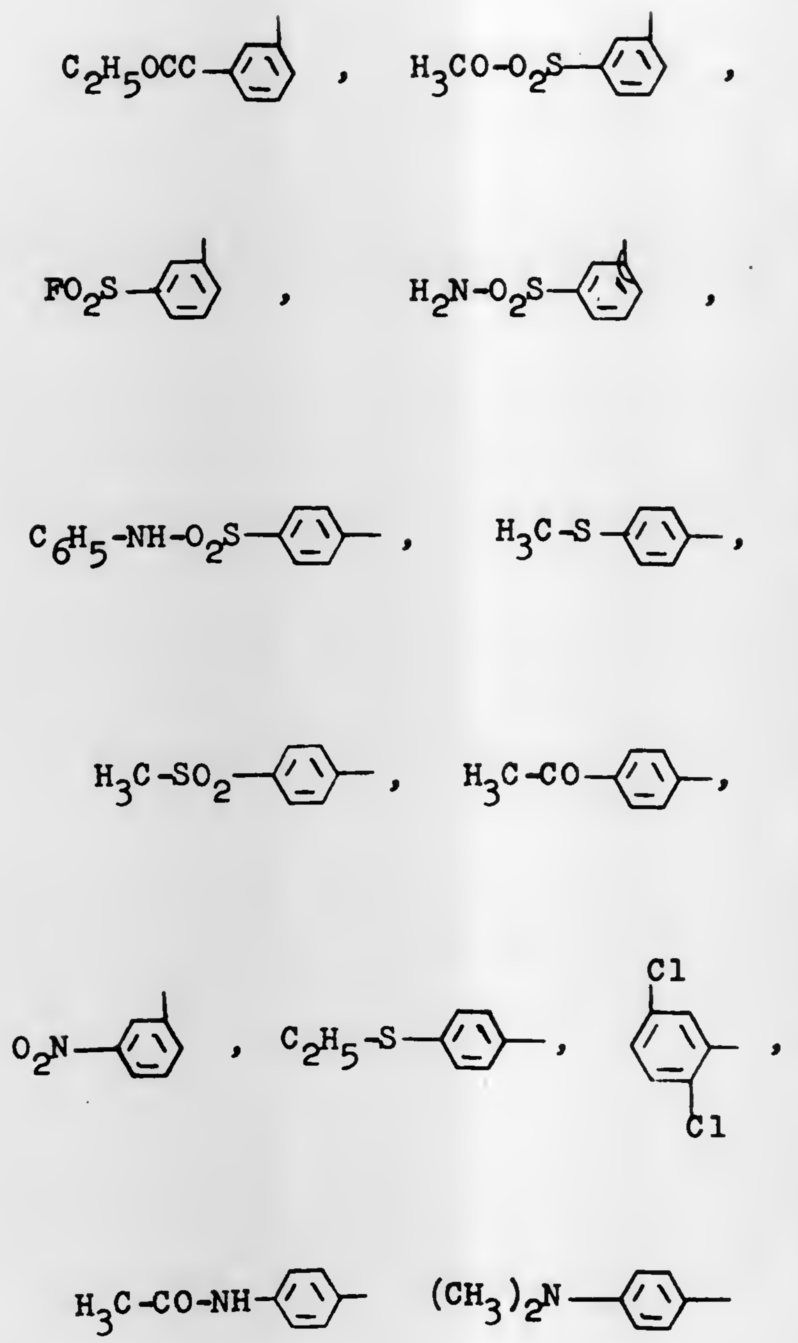
U.S. Cl. 260—364 **10 Claims**

1. A dyestuff of the formula



wherein, R, R_1 and R_2 are C_1–C_{10}-alkyl, C_1–C_{10}-alkyl substituted by chlorine, hydroxy, phenyl, cyano, methoxy-C_1–C_3-alkanoyloxy or C_1–C_2-alkoxycarbonyl (cf page 2, bottom); cyclohexyl; phenyl or phenyl substituted by C_1–C_3-alkyl, C_1–C_2-alkoxy, chlorine, bromine, cyano, nitro or acetylamino; R is also a residue of the formulae $—C_{17}H_{35}$, $NC—CH_2—$, $CH_3—O—CH_2—$, $C_2H_5—O—CH_2—$, $CH_3—O—C_2H_4—$, $—CF_3$, $C_2H_5OOC—CH_2—CH_2—$, $NC—CH_2—CH_2—$, $(CH_3)_2N—CH_2—$, $CH_2{=}CH—$, $CH_3—CH{=}CH—$, $CH_2{=}C(CH_3)_2—$, $(C_2H_5)_2CH—$, $CH_3—CO—CH_2—$, $C_6H_5—CH_2—$, $C_6H_5—O—CH_2—$,





R_3 is hydrogen or an electron-negative organic radical with a positive sigma value in the Hammet equation; and R_4 represents a halogen atom, a lower alkyl group or represents hydrogen.

3,970,676

NOVEL PROCESS AND INTERMEDIATE COMPOUNDS USED IS PREPARATION OF -Δ5,7- STEROID DIENES

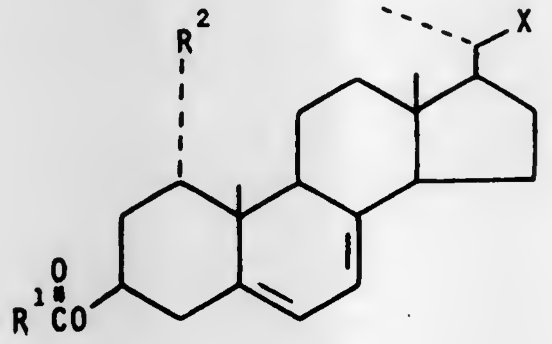
William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 29, 1974, Ser. No. 518,466

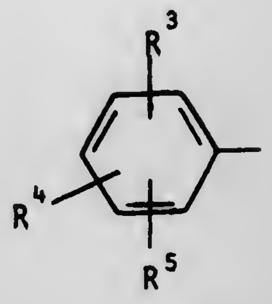
Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.2 **31 Claims**

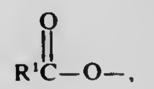
1. A process for preparing compounds of the formula



wherein R¹ is selected from alkyl of one to five carbon atoms, inclusive, and

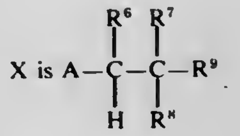


wherein R³, R⁴, and R⁵ are the same or different and are selected from the group consisting of hydrogen, alkyl of one to four carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, and halogen;
R² is selected from the group consisting of hydrogen and



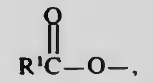
$$R^1\overset{O}{\overset{\|}{C}}-O-,$$

R¹ defined as above;



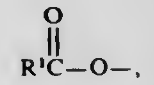
$$X \text{ is } A-\underset{H}{\overset{R^6}{C}}-\underset{R^8}{\overset{R^7}{C}}-R^9$$

wherein A is $—CH_2—CH_2—$,
R⁶· R⁷, R⁸ are the same or different and are hydrogen or methyl;
R⁹ is selected from the group consisting of hydrogen, hydroxy, and



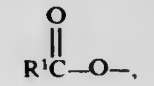
$$R^1\overset{O}{\overset{\|}{C}}-O-,$$

R¹ as defined above, with the proviso that when R⁹ is hydrogen, A is $—CH_2—CH_2$, R⁶ is hydrogen and R⁷ and R⁸ are methyl; and
when R⁹ is hydroxy or



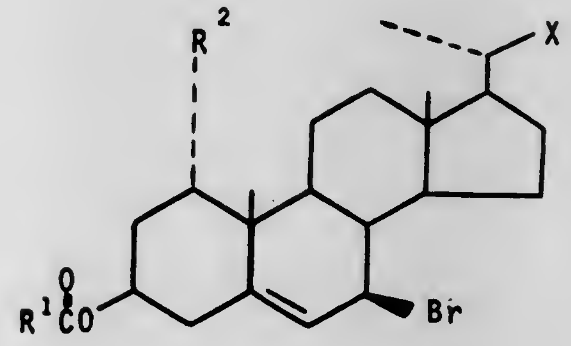
$$R^1\overset{O}{\overset{\|}{C}}-O-,$$

R¹ defined as above, and R⁷ and R⁸ are hydrogen, then R⁶ is hydrogen;
when R⁹ is hydroxy or



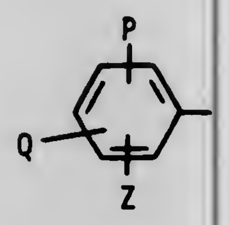
$$R^1\overset{O}{\overset{\|}{C}}-O-,$$

R⁷ is hydrogen or methyl, and R⁸ is methyl, then R⁶ is hydrogen or methyl, which comprises
a. epimerizing a 7β-bromo steroid of the formula



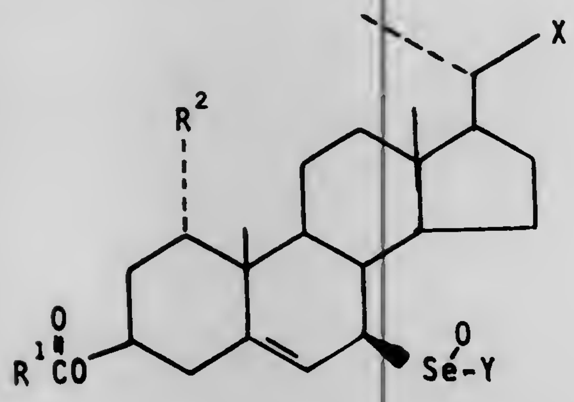
wherein R¹, R² and X are defined as above, to the 7α-bromo compound,

b. reacting the 7α-bromo compound with Y selenolate wherein Y is



with P, Q, and Z being the same or different and selected from the group consisting of hydrogen, alkyl of one to four carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, and halogen to form the 7β-selenide,

c. oxidizing the 7β-selenide to form compounds of the formula



wherein R¹, R², X and Y are as defined above,

d. decomposing the oxidized selenide of Step c to form a compound of the preamble.

3,970,677

METHOD FOR ISOLATING 11-CYANO-UNDECANOIC ACID IN ITS AMMONIUM SALT

Kenji Nishimura; Shinichi Furusaki, and Kazuo Hashimoto, all of Ube, Japan, assignors to Ube Industries, Ltd., Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,445

Claims priority, application Japan, Feb. 1, 1974, 49-12717

Int. Cl.² C07C *121/407*

U.S. Cl. 260—404.5 **8 Claims**

1. A method for isolating 11-cyano-undecanoic acid in the form of its ammonium salt from a crude oil containing therein 11-cyano-undecanoic acid obtained by thermally cracking **1,1′-peroxy-dicyclohexyl amine at a temperature between** 300° and 1000°C, comprising the steps of:

- dissolving said crude oil into an organic solvent consisting of at least one aromatic hydrocarbon having 6 to 8 carbon atoms to prepare a solution containing 5 to 30% by weight of 11-cyano-undecanoic acid;
- introducing ammonia gas into the above-prepared solution to convert the dissolved 11-cyano-undecanoic acid to its ammonium salt crystals, said ammonia gas being introduced into said solution of said crude oil in an amount of 0.5 to 2.0 times by mole the sum of the contents of the acid substances existing in said crude oil, said introducing of ammonia gas being carried out at a temperature not higher than the melting point of said ammonium salt of 11-cyano-undecanoic acid; and
- separating said crystals of ammonium salt of 11-cyano-undecanoic acid from said solution.

3,970,678

ORGANOTIN MERCAPTIDE PROCESS

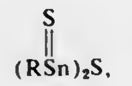
Kenneth R. Molt, Montgomery, Ohio, assignor to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Filed Mar. 8, 1974, Ser. No. 449,435

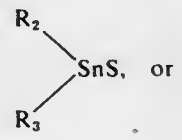
Int. Cl.² C07F *7/22*

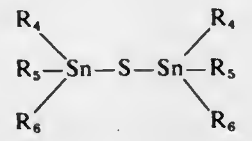
U.S. Cl. 260—429.7 **19 Claims**

1. A process of preparing an organotin halide mercaptide or a mixture of an organotin halide and an organotin mercaptide from an organotin sulfide comprising reacting:

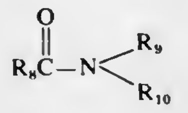
(1)


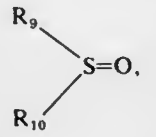
$(R\overset{S}{\overset{\|}{Sn}})_2S,$

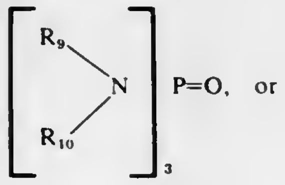
(2)


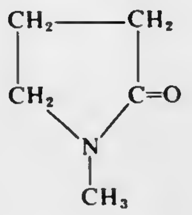
(3)


with a compound of the formula R_1X in the presence of a catalyst having the formula:

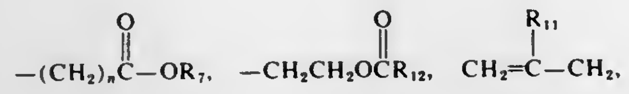
(a)


(b)


(c)


(d)


where R, R_2, R_3, R_4, R_5, and R_6 are alkyl, cycloalkyl, alkenyl, aryl or aralkyl, R_1 is



$-(CH_2)_n\overset{O}{\overset{\|}{C}}-OR_7,\quad -CH_2CH_2O\overset{O}{\overset{\|}{C}}R_{12},\quad CH_2=\overset{R_{11}}{\overset{|}{C}}-CH_2,$

or benzyl, R_7 is alkyl, cycloalkyl, alkenyl, or aralkyl, R_{12} is alkyl or alkenyl, X is halogen of atomic weight 35 to 80, *n* is 1 or 2, R_8 is hydrogen or methyl, R_9 and R_{10} are alkyl of 1 to 2 carbon atoms and R_{11} is hydrogen or methyl, with the proviso that when compound (1) is reacted the product is the reaction product of either 2 moles of R_1X with 1 mole of compound (1) or the product is the reaction product of 3 moles of compound (1) with 1 mole of R_1X, when compound (2) is reacted the product is the reaction product of 1 mole of compound (2) with 1 mole of R_1X and where compound (3) is reacted the product is the reaction product of 1 mole of compound (3) with 1 mole of R_1X.

3,970,679

PROCESS FOR THE PRODUCTION OF ORGANOTIN HALIDES IN SULPHONES AS REACTION MEDIUM

Hans Wolf Jung, Burstadt; Rudolf Maul, Bensheim, and Hermann Wolfgang Wehner, Zwingenberg, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 362,701, May 22, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,898

Claims priority, application Germany, May 25, 1972, 2225322

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **9 Claims**

1. In the process for the production of organotin halides of the formula

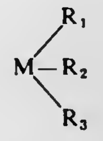
$R_nSn\ Hal_{4-n}$

wherein R represents a saturated, unsaturated straight or branched alkyl group having 1 – 4 carbon atoms, Hal represents chlorine, bromine or iodine, and *n* denotes 1, 2 or 3, by the reaction of metallic tin or tin alloys with organic halides of the formula

R – Hal

wherein R and Hal have the above given meanings, at 100°–300°C, at a pressure of 0 – 20 atmospheres and in the presence of a catalyst system, consisting of the reaction products of

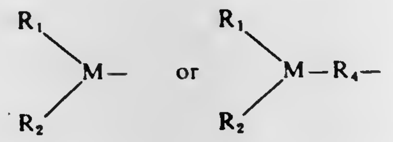
A. one or more compounds of the general formula



wherein

M is nitrogen or phosphorous,

R_1, R_2, R_3 can be equal (excepted in the case of R_1, R_2, R_3 representing halogen) or different and represent hydrogen, halogen, saturated or unsaturated, linear or branched alkyl-, cycloalkyl-, aralkyl-, alkaryl- or aryl groups, optionally containing one or more functional groups, or represents the groups



wherein R_4 is an alkylene group having from 1 to 8 carbon atoms and more of the groups R_1, R_2 and R_3 can form a ring or ring system, which can contain oxygen, including corresponding onium-compounds, and

B. one or more compounds of the formula

$E_aX_bY_c$

wherein

E is borine, silicon, titanium, vanadium, chromium, manganese, iron, cobalt, nickel or copper,

X is a one- or more valent electronegative group,

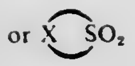
Y is molecular ligand, which is fully or partially bonded in the coordination sphere of E,

a is a whole number from 1 to 4 and, when E is titanium, vanadium, chromium, manganese, iron, cobalt, nickel or copper, *a* denotes 1 or 2,

b is a whole number from 0 to 7 and when E is silicon or borine, denotes a whole number from 1 to 13,

c is a whole number from 0 to 18 and, when E is borine or silicon, denotes a whole number from 0 to 11,

in a molar ratio of 1 mol of compound B to 1 to 10 mol of compound A, the improvement which comprises performing said reaction in at least one sulphone of the formulae

$R_1-SO_2-R_2$ or


wherein R_1 and R_2 represent identical or different, saturated or unsaturated, straight or branched alkyl groups having 1 - 4 carbon atoms, or phenyl or phenyl substituted by one or more methyl, halogen or nitro groups, and X represents a saturated or unsaturated, straight or branched hydrocarbon chain having 4 – 10 carbon atoms or such a hydrocarbon chain which is substituted by chlorine, hydroxy, $(CH_3)_2N$-, acetoxy, sulpholanyloxy or alkoxy groups, as reaction medium.

3,970,680

STORAGE-STABLE DIISOCYANATE COMPOSITIONS

John Murray Holland, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 4, 1974, Ser. No. 432,391

Int. Cl.² C07C *119/048*

U.S. Cl. 260—453 SP **3 Claims**

1. A storage stable composition comprising a diphenylmethane diisocyanate and a tertiary amine, said tertiary amine being present in an amount of not more than two equivalents for each equivalent of hydrolyzable chlorine in said diisocyanate, wherein said tertiary amine is triethylamine, didecyl methylamine, didodecylmethylamine, N-methyl piperidine, benzyl diethylamine, tripropylamine, tributylamine, N:N-dimethyl benzylamine, N:N′-dimethyl piperazine NN′-dilauryl piperazine, p-methyl-NN-diethyl benzylamine, p-dodecyl-N:N-diethyl benzylamine, N-methyl morpholine, N-dodecyl morpholine, N:N-dimethyl-t-butylamine, N:N-dimethyl-t-octylamine, N-methyl-1:1:3:5:5-pentamethyl piperidine, NN-diisopropyl dodecyl amine, NN′-distearyl piperazine, 1:4-diaza-(2:2:2)-bicyclooctane, N,N-dimethyl ethylamine, or N,N-dimethyldodecylamine.

3,970,681

NITRILE TERMINATED AROMATIC POLYETHERS

Carl Shipp Marvel, Tucson, Ariz., and Jozef Verborgt, Brussels, Belgium, assignors to University Patents, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 233,724, March 10, 1972, abandoned. This application Aug. 27, 1974, Ser. No. 501,098

Int. Cl.² C07C *121/75*, *121/76*

U.S. Cl. 260—465 F **14 Claims**

1. Low melting aromatic polyethers having the structural formula:

$$(NC-AR-CO)_n(AR_1-O(AR_1-O)_m AR_1-Z)_x AR_1(O-AR_1)_m O-AR_1(CO-AR-CN)_n$$

wherein:

AR and AR_1 are the same or different and are arylene groups:

Z is the same or different in each recurring unit and is selected from the group consisting of — OC — AR_3 — CO — and —SO_2 — AR_3 — SO_2 — wherein AR_3 is an arylene group;

x is 1–40;

m is 0–4, and

n is 0 or 1,

provided that when *n* = o, *x* is at least 3 and at least three AR_3 groups are cyanoarylene groups; and further provided that when n is 1, at least one AR_3 group is a cyanoarylene group.

3,970,682

NOVEL CYCLOPENTANONE ODORIFEROUS AGENT

Marcel Plattier, Antibes, and Paul José Teisseire, Grasse, both of France, assignors to Societe Anonyme Roure Bertrand DuPont, Paris, France

Filed Jan. 11, 1973, Ser. No. 322,748

Claims priority, application France, Jan. 18, 1972, 72.01510

Int. Cl.² C07C *69/74*

U.S. Cl. 260—468 K **3 Claims**

1. Methyl [2-n-propyl-3-keto-cyclopent-1-yl]-acetate.

3,970,683

11,15-DIHYDROXY-9-OXOPROST-13-YNOIC ACID

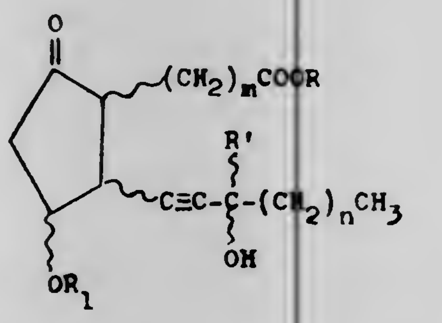
Paul W. Collins, Wheeling, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 244,238, April 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 223,299, Feb. 3, 1972. This application Nov. 12, 1974, Ser. No. 523,169

Int. Cl.² C07L *61/38, 69/74*

U.S. Cl. 260—468 D **9 Claims**

1. A compound of the formula



wherein R is hydrogen or a lower alkyl radical containing 1 to 7 carbon atoms, R′ is hydrogen or a lower alkyl radical containing 1 to 4 carbon atoms, R_1 is hydrogen or a lower alkanoyl radical containing 1 to 7 carbon atoms, *m* is an integer greater than 5 and less than 8, *n* is an integer greater than 1 and less than 6 and the wavy lines represent the α or β configuration or the epimeric mixture.

3,970,684

POLYUNSATURATED PROSTAGLANDIN DERIVATIVES

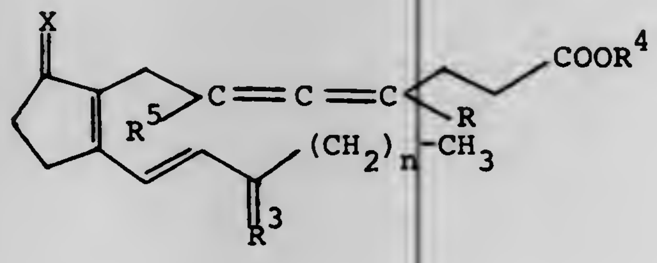
Pierre Crabbé, Grenoble, France; John H. Fried, Palo Alto, Calif., and Angel Guzman, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 377,106, July 6, 1973, Pat. No. 3,873,598. This application July 15, 1974, Ser. No. 488,595

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 D **19 Claims**

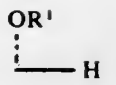
1. A racemic compound selected from the group of those represented by the following formula:



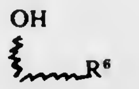
wherein X is a keto group;

each of R and R^5 is hydrogen, methyl, ethyl or propyl;

R^3 is the grouping



in which R^1 is hydrogen, tetrahydrofuran-2-yloxy, tetrahydropyran-2-yloxy, 4-methoxytetrahydropyran-4-yloxy, a hydrocarbon carboxylic acyloxy group containing from 1 to 12 carbon atoms or a substituted hydrocarbon carboxylic acyloxy group having from 1 to 12 carbon atoms wherein the substituent is selected from the group consisting of hydroxy, alkoxy containing up to twelve carbon atoms, nitro, amino and halogen, or the grouping



in which R^6 is methyl, ethyl or propyl;

- R^4 is hydrogen, a lower alkyl group of 1 to 3 carbon atoms or the pharmaceutically acceptable, non-toxic salts of compounds in which
- R^4 is hydrogen;
- *n* is an integer of from 2 to 9;
- and the wavy lines indicate the α or β configuration or mixtures thereof;
- provided that when R^6 is α the hydroxyl group, attached to the same carbon atom as R^6, is β; and when R^6 is β the hydroxyl group, attached to the same carbon atom as R^6, is α.

3,970,685

(dl)-13-SUBSTITUTED SULFINYL-PROSTAGLANDIN-LIKE COMPOUNDS

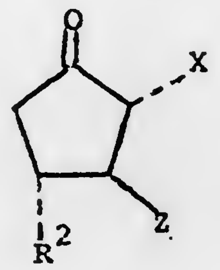
Karl G. Untch, Los Altos, Calif., and Gilbert J. Stork, New York, N.Y., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 5, 1974, Ser. No. 476,362

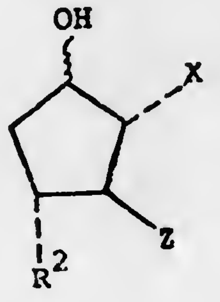
Int. Cl.² C07C *147/14*

U.S. Cl. 260—470 **15 Claims**

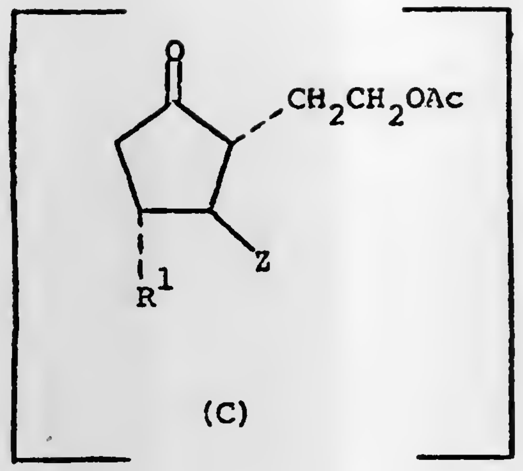
1. A compound selected from those of the formulas:



(A)

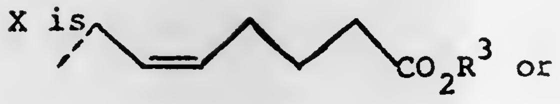


(B)



(C)

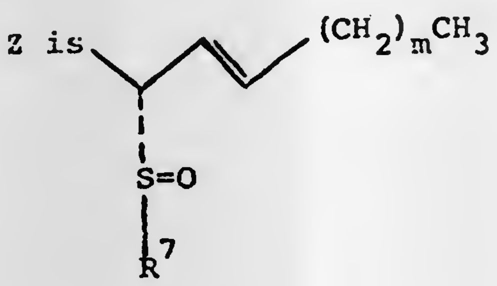
wherein



$--- (CH_2)_mCO_2R^3$,

in which

R^3 is hydrogen or alkyl containing from one through three carbon atoms, and m is a whole integer from two through eight;



wherein R^7 is phenyl, p-tolyl, p-chlorophenyl, p-fluorophenyl, 2,4-dichlorophenyl, or 2,5-dichlorophenyl, and m is defined as above; and

the wavy line (ξ) represents the α or β configuration or mixtures thereof; or a non-toxic, pharmaceutically acceptable salt of a compound of Formula (A) or (B) when R^3 is hydrogen.

3,970,686

5-(1,2,3,4-TETRAHYDRO-6-METHOXY-2-NAPHTHYL)-2-HYDROXY-1-METHYLCYCLOPENTANEETHANOLS AND ESTERS

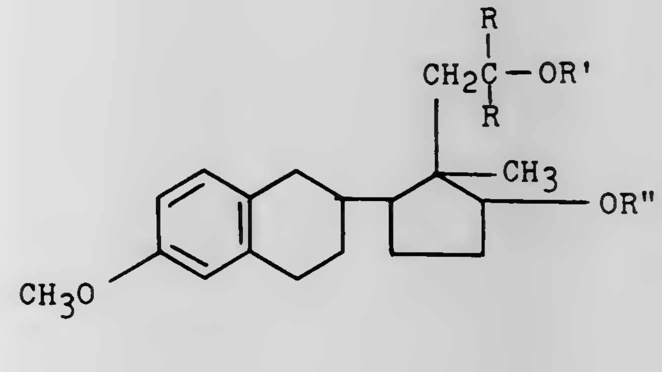
John H. Dygos, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 464,826, April 29, 1974, Pat. No. 3,907,905. This application Mar. 31, 1975, Ser. No. 563,566

Int. Cl.² C07C *69/16, 69/28, 69/78*

U.S. Cl. 260—476 C **7 Claims**

1. A compound of the formula



wherein R represents hydrogen or methyl; R′ represents hydrogen when R represents methyl, otherwise R′ represents hydrogen, lower alkanoyl, or benzoyl; R″ represents hydrogen, or lower alkanoyl, or benzoyl; and R′ and R″ do not simultaneously represent hydrogen.

3,970,687

POLYESTERS WITH SUBSTITUTED AMINE END GROUPS

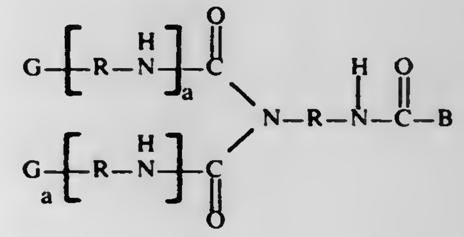
Robert A. Braun, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. Nos. 776,823, Nov. 18, 1968, abandoned, and Ser. No. 120,769, March 3, 1971, Pat. No. 3,684,771, and Ser. No. 241,402, April 5, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,015

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **3 Claims**

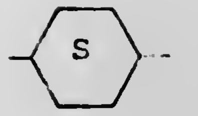
1. A polymeric material of the formula



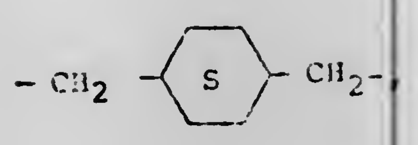
wherein

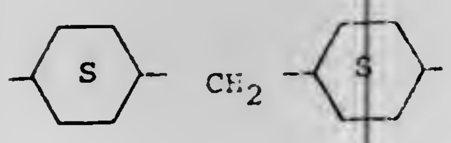
G is an amine, hydroxyamine, or mercapto-substituted amine;

R is an alkylene of 2–36 carbon atoms,

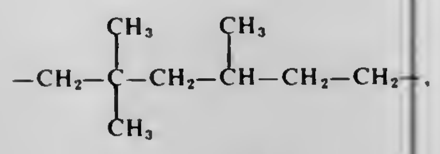


,

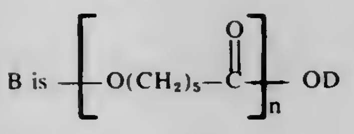




, or



$$-CH_2-\overset{CH_3}{\underset{CH_3}{C}}-CH_2-\overset{CH_3}{CH}-CH_2-CH_2-,$$



$$B \text{ is } -\left[O(CH_2)_5-\overset{O}{\overset{\|}{C}}\right]_n-OD$$

wherein n=10–200, and
D is an alkyl of 3–10 C;
and
a is 1, 2, or 3.

3,970,688

SYNTHETIC HORMONES FOR INSECT CONTROL

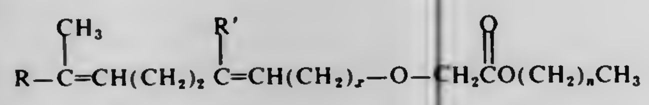
William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,682

Int. Cl.^{2} C07C *59/22*

U.S. Cl. 260—484 R 2 Claims

1. A compound of the general formula



$$R-\overset{CH_3}{C}=CH(CH_2)_2\overset{R'}{C}=CH(CH_2)_x-O-CH_2\overset{O}{\overset{\|}{C}}O(CH_2)_nCH_3$$

wherein R and R′ are selected from the group consisting of methyl and ethyl; x is a number from 1 to 2; and n is a number from 0 to 3.

3,970,689

MERCAPTO ALCOHOLS AND MERCAPTOALKYL ESTERS

Jan Stoffelsma, Hoevelaken, and Jacob Pypker, Bilthoven, both of Netherlands, assignors to Polak's Frutal Works B.V. and Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderij-en-Theehandel N.V., both of Amersfoort, Netherlands

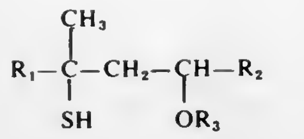
Filed Apr. 4, 1973, Ser. No. 347,624

Claims priority, application United Kingdom, Apr. 6, 1972, 15807/72

Int. Cl.^{2} C07C *148/00, 149/14, 149/18*

U.S. Cl. 260—488 F 9 Claims

1. Compounds having the formula:



$$R_1-\underset{SH}{\overset{CH_3}{C}}-CH_2-\underset{OR_3}{CH}-R_2 \qquad I$$

wherein R_1 is methyl, R_2 is selected from the group consisting of hydrogen and methyl and R_3 is selected from the group consisting of hydrogen, formyl and acetyl.

3,970,690

METHOD FOR PREPARING DISPERSING AGENT

Shigeyuki Suzuki, Sagamihara; Akira Yamauchi, Urawa; Shoji Kiyama, Tokyo, and Kiyoshi Yamaki, Fuchu, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 168,495, Aug. 2, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,224

Int. Cl.^{2} C07C *143/24*

U.S. Cl. 260—505 C 1 Claim

1. A dispersant composition which comprises a water-soluble alkali sulfonate of a pitch, said pitch
   1. being an aromatic mixture containing at least 80% thereof of a component predominantly having a fused-ring molecular structure of at least three rings and having an average molecular weight of from 500 to 2,000,
   2. having a carbon content of at least 90% based on elemental analysis, a hydrogen to carbon atomic ratio of 0.35 to 1.0 and a softening temperature of at least 150°C, and
   3. containing less than about 20% of a fraction insoluble in nitrobenzene, said alkali being selected from the group consisting of sodium, potassium, calcium and ammonium.

3,970,691

ETHERIFICATION OF BARK EXTRACTS

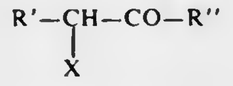
Karl David Sears, and Ronald Leroy Casebier, both of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 3, 1972, Ser. No. 277,521

Int. Cl.^{2} C07C *143/52, 69/76*

U.S. Cl. 260—507 R 2 Claims

1. Water soluble etherified polyphenolic derivatives of coniferous tree barks produced by reacting a polyphenolic extract of a coniferous tree bark, said extract being sulfonated with a salt selected from the group consisting of ammonium, sodium and potassium salts of sulfurous acid, in the proportion of about 0.1 to 8.0 moles per mole of monomeric unit in the polyphenol with a halocompound of the formula



$$R'-\underset{X}{CH}-CO-R''$$

where R′ is H; X is halogen and R″ is from the group consisting of OH, OM where M is sodium or potassium, and oxyalkyl where alkyl is methyl or ethyl; said reaction being carried out at a temperature of from about 50° – 120°C in an alkaline solution.

3,970,692

PROCESS FOR THE PREPARATION OF PROSTAGLANDIN F_2 α AND THE ANALOGS THEREOF

Bernd Radüchel; Werner Skuballa, and Helmut Vorbrüggen, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

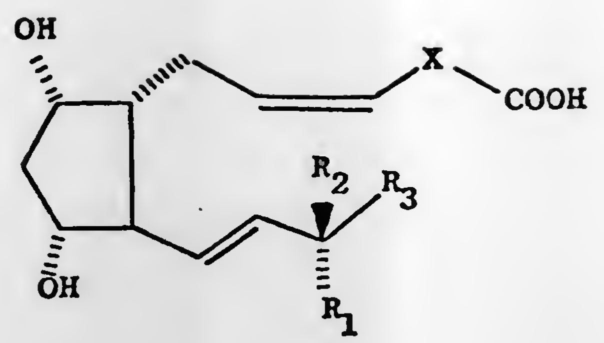
Filed May 23, 1974, Ser. No. 472,737

Claims priority, application Germany, May 30, 1973, 2328131

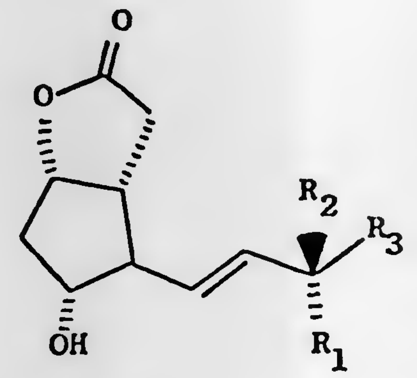
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D 10 Claims

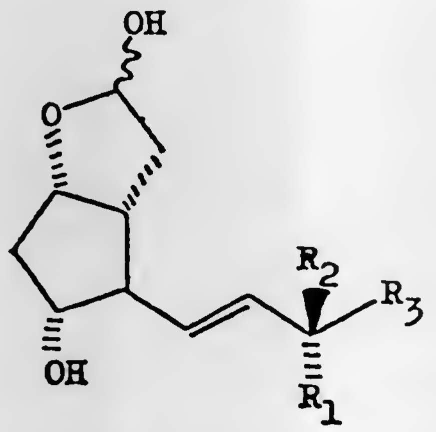
1. In a process for the production of prostaglandin F_2 and analogs thereof of the formula



wherein one of R_1 and R_2 is a hydroxy group and the other is a hydrogen atom or methyl, R_3 is alkyl of 5–7 carbon atoms, alkoxy of 3–5 carbon atoms or phenoxy and X is alkylene of 1–8 carbon atoms or alkyleneoxyalkylene of 2–5 carbon atoms, from a 3-ester of an aliphatic carboxylic acid of 1–12 carbon atoms or an aromatic carboxylic acid of 7–15 carbon atoms and with 1–2 separate or fused rings and of a lactone of the general formula



wherein R_1, R_2 and R_3 have the values given above, the improvement which comprises treating the lactone monoester with an excess of diisobutylaluminum hydride at −100° to 0° C., to produce a lactol of the formula



wherein R_1, R_2 and R_3 have the values given above, and reacting the thus-produced lactol with a Wittig reagent of the formula $Ph_3P=CH-X-COOH$ wherein Ph is phenyl and X has the values given above.

3,970,693

PROCESS FOR PREPARING INDENE ACETIC ACIDS

Roger J. Tull, Metuchen; Robert F. Czaja, Scotch Plains; Richard F. Shuman, Westfield, and Seemon H. Pines, Murray Hill, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

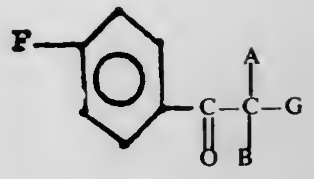
Filed July 5, 1974, Ser. No. 486,031

Int. Cl.^{2} C07C *147/14*

U.S. Cl. 260—515 A 18 Claims

1. A process for preparing 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indene-3-acetic acid or its salt which comprises the steps of:

a. reacting a ketone of the formula:



wherein:
A is methyl or together with G forms methylidene;
B is hydrogen, methyl or halo (Cl, Br, F, I);
G is methyl, CH_2R or together with A forms methylidene, wherein R is halo (Cl, Br, F, I), hydroxy, its ethers or esters or $-N-(C_{1-5}\text{ alkyl})_2$; and
  1. when A and G together is methylidene, B is methyl;
  2. when A and G are each methyl, B is halo; and
  3. when A is methyl and B is hydrogen, G is CH_2R;

under Friedel Crafts conditions to form 5-fluoro-2-methyl-1-indanone;

b. reacting said 5-fluoro-2-methyl-1-indanone with an R_1 benzyl compound wherein R_1 is p-methylthio or p-methylsulfinyl under Grignard or Wittig conditions to form 5-fluoro-2-methyl-1-R_1-benzylidene;

c. condensing said indene compound with glyoxylic acid, its ester or salt in the presence of a base to form 5-fluoro-2-methyl-1-R_1-benzylidenylidene-3-acetic acid ester or salt;

d. when R_1 is methylsulfinyl, isomerizing said indenylidene compound from step (c) with an acid or a base to form the desired product; or

e. when R_1 is methylthio, isomerizing said indenylidene compound from Step (c) with an acid or a base and subsequently oxidizing to form the desired product; or first oxidizing the product from Step (c) and subsequently isomerizing.

3,970,694

CYCLOALKYL PHENOXY CARBOXYLIC ACID DERIVATIVES

Masayoshi Minai, Moriyama; Yoshio Suzuki, Itami; Noritaka Hamma, Sakai; Eiichi Murayama, Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

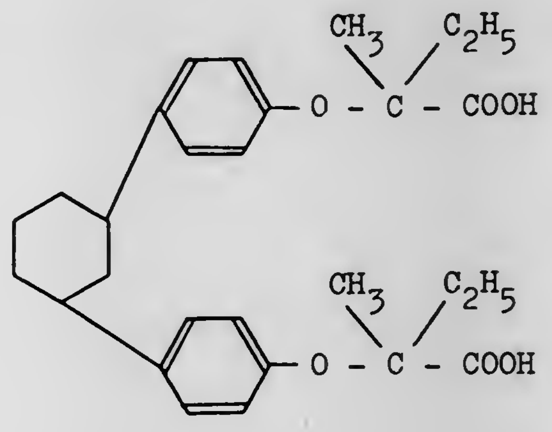
Filed June 28, 1974, Ser. No. 484,063

Claims priority, application Japan, July 2, 1973, 48-75031

Int. Cl.^{2} C07C *63/33*

U.S. Cl. 260—520 C 5 Claims

1. A compound of the formula,



3,970,695
N-(PERFLUOROACYL)-N-PHOSPHONOMETHYL GLYCINE COMPOUNDS, METHOD OF PREPARING SAME

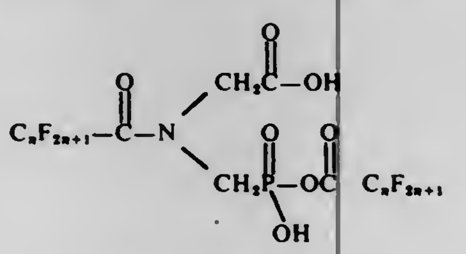
Melvin L. Rueppel, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 23, 1975, Ser. No. 580,252

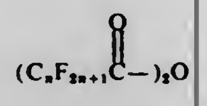
Int. Cl.² C07C *99/00*

U.S. Cl. 260—534 R **4 Claims**

1. A process for producing a compound of the formula



wherein *n* is an integer of from 1 to 4 which comprises forming an admixture of N-phosphonomethyl glycine and a perfluoroalkanoic acid and then adding thereto a perfluoroalkanoic acid anhydride of the formula



$$(C_nF_{2n+1}\overset{O}{\overset{\|}{C}}-)_2O$$

wherein *n* has the above-defined meaning and maintaining the resulting admixture at a temperature at which the anhydride and the N-phosphonomethyl glycine react to produce said compound.

3,970,696
PROCESS FOR PRODUCING AROMATIC CARBOXYLIC ACID

Motoo Shigeyasu, and Michio Kuki, both of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Filed July 29, 1974, Ser. No. 492,796

Claims priority, application Japan, July 28, 1973, 48-85215

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 R **10 Claims**

1. In a process for producing terephthalic acid comprising liquid phase oxidizing in a reaction zone p-xylene with a molecular oxygen-containing gas in a lower aliphatic carboxylic acid solvent in the presence of an oxidation catalyst containing a heavy metal compound and a bromine compound, withdrawing from the reaction system a condensed liquid obtained by condensing a gaseous mixture discharged from the top of the reaction zone during the reaction, said condensed liquid mainly comprising the lower aliphatic carboxylic acid solvent and water formed in the reaction, distilling off water from the condensed liquid thus withdrawn in a distillation column to recover the lower aliphatic carboxylic acid solvent, introducing the recovered solvent into the reaction zone to thereby maintain the water content of the reaction system below 20% by weight and recycling to the reaction zone the reaction mother liquor as it is, said reaction mother liquor being from the reaction zone, the improvement wherein (1) the oxidation catalyst contains cobalt, manganese and bromine as the inorganic components of the catalyst and is free of other inorganic atoms or groups except hydrogen, (2) at least a part of the condensed liquid is distilled in the distillation column to thereby obtain a recovered solvent as a side cut fraction of the distillation column, (3) said recovered solvent or, if necessary, a mixture of the recovered solvent and fresh lower aliphatic carboxylic acid solvent is introduced into the reaction zone in an amount corresponding to the amount of solvent contained in the condensed liquid withdrawn from the reaction system, and (4) the entire amount of the reaction mother liquid is recycled to the reaction zone.

3,970,697
OXIDATION OF ETHYLENE TO ACETIC ACID

John A. Scheben, Erlanger, Ky.; James A. Hinnenkamp, and Irving L. Mador, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 485,046

Int. Cl.² C07C *51/32*

U.S. Cl. 260—533 R **13 Claims**

1. In a process for the selective production of acetic acid by reacting ethylene and oxygen with added water in the feed over a supported catalyst consisting essentially of palladium metal or palladium metal and gold metal in a catalytically effective amount, the improvement which comprises conducting the process in the presence of a sulfur containing catalyst modifier having 2–4 atoms of oxygen per sulfur atom wherein the sulfur modifier is sulfur dioxide, sulfur trioxide, sulfurous acid, sulfuric acid, a sulfonic acid, or a salt of said acids and said sulfur modifier is impregnated in the catalyst support in an amount of about 0.05–25% by weight of the supported catalyst.

3,970,698
HYDROXY ETHER CARBOXYLATES

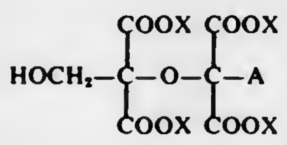
Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 19, 1973, Ser. No. 426,296

Int. Cl.² C07C *59/22, 69/66*

U.S. Cl. 260—535 P **3 Claims**

1. Compounds represented by the formula



$$HOCH_2-\underset{COOX}{\overset{COOX}{C}}-O-\underset{COOX}{\overset{COOX}{C}}-A$$

wherein A is selected from the group consisting of hydrogen, methyl, ethyl and $-CH_2OH$ and X is selected from the group consisting of hydrogen, alkali metal, ammonium, alkyl ammonium containing 1 to 4 carbon atoms alkanol ammonium containing 1 to 4 carbon atoms, and alkyl groups containing 1 to 20 carbon atoms.

3,970,699
4-ACYLAMINOPHENYLACETAMIDINES AND A METHOD FOR THEIR PREPARATION

Hartmund Wollweber; Ekkehard Niemers; Hans Peter Schulz; Herbert Thomas, and Peter Andrews, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

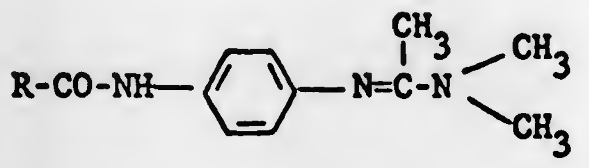
Filed Sept. 13, 1974, Ser. No. 505,738

Claims priority, application Germany, Sept. 18, 1973, 2346939

Int. Cl.² C07C *103/34*

U.S. Cl. 260—562 R **27 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof wherein

R is straight or branched chain alkoxyalkyl having 3 to 8 carbon atoms, either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl; or straight or branched chain alkenyloxyalkyl having 3 to 8 carbon atoms either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl.

3,970,700
RACEMIZATION OF OPTICALLY ACTIVE AMINES

Tsuneyuki Nagase, Takatsuk; Gohu Suzukamo, Ibaraki, and Yoshio Suzuki, Itami, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

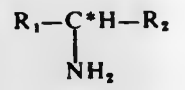
Filed Sept. 6, 1974, Ser. No. 503,691

Claims priority, application Japan, Sept. 7, 1973, 48-101418; Sept. 7, 1973, 48-101419; Sept. 7, 1973, 48-101420

Int. Cl.² C07C *20/00*

U.S. Cl. 260—570.8 R **9 Claims**

1. A method for racemization of optically active amines which comprises contacting an optically active amine of the formula:



$$R_1-\underset{NH_2}{\underset{|}{C^*H}}-R_2$$

wherein C* is an asymmetric carbon atom, R_1 is alkyl, aralkyl or aryl C. R_2 is aryl or alkoxycarbonyl, the aryl or aralkyl moiety being unsubstituted or being substituted with one or more alkyl or alkoxy groups on the aromatic ring, provided that R_1 and R_2 are always different from each other, with an alkali metal catalyst selected from the group consisting of (1) an alkali metal deposited on a solid carrier, (2) an alkali metal dispersed in a liquid medium and (3) an alkali metal alloy at a temperature of from −10° to 50°C

3,970,701
LOWER ALKENALS

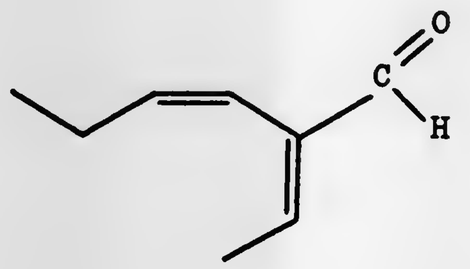
Anne Sanderson, Highlands; William L. Schreiber, Ocean, both of N.J.; Michel van Praac, Hilversum, Netherlands; Alan O. Pittet, and William J. Evers, both of Atlantic Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed July 30, 1973, Ser. No. 383,578

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R **1 Claim**

1. A composition of matter consisting essentially of trans-2-ethylidene-cis-3-hexenal having the formula:



3,970,702
CATALYTIC PROCESS FOR THE PREPARATION OF ACROLEIN

Tatsuo Shiraishi; Susumu Kishiwada; Shinkichi Shimizu; Shigern Honmaru; Hiroshi Ichihashi, and Yoshihiko Nagaoka, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation of Ser. No. 159,306, July 2, 1971, abandoned. This application Dec. 3, 1974, Ser. No. 529,100

Claims priority, application Japan, July 3, 1970, 45-58503; July 6, 1970, 45-59298; July 8, 1970, 45-60042; Aug. 15, 1970, 45-71609; Sept. 11, 1970, 45-80174

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **11 Claims**

1. A process for preparing acrolein by the vapor phase oxidation of propylene which comprises contacting propylene and oxygen with a catalyst composition consisting essentially of a catalyst system of the formula:

$$Mo_aBi_bFe_cX_dNi_eTl_fP_gO_h$$

wherein X is one or more of Mg, Mn and Co and *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h* represent, respectively, the number of atoms and wherein *a* is 12, *b* is 0.1 to 5, *c* is 0.1 to 5, *d* is 0 to 12, *e* is 0.1 to 12, *f* is 1 or less but not less than a catalytic amount, *g* is 0 to 5 and *h* is a number determined by the valence requirements of the other atoms and is 36 to 89 at a temperature from 200° to 550°C. and at a space velocity of 100 to 12,000 liter.-gas/liter.catalyst/hr.

3,970,703
PHENYLACETIC ACID DERIVATIVES

Shigeyoshi Kitamura; Yositosi Okuno, both of Toyonaka, and Masachika Hirano, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

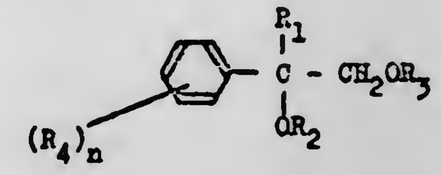
Division of Ser. No. 207,542, Dec. 13, 1971, Pat. No. 3,864,388. This application Dec. 17, 1974, Ser. No. 533,648

Claims priority, application Japan, Dec. 29, 1970, 45-124365

Int. Cl.² C07C *43/22*

U.S. Cl. 260—611 A **2 Claims**

1. A compound of the formula,



wherein R_1 is a C_{1-6} alkyl, a C_{2-6} alkenyl, a C_{3-6} alkynyl, a C_{3-6} cycloalkyl or benzyl, R_2 is a C_{1-6} alkyl, a C_{3-6} alkenyl or a C_{3-6} alkynyl, R_3 is a C_{1-6} alkyl, a C_{3-6} alkenyl or a C_{3-6} alkynyl, (provided that R_2 is a C_{3-6} alkynyl when R_3 is a C_{1-6} alkyl), R_4 is hydrogen, halogen, a C_{1-4} alkyl or methylenedioxy, and n is an integer of 1 to 5.

3,970,704
ALKOXY SUBSTITUTED ALIPHATIC DI-OLEFINIC HALIDES

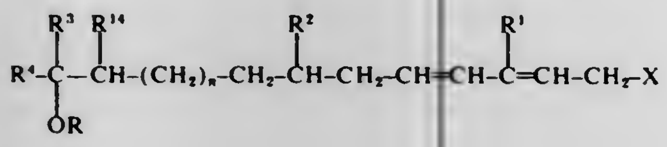
Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 217,930, Jan. 14, 1972, Pat. No. 3,890,398, which is a continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411, which is a continuation-in-part of Ser. No. 111,650, Feb. 1, 1971, Pat. No. 3,729,486, and a continuation-in-part of Ser. No. 111,702, Feb. 1, 1971, abandoned, and a continuation-in-part of Ser. No. 111,765, Feb. 1, 1971, abandoned, and a continuation-in-part of Ser. No. 111,766, Feb. 1, 1971, abandoned, and a continuation-in-part of Ser. No. 111,770, Feb. 1, 1971, abandoned, and a continuation-in-part of Ser. No. 115,725, Feb. 16, 1971, Pat. No. 3,706,733. This application Mar. 21, 1975, Ser. No. 560,851

Int. Cl.² C07C *43/00, 43/17*

U.S. Cl. 260—614 R **9 Claims**

1. A compound selected from the following formula:



$$R^4-\underset{OR}{\overset{R^3}{C}}-\overset{R^{14}}{CH}-(CH_2)_n-CH_2-\overset{R^2}{CH}-CH_2-CH=CH-\overset{R^1}{C}=CH-CH_2-X$$

wherein,

n is zero or one;

R is lower alkyl;

each of R¹, R², R³ and R⁴ is methyl or ethyl; and

X is bromo, chloro, fluoro or iodo.

3,970,705
PREPARATION OF UNSATURATED ETHERS

Brian W. Taylor, and Harold E. Swift, both of Gibsonia, Pa., assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 374,690, June 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 228,268, Feb. 22, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 603,147

Int. Cl.² C07C *41/06, 41/10*

U.S. Cl. 260—614 R **3 Claims**

1. In a method of producing unsaturated ethers in which each of the organic groups attached to the ether oxygen atom contain one carbon-to-carbon double bond by the reaction of a mixture of an allylic halide with an unsaturated alcohol, the improvement which comprises dissolving in said mixture a copper I halide and adding to said mixture a solid acid-acceptor material insoluble in said mixture and selected from the class consisting of the oxides of polyvalent metals of groups 2a and 2b of the periodic table and carrying out the said reaction in the absence of solvents and diluents, while maintaining the resulting reaction mixture in liquid form under superatmospheric pressure up to about 100 psig, at a temperature in the range of from about 25° to about 100°C and while substantially excluding moisture and oxygen, said allylic halide ingredient being selected from the class consisting of allyl chloride, 3-chloro-1-butene or 1-chloro-2-butene, said alcohol ingredient being selected from the class consisting of allyl alcohol, 1-hydroxy-3-butene or 2-hydroxy-4-pentene, and said acid-acceptor material is present in a proportion at least equivalent on a molar basis to the said allylic halide ingredient.

3,970,706
PROCESS FOR SYNTHESIZING CIS-α-SANTALENE AND CIS-α-SANTALOL

Marc Julia, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 22, 1973, Ser. No. 390,490

Claims priority, application France, Aug. 25, 1972, 72.30302

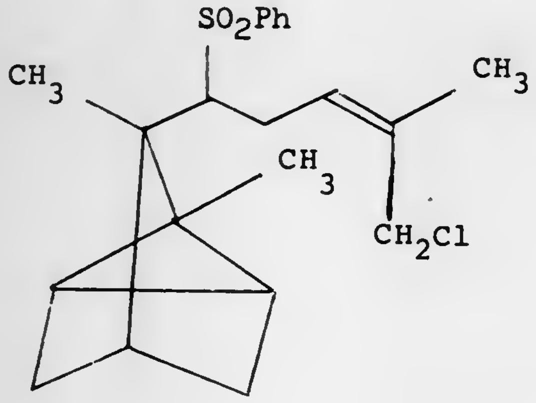
Int. Cl.² C07C *33/05, 147/08, 69/145*

U.S. Cl. 260—617 F **3 Claims**

1. Process for the preparation of cis α-santalol comprising the following stages:

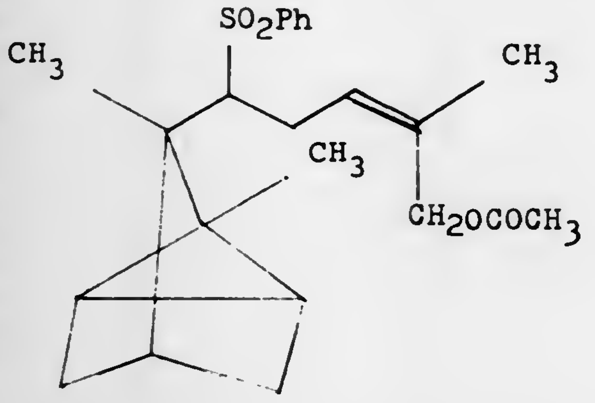
a. treating π-bromotricyclene with sodium benzene sulphinate in dimethylformamide to form the corresponding phenylsulphone;

b. treating the phenylsulphone obtained in stage (a) in presence of butyl lithium in a mixture of tetrahydrofuran/HMPT or THF/tetramethylethylene diamine with the cis 1, 4-dichloro-2-methyl-2-butene to form a compound corresponding to the following formula:



(C)

c. the compound (C) is treated with sodium acetate in dimethylformamide to form a compound corresponding to the following formula:



(D)

d. the compound obtained in stage (c) is treated with sodium amalgam to form the compound cis α-santalol.

3,970,707
METHOD FOR PREPARING 3,5,3′,5′-TETRABROMO-2,4,2′,4′-TETRAOXYDIPHENYL

Vasily Ivanovich Shvedov, ulitsa M. Ulyanovoi, 9, korpus 3, kv. 11; Alexei Nikolaevich Grinev, Belyaevo-Bogorodskoe, kvartal 44, korpus 9, kv. 57, and Evgenia Nikolaevna Sytina, 5 parkovaya ulitsa, 64, korpus 2, kv. 93, all of Moscow, U.S.S.R.

Filed Apr. 11, 1974, Ser. No. 460,104

Int. Cl.² C07C *37/00*

U.S. Cl. 260—620 **6 Claims**

1. A method which comprises reacting 2,4,2′,4′-tetramethoxydiphenyl with an acid agent selected from the group consisting of aluminium chloride, aluminium bromide, and hydrogen bromide in acetic acid in the presence of an organic solvent at a temperature up to 120°C, separating 2,4,2′,4′-tetraoxydiphenyl from the reaction mixture and reacting the separated product with bromine in the presence of an organic solvent to form 3,5,3′,5′-tetrabromo-2,4,2′,4′-tetraoxydiphenyl, and recovering the end product.

3,970,708
PROCESS FOR REMOVING ALUMINUM PHENOXIDE CATALYST FROM PHENOL ALKYLATION PRODUCTS

Kiyoshi Katsumoto, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 26, 1974, Ser. No. 536,500

Int. Cl.² C07C *39/06*

U.S. Cl. 260—624 C **3 Claims**

1. In a process for removing aluminum phenoxide catalyst from ortho-alkylphenols produced by the reaction of phenol with an olefin in the presence of aluminum phenoxide catalyst wherein the catalyst is removed at the termination of the reaction by the addition of from 3 to 12 mols of water per atom of aluminum to the reaction product at a temperature of from about 0° to 230°C to form a precipitate followed by filtration of the precipitate from the reaction product mixture the improvement which comprises adding from about 0.05 to 5.0 parts of a neutral monomeric inorganic salt of a polyvalent anion and an alkali metal or ammonium cation selected from the group consisting of sulfates, silicates, phosphates, and carbonates to said mixture prior to filtration.

3,970,709
ADHESIVE FORMULATIONS FOR BONDED METAL ASSEMBLIES WITH RESISTANCE TO AGGRESSIVE ENVIRONMENTS

William J. Owston, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 298,352, Oct. 17, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,654

Int. Cl.² C08L *83/06*

U.S. Cl. 260—827 **10 Claims**

1. An adhesive composition comprising a polymerizable mixture consisting essentially of:

A. about 75 to about 99% of a polymerizable liquid resin comprising at least one compound having at least one terminal >C=CH₂ group;

B. about 0.5 to about 15% of ethylenically unsaturated carboxylic acid; and

C. about 0.5 to about 10% of an organosilicon compound represented by the formula $X_3Si(CH_2)_mY$ in which *m* is an integer from 0 to 3, Y is an organo-functional group and X is a group selected from the group consisting of hydrolyzable groups and hydrolyzed groups.

3,970,710
PROCESS FOR MAKING TRIFLUOROETHANOL

Stephen Wolownik, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 9, 1975, Ser. No. 566,553

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **4 Claims**

1. The process of preparing 2,2,2-trifluoroethanol comprising the single step of heating a mixture of trifluoroacetyl chloride and hydrogen in the presence of palladium supported by alumina at a temperature of 100°–300° C. and condensing the formed 2,2,2 - trifluoroethanol at a temperature below its boiling point.

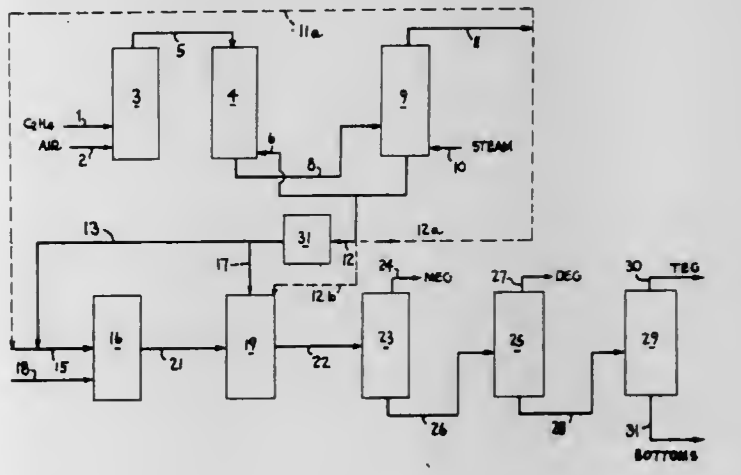
3,970,711
METHOD OF PRODUCING GLYCOLS

Charles Ronald Reiche, and Jerry A. Heckman, both of Beaumont, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 19, 1971, Ser. No. 163,579

Int. Cl.² C07C *29/00, 29/24*

U.S. Cl. 260—635 E **4 Claims**



1. In the process of producing ethylene glycol in an ethylene glycol reaction system by hydrolysis of ethylene oxide wherein ethylene oxide, which is produced by direct oxidation of ethylene, is absorbed in water in an absorbing vessel to form an ethylene oxide-water mixture, ethylene oxide is stripped from the ethylene oxide-water mixture in a stripping vessel, and ethylene glycol-containing water from the stripping vessel is recycled to the absorbing vessel, the improvement which comprises removing a portion of the ethylene glycol-containing water as a purge stream, improving the ultraviolet light transmittance of ethylene glycol-containing water purge stream by contacting it at a temperature of at least 80°F. with an adsorbent selected from the group consisting of carbon, silica, silica gel, alumina, Fuller's earth, porous glass and diatomaceous earth, forwarding ethylene glycol-containing water of improved ultraviolet light transmittance to the ethylene glycol reaction system and recovering ethylene glycol that is suitable for fiber manufacture from the ethylene glycol reaction system.

3,970,712
HYDROLYSIS OF OAT HUSKS

Hermann Friese, Berlin, Germany, assignor to Sud-Chemie AG, Munich, Germany

Filed Nov. 13, 1974, Ser. No. 523,456

Claims priority, application Germany, Nov. 23, 1973, 2358472

Int. Cl.^{2} C07C *29/00;* **C07G** *1/00;* **C13K** *1/02, 13/00*

U.S. Cl. 260—635 C 31 Claims

1. A process for the hydrolysis of oat husks which comprises:
   - a. hydrolyzing oat husks with a solvent containing at least one member selected from the group consisting of alkali metal hydroxide and alkali metal chlorite to provide oat husks from which the chemically bound acetic acid originally present therein has been substantially completely removed, and a solution of acetic acid;
   - b. recovering the oat husks from which the chemically bound acetic acid has been substantially removed; and
   - c. hydrolyzing the oat husks of step (b) with a mineral acid to provide a solid residue containing lignin and an acidic solution of D-(+)-xylose.

3,970,713
PROCESS FOR THE PRODUCTION OF ALLYL ALCOHOL

Gerhard Scharfe, Leverkusen; Wulf Schwerdtel, Cologne; Wolfgang Swodenk, Odenthal-Globusch; Bruno Engelhard, Cologne; Johann Grolig, Leverkusen; Manfred Martin, Cologne, and Karl-Hermann Reissinger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 50,341, June 26, 1970, abandoned. This application Mar. 8, 1974, Ser. No. 449,418

Claims priority, application Germany, July 2, 1969, 1933538; Mar. 3, 1970, 2009742

Int. Cl.^{2} C07C *29/00*

U.S. Cl. 260—638 R 18 Claims

1. Process for the production of allyl alcohol which comprises
   - a. reacting propylene, oxygen and acetic acid in the gaseous phase over a palladium-containing catalyst consisting essentially of palladium metal, an alkali metal acetate, and optionally a Group IV to VIII metal, copper or gold or a compound yielding such metal, said catalyst being free of halogen, sulfur and nitrogen, in the presence of 5 to 20 moles of water per mole of acetic acid at temperatures of from 50° to 250°C.;
   - b. condensing the gaseous reaction product to form a condensate comprising allyl acetate, acetic acid and water;
   - c. treating said condensate with an acid cation exchanger catalyst in the liquid phase at temperatures of from 50° to 150°C. in an acid catalyst treatment stage; and
   - d. after removal of the catalyst, separating the reaction product obtained in a first distillation column into a first head product consisting essentially of a ternary azeotrope of allyl acetate, allyl alcohol and water, and into a first sump product consisting essentially of acetic acid, allyl alcohol and water;
   - e. recycling at least part of the first head product from said first distillation column to the said acid catalyst treatment stage;
   - f. separating the first sump product from said first distillation column in a second distillation column into a second head product, consisting essentially of the azeotrope of allyl alcohol and water, and into a second sump product consisting essentially of acetic acid and water;
   - g. recycling the second sump product to the initial reaction of propylene with oxygen and acetic acid; and
   - h. removing the allyl alcohol-water azeotrope.

3,970,714
HEAT-STABLE POLYIMIDE RESIN MODIFIED BY UNSATURATED POLYESTER

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 228,232, Feb. 22, 1972. This application Mar. 5, 1974, Ser. No. 448,262

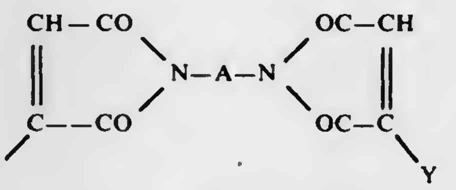
Claims priority, application France, Feb. 24, 1971, 71.06289

Int. Cl.^{2} C08L *77/00*

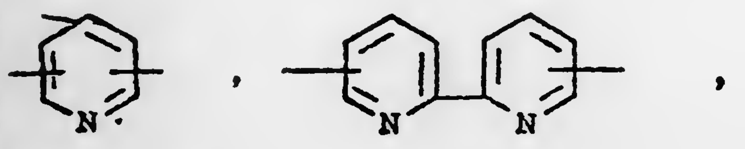
U.S. Cl. 260—857 PE 18 Claims

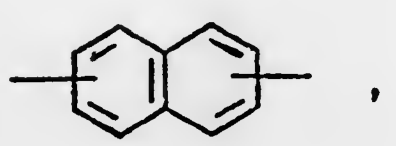
1. A heat-stable cured resin consisting essentially of a three-dimensional polyimide which is obtained by reacting at between about 50°C. and 350°C. at least one reactant from each of the following four groups:

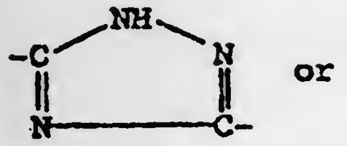
i. a bis-imide of the general formula:



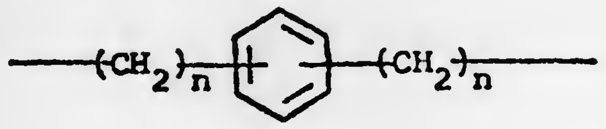
in which Y denotes H, CH_3 or Cl, and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of formulae:



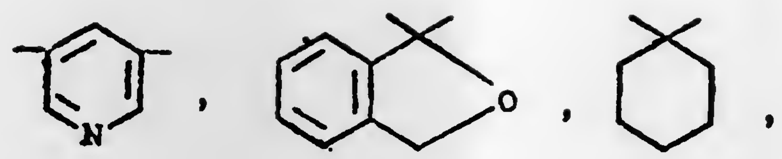


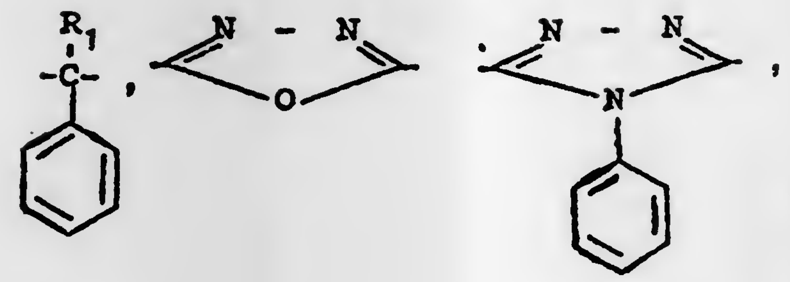


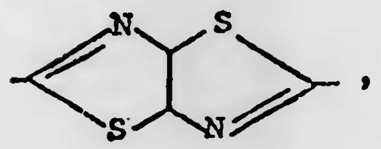
or

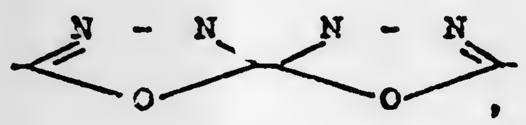


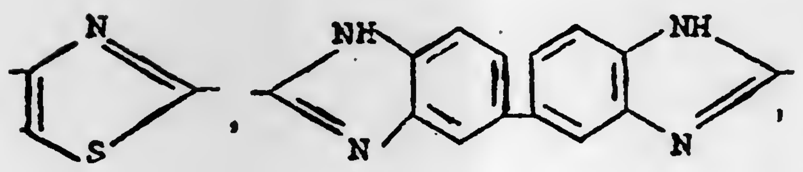
wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—; —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CUN—x—NHCO—,

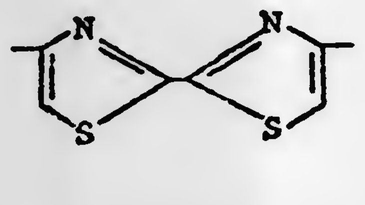










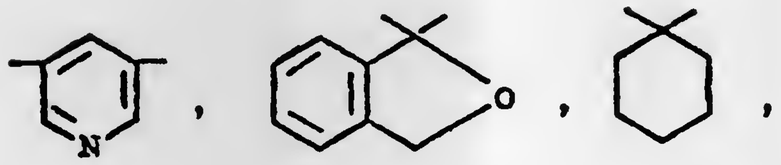


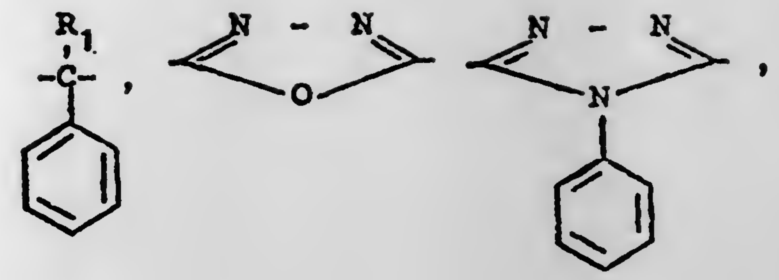
wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

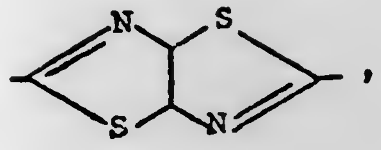
ii. a polyamine of the general formula:

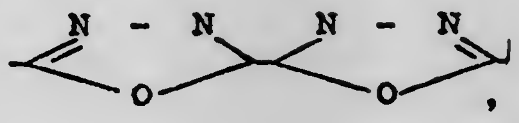
$R\ (NH_2)_x$

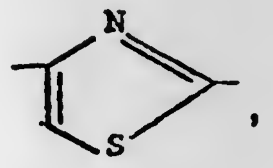
in which *x* represents an integer from 2 to 5 and R denotes an organic radical of valency *x* and selected from the group consisting of a 3 to 5 valent benzene, methylbenzene, naphthalene, pyridine or triazine radical, a 3 to 5 valent radical consisting of phenylene radials bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CONH-X-NHCO—

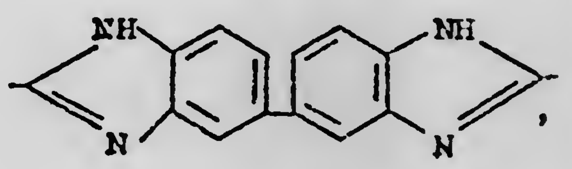


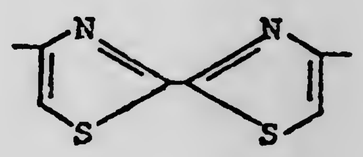




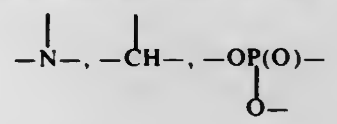






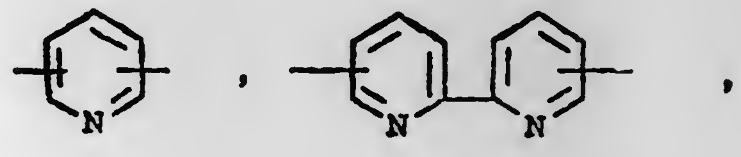


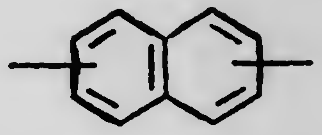
wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

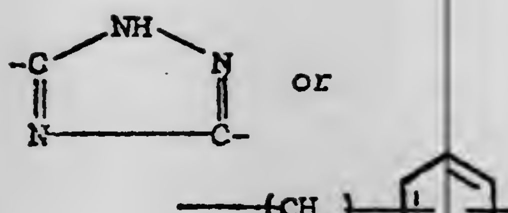


$$-\overset{|}{N}-,\ -\overset{|}{C}H-,\ -O\underset{\underset{O-}{|}}{P}(O)-$$

and —P(O)—; a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formulae:







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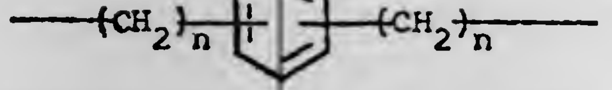
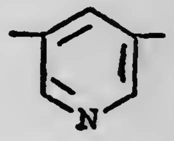


wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N<N—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,



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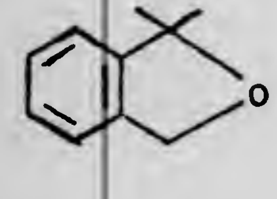

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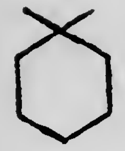

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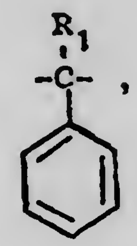

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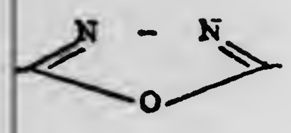

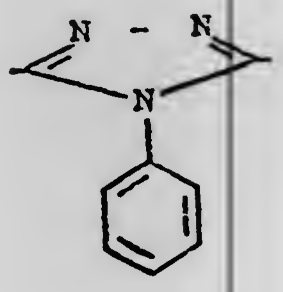

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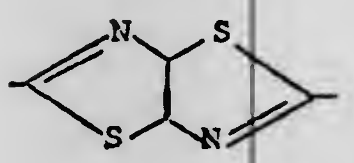

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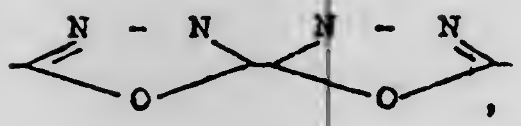

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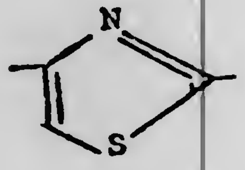

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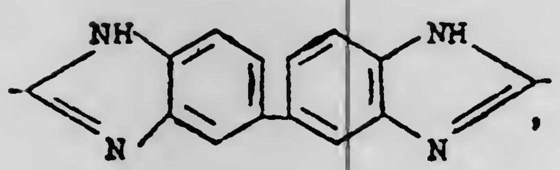

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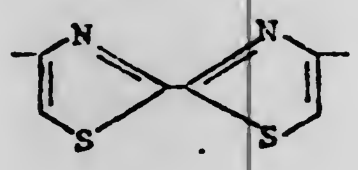

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wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical;

iii. an alazine of the general formula:
G - CH = N - N = CH - G

in which G represents a monovalent carbocyclic aromatic radical, and

iv. an unsaturated polyester of at least one polycarboxylic acid and at least one polyol, at least one containing olefinic unsaturation in an amount from 5 to 50% by weight based on the total weight of the reactants (i), (ii) and (iii)

in such amounts that if N_1 represents the number of mols of bis-imide employed, N_2 represents the number of mols of polyamine employed and N_3 represents the number of mols of alazine employed, the ratio

$$\frac{N_1}{\frac{2N_2}{x} + N_3}$$

is from 1.5 to 10, *x* being defined as above.

3,970,715
THERMOPLASTIC POLYURETHANES MIXED WITH ETHYLENE COPOLYMERS

Graham Jarrett, Hitchin, England, assignor to Imperial Chemical Industries Limited, London, England
Filed June 21, 1974, Ser. No. 482,028
Claims priority, application United Kingdom, July 30, 1973, 36137/73
Int. Cl.² C08L *75/04*
U.S. Cl. 260—859 R **6 Claims**

1. A process for the manufacture of a thermoplastic polyurethane elastomer composition having a reduced tendency to blocking compared with the thermoplastic polyurethane elastomer itself, which comprises forming a thermoplastic polyurethane elastomer of high tensile strength by reacting an organic diisocyanate with an aliphatic polymeric diol of molecular weight greater than 800 and a chain-extending agent which consists of a diol of molecular weight less than 250, the reactants being free from ethylenic unsaturation, and thereafter blending the thermoplastic polyurethane elastomer with from 1 to 5% by weight, based on the polyurethane, of an ethylene copolymer consisting of 98.3 to 79 molar % of ethylene copolymerized with from 1.7 to 21 mole % of an unsaturated ester of a fatty acid, said ester containing from 3 to 8 carbon atoms.

3,970,716
FLAME RESISTANT THERMOPLASTIC BLEND

Carl A. Evers, Naugatuck; Harold G. Wolf, Jr., Waterbury, and Howard S. Kravitz, Naugatuck, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.
Filed June 5, 1974, Ser. No. 476,344
Int. Cl.² C08L *75/00*
U.S. Cl. 260—859 R **15 Claims**

1. A flame resistant thermoplastic composition comprising a blend of

a. a thermoplastic polyurethane elastomer essentially devoid of ethylene unsaturation and free —NCO groups,
b. a chlorinated polyethylene having a chlorine content of 25 to 50 percent by weight,
c. a flame retardant selected from the group consisting of 1,2,3,4,7,8,9,10,13,13,14,14-dodecaachloro-1,4,4a,-6a,7,10,10a12a-octahydro-1,4:7,10-dimethano-dibenzocyclooctane, 1,2,3,4,5,6,7,8,10,10,11,11-dodecachloro-1,4,4a,4b,5,8,8a,9a-octahydro-1,4:5,8-dimethano-dibenzofuran, 6-(1′,4′,5′,6′,7′,7′-hexachloronorborn-5′-en-2′-yl)-1,2,3,4,10,10-hexachloro-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene, and 6-(1′,4′,5′,6′,7′,7′-hexachloronorborn-5′-en-2′-yl)-1,2,3,4,10,10,-hexachloro-1,4,4a,5,6,7,8,8a-octahydro-1,4-methano-naphthalene, wherein

the weight ratio of (a) to (b) in said blend is within the range from 90:10 to 60:40 and the mount of (c) is from 15 to 25 parts per 100 parts by weight of (a) plus (b).

3,970,717
SATURATED HYDROXY POLYESTER URETHANES AND STYRENE COPOLYMERS

Horst Müller-Albrecht, Cologne; Bernd Quiring, Leverkusen; Manfred Dollhausen, Hitdorf, and Jochen Wulff, Benrath, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Nov. 11, 1974, Ser. No. 522,399
Claims priority, application Germany, Nov. 9, 1973, 2355942
Int. Cl.² C08L *75/00*
U.S. Cl. 260—859 R **5 Claims**

1. A composition of matter comprising:

A. an hydroxy polyester urethane having a molecular weight above about 30,000, said urethane derived from
  1. a saturated polyester with a molecular weight above about 600,
  2. from 0 to 400 mol percent based on polyester (1) of a diol chain-lengthening agent having a molecular weight of between about 62 and about 300, and
  3. an organic polyisocyanate, and
B. a polymer selected from the group consisting of
  i. copolymers of styrene and/or α-methyl styrene with at least one other olefinically unsaturated monomer, and
  ii. mixtures of (i) with a rubbery elastic polymer,

wherein the weight ratio of component (A) to component (B) is between 1:0.5 and 1:3.

3,970,718
METHOD OF PRODUCING POLYMER COMPOSITIONS BASED ON CHLORINATED POLYETHYLENE

Akira Takahashi, Megurizawa; Hiroo Kojima, Seki; Masao Ogawa, Minami-Karasuyama; Hiroshi Osuka, Yokohama, and Shoichi Kobayashi, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 134,826, April 16, 1971, Pat. No. 3,887,648, which is a continuation-in-part of Ser. No. 784,517, Nov. 22, 1968, Pat. No. 3,673,279, which is a continuation-in-part of Ser. No. 339,899, Jan. 24, 1964, Pat. No. 3,406,251. This application Jan. 28, 1975, Ser. No. 544,706
Int. Cl.² C08L *51/00, 53/00*
U.S. Cl. 260—876 R **15 Claims**

1. A method for producing a blended polymer composition comprising blending

I. an interpolymer prepared by contacting
  A. a polymer component selected from the group consisting of chlorinated polyethylene of a degree of chlorination of 10–50 percent and a mixture consisting of 50–90 percent by weight of said chlorinated polyethylene and 10–50% by weight of a copolymer selected from an ethylene-propylene copolymer rubber, an ethylene-propylene-nonconjugated diene terpolymer rubber and an ethylene-vinyl acetate copolymer rubber, with
  B. a monomer mixture comprising
    b_1. at least one monomer selected from styrene, alphamethyl styrene, t-butyl styrene and chloro-styrene and
    b_2. at least one monomer selected from acrylonitrile and methacrylonitrile

under polymerization conditions in the presence of a polymerization initiator to form an interpolymer of components (A) and (B) wherein the polymer component (A) and monomer component (B) are suspended in the form of fine particles in a state of separation from each other in an aqueous medium, said component (A) having a particle size of 5–150 Tyler mesh, the weight ratio of said component (A) to component (B) ranging from about 10:90 to about 90:10 with

II. a polymer separately prepared from said component (B), the overall weight ratio of component (A) to component (B) in said blended copolymer being from 5:95 to 50:50.

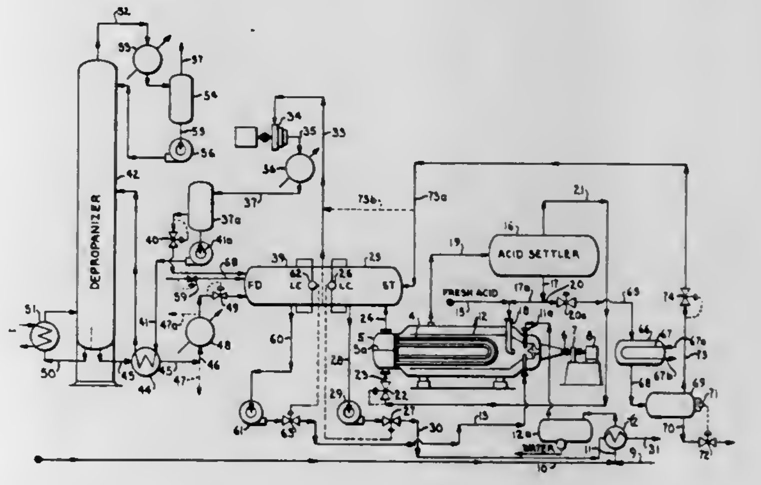
3,970,719
PREPARATION OF BLOCK COPOLYMERS

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 16, 1958, Ser. No. 709,194
Int. Cl.² C08L *23/00;* **C08F** *297/08*
U.S. Cl. 260—878 B **8 Claims**

1. A block copolymer comprising a first polymer block of a homopolymer of propylene and ajacent thereto a second polymer block of a copolymer of ethylene and propylene.

3,970,720
RECOVERY OF HYDROCARBONS FROM ACID SETTLER BOTTOMS

Charles L. West, Shawnee Mission, Kans., assignor to Stratford Engineering Corporation, Kansas City, Mo.
Filed May 30, 1974, Ser. No. 474,814
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.62 **6 Claims**



1. A process of alkylation of paraffinic hydrocarbons by olefinic hydrocarbons in the presence of sulfuric acid catalyst in a reaction step wherein:

a. a reaction mixture of hydrocarbons and sulfluric acid catalyst is withdrawn from said reaction step,
b. the sulfuric acid catalyst phase is separated from the hydrocarbon phase in a settling step,
c. a major portion of said catalyst phase from said settling step is returned to said reaction step and a minor portion of said catalyst phase is treated to separate absorbed hydrocarbons prior to withdrawing said phase from the alkylation process as a spent acid stream,
d. said reaction step and settling step being maintained under sufficient pressure that said reaction mixture, said hydrocarbon phase and said catalyst phase are held in liquid state,
e. the pressure is reduced on the hydrocarbon phase from said settling step to vaporize volatile hydrocarbons and thus refrigerate said hydrocarbon phase and
f. said refrigerated hydrocarbon phase is passed in indirected heat exchanging relationship with said reaction step to lower the temperature thereof and vaporize further volatile hydrocarbons,
g. said hydrocarbon phase from said indirect heat exchanging relationship with said reaction step being passed to a first vapor-liquid separating step wherein a vapor portion of said hydrocarbon phase is separated from a liquid portion thereof and said liquid and said vapor portions being separately removed from said first separating step, the improvement which comprises:

- h. heating said spent acid stream prior to withdrawing the same from said process and passing said heated stream to a second vapor-liquid separating step to separate said absorbed hydrocarbons from said spent acid,
- i. returning separated hydrocarbons from said second separating step to said first separating step,
- j. and withdrawing spent liquid acid from said second separating step.

3,970,721
ALKYLATION PROCESS FOR PRODUCTION OF MOTOR FUELS UTILIZING SULFURIC ACID CATALYST WITH TRIFLUOROMETHANE SULFONIC ACID

James W. Brockington, and Richard H. Bennett, both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,401

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.63 **7 Claims**

1. In a liquid phase alkylation process for alkylating C_4-C_6 isoparaffins with C_3-C_5 mono-olefins to form alkylate hydrocarbon products; the improvement which comprises:

contacting, in an alkylation zone, isoparaffin and olefin reactants with a catalyst comprising a minor portion CF_3SO_3H and a major portion H_2SO_4, and containing about 0–3 weight percent water, and about 0–10 weight percent acid oils.

5. In a liquid phase alkylation process wherein isobutane is alkylated with olefin hydrocarbons selected from the group consisting of propylene, butylenes and mixtures thereof to form highly branched alkylate hydrocarbons suitable for use in gasoline, wherein isobutane and olefin reactants are contacted in a reaction zone, in a volume ratio of isobutane to olefin of from about 2/1 to about 20/1, at a temperature of from about 0°F to about 100°F, under mixing conditions, and in the presence of a strong acid alkylation catalyst such that the reaction mixture comprises about 40–60 volume percent hydrocarbon phase and 60–40 volume percent acid phase; the improvement which comprises:

contacting isobutane and said olefin reactants in the reaction zone at an olefin space velocity of from about 0.1 to about 1.0 volumes olefin per hour per volume catalyst with an acid catalyst comprising trifluoromethane sulfonic acid and sulfuric acid in a weight ratio of 0.166/1.

3,970,722
METHOD FOR PREPARING A MODIFIED CRYSTALLINE PROPYLENE POLYMER

Sadahide Ogihara, Fujisawa; Yoichi Nakamura, Yono, and Osamu Fukui, Toyonaka, all of Japan, assignors to UBE Industries, Ltd., Tokyo, Japan

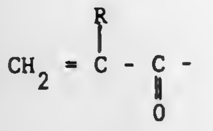
Filed Feb. 14, 1975, Ser. No. 549,863

Claims priority, application Japan, Mar. 5, 1974, 49-24811

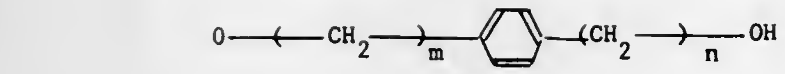
Int. Cl.² C08F *255/02*

U.S. Cl. 260—878 R **12 Claims**

1. A method for preparing a modified crystalline propylene polymer usable as a bonding agent, comprising heating a crystalline propylene polymer uniformly mixed with a modifying composition, said modifying composition consisting of an organic peroxide and at least one modifying agent selected from the group consisting of the ethylenically unsaturated organic compounds of the formula



$$CH_2=\overset{\displaystyle R}{\overset{|}{C}}-\underset{\displaystyle O}{\underset{\|}{C}}-$$



wherein R represents a hydrogen atom or methyl radical, and *m* and *n* represent 0 or 1 respectively, wherein said modifying agent is used in an amount of 0.1 to 7.0% based on the weight of said crystalline propylene polymer, wherein said organic peroxide is used in an amount of 0.1 to 5% based on the weight of said crystalline propylene polymer, and wherein said organic peroxide is used in an amount of 5 to 80% based on the weight of said modifying agent, said heating being conducted at a temperature lower than the thermal decomposing point but not lower than the melting point of said crystalline propylene polymer.

3,970,723
IMPREGNATING AND ENCAPSULATING COMPOSITION FOR USE WITH TYPE TRANSFORMERS AND TRANSFORMERS CONTAINING SUCH COMPOSITION

Robert D. Mees, and Gordon M. Bell, both of Fort Wayne, Ind., assignors to General Electric Company, Carmel, Ind.

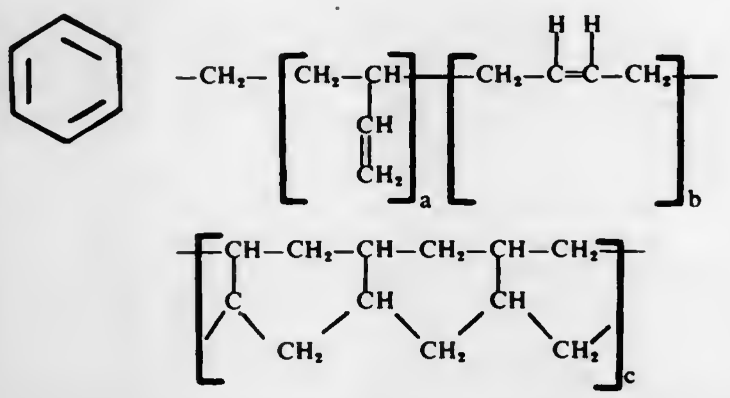
Filed July 31, 1974, Ser. No. 493,342

Int. Cl.² C08L *9/00*

U.S. Cl. 260—880 R **14 Claims**

1. A resin system for use in the insulation of electrical equipment comprising the reaction product of:

a. 100 parts of a butadiene polymer having the formula:



where *a* is from 0.40 to 0.80, *b* is from 0.10 to 0.20, and *c* is from 0.15 to 0.35, the sum of *a*, *b*, and *c* being sufficient for the polymer to have a molecular weight of from 1700 to 2100;
b. from 10 to 34 parts, by weight, of a vinyl monomer selected from the class consisting of t-butyl styrene and vinyl toluene; and

c. from 5 to 11 parts, by weight, trimethylol propane trimethacrylate.

3,970,724
PROCESSING METHOD FOR SYNTHETIC RUBBERS

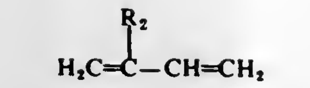
Emanuel Schoenberg, Brimfield, and Thomas L. Hanlon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 27, 1973, Ser. No. 401,317

Int. Cl.² C08L *9/00*

U.S. Cl. 260—894 **2 Claims**

1. A process for preparing a mixture of high cis-1,4 configuration polymer and high trans-1,4 configuration polymer comprising the steps of contacting monomers conforming to the structural formula



$$H_2C=\overset{\displaystyle R_2}{\overset{|}{C}}-CH=CH_2$$

wherein R_1 may be an alkyl group containing from 1 to 2 carbon atoms, with a catalyst based on an organoaluminum compound with titanium tetrachloride to produce a desired amount of high cis-1,4 configuration polymer and subsequently adding, in the presence of the cis producing catalyst, a catalyst based on organoaluminum compounds with compounds selected from the group consisting of vanadium trichloride, vanadium tetrachloride and vanadium oxychloride to form a high trans-1,4 configuration polymer wherein the mole ratio of the aluminum/titanium in the cis producing catalyst is from about 0.6 to about 1.2 and the mole ratio of the aluminum/vanadium in the trans producing catalyst is from about 3.0 to about 10.0.

3,970,725
POWDERY COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Nagaokakyo, both of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Sept. 25, 1973, Ser. No. 400,621

Claims priority, application Japan, Sept. 26, 1972, 47-96541; Oct. 28, 1972, 47-108306

Int. Cl.² C08L *33/08*

U.S. Cl. 260—901 **7 Claims**

1. A powdery coating composition comprising polymer particles having an average particle size within the range of 0.5 to 200μ and composed of, as a core component, an acrylic copolymer having a softening point not exceeding 90°C. and containing 5 to 60% by weight of units of a monomer whose homopolymer has a T*g* lower than 0°C. and, as an outer component, an acrylic polymer having a softening point of at least 100°C. and containing at least 60% by weight of units of a monomer whose homopolymer has a T*g* higher than 50°C., wherein the weight ratio of the core component to the outer component is within a range from 50/50 to 100/1, and said outer component covers said core component.

3,970,726
POLYCYCLIC PHOSPHATE ESTERS AND PROCESS FOR PREPARING SAME

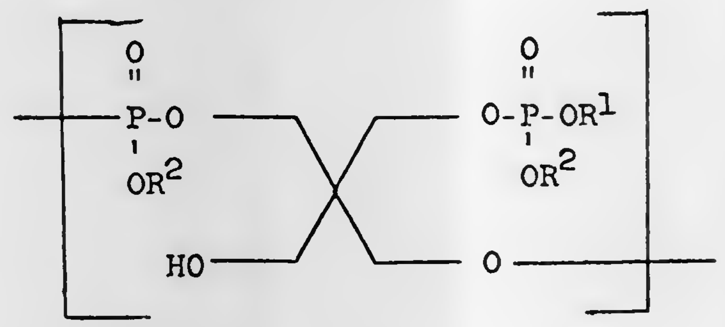
Wadim Batorewicz, New Haven, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,289

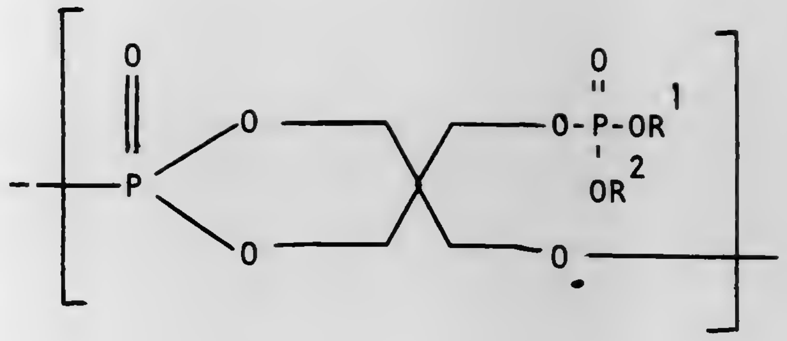
Int. Cl.² C07F *9/15;* **C08J** *9/00*

U.S. Cl. 260—927 R **13 Claims**

1. A phosphate ester having the formula $RO—(A)_m(B)_n]H$ wherein A has the structural formula



and B has the structural formula



wherein R,R¹ and R² are the same or different and are linear or branched primary radicals selected from alkyl having 1 to 6 carbon atoms, and haloalkyl and hydroxyalkyl having 2 to 6 carbon atoms; *m* and *n* are integers from 0 to about 4 and the sum of *m* plus *n* is from 1 to about 4.

6. A method for preparing the phosphate ester of claim 1 comprising:

- a. reacting a polycyclic compound (I) having the formula $(C_5H_8O_4P_2)X_uY_v$, wherein X is bromine or chlorine, Y is OR^3, wherein R^3 is an alkyl group having 1 to 6 carbon atoms or an haloalkyl group having 2 to 6 carbon atoms, *u* and *v* are integers with values of 0, 1 or 2, and the sum of *u* plus *v* is 2; with (II) a primary alcohol of the formula HOQ, wherein Q has the meanings of R^3 or is a primary hydroxyalkyl group having 2 to 6 carbon atoms, in the presence of (III) Cl_2;
- b. the molar ratio of (II) to (I) being equal to from about $(2u + v):1$ to $10\ (2w + v):1$, said ratio not exceeding a value of 20;
- c. the molar ratio of (III) to (I) being from 2 to 2.2, and
- d. the temperature being from −20° to 80°C.

3,970,727
HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS

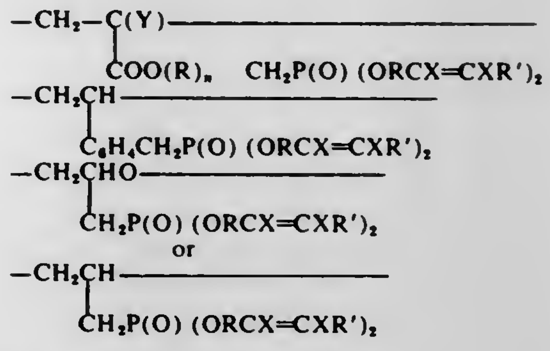
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Division of Ser. No. 383,599, July 30, 1973, Pat. No. 3,900,536, which is a continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application Jan. 9, 1975, Ser. No. 539,812

Int. Cl.² C07F *9/40*

U.S. Cl. 260—932 **9 Claims**

1. A phosphorus-halogen-containing polymer having at least five repeating units of the formula



$$—CH_2—\underset{\displaystyle COO(R)_n \quad CH_2P(O)\,(ORCX{=}CXR')_2}{\underset{|}{C}(Y)}—$$

$$—CH_2\underset{\displaystyle C_6H_4CH_2P(O)\,(ORCX{=}CXR')_2}{\underset{|}{C}H}—$$

$$—CH_2\underset{\displaystyle CH_2P(O)\,(ORCX{=}CXR')_2}{\underset{|}{C}HO}—$$

or

$$—CH_2\underset{\displaystyle CH_2P(O)\,(ORCX{=}CXR')_2}{\underset{|}{C}H}—$$

wherein Y represents H, CH_3 or Cl;

X represents Cl or Br;

R represents a divalent hydrocarbon radical of 2–20 carbon atoms;

R' represents H, X or R'';

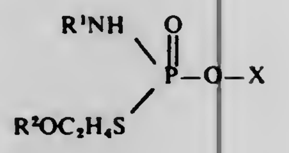
R'' represents a monovalent hydrocarbon radical of 1–20 carbon atoms and

n'' represents an intager having a value of D or I.

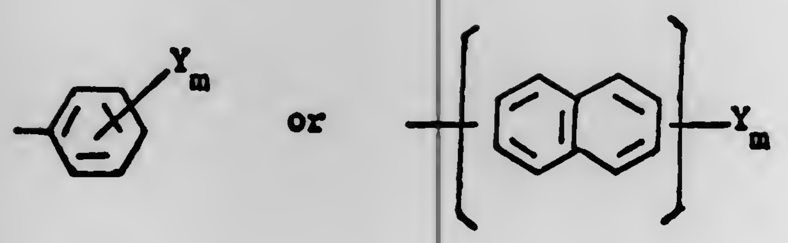
3,970,728
O-ARYL-ALKOXYETHYL-THIOLPHOSPHORIC ACID ESTER

Shigeo Kishino, Tokyo; Akio Kudamatsu, Kanagawa; Shozo Sumi, Tokyo, and Kozo Shiokawa, Kanagawa, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Division of Ser. No. 298,911, Oct. 19, 1972, Pat. No. 3,822,328. This application Mar. 29, 1974, Ser. No. 456,481
Claims priority, application Japan, Oct. 21, 1971, 46-83487
Int. Cl.² C07F *9/24*; A01N *9/36*
U.S. Cl. 260—949 **10 Claims**

1. An O-aryl-S-alkoxy-ethyl-thiolphosphoric acid ester amide of the formula

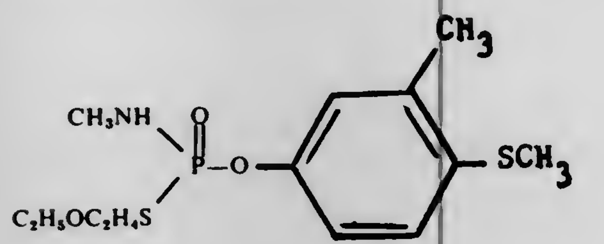


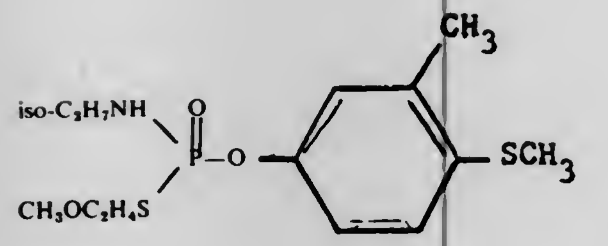
in which
R¹ is hydrogen or lower alkyl,
R² is lower alkyl, and
X is a group of the formula

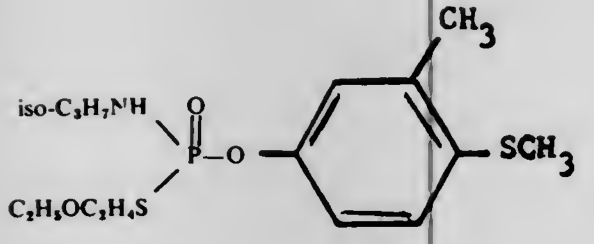


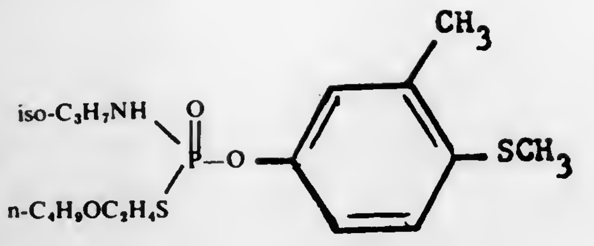
in which
m is 1, 2 or 3, and
each Y independently is lower alkoxy, lower alkylmercapto or lower alkoxycarbonyl.

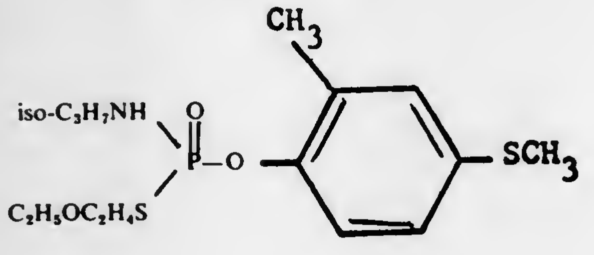
4. An O-aryl-S-alkoxy-ethyl-thiolphosphoric acid ester amide selected from the group consisting of

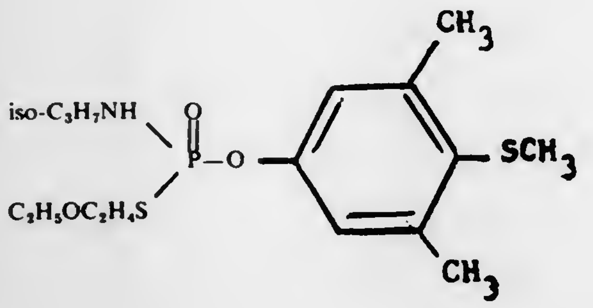








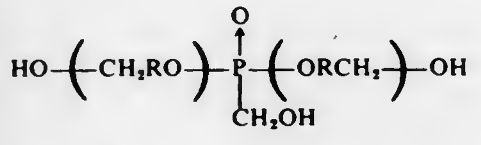




3,970,729
PROCESS OF SYNTHESIZING DI-POLYOXYLALKYLENE HYDROXYMETHYLPHOSPHONATE

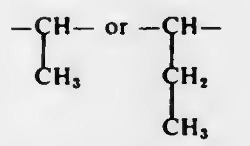
Edward N. Walsh, New City, and Kyung Sup Shim, Irvington, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.
Filed Aug. 5, 1974, Ser. No. 494,685
Int. Cl.² C07F *9/40*; C08F *2/44*
U.S. Cl. 260—978 **7 Claims**

1. A method of preparing compounds of the structural formula:



$$HO\left(CH_2RO\right)\overset{\overset{\displaystyle O}{\uparrow}}{\underset{\displaystyle CH_2OH}{\underset{|}{P}}}\left(ORCH_2\right)OH$$

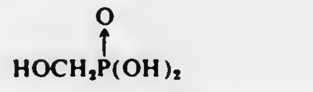
wherein R is CH_2,



$$\underset{\displaystyle CH_3}{\underset{|}{-CH-}} \text{ or } \underset{\underset{\displaystyle CH_3}{|}}{\underset{\displaystyle CH_2}{\underset{|}{-CH-}}}$$

and $n+m = 2-10$; comprising the steps of:

a. contacting phosphorous acid with a reactant selected from the group consisting of formaldehyde and formaldehyde polymers at a temperature between about 90°C. and 150°C. to form an intermediate compound of the structural formula:

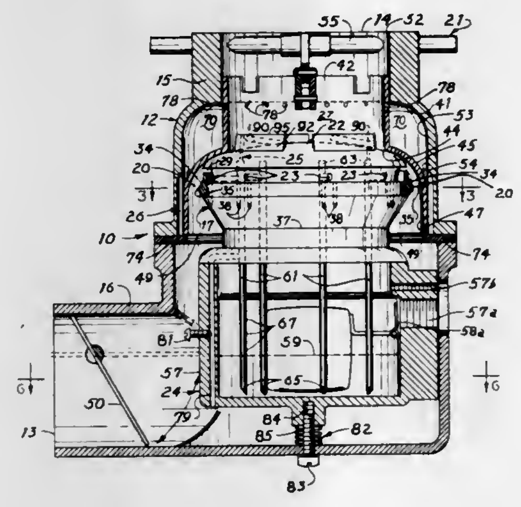


$$HOCH_2\overset{\overset{\displaystyle O}{\uparrow}}{P}(OH)_2 \qquad (II)$$

b. contacting said intermediate compound with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide or butylene oxide at a temperature between about 30°C. and 100°C. to form a compound of structural formula (I).

3,970,730
VARIABLE VENTURI CARBURETOR

Clinton L. Graybill, P.O. Box 396, Superior, Mont. 59872
Filed Feb. 7, 1975, Ser. No. 548,166
Int. Cl.² F02M *7/24*
U.S. Cl. 261—41 D **17 Claims**

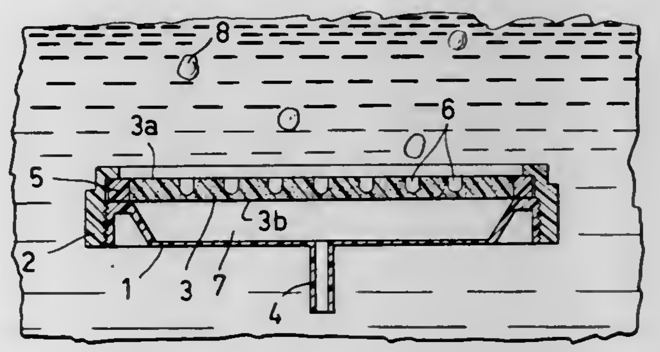


1. A carburetor for an internal combustion engine, comprising:
an induction duct having an open air intake end, an intermediate mixing chamber and a remaining end adapted to be mounted to an intake manifold for receiving and guiding air downstream from the intake end through the mixing chamber to the remaining end and into the intake manifold in response to operation of the engine;
a fuel dispensing orifice located within the induction duct;
means for supplying fuel to the fuel dispensing orifice in response to movement of air through the induction tube;
a first venturi member located within the induction duct along a central axis and adjacent the fuel dispensing orifice immediately upstream of the mixing chamber;
a second venturi member located within the induction duct operatively associated and coaxial with the first venturi member to create a restricted cross section across the induction duct;
said second venturi member having a tubular downstream portion with an upstream edge and a downstream edge; an outwardly flared portion extending arcuately outward and upstream from the upstream edge of the tubular downstream portion; a conical upstream portion extending upstream from the outwardly flared portion and having an upstream diameter increasing to an upstream edge; and
throttle means enabling relative selective axial movement of the venturi members to selectively change the area of the restricted cross section and control the flow of air into the intake manifold.

3,970,731
BUBBLE-GENERATING AERATOR

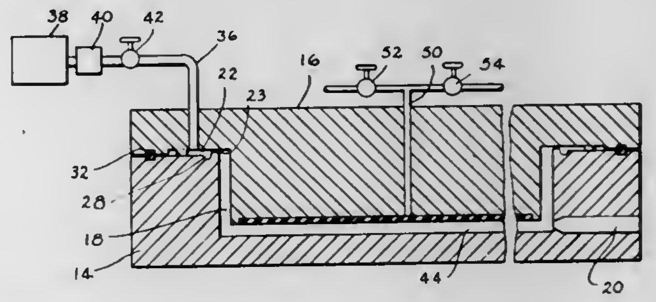
Erkki Olavi Oksman, Mayratie 6 A, Helsinki 80, Finland
Filed Jan. 22, 1975, Ser. No. 543,053
Claims priority, application Finland, Jan. 23, 1974, 185/74
Int. Cl.² B01D *47/02*; C02C *1/12*; C02D *1/00*
U.S. Cl. 261—122 **11 Claims**

1. A bubble aerator comprising and aerating element constituted of a sintered open pore material, said aerating element being of disc shape and having opposite surfaces thereof, and a mounting means supporting said element for supplying air to a first surface thereof while said element is submerged in a liquid and the second surface thereof is exposed to said liquid, said element being provided with recesses in said second surface which recesses have closed bottoms and are larger in size than the pores in the element to collect gas bubbles discharged from the pores and discharge the gas in the form of larger bubbles from the element.



3,970,732
METHOD OF MOLDING RIGID FOAMED POLYURETHANE ARTICLES

Mathew A. Slaats, and David E. Overton, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.
Filed Sept. 26, 1973, Ser. No. 401,114
Int. Cl.² B29D *27/00*
U.S. Cl. 264—40.5 **6 Claims**



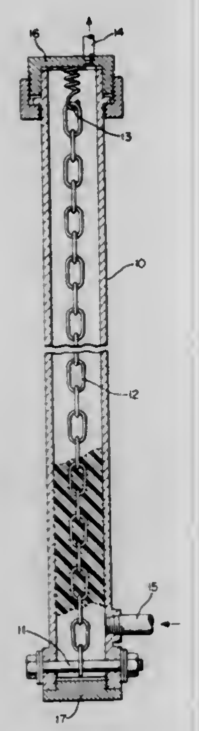
1. The method of making rigid articles of polyurethane foam in which a mixture of a polyol and isocyanate and a blowing agent is supplied to and foamed within a mold which includes separable parts defining a mold cavity therebetween when closed which comprises: injecting the polyol and isocyanate and blowing agent in admixed form to the mold cavity, and applying suction to the cavity via a restricted slit-like gap extending about the periphery of the cavity at the juncture of the mold parts not later than immediately following the injection of the aforementioned mixture into the cavity to cause extremely rapid foaming of the said admixture with expansion and flow thereof to fill the cavity without significant flashing through said gap, admixing said polyol and isocyanate not sooner than immediately prior to the injection thereof to the mold cavity and immediately adjacent the point of entry of the mixture into the cavity, said method furthermore including admixing a liquid blowing agent with at least one of said polyol and isocyanate not later than time of admixing the polyol with the isocyanate.

3,970,733
METHOD OF MAKING AN ENCAPSULATED CHAIN

Louis Seelbach Kraft, Stow, and Thomas E. Burkley, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 16, 1971, Ser. No. 134,595
Int. Cl.² B29D *3/00*
U.S. Cl. 264—135 **2 Claims**

1. A method of encapsulating a metal chain consisting suspending the chain in an elongated chamber, said chain having spacers positioned between each link thereof, coating

the surface of the chamber with a release agent, and then filling the chamber under reduced pressure with an encapsulating agent to cover the links and spacers, reacting the encapsulating agent to give the chain an elastomeric coating.



3,970,734

METHOD OF FORMING A CALIBRATED APERTURE IN A MOLDED ARTICLE

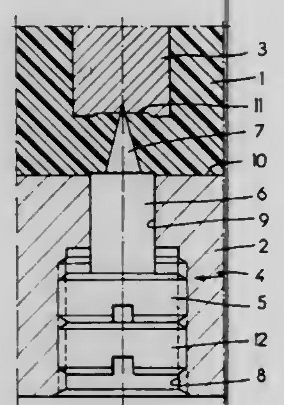
Roland Broux, Monnetier-par-Saint-Jorioz, France, assignor to S.T. Dupont, Paris, France

Filed Feb. 5, 1974, Ser. No. 439,757

Claims priority, application France, Feb. 7, 1973, 73.04230

Int. Cl.² B29F *1/00;* B29C *5/00*

U.S. Cl. 264—219 **7 Claims**



1. A method of molding a part with a tapered passage therein and a calibrated aperture at the end of said passage, said method comprising providing a mold core and a mold wall in spaced relation, mounting a tapered pin in the mold wall for displacement towards the mold core, said pin being formed with an end facing the mold core which is of pointed shape, said pin being formed of a material harder than that of the facing portion of the mold core, moving said pin towards the core to cause said pointed end to penetrate into a face of said core and form its own housing therein so that the pin is supported at both ends thereof, permitting penetration of said tapered pin into said core to a pre-determined depth to obtain a particular cross-sectional area of the tapered pin at the face of the core, injection moulding a material between said mold core and mold wall to form a part having a tapered passage therein defined by said tapered pin with a calibrated aperture at the end of said passage whose size corresponds to that of said particular cross-sectional area of the tapered pin at said face, and removing said pin from said passage and separating said molded part from the molding wall and molding core.

3,970,735

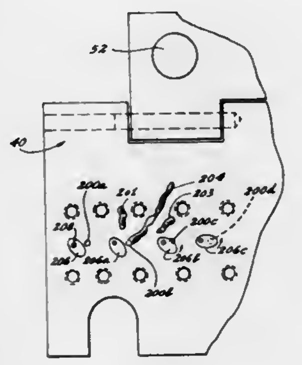
MOLDING METHOD FOR SPLICING ELECTRICAL CABLE

Arthur L. Nelson, La Jolla, Calif., assignor to Townsend and Townsend, San Francisco, Calif.

Continuation of Ser. No. 355,421, April 30, 1973, abandoned, which is a continuation of Ser. No. 115,150, Feb. 26, 1971, abandoned. This application Jan. 31, 1975, Ser. No. 545,948

Int. Cl.² B29C *6/00*

U.S. Cl. 264—272 **2 Claims**



1. A method for insulating high voltage electrical cable comprising the steps of:

providing an elongate mold for placement over a portion of the cable, the mold defining an elongate cavity and including a plurality of relatively small apertures communicating the cavity with the exterior, the apertures being spaced over at least a portion of the length of the cavity;

placing said cable within the mold cavity;

forcing a moldable, electrically insulating vulcanizable material into said mold cavity by applying pressure to the material to thereby flow it into the cavity;

maintaining the apertures in their open position during the forcing step to thereby vent insulating material and entrapped gas from the mold cavity;

closing at least some of the apertures to facilitate the propagation of the material and of the pressure throughout the cavity;

heating the material sufficiently to vulcanize it at an elevated temperature; and

maintaining the elevated temperature and the elevated pressure for a sufficient time to establish a bond between the material and the existing insulation on the cable along their interface.

3,970,736

METHOD OF MANUFACTURING HOLLOW ELEMENTS FROM THERMOPLASTIC MATERIALS

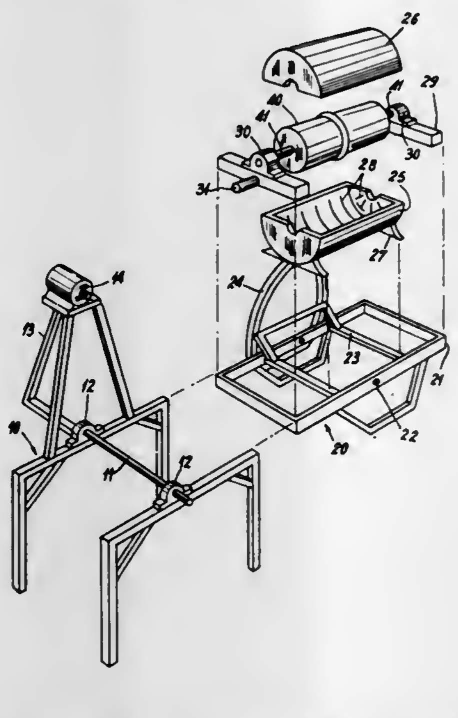
Pierre Louis Gimaret, Cailloux-sur-Fontaine, France, assignor to Etablissements Metallurgiques du Val d'Ambv, Lyon, France

Continuation of Ser. No. 123,237, March 11, 1971, abandoned. This application Jan. 29, 1975, Ser. No. 545,090

Int. Cl.² B29C *5/04;* B29F *5/00*

U.S. Cl. 264—310 **5 Claims**

1. A method for the manufacture by moulding with thermoplastic resins in powdered form of hollow elements of substantially cylindrical shape comprising a cylindrical body and two ends and having an internal volume of at least one thousand liters, and the method comprising the steps of introducing a particulate thermoplastic resin material into a cylindrical mould, said thermoplastic resin being selected from the group consisting of polyethylene, polypropylene, thermoplastic polyolefin copolymers and a self-condensate of 11-aminoundecanoic acid, a first stage of heating during which a rotational movement about a central longitudinal axis of said cylindrical mould is imparted to the mould while at the same time heating both the body and the ends of the mould, said longitudinal axis being maintained horizontal; a second stage of moulding the ends during which rotational movement in alternate directions in sequence is imparted to the mould about said axis of rotation while simultaneously heating said body and ends of said mould, said second stage further including the step of alternately tilting said mould in opposite directions about a central axis transverse to said axis of rotation at predetermined intervals, said longitudinal and transverse axis both passing through the gravity center point of the mold; which intervals at least exceed the time required for several revolutions of said mould, with said mould being retained in tilted position during each entire interval, while said alternate rotation about said axis of rotation continues, the mould thereby being tilted and thus inclined first to one side, then to the other, while heating both said body and ends of the mould; a third stage of progressively cooling the ends of the mould by first reducing and then completely terminating the heating of the ends of the mould, with the alternating tilting and rotation of the mould continuing as in said second stage; a fourth stage of moulding the body in which the same alternating rotational movement as in the second stage is imparted to the mould, but where the axis of rotation remains substantially horizontal and heat is applied only to said body of the mould; a fifth stage of cooling the body in which the method of the fourth stage is continued and the heating of the body is terminated, and a sixth stage of removing the mould, said heating being sufficient to melt said powder at least partially and to cause said powder to agglomerate.



3,970,737

METAL, PARTICULARLY GOLD, RECOVERY FROM ADSORBED CYANIDE COMPLEXES

Raymond John Davidson, 5 Max Michaelis St., Montgomery Park, Johannesburg Transvaal, South Africa

Filed Oct. 29, 1974, Ser. No. 518,833

Claims priority, application South Africa, Nov. 23, 1973, 73/8939; Feb. 22, 1974, 74/1182; Apr. 18, 1974, 74/2482

Int. Cl.² C01G *3/00, 5/00, 7/00, 53/00*

U.S. Cl. 423—27 **11 Claims**

1. A method of recovering metal values selected from gold, silver, copper and nickel from a support having adsorbed thereon the metal values in the form of a cyanide ionic complex, the metal values forming part of the anionic portion thereof, including the step of contacting the support with water of low metal cation concentration to desorb the metal values, the cation of the complex being an alkaline earth metal cation and the support being contacted with an alkali metal salt solution prior to the desorption step.

8. A method of recovering gold or silver values from a support having adsorbed thereon the metal values in the form of an alkaline earth metal cyanide ionic complex including the steps of contacting the support with alkali metal salt solution, the anion of the salt being capable of forming an insoluble or substantially insoluble salt with the alkaline earth metal of the complex, and desorbing the metal values from the support with water of low cation concentration.

3,970,738

PROCESS FOR PRODUCING IRON OXIDE PRODUCTS FROM WASTE LIQUIDS CONTAINING FERROUS SALTS

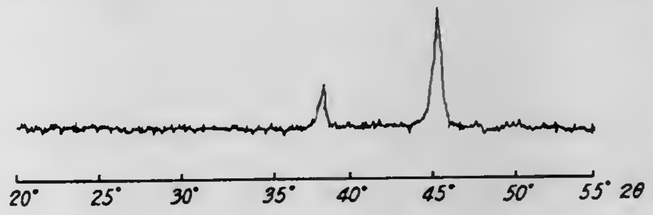
Goro Matsui; Koji Toda; Nanao Horiishi; Kazuyoshi Wakimoto; Yoshifumi Nishiyama; Tsuneyoshi Taketa, and Kazushi Takama, all of Hiroshima, Japan, assignors to Toda Kogyo Corporation, Hiroshima, Japan

Filed Dec. 23, 1974, Ser. No. 535,194

Claims priority, application Japan, July 15, 1974, 49-81496

Int. Cl.² C01G *49/02*

U.S. Cl. 423—140 **12 Claims**



1. A process for producing a spinel-type iron oxide powder comprising the steps of:

preparing a starting solution having a total Fe^{2+} concentration of 1 to 2 mols/l from a waste liquid containing ferrous salts and manganese compounds as impurities;

adding an alkali to the solution to suspend 5 to 30 mole % of Fe^{2+} in the solution as ferrous precipitate and to thereby obtain a suspension;

introducing an oxidative gas into the suspension while maintaining it at a temperature of 60° to 90°C and fully agitating it while continuously adding an alkali to the suspension so as to always maintain the pH of the suspension at a value in the range of 5 to 6 with a tolerance of ± 0.05, to thereby form particles of spinel-type iron oxide ($FeOx \cdot Fe_2O_3$ wherein $0 < x \leqq 1$) having a uniform quality; and

suspending the particles of spinel-type iron oxide in an aqueous solution having a pH of 3.5 to 5.0 as adjusted with sulfuric acid or nonoxidative inorganic acid to solubilize polyvalent manganese contained in the particles of spinel-type iron oxide, subsequently separating the particles of spinel-type iron oxide from the suspension by filtration, washing the particles with water, and drying the same to obtain particles of spinel-type iron oxide having a manganese content of less than 0.2% by weight calculated as MnO.

3,970,739

PROCESS FOR CONCURRENTLY TREATING PROCESS WASTE WATERS AND FLUE GASES FROM AMMONIA SYNTHESIS PROCESS PLANTS

Tatsuo Shiraishi; Hiroshi Fukusen; Sachio Oishi; Shinkichi Shimizu; Hiroyuki Nishikawa, and Tetsu Wakabayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Dec. 6, 1974, Ser. No. 530,302

Claims priority, application Japan, Apr. 11, 1974, 49-41219

Int. Cl.² C01B *21/00*

U.S. Cl. 423—23 S **19 Claims**

1. In a process for concurrently treating process waste waters and flue gases discharged from an ammonia-synthesis gas manufacturing plant obtained by reforming hydrocarbons with steam, said process waste waters containing ammoniacal

nitrogens and organic materials consisting essentially of methanol and a small amount of organic amines, which are derived from the condensation of the steam, and said flue gases containing nitrogen oxides, which are derived from the combustion of hydrocarbon fuels for generating heat and power required for reforming the hydrocarbons, the improvement which comprises stripping the ammoniacal nitrogens and the organic materials present in the waste waters in gaseous form, decomposing methanol in the resulting stripped gas with a first catalyst for selectively decomposing methanol to carbon dioxide and water or to carbon dioxide, water and hydrogen, at a temperature of from 120° to 400°C. while the ammonia is left undecomposed, mixing the resulting gases with the flue gases so as to provide a gaseous mixture containing ammonia therein in an amount of 0.3 to 10 moles per mole of nitrogen oxides, and reducing the nitrogen oxides with the ammonia by bringing the resulting gaseous mixture into contact with a second catalyst for reducing the nitrogen oxides to nitrogen gas and water at a temperature of from 150° to 700°C.

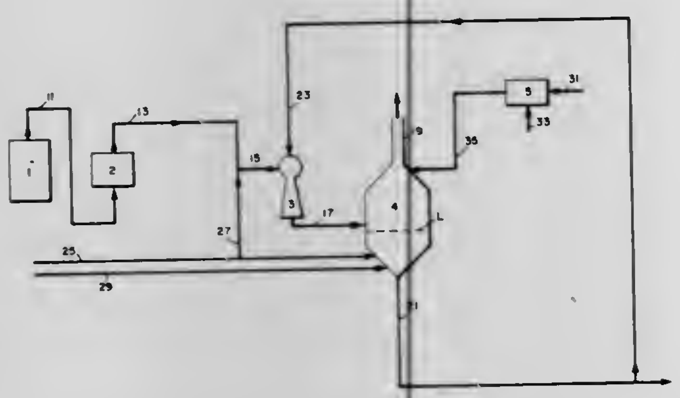
3,970,740
WET GAS SCRUBBING PROCESS

Perry E. Reeder, Baytown, Tex., and Leonard M. Williams, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 13, 1973, Ser. No. 369,771

Int. Cl.² B01D *53/34*

U.S. Cl. 423—242 **24 Claims**



1. A process for removing at least a portion of the sulfur dioxide and cracking catalyst fines, including from about 1 to 40 weight percent particles under one micron in size, from a gaseous effluent containing the same, which comprises:

a. contacting said gaseous effluent with water to produce a water-saturated gas;

b. introducing the water-saturated gas containing said particles under one micron in size into a venturi structure and contacting the same with a relatively colder, high velocity stream of an aqueous scrubbing mixture containing a basic material selected from the group consisting of alkali metal hydroxides, ammonium hydroxide, and ammonia, said scrubbing mixture being maintained at a pH in the range varying from about 6 to about 7;

c. passing the admixture of said gas and scrubbing mixture through a constricted passage of said venturi structure to increase the velocity thereof;

d. recovering the admixture resulting from step (c) from the venturi structure, and

e. separating said recovered admixture into a liquid portion and a gaseous portion having a reduced content of cracking catalyst fines and sulfur dioxide.

3,970,741
METHOD FOR PURIFYING PHOSPHORIC ACID

Engelhard Wilhelm Pavonet, Flemalle-Haute, Belgium, assignor to "Societe de Prayon", Belgium

Filed Jan. 31, 1974, Ser. No. 438,220

Claims priority, application Luxemburg, Feb. 2, 1973, 66958

Int. Cl.² C01B *25/16*

U.S. Cl. 423—321 S **9 Claims**

1. In the method for purifying phosphoric acid obtained by the reaction of sulfuric acid with natural phosphates, said method comprising extracting said phosphoric acid with an ether containing solvent forming an aqueous phase containing the major part of the impurities and an organic phase containing purified phosphoric acid and separating both said phases, the improvement which comprises extracting the phosphoric acid with a mixed solvent comprising 95% to 50% by volume of isopropyl ether and 5% to 50% by volume of tributyl phosphates and thereby forming only two phases during said extracting.

3,970,742
PROCESS FOR PREPARING CYANIC ACID

Johannes D. M. Verstegen, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 23, 1974, Ser. No. 535,838

Claims priority, application Netherlands, Dec. 27, 1973, 7317668

Int. Cl.² C01C *3/14*

U.S. Cl. 423—365 **8 Claims**

1. A process for preparing cyanic acid from urea by evaporating urea in a tubular reaction zone, comprising

atomizing molten urea into a stream of carrier gas, passing the resulting mist of fine urea droplets in said carrier gas through said tubular reaction zone,

heating the tubular reaction zone so that the temperature of the gas mixture leaving the reaction zone is at least 250°C,

wherein said carrier gas is introduced into the reaction zone at a rate at least equal to V, wherein

$$V \geq 2.8\, a^{0.1} \rho_o^{-0.4} \left(\frac{T}{p}\right) 0.5 \; \frac{2.5}{n_g}^{0.1} (1 + a\, \rho_o)^{-1}$$

where

V = superficial gas velocity at the entrance of the tubular reactor, in m/sec.

a = amount of carrier gas/amount of urea in m^3 (N.T.P.)/kg

ρ_o 32 density of carrier gas at 0°C and 1 atm. abs., in kg/m^3

T = temperature of carrier gas, in °K

p = feed pressure of carrier gas, in kg/cm^2 abs.

n_g = viscosity of carrier gas, in centipoises

3,970,743
PROCESS FOR THE PRODUCTION OF SULFUR FROM MIXTURES OF HYDROGEN SULFIDE AND FIXED NITROGEN COMPOUNDS

David K. Beavon, Pasadena, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Sept. 16, 1974, Ser. No. 506,305

Int. Cl.² C01B *17/04*

U.S. Cl. 423—574 R **5 Claims**

1. In a Claus process for sulfur production consisting of a thermal reaction stage and a catalytic Claus conversion stage wherein a portion of a total hydrogen sulfide feed is oxidized in the presence of oxygen in the thermal reaction stage to form sulfur dioxide in an amount sufficient to react with the balance of the hydrogen sulfide feed to form sulfur, a portion of the sulfur being formed in the thermal reaction stage and the balance in the catalytic Claus conversion stage, the improvement which enables continuous operation without the formation of solid nitrogen-sulfur salts with a feed gas stream containing substantial quantities of fixed nitrogen compounds

selected from the group consisting of ammonia, hydrogen cyanide and mixtures thereof which coprises:

a. combining in a first thermal reacton zone of the thermal reaction stage containing at least two separate thermal reaction zones in series, essentially all of a first hydrogen sulfide feed containing substantial quantities of fixed nitrogen compounds, a source of oxygen and a portion of a second hydrogen sulfide feed essentially free of fixed nitrogen compounds, the amount of oxygen fed to the first thermal reaction zone being insufficient to convert all of the hydrogen sulfide fed to said first thermal reaction zone to sulfur dioxide, the amount of said second hydrogen sulfide feed being sufficient to maintain said first thermal reaction zone at a temperature of from about 2,500° to about 3,000°F to form a reaction stream essentially free of fixed nitrogen compounds and containing unconverted hydrogen sulfide and formed sulfur dioxide, nitrogen and water; and

b. combining the reaction stream from the first thermal reaction zone and at least a portion of the balance of the second sulfide feed in a second thermal reaction zone of the thermal reaction stage maintained at a temperature below said first thermal reaction zone and separate from said first thermal reaction zone to form sulfur and a second reaction stream containing hydrogen sulfide and sulfur dioxide for feed to the catalytic Claus conversion stage.

3,970,744
PROCESS FOR THE PRODUCTION OF SULFUR FROM SULFUR DIOXIDE EXTRACTED FROM GAS STREAMS

Fred C. Riesenfeld, Los Angeles, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Nov. 7, 1974, Ser. No. 521,834

Int. Cl.² C01B *17/04*

U.S. Cl. 423—574 R **8 Claims**

1. A process for the production of sulfur from sulfur dioxide contained in gas streams which comprises:

a. passing a sulfur dioxide containing gas stream through a sulfur dioxide absorption zone containing an aqueous absorbent for sulfur dioxide to form a sulfur dioxide rich absorbent and a sulfur dioxide lean gaseous stream;

b. separating the sulfur dioxide rich absorbent from the absorption zone;

c. passing about one-third of the sulfur dioxide rich absorbent to a sulfur production zone;

d. passing the balance of the sulfur dioxide rich absorbent to a sulfur dioxide stripping zone to separate sulfur dioxide from the absorbent to form a sulfur dioxide lean absorbent for recycle to the absorption zone;

e. catalytically hydrogenating the sulfur dioxide separated from the sulfur dioxide rich absorbent in the stripping zone in the presence of a source of hydrogen to hydrogen sulfide at a temperature from about 300° to about 1000°F in the presence of a catalyst consisting of at least one supported metal selected from Group Va, VIa, VIII and the Rare Earth Series of the Periodic Table; and

f. passing the formed hydrogen sulfide to the sulfur production zone where sulfur is formed from the introduced hydrogen sulfide and sulfur dioxide.

3,970,745
METHOD FOR PRODUCING HYDROGEN FROM WATER

Norio Takeuchi, Isehara, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,161

Claims priority, application Japan, May 9, 1974, 49-51538; May 17, 1974, 49-54504

Int. Cl.² C01B *1/07, 1/02;* C01G *17/00*

U.S. Cl. 423—657 **5 Claims**

1. A method for producing hydrogen from water, characterized in that water is reduced to hydrogen in an autoclave at a temperature within the range of about 300°–900°C by using powdered metallic germanium in a molar ratio of at least 1:1, and thereafter the by-product germanium monoxide is reduced in the autoclave with sulfur dioxide at a temperature of about 400°–800°C to metallic germanium which is recycled and reused.

3,970,746
IMMUNOASSAY FOR THE MEASUREMENT OF TOTAL THYROXINE IN BLOOD SERUM

Bhartur Premachandra, 5 Blaytonn Lane, La Due, Mo. 63124, assignor to Bhartur Premachandra, La Due, Mo.

Filed Sept. 5, 1974, Ser. No. 503,230

Int. Cl.² G01N *31/00;* G01T *1/16*

U.S. Cl. 424—1.5 **5 Claims**

1. A radioimmunoassay for the measurement of total thyroxine in a serum sample which comprises the steps of:

mixing trichloroacetic acid and sodium hydroxide with the serum sample to form a mixture;

adding radioactively labeled thyroxine antiserum to the mixture;

permitting the mixture to equilibrate;

placing in contact with the mixture a resin sponge comprising a polyurethane foam of intercommunicating cell type containing a strong base anion exchange resin;

incubating the mixture and resin sponge;

measuring the initial radioactivity of the combined mixture and resin sponge with suitable detecting means;

removing the resin sponge from the mixture;

washing the resin sponge; and

measuring the residual radioactivity in the resin sponge.

3,970,747
HUMECTANT SWEETENER

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 449,620, March 11, 1974, Pat. No. 3,932,604, which is a continuation-in-part of Ser. No. 317,696, Dec. 22, 1972, abandoned. This application Sept. 22, 1975, Ser. No. 615,336

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.² A61K *7/16, 7/18*

U.S. Cl. 424—52 **14 Claims**

1. A dentifrice aqueous dental cream toothpaste containing at least about 10% water, requiring and containing a humectant, part of said total humectant comprising a mixture comprising at least about 10% by weight of a solution in water of xylitol in combination with a further polyol humectant, thereby providing said total humectant, said xylitol adapted to function as co-humectant in said dentifrice.

3,970,748
ALUMINUM CHLORHYDROXY GLYCINATE COMPLEXES

Sebastian B. Mecca, Abington, Pa., assignor to Schuylkill Chemical Company, Philadelphia, Pa.

Filed Feb. 24, 1975, Ser. No. 552,316

Int. Cl.² A61K *7/38*

U.S. Cl. 424—68 **4 Claims**

1. An aluminum chlorhydroxy glycinate complex of the formula $[Al_2(OH)_4Cl]_x \cdot [H_2NCH_2COOH]_y$ wherein x and y are each about 1.

3. Antiperspirant-deodorant compositions comprising from about 10 to about 25%, by weight, based on the weight of the composition, of the aluminum chlorhydroxy glycinate complex of claim 1 and a pharmaceutically acceptable carrier.

3,970,749
INTERFERON PRODUCTION

Clarence L. Baugh, 6608 Orlando Ave., Lubbock, Tex. 79413
Filed Apr. 3, 1973, Ser. No. 347,422
Int. Cl.² A61K *45/02*
U.S. Cl. 424—85 **18 Claims**

1. A method of producing interferon which comprises:

a. inoculating with virus a suspension of virus-culture-supporting animal cells, taken directly from trypsinized normal animal tissue, in a nutrient or culture medium without permitting an intervening growth period for the cells in the suspension,

b. maintaining the resulting virus-inoculated suspension in the nutrient or culture medium of virus-culture-supporting animal cells at least until interferon is produced therein, and

c. centrifuging the interferon-containing composition to remove solids therefrom and to collect interferon in thus-obtained centrifugate.

3,970,750
EFFERVESCENT POTASSIUM CHLORIDE COMPOSITION

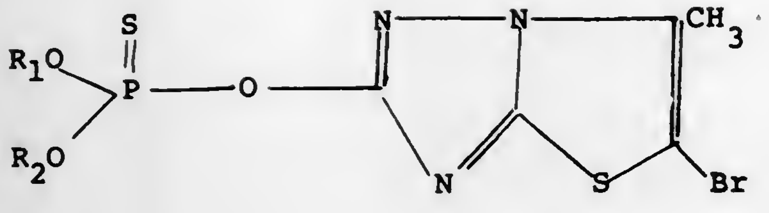
Eugene W. Brockemeyer, Lincoln, Nebr., and Michael B. Rodell, Santa Ana, Calif., assignors to Sandoz, Inc., E. Hanover, N.J.
Continuation-in-part of Ser. No. 513,041, Oct. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 358,662, May 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,632, Oct. 26, 1971, abandoned. This application May 30, 1975, Ser. No. 582,130
Int. Cl.² A61K *31/14, 31/195, 33/00*
U.S. Cl. 424—153 **22 Claims**

1. A method of treating potassium depletion which comprises orally administering to a human being in need of said treatment large doses of potassium chloride in a pleasant tasting effervescent drink resulting from the dissolution in water of a stable pharmaceutical composition in unit dosage form comprising from 500 to 1,500 milligrams of potassium chloride, 500 to 2,000 milligrams of potassium carbonate or bicarbonate, 500 to 2,000 milligrams of a substance which on dissolution in water forms an acid reacting solution, and an amount of L-lysine hydrochloride sufficient to provide one chloride ion for each potassium ion formed by the dissolution of the composition in water.

3,970,751
CERTAIN THIAZOLOTRIAZOLYPHOSPHONOTHIOATES USED AS INSECTICIDES

Saburo Kano; Osami Nomura, both of Odawara; Mitsuo Asada, Hiratsuka; Meiki Ando; Michihiko Matsuda, both of Kanagawa; Tomio Yamada; Hitoshi Watanabe, both of Hiratsuka, and Takuzo Taniguchi, Kamakura, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan
Division of Ser. No. 319,490, Dec. 29, 1972, Pat. No. 3,904,639. This application Jan. 30, 1975, Ser. No. 545,307
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 **6 Claims**

1. A method of preventing injury to plants by phytophagous insects comprising applying to the plants to be protected an insecticidally effective amount of a compound represented by the formula:

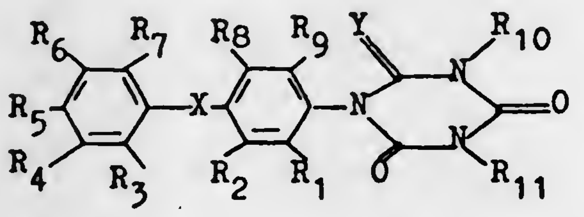


in which R_1 and R_2 are each methyl or ethyl.

3,970,752
COCCIDIOCIDAL COMPOSITIONS UTILIZING 1-PHENYL-SUBSTITUTED 1,3,5-TRIAZINE

Gerd Aichinger; Axel Haberkorn, both of Wuppertal; Heinrich Kolling, Haan; Eckart Kranz, and Josef Reisdorff, both of Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany
Division of Ser. No. 452,140, March 18, 1974. This application Dec. 12, 1974, Ser. No. 532,221
Claims priority, application Germany, Mar. 20, 1973, 2313721
Int. Cl.² A61K *31/53*
U.S. Cl. 424—249 **43 Claims**

1. A pharmaceutical composition useful for the treatment of and prophylaxis against coccidiosis in humans and animals which comprises a therapeutically effective amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 are the same or different and each is selected from the group consisting of hydrogen, straight or branched chain lower alkyl, halo lower alkyl, lower alkoxy, halo lower alkoxy, lower alkylthio, halo lower alkylthio, halogen, nitro, cyano, amino, lower alkanoylamino, lower alkoxycarbonylamino, carboxy, lower alkoxycarbonyl, carbamoyl, lower alkanoyl, halo lower alkanoyl, lower alkylsulphinyl, lower alkylsulphonyl, halo lower alkylsulphonyl, and sulphamoyl;

R_{10} is hydrogen, straight or branched chain lower alkyl, cycloalkyl of 3 to 7 carbon atoms, halo lower alkyl, lower alkoxy, lower alkoxy lower alkyl, halo lower alkoxy lower alkyl, lower alkylthio lower alkyl, halo lower alkylthio lower alkyl, lower alkenyl, lower alkynyl, lower alkoxycarbonyl, (lower alkylthio)carbonyl, (lower alkylthio)thiocarbonyl, lower alkanoylamino, succinimido, phthalimido, amino, dilower alkylamino, benzyl, phenyl, or benzyl or phenyl substituted by halogen;

R_{11} is hydrogen or lower alkyl;

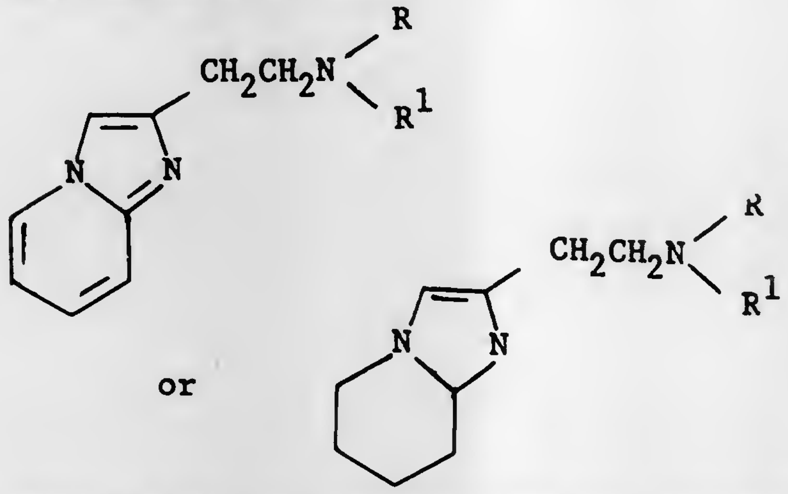
X is sulphur, sulphinyl or sulphonyl; and

Y is oxygen or sulphur; in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

3,970,753
IMIDAZO[1,2-a]PYRIDINES

Graham John Durant, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Division of Ser. No. 476,345, June 5, 1974, abandoned. This application July 31, 1975, Ser. No. 600,664
Claims priority, application United Kingdom, June 12, 1973, 27796/73
Int. Cl.² A61K *31/44*
U.S. Cl. 424—263 **5 Claims**

1. A method of stimulting H-1 histamine receptors which comprises administering to an animal in need thereof, in an effective amount to stimulate said receptors, an imidazo-pyridine compound of the formula:

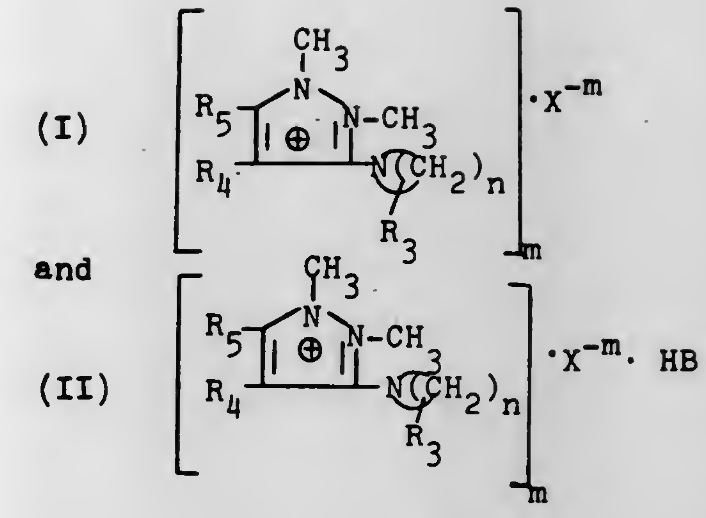


wherein R and R¹ may each be hydrogen, methyl or ethyl or a pharmaceutically acceptable acid addition salt thereof.

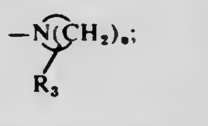
3,970,754
1,2-DIALKYL-3(OR 3,5)-N-HETEROCYCLIC PYRAZOLIUM SALTS OF DERIVATIVES THEREOF AS FUNGICIDAL AGENTS

Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 10, 1975, Ser. No. 556,748
Int. Cl.² A01N *9/22*
U.S. Cl. 424—267 **11 Claims**

1. A method for protecting plants from attack by fungi comprising: applying to said plants a fungicidally effective amount of a compound having a formula selected from the group consisting of:



wherein R_3 represents a member selected from the group consisting of hydrogen, methyl, hydroxy and phenyl; R_4 represents a member selected from the group consisting of hydrogen, and halogen; R_5 represents a member selected from the group consisting of phenyl, cyclohexyl and


$$-\underset{R_3}{N}(CH_2)_n;$$

X represents an anion with a charge of 1 or 2; *n* is five; *m* represents an integer selected from 1 and 2; and HB is an acid of sufficient strength to form a stable salt with the

$$-N(CH_2)_n$$

group.

3,970,755
BIOCIDAL COMPOSITIONS

Edward George Gazzard, and Michael Singer, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Apr. 25, 1974, Ser. No. 464,233
Claims priority, application United Kingdom, May 10, 1973, 22353/73
Int. Cl.² A01N *9/12, 9/20, 9/22*
U.S. Cl. 424—270 **5 Claims**

1. A biocidal composition comprising 1,2-benzisothiazolin-3-one and a quaternary ammonium compound selected from the group consisting of lauryl benzyl dimethyl ammonium chloride and cetyl trimethyl ammonium bromide, the molar ratio of 1,2-benzisothiazolin-3-one to quaternary ammonium compound being in the range 1.0: 0.04 to 1.0: 1.0.

3,970,756
MEDICINAL OR COSMETIC COMPOSITION CONTAINING ALLANTOIN GLYCINATE

Sebastian B. Mecca, Abington, Pa., assignor to Schuylkill Chemical Company, Philadelphia, Pa.
Division of Ser. No. 552,315, Feb. 24, 1975, Pat. No. 3,927,021. This application Aug. 8, 1975, Ser. No. 603,194
Int. Cl.² A61K *31/415*
U.S. Cl. 424—273 **1 Claim**

1. A medicinal or cosmetic composition useful for topical application comprising from about 0.2 to about 2%, by weight based on the weight of the composition, of allantoin glycinate of the formula

$$[C_4H_5N_4O_3]_x \cdot [H_2NCH_2COOH]_y$$

where *x* and *y* are each about 1 and a medicinal or cosmetic acceptable carrier.

3,970,757
TETRAHYDRO-CARBAZOLE DERIVATIVES AS GASTRIC ANTI-SECRETORY AGENTS

Peter E. Cross, Canterbury; Roger P. Dickinson, Worth near Deal, and John E. G. Kemp, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

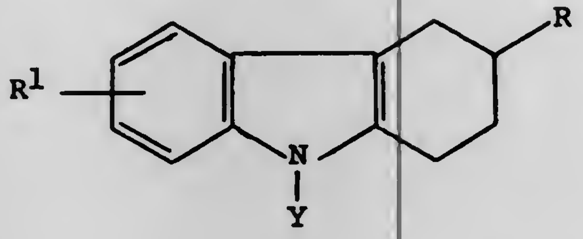
Division of Ser. No. 474,151, May 29, 1974, Pat. No. 3,931,222. This application Oct. 15, 1975, Ser. No. 622,798

Claims priority, application United Kingdom, June 2, 1973, 26414/73

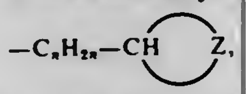
Int. Cl.^{2} A61K *31/40*

U.S. Cl. 424—274 **2 Claims**

1. A composition in unit dosage useful for alleviating excess gastric acid secretion in a host comprising a pharmaceutical carrier containing from about 25 mg to about 500 mg of a compound of the formula:



or an N-oxide or a pharmaceutically-acceptable acid addition salt thereof wherein R is alkyl of from 3 to 5 carbon atoms, R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy; and Y is aminoalkyl of the formula -Alk-NR^{2}R^3 in which R^2 and R^3 taken separately are each lower alkyl and R^2 and R^3 taken together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, perhydroazepino, morpholino, thiomorpholino or 1,1-dioxo-perhydro-1,4-thiazino group and 'Alk' is a divalent alkyl group containing from 2 to 4 carbon atoms; or Y is an aminocyclic group of the formula



$$-C_nH_{2n}-CH\quad Z,$$

in which n is 0 to 3 and Z is a divalent group which completes a pyrrolidine, piperidine or perhydroazepine ring, the nitrogen atom in said ring being separated from the nitrogen atom to which the aminocyclic group is attached by a chain of from 2 to 4 carbon atoms.

3,970,758
CERTAIN GERANYL PHENYL ETHERS AND THEIR EPOXIDES AND THEIR USE IN CONTROLLING INSECTS

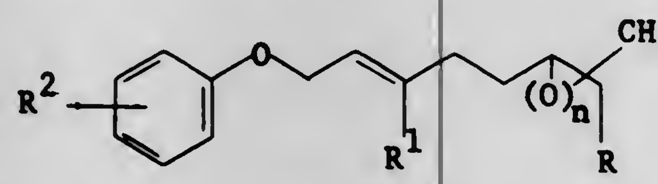
Ferenc M. Pallos, Pleasant Hill; Hwalin Lee, Palo Alto, and Julius J. Menn, Saratoga, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 856,140, Sept. 8, 1969, Pat. No. 3,907,783, which is a continuation-in-part of Ser. No. 815,229, April 10, 1969, abandoned. This application May 19, 1975, Ser. No. 578,580

Int. Cl.^{2} A01N *9/28*

U.S. Cl. 424—278 **19 Claims**

1. A method of controlling Tenebrio molitor comprising applying thereto at any stage of their development a metamorphosis hindering amount of a compound of the formula:



in which R and R^1 are independently methyl or ethyl; *n* is the integer 1; R^2 is hydrogen, halogen, lower alkyl having 1 to 6 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, lower alkenyl having 2 to 6 carbon atoms, lower alkylthio having 1 to 5 carbon atoms, or nitro.

3,970,759
ALIPHATIC DIOLS AS PRESERVATIVES FOR COSMETICS AND RELATED PRODUCTS

John W. Frankenfeld, Atlantic Highlands, N.J., and Donald L. Wright, New York, N.Y., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 313,781, Dec. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 67,270, Aug. 26, 1970, abandoned. This application Aug. 19, 1974, Ser. No. 498,651

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—343 **5 Claims**

1. A method of inhibiting the growth of public health implicated bacteria, yeasts and molds in cosmetic and personal care preparations containing edible oils and organic nitrogen compounds comprising incorporating in the preparations an effective amount of a linear aliphatic 1,3-diol having 5 to 15 carbon atoms in the molecule, whereby the preparation is preserved against deterioration.

3,970,760
FUNGITOXIC COMPOSITIONS CONTAINING 2,2'-DIHYDROXYDINAPHTHYLMETHANE

Glentworth Lamb, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1972, Ser. No. 317,043

Int. Cl.^{2} A01N *9/26*

U.S. Cl. 424—346 **1 Claim**

1. A method for the protection of plant materials susceptible to attack by fungi which comprises: applying to the said plant materials a preparation comprising from about 99.99% to about 90% of an inert solid fungicidal carrier selected from the group consisting of clay, pumice, fuller's earth, pyrophyllite and bentonite, and from about 0.01% to about 10% of 2,2'-dihydroxydinaphthylmethane, said preparation being applied to said plant materials at a rate ranging from about 100 ppm to about 500 ppm of said 2,2'dihydroxydinaphthylmethane.

3,970,761
METHOD OF PREPARING DENSE, UNIFORMLY LAYERED VEGETABLE PROTEIN MEAT ANALOGUE

La Von Gene Wenger, Sabetha; Elmer John Osterhaus, Seneca, and Oak Birchard Smith, Shawnee Mission, all of Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Filed May 27, 1975, Ser. No. 581,111

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—250 **40 Claims**

1. A method of preparing a dense, layered, untwisted meat analogue product comprising the steps of:

heating and agitating an admixture comprising a vegetable protein and moisture to an extent sufficient to render the same hot, flowable and substantially unoriented;

moving said admixture under pressure through an elongated processing zone along a generally helical path of travel which simultaneously subjecting the admixture to displacement forces in an axial direction relative to the zone and also transversely of the longitudinal axis thereof, said displacement forces being of a magnitude to assure stretching and working of the protein for permitting subsequent orientation thereof in said product;

thereafter moving said admixture into an elongated processing area without substantially restricting the flow of admixture thereinto and subjecting the latter to displacement forces in said area which are primarily axial relative to the area;

causing the layering of said admixture by maintaining the axial movement thereof in said area while controlling the temperature and pressure therewithin at levels permitting said layering; and

extruding said admixture from said area as a dense, layered meat analogue product.

3,970,762
METHOD OF CHEMICAL PEELING OF FRUITS AND VEGETABLES WITH AN ALKANOLAMINE

Alexandre Askienazy; Georges Melki, both of Paris, and Jean Stevenin, Creteil, all of France, assignors to Compagnie Francaise de Produits Industriels, Asnieres, France

Continuation-in-part of Ser. No. 217,641, Jan. 13, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 439,974

Claims priority, application France, Jan. 28, 1971, 71.02875

Int. Cl.^{2} A23P *1/00*

U.S. Cl. 426—287 **8 Claims**

1. A method for chemical peeling the skin of fruits and vegetables which comprises (1) applying to a fruit or vegetable an aqueous composition comprising from about 0.2 to about 20% by weight of at least one alkanolamine selected from the group consisting of mono-, di-, and tri-alkanolamines, at a temperature of at least about 20°C for from about one to about 30 minutes, to loosen the skin without attacking the pulp, (2) removing the loosened skin from the pulp, and (3) recovering the peeled fruit or vegetable.

3,970,763
HEAT PASTEURIZED CAKE BATTER

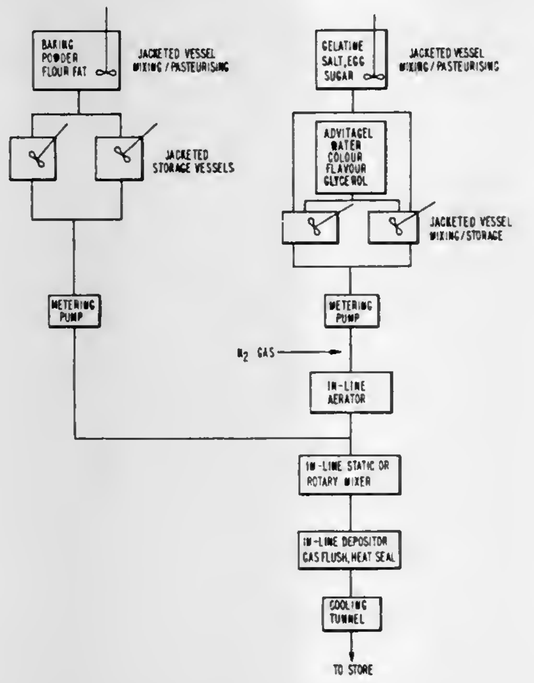
David Patrick Joseph Moran, Potters Bar, England, and Henricus Jacobus Pennings, Oud Beyerland, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 9, 1974, Ser. No. 459,502

Claims priority, application United Kingdom, Apr. 11, 1973, 17293/73

Int. Cl.^{2} A21D *2/00*

U.S. Cl. 426—324 **15 Claims**


BAKING POWDER FLOUR FAT
JACKETED VESSEL MIXING / PASTEURISING
JACKETED STORAGE VESSELS
GELATINE SALT, EGG SUGAR
JACKETED VESSEL MIXING / PASTEURISING
ADVITAGEL WATER COLOUR FLAVOUR GLYCEROL
JACKETED VESSEL MIXING / STORAGE
METERING PUMP
METERING PUMP
N$_2$ GAS
IN-LINE AERATOR
IN-LINE STATIC OR ROTARY MIXER
IN-LINE DEPOSITOR GAS FLUSH, HEAT SEAL
COOLING TUNNEL
TO STORE

1. A process for the preparation of a ready-to-bake cake batter having egg, sugar, flour and fat ingredients in conventional proportions comprising:

a. heat-pasteurising an aqueous phase containing the egg in the presence of sufficient sugar to inhibit denaturing the egg by the heat-pasteurising treatment;

b. heat-pasteurising a fat phase containing both the fat and flour by melting the fat and admixing a stream of the flour therewith while maintaining said fat phase at a temperature which is sufficiently high to pasteurise the flour but below the degradation temperature of the flour;

c. aerating the pasteurised aqueous phase with an inert gas at a temperature at which an overrun is induced, to produce a foamed aqueous phase in the presence of a sufficient amount of an edible stiffening agent to stiffen the batter;

d. cooling and blending the fat phase and the foamed aqueous phase together with any remaining ingredients, at a temperature at which the overrun of the aqueous phase is preserved and in proportions of ingredients so as to provide a maximum water activity of 0.85; and

e. packaging the cake mix produced in sealed containers under aseptic conditions.

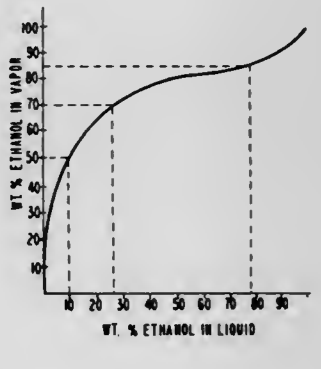
3,970,764
PROCESS FOR PREPARING A PROTEIN CONCENTRATE WITH MINIMAL PROTEIN DENATURATION

George B. Karnofsky, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1974, Ser. No. 536,802

Int. Cl.^{2} A23L *1/20*

U.S. Cl. 426—430 **8 Claims**



1. In a process for treating a seed material with an aqueous solvent which contains an organic component to produce an extract solution and extracted material containing a residue of solvent, wherein desolventizing of said extracted material is accomplished in a desolventizer by direct contacting with a recirculating stream of superheated vapor, the improvement wherein said recirculating stream is a mixture of said organic component and water and having a concentration of organic component greater than the organic component concentration of the aqueous solvent in said residue said recirculating stream of superheated vapor, obtained by mixing vapor originating from said residue of solvent with vapor originating outside the desolventizer.

3,970,765
METHOD FOR PRODUCING SUCROSE FIXED VOLATILE FLAVORS

Esra Pitchon, Flushing; Steven Barry Chall, Monsey, and Marvin Schulman, Monroe, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed July 3, 1975, Ser. No. 593,146

Int. Cl.^{2} A23L *1/26*

U.S. Cl. 426—534 **10 Claims**

1. A method for producing a solid flavoring composition containing low levels of volatile flavoring compound comprising the steps of:

a. providing a supersaturated, glassy, aqueous sucrose solution;

b. rapidly cooling the aqueous sucrose solution to a temperature below about 30°F. to cause it to solidify while maintaining it in the glassy state;

c. charging particles of the solidified aqueous sucrose solution and a volatile flavoring compound into a revolving screw fed extruder to cause intimate mixing of the charged materials and to initiate crystallization of the sucrose;

d. expressing the resultant intimate mixture of charged materials from the extruder; and

e. subjecting the extruded mixture to additional mixing for a period of time effective to complete crystallization.

3,970,766
FIXED VOLATILE FLAVORS AND METHOD FOR MAKING SAME

William A. Mitchell, Lincoln Park, N.J.; Howard D. Stahl, Hartsdale, and William C. Seidel, Monsey, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 399,201, Sept. 20, 1973, Pat. No. 3,889,008, which is a continuation-in-part of Ser. No. 36,666, May 12, 1970, Pat. No. 3,787,592. This application June 9, 1975, Ser. No. 585,015

Int. Cl.^{2} A23L *1/221, 1/232, 1/237*

U.S. Cl. 426—534 **2 Claims**

1. A method for producing a solid flavoring composition containing low levels of volatile flavor compounds comprising the steps of:

a. forming a supersaturated aqueous solution of sodium chloride, the solution also containing a volatile flavoring composition;

b. crystallizing sodium chloride from the solution to fix the portion of the relative flavoring composition within the individual sodium chloride crystals at a level of less than about 0.5% by weight of the crystal, and thereafter,

c. drying the crystals.

3,970,767
RETORT STARCHES PRODUCTS PREPARED FROM BLENDS OF STARCH AND HIGH AMYLOSE STARCH COMPONENTS

Martin M. Tessler, Edison, and Wadym Jarowenko, Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 487,013, July 10, 1974. This application Nov. 14, 1975, Ser. No. 631,835

Int. Cl.^{2} A23L *1/195, 1/187, 1/40*

U.S. Cl. 426—579 **4 Claims**

1. A food product adapted for retorting containing as a thickener a cross-linked, hydroxypropylated starch product comprising:

a. 15–85% by weight, of a starch containing at least 50% amylose; and

b. the remainder of the product comprising a starch containing less than 50% amylose;

said product being hydroxypropylated and cross-linked to an extent such that an aqueous dispersion containing 5.0% of said starch product has a Brookfield viscosity measured at 180°F. of less than 2,000 cps. after being cooked at 5.0% starch solids concentration dry basis, in a pH 6.5 buffered salt solution at 212°F. for 10 minutes, followed by 15 minutes at 250°F. and standing at room temperature until it cools to 180°F.; and a Brookfield viscosity measured at 75°F. of greater than 1,500 cps. when said cooked starch is allowed to stand at room temperature for 24 hours; said viscosity measured at 75°F. being at least about five times greater than the viscosity at 180°F.; the degree of hydroxypropylation being such that when the two starch components are blended together prior to being hydroxypropylated, the resulting blend is hydroxypropylated to an M.S. of 0.10–0.30 and when the two starch components are separately hydroxypropylated prior to blending, the starch component containing at least 50% amylose has a hydroxypropyl M.S. of 0.10–0.30 and the starch containing less than 50% amylose has a hydroxypropyl M.S. of 0.06–0.30.

3,970,768
GRID ELECTRODES

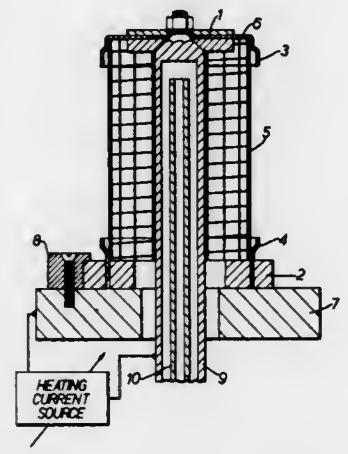
David Mark Wilcox, and William David Richard Rivers, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed July 30, 1975, Ser. No. 600,499

Claims priority, application United Kingdom, Aug. 3, 1974, 34307/74

Int. Cl.^{2} H01J *1/48;* **C23C** *11/00*

U.S. Cl. 427—50 **6 Claims**



1. A method of making a pyrolytic graphite grid electrode comprising the steps of holding a metallic grid electrode core between relatively massive bodies which are of good thermal conductivity, passing a carbonaceous gas over said metallic grid electrode core whilst the grid electrode core is held at the temperature required for the deposition of pyrolytic graphite by passing an electric current through it.

3,970,769
RECORDING SHEET AND METHOD FOR THE PRODUCTION THEREOF

Hajime Kato, and Takao Hayashi, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 15, 1974, Ser. No. 514,714

Claims priority, application Japan, Oct. 12, 1973, 48-114435

Int. Cl.^{2} B41M *5/22;* **B32B** *27/42, 9/02*

U.S. Cl. 427—145 **10 Claims**

1. A method for producing a recording sheet comprising admixing a phenol resin selected from a novolak type phenol-aldehyde polymer or a phenol-acetylene polymer and an aqueous emulsion of a hydrophobic material to produce a coating composition and coating the resulting coating composition on a support; said hydrophobic material being selected from the group consisting of a vegetable oil, an animal oil, a mineral oil, a synthetic oil or a hydrophobic organic solvent; said hydrophobic material emulsion being used in an amount of between about 0.1 to 10 parts by weight calculated in terms of the amount of the hydrophobic material per 100 parts by weight of the solid content in the phenol resin coating composition; and said phenol resin being capable of being colored when reacted with an electron donating colorless organic compound.

3,970,770
WIRE COATED WITH FLUOROCARBON POLYMERS CROSS-LINKED WITH DIALYL ESTER OF 4,4'-DICARBOXYDIPHENYL ESTER

Kewal Singh Dhami, Shrewsbury, Mass., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,020

Int. Cl.^{2} B32B *15/00;* **C08L** *53/00*

U.S. Cl. 428—379 **1 Claim**

1. A wire coated with an irradiation crosslinked composition comprising a fluorocarbon polymer and the diallyl ester of 4,4'-dicarboxydiphenyl ether.

3,970,771
SUBSTRATE COATED WITH MIXED RESIN PRIMER COAT COMPRISING A BLOCK COPOLYMER

Sol Davison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 25, 1974, Ser. No. 526,882

Int. Cl.^{2} B32B *27/08, 27/32, 27/36, 27/40*

U.S. Cl. 428—425 **5 Claims**

1. A coated article of manufacture comprising a substrate surface bearing a primer coat and a top coat, said primer coat being adherent both to the substrate and the top coating, wherein said primer coat contains no oil component and comprises:

a. a selectively hydrogenated block copolymer having at least two polymer blocks A and at least one polymer block B, each block A being a non-elastomeric polymer block of a monoalkenyl arene having an average molecular weight between about 2,000 and about 125,000 and each block B being a hydrogenated polymer block of a conjugated diene wherein at least 80% of the double bonds have been reduced by hydrogenation and wherein block B has an average molecular weight between about 10,000 and 250,000;

b. 50–150 parts by weight per 100 parts by weight of said block copolymer of a first resin being compatible with the blocks A in the proportions employed, wherein said first resin is selected from the group consisting of coumarone-indene resins, olefinic hydrocarbon resins, rosin methyl ester, vinyl toluene/alphamethyl styrene copolymer, alphamethyl styrene copolymer, polyindene resin, and poly(methyl indene)resin; and

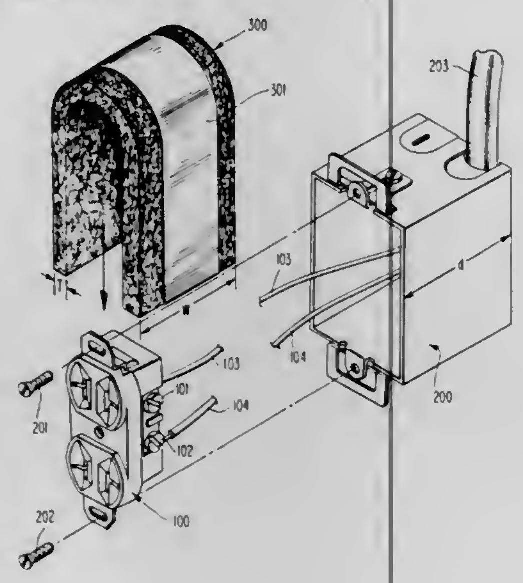
c. 50–150 parts by weight per 100 parts by weight of said block copolymer of a halogen-free carboxylated second resin, having an acid number between 15 and 60, said second resin comprising the reaction product of a component C of the group consisting of conjugated dienes, rosin, unsaturated fatty acids, and mixtures thereof with a component D of the group consisting of unsaturated polycarboxylic acids, and anhydrides or esters thereof, said resin being at least partially compatible with blocks A and largely incompatible with hydrogenated diene block B.

4. An article according to claim 1 wherein the top coating comprises a polyurethane.

ELECTRICAL

3,970,772
METHOD AND APPARATUS FOR SEALING AN ELECTRICAL RECEPTACLE

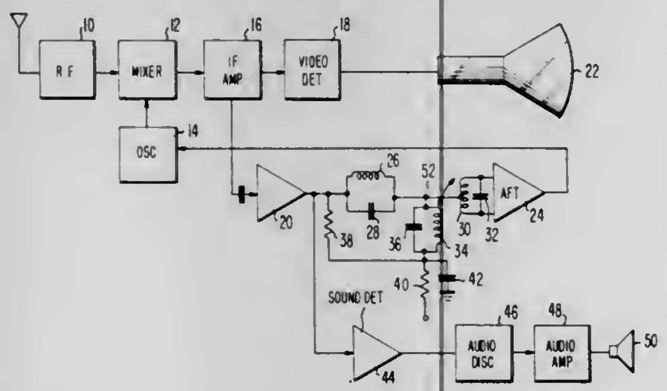
Hyde W. Ballard, Barto, Pa. 19504
Filed Aug. 7, 1975, Ser. No. 602,565
Int. Cl.² H02G *3/08*
U.S. Cl. 174—53 **5 Claims**



3. In combination, an electrical outlet box; an electrical receptacle affixed to the outlet box; a strip of insulating material sandwiched between the electrical outlet box and the electrical receptacle in such a manner that the insulating material prevents the passage of air through the completed assembly.

3,970,773
FREQUENCY SELECTIVE CIRCUIT FOR AUTOMATIC FREQUENCY CONTROL AND SOUND SIGNALS

Max Ward Muterspaugh, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Aug. 18, 1975, Ser. No. 605,592
Int. Cl.² H04N *5/44, 5/62*
U.S. Cl. 178—5.8 R **6 Claims**

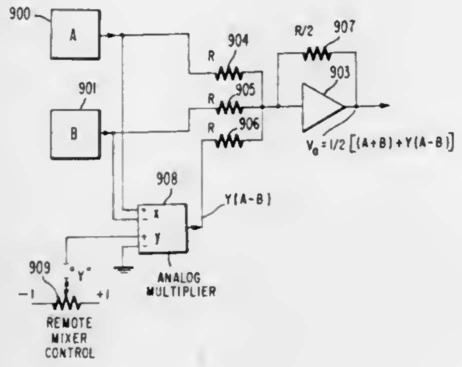


1. In a television receiver receptive to composite video signals including modulated sound and picture carrier components and having an intercarrier intermediate frequency amplifier for amplifying both sound and picture component signals, said amplifier having a bandwidth suitable for passing said modulated sound and picture carrier components, apparatus providing a desired response to said sound and picture carrier components and providing an automatic fine tuning voltage comprising:

- amplifier means for receiving intermediate frequency signals including modulated audio and video carrier components;
- discriminator means including a first resonant circuit having a resonance at a frequency substantially equal to said picture carrier frequency and receptive to signals provided by said amplifier means for providing automatic fine tuning signals responsive to picture carrier frequency deviation from said resonant frequency; and
- a second resonant circuit interposed in series between said amplifier means and said discriminator means having a resonance at a frequency lower than said sound carrier frequency for providing a greater impedance loading upon said amplifier means at frequencies away from said resonance than near said resonance, said impedance loading causing said amplifier means to provide a lower gain for signals removed from said resonance than for those close to said resonance.

3,970,774
ELECTRONIC SIGNAL MIXER

Lucas John Bazin, Stratford, and Gary Ray Peterson, Runnemede, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Mar. 31, 1975, Ser. No. 563,683
Int. Cl.² H04N *5/14, 5/20, 5/22*
U.S. Cl. 178—6 **9 Claims**

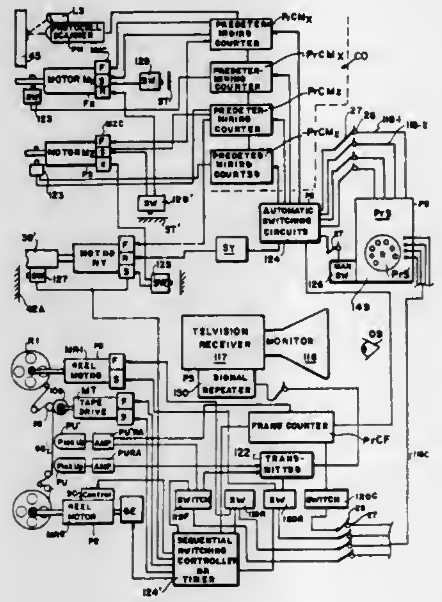


1. A signal mixer comprising:

- a pair of terminals for receiving first and second signals respectively;
- first combining means coupled to said pair of terminals for providing an additive combination of said first and second signals;
- a multiplier having a first input circuit coupled to said pair of terminals, a second input circuit for connection to a source of control voltage, and an output circuit for developing an output signal which is an additive combination of said first and second signals multiplied by a coefficient determined by said control voltage;
- second combining means coupled to said first combining means to receive the additive combination of said first and second signals, and coupled to said multiplier output circuit to receive the additive combination of said first and second signals multiplied by said coefficient, one of said additive combinations of said first and second signals produced by said first combining means and said multiplier comprising the difference between said first and second signals and the other of said additive combinations comprising the sum of said first and second signals.

3,970,775
SYSTEM FOR SCANNING INFORMATION RECORDED ON A PLURALITY OF MAGAZINE CONTAINED FILMSTRIPS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 295,807, Oct. 10, 1972, Pat. No. 3,881,053, which is a continuation-in-part of Ser. No. 224,131, Feb. 7, 1972, Pat. No. 3,699,266, and a continuation-in-part of Ser. No. 142,748, Aug. 28, 1961, Pat. No. 3,646,258, which is a division of Ser. No. 515,417, June 14, 1955, Pat. No. 3,003,119. This application Nov. 5, 1974, Ser. No. 521,028
The portion of the term of this patent subsequent to Feb. 29, 1989, has been disclaimed.
Int. Cl.² G11B *7/00;* **H04N** *7/18*
U.S. Cl. 178—6.8 **12 Claims**

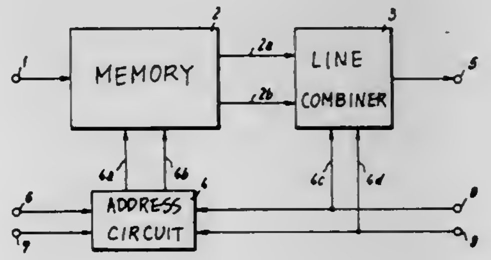


12. An apparatus for storing and viewing information comprising in combination:

- a plurality of magazines each containing a filmstrip having a tandem array of frames of recordings provided along its length,
- first means for retaining said magazines in a predetermined side-by-side array adjacent to each other,
- second means for engaging the filmstrip of a selected magazine and driving said filmstrip,
- third means for effecting controlled relative movement between said second means and said first means to bring said second and first means into alignment with each other and to align the filmstrip of a selected magazine with said second means,
- fourth means for controlling said second means to operatively engage the filmstrip of a selected magazine when said second means is aligned with said filmstrip,
- fifth means associated with said second means and movable therewith for power driving said second means and causing said second means to move said filmstrip in a fixed path,
- sixth means for scanning said filmstrip as it is moved in said fixed path by said second means, said sixth means being modulateable by the recordings along said filmstrip for generating output energy representative of said filmstrip information, and
- seventh means for receiving said output energy and displaying information recorded on said filmstrip in a visually monitorable form.

3,970,776
SYSTEM FOR CONVERTING THE NUMBER OF LINES OF A TELEVISION SIGNAL

Koji Kinuhata, Tokyo; Kitsutaro Amano, Yokohama; Hiroshi Sasaki, Nagareyama; Hideo Yamamoto, Sagamihara; Kosho Shibata, Niza, and Kazuo Yamada, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan
Filed May 22, 1974, Ser. No. 472,505
Claims priority, application Japan, May 24, 1973, 48-57159
Int. Cl.² H04N *5/02*
U.S. Cl. 178—6.8 **2 Claims**



1. A system for converting the number of lines of an input television signal having frames each formed by two adjacent interlaced fields, comprising:

- input terminal means for receiving said input television signal;
- memory means connected to said input terminal means for successively storing said input television signal;
- first synchronizing terminal means for receiving horizontal synchronizing pulses and vertical synchronizing pulses of said input television signal;
- second synchronizing terminal means for receiving horizontal synchronizing pulses and vertical synchronizing pulses of an output television signal to be obtained;
- address circuit means connected to said memory means, said first synchronizing terminal means and said second synchronizing terminal means for performing the write-in operation to the memory means in response to said horizontal synchronizing pulses and said vertical synchronizing pulses of the first synchronizing terminal means and for performing the read-out operation from the memory means in response to said horizontal synchronizing pulses and said vertical synchronizing pulses of said second synchronizing terminal means;
- line combiner means connected to said memory means and said second synchronizing terminal means for forming each interlaced frame of said output television signal by signals of two adjacent fields of said input television signal read-out from said memory means in response to said horizontal synchronizing pulses and said vertical synchronizing pulses of said second synchronizing terminal means under a condition where signals of each field of said each frame of said output television signal are formed by sequentially weighting and combining line signals of the former and the latter of the two fields of said input television signal so that the order of lines is not reversed in said output frame while the lines are not repeated in the same field; and
- output terminal means connected to said line combiner means for obtaining said output television signal.

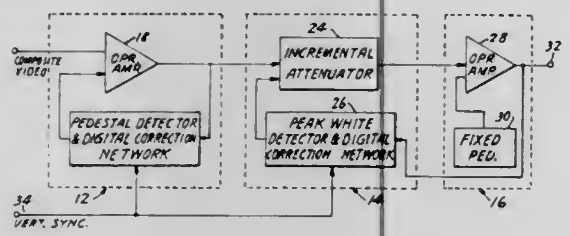
3,970,777
APPARATUS FOR ADJUSTING VIDEO PEDESTAL AND PEAK WHITE LEVEL

Robert S. Bradford, Woodland Hills, and Peter Amass, Camarillo, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 9, 1975, Ser. No. 585,102

Int. Cl.² H04N *5/16*

U.S. Cl. 178—7.1 **17 Claims**



COMPOSITE VIDEO
18
DIFF AMP
24
INCREMENTAL ATTENUATOR
28
DIFF AMP
32
PEDESTAL DETECTOR & DIGITAL CORRECTION NETWORK
26
PEAK WHITE DETECTOR & DIGITAL CORRECTION NETWORK
30
FIXED PED.
34
12
14
16
VERT. SYNC.

1. A video compensation network for automatically adjusting a received composite video signal comprising
pedestal adjustment means having a feedback loop for processing a composite video signal to automatically maintain the pedestal level of a thus processed composite video signal at a desired pedestal level, and
video gain adjustment means having a feedback loop for automatically maintaining the peak white level of said processed composite video signal at a desired level,
the improvement wherein
said pedestal adjustment means comprises
a. means for detecting the pedestal level of said processed video signal,
b. means activated by a vertical sync signal associated with said received composite video signal for comparing said detected pedestal level with a desired pedestal level to produce a digital pedestal control signal which is adjusted not more than one increment once each video field, and for producing a first feedback signal corresponding to said pedestal control signal, and
means for combining said first feedback signal together with said received composite video signal to produce as a said processed video signal a stripped video signal having a zero pedestal level and a peak black level at approximately ground potential, wherein
said video gain adjustment means comprises
means for detecting the peak white level of said processed video signal,
means activated by said vertical blanking signal for comparing said detected peak white level with a desired peak white level to produce a digital gain control signal which is adjusted not more than one increment each video field, and for producing a second feedback signal corresponding to said gain control signal, and
means for further processing said processed video signal in response to said second feedback signal such that the maximum excursion of said processed signal is automatically maintained within a predetermined range, and wherein
said network further comprises means for adding blanking pulses having a predetermined amplitude to said automatically maintained processed video signal to provide a compensated composite video signal in which the pedestal level and video gain may each be independently automatically adjusted upon each vertical blanking pulse.

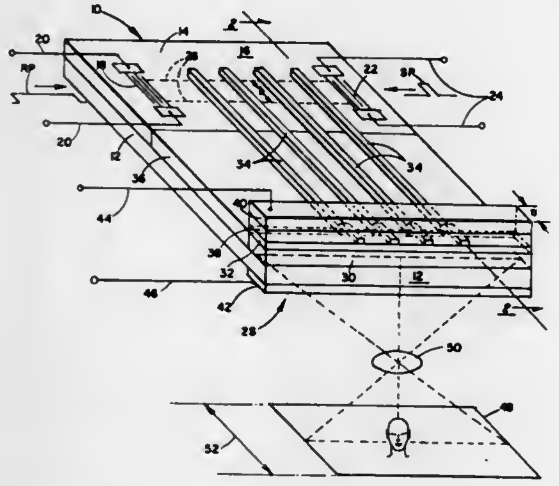
3,970,778
MONOLITHIC ACOUSTOELECTRIC IMAGE PICK-UP DEVICE

Larry R. Adkins, Tustin, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 18, 1975, Ser. No. 588,102

Int. Cl.² H04N *5/30*

U.S. Cl. 178—7.1 **9 Claims**



1. An acoustoelectric imager comprising:
a. substrate means of dielectric material having first and second portions;
b. a film of piezoelectric material disposed on the first portion of said substrate means, said film of piezoelectric material having a propagation path for surface acoustic waves thereon;
c. means for exciting counter-propagating surface acoustic waves along said propagation path;
d. screen means for receiving radiation projected thereon disposed on said second portion of said substrate means and including:
1. semiconductor material sensitive to said radiation; and
2. electrode means for sensing and applying voltage across said semiconductor material;
3. wherein every part of said screen means and said substrate means interposed in a beam path for projected radiation intended to illuminate said semiconductor material is transparent to the projected readiation; and
e. multistrip coupler means for sensing electric fields associated with surface acoustic waves on said propagation path and for causing said electric fields to interact with charge carriers in said semiconductor material.

3,970,779
POWER SUPPLY CIRCUIT

Shigenori Takahashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

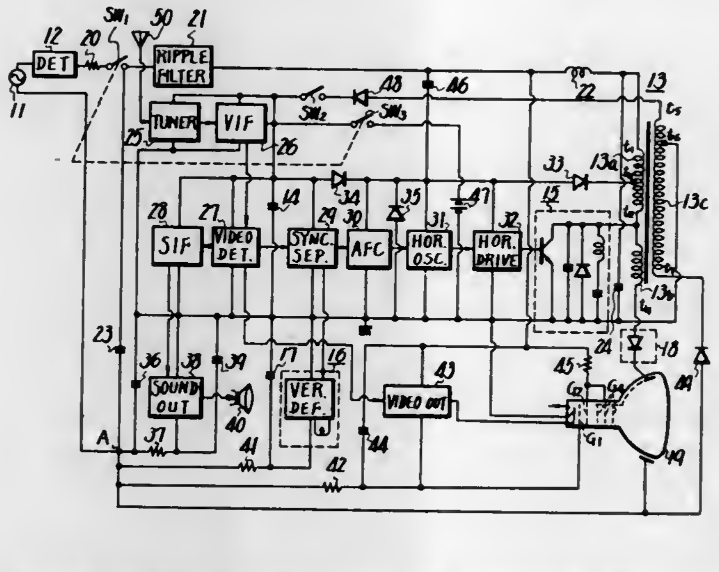
Filed July 17, 1974, Ser. No. 489,083

Claims priority, application Japan, July 24, 1973, 48-83275

Int. Cl.² H04N *5/44*

U.S. Cl. 178—7.3 R **5 Claims**

1. A power supply circuit for supplying stabilized direct currents to at least first and second load circuits comprising:
A. a direct current source means having a pair of output terminals and being operative to produce a DC voltage between said terminals,
B. means connecting said first and second load circuits in series to each other between said pair of output terminals of said direct current source means so that said first and second load circuits have respective DC voltages applied thereacross in dependence on their respective impedances, and
C. control means connected to said first load circuit for producing an additional direct current varying in response to variations in the DC voltage applied across said first load circuit, said control means being connected to said second load circuit for applying said additional direct current in series with the direct current from said direct current source means to said second load circuit to compensate for the variations in the DC voltage applied across said second load circuit that result from said variations in said DC voltage applied across said first load circuit.



3,970,780
CONSTANT-VOLTAGE POWER SUPPLY

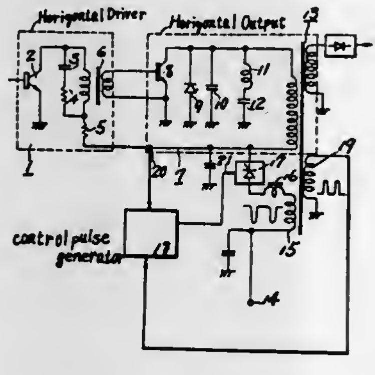
Nobuo Minoura, Ootawara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sept. 28, 1973, Ser. No. 401,847

Claims priority, application Japan, Oct. 4, 1972, 47-99613; May 17, 1973, 48-55097

Int. Cl.² H04N *3/18*

U.S. Cl. 178—7.3 R **6 Claims**



1. A constant-voltage power supply circuit for use in the horizontal deflection circuit of a television receiver comprising;
a source of non-stabilized DC input voltage;
voltage-controlled semiconductor gating means having an input and an output;
means for supplying said non-stabilized DC input voltage to the input of said semiconductor means;
means for generating a DC output voltage at the output of said semiconductor gating means, the amplitude of said DC output voltage being a function of the conduction period of said semiconductor gating means;
means for extracting flyback pulses of a substantially constant frequency from the horizontal deflection circuit of said television receiver;
control means for detecting amplitude variations in said DC output voltage and producing control pulses, said control pulses being delayed in phase from said flyback pulses as a function of the amplitude of said DC output voltage;
means for applying said flyback pulses to both said voltage-controlled semiconductor gating means and said control means, said flyback pulses applied to said semiconductor gating means biasing said semiconductor gating means out of conduction, said flyback pulses applied to said control means providing a pulse train from which said control pulses are generated in conjunction with the amplitude of said DC output voltage;
means for applying said control pulses to said voltage-controlled semiconductor gating means to bias said semiconductor means into conduction;
whereby the conduction period of said semiconductor gating means is a function of said delay in phase of said control pulses from said flyback pulses thereby regulating and stabilizing the DC output voltage.

3,970,781
APPARATUS FOR MAINTAINING THE POSITION OF A WORKING HEAD IN RELATION TO A CYLINDRICAL WORKPIECE

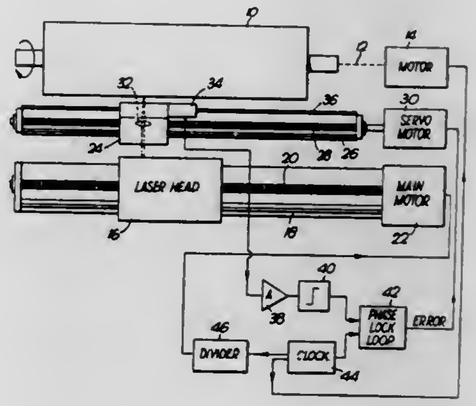
Brian L. Dalton, London, and Edward J. Judd, Hemel Hempstead, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Aug. 21, 1975, Ser. No. 606,571

Claims priority, application United Kingdom, Aug. 22, 1974, 36974/74

Int. Cl.² H04N *1/24*

U.S. Cl. 178—7.6 **10 Claims**



1. Apparatus for scanning the cylindrical surface of a cylinder or of a sheet wrapped around the cylinder with a laser beam, the cylinder being mounted for rotation about its axis, comprising:
a scanning head including a laser;
a lens head comprising an aperture and a focusing lens positioned for focusing the beam of the said laser on to the said cylindrical surface;
a driving system for rotating the cylinder and including first and second driving means for moving the scanning head and lens head, simultaneously with the cylinder rotation, along first and second paths, respectively, each path being parallel to the axis of the cylinder so that the scanning head acts through the focusing lens to move the laser beam along the said cylindrical surface in a direction parallel to the cylinder axis and the beam traces a helical path on the rotating cylinder, the first and second driving means being constructed so that the rate of movement of the lens head by the second driving means is more uniform than that of the scanning head by the first driving means;
the lens head and the scanning head being mounted to permit, during such movement in a direction parallel to the cylinder axis, relative movement between them in the said direction to accommodate differences in their rates of movement, the size of the said lens head aperture and the extent of the said permitted relative movement being such that the laser beam always passes through the lens aperture during operation of the driving system.

3,970,782

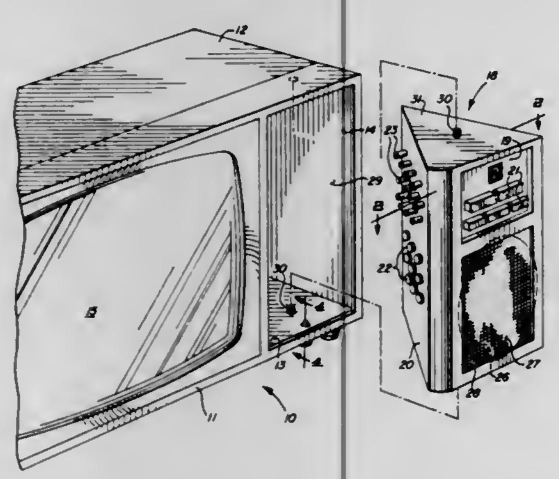
MODULAR CONTROL PANEL DEVICE FOR AUDIO-VISUAL RECEIVING APPARATUS

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed May 2, 1975, Ser. No. 573,855

Int. Cl.² A47B *81/06*; H04B *1/08*; H04N *5/645*; H05K *5/02*

U.S. Cl. 178—7.9 **16 Claims**



1. In an audio-visual receiving apparatus which includes
a cabinet having top, bottom and side panels,
a visual display screen,
an audio output speaker,
a plurality of primary manually operable control devices,
a plurality of secondary manually operable control devices, and
electronic receiving, amplifying and control circuitry associated with said screen and said speaker and responsive to said primary and said secondary control devices,

an improved control panel device for use in combination therewith to provide improved accessibility to said control devices for manipulation and servicing thereof, said improved control panel device comprising:
a. a base pivotally carried by said cabinet;
b. a first panelboard extending from said base and having said primary control devices arranged thereon; and
c. a second panelboard extending from said base and having said secondary control devices arranged thereon.

3,970,783

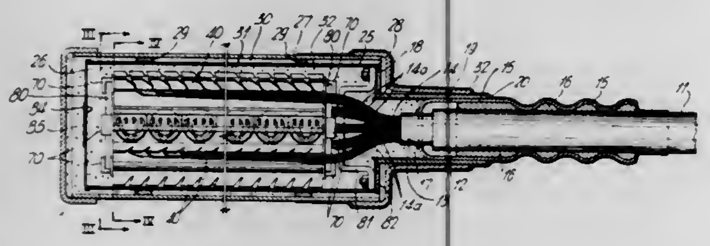
LOADING COIL CASE AND CABLE CONNECTION FOR COMMUNICATIONS CABLES

Helmut H. Lukas, Carleton Place, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 22, 1975, Ser. No. 615,548

Int. Cl.² H01F *17/08*

U.S. Cl. 178—46 **3 Claims**



1. A loading coil case and cable end connection assembly, comprising:
a loading coil case including an inlet tube assembly at an inlet end, said inlet tube assembly including an end plate and a tube extending from said end plate;
a cable end entered into said tube, the cable end including a metal sheathing around conductors of the cable and a protective sheating around said metal sheathing;
said metal sheathing removed at said cable end for a length to expose the conductors, the conductors entering the casing and connected to loading coils in said case;
said protective sheathing removed to expose a short length of the end of said metal sheathing, the ends of said metal sheathing and said protective sheathing positioned within said tube;
a layer of sealing compound over said protective sheathing;
a lead sleeve over said layer of sealing compound and extending part way over said exposed length of said metal sheathing, and crimped onto said cable end, an end of said metal sheathing soldered to said exposed length of metal sheathing.

3,970,784

TRANSMISSION SYSTEM

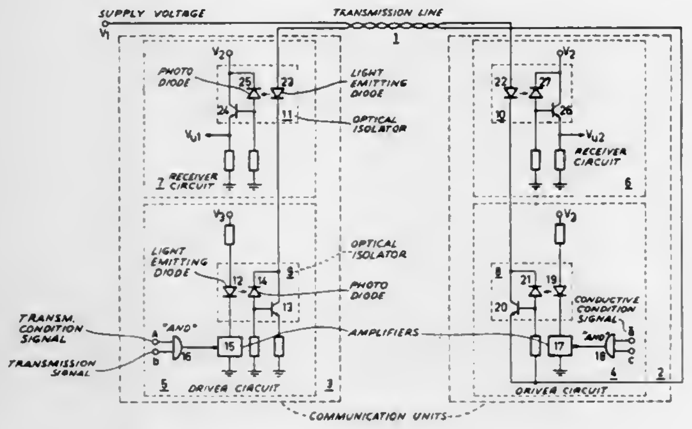
Hermanus Martinus Meijerink, Haaksbergen, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Apr. 18, 1974, Ser. No. 461,871

Claims priority, application Netherlands, May 3, 1973, 7306137

Int. Cl.² H04L *25/02*

U.S. Cl. 178—58 A **4 Claims**



1. A transmission system comprising: a transmission line; a unidirectional power supply and two communication units connected in series with said transmission line; each unit including a driver circuit and a receiver circuit; at least one driver circuit including a photosensitive electronic device connected in the transmission line and a light emitting electronic device optically coupled to said photosensitive device; at least one receiver circuit including a light emitting electronic device connected in the transmission line; and control means coupled to each driving circuit for controlling conductive condition of the photosensitive device in said one driving circuit and for maintaining conductive condition in the other driving circuit.

3,970,785

TONE COUNT AUDIOMETRIC COMPUTER

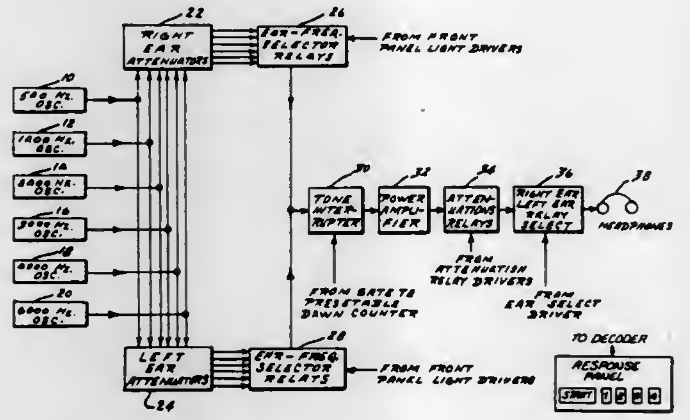
Charles R. Meyer, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 13, 1975, Ser. No. 577,133

Int. Cl.² H04R *29/00*

U.S. Cl. 179—1 N **9 Claims**

1. A tone count audiometric computer apparatus comprising in combination:
a tone generating means for providing a plurality of different frequency tones, said tone generating means being controllable in frequency tone level, said tone generating means being programable as to the ear to be tested,
a logical control means connected to said tone generating means for controlling said frequency tone level, said logical control means selecting the frequency tones to be applied to the ear under test, said logical control unit providing an ear-select signal to said tone generating means to test a particular ear, said logical control means providing a tone interrupt signal to said tone generating means to provide a plurality of different tone burst to said ear under test, and


RIGHT EAR ATTENUATORS
EAR-FREQ. SELECTOR RELAYS
FROM FRONT PANEL LIGHT DRIVERS
TONE INTERRUPTER
POWER AMPLIFIER
ATTENUATION RELAYS
RIGHT EAR LEFT EAR RELAY SELECT
HEADPHONES
FROM ATTENUATION RELAY DRIVERS
FROM GATE TO PRESETABLE DOWN COUNTER
FROM EAR SELECT DRIVER
TO DECODER
LEFT EAR ATTENUATORS
EAR-FREQ. SELECTOR RELAYS
FROM FRONT PANEL LIGHT DRIVERS
RESPONSE PANEL
START

a response panel unit connected to said logical control means to record the number of different tone bursts heard, said response panel unit having a start testing sequence control signal, said response panel unit having a testing ready indication and a listen indication.

3,970,786

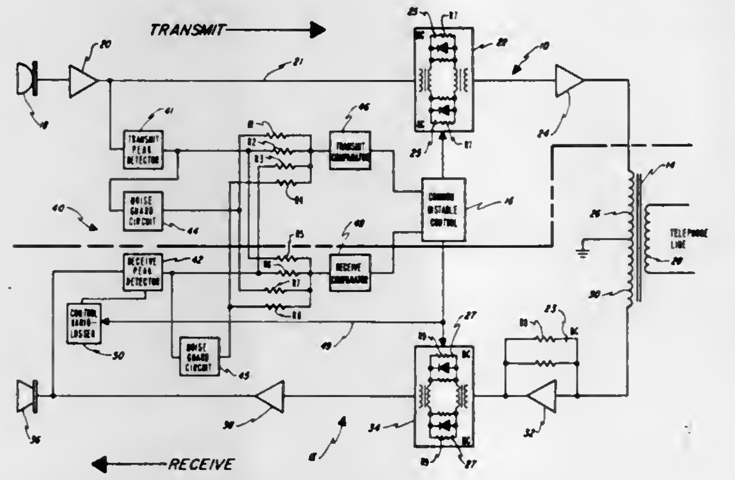
LOUDSPEAKING TELEPHONE WITH IMPROVED RECEIVE SENSITIVITY

Uno Randmere, Victor, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 483,591, June 27, 1974. This application Oct. 21, 1974, Ser. No. 516,333

Int. Cl.² H04M *1/60*, *9/08*

U.S. Cl. 179—1 VC **5 Claims**



1. In a loudspeaking telephone system including transmission and receiving channels, a control circuit for switching between said transmission and receiving channels, selection control means responsive to transmit and receive seizure commands for effectively selecting between said transmission and receiving channels, respectively, by degrading the gain of the unselected channel, input control means for producing said receive seizure commands and said transmit seizure commands, said input control means including receive comparator means and transmit comparator means responsive to receive trigger signals and transmit trigger signals, respectively, for producing, respectively, receive and transmit seizure commands, and passive receive and transmit summing means, having output lines connected to said receive and transmit comparator means, respectively, and each being connected to directly compare the signal levels in both of said transmission and said receiving channels, said receive summing means being arranged to generate over its output line a receive trigger signal when the signal level in said receiving channel exceeds the signal level in said transmission channel by a predetermined amount of said transmit summing means being arranged to generate over its output a transmit trigger signal when the signal level in said transmission channel exceeds the signal level in said receiving channel by said predetermined amount, the improvement comprising:
transmit noise guard circuit means connected to the transmit summing means and to the receive summing means for substantially cancelling ambient noise parameters in said transmission channel, and
receive noise guard circuit means connected to the transmit summing means and to the receive summing means for substantially cancelling noise parameters and a hybrid parameter in said receiving channel, said receive and transmit summing means each comprising a plurality of unequal impedances connected to perform an analog addition of the signal levels in said transmission and receiving channels across each said summing means, said unequal impedances being further connected to perform an analog addition of signals produced by said transmit and receive noise guard circuit means across each said summing junction, said transmit channel being connected to said transmit summing means by a first impedance, said receive channel signal being connected to said transmit summing means by a second impedance, said transmit noise guard circuit signal being connected to said transmit summing means by a third impedance, said receive noise guard circuit signal being connected to said transmit summing means by a fourth impedance, said receive channel signal being connected to said receive summing means by a fifth impedance, said transmit channel signal being connected to said receive summing means by a sixth impedance, said receive noise guard circuit signal being connected to said receive summing means by a seventh impedance, and said transmit noise guard circuit signal being connected to said receive summing means by an eighth impedance, said first, third, fifth and seventh impedances being equal to each other, said second, fourth, sixth and eighth impedances being equal to each other, and said first impedance being greater than said second impedance.

3,970,787

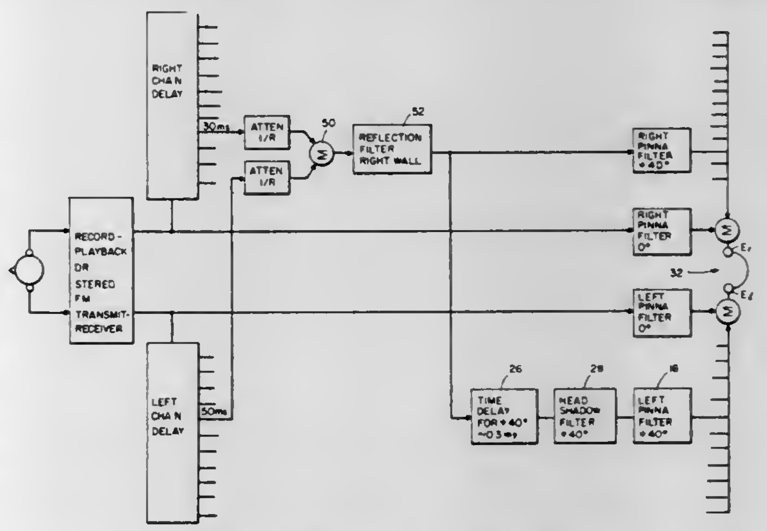
AUDITORIUM SIMULATOR AND THE LIKE EMPLOYING DIFFERENT PINNA FILTERS FOR HEADPHONE LISTENING

Campbell L. Searle, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 11, 1974, Ser. No. 441,259

Int. Cl.² H04R *5/04*

U.S. Cl. 179—1 AT **15 Claims**



1. For use with an auditorium simulator for sound performances having an input for the signal to be played and outputs for right and left transducers that are closely associated with the respective ears of the listener, listener simulating means comprising pinna response simulating circuitry having characteristics simulating differences between the left and right pinnas of a listener for modifying said signal and applying to said right and left transducers outputs in the form of different direction signifying transforms in accordance with the effect

of the listener being disposed in the auditorium being simulated, the output of said pinna response simulating circuitry corresponding as a function of amplitude and frequency to the binaural pinna disparity auditory localization cue of the listener.

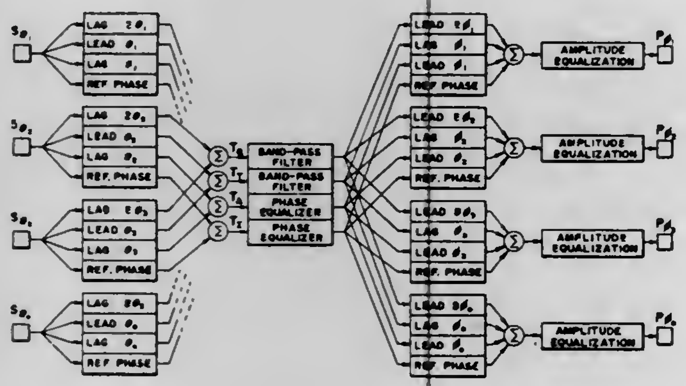
3,970,788
MONAURAL AND STEREO COMPATIBLE MULTIDIRECTIONAL SOUND MATRIXING

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820

Division of Ser. No. 288,873, Sept. 13, 1972, Pat. No. 3,906,156, and a continuation-in-part of Ser. No. 187,065, Oct. 6, 1971, Pat. No. 3,856,992. This application May 16, 1975, Ser. No. 578,078

Int. Cl.^{2} H04R *5/00*

U.S. Cl. 179—1 GQ **7 Claims**



1. In the method of audio reproduction wherein multidirectional source signals are transmitted in two channels adapted for monaural and stereo loudspeaker presentation and having the multidirectional signals encoded in said two channels with predetermined amplitude and phase relations indicative of source directions and adapted to be decoded for formation from the signals in said two channels of more than two loudspeaker presentation signals having source signals corresponding to every source direction appearing in a plurality of such presentation signals but in differing relative amplitude, the improvement comprising

transmitting said multidirectional source signals encoded in at least one auxiliary channel with predetermined amplitude and phase relations differently indicative of source directions relative to the amplitude and phase relations of the multidirectional signals encoded in said two monaural and stereo compatible channels,

decoding the signals of all of said transmission channels to form multidirectional presentation signals wherein said decoding of all of said transmission channels is carried out by decoding said two monaural and stereo compatible channels to provide a first set of more than two loudspeaker presentation signals for presentation at more than two listening space bearing angles and having source signals corresponding to every source direction appearing in a plurality of such presentation signals but in different relative amplitude and decoding said auxiliary channel or channels to provide a second set of a plurality of presentation signals for presentation at listening space bearing angles corresponding to the listening space bearing angle presentation directions of said first set of presentation signals, and

adding to each of said first set of presentation signals the signal of said second set of presentation signals for the corresponding listening space bearing angle to provide a plurality of output signals for the presentation directions corresponding to the presentation directions of said first set of presentation signals but with a sharpened directionality pattern with respect to that of said first set of presentation signals.

6. A method of audio reproduction of multidirectional source signals comprising the steps of transmitting the source signals encoded in two basic transmission channels and also transmitting a limited frequency range of the source signals in at least one auxiliary transmission channel having a frequency range substantially narrower than the first two channels and corresponding to said limited source signal range, phase compensating the signals in said first two transmission channels to match any frequency-dependent phase characteristics attributable to the narrowing of the frequency range in said auxiliary channel or channels, matrixing the signals from all said channels to form more than two directional presentation signals, and individually attenuating the narrower frequency range of each of the presentation signals to essentially the same extent to restore the frequency components of said source signals to their original relative amplitude.

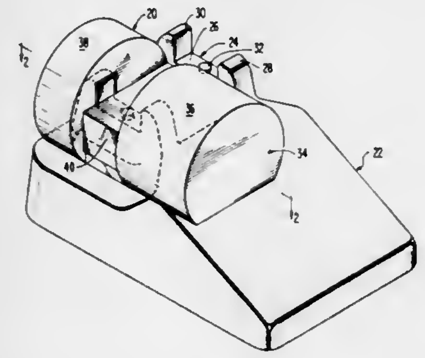
3,970,789
TELEPHONE SERVICE CONTROL DEVICE

Ryden R. Simmons, Sr., 1342 Longfellow St., NW., Washington, D.C. 20011

Filed Jan. 15, 1975, Ser. No. 541,201

Int. Cl.^{2} H04M *1/66*

U.S. Cl. 179—1 HS **2 Claims**



1. A telephone service device for use with a telephone set having a circuit plunger, comprising:

a housing adapted to seat on the telephone set over at least one circuit plunger;

a rotatable shaft operatively mounted within said housing, and a motor and a control accessory means mounted on opposite ends of said shaft;

the shaft having a series of sleeves journaled thereon and the shaft being adapted to drive at least one of said sleeves;

a lift frame extending partially over the circuit plunger and movably secured to the housing;

lever means secured to said one of said sleeves, the lever means including a pivotal tilt lever, said tilt lever being moved by said one of said sleeves responsive to rotation of said shaft and contacting the circuit plunger to depress the same, and contacting the lift frame to vertically move said frame; and

a bail secured to another of the sleeves and to the lift frame to effect upward or downward movement of the lift frame responsive to rotation of the sleeve.

3,970,790
METHOD AND DEVICE FOR THE CODED TRANSMISSION OF MESSAGES

Gustav Guanella, Zurich, Switzerland, assignor to Patelhold Patentverwertungs & Elektro-Holding AG, Glarus, Switzerland

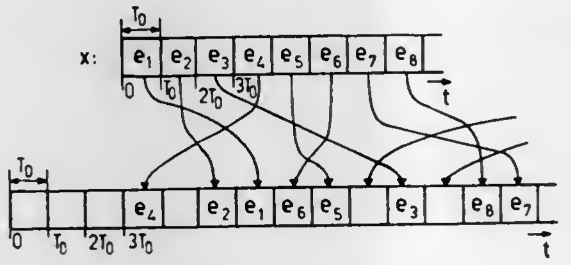
Filed Mar. 7, 1974, Ser. No. 448,977

Claims priority, application Switzerland, Mar. 19, 1973, 3876/73

Int. Cl.^{2} H04K *1/06*

U.S. Cl. 179—1.5 S **41 Claims**

1. A method for the enciphered transmission of messages by splitting up the clear signals to be transmitted into elements of equal length T_o, which are transposed at the transmitting end by being delayed by at least partially unequal times and are re-transposed at the receiving end by being further delayed by at least partially unequal times, said method comprising the steps of transposing a pair of elements at a time, which elements have a specific mutual spacing, at the transmitting end, and re-exchange of the same elements in pairs at the receiving end, the pairs of elements which are transposed at the transmitting end and re-transposed at the receiving end being determined by providing irregular trains of control pulses which are identical at the transmitting and receiving ends, and delaying those elements which do not belong to the pairs of elements by a fixed time T at the transmitting and receiving ends, and delaying the element of each pair arriving first at the transmitting end and at the receiving end by double the time 2T and passing the second element of the pair without delay.



T_o
x:
e_1 e_2 e_3 e_4 e_5 e_6 e_7 e_8
0 T_o $2T_o$ $3T_o$
t
y:
e_4 e_2 e_1 e_6 e_5 e_3 e_8 e_7

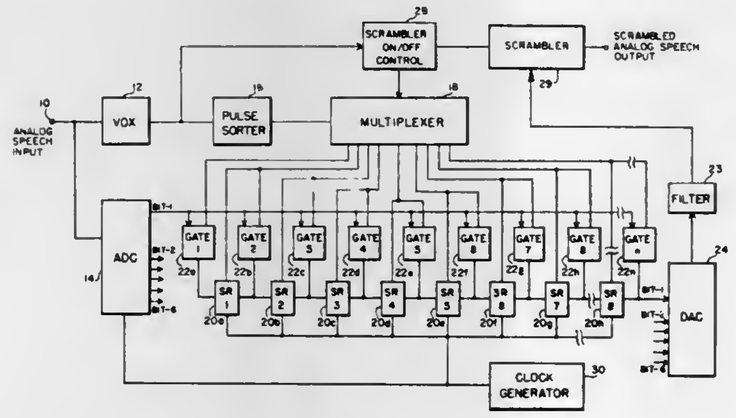
3,970,791
VOICE CONTROLLED DISAPPEARING AUDIO DELAY LINE

George B. Johnson, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1975, Ser. No. 581,060

Int. Cl.^{2} H04M *1/70*

U.S. Cl. 179—1.5 S **9 Claims**



1. A voice-controlled disappearing audio delay apparatus for use with a voice scrambler transmitter, the combination comprising:

a. input means for receiving voice generated signals;

b. first means coupled to said input means for delaying the incoming voice signal for a predetermined time duration equal to the time required for a scrambler preamble to be transmitted,

c. second means coupled to said input means and to said first means for incrementally removing the delay of the voice signal in response to pauses of predetermined time durations in said voice generated signals.

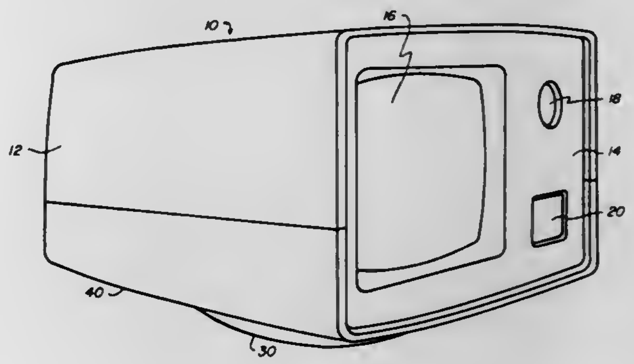
3,970,792
ADJUSTABLE MOUNTING STRUCTURE FOR VIDEO TELEPHONE UNIT

Edward Edmund Benham, Greenwich; Walter A. Menn, Stamford, both of Conn.; Douglas M. Spranger, Brooklyn, and Malcolm J. Brookes, New York, both of N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,844

Int. Cl.^{2} H04M *1/04*

U.S. Cl. 179—2 TV **6 Claims**



1. An adjustable mounting base for a video telephone terminal comprised of an enlarged housing having a viewing face in one side thereof, said base being adapted to rest on a generally horizontal surface, the base including a pedestal having an enlarged surface adapted to rest on the horizontal surface, a recess in said central portion of said pedestal, said recess having a circular periphery, an insert member fitted in said recess, said insert member including a basal portion mating with said recess to allow rotation of said insert member relative to said base, a socket of rectangular cross section in said insert member, said socket terminating in opposed shoulders at the extreme ends of said socket, a rocker member including an arcuate lower wall, means mounting said rocker member to the underside of said housing with the arcuate wall extending downwardly therefrom, said rocker member resting in said socket with the arcuate wall of said member engaging the shoulders of said socket to enable manually settable inclination of the viewing face of said housing, said rocker to shoulder engagement frictionally holding said terminal in an inclination and said insert member enabling rotation of said housing viewing face.

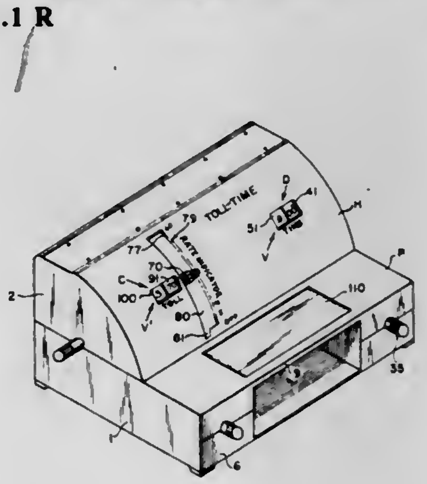
3,970,793
TELEPHONE-CALL TOLL MONITOR AND INDICATOR

Leslie M. Profitt, 147 Sunset Court, Monroe, Ohio 45050, and Merle E. Lehmer, Jr., 810 Melody Drive, North Huntingdon, Pa. 15642

Filed Oct. 25, 1974, Ser. No. 518,169

Int. Cl.^{2} H04M *15/18*

U.S. Cl. 179—7.1 R **25 Claims**

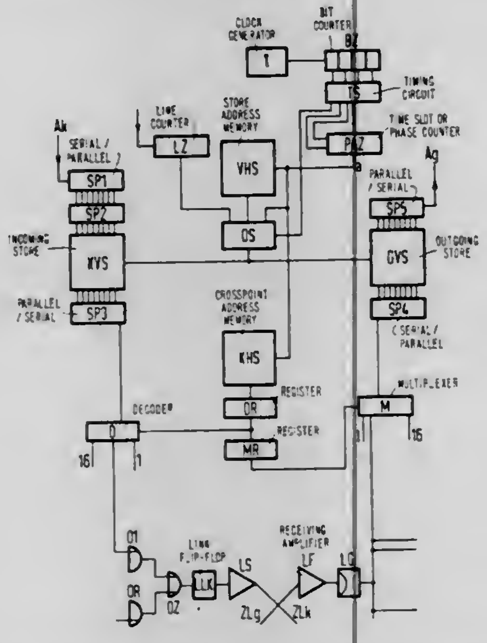


16. A telephone-call toll indicating apparatus comprising

a. a timing mechanism,
b. a disk adapted to be driven at a constant speed by said timing mechanism,
c. a rotary toll-indicating device having an actuating disk spaced from said first-mentioned disk for rotation on a common rotary axis,
d. a rockable setting lever adjustably mounted for pivotal movement between said disks and provided with a rotary shaft extending in opposite directions from the longitudinal axis of said setting lever,
e. a drive wheel at one end of said shaft adapted for frictional contact with said first-mentioned disk,
f. a driven wheel at the opposite end of said shaft in frictional contact with said actuating disk for the toll indicating device, and
g. a rate-indicating scale adjacent to said rockable setting lever so that the setting of said lever at a predetermined point of the scale positions the radial displacements of said driving and driven wheels from their common rotary axis in frictional contact with the respective disks so that the constant rotary movement of said first disk is converted to variable speeds of said rotary shaft and corresponding varying lineal speeds of said actuating disk of said toll-indicating device.

3,970,794
PCM TIME-DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

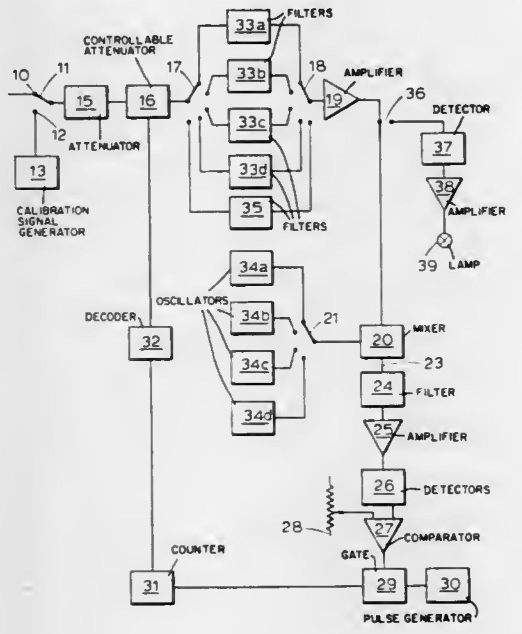
Karlheinz Neufang, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Mar. 26, 1974, Ser. No. 454,851
Claims priority, application Germany, Mar. 29, 1973, 2315751
Int. Cl.^{2} H04J *3/00*
U.S. Cl. 179—15 AQ **1 Claim**



1. A PCM time-division multiplex telecommunication network having a plurality of PCM time-division multiplex switching centers interconnected over four-wire time-division multiplex connections, each of said PCM time-division multiplex switching centers having stores assigned individually to each pair of conductors of the four-wire time-division multiplex connections for storing all elements of information associated with message time slots during a pulse frame and arriving on or to be transferred over the time-division multiplex connection concerned, said pulse frame being determined by the duration of the sampling period of the time-division multiplex system, said network further having crosspoint elements for the space-division switching of the message time slots as well as address memories which are used to accomplish the space- and time-division coordination of the operation of the crosspoint elements and of the store allocations of the stores assigned to the individual message time slots, said PCM time-division multiplex telecommunication network being provided with a number of switching time slots larger than the number of said message time slots available on the four-wire time-division multiplex connections, characterized in that in the time-division multiplex switching centers means are provided for supplying the operating pulses required for a four-wire time-division multiplex connection in the course of a switching operation for the writing of elements of information or communication-channel addresses into the stores or address memories (VHS,KHS) and for the readout thereof, comprising a single clock generator whose clock frequency corresponds to the number of bit times for elements of information which lie within a sampling period, a bit counter (BZ) having designated counter positions for counting the bit times appearing during one of said switching time slots, and a time slot counter for uniquely representing by count the number of said switching time slots, said time slot counter being normally stepped by a series of pulses collected at a counter stage of said bit counter the repetition rate of said pulses equalling the rate of appearance of elements of information on the four-wire time-division multiplex connections stepped during each run of the bit counter during each of said pulse frames for the duration of one bit time, the counter being moved backward one counter position during another of said bit times as uniquely determined by one of said counter positions of said bit counter, the output signals of said bit counter specifying switching time slot addresses which are routed continually to the address memories and there being provided in each switching center for each four-wire time-division multiplex connection a controlled OR circuit over which the switching time slot addresses specified by the time slot counter or the message time slot addresses output by the address memories allocated to the stores during the individual switching time slots, or the message time slot addresses produced by a line counter according to the rate of appearance of elements of information, are applied as access addresses for the stores as a function of designated counter positions of the bit counter.

3,970,795
MEASUREMENT OF NOISE IN A COMMUNICATION CHANNEL

Edgar Robert Allen, Stanmore, England, assignor to The Post Office, London, England
Filed July 16, 1974, Ser. No. 488,993
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.^{2} H04J *1/16*
U.S. Cl. 179—15 BF **4 Claims**

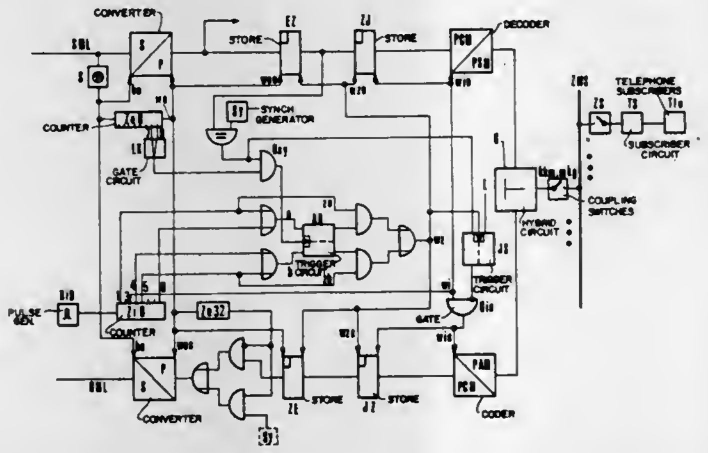


1. In a FDM communications link having a plurality of channels, and wherein a multiplicity of said plurality of channels is carrying traffic and at least one channel, called a quiet channel, carries no traffic; apparatus for assessing the noise performance of said FDM communications link, comprising:

a. Tee-in means for tapping off a portion of a broad band signal transmitted over said communications link;
b. filter means connected to said tee-in means for isolating a predetermined bandwidth lying within said quiet channel;
c. power measuring means including signal mixing means and detector means operable to produce a DC output representative of the power level in said predetermined bandwidth of a noise signal;
d. display means;
e. comparator means having said DC output applied to a first input, a reference level applied to a second input and an output connected to operate said display means; and
f. said power measuring means further including a controllable attenuator connected between said tee-in means and said filter means, an output from said display means connected to control said controllable attenuator so that said comparator means has zero output.

3,970,796
TIME-DIVISION-MULTIPLEX ARRANGEMENT

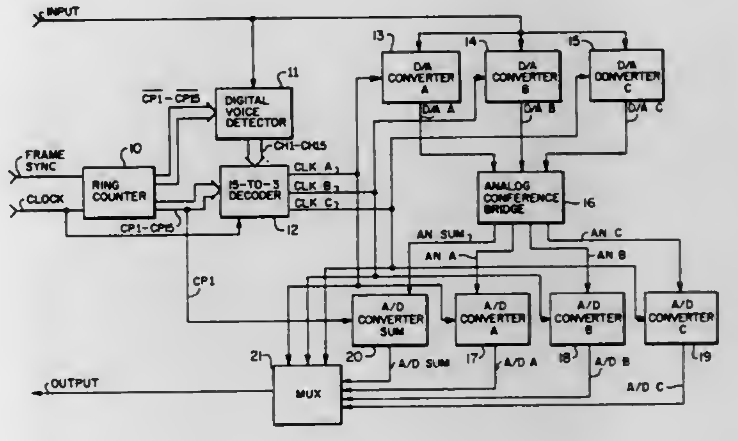
Karoly Gyürki, Bolligen, Switzerland, assignor to Siemens-Albis AG, Zurich, Switzerland
Filed Oct. 7, 1974, Ser. No. 512,453
Claims priority, application Switzerland, Oct. 10, 1973, 14399/73
Int. Cl.^{2} H04J *3/06*
U.S. Cl. 179—15 AF **9 Claims**



1. A time-division-multiplex arrangement for compensating changes in the mutual phase position of the timing pulse frames of a PCM-time-division-multiplex transmission line, comprising means defining a transmitting end and a receiving end for the time-division-multiplex arrangement, a series/parallel converter provided at said receiving end, a first one-word intermediate store arranged in circuit with said series/parallel converter, said one-word intermediate store having an input side and an output side, means for operating the input side of said first one-word intermediate store in an external word pulse train corresponding to a received bit pulse train, means for operating the output side of said first one-word intermediate store in one of two uniformly mutually offset intermediate word pulse trains, a second one-word intermediate store having an output side connected in circuit with the first one-word intermediate store, means for operating the second one-word intermediate store at its output side in an internal word pulse train, a parallel/series converter connected in circuit at the transmitting end, a first one-word intermediate store having an input side and an output side in circuit with the parallel/series converter, means for operating said output side of the first one-word-intermediate store at an external word pulse train at the transmitter end, means for controlling said input side of said first one-word intermediate store at the transmitter end in one of two uniformly mutually shifted intermediate word pulse trains, a second one-word intermediate store arranged in circuit with said first one-word intermediate store at the transmitter end, means which in the presence of phase differences which vary by a predetermined amount from a given limit between the pulse frames of the external word pulse train and pulse frames of the momentarily active intermediate word pulse train initiate a change to the other intermediate word pulse train, means for controlling the one-word intermediate store both at the receiver end and at the transmitter end with the same intermediate word pulse train of both uniformly mutually shifted intermediate word pulse trains with the period of the internal word pulse train of the time-division-multiplex apparatus, and means for directly connecting at the receiver end the output of the second one-word intermediate store and at the transmitter end the input of the second one-word intermediate store with the time-division-multiplex arrangement for transmitting in parallel form the arriving PCM-words in the internal word pulse train.

3,970,797
DIGITAL CONFERENCE BRIDGE

David A. Johnson, Easton, and William C. Towle, Sudbury, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Jan. 13, 1975, Ser. No. 540,717
Int. Cl.^{2} H04M *3/56, 1/58*
U.S. Cl. 179—15 AT **8 Claims**



1. Digital conference bridge apparatus comprising
a plurality of M input channels for transmitting digital signals;
a plurality of M output channels, each output channel corresponding to a different one of said input channels;
detection means coupled to said input channels for detecting the presence of digital signal information thereon;
a group of N digital-to-analog converting means for converting digital signals to analog signals;
decoder means coupled to said detection means and to said digital-to-analog converting means, said decoder means being operable individually to couple said digital-to-analog converting means to up to N input channels having digital signal information present thereon;
analog bridge means having N input connections and N+1 output connections, each of N of the output connections corresponding to an input connection and the other output connection being a summing output connection;
each of said digital-to-analog converting means being coupled to a different one of the N input connections of said analog bridge means;
said analog bridge means being operable to produce at each of the N output connections the analog signals present at all but the corresponding one of said N input connections, and being operable to produce at the summing output connection an analog signal which is the sum of the analog signals present at said input connections;
a group of N+1 analog-to-digital converting means for converting analog signals to digital signals, each of said analog-to-digital converting means being coupled to a different one of the N+1 output connections of said analog bridge means; and

output multiplexing means coupled to said analog-to-digital converting means, to said decoder means, and to said plurality of output channels for applying digital signals from particular analog-to-digital converting means to particular output channels.

3,970,798

TIME DIVISION MULTIPLEX DATA TRANSMISSION SYSTEM

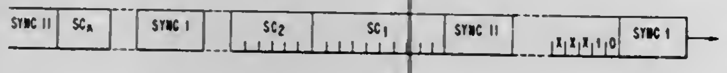
Gabriel Epenoy, Vence, and Remi Vautier, Nice, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,718

Claims priority, application France, Apr. 26, 1974, 74.15155

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 AF **4 Claims**



1. A data transmission system including a number of switching nodes and data transmission lines connecting said nodes, for transmitting data by interspersed data frames and switching control frames, said system characterized in that each node includes:

reception adapter means for detecting a first synchronization character in an incoming transmission frame and for extracting data and non-significant stuffing bits from a high speed channel of said frame, said reception adapter means also including means for detecting a second synchronization character,

a counter means energized by said reception adapter means upon detection of said second synchronization character, to supply the addresses of switching control frame sub-channels according to the positions of said sub-channels with respect to said second synchronization character;

means responsive to said counter means for extracting data from selected switching control frame sub-channels;

a transmission adapter means for regenerating said first synchronization character of said data frame and for thereafter transmitting both data received on selected sub-channels and data originating at each node, said transmission adapter means including a means for inserting non-significant stuffing bits into said high speed channel of frames transmitted after said first synchronization character over said transmission line.

3,970,799

COMMON CONTROL SIGNALING EXTRACTION CIRCUIT

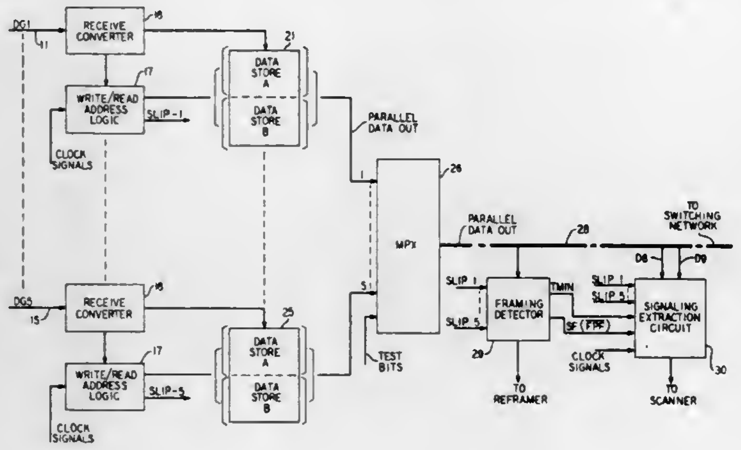
John Robert Colton, Freehold; Robert Bruce Heick, Eatontown, and Henry Mann, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 6, 1975, Ser. No. 619,813

Int. Cl.² H04J *3/12*

U.S. Cl. 179—15 BY **11 Claims**

11. In a time division multiplex system wherein a plurality of digital groups of time division multiplexed channels are time multiplexed together on to a transmission link, each digital group including a similar predetermined framing bit pattern, each digital group using *n*-bits for transmitting digital information for each channel with the *n*th bit borrowed for signaling purposes in every *m*th frame, each digital group also including signaling framing bits in a given bit position of every *f* frames for the purpose of identifying the signaling bits of the group; a signaling extraction circuit characterized by signaling framing pattern store means for maintaining a continuing real time record of the pattern of the signaling framing bits for each digital group, a signal bit storage means for storing the *n*th signaling bit of each channel of each digital group, and means for enabling the signal bit storage means to receive the *n*th signaling bit of each channel of a digital group after a predetermined signaling framing bit pattern has been recorded for the group.



3,970,800

SWITCHING ARRANGEMENT FOR ASCERTAINING OVERLAP PRIOR TO TRANSFER OF CODE DIGITS IN A TELEPHONE EXCHANGE

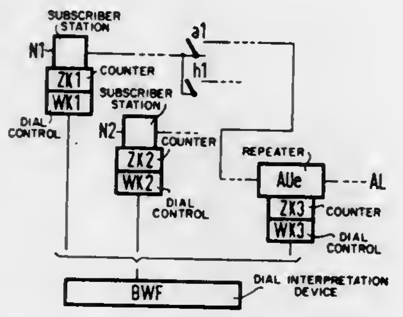
Werner Braunbeck, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,556

Claims priority, application Germany, Nov. 30, 1973, 2359829

Int. Cl.² H04M *1/26*

U.S. Cl. 179—18 AD **4 Claims**



1. In a telephone exchange switching system having subscriber stations and/or local repeaters connected thereto, apparatus for ascertaining an overlap prior to transfer of code digits being interpreted to a dial interpretation device in said exchange, comprising:

a plurality of dial control means and counting means for receiving and storing dial code digits, each subscriber station and local repeater in said system having a said dial control means and counting means assigned thereto.

means for producing clock pulses,

switching means in each said dial control means for controlling, upon expiration of a time period determined by a said clock pulse, the triggering of the transfer of a code digit from said counting means and as a result of a signal identifying the end of a digit,

means in each said dial control means for generating and transmitting a test signal, upon operation of the said switching means associated therewith, responsive to said clock pulses, said test signal being coupled to switching means in others of said dial control means and

means for blocking transfer of code digits to said dial interpretation device responsive to operating states in said switching means of said other dial control means as determined by said test signals.

3,970,801

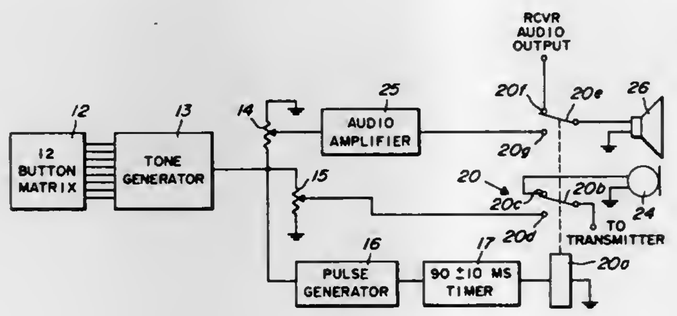
DIALING APPARATUS FOR A PORTABLE RADIO TELEPHONE

Danny E. Ross, Plantation, and James M. Mueller, Margate, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1974, Ser. No. 529,020

Int. Cl.² H04M *1/50*

U.S. Cl. 179—41 A **5 Claims**



1. In a portable radio including a transmitter/receiver with a microphone and audio transducer, the improved pushbutton telephone dialing apparatus comprising:

a. tone generating means having a plurality of control inputs and an output, said tone generating means providing a predetermined one of a plurality of tones in response to each of a plurality of control signals on the plurality of control inputs;

b a multibutton device coupled to the plurality of control inputs of said tone generating means for providing any of the plurality of control signals in response to the activation of predetermined buttons of said multibutton device;

c pulse generating means having an input connected to the output of the tone generating means and an output for sensing the beginning of a tone from the tone generating means and providing a single pulse at the output in response thereto;

d a timer having an input coupled to the output of said pulse generating means and having an output, said timer providing a signal of a predetermined duration on the output thereof in response to each pulse produced at the output of said pulse generating means;

e. switching means coupled to the output of said timer and being activated for the predetermined duration in response to a signal thereon, said switching means normally coupling the microphone to the transmitter and the audio transducer to the receiver and said switching means, upon activation thereof, disconnecting the microphone and coupling the audio transducer and the transmitter to the output of said tone generating means.

3,970,802

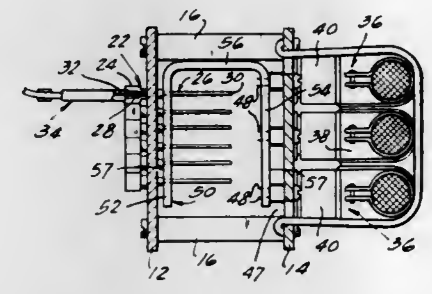
FLEXIBLE CIRCUIT CONNECTING ARRANGEMENT FOR INTERCONNECTION MODULES

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 16, 1974, Ser. No. 515,274

Int. Cl.² H04Q *1/06, 1/14;* **H01R** *11/00*

U.S. Cl. 179—98 **14 Claims**



1. An electrical interconnection module, comprising:

a front panel and a back panel spaced from and secured to said front panel and forming a space between said panels;

plurality of first electrical/contacts extending through and supported in aligned rows by said front panel with forward portions for engagement with external mating contacts and rear portions disposed in said space;

a plurality of second electrical contacts extending through and supported by said back panel with forwardly extending portions disposed in said space and rearwardly extending portions for engagement with external mating contacts, said second electrical contacts supported in groups; and

flexible printed circuit means disposed between said front and back panels and being formed with a surface extending between said panels for receiving said rear portions of said first contacts and said forwardly extending portions of said seond contacts, and printed circuit means comprising at least one layer of insulating material and at least one pair of printed circuits on respective sides of said layer and extending between said first contacts of at least two of said rows and said second contacts of at least two of said groups, each of said printed circuits individually connecting said first electrical contacts of a row with said second contacts of a respective group of second contacts.

3,970,803

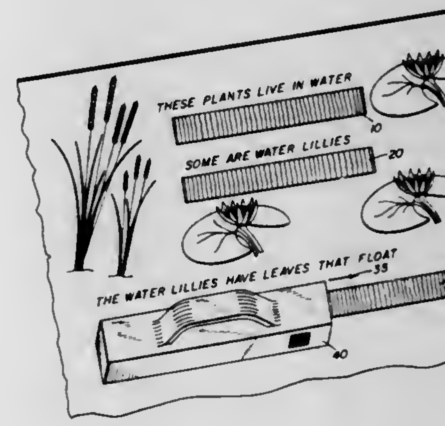
PRINTED SOUND TRACK SYSTEM

George R. Kinzie, Jr., Ridgefield, and Daniel Gravereaux, Wilton, both of Conn., assignors to CBS Inc., New York, N.Y.

Continuation of Ser. No. 322,774, Jan. 11, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 550,065

Int. Cl.² G11B *7/08, 7/18, 7/24*

U.S. Cl. 179—100.3 B **6 Claims**


THESE PLANTS LIVE IN WATER
10
SOME ARE WATER LILLIES
20
THE WATER LILLIES HAVE LEAVES THAT FLOAT
35
30
40

1. A system for generating audible information from indicia printed on a paper comprising:

a sound track oriented on said paper in a manual scanning direction, said track consisting of a multiplicity of elongated parallel sound track segments of the variable area-type printed on said paper in closely spaced arrangement, the segments being oriented in a direction which is generally transverse the manual scanning direction, said segments being arranged in an order which represents sequential portions of the complete sound information contained in said track, adjacent segments having a substantial degree of waveform redundancy;

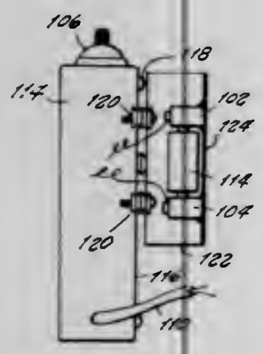
an optical scanner adapted to be manually scanned over said track in the manual scanning direction, the scanner including automatic means for continuously scanning the segments longitudinally to produce electrical signals representative of audio information; and

means for converting said electrical signals into audible sounds.

3,970,804
ELECTRO-MECHANICAL AMPLIFIER SOUND TRANSDUCER

Jerry O'Brien, deceased, late of Jersey City, N.J., and Catherine H. O'Brien, executrix, 33 Pamrapo Ave., Jersey City, N.J. 07305

Filed Mar. 25, 1974, Ser. No. 454,224
Int. Cl.² H04L *15/04*; **H04R** *21/00, 21/02*
U.S. Cl. 179—131 **18 Claims**



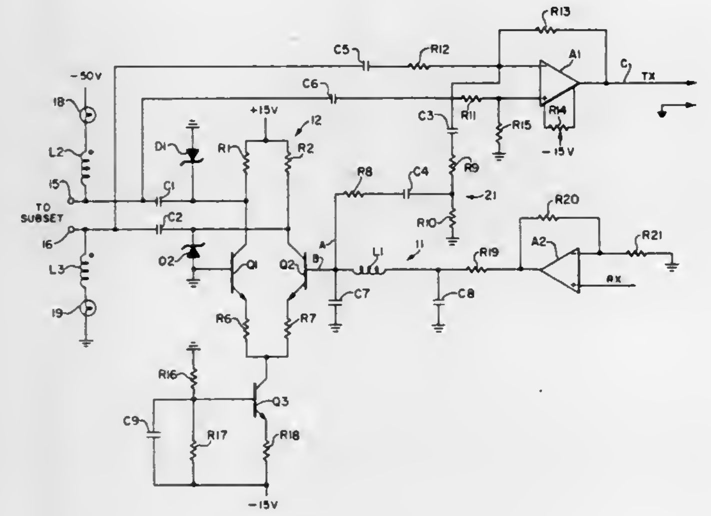
1. An electromechanical amplifying sound transducer comprising:
- a. diaphragm means for receiving acoustic waves and vibrating in response thereto;
- b. conductive support means mounted onto said diaphragm and adapted to be connected to a source of electrical energy;
- c. weighted conductive bar means loosely coupled to said support means, said support means comprising at least two spaced apart bearing supports said bearing supports each including holes therein such that the holes of the two supports are in axially aligned relationship, each of said supports being connected to opposite terminals of the source of electrical energy, said bar means including a shaft loosely mounted in said axially aligned holes and conductively interconnecting said bearing supports to complete the electrical circuit therethrough, said support means transmitting said vibrations to said bar means whereby said bar means can control the electrical energy delivered from the source of energy so that the acoustic waves are converted into amplified electrical waves, and
- d. weight means affixed to said bar means and adjustable along the length of said bar means.

9. An electromechanical amplifying device for transmission of binary information and audible sound, comprising:
- a. base means vibrating in response to acoustic waves;
- b. at least a pair of spaced apart conductive support means mounted onto said base means and adapted to be connected to a source of electrical energy;
- c. weighted conductive bar means loosely contacting said support means and interconnecting them, said support means transmitting said vibrations to said bar means; and
- d. manually operated mechanical interrupt means unconnected to the electrical circuit, arranged on said base means for mechanically contacting with said bar means for intermittently disconnecting said bar means from said support means when said interrupt means are mechanically actuated, whereby said bar means can control the electrical energy delivered from the source of electrical energy so that the audible sounds and the intermittent disconnections are converted into amplified electrical waves, such that the identical electrical circuit can be utilized for both the transmission of binary information and audible sound.

3,970,805
ACTIVE HYBRID CIRCUIT

Robert M. Thomas, Maitland, Canada, assignor to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Feb. 22, 1974, Ser. No. 444,889
Int. Cl.² H04B *1/58*
U.S. Cl. 179—170 NC **5 Claims**

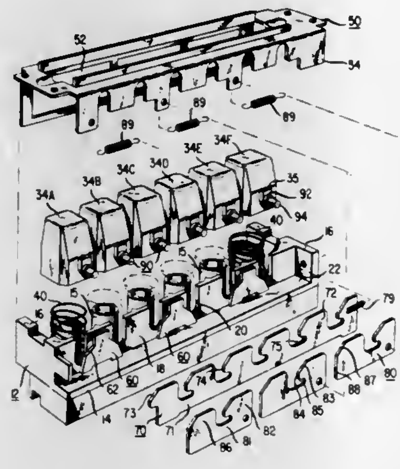


1. An active hybrid circuit comprising
an input terminal for receiving input signals;
receiving amplifier means having an input connection coupled to said input terminal and having two output connections for producing therebetween a differential output of the signals applied at the input connection;
two common terminals for connecting a transmitting and receiving unit thereto;
said output connections of the receiving amplifier means being coupled to said common terminals, whereby input signals received at the input terminal and amplified to produce a differential output by the receiving amplifier means are applied to the transmitting and receiving unit;
transmitting amplifier means having two input connections for receiving a differential input and having an output connection;
said input connections of the transmitting amplifier means being coupled to said common terminals, whereby signals being transmitted by the transmitting and receiving unit are applied to the transmitting amplifier means and amplified transmitted signals are produced at the output connection of the transmitting amplifier means; and
compensating means coupled to the input terminal and directly to a first of said two input connections of the transmitting amplifier means;
said compensating means including
first circuit means including impedance means connected between said input terminal and a connection point,
second circuit means including impedance means connected between said connection point and said first input connection of the transmitting amplifier means, and
third circuit means including impedance means connected between said connection point and a point of reference potential;
said compensating means being operable in response to a signal at the input terminal to produce a signal at said first input connection of the transmitting amplifier means causing the transmitting amplifier means to produce at its output connection a signal which is substantially equal and of opposite polarity to the signal produced at its output connection in response to the same input signal amplified by the receiving amplifier means, coupled to the transmitting amplifier means, and amplified by the transmitting amplifier means, whereby substantially none of a signal received at the input terminal appears at the output connection of the transmitting amplifier means.

3,970,806
MULTIPLE SWITCH

Jack Edward Distler, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 9, 1975, Ser. No. 585,061
Int. Cl.² G05G *9/00*; **H01H** *9/20*
U.S. Cl. 200—5 R **12 Claims**

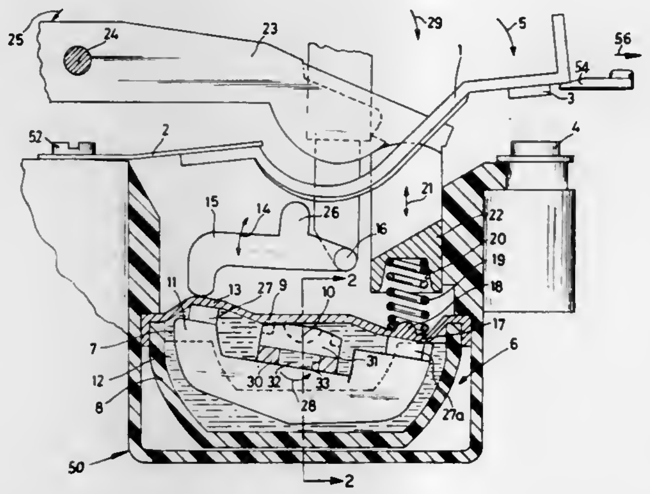


1. A multiple switch comprising a multiplicity of switch actuators each of which is movable between a first and a second position, the switch actuators being associated in a multiple of pairs, each pair consisting of a first and a second switch actuator, and means for providing interaction between the switch actuators responsive to the movement of the switch actuators, the interaction means permitting all of the first switch actuators that are in the second position to move to the first position responsive to the movement of the second switch actuator of any pair to the second position, the interaction means retaining in the second position all other second switch actuators in the second position.

3,970,807
ELECTRIC SWITCH HAVING A TIME-DELAY MECHANISM

Alois Schaffeler, Spaichingen, and Wolfgang Moller, Schwenningen, both of Germany, assignors to J. & J. Marquardt, Germany

Filed Mar. 17, 1975, Ser. No. 558,652
Claims priority, application Germany, Mar. 22, 1974, 2413786
Int. Cl.² H01H *7/03, 43/00*
U.S. Cl. 200—34 **7 Claims**

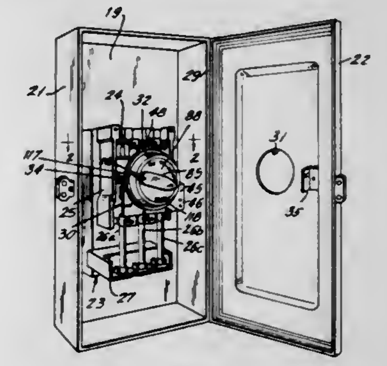


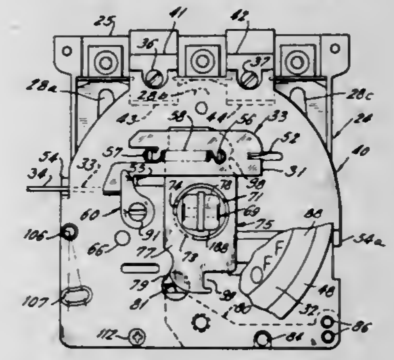
1. An electric switch, comprising a housing, a fixed contact on said housing, a contact arm adjacent said fixed contact having a free end with a movable contact and an opposite end mounted on said housing, said free end of said arm with said movable contact being biased in a direction toward said fixed contact for engagement of said movable contact with said fixed contact, a lever pivotally mounted on said housing below said contact arm and being displaced by contact of said arm and movement of said arm toward said fixed contact, a liquid choke medium reservoir in said housing below said lever, second plate means defining at least one choke medium passage in said reservoir, first plate means pivotally mounted in said housing below said lever and having a first end portion operatively associated with said lever so as to be pivotally displaceable by movement of said lever and having a second end portion on the opposite side of said pivot movable in an opposite direction and also having a movement delay part in the choke medium passage acting on the medium so as to delay the movement of said first plate means and hence the closing movement of said contact arm.

3,970,808
CIRCUIT INTERRUPTER HAVING ROTARY SWITCH OPERATOR AND INTERLOCKING STRUCTURE WITH TWO POSITION MOUNTING PLATE

Carl E. Gryctko, Haddon Heights, N.J.; Kenneth D. Ball, Warminster, and Peter J. McGinnis, Chester Township, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Oct. 15, 1974, Ser. No. 514,591
Int. Cl.² H01H *9/22, 3/20, 33/48*
U.S. Cl. 200—50 A **11 Claims**





1. In combination, an enclosure having a first side normally closed by an openable front cover; a circuit interrupter within said enclosure and having a handle disposed entirely within said enclosure; an operator mechanism separate from said cover for manually operating said circuit interrupter from a point outside of said enclosure and in front of said cover; said mechanism including a single mounting plate fixedly mounted to said interrupter, a crank means positioned at the rear of said plate and operatively connected to said handle, an operating handle disposed in front of said plate in operative position received by an aperture in said cover as the latter moves from its open to its closed position, a main shaft connecting said operating handle to said crank means whereby pivotal movement of said operating handle in a plane parallel to said cover in its said closed position is effective to operate said crank means which in turn operates said handle, a first element biased to cover latching position for maintaining said cover closed, a second element biased to blocking position, cam means operable by said operating handle to move said first element to cover releasing position, said cam means and said second element in said blocking position cooperating to prevent operation of said operating handle to close said circuit interrupter when said front cover is open, interlock means

operable by said cover upon closing thereof to move said second element from said blocking position to a retracted position wherein said operating handle may be operated to close said circuit interrupter, defeater means for moving said first element to said cover releasing position when said circuit interrupter is closed, an indicia carrying plate behind said operating handle and cooperating therewith to indicate the position of said handle; said mounting plate including a first set of formations operatively positioning said first element, said second element, said interlock means and said defeater means on said mounting plate in combination for use of said mechanism with said cover hinged along a first edge of said enclosure; said mounting plate also including a second set of formations defining alternate operative positions on said mounting plate for said first element and said defeater means; with said first element and said defeater means in said alternate positions said mechanism being usable with a cover hinged along a second edge of said enclosure opposite to said first edge.

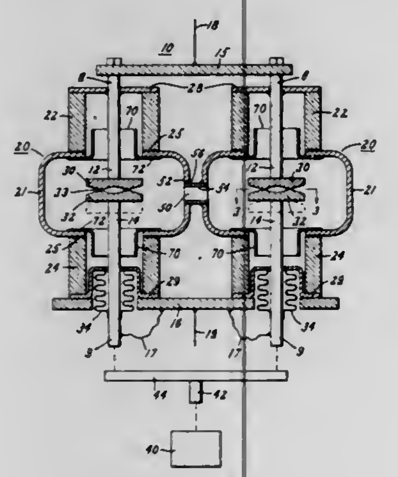
3,970,809
ELECTRIC CIRCUIT BREAKER COMPRISING PARALLEL-CONNECTED VACUUM INTERRUPTERS

Graham R. Mitchell, Willingboro, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 10, 1975, Ser. No. 548,847

Int. Cl.^{2} H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. In an electric circuit breaker,
a. a pair of circuit interrupters of the vacuum-type electrically connected in parallel circuit relation with each other,
b. each interrupter comprising:
  i. a pair of separable contacts, one of which is movable from a closed position of engagement with the other contact to an open position spaced from said other contact, thus providing a gap between said contacts across which arcs are established during circuit-interrupting operations,
  ii. an evacuated envelope within which said contacts are located, said envelope having a tubular metal wall portion surrounding said inter-contact gap,
  iii. an opening within said tubular metal wall portion,
c. means for separating the contacts of said interrupters substantially simultaneously during a circuit-interrupting operation,
d. said interrupters being located with said tubular wall portions in closely adjacent side-by-side relationship,
e. and means providing a passage between said openings in said metal wall portions for conveying arcing products from any of said inter-contact gaps that is arcing during circuit-interruption to any of said inter-contact gaps that is not then arcing, thereby promoting concurrent arcing at said gaps during a high-current circuit interrupting operation,
f. and means providing a seal between said openings for maintaining said passage sealed from the space surrounding said envelopes.

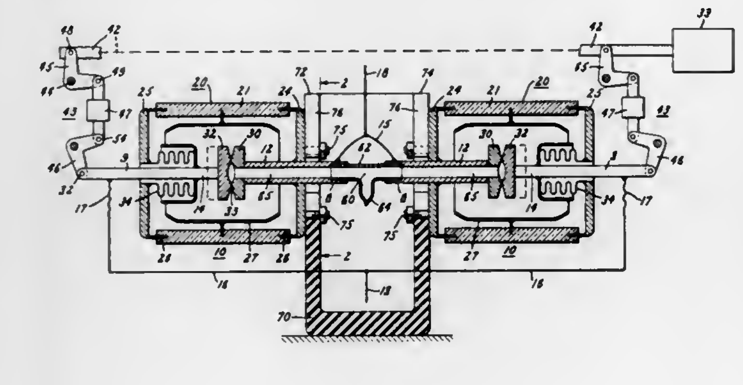
3,970,810
ELECTRIC CIRCUIT BREAKER COMPRISING PARALLEL-CONNECTED VACUUM INTERRUPTERS

James J. Carroll, Turnersville, and Graham R. Mitchell, Willingboro, both of N.J., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 6, 1975, Ser. No. 556,077

Int. Cl.^{2} H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. In an electric circuit breaker,
a. a pair of circuit interrupters of the vacuum-type electrically connected in parallel circuit relation with each other,
b. each interrupter comprising:
  i. a pair of separable contacts, one of which is movable from a closed position of engagement with the other contact to an open position spaced from the other contact, thus providing an inter-contact gap between said contacts across which arcs are established during circuit-interrupting operations,
  ii. an evacuated envelope within which said contacts are located, said envelope comprising a casing at least partially of insulating material and an end cap at one end of said casing sealed to said casing,
  iii. a contact rod extending through said end cap in sealed relationship thereto and having an inner end located within said envelope and an outer end located outside said envelope,
  iv. and means for supporting said other contact on the inner end of said contact rod, said other contact and contact rod containing a conduit extending therethrough between said inter-contact gap and the outer end of said rod,
c. means for separating the contacts of said interrupters substantially simultaneously during a circuit-interrupting operation,
d. means for mounting said interrupters in such positions that said end caps of the two interrupters face each other and the outer ends of said contact rods of the interrupters are located closely adjacent each other,
e. and connecting means located between the outer ends of said contact rods and providing a communicating passage between the conduits in said contact rods for conveying arcing products from any of said inter-contact gaps that is then arcing to any of said inter-contact gaps that is not then arcing, thereby promoting concurrent arcing at said gaps during high-current circuit interruption.

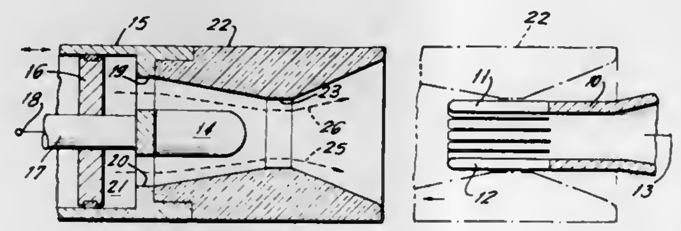
3,970,811
NOZZLE AND CONTACT ARRANGEMENT FOR PUFFER TYPE INTERRUPTER

Peter Krebs, Harleysville, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 16, 1974, Ser. No. 506,426

Int. Cl.^{2} H01H *33/88*

U.S. Cl. 200—148 A **10 Claims**



1. A puffer interrupter comprising, in combination:
a stationary contact comprising an elongated tube;
a movable contact comprising a plurality of flexible contact fingers disposed in the form of an inwardly tapering truncated cone, a first end of each said fingers arranged to form an opening at the narrower end of said movable contact to axially telescope over the end of said stationary contact elongated tube to make contact with the outer surface of said tube;
a piston means and a cylinder means relatively movable with respect to one another to produce gas movement, one of said piston and cylinder means being connected to and movable with said movable contact;
a movable operating rod connected to said movable contact for moving said movable contact relative to said stationary contact and for producing movement of gas by said piston means and said cylinder means;
an insulation nozzle secured to and movable with said movable contact for guiding the flow of gas therethrough during the opening of said movable and stationary contacts, said insulation nozzle surrounding said movable contact and having an interior orifice restriction having a diameter just larger than the outer diameter of said stationary contact elongated tube;
said movable contact being positioned within said nozzle and disposed on one side of said orifice restriction and along the interior surface of said nozzle with said fingers tapering from one end of said nozzle to said orifice restriction; said nozzle being axially movable with said movable contact to an engaged position such that said stationary contact tube moves into said nozzle, through said orifice restriction, and into engagement with said movable contact;
said piston means and said cylinder means being disposed adjacent said movable contact and forcing gas flow substantially completely through the entire volume defined by said conically disposed contact fingers and along the interior surfaces of each of said fingers and into and through said orifice restriction when said movable contact is moved away from said stationary contact said one side of said orifice restriction within which said movable contact is disposed being the side which is downstream of the movement of gas through said orifice restriction; the other side of the interior of said nozzle being upstream of said gas flow and comprising an insulation surface and allowing the creation of an upstream arc during interruption operation.

3,970,812
PLURAL, STACKED SIDE BY SIDE SWITCH HOUSING ARRAY HAVING DISCRETE HOUSING COUPLING ELEMENTS

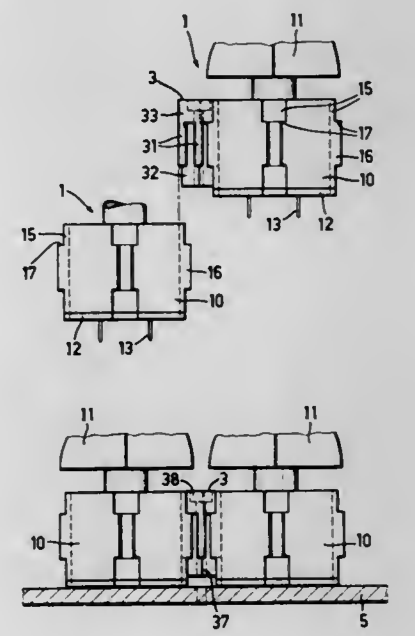
Klaus Nowack, Baden, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Nov. 11, 1974, Ser. No. 522,746

Claims priority, application Switzerland, June 21, 1974, 8505/74

Int. Cl.^{2} H01H *9/02, 13/02;* **A63H** *33/10*

U.S. Cl. 200—307 **6 Claims**



1. A mosaic arrangement of switch elements, especially electrical push-button switches with substantially quadratic switch bodies arranged at intersection locations at the front surface of an electrical switch panel and the like, the improvement wherein each of the switch bodies are provided with recesses at their edge corners extending substantially perpendicular to the front surface of the switch panel, each of said recesses being constructed over a portion of the edge corner length as guide grooves, and at least partially at the intersection locations there are provided coupling elements, each coupling element having four corner noses, said four corner noses extending into respective recesses of switch bodies neighboring one another at an intersection location and engaging with respective guide grooves of said neighboring switch bodies for interlocking to one another said neighboring switch bodies, each coupling element being provided with an axial throughpassage bore for receiving an associated attachment means for securing the switch bodies which are interlocked by such coupling element to the electrical switch panel.

3,970,813
APPARATUS FOR INDUCTIVELY HEATING THE END OF AN ELONGATED WORKPIECE

Paul L. Day, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Jan. 9, 1975, Ser. No. 539,919

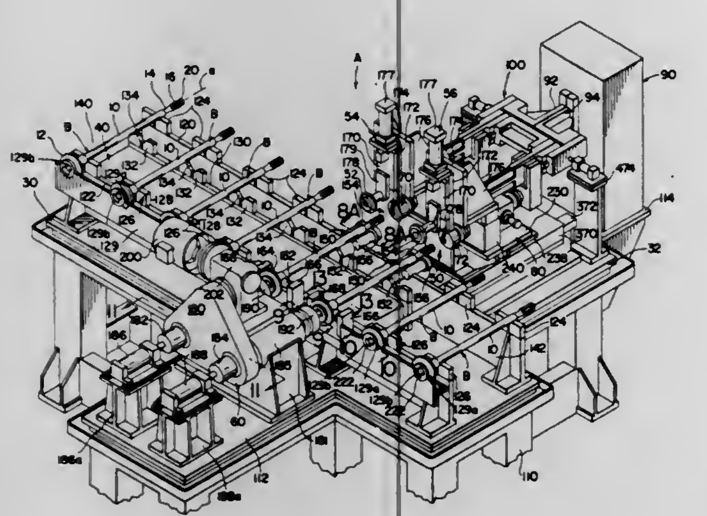
Int. Cl.^{2} H05B *5/00;* **C21D** *1/06, 1/66*

U.S. Cl. 219—10.57 **9 Claims**

1. An apparatus for inductively heating the axial generally cylindrical end of an elongated workpiece having a central axis, said end terminating in a generally flat surface generally perpendicular to said axis, said apparatus comprising: means for mounting said workpiece for rotation about the axis of a workpiece being heated; means for rotating the workpiece being heated about said axis; a generally circular inductor for matching said end; means for mounting said inductor generally concentric with said axis; means for moving said inductor in a direction parallel to said axis from a remote position to a position contacting said surface of a workpiece being heated; means for retracting said inductor along said axis and away

from said surface a preselected air gap distance; means for energizing said inductor when said inductor is in the retracted position and while said workpiece is rotating, said energizing means including two output leads of a power supply and means for connecting said output leads to said inductor; said connecting means comprising a first element movable with said inductor and having first and second electrically insulated portions; a second element electrically connected to one of said output leads and adapted to engage said first portion; a third element electrically connected to the other of said output leads and adapted to engage said second portion; and means for allowing relative movement of said first element with respect to said second and third elements.

8. An induction heating device for heating the end of an elongated workpiece having a central axis, said device comprising: a rod-like member having a first end facing the end of a workpiece to be heated and a second end, said rod-like member being adapted for reciprocation in a direction corresponding to the axis of a workpiece to be heated; a carrier affixed to said first end of said rod-like member; a generally circular inductor for matching said end of said workpiece to be heated; means for securing said inductor onto said carrier in a plane generally perpendicular to the central axis of a workpiece mounted for heating; said inductor having first and second input leads; rigid first and second conductor bars electrically connected to said leads and extending generally parallel to and offset outwardly from said rod-like element; first support means adjacent said carrier for supporting said conductor bars; second support means adjacent said second end of said rod-like member for supporting said conductor bars; and means for connecting said conductor bars to a power supply.



3,970,814

METHOD FOR REPAIRING INGOT MOLDS AND APPARATUS THEREFOR

Arne Georg Arnesen, Vagsbygd, Norway, and Jan Schokkenbroek, Alkmaar, Netherlands, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Filed Sept. 10, 1974, Ser. No. 504,823

Claims priority, application Norway, Sept. 13, 1973, 3578/73

Int. Cl.^{2} B23K *9/04*

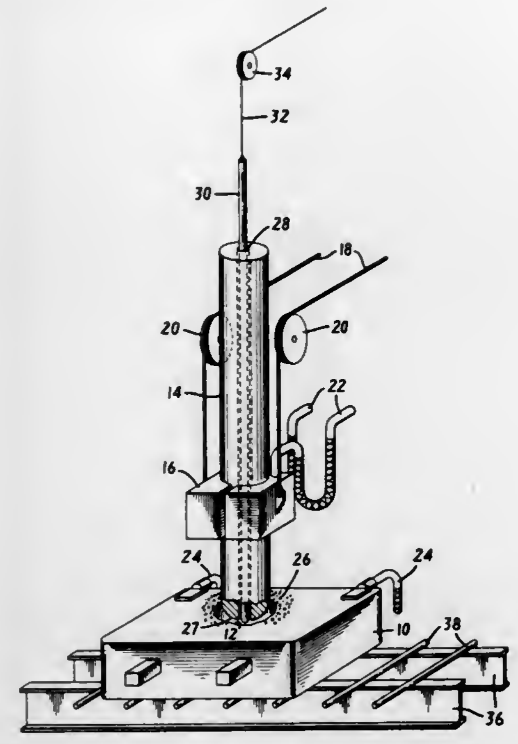
U.S. Cl. 219—76 **8 Claims**

3. Apparatus for repair of cavities in cast iron parts comprising:

a. a substantially non-consumable electrode having a longitudinal extent and having a hollow core along its longitudinal extent;

b. means for bringing the cast iron part into proximity with said electrode in the area of the cavity to be repaired;

c. means for supplying an electrical charge to the electrode in sufficient amount to cause the cavity area of the cast iron part to become molten; and



d. means for supplying repair material comprising cast iron to the cavity of the cast iron part through the hollow core of the non-consumable electrode.

3,970,815

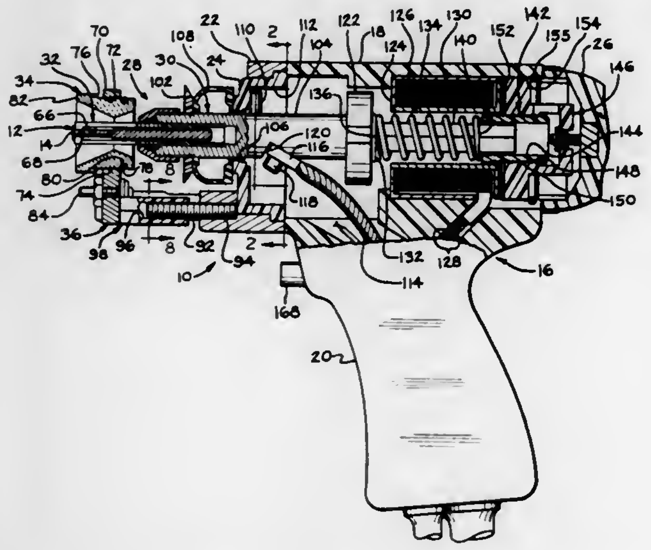
STUD WELDING TOOL

Howard N. Wieland, Jr., Amherst, and Lawrence A. Krischer, Elyria, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Nov. 6, 1974, Ser. No. 521,183

Int. Cl.^{2} B23K *11/04*

U.S. Cl. 219—98 **21 Claims**



13. In a tool for welding a stud to a workpiece, a tool body, a chuck, means for supporting said chuck in a position extending forwardly of the tool body, a spark shield, a welding foot supported by said body and holding the spark shield loosely to enable said spark shield to float relative to said foot and said chuck, and positioning means rigidly extending forwardly of said welding foot to engage the workpiece and position said welding foot at a fixed distance from the workpiece, whereby said spark shield will be positioned with a forward end thereof against a workpiece when the tool is in a welding position with said positioning means engaging the workpiece.

16. In a tool for welding a stud to a workpiece, a tool body, a chuck leg in said tool body and supported for longitudinal movement with respect thereto, a coil spring located around a rear portion of said chuck leg, said chuck leg having seating means against which one end of said coil spring is engaged, second seating means located around said chuck leg against which the other end of said coil spring is engaged, said second seating means comprising a sleeve having outer threads and having a central opening exceeding the size of the rear portion of said chuck leg and held in a nonrotatable position relative to said chuck leg, and adjustable means for moving said second seating means toward and away from said first seating means when the chuck leg is stationary, said adjustable means comprising threaded means engagable with the threads of said sleeve.

3,970,816

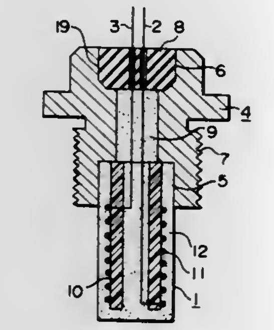
ELECTRIC HEATER FOR HEATING LUBRICATING OILS

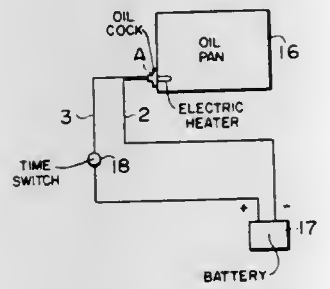
Hisashi Hosokawa, 2-7, 4-chome, Nishi-ochiai, Shinjuku, Tokyo, and Eicho Iijima, 9-6, 7-chome, Shakujii-cho, Nerima, Tokyo, both of Japan

Filed June 10, 1974, Ser. No. 477,704

Int. Cl.^{2} H05B *3/02;* **F01M** *5/02;* **F02N** *17/04*

U.S. Cl. 219—205 **9 Claims**





1. An oil heater for heating lubricating oils having infrared energy absorption peaks within infrared wavelengths ranging from 2.5 μ to at least 15 μ comprising:

a. an oil cock having a top section and a bottom section, said bottom section being adapted to sealingly engage an opening in the wall of an oil reservoir; and

b. an electrical infrared heating element coupled to said oil cock and adapted to contact said oil contained within said oil reservoir when said cock engages said opening in the wall of said reservoir, said heating element having an infrared emission spectrum at 400°C ranging from 2.5μ to at least 15μ to match the infrared absorption spectrum of the oil contained in the reservoir and in which the relative strength of the radiation emitted between the wavelengths 5μ–15μ averages at least approximately 50% of the relative strength of the radiation emitted between 2.5μ and 4μ.

3,970,817

HAZARDOUS LEAKAGE CURRENT PREVENTING FOR REFRACTORY-ENCASED HEATER ELEMENTS

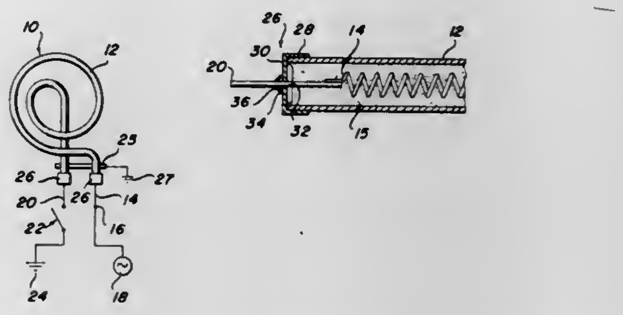
Robert Lee Boyd, 103 Ross Drive, Vienna, Va. 22180

Filed May 14, 1975, Ser. No. 577,214

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—209 **15 Claims**

1. A leakage current protective device for refractory-encased electric heating elements comprising a controlled resistance extending between a resistance heating element and a ground connection adjacent the refractory encasing said element, thereby to provide low current flow therethrough with resultant low heat to drive off moisture attracted to said refractory.



3,970,818

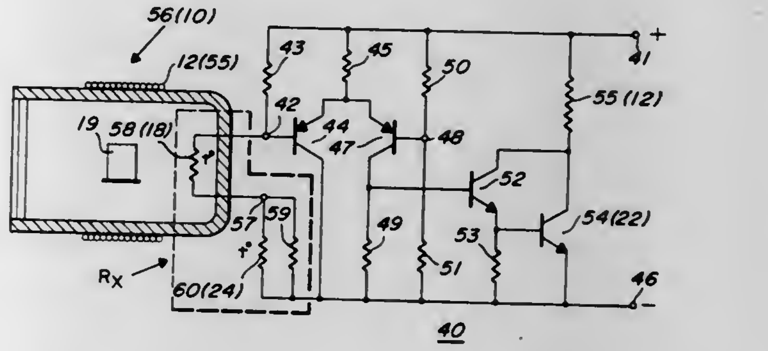
METHOD AND APPARATUS FOR A THERMISTOR COMPENSATED OVEN

Jerome Peter Friedrichs, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 17, 1974, Ser. No. 515,798

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—210 **12 Claims**



1. A method for maintaining a constant temperature at a desired point within an oven as the ambient temperature changes, including the steps of;

providing an oven having such desired point at one location therein,

sensing the temperature at a second location inside of said oven;

producing a control signal with an apparatus, the magnitude of said control signal varying inversely with respect to the magnitude of said temperature at said second location,

providing continuous heat to said oven proportionally to the magnitude of said control signal,

sensing ambient temperature at a third location exterior to said oven with a sensor at said third location, and

varying continuously the magnitude of said control signal in a predetermined relationship to said sensed ambient temperature by electrically coupling said sensor to said apparatus.

3,970,819

BACKSIDE LASER DICING SYSTEM

Gerald Alan Gates, and William John Ryan, both of Jericho, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,988

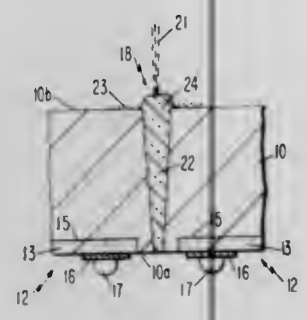
Int. Cl.^{2} B23K *26/00*

U.S. Cl. 219—121 LM **8 Claims**

1. A process for breaking along predetermined lines a wafer of single crystal material having a given thickness and selected breaking strength comprising the steps of,

applying a laser beam along said lines, said laser beam having an intensity sufficient to convert all the thickness of the wafer along said lines into a continuous non-crystalline material extending through the thickness of the wafer and having a breaking strength less than the breaking strength of the single crystal material,

converting a portion of said wafer extending through said given thickness and defined by said lines into said non-crystalline material,



removing said beam,and

separating the wafer into individual units by applying a force to said wafer sufficient to exceed the breaking strength of the non-crystalline material but insufficient to break the crystalline material.

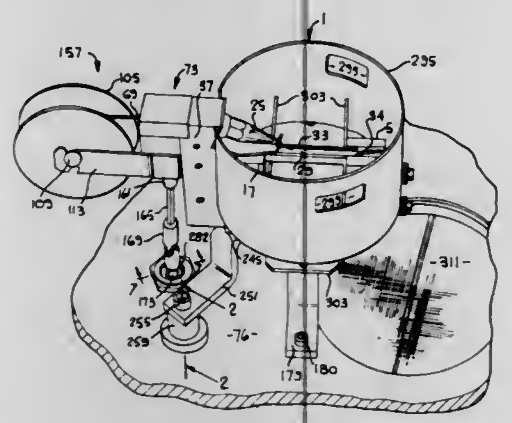
3,970,820
WIRE FED FLASH EVAPORATION SOURCE

Gunard O. B. Mahl, San Francisco, Calif., assignor to CHA Industries, Menlo Park, Calif.

Filed Feb. 3, 1975, Ser. No. 546,596

Int. Cl.^{2} F22B *1/28*

U.S. Cl. 219—271 11 Claims



1. A device for evaporating a material within a shell which forms a vacuum chamber and positionable above a baseplate portion of said shell, comprising:

a first electrode grounded to said shell;

a second non-grounded electrode positioned away from said grounded electrode and connected to a power supply;

a resistive heating boat in electrical contact with said grounded electrode and with said non-grounded electrode;

a support adjacent said boat and electrically insulated from said grounded and non-grounded electrodes;

a nozzle communicating with said support and in position to feed a wire onto an evaporation portion of said boat;

means communicating with said nozzle for impelling said wire therethrough;

means for fastening said grounded electrode, said non-grounded electrode and said support in spaced apart relationship from one another; and

means for flowing a single stream of coolant into contact with each of said grounded electrode, said non-grounded electrode and said support.

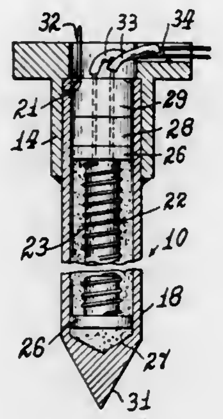
3,970,821
ELECTRICALLY HEATED TORPEDO

Walter R. Crandell, Addison, Ill., assignor to Fast Heat Element Manufacturing Co., Inc., Elmhurst, Ill.

Filed Oct. 21, 1974, Ser. No. 516,618

Int. Cl.^{2} H05B *3/54;* B29F *1/08*

U.S. Cl. 219—523 6 Claims



1. An integral heated torpedo for maintaining material passing over an exposed surface thereof at an elevated temperature, comprising, in combination, an unsheathed electrical heating element, lead wires extending from said heating element for electrically connecting said heating element to a power source, a heat conductive torpedo body having a bore closed at one end containing said heating element and a surface on the body in heat transfer relation with said heating element, said surface being adapted to define a passage for said material, said torpedo body being tapered at said closed end, heat transmitting material compacted in the bore and surrounding said heating element for electrically insulating the heating element from the torpedo body and filling all air voids between said torpedo body and said heating element to effect direct heat transfer to the torpedo body from the heating element, insulating means sealing the open end of said torpedo body bore, and temperature control means for regulating the temperature of said heating element and said torpedo body.

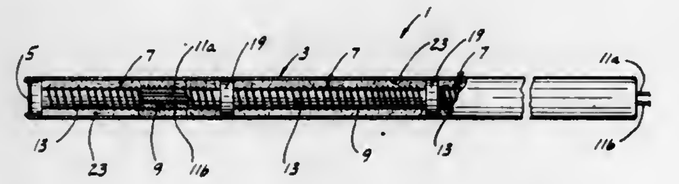
3,970,822
ELECTRIC CARTRIDGE HEATER

Ronald M. Wrob, Kirkwood, Mo., assignor to Watlow Electric Manufacturing Company, St. Louis, Mo.

Filed Mar. 17, 1975, Ser. No. 558,846

Int. Cl.^{2} H05B *3/08, 3/52*

U.S. Cl. 219—541 2 Claims



1. In an electric cartridge heater having a metallic tubular sheath of generally circular cross section, an elongate core of generally circular cross section received within said sheath, a resistance wire wound around the outer surface of the core, terminal means for connection of said wire to a power source for energization of the wire, said core being of a crushable ceramic material and being substantially coaxial within said sheath with an annular space between the sheath and the core, and particulate electrical insulating material filling said annular space for providing a conductive heat transfer path between said wire and said sheath and for electrically insulating said wire from said sheath, said sheath with said core and with said particulate insulating material in place within said space being adapted to be compressed by a diameter reduction process thereby to compact said particulate insulative material and to at least partially crush said core; wherein the improvement of this invention comprises said core having a substantially uniform diameter intermediate its ends and ends of a smaller diameter than said intermediate portion with a transition portion between each of said ends and said intermediate portion whereby upon said heater being compressed during said diameter reduction process, said intermediate portion is crushed more than said transition portions and said particulate insulating material is compacted to form a layer of substantially uniform thickness between said core and said sheath along the entire length of said core.

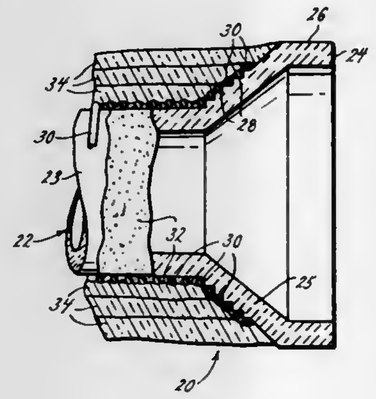
3,970,823
ELECTRIC HEATER

Joseph A. Volk, Jr., Florissant, Mo., assignor to Beta Corporation of St. Louis, Bridgeton, Mo.

Filed Dec. 5, 1974, Ser. No. 529,755

Int. Cl.^{2} H05B *3/02*

U.S. Cl. 219—546 4 Claims



1. A heater comprising a rigid, substantial hollow core of heat conductive material, said core having an elongated tapered shank and an enlarged neck portion at the large end of the shank said core being open at the end where the enlarged neck portion is located said neck portion having an externally threaded portion that tapers into the shank, a jacket of electrical and heat insulating material surrounding the core, the inside surface of said jacket being of the same taper as the shank and externally threaded neck portion, an electrical heating element coil secured to the inside surface of said jacket, said element coil following the threads of the externally threaded neck portion and along the shank of said core, and being contiguous therewith, there being a substantial freedom of attachment between said heating element and said core.

3,970,824
ELECTRONIC RECOGNITION AND IDENTIFICATION SYSTEM FOR IDENTIFYING A FAMILY OF CODES

Charles A. Walton, Los Gatos; Robert D. Kohler, Santa Clara, and David P. Sidlauskas, San Jose, all of Calif., assignors to Schlage Electronics, Inc., Sunnyvale, Calif.

Filed Jan. 13, 1975, Ser. No. 540,659

Int. Cl.^{2} G06K *7/08;* G01S *9/56;* G06K *19/06*

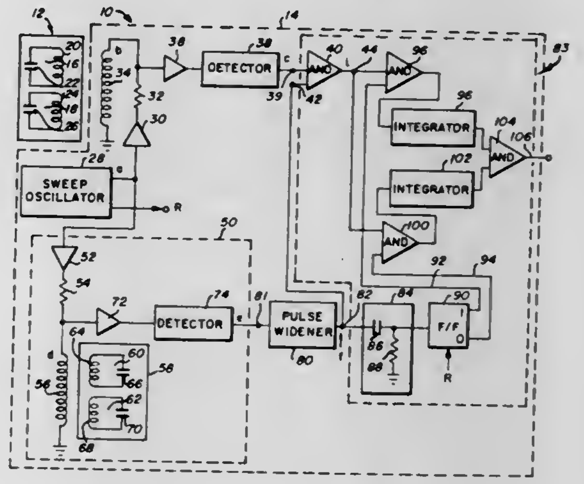
U.S. Cl. 235—61.11 H 9 Claims

1. An improved electronic recognition and identification system for identifying any one of a family of electrically-coded passive objects each having at least one tuned electrical circuit which is resonant at at least one of a plurality of predetermined frequencies and is adapted to be brought within an external sensing zone, said system comprising:

a sensing coil for providing an electromagnetic field within said external sensing zone when energized by an alternating current signal;

signal source means for generating an alternating current signal for energizing said sensing coil, said alternating current signal having a frequency which varies with time over a range of frequencies including said plurality of predetermined frequencies and having a constant amplitude over said range, whereby when one of the external passive objects is brought within said external sensing zone the object is inductively coupled to said sensing coil by said electromagnetic field and loads said sensing coil when the frequency of said alternating current signal passes through said predetermined frequency such that the potential developed across said sensing coil is changed during the passage of said predetermined frequency;

detector means responsive to the potential developed across said sensing coil and operative to produce a condition pulse each time said potential drops below a predetermined threshold, the duration of said condition pulse corresponding to the time that said potential remains below said threshold;



generator means for producing a reference pulse when said alternating current signal passes through the frequency of the first encountered one of said predetermined frequencies;

pulse widening means responsive to said reference pulse and operative to provide a widened reference pulse having a duration that extends from the time corresponding to the occurrence of said first encountered frequency to the time corresponding to the passage of said alternating current signal through the last encountered one of said predetermined frequencies; and

control signal generating means responsive to said condition pulse and said widened reference pulse and operative to produce a control signal when there is time coincidence between said condition pulse and said widened reference pulse.

3,970,825
APPARATUS AND A METHOD FOR READING LIGHT-DARK OR COLOR-CONTRAST CODES ON ARTICLES

Johann Plöckl, Unterhaching, Germany, assignor to Erwin Sick Optik-Elektronik, Germany

Filed Oct. 3, 1974, Ser. No. 511,703

Claims priority, application Germany, Oct. 6, 1973, 2350278; Apr. 25, 1974, 2419935

Int. Cl.^{2} G06K *7/10;* G08C *9/06*

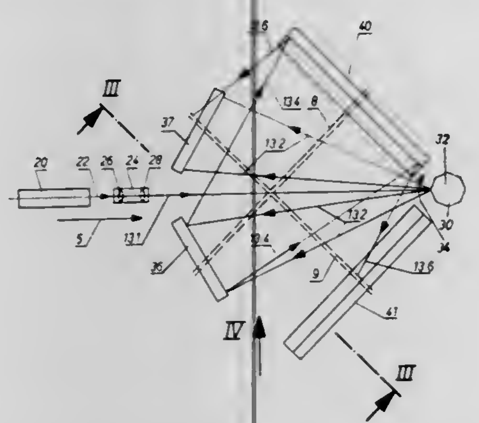
U.S. Cl. 235—61.11 E 17 Claims

1. Apparatus for reading light-dark or colour-contrast codes on articles which are displaced over a light-transmitting region of a support for the articles of the kind wherein a scanning light beam is directed onto the articles and scattered light reflected. from the articles and codes is supplied to a photoelectric transducer the output signal from which is supplied to electronic evaluating means, comprising:

means located beneath the support for producing a slender scanning beam of light,

beam guiding means including means for fanning-out the scanning beam and means for deflecting the fanned-out scanning beam upwardly through the light-transmitting region of the support and displacing it along two imaginary straight lines located in the light-transmitting region of the support, said lines extending obliquely to the direction of displacement of the articles and substantially at right angles to one another,

said deflecting means comprising first reflecting means having a planar reflecting surface arranged parallel with one of said imaginary straight lines and obliquely to the said support for deflecting the fanned-out scanning beam along said one imaginary straight line and a second reflecting means having a planar reflecting surface arranged parallel with the other of said imaginary straight lines and obliquely to the said support for deflecting the fanned-out scanning beam along said other imaginary straight line,

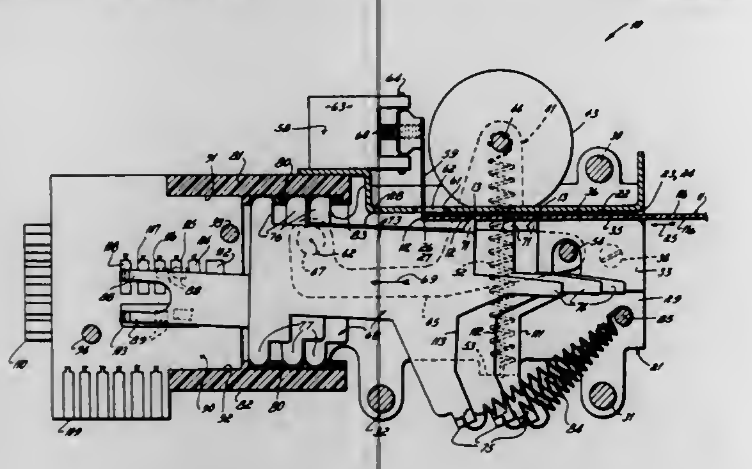


said deflecting means further comprising a third reflecting means for directing the fanned-out scanning beam from the fanning-out means onto the reflecting surface of said first reflecting means and a fourth reflecting means for directing the fanned-out scanning beam from the fanning-out means onto the reflecting surface of said second reflecting means.

3,970,826
ELECTRO-MECHANICAL CARD READER HEAD

Vermon T. Kleimeyer, and Thomas J. Schinner, both of Cincinnati, Ohio, assignors to General Signal Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,655
Int. Cl.² G06K *7/04*
U.S. Cl. 235—61.11 C **15 Claims**



1. A reader head adapted to read a code provided on a card once that card is inserted into home position within said reader head, said reader head comprising:
- a frame defining a passageway sized to receive said card, said passageway including an entry throat at one end through which said card may be inserted along an entry path into a home position within said passageway,
- a card sensing carriage pivotally mounted to said frame, said carriage being pivotable between a rest position where a carriage contactor is at least partially disposed within said passageway and a home position where said carriage contactor is biased out of said passageway in response to contact of said card with said contactor upon insertion of said card,
- carriage spring means connecting said sensing carriage and said frame, said carriage spring means continuously biasing said carriage contactor into said passageway,
- a plurality of code sensing fingers mounted within said frame, each of said fingers being adapted to move laterally in a path parallel to the entry path of said passageway between a rest position and an active position, and each of said fingers being pivotable into and out of said passageway in a plane transverse to the plane of said passageway, the entry point of said fingers into said passageway being positioned forwardly of the entry point of said carriage contactor into said passageway relative to the insertion direction of said card,
- a finger restrainer bar fixed to said carriage and extending transverse to said passageway,
- a first limit stop mounted to each finger, said restrainer bar cooperating with said first limit stops to prevent said fingers from pivoting into said passageway when said carriage is at the rest position,
- a second limit stop mounted to each finger, said reader head structure cooperating with said second limit stop to define a forward stop for said fingers as to lateral movement when said carriage is at both the rest and the home positions, and cooperating with said second limit stops to permit rearward lateral motion of one or more of said fingers toward the active position away from the entry throat of said passageway when said carriage is at the home position,
- finger spring means connecting each of said sensing fingers and said frame, said finger spring means continuously biasing each finger's first limit stop against said restrainer bar and each finger's second limit stop against said reader head structure when said carriage is in the rest position to establish said fingers in the rest position, said finger spring means continuously biasing each finger in a pivoting motion against a card positioned within said passageway when said carriage is in the home position relative to said passageway, and said finger spring means continuously biasing each finger's first limit stop against said restrainer bar when said carriage is in the home position until one or more of said fingers is engaged by the code on said card as said card is inserted into said passageway,
- one or more of said fingers engaging the code provided on said card to disengage one or more of said fingers' second limit stops from said reader head structure such that one or more of said fingers move rearwardly to an active finger position as said card is inserted through said passageway from one end toward the other into the card's home position, said sensing fingers having been biased against said card after the leading edge of said card has passed said sensing fingers and after said carriage has moved to the home position as said card is inserted into said passageway, and
- switch means carried by each of said fingers, said switch means being interconnected with a readout terminal adapted to sense the validity of the card presented to the reader head structure.

3,970,827
ELECTRONIC TAXI FARE METER

Hiroshi Ikuta, Nagoya, and Takaaki Kato, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

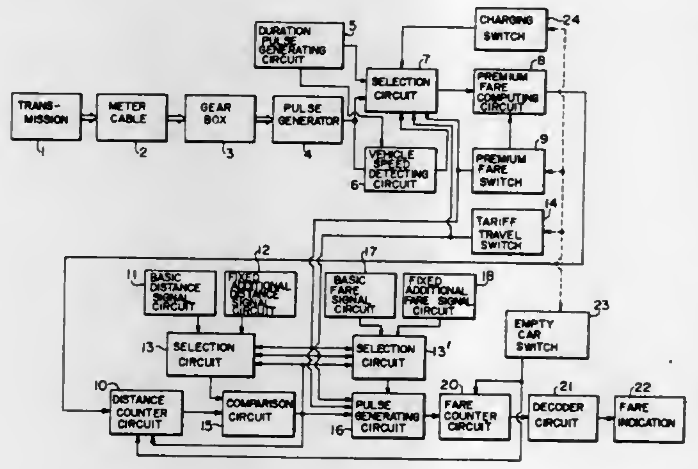
Filed Nov. 20, 1974, Ser. No. 525,666

Claims priority, application Japan, Dec. 4, 1973, 48-136360; Dec. 4, 1973, 48-136361; Dec. 6, 1973, 48-138415; June 21, 1974, 49-71609

Int. Cl.² G07B *13/10*
U.S. Cl. 235—92 TC **18 Claims**

1. An electronic taxi fare meter of the type in which a pulse generator generates a distance pulse each time a taxi travels a predetermined distance and a distance counter circuit counts and operates on said distance pulses to indicate on fare indicating means a fare corresponding to a total distance

traveled in accordance with the result of the operation of said distance counter circuit, said meter comprising:
- a premium fare switch for switching at a premium fare traveling of the taxi; and
- a premium fare computing circuit connected to said premium fare switch and responsive to the switching of said premium fare switch for computing a premium fare in accordance with a predetermined percentage premium rate *n*, said premium fare computing circuit including:
- a scale-of-K counter circuit connected to said pulse generator for dividing the frequency of said distance pulses from said pulse generator by a factor of K;

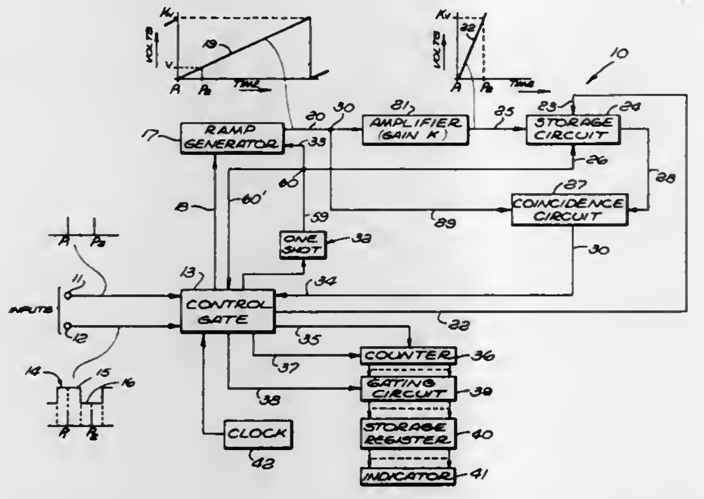


- a premium pulse generating circuit connected to said scale-of-K counter circuit and responsive to an output signal of said scale-of-K counter circuit for generating N pulses corresponding to said percentage premium rate *n* and satisfying $N = K \cdot (n/100)$ and
- an addition circuit connected to said premium pulse generating circuit, said pulse generator and said distance counter circuit for adding said N pulses to said distance pulses and the resulting pulses to said distance counter circuit.

3,970,828
SYSTEM FOR PRECISION TIME MEASUREMENT

Albert M. Klein, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 13, 1975, Ser. No. 540,332
Int. Cl.² H03K *21/00, 21/30*
U.S. Cl. 235—92 T **4 Claims**

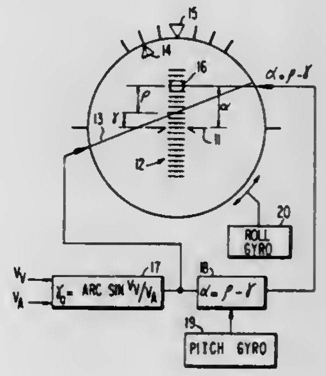


1. A system for producing a real time precision output, said system comprising: a ramp generator having start and reset inputs, and an output; first means to apply a start signal to said ramp generator start input to cause the output thereof to rise until reset; an amplifier having an input connected from the output of said ramp generator, said amplifier having a gain larger than unity, said amplifier having an output; a sample and hold storage circuit having a sample input, a sample gate input, a reset input, and an output, said storage circuit sample input being connected from the output of said amplifier; a coincidence circuit having an input and an output, said coincidence circuit being connected from the outputs of both said ramp generator and said storage circuit output for producing a main pulse at said coincidence circuit output when the signals at said ramp generator and storage circuit outputs have equal magnitudes; second means to apply a stop signal to said storage circuit sample gate input; and third means connected from said coincidence circuit output to said ramp generator reset input, the first period of time between the occurrences of the said application of said start signal and the production of said main pulse being longer than, but directly proportional to the second period of time between the occurrences of said start and stop signals.

3,970,829
COMPOSITE SITUATION ANALYZER AND INSTRUMENT FLIGHT SYSTEM

William W. Melvin, 8434 Greenstone Drive, Dallas, Tex. 75231

Filed Dec. 23, 1974, Ser. No. 536,948
Int. Cl.² G06G *7/78*
U.S. Cl. 235—150.22 **21 Claims**



1. An aircraft control system display comprising:
- an aircraft reference indicator,
- a horizon reference indicator,
- means for producing a relative displacement of said aircraft and horizon reference indicators as a function of flight path angle of the aircraft,
- an angle of attack indicator, and
- means for producing a displacement of said angle of attack indicator with respect to said aircraft reference indicators as a function of the difference between the pitch and the flight path angle of the aircraft.

3,970,830
COMPUTER CONTROLLED MACHINE TOOL CONTOURING SYSTEM

Philip H. White; Bernard W. Wilterdink, both of Claremont, and Guy J. Andrews, Londonderry, all of N.H., assignors to Cone-Blanchard Machine Company, Windsor, Vt.

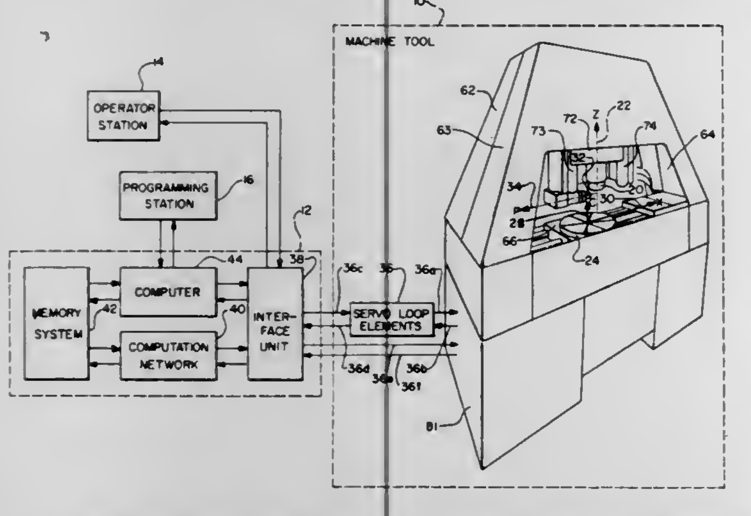
Filed June 24, 1974, Ser. No. 482,782
Int. Cl.² B24B *17/10, 19/08;* **G06F** *15/46*
U.S. Cl. 235—151.11 **54 Claims**

1. In a contouring system including a machine tool, said machine tool having a cutting element with a lateral surface which is substantially symmetrical about a first or Z axis, and a workpiece support table having a top surface substantially disposed in a plane perpendicular to said Z axis, wherein said cutting element both rotates about and translates along said Z axis, and wherein said workpiece support table both rotates about a second or C axis, said C axis being parallel to said Z axis, and translates along a third or X axis, said X axis being perpendicular to said Z axis and having a point of intersection with said C and Z axes, the improvement comprising:

a means for controlling said rotating and translating motions of said cutting element and said workpiece support table including:

A. a cutting element drive means for rotating said cutting element at a predetermined angular velocity about said Z axis, and

B. a positioning control means for controlling the relative position of said cutting element with respect to a sequence of predetermined spatial points, each of said spatial points bearing a predetermined spatial relationship to said top surface and each of said points having an associated reference tangent line segment passing therethrough, with said tangent line segment disposed parallel to said top surface of said support table at a predetermined angle defined with respect to a reference line segment on said top surface so that said support table is synchronously translated along said X axis and rotated about said C axis and said cutting element is translated along said Z axis, said cutting element having a contact point on the periphery thereof successively located at each of said spatial points and said cutting element further having its lateral surface at said contact point successively tangent to each of said reference tangent line segments at its associated spatial point.



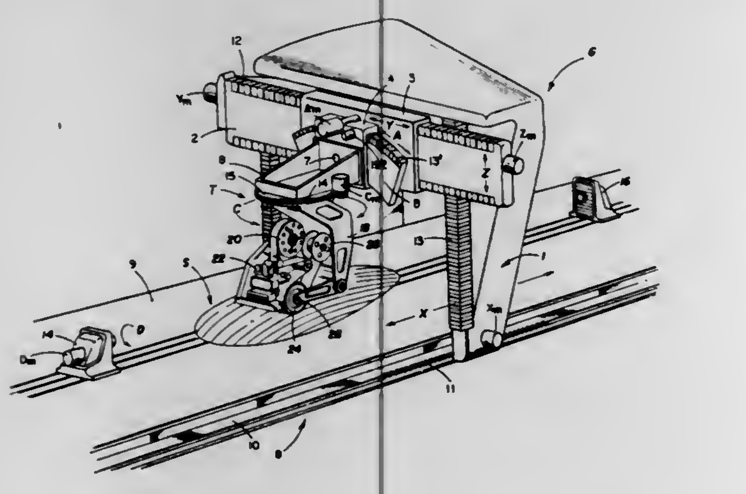
3,970,831
DIGITIZING SYSTEM FOR TAPE PLACEMENT APPARATUS

Tim T. Hegyi, Lomita, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 441,256, Feb. 11, 1974. This application Jan. 8, 1975, Ser. No. 539,288

Int. Cl.² B32B *31/00;* **G05B** *19/18*

U.S. Cl. 235—151.1 **21 Claims**



1. A system for programmably digitizing a control apparatus which provides operation control information to a machine having a work structure movable with respect to a work surface, and which work structure is movable through a plurality of axes including (1) a longitudinal X axis, (2) a transverse Y axis, and (3) an arcuate A axis with movement in an arcuate plane transverse to said X axis and relatively parallel to said Y axis; said system comprising detector means locatable on said work surface defining a desired path of movement of a work member on said work structure, a sensing head replacable on said machine for said work member in substantially the same position which was occupied by said work member, said sensing head comprising a support frame movable by said machine in the X axis and Y axis, a first sensing means associated with said sensing head and spaced from said work surface for detecting said desired path of movement of said work member, a lens means interposed between said detector means and said first sensing means for reflecting light from said detector means to said first sensing means as if said first sensing means were on such work surface to generate informational signals from said first sensing means, transfer means for providing the informational signals developed by said first sensory means to said control apparatus in response to movement of said sensing head on said machine, and a second sensing means on said sensing head movable through a path conforming to said arcuate A axis and also spaced from said said detector means and receiving signals through said lens means to generate informational signals from said second sensing means, said transfer means also providing said last named informational signals to said control apparatus in response to the movement of said second sensing means.

3,970,832
APPARATUS AND METHOD FOR OBTAINING AN ELECTRICAL SIGNAL CORRESPONDING TO THE SPECIFIC ENTHALPY OF STEAM

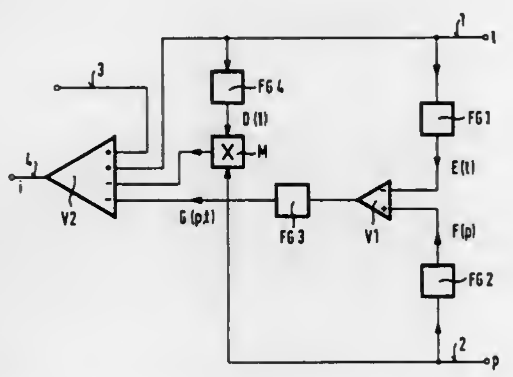
Bruno Itschner, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 469,621, May 13, 1974, which is a continuation of Ser. No. 286,922, Sept. 7, 1972. This application Mar. 5, 1975, Ser. No. 555,541

Claims priority, application Germany, Sept. 16, 1971, 2146240

Int. Cl.² G06G *7/56;* **G01K** *17/08*

U.S. Cl. 235—151.3 **9 Claims**



1. Apparatus for determining the specific enthalpy of steam according to Koch's state equation comprising

a first means responsive to the temperature of the steam for producing a variable output signal $E(t)$ which is a function of the natural logarithm of the temperature;

a second means responsive to the pressure of the steam for producing a variable output signal $F(p)$ which is a function of the sum of a constant and the natural logarithm of the pressure;

a third means connected to the output of the two means for algebraically adding the variable outputs of said means to form a combined output signal;

means connected to the combining means responsive to the combined signals for producing a variable output signal $G(p,t)$ which is a function of $c^{[F(p) - E(t)]}$;

means responsive to the temperature of the steam for producing a variable output signal $D(t)$ which is a function of the temperature raised to the -2.82 power;

means connected to the output of the temperature responsive means and a signal proportional to the pressure, said means responsive to both signals for producing a variable output signal which is a function of the product of the steam pressure and the function $D(t)$; and

a summing means having four inputs, the variable output signal $G(p,t)$ as a first input, the product of the pressure and $D(t)$ as a second input, the variable signal which is a function of the temperature of the steam as a third input and a signal which is proportional to a predetermined constant as a fourth input, said summing means producing a variable output signal in response to said inputs which is a function of the specific enthalpy of the steam in accordance with Koch's state equation.

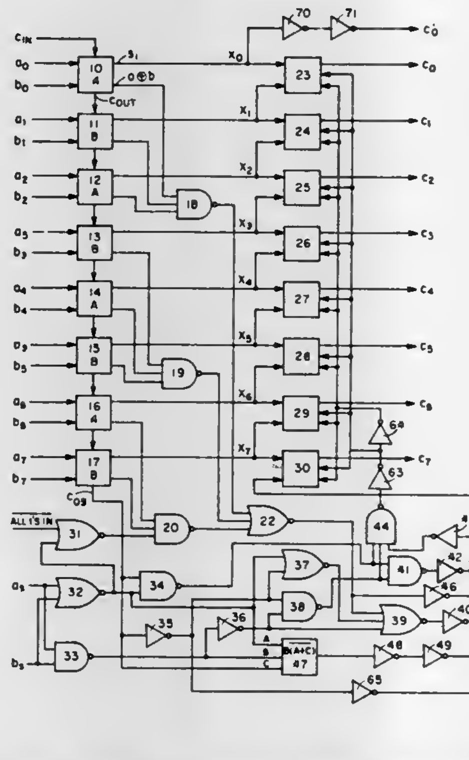
3,970,833
HIGH-SPEED ADDER

William Frederick Gehweiler, Moorestown, and Junius Isaac Pridgen, Cherry Hill, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,104

Int. Cl.² G06F *7/50*

U.S. Cl. 235—175 **16 Claims**



1. A binary adder comprising, in combination N binary adder stages,

each stage having a first and second input terminal at which a corresponding bit designating the magnitude portion of each number is applied, a carry-in and a carry-out terminal, a first output terminal at which the sum S appears, a second output terminal at which the partial sum appears;

means for serially interconnecting said stages so as to form a full adder wherein the carry-out terminal of one stage is connected to the carry-in terminal of the next higher stage and with the carry-out terminal of the most significant bit stage being connected to the carry-in terminal of the least significant bit stage; and

means responsive to the appearance of a 1 logic condition at each of the second output terminals when the binary numbers being added are in the 1's complement format for applying a logic 1 to the carry-in terminal of the least significant bit stage whereby the —0 sum is converted to the +0 sum to prevent any oscillations from occurring in the closed loop circuit formed by the interconnections of the carry-out terminals to the carry-in terminals.

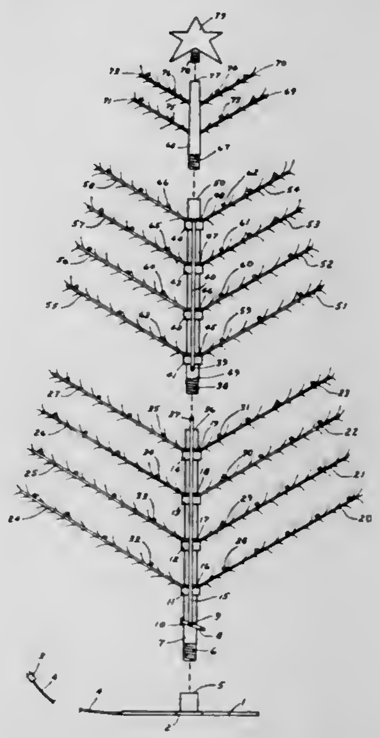
3,970,834
ARTIFICIAL TREE

Marion Joseph Smith, Rte. 1, Box 117, Bowman, S.C. 29018

Filed Dec. 16, 1974, Ser. No. 532,944

Int. Cl.² F21P *1/02;* **F21V** *21/00*

U.S. Cl. 240—10 Q **16 Claims**



1. An artificial tree comprising a plurality of tree sections secured together to form said artificial tree, each of said plurality of tree sections comprising a center shaft, a plurality of slip rings secured to said center shaft, a plurality of sets of branches attached to and emanating from said plurality of slip rings, each of said plurality of sets of branches being supported on each said center shaft by one of said plurality of slip rings, an upper connection peice on the top of said center shaft, and a lower connection piece on the bottom of said center shaft wherein each of said plurality of tree sections further comprises:

a. a plurality of slip collars, and

b. a plurality of connecting bars securing said plurality of slip collars rigidly with each other.

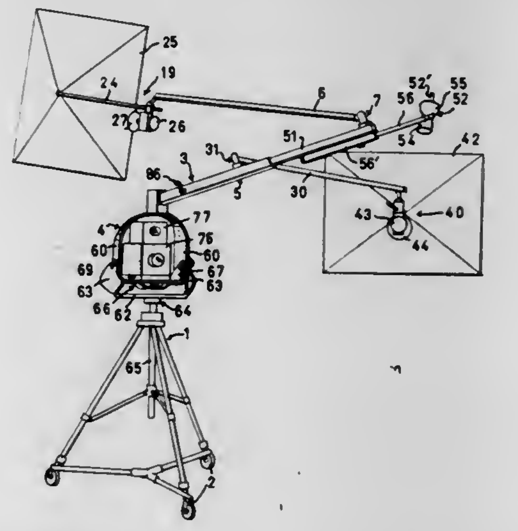
3,970,835
PHOTOGRAPHIC LIGHT SUPPORT APPARATUS

Richard C. Crete, 16 South St., Lodi, Calif. 95240

Filed July 7, 1975, Ser. No. 593,513

Int. Cl.² G03B *15/02*

U.S. Cl. 240—1.3 **12 Claims**



1. Photographic lighting apparatus comprising:

a. a mobile boom support having a boom thereon extending laterally outwardly and upwardly therefrom providing an inner end at said support and an outer end spaced therefrom at a height spaced above a person to be photographed when such person is directly below said outer end;

b. a first arm and a second arm;

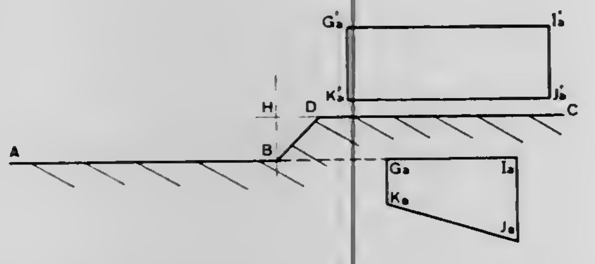
c. separate pivot means respectively supporting said first arm at one end thereof on the outer end of said boom, and supporting said second arm at one end thereof on said boom at a point intermediate said inner end and said outer end for movement of said first and second arms about their said one ends in generally horizontally disposed arcuate paths between positions projecting oppositely outwardly from said boom;

d. a lighting device on each of the ends of said arms that are remote from said boom, each including electrical photographic lighting means in an electrical circuit extending to said boom support; and

e. mounting means supporting each of said lighting devices for substantially universal movement relative to said arms.

3,970,836
MOTOR VEHICLE HEADLAMPS

Jacques Ricard, Fontenay-sous-Bois, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Dec. 10, 1974, Ser. No. 531,232
Claims priority, application France, Dec. 26, 1973, 73.46304
Int. Cl.² F21M *3/00*
U.S. Cl. 240—41 R **4 Claims**

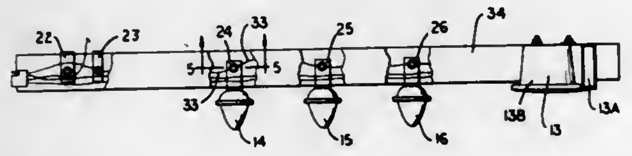


1. In a dipped headlamp for a motor vehicle of the type comprising a front glass, cut-out means producing masking of the dipped beam along two horizontal half-planes of cut-out on either side of the central axis and a plurality of juxtaposed prismatic deflecting surfaces associated with said front glass causing the raising of the half-plane of cut-out located on the side on which said vehicle normally travels and producing two horizontal half-planes of staggered height connected by an inclined oblique segment, the improvement comprising an auxiliary dioptric system adapted to intercept a portion of the flux passing through the glass and to raise it above the half-plane of cut-out located on the side of the road on which said vehicle normally travels in order to sufficiently illuminate traffic signs.

3,970,837
MAGNETIC LIGHT ASSEMBLY

Leon E. Helm, Villa Grove, Ill. 61956
Division of Ser. No. 290,231, Sept. 18, 1972, Pat. No. 3,848,227. This application Mar. 18, 1974, Ser. No. 451,887
The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.
Int. Cl.² F21L *15/16, 25/00;* **B60Q** *1/00*
U.S. Cl. 240—52.15 **2 Claims**

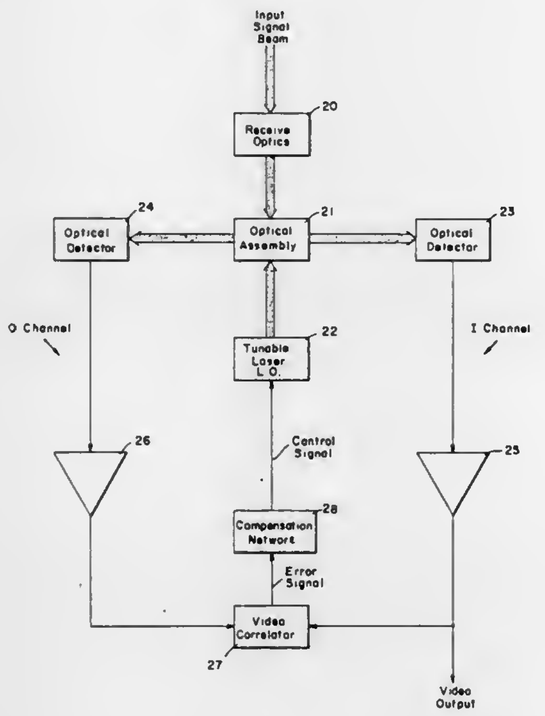
1. A light fixture apparatus comprising:
a flexible magnetic member which can be conformingly and magnetically attached to a curved metal surface;
a plurality of electrical wires including a first wire and a second wire mounted across said member;
means operable to hold said wires on said member;
a metal bracket fixedly mounted on said member;
fastening means securing said bracket to said member and electrically connected directly to said first wire;
a first light mounted on said bracket and electrically connected to said first wire by said bracket and said fastening means and electrically connected to said second wire;
a second light mounted on said member and electrically connected to at least said second wire;



a magnetic pad having a magnetic sheet and covering adhesively secured together; and,
a flexible cable extending between said magnetic sheet and said covering, said cable hving additional electrical wires connected to said first light.

3,970,838
DUAL CHANNEL PHASE LOCKED OPTICAL HOMODYNE RECEIVER

Frank E. Goodwin, Malibu, and Ross E. Graves, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Aug. 29, 1975, Ser. No. 608,868
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **10 Claims**

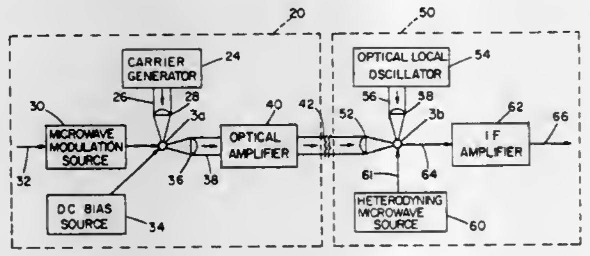


6. An optical homodyne receiver comprising, in combination:
first and second optical detectors each having an optical input and a video output;
an optical input signal;
a controllable laser oscillator for generating a local oscillator signal;
an optical assembly coupling said local oscillator signal and said input signal to said first and second optical detectors in adjustable proportions, the portions of said local oscillator signals coupled to said first and second optical detectors differing by substantially 90° with respect to the carrier of said input signal at the optical inputs of said first and second optical detectors;
a video correlator having at least two inputs and an output;
means for coupling the outputs of said optical detectors to the inputs of said video correlator;

means for coupling the output of said video correlator to a control input of said controllable laser oscillator; and
means for deriving a video output signal from one input of said video correlator.

3,970,839
GENERATING AND USING COHERENT OPTICAL RADIATION

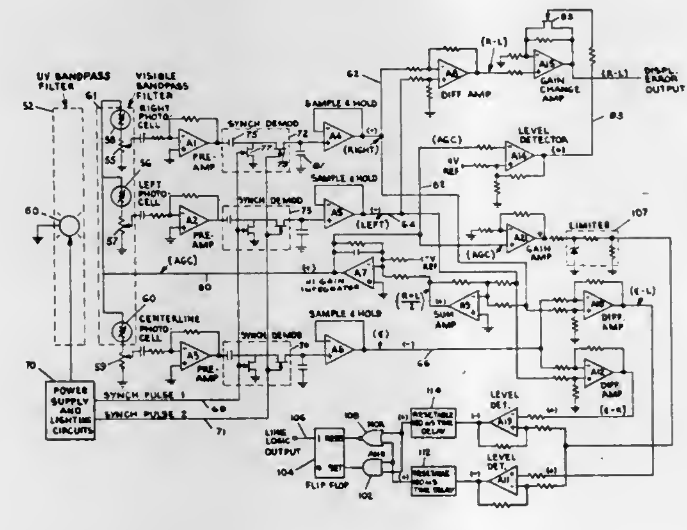
Ali Javan, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Division of Ser. No. 389,970, Aug. 20, 1973, abandoned, and a continuation-in-part of Ser. No. 62,380, Aug. 10, 1970, Pat. No. 3,755,678. This application Dec. 20, 1974, Ser. No. 535,023
Int. Cl.² H01J *39/12;* **H04B** *9/00*
U.S. Cl. 250—199 **8 Claims**



1. Apparatus for generating coherent optical radiation comprising at least one antenna connected to a diode junction having non-linear characteristics;
a source of electromagnetic energy coupled to said diode junction to interact with said junction to cause generation of a current through said junction, flow of said current through said antenna and emission of radiation from said antenna, said current and radiation being of optical frequency which is related to the frequency of the input and absent from the input;
an optical element for collecting said radiation of said optical frequency emitted from said antenna for direction to a station for utilization.

3,970,840
CONTROL CIRCUITRY FOR VEHICLE GUIDANCE MECHANISM

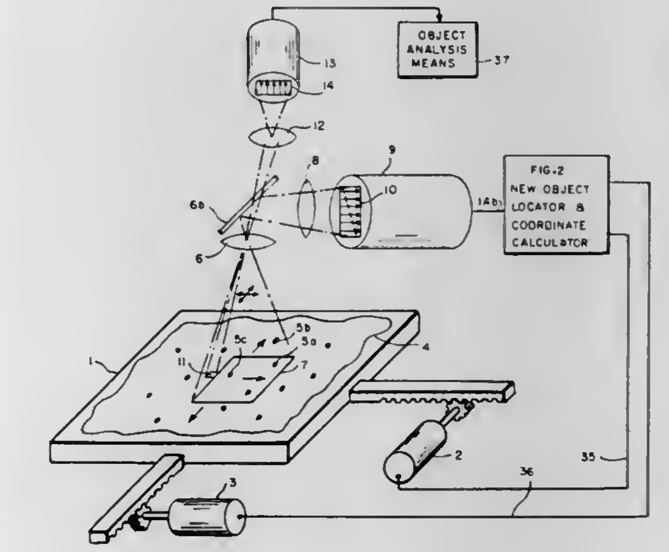
Carl De Bruine, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed July 16, 1974, Ser. No. 488,961
Int. Cl.² G05B *1/01*
U.S. Cl. 250—202 **8 Claims**



1. In a vehicle guidance means for guiding a vehicle along a guide line, wherein guidance system radiation means causes the guide line to emit or reflect a guidance signal, sensor means senses the guidance signal and produces a differential error output signal representative of the deviation of the vehicle position from the guide line, and control means automatically controls the position of the vehicle in accordance with the error output signal, the improvement comprising:
feedback means for maintaining a generally constant ratio between error output signal strength and displacement of the guide line from a predetermined centerline position, regardless of the strength of background radiation, said feedback means maintaining said ratio generally constant, as long as the vehicle is following the guide line and the guidance signal is stronger than the signal produced by background radiation when the radiation means is switched on;
modulation means for modulating the guidance signal with a predetermined modulation signal, said modulation means modulating the guidance signal by switching the radiation means on and off at synchronized intervals, the modulation means further generating first and second synchronized pulse signals once each cycle, the first synchronized pulse being generated at a first time interval representative of the time when the radiation means is switched on and the second synchronized pulse being generated at a second time interval representative of the time when the radiation means is switched off, each time interval being a relatively small portion of the total time the radiation means is switched on and off each cycle; and
demodulation circuit means for demodulating the error output signal of the sensor means so as to eliminate the effects of static background radiation and the modulation signal from the error output singal, thus limiting the error output signal to the output signal produced by the guidance signal, said demodulation circuit means comprising synchronized demodulation means for measuring the level of the output signal of each sensor means during each first and second time interval and measuring the difference between said signals, said demodulation circuit further comprising sample and hold amplifier means for producing and holding a DC output signal at a level equal to said difference until the value of the difference signal changes in a subsequent cycle.

3,970,841
METHOD AND APPARATUS FOR DUAL RESOLUTION ANALYSIS OF A SCENE

James E. Green, Box 734, Fayetteville, Tenn. 37334
Filed Nov. 25, 1974, Ser. No. 526,896
Int. Cl.² H01J *39/12;* **G01N** *33/16*
U.S. Cl. 250—201 **22 Claims**



1. A dual resolution sample scanning apparatus comprising:
means for positioning a sample;
a first opto-electrical image scanning means producing an output signal when a sample object is encountered during scanning;
a second opto-electrical image scanning means for producing output signals representative of a scanned image;

optical means for imaging a low resolution sample field on said first opto-electrical image scanning means and a higher resolution sample field on said second opto-electrical image scanning means;

means responsive to the output signal from said first opto-electrical image scanning means for moving the higher resolution sample field relative to the sample to bring the encountered sample object into the higher resolution field for scanning by said second opto-electrical image scanning means while the first opto-electrical image scanning means continues to scan the low resolution field to detect any other objects in the sample, said continuing low resolution field scan being performed without moving the sample relative to at least one of said resolution fields; and,

utilization means responsive to the output signals from said second opto-electrical image scanning means.

3,970,842
AUTOMATIC FOCUS CONTROL DEVICE

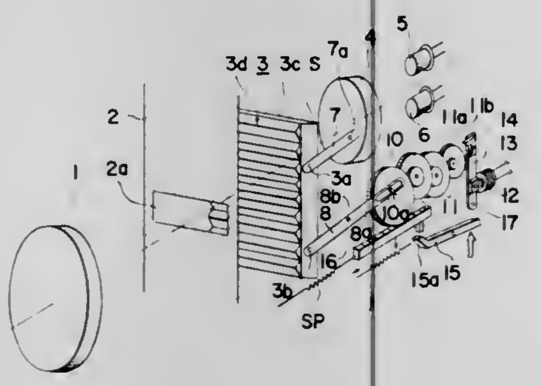
Yasuhiro Nanba, Osaka; Toshinori Imura, Sakai, and Mitsuru Saito, Kaizuka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 8, 1975, Ser. No. 594,076

Claims priority, application Japan, July 30, 1974, 49-87796

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 13 Claims



1. An automatic focus control device which comprises:

lens means for focusing an image of a target object;

scanning means functioning as a spatial frequency filter and substantially disposed on the optical axis of said lens means for movement in a direction diagonal to said optical axis close to and away from said lens means, said image of said target object being adapted to be focused on said scanner means during movement of said scanner means;

means for reciprocally moving said scanner means in said diagonal direction close to and away from said lens means with the plane of said scanner means maintaining a parallel relation to the plane perpendicular to said optical axis;

first means for detecting the amplitude of spatial frequency of said image of said target object projected onto said scanner means through said lens means;

second means electrically connected with said first detecting means for detecting a maximum value of said amplitude of said spatial frequency, said maximum value when detected indicating that the image of said target object has exactly been focused.

3,970,843
PHOTOSENSITIVE JUNCTION DEVICES HAVING CONTROLLABLE SENSITIVITY

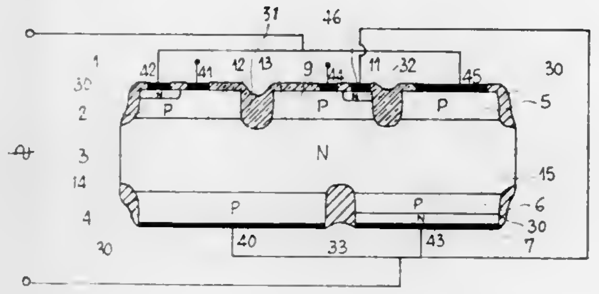
Guy H. Dumas, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France

Filed Nov. 19, 1974, Ser. No. 525,108

Claims priority, application France, Nov. 30, 1973, 73.42855

Int. Cl.² H01L *27/14*

U.S. Cl. 250—211 J 9 Claims



1. A photothyristor device having high photosensitivity and ability to withstand high voltages and voltage gradients comprising

a substrate of a first type of semiconductor material having upper and lower major faces;

a first layer of a second type of material on said lower face of said substrate;

a second layer of said second type on said upper face of said substrate;

a third layer of said first type of material on and partially covering the exposed surface of said second layer;

means defining grooves extending through said second layer and into said substrate while leaving portions of said second layer continuous so that an electrical path remains through said second layer between any two points in said second layer,

said grooves exposing planar junction regions between said second layer and said substrate; and

a light-transmitting passivating material filling said grooves to permit irradiation of said junction regions therethrough.

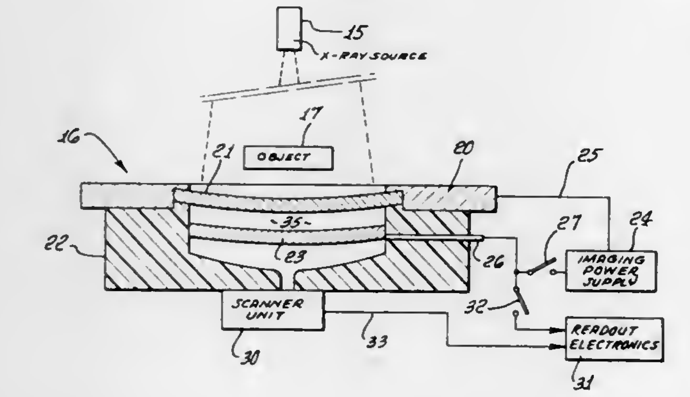
3,970,844
DIRECT CHARGE READOUT ELECTRON-RADIOGRAPHY CHAMBER

John B. Fenn, Jr, Canoga Park, and Murray S. Welkowsky, Sherman Oaks, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Jan. 7, 1975, Ser. No. 539,064

Int. Cl.² H01J *31/50*

U.S. Cl. 250—213 VT 17 Claims



1. In a system for readout of an electrostatic charge pattern and having an electrode and means for forming an electrostatic charge image on said electrode,

the improvement wherein said electrode includes a first photoconductor layer for receiving the electrostatic charge and being selectively switchable from a first electrical non-conducting state to a second electrical conducting state by exposure to light, with said first layer returning to said first state when light exposure is discontinued, and a second electrical conducting, optically transparent layer,

and including:

means for scanning a photoconductor switching light beam over said first layer through said second layer; and

means connecting said second layer to storage means for storing data corresponding to the magnitude of charge at points on said electrode which charge is selectively transferred to said second layer through said first layer as said first layer is illuminated by said light beam and switched to said second conducting state.

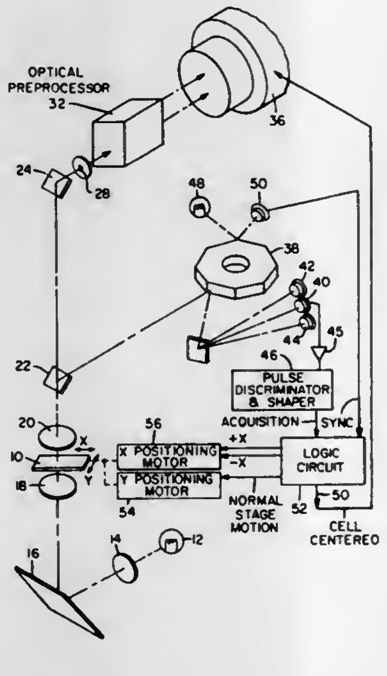
3,970,845
PULSE DISCRIMINATOR CIRCUIT

David L. Hollis, and Richard G. Magner, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,048

Int. Cl.² H01J *39/12*

U.S. Cl. 250—214 R 6 Claims



6. In a system for producing an electrical output representing the optical characteristics of an analytical slide containing a specimen of interest, including:

conversion means producing said electrical output representing the optical characteristics of said slide,

a rotating mirror,

means for projecting an optical image of said analytical slide to said conversion means and to said rotating mirror,

a light sensing device, said rotating mirror successively scanning a portion of said optical image across said light sensing device, said light sensing device producing an output representing the light absorption of the area of the slide being scanned, the output from said light sensing device comprising a varying background level of dc voltage on which is superimposed pulses of different amplitudes,

pulse discriminating means connected to the output of said light sensing device and producing an acquisition pulse when the area of the slide being scanned contains a specimen of interest,

means for producing a synchronizing pulse when said mirror is in a predetermined beam position,

a positioning mechanism for positioning said slide, and

logic circuitry responsive to said synchronizing pulse and to said acquisition pulse for producing control signals, said control signals being used to control said positioning mechanism to position said slide so that the image of a specimen of interest is centered on said conversion means,

said pulse discriminating means being characterized in that it comprises:

a voltage comparator for producing an output signal only when the voltage applied to a first terminal thereof exceeds that applied to a second terminal thereof,

an inverting amplifier,

first connecting means for connecting the output of said light sensing device to the input of said inverting amplifier,

second connecting means for connecting the output of said inverting amplifier to the second terminal of said comparator,

a non-inverting amplifier,

a filter connecting the output of said light sensing device to the input terminal of said non-inverting amplifier, said filter passing said pulses while removing said background level of dc voltage, and

third connecting means for connecting the output of said non-inverting amplifier to the first terminal of said comparator.

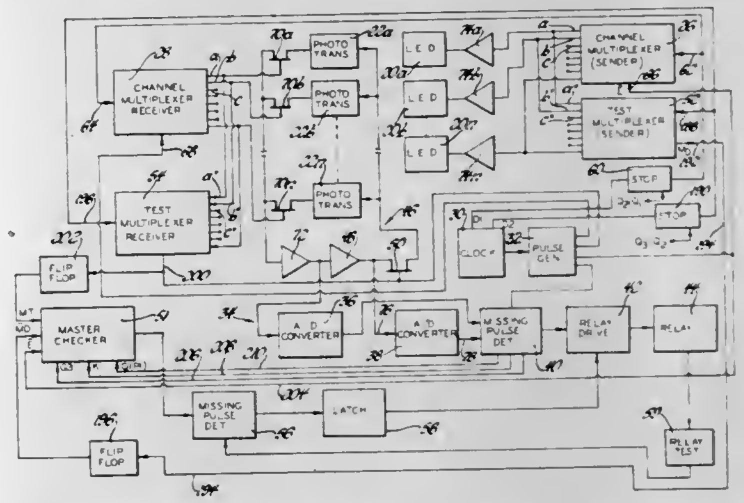
3,970,846
PRESENCE DETECTING SYSTEM WITH SELF-CHECKING

George L. Schofield, Jr., and James L. Lignell, both of Ann Arbor, Mich., assignors to Xenex Corporation, Woburn, Mass.

Continuation of Ser. No. 410,861, Oct. 29, 1973, abandoned. This application Aug. 15, 1974, Ser. No. 497,014

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 6 Claims



1. A presence detection system comprising a plurality of light source and photodetectors arranged in plural sets with a light source and a photodetector in each set, the source and photodetector of each set defining a channel and being disposed so that light from the source impinges upon the photodetector in the absence of an obstruction in the channel, each photodetector adapted to produce an electrical pulse when excited by a light inpulse, pulse generating means for energizing the light sources, a sender channel multiplexing means having an input connected with the pulse generating means and having plural channel outputs each connected with a different one of the light sources and having channel switching means with a channel address input, a clock connected with the channel address input for sequentially connecting the light sources to the pulse generating means, a pulse detection means having an input adapted for connection with one of the photodetectors, a receiver channel multiplexing means having plural channel outputs each corresponding with a different one of the photodetectors and having channel switching means with a channel address input, a switch connected between each photodetector and pulse detection means and being connected with the corresponding channel output of the receiver channel multiplexing means, said clock being connected with the channel address input for sequentially connecting the photodetectors to the input of pulse detection

means, whereby said multiplexers are switched synchronously by the clock and said channels are sequentially activated with each channel being activated during an activation interval determined by the clock, said pulse generating means being synchronized with the clock to produce a pulse during the activation interval of each channel for transmitting a light pulse from the light source to the photodetector of the same set, said photodetectors thereby being sequentially excited by light impulses whereby said pulse detection means receives at its input a train of pulses including a pulse corresponding to each of the activated channels in the absence of an obstruction in any of the activated channels, said pulse detection means including detector means responsive to a missing pulse in said train of pulses.

3,970,847
DIMENSION MEASURING APPARATUS

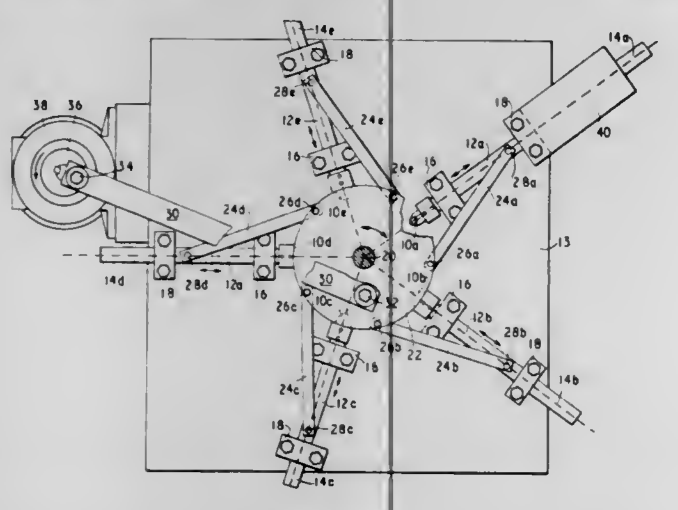
John Keith Wood, 147 Prescot Road, Aughton, Ormskirk, England

Filed Dec. 13, 1974, Ser. No. 532,440

Claims priority, application United Kingdom, Dec. 21, 1973, 59366/73

Int. Cl.² H01J ***3/14***

U.S. Cl. 250—234 **7 Claims**



7. A measuring apparatus comprising at least four photocells, a respective slider means carrying each of said photocells, for displacement in a common plane to scan a projected image of a zone to be measured, means constraining the sliders for displacement such that the photocells move along respective, similar paths which project to a single point whereby said photocells are caused to move radially relative to that point in scanning the image, and a mechanism for synchronously reciprocating said photocells along said paths, said mechanism including a common, angularly reciprocable member, means mounting said member for angular displacement in a plane parallel to said common plane and about an axis passing through said single point, means for angularly reciprocating said common member in said parallel plane about said axis, and a respective linkage connecting said common member to each slider means and a transducer means arranged to provide a signal indicative of the radial position of one of the sliders relative to said point and hence of the radial positions of all of the photocells relative to that point.

3,970,848
PROFILE TECHNIQUE FOR CALIBRATING INFRARED THERMAL IMAGING SYSTEMS

John R. Schott, Buffalo, and Timothy W. Gallagher, North Tonawanda, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,904

Int. Cl.² G01D ***18/00***

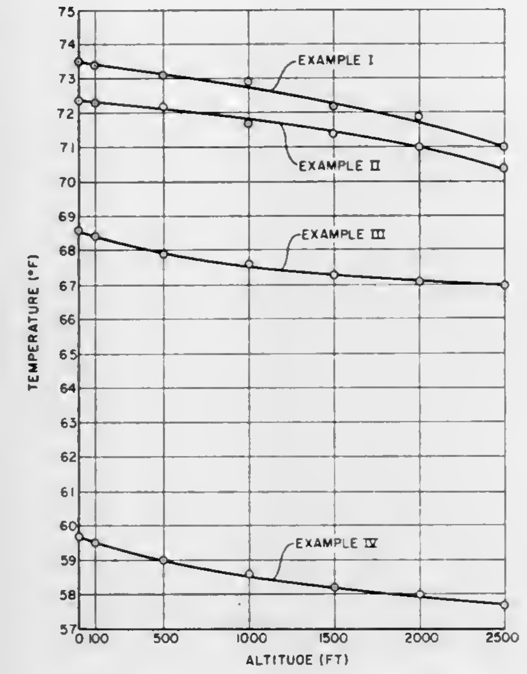
U.S. Cl. 250—252 **9 Claims**

1. A method for calibrating airborne thermal imaging systems including the steps:

selecting a stable reference point;

making a plurality of flights over the selected reference point at altitudes ranging from ground level to flight altitude;

observing and recording the flight altitude and observed temperature for the selected reference point on each flight;



plotting the observed temperature for the reference point on each flight against flight altitude;

extrapolating the plotted data to zero altitude to obtain the actual ground temperature; and

subtracting the extrapolated ground temperature from the observed temperature at flight altitude to obtain the thermal imaging system correction.

3,970,849
DEVICE FOR MASS ANALYSIS AND STRUCTURE ANALYSIS OF A SURFACE LAYER BY MEANS OF ION SCATTERING

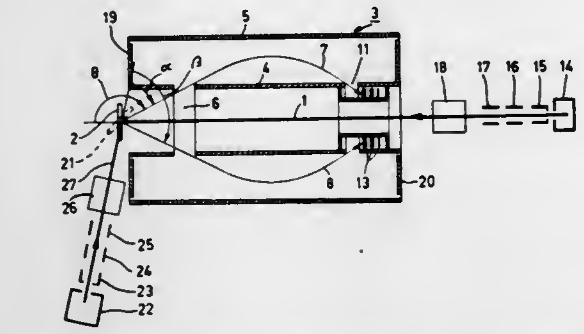
Hidde Herman Brongersma, and Jacob Walinga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,190

Claims priority, application Netherlands, Dec. 20, 1973, 7317436

Int. Cl.² B01D ***59/44***

U.S. Cl. 250—281 **2 Claims**



1. A device for mass analysis and structure analysis of a surface layer of a target, comprising: means for generating a primary, substantially monoenergetic ion beam, means for directing said beam to said target; an energy analyzer including two substantially coaxial electrodes for producing an electrostatic radial field therebetween, the center axis of said electrodes coinciding with the intersection of said primary beam and said target, the inner electrode having a substantially annular aperture the position of which relative to said intersection determines the angles of scatter whereas the size of which together with said radial field determines the focal area for the scattered secondary ion beam; and means for detecting the secondary ion beam, said detecting means including a plurality of ion detectors arranged around said center axis in said focal area to detect a plurality of angles of scatter of the secondary ion beam.

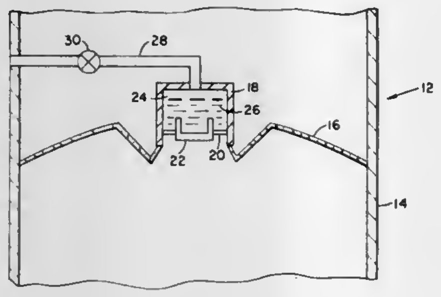
3,970,850
POOL COOLING INFRARED TELESCOPE

William D. Jordan, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 20, 1975, Ser. No. 579,168

Int. Cl.² G01J ***3/02;*** **F17C** ***7/00***

U.S. Cl. 250—352 **3 Claims**



1. A method of cooling an infrared detector element comprising spinning said detector element, subjecting one side of said detector element to a pool of cryogenic fluid that spins as said detector element spins, and subjecting said cryogenic fluid to a low pressure sufficient for dropping the pressure on said cryogenic fluid below the triple point thereof to cause said fluid to form a frozen pool of the cryogenic fluid and thereby cool the detector element, the spinning of said detector element and said pool of cryogenic fluid when subjected to said low pressure causing accelerated freezing of said cryogenic fluid by rotational forces which tend to carry solid particles into the freezing cryogenic fluid to form said frozen pool.

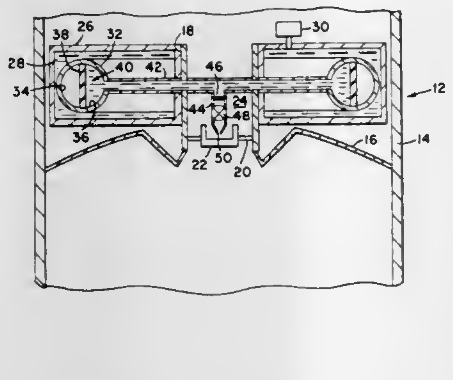
3,970,851
SPRAY COOLING FOR INFRARED TELESCOPE

William D. Jordan, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 20, 1975, Ser. No. 579,167

Int. Cl.² G01J ***3/02;*** **F17C** ***7/00***

U.S. Cl. 250—352 **6 Claims**



1. A method of cooling an infrared detector element comprising subjecting one side of said detector element to a chamber space of low pressure, and spraying a cryogenic fluid into said chamber space and toward said one surface of said detector element, said low pressure of said chamber being sufficiently low to cause said cryogenic fluid to be dropped below its triple point pressure and thereby cause said cryogenic fluid to flash freeze and deposit on said one surface of said detector element to thereby cool said detector element, said cryogenic fluid being neon.

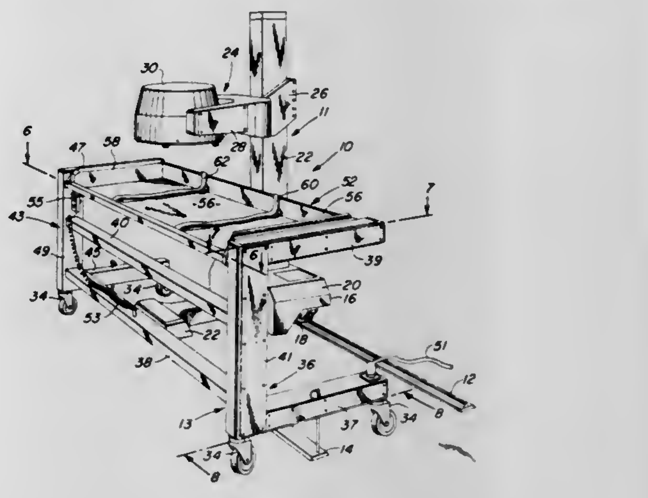
3,970,852
PROCESS AND APPARATUS FOR SCANNING SECTIONS OF RADIATION

Joseph B. Richey, Shaker Heights; Robert H. Wake, Warrensville Heights, and John T. Keller, Willoughby, all of Ohio, assignors to Ohio Nuclear, Inc., Solon, Ohio

Filed July 8, 1974, Ser. No. 486,398

Int. Cl.² G01T ***1/164***

U.S. Cl. 250—363 S **32 Claims**



1. A radiation sensing device for scanning a section of radiation on a support means comprising:

means for detecting radiation and give electrical impulses in response thereto;

means for operating on the electrical impulses to create a signal which gives an indication of the relative location of the radiation;

means for scanning the section of radiation including:

a. means for selecting an area of radiation having a perimeter in which radiation is detected and operated on at any one time to determine its relative location during a scan;

b. means for varying at least part of the perimeter parallel to the longitudinal direction of a pass of the means for detecting, the means for varying including a means for generating a variable voltage as a signal for a portion of the perimeter of the area of radiation so that the portion of the perimeter is not a distinct edge;

means for controlling the means for detecting and the means for scanning including means for making multiple passes of the means for detecting relative to the support means for the section of radiation in order that information from the multiple passes over different portions of the section of radiation can be blended along the portions of the perimeters without any substantial artifacts.

3,970,853
TRANSVERSE SECTION RADIONUCLIDE SCANNING SYSTEM

David E. Kuhl, Rosemont, and Roy Q. Edwards, Plymouth Township, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,625

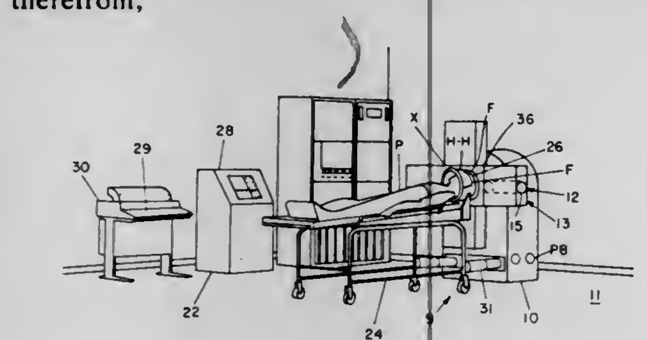
Int. Cl.² G01T ***1/20***

U.S. Cl. 250—363 S **5 Claims**

1. Transverse section radionuclide scan field apparatus for use with an electronic system for the high-sensitivity quantification of brain radioactivity in cross-section picture format in order to permit accurate assessment of regional brain function localized in three-dimensions, the apparatus detecting high energy radiation emanating from sources at fixed locations in a human head, and the electronic system producing and displaying therefrom data that corresponds spatially with the location of the sources and quantatively with the intensity of the radiation emanating from the sources in a transverse plane, comprising:

a. means communicating with the electronic system, comprising a system of high energy radiation detectors forming a continuous picture frame line of detectors that completely encloses the scan field in a plane for receiving and detecting said radiation from said sources and producing therefrom data corresponding spatially with the location of the sources and quantitatively with the intensity of the radiation emanating therefrom in a plane transverse to said head;

b. means for rotating said detectors in unison as an integral unit in one direction around a single axis in a plane transverse to the head so as continuously to transmit data therefrom;



c. said means for rotating said detectors rotating the same in a continuous, uninterrupted picture frame line of detectors that are tangent to the scan field and that completely enclose the same around the single axis to produce data corresponding to the spatial location and intensity of the sources; and

d. electromagnetic means for transmitting to the electronic system the data produced by the detectors in response to the detection of the radiation thereby,

the electromagnetic means for transmitting the data from the detectors, comprising laser-emitting photodiodes responsive to the detectors for producing data in the form of light pulses corresponding to the radiation detected.

3,970,854
HIGH SPEED ION BEAM SWITCHING ARRANGEMENT FOR USE IN THE PRODUCTION OF DETERMINATE SOLID BODY DOPINGS BY MEANS OF ION IMPLANTATION

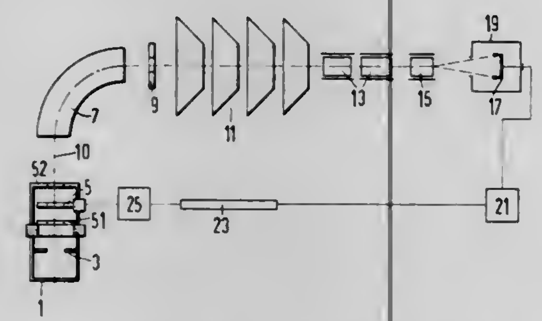
Hartmut Boroffka, Irschenhausen; Eberhard Krimmel, Pullach, and Hartmut Runge, Kirchseeon, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 20, 1974, Ser. No. 471,283

Claims priority, application Germany, May 23, 1973, 2326279

Int. Cl.² H01J *37/00*

U.S. Cl. 250—492 A **13 Claims**



1. In an arrangement for high speed ion beam switching, in the production of determinate implantation doses for the doping, by ion implantation, in solid bodies, which arrangement includes an ion source, a mass separator, a main acceleration system and a lens system, the combination of an electrode interposed in the path of an ion beam from said source preceding the main acceleration system, and switching means for intermittently connecting and disconnecting said electrode from a potential having a value, relative to the kinetic energy of the discharged ions, that upon application of such potential to said electrode, a potential wall will be produced thereat, disposed in the beam path of the ions and having a value exceeding the kinetic energy of such ions whereby the latter cannot pass therethrough; and an ion current integrator operatively disposed to monitor predetermined implantation dosage, operative to control at least the disconnection of the ion beam.

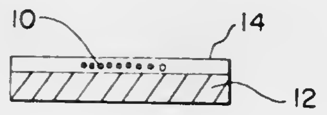
3,970,855
POSITRON PROBES FOR MECHANICAL FATIGUE DETECTION SYSTEM

William H. Holt, and Willis Mock, Jr., both of Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1975, Ser. No. 580,447

Int. Cl.² G21G *4/00*

U.S. Cl. 250—493 **9 Claims**



1. A positron-emitting probe for use in testing samples of metals for defects by positron annihilation techniques comprising:

a substrate made from the same material as the test sample;

positron-emitting material supported by one surface of said substrate; and

a cover for said material, said cover being sealed to said substrate to keep said material in place, said cover being of such thinness and density as to provide a window through which positron passage is uninhibited.

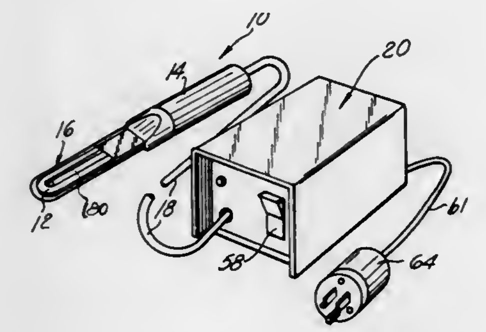
3,970,856
ULTRAVIOLET LIGHT APPLICATOR

James W. Mahaffey, Huntington, N.Y., and Charles J. Ziegler, Cleveland, Ohio, assignors to Cavitron Corporation, New York, N.Y.

Filed May 16, 1975, Ser. No. 578,284

Int. Cl.² G01J *1/00*

U.S. Cl. 250—493 **13 Claims**



12. A method of treating the arch of teeth located in a patient's mouth, said method comprising

inserting a lens enclosing a means for radiating ultraviolet light in the patient's mouth opposite the arch of teeth, said lens being curved to conform with the shape of a normal human arch of teeth, and

energizing said lamp for a sufficient period to irradiate the arch of teeth opposite the lens with a sufficient amount of ultraviolet light.

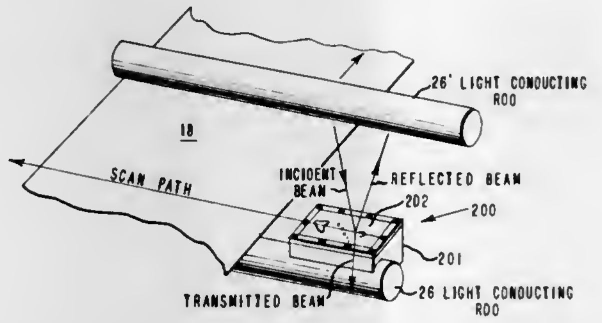
3,970,857
APPARATUS FOR WEB DEFECT DETECTION INCLUDING A WEB SWATCH THAT CONTAINS A DEFECT

Gerald Irving Buckson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1975, Ser. No. 602,466

Int. Cl.² G01N *21/32*

U.S. Cl. 250—563 **2 Claims**



1. In an inspection system for webs that includes means scanning the web for detecting defects in the web and generating output signals representative of said defects, and discriminator circuitry actuated by said output signals for generating alarm signals when said output signals exceed predetermined threshold levels, the improvement comprising: a swatch assembly containing standard defects located adjacent said web in the path of the means for scanning the web, there being output signals normally exceeding said predetermined threshold levels generated during each scan of said swatch assembly; and means for indicating when said inspection system fails to detect said standard defects in each scan.

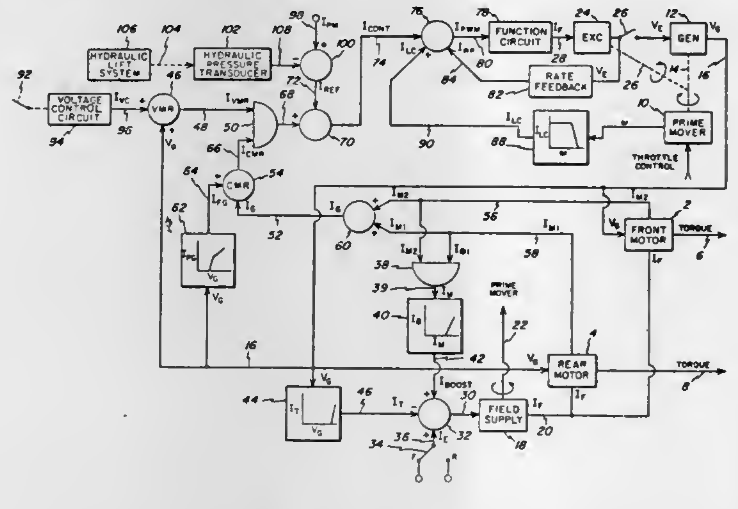
3,970,858
PRIME MOVER SPEED RESPONSIVE LOAD CONTROL FOR ELECTRICALLY PROPELLED TRACTION VEHICLES

Donald Hammond Rist, and Barry Jay Turley, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,862

Int. Cl.² B60I *11/02*

U.S. Cl. 290—14 **6 Claims**



1. For use in a traction vehicle including electric traction motor means for propelling the vehicle, electrical generating means for supplying electrical energy to said motor means, and thermal prime mover means for driving said generating means at a speed which normally is relatively constant, said prime mover also being adapted to supply power for additional auxiliary loads, an electric propulsion control system adapted to regulate the electrical output of said generating means within given limits and to control the performance of said motor means, said control system comprising:

a. a variable excitation source arranged normally to supply a predetermined maximum level of excitation to the field of said generating means;

b. first means for providing feedback signals which vary as functions of voltage and current levels of the electrical output supplied by said generating means to said motor means;

c. second means for providing reference signals representative of desired performance limits of said motor means;

d. comparison means responsive to said feedback and reference signals for generating error signals indicative of the actual performance of said motor means exceeding said limits;

e. load control means responsive solely to the shaft speed of said prime mover means for producing a load control signal indicative of said shaft speed decreasing to angular velocities at which said prime mover means is subject to bogging as a result of excessive load demand; and

f. means associated with said excitation source for modifying the excitation of said generating means as a function of said error signals and independently as a function of said load control signal.

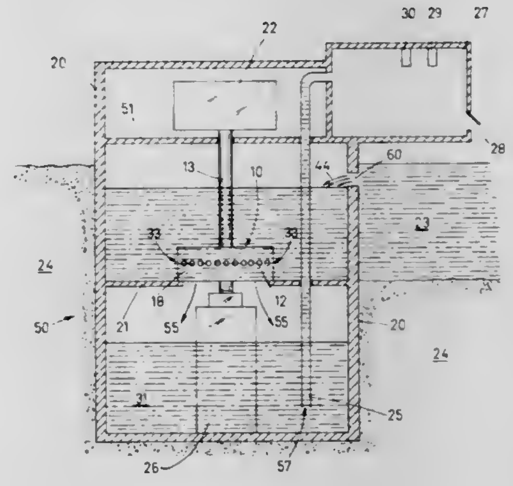
3,970,859
HYDRO-ELECTRIC GENERATION OF POWER FROM SMALL BODIES OF WATER

George Riem, 295 Shuter St., Toronto, Ontario, Canada M5A1W6

Filed Jan. 9, 1975, Ser. No. 539,862

Int. Cl.² F03B *13/10*

U.S. Cl. 290—54 **4 Claims**



1. A means for generating electric energy from a body of water having a depth of at least 4 meters comprising in combination;

a crib having a basin contained therein and being constructed below the bottom of and adjacent said body of water;

a turbine fixed within said crib above said basin;

a means for directing a flow of water from said body of water toward said turbine;

an electric generator means connected to a shaft means rotated by said turbine;

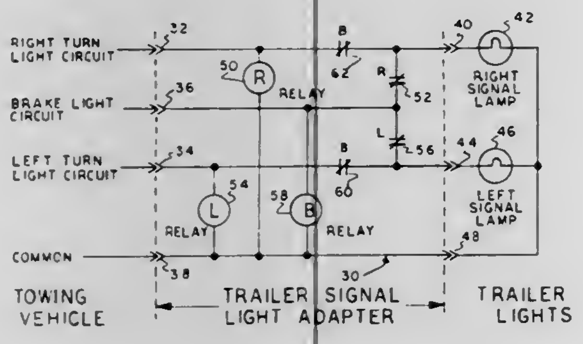
a tank member mounted on the upper structure of said crib and above the upper surface level of said body of water and interconnected to said basin by water siphoning means;

means for alternately creating a vacuum in said tank, drawing water from said basin to fill said vacuum, and then emptying said water from said tank to said body of water.

3,970,860

ELECTRICAL APPARATUS TO CONNECT TOWING VEHICLE LIGHT CIRCUITS TO A TRAILER LIGHT CIRCUIT WHEN THE TOWING VEHICLE HAS SEPARATE CIRCUITS RESPECTIVELY FOR TURNING AND STOP LIGHTS AND THE TRAILER HAS A COMMON LIGHT CIRCUIT FOR BOTH TURNING AND STOP LIGHTS

James P. Purdy, 203 154th Place SE., Bellevue, Wash. 98007
Filed Aug. 23, 1974, Ser. No. 499,897
Int. Cl.² B60Q *1/00*
U.S. Cl. 307—10 LS **2 Claims**



1. An electrical apparatus for connecting trailer towing vehicle light circuits to trailer signal light circuits when the towing vehicle has separate circuits for turning and stop lights including a right turn light circuit, a brake light circuit, a left turn light circuit, and a light system common and the trailer has a common light circuit for both turning and stop lights including a right signal lamp and a left signal lamp each having a first and second terminal for connection to an electrical system, comprising:

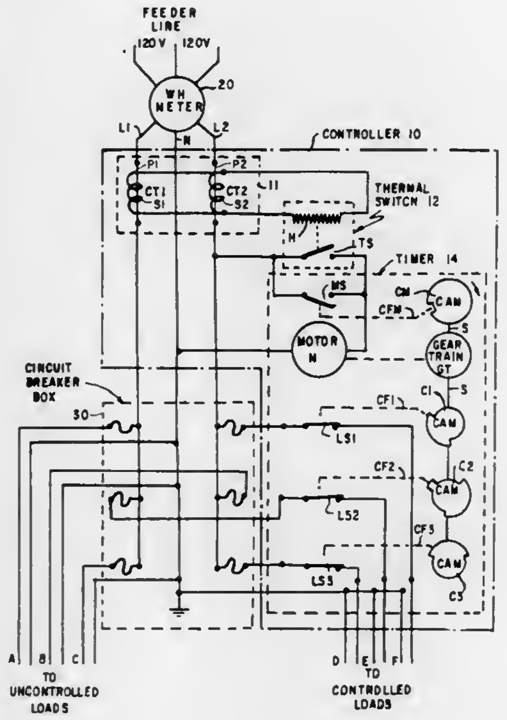
a. a first relay responsive to the operation of the right turn light circuit;
b. a second relay responsive to the operation of the left turn light circuit;
c. a third relay responsive to the operation of the brake light circuit;
d. a means for electrically connecting the right turn light circuit to the first terminal of the right signal lamp said means having a contact operated by a third relay, the contact being open when the brake circuit is energized and closed when it is not;
e. a means for electrically connecting the brake light circuit to the first terminal of the right signal lamp said means having a contact operated by the first relay, the contact being open when the right turn light circuit is energized and closed when it is not;
f. a means for electrically connecting the brake light circuit to the first terminal of the left signal lamp said means having a contact operated by the second relay, the contact being open when the left turn light circuit is energized and closed when it is not;
g. a means for electrically connecting the left turn light circuit to the first terminal of the left signal lamp said means having a contact operated by the third relay, the contact being open when the left turn signal lamp is energized and closed when it is not;
h. a means for electrically connecting the common to the second terminal of the right signal lamp; and
i. a means for electrically connecting the common to the second terminal of the left signal lamp;

whereby turn and stop signals will appear on the towed vehicle signal lamps when such signals are present on the towing vehicle light circuits.

3,970,861

DEMAND CONTROLLER

Samuel C. McCollum, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.
Filed Oct. 18, 1974, Ser. No. 515,836
Int. Cl.² H02J *3/00*
U.S. Cl. 307—35 **11 Claims**



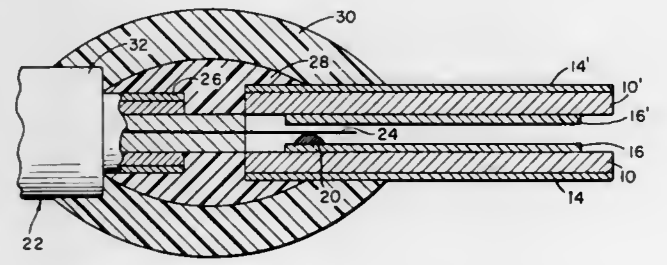
1. In a multiple load control for use with a feeder line which supplies power to controlled and uncontrolled multiple loads:

a thermal switch, first means connecting said thermal switch to said feeder line to monitor the total power being used from said feeder line at any time by said uncontrolled and controlled loads, said thermal switch being operative only whenever the total power supplied by the feeder line to said multiple loads exceeds a predetermined value for a predetermined period of time,
a plurality of load switches for selectably connecting said controlled loads to said feeder line,
cycling means for operating each of said load switches in a present pattern to effect connection of each controlled load to the feeder line at least once in each cycle, and
hold means operative to effect completion of each cycle of said cycling means responsive to initiation of a cycle by said thermal switch.

3,970,862

POLYMERIC SENSOR OF VIBRATION AND DYNAMIC PRESSURE

Seymour Edelman, Silver Spring, Md.; Steven C. Roth, Fairfax, Va., and John F. Mayo-Wells, Mount Airy, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed June 25, 1974, Ser. No. 477,141
Int. Cl.² G11C *13/02;* **H01S** *4/00*
U.S. Cl. 307—88 ET **7 Claims**



1. A polymeric film transducer for sensing dynamic pressure and vibrations comprising:

a first film sandwich comprising a sheet of permanently polarizable polymeric film, one surface being coated with at least one geometrically shaped area of electrically conductive material forming a lead to said geometrically shaped area, the other surface of said polymeric sheet having an electrically conductive coating covering at least the same area as said geometrically shaped area;
a second film sandwich which is a mirror image of the first, said second sandwich being cemented over and in geometrical correspondence with the first, the surface carrying the geometrically shaped films and leads forming the contacting interface, wherein the inactive lead area is in the form of a narrow strip;
electrical connection means making electrical contact with said interfacing coatings in the lead area comprising the center wire of a coaxial cable fitting between the interfacing coatings; and
electrical connection means making electrical contact with both of said outer conductive coatings in the lead area including the metallic shield of said cable and an electrically conductive, flexible, adhesive material extending from the shield to the outer coatings.

3,970,863

ELEMENT AND METHOD FOR DETECTING LEAKAGE OF PETROLEUM PRODUCTS

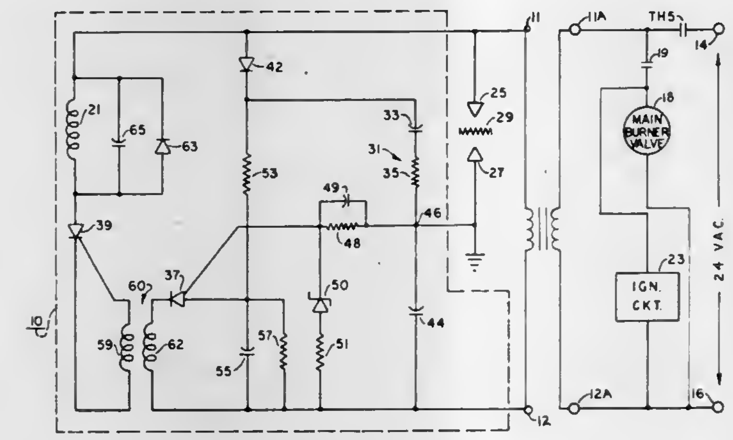
Hiroshi Kishikawa, Toyonaka; Takayoshi Adachi, Nishinomiya, and Tamio Usami, Kokubunji, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Japanese National Railways, Tokyo, both of, Japan
Filed Dec. 13, 1974, Ser. No. 532,600
Claims priority, application Japan, Dec. 18, 1973, 48-142672
Int. Cl.² H01H *35/00*
U.S. Cl. 307—116 **10 Claims**

1. An element for detecting and locating leakage of petroleum product by detecting the change in an electric signal, which element comprises a styrene-butadiene-styrene block copolymer of a butadiene content of 50 to 70% by weight and an electroconductive metal.

3,970,864

CONTROL ARRANGEMENT FAIL-SAFE TIMING CIRCUIT

Russell B. Matthews, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.
Filed Mar. 1, 1974, Ser. No. 447,165
Int. Cl.² H01H *7/00*
U.S. Cl. 307—141 **11 Claims**

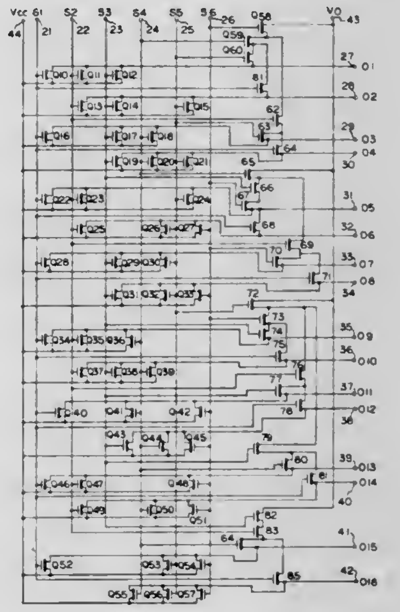


1. In a control arrangement for activating a system, a fail-safe timing circuit energizable in response to a request signal, said fail-safe timing circuit comprising first switching means operable when enabled to activate the system to commence its operation tentatively, second switching means operable when enabled to enable said first switching means, first timing means including first charge retaining means responsive to said request signal for charging toward a given potential to provide an increasing potential at a first control input of said second switching means, and second charge retaining means responsive to said request signal for discharging from said given potential to provide a decreasing potential at a second control input of said second switching means, said second switching means being enabled when the potential at said second control input decreases to a value which is a predetermined amount less than the potential at said first control input to enable said first switching means, second timing means responsive to said request signal for generating a time-out signal after a predetermined time delay interval for inhibiting said first timing means whereby said first and second switching means are disabled to de-activate the system, and circuit means responsive to a system variable becoming a predetermined condition for preventing said second timing means from generating its time-out signal.

3,970,865

PSEUDO-COMPLEMENTARY DECODE DRIVER

Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.
Continuation of Ser. No. 368,855, June 11, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,433
Int. Cl.² H03K *19/08*
U.S. Cl. 307—218 **9 Claims**



1. In a decoder circuit having inputs and outputs, a decode driver circuit for forming a plurality of said outputs at output terminals and for selectively coupling each one of the outputs to one of two reference potential levels in response to predetermined coded signal combinations on a plurality of said inputs comprising,

first and second reference potential terminals,
a first plurality of transistors for forming AND circuits where each AND circuit connects between said first reference potential terminal and a different one of said output terminals, said first plurality including parallel first and second transistors and including a third transistor connected in series with both said first and second transistors, said first and third transistors forming a first one of said AND circuits between said first reference potential terminal and a first one of said output terminals, said second and third transistors forming a second one of said AND circuits between said first reference potential terminal and a second one of said output terminals,
a second plurality of transistors connected in parallel to form an OR circuit between said first one of said output terminals and said second reference potential terminal in combination with said first plurality of transistors,
a third plurality of transistors connected in parallel to form an OR circuit between said second one of said output

terminals and said second reference potential terminal in combination with said first plurality of transistors,

said combined transistors of said first, second and third plurality being connectd to be switched on or off by one of said inputs in a predetermined manner providing a decoded output.

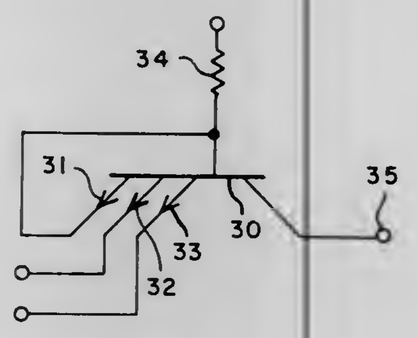
3,970,866
LOGIC GATE CIRCUITS

David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 13, 1974, Ser. No. 497,018

Int. Cl.^{2} H03K *19/08, 19/22, 19/34*

U.S. Cl. 307—218 **24 Claims**



1. A circuit for performing logical functions including an AND function, said circuit comprising:

a first gate circuit comprising:

a bipolar transistor having a first gate base, a first gate collector and a plurality of emitters therein, said emitters, including a first emitter, being inputs to receive signals from sources of signals excepting those said emitters which are directly connected to said first gate base including a second emitter so connected; and

a first resistor connected between said first gate base and a first terminal means adapted for connection to a voltage source, whereby a logic gate circuit capable of performing said AND function is provided including said bipolar transistor as a non-inverting transistor.

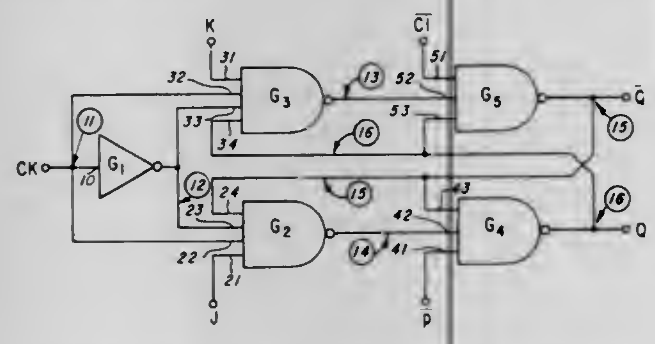
3,970,867
SYNCHRONOUS COUNTER/DIVIDER USING ONLY FOUR NAND OR NOR GATES PER BIT

Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 18, 1975, Ser. No. 550,804

Int. Cl.^{2} H03K *21/00*

U.S. Cl. 307—225 R **9 Claims**



1. A synchronous counter/divider circuit comprising:

a. a plurality of serially connected flip-flop stages with each stage receiving outputs from each of the preceding stages;

b. a clock pulse generator;

c. each of said flip-flop stages comprising a pair of multiple input inverting steering gates and a pair of multiple input inverting latch gates, each of said steering gates having a clock pulse input common to said steering gate pair, individual inputs from each preceding stage common to said steering gate pair and a feedback input, each of said pair of latch gates having a feedback input, an input from a corresponding steering gate output of said stage, one additional input and an output connected in common to said feedback inputs of the opposite latch gate and opposite steering gate of said stage, the output of one of said latch gates of each stage being the output of said stage;

d. said clock pulse generator comprising means to produce a clock pulse having a duration of between one and two times the propagation delay time of the slowest of said inverting gates in response to an input clock signal, said clock pulse being applied to said clock pulse inputs of each of said stages; and

e. said additional inputs of one of said latch gates in each of said stages being connected together as a preset input and said additional inputs of the other of said latch gates of each of said stages being connected together as a clear input.

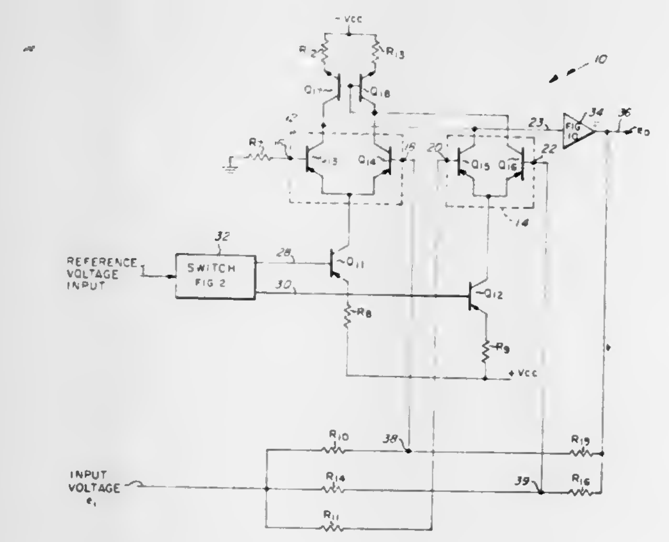
3,970,868
PHASE COMPARATOR

Ivor K. Clements, Chelmsford, and George R. Spencer, Needham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 27, 1975, Ser. No. 590,894

Int. Cl.^{2} H03K *5/20;* H03F *3/45*

U.S. Cl. 307—232 **4 Claims**



1. An electronic circuit comprising:

a. a first differential amplifier having an input terminal adapted for coupling to an input signal source through a first impedance and a first output terminal;

b. a second differential amplifier having first and second input terminals adapted for coupling to the input signal source through second and third input impedances, respectively; and a second output terminal connected to the first output terminal;

c. a high gain amplifier having an input coupled to the first and second output terminals and an output coupled in degenerative feedback to the input terminal of the first differential amplifier through a first feedback impedance and also coupled in degenerative feedback to the first input terminal of the second differential amplifier through a second feedback impedance; and

d. switching means, responsive to a reference signal, selectively to actuate the first differential amplifier to couple the input signal to the high gain amplifier through such first differential amplifier or to actuate the second differential amplifier to couple the input signal to the high gain amplifier through such second differential amplifier.

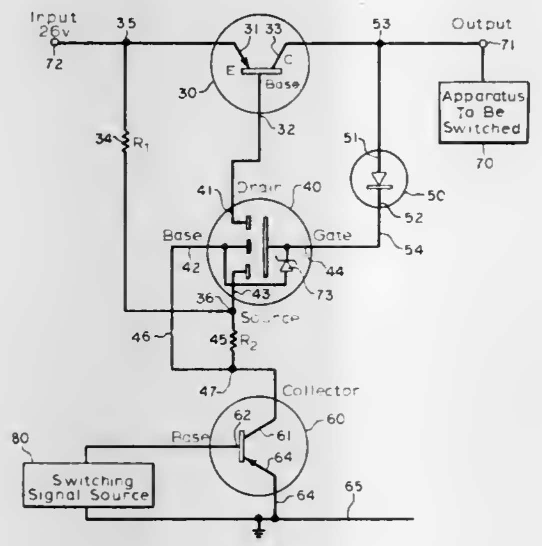
3,970,869
LOW POWER DRIVER

Charles L. Coats, Jr., Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,894

Int. Cl.^{2} H03K *17/00, 17/60*

U.S. Cl. 307—251 **4 Claims**



1. An improved low power driver switching circuit having capabilities of high speed switching between "on" and "off" and having a very low current drain, comprising:

a. a first semi-conductor device having base, emitter, and collector electrodes;

b. a second semi-conductor device having source, drain, base, and gate electrodes;

c. a third semi-conductor device having anode and cathode electrodes;

d. a fourth semi-conductor device having base, emitter and collector electrodes;

e. an input power circuit having a positive terminal and a low voltage end and including a voltage dividing network;

f. an output terminal coupled to a device to be switched;

g. means for connecting said emitter electrode of said first semi-conductor device to the positive terminal of said input circuit, for connecting said collector electrode of said first semi-conductor to said output terminal, and for connecting said base electrode to said drain electrode of said second semi-conductor device;

h. means for connecting said third semi-conductor device between said collector electrode of said first semi-conductor device and said gate electrode of said second semi-conductor device;

i. means for connecting said source electrode of said second semi-conductor device to a predetermined point in said input voltage divider network;

j. means connecting said fourth semi-conductor device between ground and one end of said voltage dividing network, said fourth semi-conductor device receiving switching signals and initiating switching operations;

k. means for connecting said base electrode of said second semi-conductor device to said low voltage end of said input voltage divider network; said third semi-conductor device maintaining the voltage at said gate electrode of said second device at substantially the input voltage until switching operations is initiated; said voltage dividing network causing voltage at said source electrode to go negative with regard to the input voltage upon initiation of the switching operation, said voltage causing a very rapid switching in response to the initiation of the switching cycle.

3,970,870
SIGNAL RECTIFYING CIRCUIT

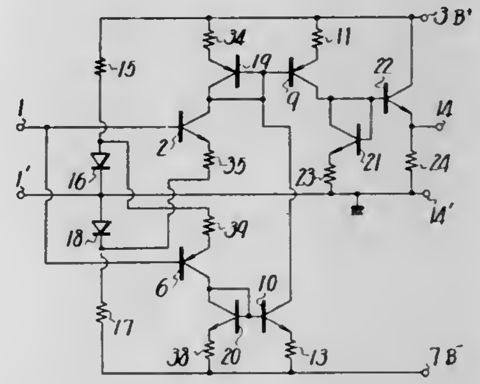
Tetsuya Horichi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,857

Claims priority, application Japan, Nov. 30, 1973, 48-138761[U]

Int. Cl.^{2} H03K *5/00*

U.S. Cl. 307—261 **6 Claims**



1. A signal rectifying circuit adapted for rectifying an input terminal signal having first and second polarity cycles with respect to a reference terminal, comprising:

a. an input terminal;

b. a reference terminal;

c. a first signal input means connected between the input and reference terminals for inverting at least a portion of the first polarity signal cycle;

d. a second signal input means connected between the input and reference terminals for inverting at least a portion of the second polarity signal cycle;

e. a signal inversion means connected to said second signal input means for further inverting at least a portion of said second polarity signal cycle; and

f. an output signal means connected to both said first signal input means and signal inversion means for providing a rectified output between an output terminal and said reference terminal.

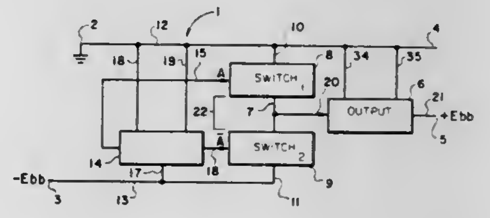
3,970,871
NEGATIVE DC TO POSITIVE DC CONVERTER

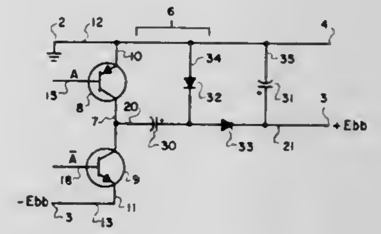
Neale A. Zellmer, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 19, 1974, Ser. No. 443,587

Int. Cl.^{2} H03K *1/12*

U.S. Cl. 307—262 **8 Claims**





1. In an inductorless d-c to d-c power converter which inverts an input voltage of one polarity from the output conductor of a power source and supplies power to a load with an output voltage of the opposite polarity and of substantially the

same magnitude, apparatus for improving the conversion efficiency of the power converter which comprises:

regenerative switching mode means having a pair of input terminals for connection to the output of said power source, said regenerative mode means providing a pair of complementary output switching control signals at a selected switching frequency as well as providing a through-path for power from said source;

power switching means comprising first and second transistor means serially connected across the through-path of said regenerative switching mode means, said first and second transistor means each being operatively connected to receive one of the pair of said switching control signals so as to drive said first transistor means during one-half cycle of said selected frequency and to drive the second transistor means during the alternate one-half cycle; said power switching means providing a power output between a common conductor of said through-path and a junction between said first and second transistor means;

transistor sub-circuit means connected to said power switching means and to said regenerative switching mode means, said sub-circuit means being responsive to said switching control signals to provide low-impedance discharge paths to substantially reduce the resetting time of said power switching means when the first and second transistor means are alternately turned off;

an output capacitor means having an input connected to the power output of said power switching means, said output capacitor means providing at its output a voltage of a polarity opposite to the polarity of the voltage of the power source.

3,970,872

CIRCUIT FOR GENERATING A TRIGGER BLANKING VOLTAGE FOR USE IN ANALYSIS OF THE IGNITION VOLTAGE WAVEFORM OF AN INTERNAL COMBUSTION ENGINE

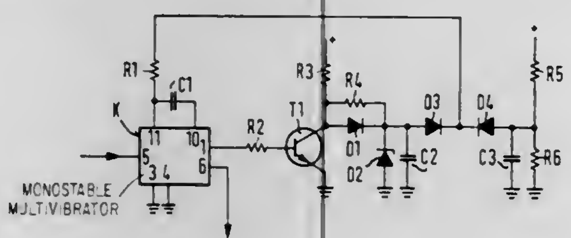
Klaus Roland Kuhn, and Viktor Stigler, both of Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 27, 1974, Ser. No. 483,527

Claims priority, application Germany, July 12, 1973, 2335562

Int. Cl.^{2} H03K *5/04*

U.S. Cl. 307—265 **3 Claims**



1. A circuit for generating a trigger blanking voltage useful in the analysis of the ignition voltage waveform of an internal combustion engine comprising:

a. a monostable multivibrator having an input adapted to be coupled to the trigger voltage associated with the ignition voltage waveform, the output of said monostable providing said trigger blanking voltage, said monostable including an RC circuit which controls the duration of its unstable state;

b. capacitor circuit means coupled to the output of said monostable and providing an output coupled to the said RC circuit to thereby control the duration of the unstable state of said monostable comprising:

1. a switching transistor having its base coupled to the output of said monostable;
2. a first resistor in series with the collector-emitter path of said transistor said series combination including said resistor and said collector-emitter path coupled across a voltage; and a capacitor having one terminal coupled to one side of the collector-emitter path of said transistor;
3. a first diode and second resistor in parallel coupling the other side of said collector-emitter path to the other terminal of said capacitor; and

c. means for generating a threshold voltage, said means coupled to said RC circuit through means isolating it from said capacitor circuit means.

3,970,873

BISTABLE LOGIC CIRCUIT WITH IN-SERVICE TEST CAPABILITY

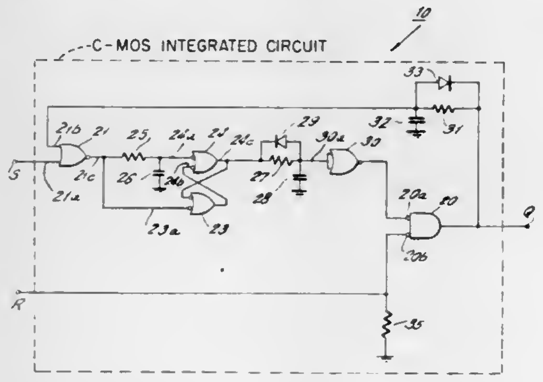
Antonio Banfi, Milan, Vimercate, Italy, assignor to Societa Italiana Elettronica S.p.A., Milan, Italy

Filed Jan. 2, 1975, Ser. No. 537,849

Claims priority, application Italy, Mar. 15, 1974, 49300/74

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—276 **11 Claims**



1. A bistable binary logic circuit with complete test capability even during normal service, said bistable logic circuit having master set and master reset inputs and a master output, and comprising:

memory means having set and reset inputs and an output;

first gate means having first and second inputs and an output, said second input being coupled to said master reset input, said output being coupled to said master output, for operating a load having a known response time (T_R), if said first input is at a second binary level and said master reset input remains at a first binary level;

first asymmetric delay means for coupling the output of said memory means to the first input of said first gate means after a first predetermined delay (T_1);

second gate means having first and second inputs and an output, said first input being coupled to said master set input, said output being coupled to said memory means reset input, for generating a resetting signal when at least one of its inputs is at a second binary level;

second asymmetric delay means for coupling said master output signal to the second input of said second gate means after a second predetermined delay (T_2);

third delay means for coupling the output of said second gate means to said memory means set input for generating a setting signal after a third predetermined delay (T_3);

whereby an input signal of duration (T_{is}) applied at a second binary level to said master set input causes the master output to develop said master output signal at a second binary level and remain at the master output signal level if the time interval (T_{is}) of the input signal (applied for normal operation) is such that the input signal is still present at the master set input when said second delay means delivers the master output signal to the second input of said second gate means and which causes said master output signal to be only briefly maintained if the time interval T_{is} of the input signal (applied for test purposes) is such that the input signal is removed before the second delay means delivers the master output signal to the second input of said second gate means.

3,970,874

CIRCUITRY FOR CONTROLLING SHUTTER TIME IN ACCORDANCE WITH A MANUALLY ADJUSTABLE RESISTOR

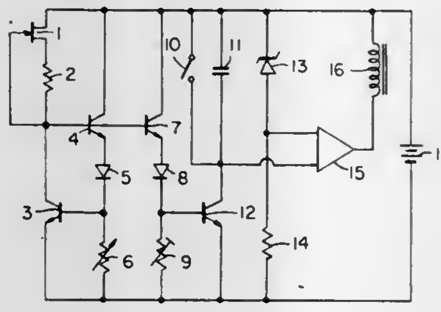
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,841

Claims priority, application Japan, Sept. 12, 1973, 48-106923

Int. Cl.^{2} H03K *5/13*; **G03B** *9/08*

U.S. Cl. 307—293 **3 Claims**



1. In a camera arrangement having a d.c. power source, an electromagnet, a timing capacitor, a timing switch for switchably enabling charging current to flow through the timing capacitor to develop a voltage across the timing capacitor, and switching circuit means connected to respond to the voltage across the timing capacitor to switchably energize the electromagnet, the combination comprising:

a constant current source;

first and second transistors each having a base electrode, an emitter electrode, and collector electrode;

the first transistor having a base-emitter junction between its base and emitter electrode, and having its collector electrode coupled to the constant current source;

the second transistor having a base-emitter junction between its base and emitter electrodes, and having its collector electrode connected to one end of the timing capacitor;

the other end of the timing capacitor being connected to one terminal of the d.c. power source, and the other terminal of the d.c. power source being connected to the emitter electrode of the second transistor so that there is defined a circuit loop through which the charging current flows in an amount which depends upon the magnitude of voltage defined across the base-emitter junction of the second transistor;

first and second resistors;

the first transistor having its base and emitter electrodes connected to opposite ends of the first resistor so that the first resistor is in parallel-circuit relationship with the base-emitter junction of the first transistor;

the second transistor having its base and emitter electrodes connected to opposite ends of the second resistor so that the second resistor is in parallel-circuit relationship with the base-emitter junction of the second transistor;

first and second current amplification circuit means having substantially the same current gain, the first current amplification circuit means being connected between the constant current source and the first resistor so as to serve as a feedback circuit for the first transistor, the second current amplification circuit means being connected between the constant current source and the second transistor; and

one of said first and second resistors being manually adjustable to control the magnitude of the voltage defined across the base-emitter junction of the second transistor so as thereby to control the amount of charging current flowing through the timing capacitor.

3,970,875

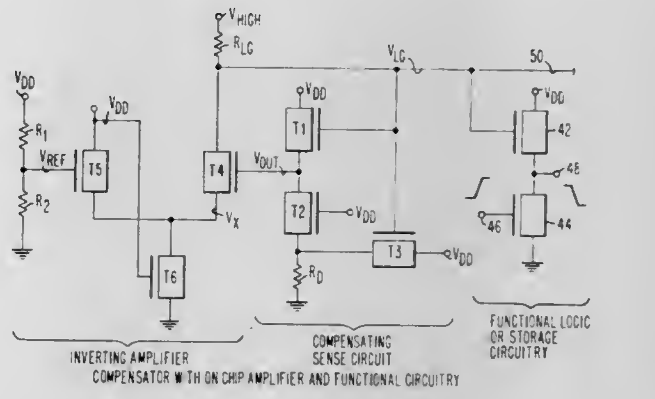
LSI CHIP COMPENSATOR FOR PROCESS PARAMETER VARIATIONS

Gerald William Leehan, Centreville, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1974, Ser. No. 526,020

Int. Cl.^{2} H03K *3/353*

U.S. Cl. 307—304 **14 Claims**


V_HIGH
R_LG
V_LG
50
V_DD
R1
R2
V_REF
T5
V_DD
T4
V_OUT
V_X
T6
T1
T2
T3
R_D
V_DD
42
48
44
46
INVERTING AMPLIFIER
COMPENSATING SENSE CIRCUIT
FUNCTIONAL LOGIC OR STORAGE CIRCUITRY
COMPENSATOR WITH ON CHIP AMPLIFIER AND FUNCTIONAL CIRCUITRY

1. Stabilization and control apparatus comprising:

a semiconductor substrate containing a plurality of functional field effect transistor circuits in the linear load configuration with an FET active device and an FET load device;

a compensating sense circuit integral with said substrate and comprising FET means, for detecting variations in the performance of said FET means resulting from variations in process parameters, and outputting a voltage with magnitude which varies in accordance with said variation in said process parameters;

said FET means including a first FET means having a drain-to-source current whose response to said variations in process parameters is proportional to the response of the drain-to-source current in said FET load device in said functional circuit, to said variations in process parameters;

said FET means further including a second FET means having a drain-to-source current whose response to said variations in process parameters is proportional to the response of the drain-to-source current in said FET active device in said functional circuit, to said variations in process parameters;

an amplifier integral with said substrate and connected to a reference potential, having an input connected to said output voltage from said compensating circuit, for outputting a load gate correction voltage to the gate of the load device in each of said functional FET circuits to be regulated;

whereby the load gate voltage for functional FET circuits is regulated so as to compensate for variations in the process parameters which obtain during the fabrication of the LSI chip.

3,970,876

VOLTAGE AND TEMPERATURE COMPENSATION CIRCUITRY FOR CURRENT MODE LOGIC

William W. Allen, Ambler, Pa., and Herbert Stopper, Orchard Lake, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 366,083, June 1, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,705

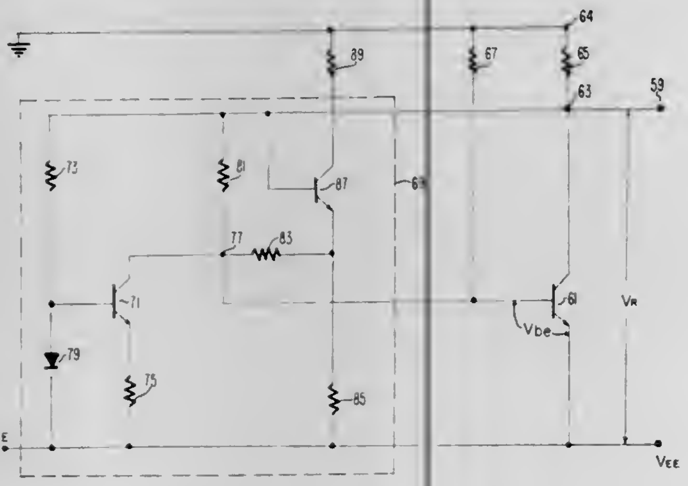
Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—310 **23 Claims**

1. An improved current mode logic (CML) circuit having input thresholds and output levels which are substantially invariant with fluctuations in junction temperature and supply voltage, said logic circuit comprising:

first and second transistors having commonly coupled emitters, the base of said first transistor serving as an input means;

means for generating a control signal which tracks variations in supply voltage on a one-to-one basis and compensates for junction temperature variations of as much as one V_{be}; and



means responsive to said control signal and compensated thereby for supplying a constant current to said commonly coupled emitters.

3,970,877
POWER GENERATION IN UNDERGROUND DRILLING OPERATIONS

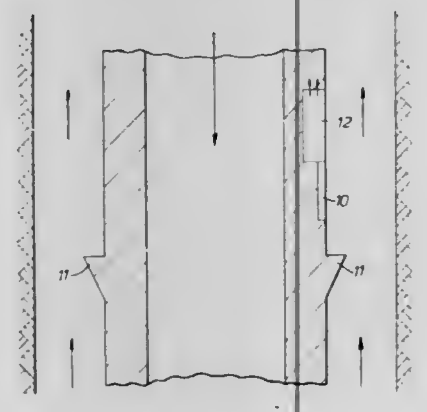
Michael King Russell, 3, Culross Close, and Anthony William Russell, 265, Old Bath Road, both of Cheltenham, England

Filed Aug. 30, 1974, Ser. No. 502,227

Claims priority, application United Kingdom, Aug. 31, 1973, 40989/73

Int. Cl.^{2} H01L *41/10*

U.S. Cl. 310—8.3 **3 Claims**



1. A method of generating electrical power in underground drilling operations which involve the flow of mud past a hollow drill string, said method comprising providing a hollow unit forming part of the hollow drill string, said unit including a vibratory flexible element forming part of the outer surface of the unit so as to be distorted by turbulence in said mud flow and means for producing an electrical voltage in response to distortion of said flexible element, wherein vibration of the flexible element results in the production of an output comprising high-voltage pulses and wherein electronic devices are provided to rectify and smooth said output, providing a projection on the outer surface of said unit below said flexible element, and flowing mud down through the inside of said hollow unit and up past the outside of said hollow unit past said projection and then past said flexible element whereby said projection creates turbulence that distorts said flexible element.

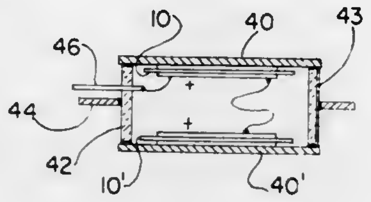
3,970,878
PIEZOELECTRIC TRANSDUCER UNIT AND HYDROPHONE ASSEMBLY

Carl O. Berglund, Houston, Tex., assignor to Teledyne Exploration Company, Houston, Tex.

Filed Mar. 31, 1975, Ser. No. 563,898

Int. Cl.^{2} H01L *41/08*

U.S. Cl. 310—8.6 **12 Claims**



1. A pressure-sensitive acceleration-cancelling piezoelectric transducer unit for use in a hydrophone assembly, comprising:
- a. an hermetically sealed hollow shell member having a central portion and having paired mutually-parallel opposed planar end portions joined to and spaced apart by the central portion, the material in the end portions having a high modulus of elasticity and being thin so that the end portions operate as diaphragms deformable inwardly of the shell member by hydro-pressure applied thereto;
- b. a piezoelectric wafer attached to the interior surface of each end portion, each wafer comprising a crystal sheet metallized on its opposed surfaces to provide electrodes of opposite polarity, the wafers of opposed end portions being conductively attached to the end portions such that the electrodes of paired wafers having one polarity are attached to the end portions and the electrodes of the opposite polarity face inwardly of the shell member;
- c. electrical terminal means each including an insulator member and a conductor member passing through the central portion of the shell member and hermetically sealed thereto, the terminal means being connected inside the shell member with said electrodes of the opposite polarity;
- d. means on the outside of the central portion of the shell member for mounting the transducer means in a hydrophone array; and
- e. said shell and terminal members being the only parts exposed outside of the transducer unit and consisting entirely of glass and metal hermetically sealed together.

3,970,879
PIEZOELECTRIC ACOUSTIC DEVICE

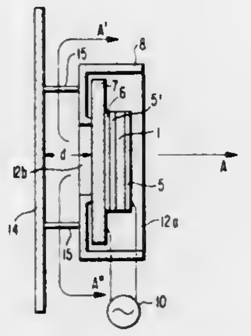
Osamu Kumon, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 29, 1972, Ser. No. 319,819

Claims priority, application Japan, Dec. 29, 1971, 47-003782[U]; Sept. 26, 1972, 47-112143[U]

Int. Cl.^{2} H01L *41/04*

U.S. Cl. 310—9.1 **4 Claims**



1. In a piezoelectric acoustic device including a planar piezoelectric element mounted in a housing, means for electrically energizing said element to cause mechanical vibration thereof to produce sound waves propagating in opposite directions substantially perpendicular to the plane of said piezoelectric element toward opposite ends of said housing, the housing having a first opening in one end thereof for passing sound waves propagating in one of said directions, the improvement comprising:
- a. a second opening in the other end of said housing for passing sound waves propagating in the other of said directions, and
- b. reflector means spaced from said housing for reflecting the sound waves passing through said second opening to cause them to progagate outside of said housing in said one direction and reinforce the sound waves passing through said first opening.

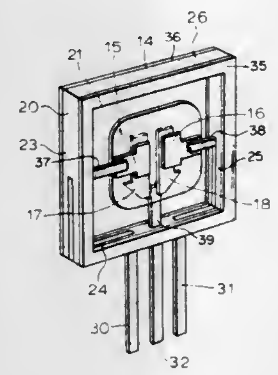
3,970,880
CRYSTAL MOUNTING STRUCTURE AND METHOD OF ASSEMBLY

William B. Deutschmann, Chicago; Corwin E. Livenick, Hickory Hills; Robert W. Paulsen, Arlington Heights; Len A. Tyler, Chicago, and Clifford L. Rose, River Grove, all of Ill., assignors to Motorola, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 395,305, Sept. 7, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 491,709

Int. Cl.^{2} H01L *41/04*

U.S. Cl. 310—9.4 **15 Claims**



1. A crystal plate mounting structure for mounting a crystal plate having a plurality of electrodes on major surfaces thereof including in combination:
- a frame of insulating material defining a central aperture;
- a plurality of conductive mounting members each extending through said insulating material and having first portions extending into said aperture;
- two of said first portions of said plurality of mounting members extending into said central aperture from substantially opposite directions;
- plastic material, having shear and tensile strengths substantially less than the force required to fracture the crystal plate, electrically and mechanically securing said crystal electrodes to said first portions of said mounting members;
- said first portions of said mounting members being substantially rigid for reducing flexure of said portions and said crystal plate; and
- top and bottom cover members secured to said frame for providing a sealed enclosure.

3,970,881
RECTIFIER ASSEMBLY

Suguru Sato, Ohbu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

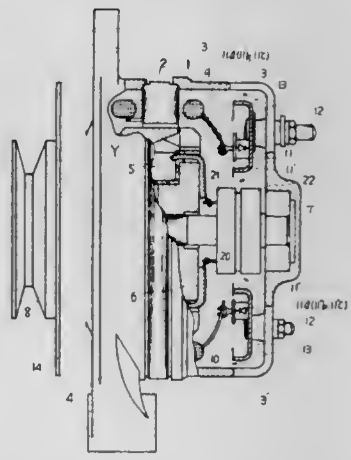
Filed Mar. 10, 1975, Ser. No. 556,954

Claims priority, application Japan, Mar. 12, 1974, 49-28871; Oct. 24, 1974, 49-129214; Oct. 28, 1974, 49-130788

Int. Cl.^{2} H02K *11/00*

U.S. Cl. 310—68 D **4 Claims**

1. A rectifier assembly, combined with an alternating current generator having a field winding and a polyphase output winding, comprising;
- a plurality of pairs of positive and negative diodes;
- a positive and a negative cooling fin respectively providing a positive and a negative output terminal;
- each of said positive diodes being mounted on said positive cooling fin at its cathode side;
- each of said negative diodes being mounted on said negative cooling fin at its anode side;
- said polyphase output winding being wound on a stator core of said alternating current generator;



- a plurality of leads each respectively interconnecting an anode side of a positive diode with a cathode side of a negative diode;
- means connecting said polyphase output winding to said interconnecting leads; and
- at least one of said interconnecting leads being disposed in slots within said stator core.

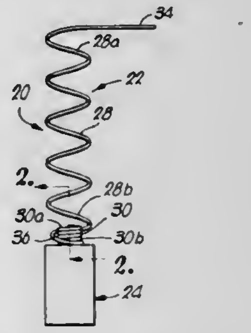
3,970,882
CARBON BRUSH ASSEMBLY

Maurice Victor Dupuis, 8101 Manning, Raytown, Mo. 64138, and Frederick William Hohman, 16130 Harbor Point Drive, Spring Lake, Mich. 49456

Division of Ser. No. 302,918, Nov. 1, 1972, abandoned. This application Nov. 28, 1973, Ser. No. 419,651

Int. Cl.^{2} H02K *13/00*

U.S. Cl. 310—245 **6 Claims**



1. An electrical brush assembly comprising:
- a brush of electrically conductive material having a mounting projection; and
- a helical compression spring attached to said brush,
- said spring comprising a single, spiralled strand of material formed into a first longitudinal series of outer turns of one diameter which defines an elongated cylindrical space within said turns extending from one end of said first series to the opposite end thereof,
- said strand further being formed into a second series of inner turns smaller in diameter than said outer turns which securely receives said projection inside said cylindrical space at all times, whether the spring is compressed or uncompressed,
- said inner turns of the single strand being integrally joined to the outer turns, being disposed wholly within said space, and extending from said one end of the first series toward the opposite end thereof.

3,970,883

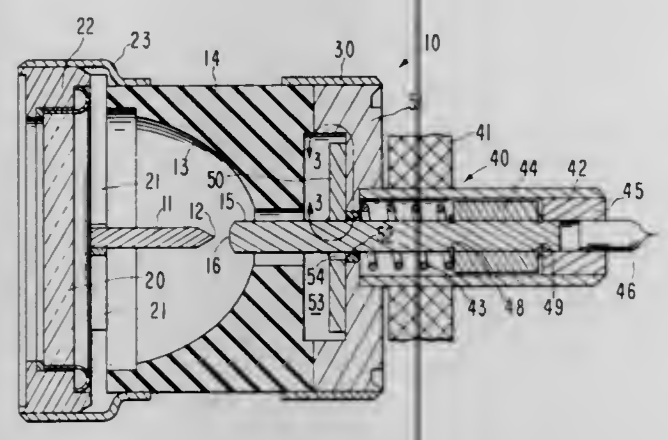
ARC LAMP WITH MOVABLE ELECTRODE

Gordon R. Lavering, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 7, 1975, Ser. No. 565,893

Int. Cl.² H01J *61/52*

U.S. Cl. 313—39 **15 Claims**



1. An arc lamp comprising a stationary electrode and an elongate movable electrode, means for moving said movable electrode between a first position in which an arc tip thereof is in contact with said stationary electrode and a retracted fixed position in which said arc tip of said movable electrode is spaced apart from said stationary electrode to form an arc gap between the movable electrode and the stationary electrode, said moving means comprising a solenoid armature on said movable electrode, and means for providing a shunt heat-transfer path from said movable electrode at a location between the arc tip of said movable electrode and said armature, the thermal impedance of said shunt heat-transfer path being lower than the thermal impedance from said arc tip through the length of said electrode.

3,970,884

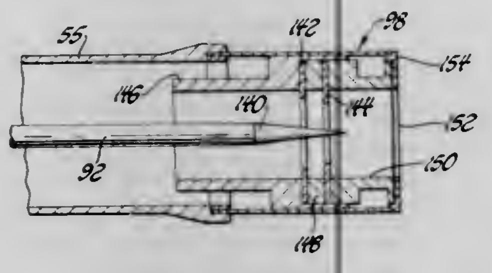
PORTABLE X-RAY DEVICE

John P. Golden, 5740 Warren Road, Ann Arbor, Mich. 48105

Division of Ser. No. 377,741, July 9, 1973, Pat. No. 3,878,394. This application Nov. 29, 1974, Ser. No. 527,970

Int. Cl.² H01J *35/04*

U.S. Cl. 313—55 **7 Claims**



1. In an X-ray source device, an X-ray emitting tube comprising: an envelope, an elongated anode having an emitting end tapering substantially to a point within said envelope and spaced therefrom, and a cathode spaced from said anode and comprising an annular disk of high resistance material disposed coaxially about and uniformly spaced from said emitting end point and in a plane which intersects the tapered end.

3,970,885

IGNITION PLUG FOR INTERNAL COMBUSTION ENGINES

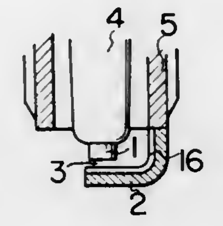
Osamu Kasima, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 397,905, Sept. 17, 1973, abandoned. This application June 3, 1975, Ser. No. 583,405

Claims priority, application Japan, Sept. 18, 1972, 47-93988; Sept. 18, 1972, 47-93989; Nov. 20, 1972, 47-117046; Nov. 29, 1972, 47-119697; Dec. 1, 1972, 47-120845

Int. Cl.² H01T *13/20*

U.S. Cl. 313—141 **6 Claims**



1. An ignition plug for internal combustion engines including a central electrode and an opposed ground electrode with a spark gap therebetween so that a spark discharge is produced in said spark gap to ignite a mixture, said ground electrode having a surface confronting said central electrode a part of which is not uniform but discontinuous, the improvement in which there is provided a groove at the surface of said ground electrode confronting said central electrode, said groove extending longitudinally along the entire length of the ground electrode and but partially through the thickness thereof.

3,970,886

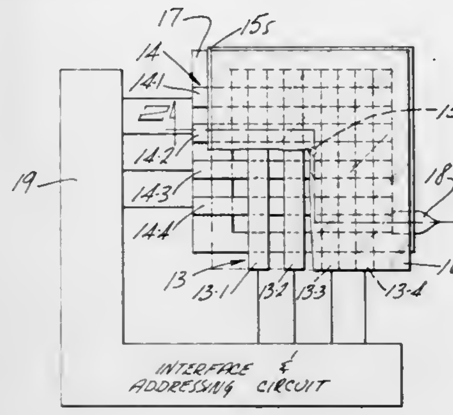
MULTIPLE GAS DISCHARGE DEVICE HAVING IMPROVED PHOTON CONDITIONING

Wolfgang W. Bode, Sylvania; Michael E. Fein, Toledo, and David C. Hinson, Whitehouse, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 201,963, Nov. 24, 1971, abandoned. This application Nov. 2, 1973, Ser. No. 412,499

Int. Cl.² H01J *17/20*

U.S. Cl. 313—223 **11 Claims**



6. In a multiple gaseous discharge display/memory device characterized by an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material charge storage members backed by electrode members, the electrode members behind each dielectric material member being transversely oriented with respect to the electrode members behind the opposing dielectric material member so as to define a plurality of discrete discharge volumes constituting discharge units in open photonic communication, the improvement wherein the gaseous medium contains at least one photon conditioning improving gaseous constituent selected from mercury, xenon and krypton which emits high intensity ultraviolet radiation upon excitation, said constituent being present in an amount sufficient to provide an increased number of initial free electrons and improve conditioning of a to-be-addressed discharge unit by photon radiation generated by the discharge of a further discharge unit remotely spaced from said to-be-addressed pair of transversely oriented electrode members at said to-be-addressed discharge unit to discharge same.

3,970,887

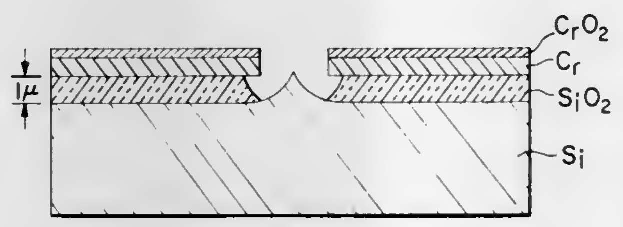
MICRO-STRUCTURE FIELD EMISSION ELECTRON SOURCE

Donald O. Smith, and John S. Judge, both of Lexington, Mass., assignors to Micro-Bit Corporation, Lexington, Mass.

Filed June 19, 1974, Ser. No. 480,962

Int. Cl.² H01J *1/02*

U.S. Cl. 313—309 **18 Claims**



1. A new and improved field emission electron source comprising a semiconductor substrate, an insulating layer formed over a surface of the semiconductor substrate, an overlying conductive layer formed over the insulating layer and at least one field emission cathode site comprised by an opening formed in the insulating layer and overlying conductive layer exposing a part of the underlying semiconductor substrate with the central region of the exposed underlying semiconductor forming a raised emitting tip of semiconductor integral with the underlying semiconductor substrate.

3,970,888

TUNGSTEN-THORIUM DIOXIDE-ALUMINUM OXIDE MASS FOR A HIGH-TEMPERATURE-RESISTANT EMISSION ELECTRODE AND PROCESS FOR THE PRODUCTION THEREOF

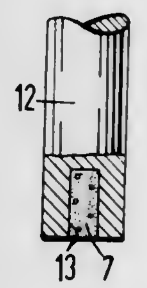
Hermann Trattner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 23, 1974, Ser. No. 491,040

Claims priority, application Germany, July 23, 1973, 2337344

Int. Cl.² H01J *1/14, 19/06*

U.S. Cl. 313—346 R **15 Claims**



1. A mass for emission electrode operating at a high temperature, comprising a mixture of thorium dioxide and aluminum oxide to which is added tungsten powder, with such components being present in the following proportions:

thorium dioxide	33–50%
aluminum oxide	4–15%
tungsten powder	63–35%.

3,970,889

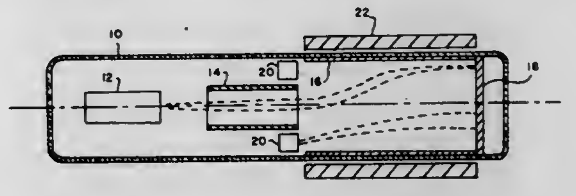
ERASURE MEANS FOR CHARGE STORAGE DEVICE

G. Harold Cobb, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 365,394, May 30, 1973. This application Nov. 21, 1973, Ser. No. 525,793

Int. Cl.² H01J *29/08, 29/10, 29/39*

U.S. Cl. 313—396 **12 Claims**



1. A charge storage scan conversion apparatus, comprising:

an evacuated envelope having a longitudinal axis;

storage target means mounted within said envelope, said target means including a storage element of dielectric material provided on a target electrode;

write-read means for producing a low-current first electron beam of narrow divergence angle, said write-read means including first electron gun means;

erase means for producing a high-current second electron beam, said erase means including second electron gun means; and

scanning means for deflecting said first and second electron beams across the surface of said storage target in a predetermined manner.

3,970,890

PLURAL BEAM CATHODE RAY TUBE INCLUDING AN ASTIGMATIC ELECTRON LENS AND SELF-CONVERGING

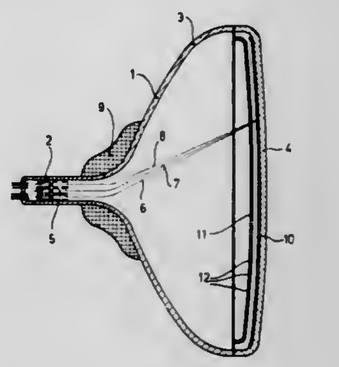
Henricus Wilhelmus Maria Linssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,693

Claims priority, application Netherlands, Jan. 23, 1974, 7400887

Int. Cl.² H01J *29/51, 29/56*

U.S. Cl. 313—413 **4 Claims**



1. A cathode ray tube having means for generating three electron beams the axes of which are located substantially in one plane with the longitudinal axis of the tube, a display screen which extends substantially perpendicularly to the said longitudinal axis and on which the electron beams form three substantially coinciding electron spots, a first astigmatic deflection coil for deflecting the three electron beams in a first direction perpendicular to the said longitudinal axis and parallel to the said plane, and a second astigmatic deflection coil for deflecting the three electron beams in a second direction

perpendicular to the said longitudinal axis and perpendicular to the said plane, of which first deflection coil the meridional image plane coincides substantially with the display screen and the sagittal image plane is located within the tube, and of which second deflection coil the sagittal image plane coincides substantially with the display screen and the meridional image plane is located within the tube comprising means which form an astigmatic electron lens to restrict the dimension of the electron spots in the said second direction, said means comprising a static magnetic quadrupole axis of which coincides substantially with the central electron beam.

3,970,891

ELECTRON COLLECTOR FOR AN ELECTRON BEAM TUBE

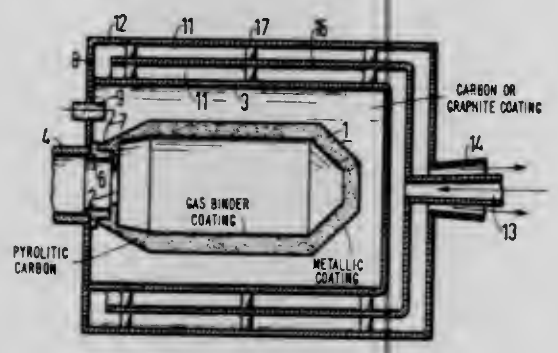
Hinrich Heynisch, Graefelfing; Paul Meyerer, Ottobrunn, and Roland Wolfram, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 30, 1975, Ser. No. 545,377

Claims priority, application Germany, Mar. 1, 1974, 2409869

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—3.5 **11 Claims**



1. An electron collector structure for an electron beam tube, comprising: a hollow member for receiving the beam electrons a metallic cooling sleeve surrounding said hollow member and connected to ground, said hollow member electrically insulated from said cooling sleeve for operation at a potential which is different from ground, said hollow member comprising a highly heat resistant material having a low vapor pressure, means mounting said hollow member in a free standing condition within said cooling sleeve, a black coating on the inner surface of said cooling sleeve facing said hollow member, and said cooling sleeve adapted for connection to a forced cooling system to receiving a flow of coolant therethrough.

3,970,892

ION PLASMA ELECTRON GUN

George Wakalopulos, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 19, 1975, Ser. No. 578,551

Int. Cl.^{2} H01J *7/24*

U.S. Cl. 315—111.3 **10 Claims**

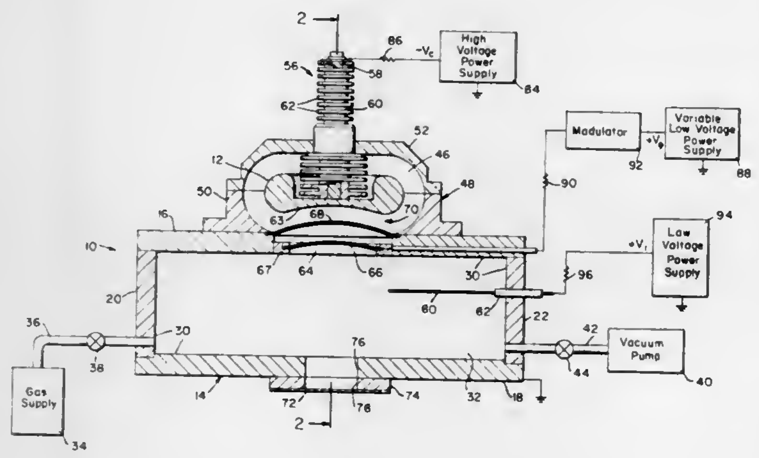
1. An electron gun comprising:

a source of positive ions including a plasma region;

a cathode spaced from said ion source and positioned to intercept positive ions extracted therefrom;

means for applying to said cathode a large negative voltage sufficient to cause positive ions generated by said ion source to bombard a surface of said cathode such that secondary electrons are emitted therefrom to form an electron beam; and

said ion source including grid electrode means disposed between said plasma region and said cathode for controlling the density of the positive ions bombarding said cathode surface.



3,970,893

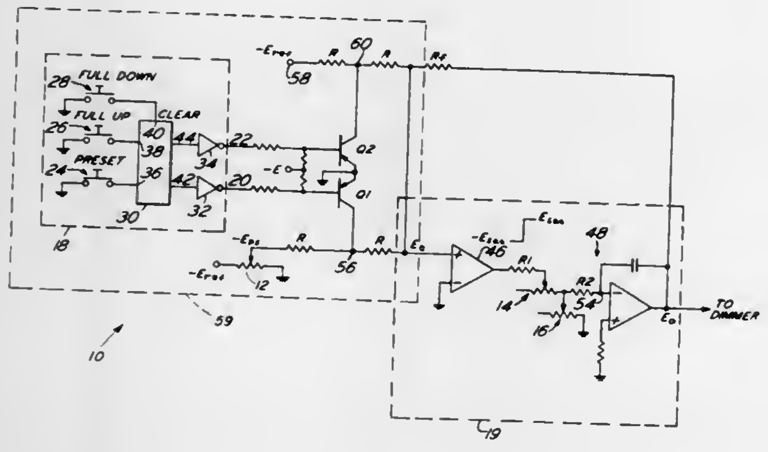
APPARATUS FOR CONTROLLING THE INTENSITY OF LIGHTS

Doyle D. Bryant, Granada Hills, Calif., assignor to Strand Century Incorporated, Elmwood Park, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,922

Int. Cl.^{2} H05B *41/38*

U.S. Cl. 315—293 **19 Claims**



1. Apparatus for generating an output signal for controlling the intensity of a light source, comprising:

means for generating a command signal;

comparator means for comparing said command signal to an output signal and for generating a driving signal representative of said comparison;

integrator means responsive to said driving signal for generating said output signal the absolute value of which increases when the absolute value of said command signal is greater than the absolute value of said output signal, decreases when the absolute value of said command signal is less than the absolute value of said output signal, and remains at a constant value when the absolute value of said command signal is equal to the absolute value of said output signal; and

feedback means for applying said output signal to said comparator means.

3,970,894

DEFLECTION SYSTEM

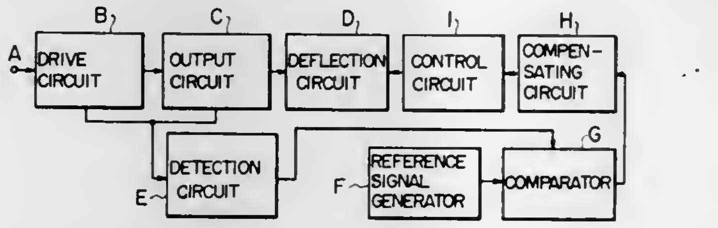
Tooru Yasuda, Yao; Yoshinori Kitamura, Katano, and Ryuhei Nakabe, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 3, 1974, Ser. No. 502,796

Claims priority, application Japan, Sept. 3, 1973, 48-99018; Sept. 3, 1973, 48-99019; Sept. 3, 1973, 48-99020; Nov. 19, 1973, 48-131073

Int. Cl.^{2} H01J *29/70*

U.S. Cl. 315—370 **16 Claims**



1. A deflection system for generating a deflection current that flows through a deflection coil, comprising:

detection means, responsive to said deflection current, for generating a detection signal analogous to said deflection current;

reference signal generating means for generating a reference signal synchronized to the deflection current;

first circuit means, responsive to both of said detection signal and reference signal, for generating a controlled signal; and

second circuit means for compensating said deflection current in response to said controlled signal.

3,970,895

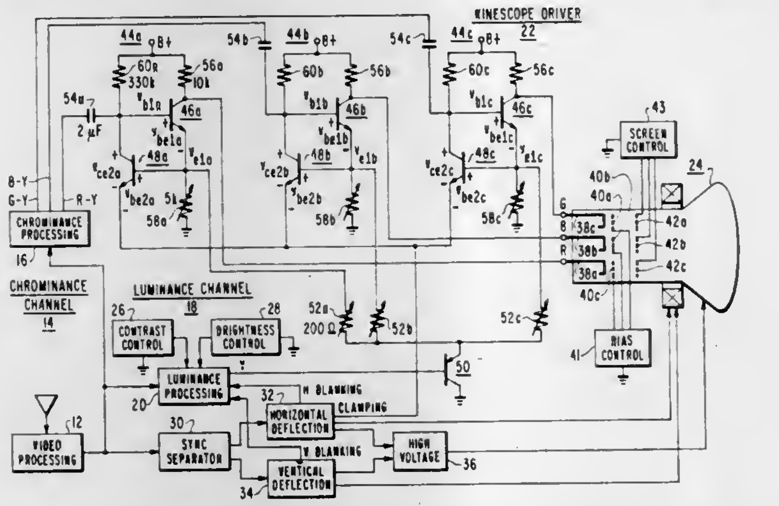
CIRCUIT FOR MAINTAINING OPERATING POINT STABILITY OF AN AMPLIFIER

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,357

Int. Cl.^{2} H01J *29/52*

U.S. Cl. 315—381 **7 Claims**



1. In a television receiver including a color kinescope having a plurality of electron beams forming apparatus, electron beam deflection means to control the scanning and retrace of electron beams generated by said electron beam forming apparatus, a source of luminance signals and a source of a plurality of color difference signals, the combination comprising:

a plurality of kinescope driver means each for combining a preselected one of said color difference signals and said luminance signals to derive color signals, each of said kinescope driver means including

first and second semiconductor devices of like conductivity type each having first and second electrodes and a conduction path therebetween and a control electrode for controlling the conduction of the conduction path, said first electrode of said first semiconductor device being direct current coupled to a preselected one of said plurality of said electron beam forming apparatus, said second electrode of said first semiconductor device being direct current coupled to said control electrode of said second semiconductor device, said first electrode of said second semiconductor device being direct current coupled to said control electrode of said first semiconductor device,

capacitive means for capacitively coupling said preselected one of said color difference signals to said control electrode of said first semiconductor device;

means for direct current coupling said luminance signals to said second electrodes of each of said first semiconductor devices; and

means coupled to said deflection means and to said second electrode of each of said second semiconductor devices for selectively applying a direct reference voltage to said second electrode of each of said second semiconductor devices to render it conductive during intervals when said electron beams are being retraced, so that the operating point of each of said kinescope driver means is stabilized in response to said direct reference voltage.

3,970,896

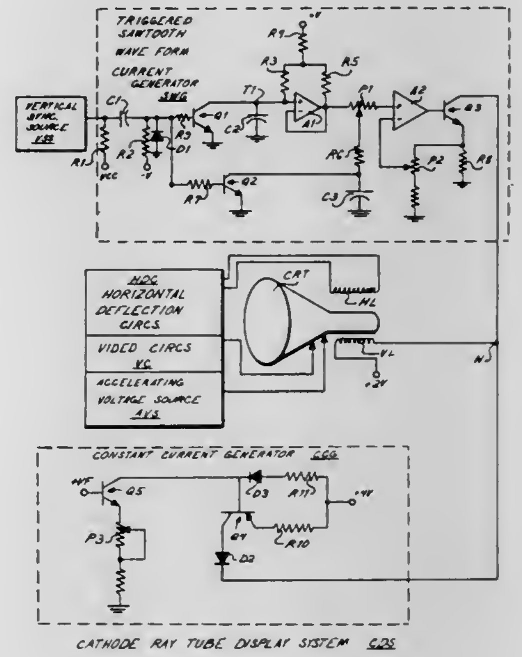
VERTICAL DEFLECTION CIRCUIT

Francis C. Marino, Dix Hills, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,766

Int. Cl.^{2} H01J *29/72, 29/76*

U.S. Cl. 315—387 **11 Claims**


TRIGGERED SAWTOOTH WAVE FORM
CURRENT GENERATOR
VERTICAL SYNC SOURCE
HORIZONTAL DEFLECTION CIRCS
VIDEO CIRCS
ACCELERATING VOLTAGE SOURCE
CRT
CONSTANT CURRENT GENERATOR
CATHODE RAY TUBE DISPLAY SYSTEM

1. Vertical deflection circuit for vertically deflecting the electron beam of a cathode ray tube in response to vertical synchronizing pulses comprising a vertical deflection coil, a reference voltage source connected to one end of said vertical deflection coil, a first current generating means connected to the other end of said vertical deflection coil, for generating a current having a repetitive sawtooth waveform in synchronism with the vertical synchronizing pulses, and a second current generating means, connected to the other end of said vertical deflection coil, for generating a constant current whose amplitude is selectively adjustable in order to control the vertical starting position of the electron beam of the cathode ray tube.

3,970,897

DETECTOR AND APPARATUS INCORPORATING THE SAME FOR DETECTING PHASE-ASYMMETRY AND PROTECTING THREE-PHASE MOTORS AGAINST DANGEROUS OPERATING CONDITIONS

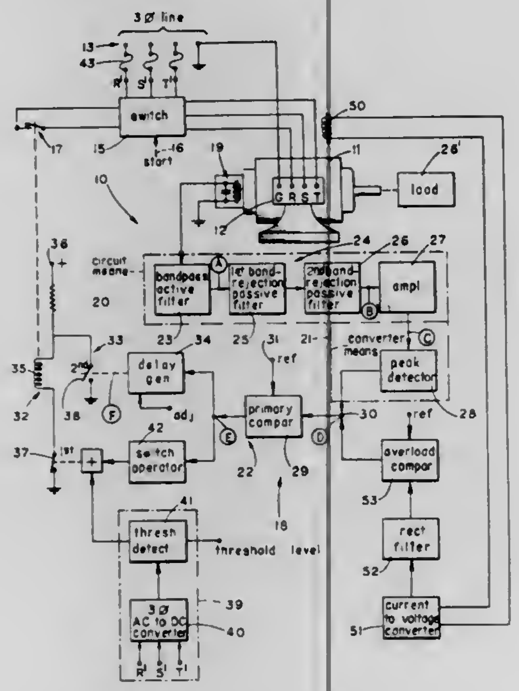
David Tamir, Jerusalem, and Michael S. Erlicki, Haifa, both of Israel, assignors to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Apr. 22, 1974, Ser. No. 463,199

Claims priority, application Israel, Apr. 30, 1973, 42142

Int. Cl.² H02H *7/08*

U.S. Cl. 317—13 R **14 Claims**



1. A detector for detecting phase-asymmetry in connection with a three-phase machine comprising a sensor couplable to the machine for picking up a signal associated with the leakage field during rotation of the machine; circuit means including a bandpass active filter for amplifying characteristic components of the signal (i.e., components whose amplitudes greatly increase relative to other components in the signal when phase-asymmetry occurs) without amplifying other components of the signal, and passive filter means for attenuating other components of the signal, particularly at frequencies around *f* and 3*f* where *f* is the line frequency; converter means for converting the output of the circuit means into a control voltage; and control means responsive to increases in the control voltage above a predetermined level established in the absence of phase-asymmetry for producing an output signal indicative of phase-asymmetry.

3,970,898

METHOD OF AUTOMATICALLY ISOLATING A FAULTY SECTION OF A POWER LINE BELONGING TO AN ELECTRICAL ENERGY SUPPLY NETWORK, AND ARRANGEMENT FOR CARRYING OUT THIS METHOD

Eduard Baumann, Uster, and Candidus A. Waldispuhl, Zurich, both of Switzerland, assignors to Zellweger Uster AG, Uster, Switzerland

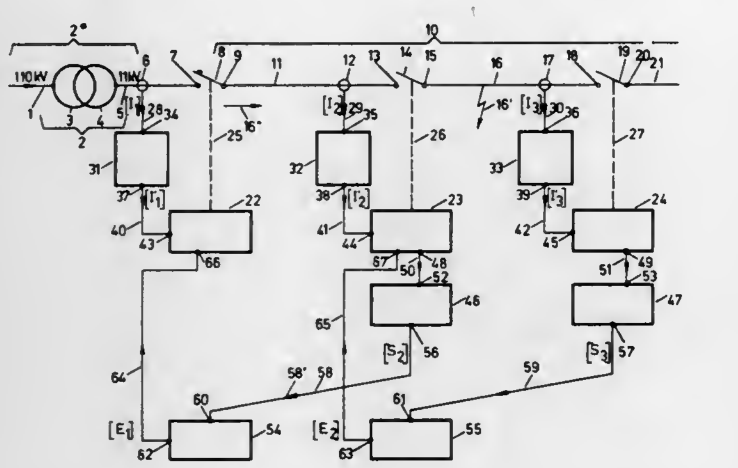
Filed Nov. 4, 1974, Ser. No. 520,733

Claims priority, application Switzerland, Nov. 23, 1973, 16520/73

Int. Cl.² H02H *7/26*

U.S. Cl. 317—25 **17 Claims**

1. A method of automatically isolating a faulty section of a power line of an electrical supply network, the power line being adapted to be connected to at least one energy source and to be temporarily divided up into sections by switches following the appearance of an excess current, and automatically reconnecting normally operating sections of the power line to said at least one energy source, the improvement comprising the steps of transmitting a signal from the location of at least one switch, when said one switch is open, which has automatically opened after an excess current has passed through it through a non-faulty part of the power line to at least one other switch through which at least a part of the excess current had passed to the now opened said one switch, and which other switch has also automatically opened, reception of the aforementioned signal being an essential requirement for closing said other switch.



3,970,899

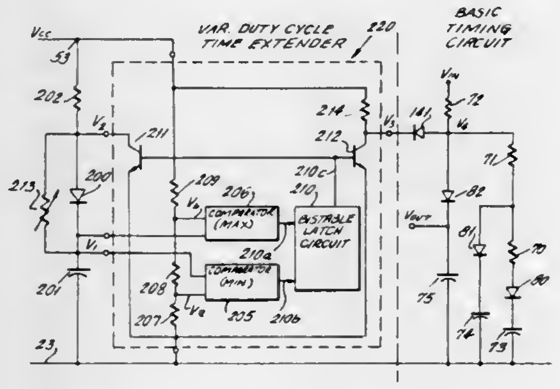
INTEGRATED CIRCUIT LINEAR TIME DELAY EXTENDER FOR STATIC RELAYS

Lee A. Davis, Audubon, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 3, 1975, Ser. No. 546,622

Int. Cl.² H02H *3/08*

U.S. Cl. 317—33 R **10 Claims**



1. an improved static relay of the type having a time delay network whose output increases with time according to a first predetermined curve after an input terminal of said time delay network is coupled by a pickup circuit to a current-sensing circuit when the output of said current-sensing circuit reaches a first pickup level and output circuit means is energized at the end of a first time interval required for said time delay network output to exceed a first predetermined value, wherein the improvement comprises:

first means for providing a substantially constant supply voltage level;

charging means coupled to said first means for charging at a first rate;

second means coupled to said charging means and activated in response to said charging means reaching said first predetermined charging level for suspending the charging of said time delay network;

fourth means coupled to said charging means for deactivating said second and third means when said charging means has discharged to a second predetermined level to thereby enable said time delay network and said charging means to resume charging.

3,970,900

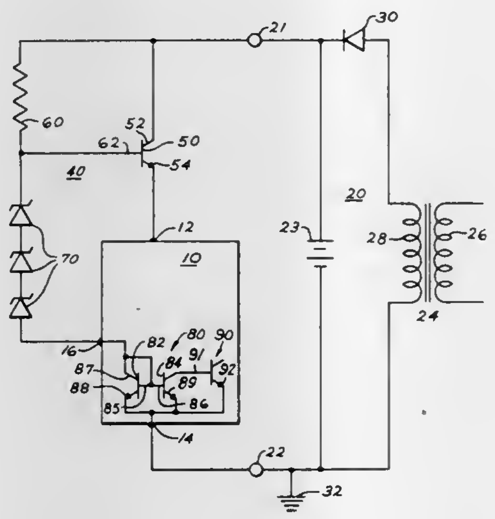
OVERVOLTAGE PROTECTION FOR AN INTEGRATED CIRCUIT

Robert G. Hodgins, Canastota, N.Y., assignor to General Electric Company, Carmel, Ind.

Filed Dec. 19, 1974, Ser. No. 534,650

Int. Cl.² H02H *3/28*

U.S. Cl. 317—31 **6 Claims**



1. Overvoltage protection means for a monolithic integrated circuit comprising:

a pass transistor having a collector and an emitter connected serially with the integrated circuit across a DC energy source;

a current source for providing continuous base drive for the pass transistor when the DC source is operative for assuring conduction of the transistor to energize the integrated circuit and in a nonovervoltage condition when the DC source voltage is below a predetermined value to preserve low power dissipation in the circuit by allowing only a low-voltage drop across the current source and the transistor base-emitter;

voltage limiting means for clamping the transistor base during an overvoltage condition when the DC source voltage is at or above the predetermined value; and

a switch in the integrated circuit connected serially between the voltage limiting means and the ground side of the DC source such that, upon conduction of the voltage limiting means, a current flowing therethrough serves to turn on the switch thereby to protect the integrated circuit from high voltage breakdown.

3,970,901

METHOD AND APPARATUS FOR THE DETECTION OF SHORT CIRCUITS

André Rohr, Geneva, Switzerland, assignor to Societe Anonyme des Ateliers de Secheron, Geneva, Switzerland

Filed Dec. 6, 1974, Ser. No. 530,152

Claims priority, application Switzerland, Dec. 14, 1973, 17525/73

Int. Cl.² H02H *3/16*

U.S. Cl. 317—49 **22 Claims**

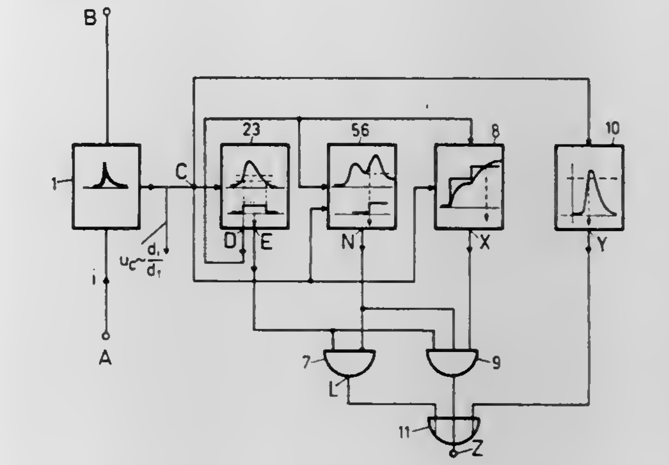
1. A method for the detection of short circuits in electrical installations, in particular on railway contact wires, comprising:

generating a signal corresponding to the time derivative of the monitored current,

comparing the generated current time derivative signal with a first limit value,

generating, in case of the current time derivative signal exceeding the first limit value, a replica signal corresponding to the wave-form of the monitored current from the moment of the exceeding onwards,

comparing the replica signal with at least one further limit value and



providing a short circuit condition indication signal if the at least one further limit value is exceeded.

3,970,902

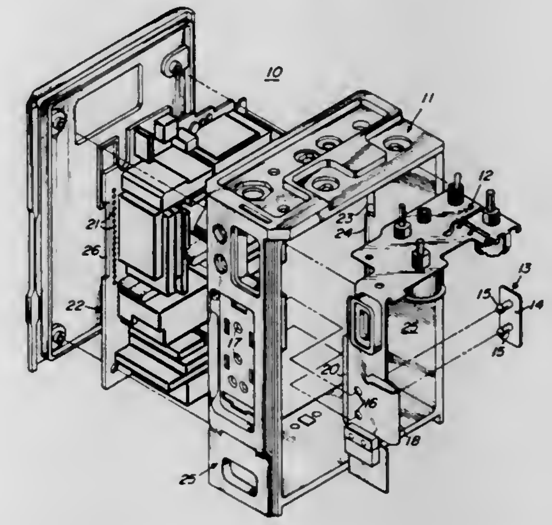
HOUSING ARRANGEMENT FOR MINIATURIZED ELECTRONIC DEVICES

William M. Brettman, Margate, and David L. White, Lauderhill, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1975, Ser. No. 558,044

Int. Cl.² H05K *7/06*

U.S. Cl. 317—120 **3 Claims**



1. An improved housing arrangement for miniaturized electrical apparatus, comprising in combination:

a housing formed of a resilient material with open front and back faces, the housing including shoulders formed along opposing side walls thereof with offset tab portions extending laterally inwardly;

a rigid base chassis for retaining associated electrical components thereon and having a plurality of connection terminals, the chassis having edge portions overlying and resting upon said housing shoulders, the chassis further including notched portions receiving said housing tab portions and maintaining the chassis within the housing and in contact with the shoulders;

a flexible circuit member having a non-rigid base and serving to effect electrical interconnections, the flexible circuit member including connector means interconnecting to the plurality of connection terminals on the rigid base chassis, the connector means hingeing the rigid base chassis to the housing; and

strain relief means for the flexible circuit member, including snap-in, retainer means releasably securing a portion of the flexible circuit member to a side of the housing.

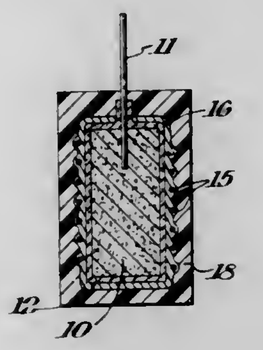
3,970,903
SOLID ELECTROLYTIC CAPACITOR WITH EMBEDDED COUNTERELECTRODE

George A. Shirn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 382,782, July 26, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,028

Int. Cl.² H01G *9/00*

U.S. Cl. 317—230 **11 Claims**



1. In a solid valve-metal capacitor having a porous valve-metal body, a valve-metal oxide film covering all surfaces of said porous body and a coating of manganese dioxide overlying and in contact with said oxide film; the improvement comprising a conductive counterelectrode member having a surface portion that is inert to manganese dioxide at temperatures as high as 450°C, said inert portion being buried in said manganese dioxide coating and another portion of said member extending outside said coating for the purpose of serving as the cathode lead of said capacitor; and a housing formed of an organic material enclosing said coated body.

3,970,904
IMPREGNATED CAPACITOR AND METHOD OF MANUFACTURE

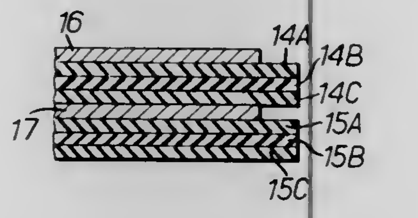
John Edward Murfitt, Ditchingham, near Bungay, and Alastair Martin Pitt, Sudbury, both of England, assignors to Johnson & Phillips (Capacitors) Limited, England

Filed June 6, 1974, Ser. No. 477,319

Claims priority, application United Kingdom, June 6, 1973, 26966/73

Int. Cl.² H01G *4/20, 13/04*

U.S. Cl. 317—258 **16 Claims**



1. In a method of making a capacitor element comprising the steps of

a. interwinding electrode foils and layers of substantially non-porous dielectric film, to form a winding, and

b. impregnating said winding with a dielectric liquid,

the improvement according to which said foils and said layers in said winding are interwound under conditions such that the foils and films of said winding are at sufficiently different tensions that at least one of each pair of adjacent foil and film surfaces is corrugated during winding to form passages extending transversely to the lengths of said layers between said adjacent surfaces, which passages assist entry of said impregnating liquid between said foils and said layers.

3,970,905
THIN WIRE TYPE OF ELECTRIC FIELD CURTAIN SYSTEM

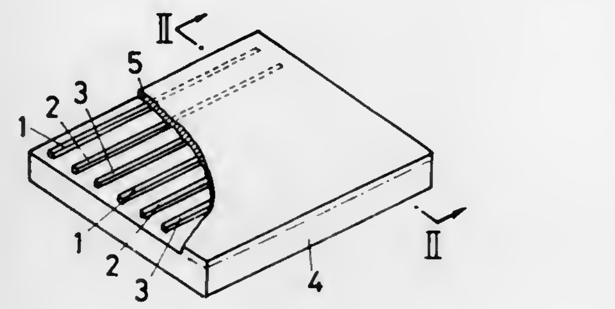
Tsutomu Itoh, Tokyo; Munekazu Sakurai, Kitamoto; Masahiro Yamamoto, Chiba, and Yasunari Okamoto, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed July 3, 1975, Ser. No. 593,105

Claims priority, application Japan, July 10, 1974, 49-78224; July 10, 1974, 49-78225

Int. Cl.² B08B *7/00*

U.S. Cl. 317—262 E **8 Claims**



1. A thin wire type of electric field curtain system including a plurality of linear electrodes embedded in an insulator layer in parallel to each other along the surface of said insulator layer wherein said system comprises silent discharge means including power supply means coupled to said linear electrodes for providing curved electric lines of force which extend outwardly in a convex pattern from the surface of said insulator layer, and wherein the width of each of said plurality of linear electrodes is chosen equal to or less than 3 mm.

3,970,906
BRAKING DEVICE FOR THREE-MOTOR TYPE TAPE RECORDER

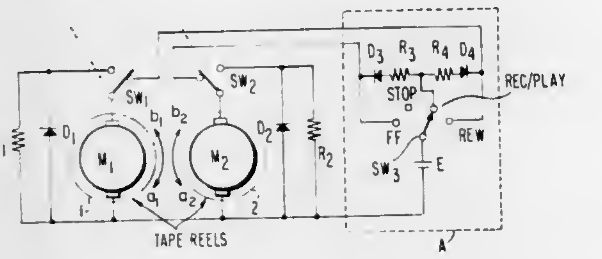
Masahiro Komatsubara, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 19, 1974, Ser. No. 525,264

Claims priority, application Japan, Nov. 19, 1973, 48-132665[U]

Int. Cl.² B65H *59/38*

U.S. Cl. 318—7 **6 Claims**



1. In a tape recorder including a first D.C. motor for driving a tape supply reel and a second D.C. motor for driving a tape take-up reel with recording tape wound on the two reels, and switch means connected between said motors and a power supply for selectively energizing and deenergizing both motors simultaneously, an improved braking system comprising:

a first unidirectional current conducting element and a first resistor connected via said switch means in parallel with said first motor; and

a second unidirectional current conducting element and a second resistor connected via said switch means in parallel with said second motor;

said unidirectional current conducting elements being poled such that, upon simultaneous deenergization of both motors, a first regenerative braking current generated by one motor flows in the forward direction through its parallel-connected unidirectional element to immediately brake said one motor to a stop, and a second regenerative braking current generated by the other motor is blocked by its parallel-connected unidirectional element and flows only through its parallel-connected resistor, whereby said second regenerative braking current is less than the first, so that the braking force on said other motor is less than that on said one motor, thereby stopping a running tape without producing slack therein.

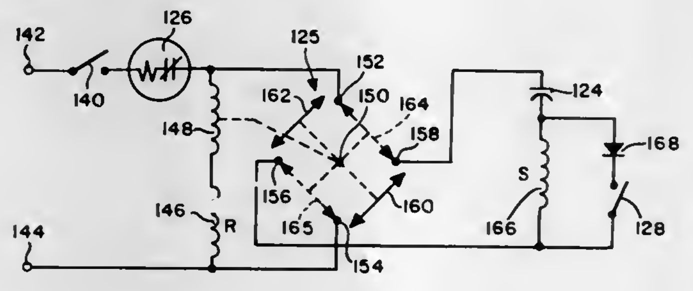
3,970,907
PULSATING TORQUE APPARATUS AND METHOD

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 17, 1974, Ser. No. 461,638

Int. Cl.² H02P *1/42*

U.S. Cl. 318—207 C **36 Claims**



1. A waste disposer device comprising:

a substantially hollow cylindrical stator member;

a rotor member contained within said stator member and defining therewith a receptacle for receiving waste material, said rotor and stator members including cooperating teeth members;

means including an induction motor for driving said rotor member;

first control means for generating unidirectional rotation in said means for driving;

second control means including means for simultaneously applying alternating and direct current to said means for driving for generating rapidly fluctuating bidirectional rotational movement in said means for driving, to provodie disintegrating action between said rotor and said stator members.

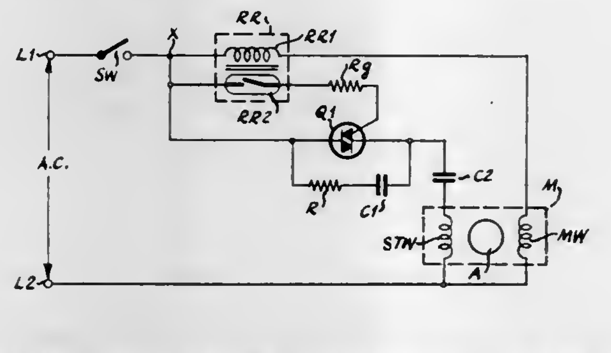
3,970,908
A.C. MOTOR STARTING SYSTEM

James E. Hansen, Oak Creek, and Eugene R. Schmit, Elm Grove, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 9, 1974, Ser. No. 530,768

Int. Cl.² H02P *1/44*

U.S. Cl. 318—221 E **7 Claims**



1. An A.C. motor starting system supplied from an alternating current source for controlling a motor having a rotor, a run field winding and a start field winding including means for shifting the phase of the start field winding with respect to the run field winding to provide a rotating magnetic field for starting, comprising:

a precision current sensor having an operating coil and a contact;

means applying alternating current from the alternating current source to said operating coil;

said main field winding being connected in circuit with said operating coil to also receive alternating current from the alternating current source;

said precision current sensor including means making it responsive to and fast enough to pick up on the leading side of each half-cycle of alternating current and to drop out on the trailing side of each half-cycle thereof, and having a critical current amplitude at and above which it will pick up on increasing alternating current and below which it will stop picking up on decreasing alternating current;

a bidirectional thyristor having main electrodes and a control electrode with said main electrodes being connected in circuit with the start field winding and its phase-shifting means across the alternating current source;

and means connecting said contact between one side of the alternating current source and said control electrode whereby upon application of power to the system said operating coil responds to the main field winding current to operate said contact and apply a firing current to said control electrode for a substantial time range during each half-cycle of the run field winding current, which substantially overlaps, due to phase-shift, the point where the start field winding current passes through zero, thus to insure refiring of said thyristor at the beginning of each half-cycle of its current, and said operating coil stops the closing of said contact at said critical level of the decreasing main field winding current as the motor approaches its running speed, thus to discontinue energization of the start field winding at a precisely controllable point.

3,970,909
CONSTANT SPEED REGULATOR FOR DC MOTOR

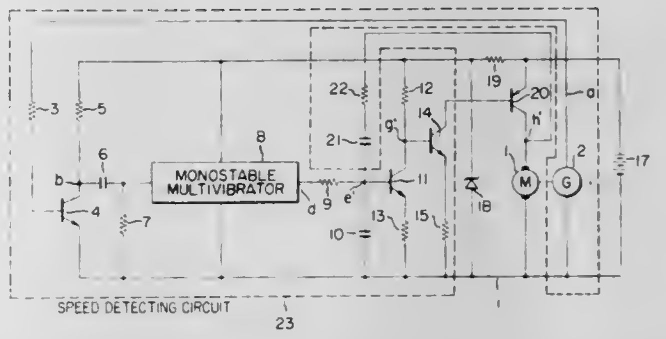
Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 29, 1974, Ser. No. 501,848

Claims priority, application Japan, Sept. 10, 1973, 48-102522

Int. Cl.² H02P *5/16*

U.S. Cl. 318—341 **11 Claims**



1. A constant speed regulator for a DC motor comprising

a. a positive feed line and a negative feed line one of which is a common power source line connected to one terminal of said DC motor,

b. a positive source line and a negative source line one of which is a common power source line,

c. a means for stabilizing the voltage between said positive feed line and said negative feed line,

d. a speed detecting circuit for generating DC voltage or DC current corresponding to the speed of DC motor, said feed lines being connected to said speed detecting circuit to supply operating current therefore, whereby, due to said stabilizing means, the output DC voltage or DC current from said speed detecting circuit is not influenced by the change in power voltage between said source lines,

- e. a driving transistor having its emitter-collector path connected between the other power source line and the other terminal of said DC motor, and
- f. an AC negative feed-back means connected between an output terminal of DC voltage corresponding to the speed of said DC motor and said other terminal of said DC motor, whereby, said AC negative feed-back means decreases the AC ripple component of the power voltage applied to said DC motor.

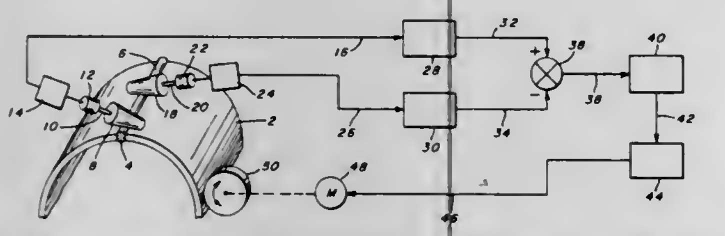
3,970,910
WELD TRACKING MECHANISM

Donald G. Schindler, Whitehall Boro, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,685

Int. Cl.² G05B *19/36*

U.S. Cl. 318—576 **5 Claims**



1. A system for sensing lateral movement of a narrow longitudinally moving object away from a lateral reference position and for moving the object laterally to the reference position comprising

a pair of adjacent conical shaped contact rollers adapted to contact the moving object and to be rotated by longitudinal movement of the object,

each of said rollers being mounted on a shaft generally at right angles to the longitudinal dimension of the object and with the large ends of the rollers opposed whereby a lateral reference position is established when the object contacts the rollers at equal roller diameters,

means connected to each shaft for providing electrical signals indicative of shaft rotation, and

means connected to the means for providing electrical signals and responsive to different electrical signals for laterally moving the longitudinally moving object to the reference position.

3,970,911
APPARATUS FOR DISTANCE CONTROL

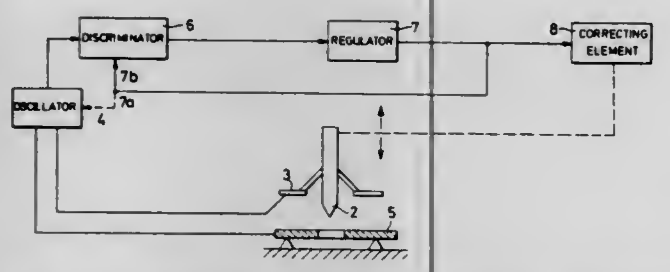
Karl Heinz Schmall, Baden-Baden, Germany, assignor to Precitec GmbH, Baden-Baden, Germany

Filed June 14, 1974, Ser. No. 479,356

Claims priority, application Germany, June 29, 1973, 2333089

Int. Cl.² G05B *1/01*

U.S. Cl. 318—607 **7 Claims**



1. An apparatus for the regulation of distance, particularly for the regulation of maintaining substantially constant the distance between a tool and the surface of a workpiece to be processed by means of an electronic sensing element, which is incorporated into an oscillator circuit of an oscillator in such a manner that the distance to the workpiece determines the oscillating frequency, and that the output signals of the oscillator are fed to a discriminator for conversion into direct current output-signals whose polarity and amplitude correspond to the direction and the extent of the regulating deviation, characterized in that the oscillator and the discriminator have tuning circuits in electrical contact between the tool and the workpiece which are variable by means of the output signals, a tool position-correcting element being connected to the tool towards and away from the workpiece, and the oscillator and discriminator being electrically connected to the tool position-correcting element for regulating the position of the tool to be substantially constant from the workpiece.

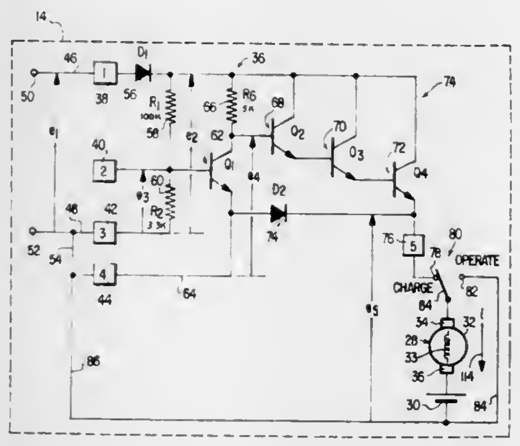
3,970,912
BATTERY CHARGING CIRCUIT

Philip A. Hoffman, 514 Piccadilly Road, Towson, Md. 21204

Continuation of Ser. No. 392,225, Aug. 28, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,490

Int. Cl.² H02J *7/10*

U.S. Cl. 320—2 **18 Claims**



1. A battery operated hand tool comprising a housing, an electrical motor in said housing for operating said tool, means in said housing for coupling said motor to a rechargeable battery, a battery charging circuit in said housing coupled to said motor for charging a battery in said housing in series with an inductance of said motor, said charging circuit comprising a pair of input terminals, a solid state switch connected to said terminals for causing the current from said terminals to flow through said motor, said charging circuit comprising means for automatically varying the charging rate in accordance with the charge on a battery, said solid state switch comprising a transistor, said automatic rate varying means comprising a positive feedback resistor coupling one side of said motor to the emitter-collector circuit of said transistor, and a negative feedback transistor coupling the other side of said motor to the base of said transistor.

6. A battery charging circuit comprising first and second input terminals, a rectifier coupled to said terminals for rectifying an AC input applied to said terminals, a battery, a transistor amplifier coupling said rectifier to said battery whereby rectified current from said terminals flows through said amplifier to said battery, a transistor switch having first and second controlled terminals connected in parallel with said amplifier and battery, said switch having a third control terminal, and means coupling said control terminal to said rectifier whereby said switch is rendered conductive and shunts current around said amplifier and battery when the input voltage exceeds a predetermined value, said switch being rendered non conductive when the input voltage falls below said predetermined value, said switch permitting current flow through said amplifier to said battery when a conventional 60 Hz household outlet electrical source is applied to said input terminals only during those portions of a source cycle when the source voltage is below a predetermined voltage level substantially less than its maximum.

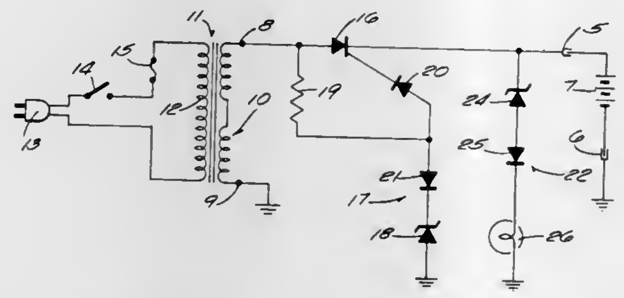
3,970,913
STATE-OF-CHARGE INDICATOR FOR VOLTAGE-REGULATED BATTERY CHARGER

Kenneth J. Heindl, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 16, 1974, Ser. No. 532,999

Int. Cl.² H02J *7/04*

U.S. Cl. 320—48 **4 Claims**



1. In combination with voltage regulated battery charging apparatus of the type having a pair of output terminals to which a storage battery can be connected for charging, a pair of input terminals that provide a source of alternating current having a substantially constant peak voltage, a controlled rectifier which has a gate and which is connected to control flow of current between one of said input terminals and one of said output terminals, and regulating means which comprises a zener diode and which has connections with said gate, with said one input terminal and with the other output terminal, for causing the controlled rectifier to be forwardly conductive when the difference between voltage across the input terminals and voltage across the output terminals exceeds a predetermined value, means for indicating the state of charge of a battery connected with the output terminals, the last mentioned means comprising:

- A. a second zener diode;
- B. a device capable of producing a perceptible signal upon being electrically energized; and
- C. means connecting said device and the second zener diode in series with one another and across the output terminals, with the second zener diode being so connected and having such a zener value that it permits flow of energizing current through said device when voltage across the output terminals is high enough so that said difference remains substantially equal to said predetermined value.

3,970,914
CIRCUIT ARRANGEMENT INCLUDING A NUMBER OF CONVERTERS, IN PARTICULAR DIRECT CONVERTERS, IN Y CONNECTION

Theodor Salzmann; Franz Wesselak, and Wolfgang Timpe, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 24, 1975, Ser. No. 561,279

Claims priority, application Germany, Mar. 29, 1974, 2415398

Int. Cl.² H02M *5/45*

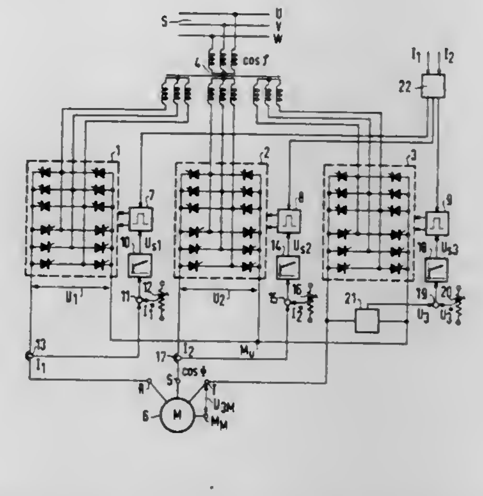
U.S. Cl. 321—2 **35 Claims**

1. A circuit arrangement for use with an a.c. voltage network and m-phase symmetrical load, said load having a first neutral point common to said phases, comprising:

a number m of direct converters arranged in an m-phase symmetrical Y configuration having a second neutral point which is common to said converters and not directly connected to said first point, each of said converters being adapted to be connectd to said network and to a different one of said phases of said load;

a number of control units, each of said control units developing an output voltage for controlling a different one of said converters;

means for developing a control voltage which is applied to at least one of said control units and is such that the output voltage of the converter associated with said one unit is caused to be periodic and to include the voltage across the phase of the load connected to said associated converter and at least one harmonic of an odd-numbered order divisible by *m*.



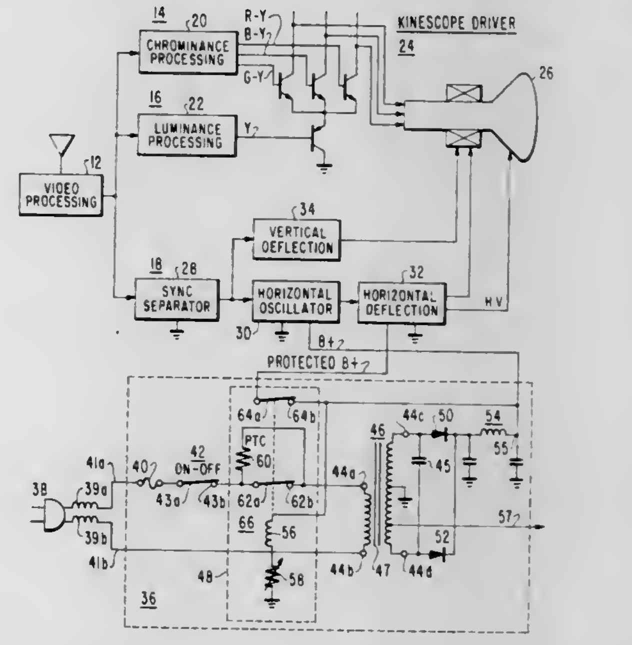
3,970,915
FAULT DETECTOR AND INTERRUPT CIRCUIT USEFUL IN A TELEVISION SIGNAL PROCESSING SYSTEM

Adam John Suchko, Elizabeth, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,548

Int. Cl.² H02M *1/08, 7/00*

U.S. Cl. 321—21 **11 Claims**



1. Apparatus for supplying operating voltage to signal processing circuits comprising:

first and second circuit points;

means for coupling said first circuit point to a source of alternating voltage;

direct voltage supplying means coupled to said second circuit point for producing from said alternating voltage a direct operating voltage normally at least equal to a predetermined level; and

switching means for coupling said means for coupling to a source of alternating voltage to said direct voltage supplying means, said switching means including a first circuit path coupled between said first circuit point and said second circuit point and controllable between high and low impedance states, sensing means coupled to said direct voltage supplying means and responsive to the level of said direct operating voltage for varying said first circuit path between said high and low impedance states when said operating voltage is below and at least equal to said predetermined level, respectively, and a second circuit path coupled between said first circuit point and said second circuit point in parallel relationship to said first circuit path and variable between low and high impedance states in direct relation to current flow therein.

3,970,916
CIRCUIT ARRANGEMENT FOR PRODUCING AN ALTERNATING VOLTAGE

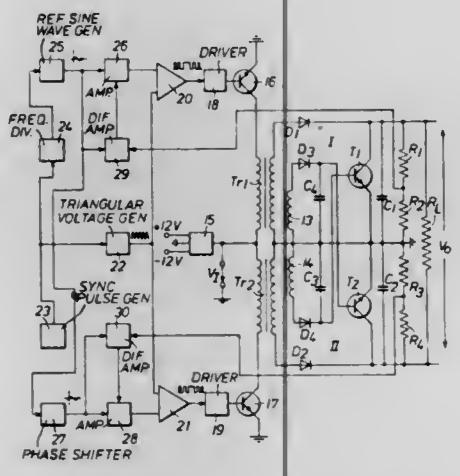
Eckhard Kienscherf, Wedel, Holstein, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 16, 1975, Ser. No. 578,253

Claims priority, application Germany, May 16, 1974, 2423718

Int. Cl.² H02M *7/00, 5/45*

U.S. Cl. 321—27 R **10 Claims**



1. A circuit arrangement for producing an alternating output voltage from a d.c. input voltage comprising: means for providing pulse width modulated signals at a high frequency; first and second voltage inverter circuit means, each controlled by said pulse width modulated signals at a high frequency, for producing the positive half waves of the alternating output voltage and the negative half waves of the output voltage respectively from a d.c. input signal; means for connecting the outputs of said first and second voltage inverter circuit means in series across a common load; first and second electronic power switches connected across the outputs of said first and second voltage inverter circuit means respectively; and means for controlling said power switches to short-circuit the output of the respective first and second voltage inverter circuit means during the time it is not producing output energy.

3,970,917
SYSTEM FOR ENERGY STORAGE AND DC TO AC CONVERSION

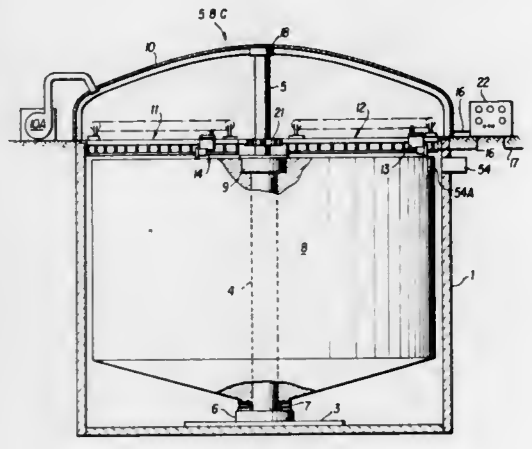
Richard E. Diggs, P.O. Box 776, Carthage, Mo. 64836

Filed July 16, 1975, Ser. No. 596,302

Int. Cl.² H02K *7/02;* **F16F** *15/30*

U.S. Cl. 322—4 **11 Claims**

1. An energy storage and conversion system comprising:
- a massive flywheel rotatably mounted within a housing;
- drive means coupled to said housing and positioned to selectively engage a surface of said flywheel for supplying power to said flywheel,
- driven means coupled to said housing and positioned to selectively engage a surface of said flywheel for withdrawing power from said flywheel,
- vertical control means coupled to said drive means and to said driven means for controlling engagement thereof with said flywheel; and,
- radial control means coupled to said drive means and to said driven means for adjusting the radial position at which



said drive means and said driven means engage said flywheel.

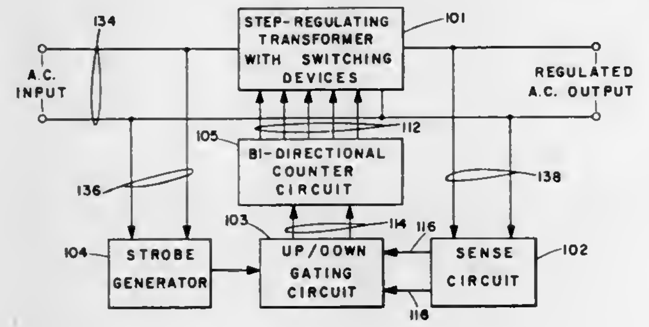
3,970,918
HIGH SPEED, STEP-SWITCHING AC LINE VOLTAGE REGULATOR WITH HALF-CYCLE STEP RESPONSE

Edward Cooper, 2612 Penrose St., San Diego, Calif. 92110

Filed Jan. 13, 1975, Ser. No. 540,647

Int. Cl.² G05F *1/24*

U.S. Cl. 323—6 **6 Claims**



1. An AC line voltage regulator comprising,
- switchable means for regulating the line voltage,
- sense circuit means for detecting the magnitude of the line voltage and providing an up or down condition signal when the line voltage varies by a given magnitude up or down from a set voltage to be regulated,
- zero crossing detector means responsive to the line voltage for detecting and providing output signals at half cycle zero crossings of the line voltage,
- gate circuit means responsive to the sense circuit means up or down condition signal and an output signal from said zero crossing detector at each half cycle for providing a corresponding up or down switch signal to said switch means at each half cycle that the line voltage has varied from the given magnitude,
- and said gate circuit means including gate control means for inhibiting the providing of an up switch signal after a down switch signal unless the switch signal preceding the down switch signal was a down switch signal and from providing a down switch signal after an up switch signal unless the preceding signal was an up switch signal.

3,970,919
REGULATING DIGITAL POWER SUPPLY

Daryl T. Butcher, La Habra, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

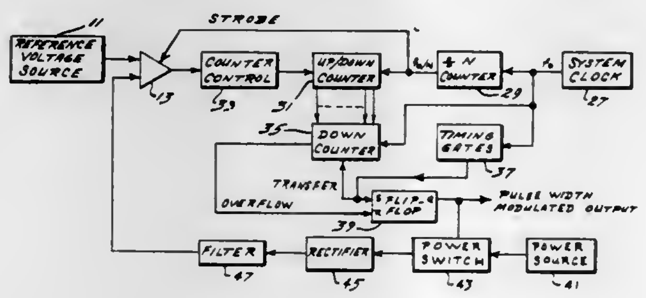
Filed June 19, 1975, Ser. No. 588,735

Int. Cl.² G05F *1/10*

U.S. Cl. 323—19 **3 Claims**

1. A regulated digital power supply system comprising:

- a. a clock;
- b. a frequency divider fed by the clock;
- c. means for comparing a reference signal with an unknown signal upon application of a strobe pulse from the frequency divider;
- c. a first means for counting pulses, the first counting means counting the pulses from the frequency divider and being fed by a signal from the comparing means for controlling selectively the direction of the count;



- d. a second means for counting pulses, the second counting means counting pulses from the clock in the down direction and being fed by the contents of the first counting means upon a transfer command signal through the clock;
- e. a flip-flop being set by the transfer command signal and reset by the second counting means upon reaching an overflow, the output of the flip-flop being the regulated power supply;
- f. a source of power; and
- g. a power switch interposed between the source of power and the comparing means and activated by the flip-flop for controlling the magnitude of the unknown signal.

3,970,920
MEASURING ARRANGEMENT FOR AN APPARATUS FOR ELECTROSTATIC COATING OF GROUNDED OBJECTS FOR MEASURING THE GROUND RESISTENCE

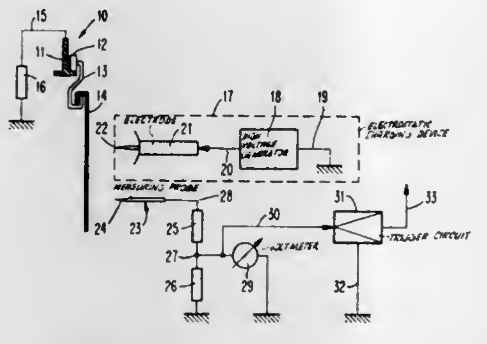
Franz Braun, Staad, Switzerland, assignor to Gema AG Apparatebau, St. Gall, Switzerland

Continuation of Ser. No. 342,857, March 19, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,413

Claims priority, application Switzerland, Mar. 22, 1972, 4217/72

Int. Cl.² G01R *5/28;* **G01N** *27/00*

U.S. Cl. 324—32 **10 Claims**



1. Means for measuring the ground resistance of successive grounded objects which are to be electrostatically coated in a coating apparatus, said coating apparatus including conveying means for moving said objects over a defined conveying path, influencing means proximate to said path for continuously influencing the electrical potential of said objects without contacting the same, and a power source for energizing said influencing means, said measuring means comprising monitoring means for delivering and early warning signal in response to a gradual increase in ground resistance of the objects before the potential of the objects has reached a predetermined value below the breakdown value.

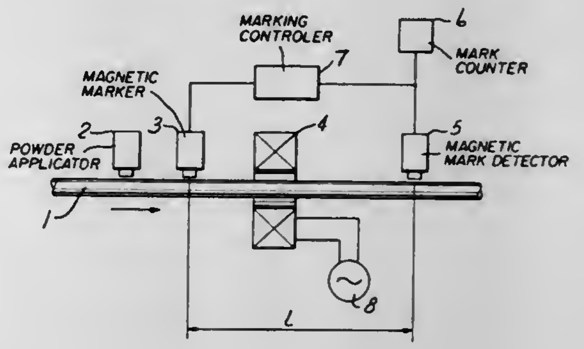
3,970,921
METHOD AND APPARATUS FOR MEASURING THE LENGTH OF LONG LENGTH MATERIALS

Hiroshi Ito, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1975, Ser. No. 550,152

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 L **6 Claims**



1. An apparatus for measuring the length of a longitudinally traveling long length material containing a magnetic constituent comprising a magnetic powder application device to apply a magnetic powder layer to the traveling long length material, a magnetic marking device to periodically magnetize said magnetic powder layer and inevitably said magnetic constituent and thereby produce a periodic magnetic mark, an alternating current magnetizing coil positioned to demagnetize the magnetic constituent of said material as it travels through the field of said coil to shorten the length of said mark and thereby more sharply define it, a magnetic mark detector positioned a predetermined length from said magnetic marking device to detect said magnetic marks as they pass by said detector, and counting means to count the detected marks and thereby measure said long length material by counting the number of said predetermined lengths which pass said detector.

3,970,922
HALL-VOLTAGE DEVICE

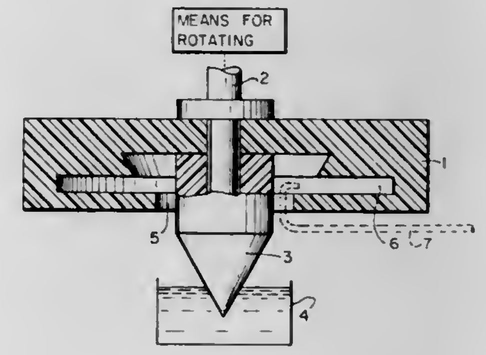
Ferdinand Hubert Franciscus Gerardus Spierings, Wageningen, Netherlands

Filed Sept. 9, 1974, Ser. No. 504,658

Claims priority, application Netherlands, Sept. 13, 1973, 7312638; Sept. 13, 1973, 7312639

Int. Cl.² G01R *33/06;* **G21D** *7/02*

U.S. Cl. 324—45 **5 Claims**



1. In a Hall voltage device of the type having a magnetic system for defining and generating a magnetic field in an air gap, a cylindrical box mounted between and substantially parallel to the planar boundaries of the air gap defined by the magnetic system, the box having an interior cavity arranged to

contain a fluid having charged particles distributed therein, the box including electrodes located adjacent to its axis and the outer periphery of the cavity, respectively, and adapted to cooperate with said fluid, and means for imparting to the box a rotational motion about its axis, said axis substantially coinciding with the central axis of said magnetic circuit, the improvement comprising

means in an end face of said box defining an aperture centered on said axis for introducing said fluid into said box while said box is rotating.

3,970,923

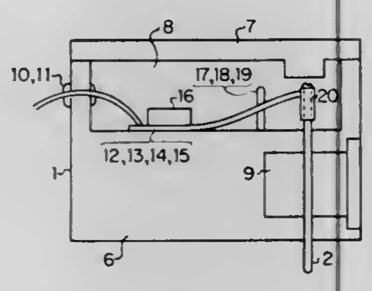
APPARATUS FOR MEASURING SHEET RESISTIVITY OF SEMICONDUCTOR MATERIALS AND DIFFUSED LAYERS

George Reed Clark, and Kenneth Charles Winkleblack, both of Mountain View, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 9, 1974, Ser. No. 513,425

Int. Cl.² G01R *27/14*

U.S. Cl. 324—64 **3 Claims**



1. Apparatus for measuring sheet resistivity of semiconductor materials and diffused layers comprising:

pneumatically operated probe means for applying current to a material to be tested and for detecting a voltage created in the material to be tested by the current applied thereto, said probe means comprising a probe head having a body structure with a main pressure cavity, having first and second sealed inlets and a plurality of probe orifices and a plurality of probe pins fitted to the plurality of probe orifices and positioned therein for passing therethrough in response to pressure being applied to the main pressure cavity;

a current source having high output impedance for producing a selected value of current at a range of voltages;

self-zeroing voltage amplification means for amplifying the voltage detected by the probe means and producing an output in response to said voltage;

means coupled to the first sealed inlet for connecting the current source and the self-zeroing amplification means to the plurality of probe pins;

means coupled to the second sealed inlet for applying pressure to the main pressure cavity; and

means for applying the probe head to a material to be tested, comprising a lever having a first and second end and pivoted at a point located between said first and second ends,

means for coupling the probe head to the second end,

a pneumatic cylinder coupled to the lever between the point and the second end for lowering the second end with reference to the first end in response to a control signal,

an adjustable stop positioned to limit the movement of the first end,

an interlocking system having a first and second microswitch, the first microswitch positioned to actuate when the first end communicates with the adjustable stop and the second microswitch positioned to actuate in response to a material to be tested being in a sample receiving position, and

control means coupled to the first and second microswitches for producing a control signal in response to the probe head being in pin contact range of a material to be tested and the material being in a sample receiving position.

3,970,924

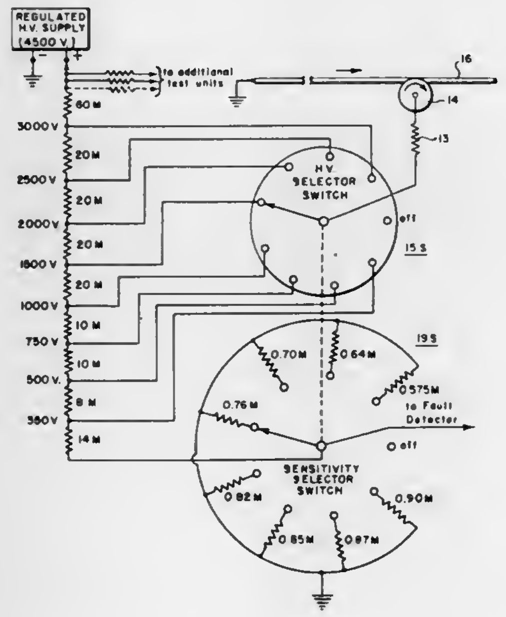
APPARATUS FOR DETECTING FAULTS IN MAGNET WIRE INSULATION WITHOUT THERMALLY DAMAGING THE INSULATION AND WHICH DOES NOT RESPOND TO IMPEDANCE INDICATIONS ABOVE A PREDETERMINED THRESHOLD VALUE

Wesley William Pendleton, and Robert Clifton Thompson, both of Muskegon, Mich., assignors to Anaconda Wire & Cable Company, Greenwich, Conn.

Division of Ser. No. 170,307, Aug. 9, 1971, Pat. No. 3,823,370, which is a continuation of Ser. No. 876,968, Nov. 14, 1969, abandoned. This application Jan. 16, 1974, Ser. No. 433,782

Int. Cl.² G01R *31/14*

U.S. Cl. 324—54 **3 Claims**



1. Apparatus for continuously testing continuity of the insulation coating on a moving insulated wire conductor, said apparatus comprising:

a. contact means for applying one of a plurality of D-C high voltage test potentials between the exterior surface of the insulation coating and the interior conductor;

b. first switching means for selecting any one of the test potentials to be applied;

c. a current limiting impedance connected in circuit with the contact means for limiting the current through a fault to a value such that the product of the D-C high voltage and the fault current does not exceed about 150 milliwatts;

d. current sensing impedance means connected in circuit with the contact means, the current sensing impedance means including a plurality of different values of impedance each of which corresponds to one of the test potentials in a predetermined chosen relationship;

e. second switching means ganged to the first switching means for connecting in the circuit one of the values of impedance as determined by the test potential selected, the value of impedance connected in the circuit being chosen predeterminedly in accordance with the test potential such that the apparatus responds to the highest resistance pin-hole fault desired to be detected for the particular thickness of insulation coating under test, each of which resistance pin-hole faults are different for different thicknesses of insulation coating;

f. threshold amplifying means for amplifying pulses of current flowing through said current sensing impedance means and passing only pulses above a predetermined threshold level; and,

g. fault-rate counter means for counting the number of fault current pulses for each successive predetermined incremental length of insulated wire.

3,970,925

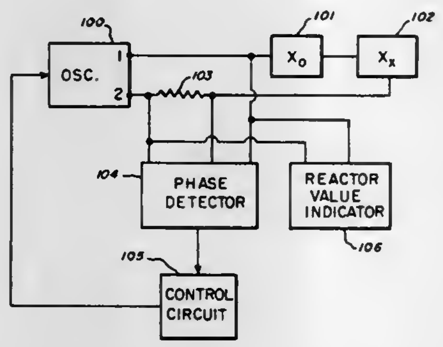
DIRECT READING REACTANCE METER

Samuel Anderson Procter, Minneapolis, and Robert Dewitt Younger, Bloomington, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 468,946, May 10, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,571

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 Q **12 Claims**



11. Apparatus for generating a signal indicative of the unknown value of a first reactive element having first and second terminals, whose value is within a predetermined range, comprising:

a. an oscillator supplying across first and second output terminals the first of which is connected to the first terminal of the first circuit element, an approximately sinusoidal voltage output signal whose frequency varies within a predetermined range as a function of an input signal, and is the required unknown element value indication;

b. a second reactive circuit element connected to the first reactive element to form therewith a circuit having a resonant frequency and which receives the oscillator output;

c. means receiving the oscillator current for producing a signal specifying phase of the oscillator current;

d. a phase detector receiving the oscillator current phase signal and the oscillator voltage and producing a signal indicating the phase relationship between oscillator voltage and current; and

e. control means receiving the phase detector output signal for supplying the input signal to the oscillator and for varying the input signal to the oscillator to shift the oscillator output frequency so as to drive the phase shift between the oscillator output voltage and current progressively toward a predetermined value.

3,970,926

METHOD AND APPARATUS FOR MEASURING THE GROUP DELAY CHARACTERISTICS OF A TRANSMISSION PATH

Peter Anthony Rigby, Linlithgow; Ralph Hodgson, Easter Pitcorthie, and David Hubert Guest, Balerno, all of Scotland, assignors to Hewlett-Packard Limited, South Queensferry, Scotland

Filed Feb. 21, 1975, Ser. No. 551,819

Claims priority, application United Kingdom, June 3, 1974, 24572/74

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 R **23 Claims**

1. A method of measuring group delay characteristics of a transmission path, comprising the steps of:

a. feeding a test signal to the input of a transmission path, the test signal including a carrier with a frequency that is interchanged periodically between a measuring frequency and a reference frequency, the carrier being amplitude modulated by a split frequency during both carrier periods;

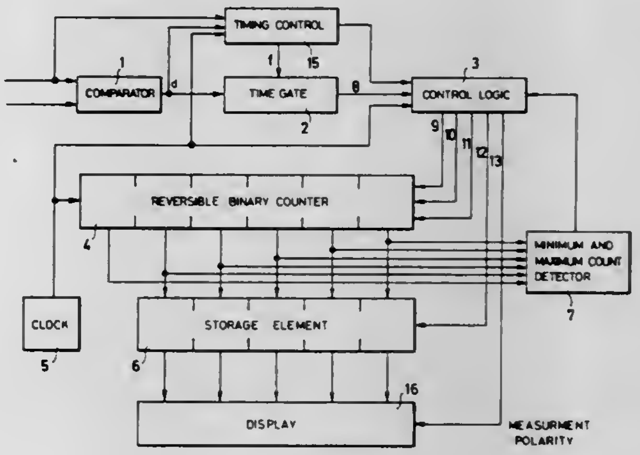
b. receiving the test signal from the output of the transmission path;

c. demodulating the received test signal;

d. sensing in the demodulated test signal a plurality of specified points, said specified points including:

a first specified point in any period of a first of the reference and measuring carrier periods of the demodulated test signal;

a second specified point in a selected period of a second of the reference and measuring carrier periods of the demodulated test signal;



a third specified point in a selected period of the second of the reference and measuring carrier periods of the demodulated test signal; and

a fourth specified point in a selected period of the first of the reference and measuring carrier periods of the demodulated test signal;

e. measuring a first time interval between the first and second specified points;

f. measuring a second time interval between the third and fourth specified points; and

g. deriving said group delay characteristics from the measured first and second time intervals, the first and second time intervals being digitally measured by a pulse counter.

3,970,927

METHOD AND APPARATUS INCLUDING A SENSING HEAD WITH A PAIR OF STRIP TRANSMISSION LINES FOR DETECTING METALLIC OBJECTS

Peter Howard Ladbrooke, Portsmouth; Arthur Timothy Torlesse, Chichester, and John David Newman, Titchfield, all of England, assignors to Plessey Handel und Investments A.G., Switzerland

Filed Dec. 2, 1974, Ser. No. 528,995

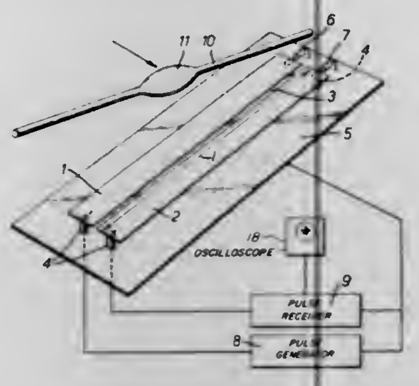
Claims priority, application United Kingdom, Nov. 30, 1973, 55712/73

Int. Cl.² G01R *31/00*; G01V *3/08*

U.S. Cl. 324—67 **10 Claims**

1. Apparatus for the detection of local variations in the dielectric constant of a structure, which comprises: a sensing head arranged to be moved along a surface of the structure and including a single, electrically conducting ground plane, a first and second electrically conductive strip supported on one side of said ground plane, said strips being disposed in spaced-apart relationship in a common plane and in equally spaced-apart, parallel relationship with said ground plane, each of said strips forming therewith a transmission line, said strips being spaced from each other to provide an electric potential difference between said strips for producing an electric field of significant intensity substantially beyond the plane of said strips to intersect the surface of the structure along which said sensing head is moved, means for generating and applying to one end of said first strip time-spaced pulses

of electric potential relative to said ground plane and potential-detector means interposed between the adjacent end of said second strip and the ground plane, said detector means being distinctively responsive to pulse potentials of different magnitudes for providing an indication of said variations in dielectric constant.



3,970,928
ELECTRICAL APPARATUS FOR THE CALIBRATION OF EQUIPMENT USED IN THE MEASUREMENT OF PARTICLE VOLUME.

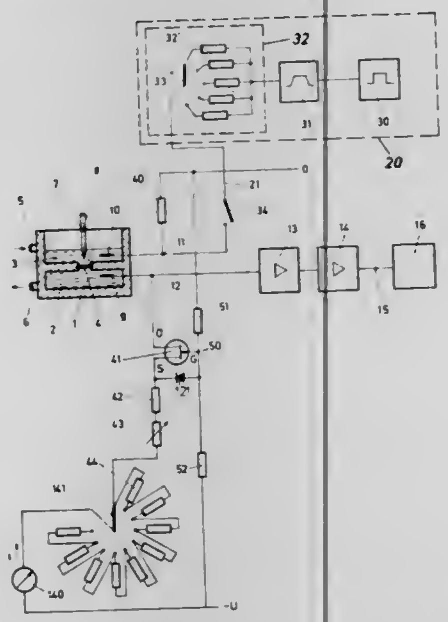
Volker Kachel, Gauting, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Dec. 17, 1974, Ser. No. 533,658

Claims priority, application Germany, June 11, 1974, 2428082

Int. Cl.^{2} G01N ***27/04***

U.S. Cl. 324—71 CP **6 Claims**



1. In an electrical apparatus for calibration of measurement equipment for measuring the volume of particles, which includes two chambers filled with liquid electrolyte which communicate through a measurement aperture, and which further includes two electrodes located on opposite sides of the aperture, by which a current can be passed through the aperture, and which further includes means for introducing particles into the first of said two chambers, said particles passing through said measurement aperture, thereby generating voltage pulses across the electrodes, said apparatus further including a processing and analysis unit for processing and analyzing said voltage pulses, and including means for producing calibration voltage pulses which are used by said processing and analyzing unit to associate a certain particle volume with a certain voltage pulse amplitude, the improvement comprising:

- a resistor which is positioned in the electrical path in series with said measurement aperture, said resistor having an ohmic resistance which is small with respect to the ohmic resistance of said measurement aperture; and
- a calibration pulse generator, for producing calibration voltage pulses of adjustable amplitude, said calibration voltage pulses being introduced into the electrical path formed between said resistor and said measurement aperture, thereby applying the calibration voltage pulses essentially across the electrodes, said calibration pulses also being fed to the processing and analyzing unit, in which a numerical volume derived by calculation and theory from said calibration voltage pulses is associated with the voltage pulses received by said processing and analysis unit.

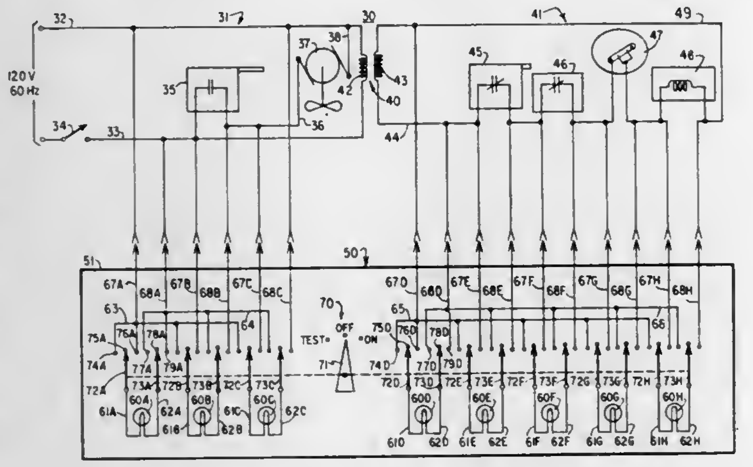
3,970,929
TEST APPARATUS FOR USE WITH A HEATING SYSTEM

Eugene W. Borucki, 8115 N. Greenwood, Niles, Ill. 60648, and Peter P. Zaloga, 5818 W. Newport, Chicago, Ill. 60634

Filed Aug. 22, 1974, Ser. No. 499,471

Int. Cl.^{2} G01R ***15/12;*** **G08B** ***25/00;*** **F27D** ***21/00***

U.S. Cl. 324—73 R **10 Claims**



1. Test apparatus for use in connection with a heating system including a plurality of control elements connected to an associated source of AC electric power, said test apparatus comprising only a plurality of indicator means equal in number to and corresponding respectively to the control elements, and passive switch means connected to each of said indicator means and to the associated source of AC electric power and adapted for connection to said heating system, said switch means having an indicator-checking condition disconnecting each of said indicator means from the control elements and interconnecting each of said indicator means and the associated source for simultaneously indicating the condition of each of said indicator means, said switch means having an analyzing condition interconnecting said indicator means respectively in parallel with the corresponding control elements for simultaneously indicating the condition of each of said control elements, said switch means being selectively operable between the indicator-checking and analyzing conditions thereof without consumption of electricl power.

3,970,930
CURRENT METER

Johannes Volkert Vermolen, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, N.Y., N.Y.

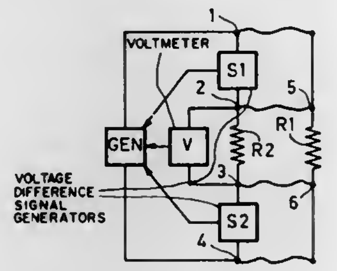
Filed Sept. 17, 1974, Ser. No. 506,783

Claims priority, application Netherlands, Sept. 22, 1973, 7313095

Int. Cl.^{2} G01R ***17/02, 1/36***

U.S. Cl. 324—98 **10 Claims**

1. A device for monitoring a measuring circuit connected to a load to be supplied with an electric current from a source of electric energy comprising, a first supply lead connecting a first end of said load to a first supply terminal of the energy source, a first measuring lead connecting said first end of the load to a first measuring terminal of an electric measuring device, means including a second supply lead connecting a second end of the load to a second supply terminal of the energy source and by a second measuring lead to a second measuring terminal of the measuring device, respectively, a bridge resistor connected between the first and the second measuring terminal, the resistance value of said bridge resistor being high with respect to the resistance of the load, first and second voltage difference signal generators each having three electrodes, means connecting first and second electrodes of the first signal generator between the first measuring terminal and the first supply terminal and first and second electrodes of the second signal generator between the second measuring terminal and the second supply terminal, respectively, and means including the third electrode of one of said signal generators for deriving an error signal upon interruption of any of said supply and measuring leads.



3,970,931
APPARATUS FOR RECORDING ELECTRICAL QUANTITIES

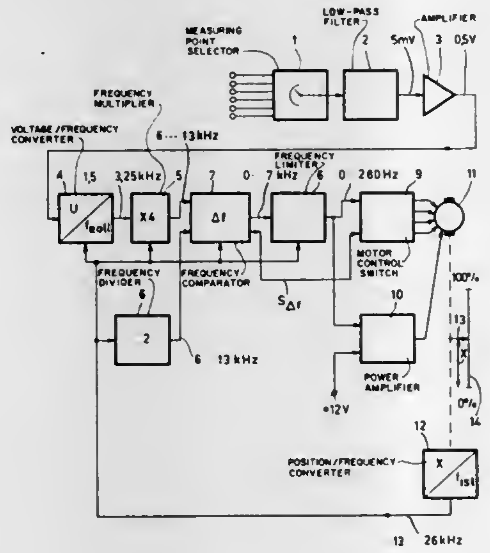
Ivan Novak, Kassel, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,221

Claims priority, application Germany, June 30, 1973, 2333413

Int. Cl.^{2} G01R ***17/06, 19/26***

U.S. Cl. 324—99 R **16 Claims**



1. Apparatus for indicating the value of an electric quantity comprising, means for producing a signal voltage determined by the electric quantity, means responsive to said signal voltage for converting the signal voltage into a first repetitive signal having a first frequency that is proportional to the amplitude of the electric quantity, a comparator having a first input coupled to the output of the voltage-frequency converting means, a frequency limiter having an input coupled to the output of the comparator, a servo stepping motor having a rotatable shaft connected to an indicator member, control switching means coupled between the output of the frequency limiter and an input of the stepping motor for controlling the rotation direction and speed of the motor, means responsive to the shaft position for converting the shaft position into a second repetitive signal having a second frequency that is determined by the shaft position, and mens for coupling said second signal to a second input of the comparator in a sense which tends to compensate the first signal whereby the comparator produces a difference frequency signal at the comparator output which approaches a zero value when the motor shaft corresponds to the value of the electric quantity.

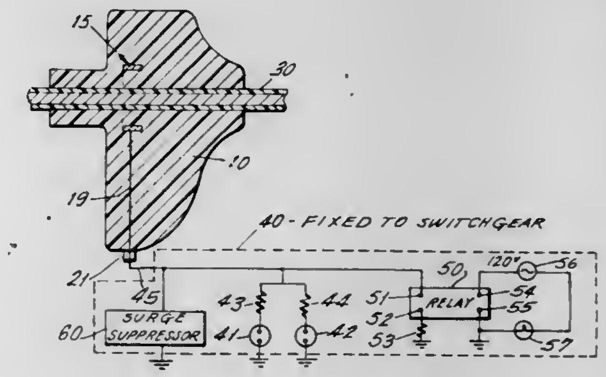
3,970,932
HOT LINE DETECTION SYSTEM FOR HIGH VOLTAGE SWITCHGEAR

Horace A. Harvey, Trevose, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 3, 1974, Ser. No. 502,546

Int. Cl.^{2} G01R ***19/16***

U.S. Cl. 324—133 **3 Claims**



1. A hot line detector for connection to high voltage lines comprising, in combination:

- a housing formed entirely of an insulating material having a substantially invarient dielectric constant and having an opening therethrough for receiving a continuous length of energizable conductor, said housing having an annular chamber formed therein concentric with said opening;
- a conductive coating formed on the interior surface of said chamber;
- a conductive foil surrounding and in contact with said coating for defining a single cylindrical conductive electrode embedded in said insulation housing and surrounding said opening, said cylindrical conductive electrode being the sole electrical conductive device within said insulation housing;
- a mass of insulation potting material filling said annular chamber to encapsulate said conductive electrode therein;
- a lead wire leading through said insulation housing and being exposed at one end at the exterior surface of said insulation housing for connection to an exterior circuit, said lead wire being connected at its other end to said cylindrical conductive electrode;
- indicating circuit means at a location remote from said housing for indicating the presence of a conductor at a voltage in excess of a given voltage in said insulation housing by the capacitive coupling between said cylindrical conductive electrode and a conductor which passes through said cylindrical conductive electrode; and
- remote connection means permanently connecting said one end of said lead wire to said remote indicating circuit means.

3,970,933
DEVICE FOR CHECKING A D.C. SOURCE VOLTAGE RELATIVE TO A PREDETERMINED VALUE

Ichiro Hamaguchi, Yokohama, and Kenji Toyoda, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

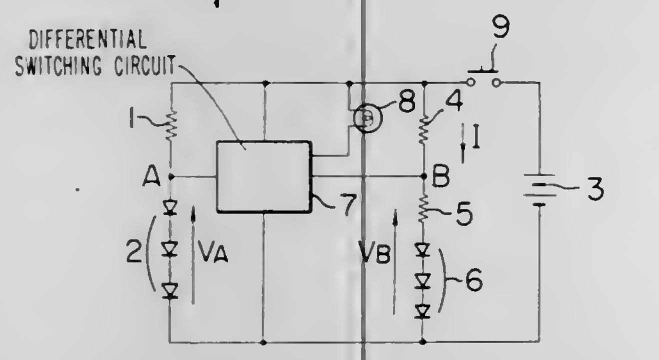
Filed Jan. 20, 1975, Ser. No. 542,542

Int. Cl.^{2} G01R ***19/16;*** **G01N** ***27/46***

U.S. Cl. 324—133 **10 Claims**

1. A Device for checking and indicating the voltage of a D.C. source relative to a predetermined value, comprising:

a. a bridge circuit including:
  - a first circuit comprising a first resistor;
  - a second circuit comprising a first diode means and connected to said first circuit;
  - a third circuit comprising a second resistor and connected to said first circuit, the junction between said third and first circuits being connected to one of the terminals of said D.C. source; and
  - a fourth circuit comprising a serial connection of second diode means and a third resistor, one end of said fourth circuit being connected to said third circuit and the other end being connected to said second circuit, the junction between said fourth and second circuits being connected to the other terminal of said D.C. source, the resistance value of said third resistor being sufficiently great so that the differential voltage between the junction of said first and second circuits and the junction of said third and fourth circuits varies in dependence on the voltage of said D.C. source;

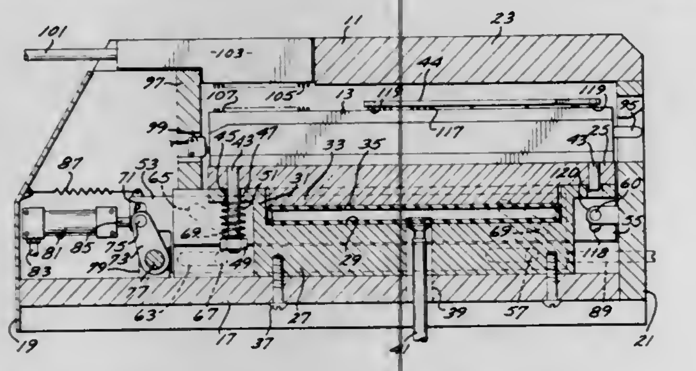


b. a differential switching circuit connected between the junction between said first and second circuits and the junction between said third and fourth circuits to change its condition in accordance with the differential voltage between said two junctions, said differential switching circuit having an output terminal for representing the condition thereof; and

c. an indicator element connected to said output terminal for indicating the condition of said differential switching circuit to provide an indication of the voltage of said D.C. source relative to said predetermined value.

3,970,934
PRINTED CIRCUIT BOARD TESTING MEANS

Akin Aksu, 739 E. 223rd St., Carson, Calif. 90745
Filed Aug. 12, 1974, Ser. No. 496,385
Int. Cl.² G01R *1/06, 31/02*
U.S. Cl. 324—158 F **25 Claims**



1. A circuit board test fixture which comprises:

a housing;

a pair of generally opposed and parallel platen members carried therein with at least one of said platen members movably mounted in said housing with peripheral flange means and an integral central boss carried by said member, said central boss received within a coextensive, central cavity formed by the facing interior wall of said housing and spaced apart from the bottom of said central cavity to define a central chamber therein;

guide rail means on opposite sides of the movable platen member and connected by guide pins at opposite ends thereof between said movable platen member and housing to maintain said platen members in parallel alignment during movement of said movable platen member;

means for supporting a circuit board against one of said platen members;

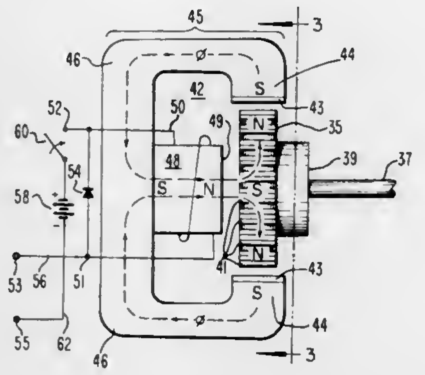
means for supporting on the other of said platen members pressured contact units juxtaposed towards said circuit board;

fluid-sealed expansion means within said chamber; and

means communicting with said fluid-sealed means exteriorly of said chamber for sending pressured fluid into said sealed expansion means to impart relative movement to said platen members and direct said contact units against circuitry of said circuit board.

3,970,935
WIDE-RANGE DIGITAL RELUCTANCE TACHOMETER

Jack Beery, Farmington, and Daniel A. Wisner, Milan, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Feb. 18, 1975, Ser. No. 550,596
Int. Cl.² G01P *3/48;* H03K *13/20*
U.S. Cl. 324—166 **10 Claims**



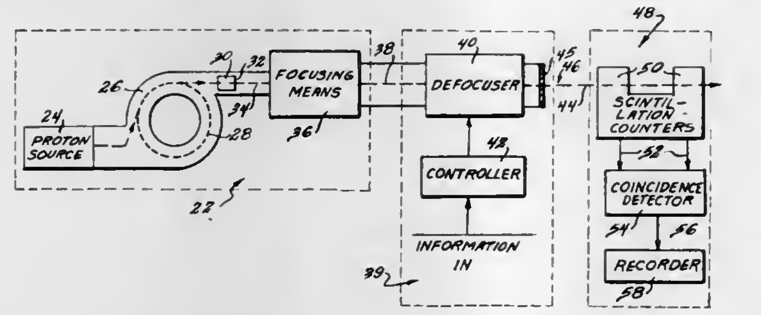
1. A system for generating digital pulses at a rate proportional to the speed of rotation of a shaft having toothed disk means attached to said rotating shaft and including a first set of M teeth about the periphery thereof and housing assembly means including a second set of M tooth-like members, said housing means further including means for positioning said M tooth-like members around said toothed disk means for establishing a flux path therebetween comprising:

detector means responsive to the position of said toothed disk means with respect to said housing assembly means for generating an output pulse which changes state at the approximate relative position which establishes a minimum of reluctance in said flux path and at the approximate relative position which establishes a maximum of reluctance in said flux path, thereby generating digital pulses at a rate proportional to the speed of rotation of said shaft, said detector means comprising means coupled to said housing assembly means and about at least a portion of said flux path for sensing increases and decreases in the reluctance of said flux path, said reluctance sensing means including an electrical coil wrapped around at least a portion of said flux path for generating an electrical current which increases and decreases with the increases and decreases of the reluctance of said flux path and an electrical current-sensing resistor means coupled between the opposite end of said electrical coil for sensing said generated electrical current; and

means responsive to said reluctance sensing means for generating a first output signal when said reluctance has ceased to increase and begun to decrease and for generating a second output signal when said reluctance has ceased to decrease and begun to increase, said means responsive to said reluctance sensing means including differential voltage comparator means having a first and second input and a comparator output, and means coupled across said current-sensing resistive means and responsive thereto such that the output of said comparator means will pass said first output signal when the current flowing in said current-sensing resistor means has ceased to increase and begun to decrease which is indicative of the reluctance of said flux path having ceased to increase and begun to decrease so as to establish a differential voltage ratio of a first polarity between said first and second inputs and such that the output of said comparator means will pass said second signal in response to the current in said current-sensing resistor means having ceased to decrease and begun to increase which is indicative of the reluctance of said flux path having ceased to decrease and begun to increase so as to establish a differential voltage ratio of a second polarity between said first and second inputs of said comparator means.

3,970,936
TELECOMMUNICATION USING MUON BEAMS

Richard C. Arnold, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed May 29, 1973, Ser. No. 364,397
Int. Cl.² H04B *9/00*
U.S. Cl. 325—26 **3 Claims**



1. A method of telecommunication comprising the steps of:

a. generating a beam of protons;

b. impinging said beam of protons on a target to generate a beam of pi mesons;

c. permitting said beam of pi mesons to decay into a beam of muons;

d. defocusing said beam of muons at a modulating rate to generate a modulated beam of muons at a first location;

e. transmitting said modulated beam;

f. receiving said modulated beam at a second location; and

g. detecting the modulation in said modulated beam,

whereby telecommunication is effected between said two locations.

3,970,937
MODEM FOR A SUPPRESSED CARRIER COMMUNICATIONS SYSTEM

Wayne J. Bates, Des Plaines; Walter L. Berenson, Palatine; William H. Euchner, Jr., Arlington Heights; James H. Grigg, Chicago; Morton Stern, Skokie, and Ronald W. Taylor, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 19, 1974, Ser. No. 534,388
Int. Cl.² H04B *1/68*
U.S. Cl. 325—49 **6 Claims**

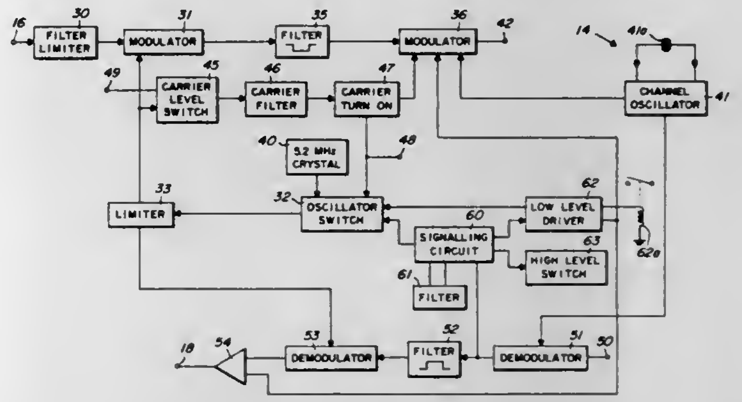
1. In a suppressed carrier, communications system including at least two, spaced apart, transmitter-receivers wherein a portion of the carrier is transmitted for use as a synchronizing signal, a modem comprising:

a. a transmitter portion including a first modulator connected to receive audio frequency signals and supplying an output signal to a second modulator through a bandpass filter, the second modulator supplying an output signal at a unique channel frequency to one of the transmitters of the communications system;

b. a receiver portion including a first demodulator connected to receive signals from the receiver of the communications system associated with the one transmitter and supplying an output signal to a second demodulator through a bandpass filter, the second demodulator providing audio frequency signals at the output thereof;

c. carrier frequency supplying means connected to the first modulator of said transmitter portion and the second demodulator of said receiver portion;

d. a crystal controlled channel oscillator connected to the second modulator of said transmitter portion and the first demodulator of said receiver portion, said channel oscillator having a variable frequency controlling means connected thereto including a replaceable plug-in crystal for controlling the channel frequency at which the modem operates;

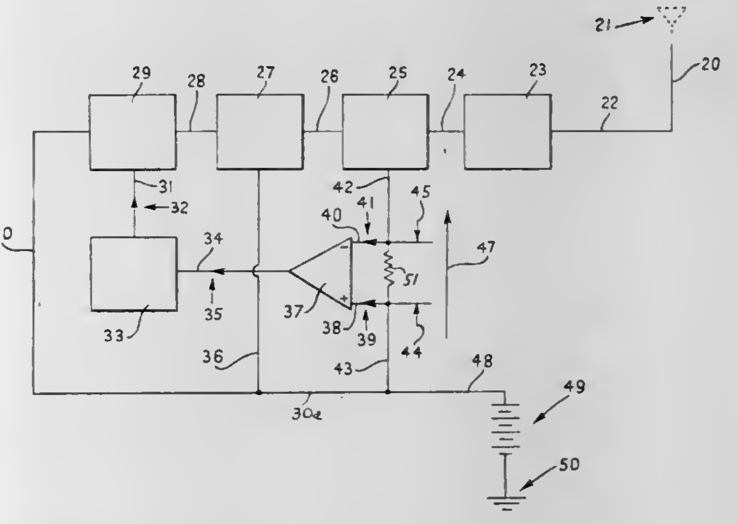


e. means for introducing a small portion of the carrier from the carrier frequency supplying means to the second modulator of the transmitter portion for synchronization of any communicating modems; and

f. switch means connected to said carrier introducing means for providing first and second levels of carrier signal with the first level being substantially lower in amplitude than the second level to perform signalling functions.

3,970,938
METHOD AND APPARATUS FOR DETERMINING MOTION AND SPEED

Hans D. Sylten, Fort Lauderdale, Fla., assignor to Jack N. Holcomb, Fort Lauderdale, Fla.
Filed June 24, 1974, Ser. No. 482,481
Int. Cl.² G01R *33/00*
U.S. Cl. 325—117 **6 Claims**



1. Apparatus for detecting motion of a transmitter comprising; a transmitter; an antenna connected to such transmitter and depending therefrom; means to sense the load impedance of said antenna; means connected to the transmitter, controlled by said means sensing said load impedance, which

means affects a voltage controlled oscillator so as to modulate the transmitter.

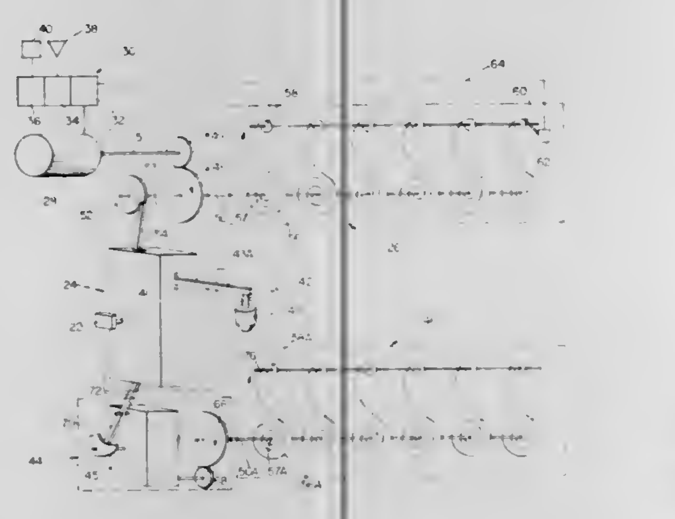
3,970,939
SIGNAL GENERATING AND TRANSMITTING APPARATUS

John G. Willis, Wakefield, Mass., assignor to Solid State Technology, Inc., Wilmington, Mass.

Filed Oct. 22, 1974, Ser. No. 516,973

Int. Cl.² H04B *1/04*

U.S. Cl. 325—185 **13 Claims**



1. A self-contained alarm signal apparatus comprising
an electrical signal generator,
a transmitter connected to receive the output of said generator,
a first source of mechanical energy, including first spring means and manual winding means therefor,
a second source of mechanical energy, including second spring means and manual winding means therefor
connector means for intermittently applying energy from said first and second sources of mechanical energy to said generator for the production of an electrical signal, and
first and second input devices for delivering mechanical inputs from said first and second sources of mechanical energy to said connector means, each said mechanical input device being operative to cause said connector means to apply mechanical energy to said generator,
said first input device being connected to said first source of mechanical energy, and
said second input device being automatically operable and being connected to said second source of mechanical energy and including a timer and means responsive to said timer to deliver a mechanical input from said second spring means to said connector means at predetermined time intervals.

3,970,940
OVERALL EQUIPMENT CONDITION CHECKING

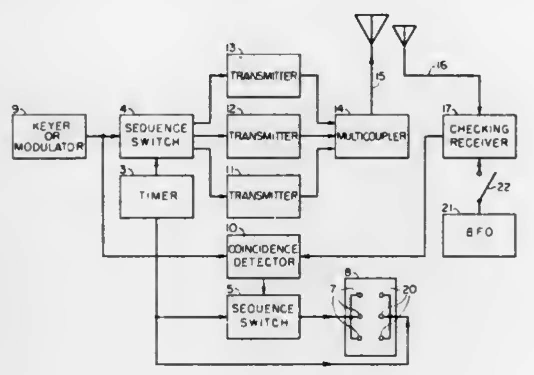
Douglas A. Venn, Suitland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1960, Ser. No. 5,317

Int. Cl.² H04B *17/00*

U.S. Cl. 325—363 **2 Claims**

1. An electrical system for checking the operational state of a plurality of transmitters comprising,
a. signal generating means,
b. signal applying means for sequentially applying the output of said signal generating means to said plurality of transmitters,
c. means for radiating the output of each of said transmitters,
d. means for receiving the radiated energy,
e. a coincidence detector,
f. means for connecting said coincidence detector between said signal generating means and said receiving means, and



g. an alarm circuit connected to said coincidence detector, whereby said alarm circuit will be actuated in the absence of a coincidence condition in said detector between the signal received from said generating means and the signal from said receiving means.

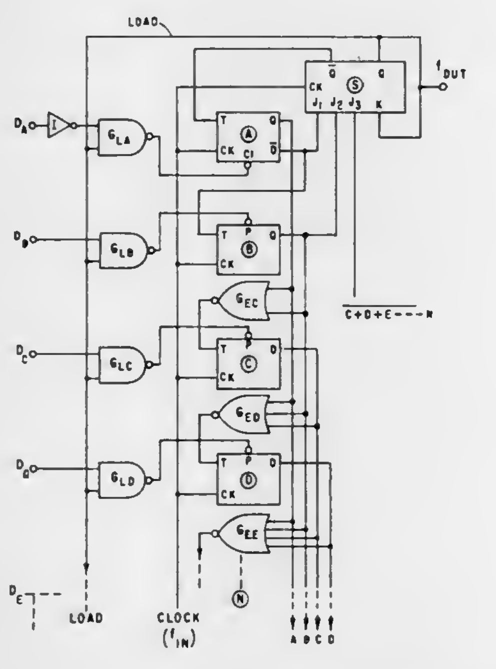
3,970,941
FAST PROGRAMMABLE DIVIDER WITH A NEW 5-GATE FLIP-FLOP

Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 18, 1975, Ser. No. 550,320

Int. Cl.² H03K *21/00, 23/02*

U.S. Cl. 328—41 **5 Claims**



1. A programmable divider for dividing an input pulse train signal by any whole number divisor represented by an N-bit binary number where N is an integer comprising: an output terminal, a pulse train input terminal, and a divisor-bit input terminal for each bit of said N-bit binary number, an output JK flip-flop, a T flip-flop stage for each bit of said N-bit binary number, means responsive to a load signal to apply the complement signal of the bit of said N-bit binary number appearing at the least significant bit input terminal of said divisor bit input terminals to the clear input of the T flip-flop stage for the least significant bit of said binary number, means responsive to said load signal to apply the bit signal appearing at each of the remaining divisor bit input terminals to the preset terminal of a respective one of each of the others of said T flip-flop stages, means to apply a signal appearing at said pulse train input terminal to the clock terminal of each of said flip-flops, means applying the Q output of said output flip-flop to said output terminal, to the K input of said output flip-flop and as the load signal to each of said means responsive to a load signal, means applying the Q output of said output flip-flop to the T input of said least significant bit flip-flop, means applying the Q output of said least significant bit flip-flop to a J input of said output flip-flop and to the T input of the flip-flop receiving signal from the divisor bit input terminal receiving the second least significant bit of said N-bit binary number, means associated with each T flip-flop stage other than said least significant bit flip-flop stage and said second least significant bit flip-flop stage to receive the Q outputs from all T flip-flop stages associated with less significant bits of said N-bit binary number than said associated T flip-flop stage and to apply to the T input of said associated flip-flop stage the NOR function of said received Q outputs, means applying the Q output of said second least significant bit T flip-flop stage to a second J input of said output flip-flop and means receiving the Q outputs of all of said T flip-flop stages other than said least significant bit and said second least significant bit T flip-flops and applying the NOR function signal thereof to the remaining J inputs of said output flip-flop.

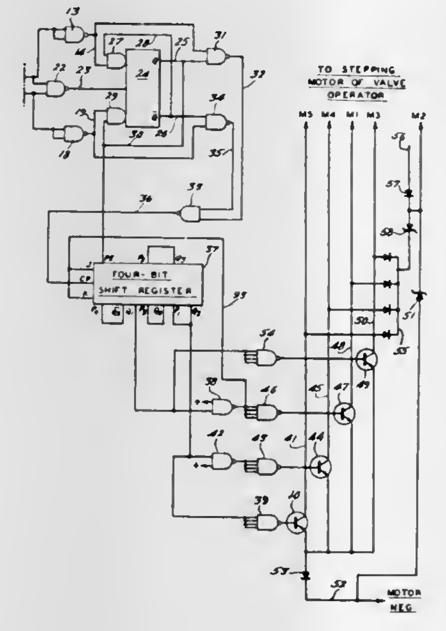
3,970,942
ANTI-HUNTING SYSTEM FOR VALVE OPERATOR CIRCUIT

Robert Mayer, Ardmore, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 462,837, April 22, 1974, abandoned. This application Jan. 2, 1975, Ser. No. 537,994

Int. Cl.² H03D *13/00*

U.S. Cl. 328—133 **6 Claims**



1. A pulse rate comparison system for comparing two input pulse trains to control a stepping motor and having means for preventing hunting action, and comprising:
a. a J-K flip-flop circuit, said J-K flip-flop comprising,
 i. a flip-flop circuit with a set terminal, a reset terminal and a clock terminal as input terminals and Q and Q output terminals,
 ii. a first AND gate having one input terminal designated as the J input terminal and a second input terminal connected to the Q output terminal, the output of said first AND gate being connected to the set input terminal of the flip-flop circuit, and
 iii. a second AND gate having one input terminal designated as the K input terminal and a second input terminal connected to the Q output terminal, the output of said second AND gate being connected to the reset input terminal of the flip-flop circuit;
b. means for applying one of two input pulse trains to be compared to the J input terminal of the J-K flip-flop circuit;
c. means for applying the remaining or second pulse train to the K input terminal of the J-K flip-flop circuit;
d. means for combining the two input pulse trains to form a third pulse train having an absolute time relationship with the input pulse trains;
e. means for applying the third pulse train to the clock pulse terminal of the J-K flip-flop circuit; and
f. means, responsive to the state of the input and output terminals of the J-K flip-flop circuit, for controlling the energizing of the stepping motor so that the motor is moved into the correct position without hunting, whereby a control pulse for energizing the stepping motor is produced only when a pulse is received by either the J or K input terminals of the J-K flip-flop circuit which does not change the state of the output of the J-K flip-flop circuit.

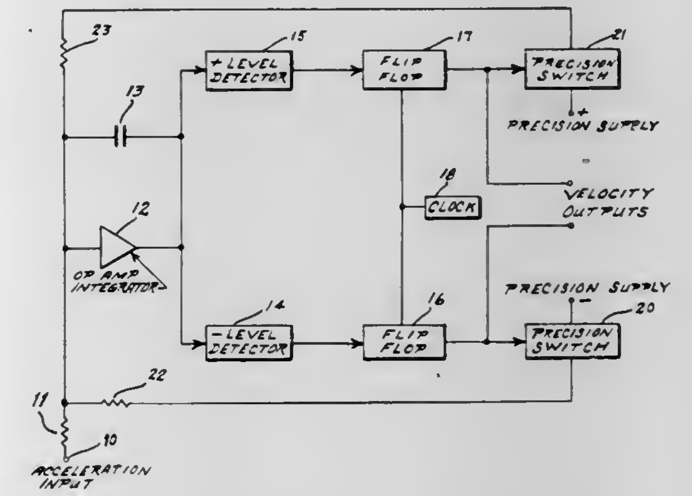
3,970,943
ANALOG-TO-PULSE INTEGRATING CONVERTER

Everett E. Chapman, Ipswich; Thomas H. Crocker, Burlington, and Barry N. Levitt, Framingham, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1975, Ser. No. 563,011

Int. Cl.² H03K *1/16*

U.S. Cl. 328—151 **2 Claims**



1. An analog-to-pulse integrating converter being comprised of analog means to integrate a bipolar DC signal, a feedback capacitor for said integrating means, an input resistor connected to said analog integrator means, said input resistor receiving said bipolar DC signal with said analog integrating means yielding as an output signal, the integral of the bipolar DC signal at a scale factor dependent on said input resistor and said feedback capacitor, said output signal also being positive or negative swinging, first and second level detector receiving the output signals from said analog integrating means, said first level detector being for positive levels and the second for negative levels, with said level detectors providing pulse output signals when said analog integrating means reaches a predetermined level, clock means to provide pulses at a predetermined frequency, first and second flip-flops receiving output pulses from said first and second level detectors, respectively, said first and second flip-flops also receiving the clock pulses to permit clocked synchronized first and second output pulses to be obtained from said first and second flip-flops, respectively, first and second positive and negative predetermined reference voltage sources normally disconnected, and switching means to connect said positive and negative reference voltage sources to said integrating means upon receiving said clocked synchronized first and second output pulses, respectively.

3,970,944

PULSE SUPPRESSING CIRCUIT ARRANGEMENTS AND EQUIPMENT INCORPORATING THE SAME

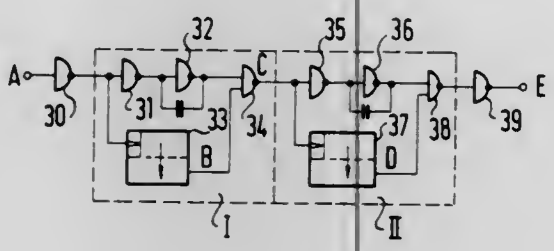
Josef Huellwegen, Altenbeken, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Feb. 27, 1975, Ser. No. 553,587

Claims priority, application Germany, Mar. 7, 1974, 2410957

Int. Cl.^{2} H03B *1/04;* **H03K** *5/01;* **H04B** *15/00*

U.S. Cl. 328—162 **12 Claims**



1. In a pulse suppression circuit arrangement for use in a data transmission system for suppressing undesired signal pulses having a duration sufficient to interrupt a desired signal pulse transmission, which desired signal transmission has a duration at least equal to a first time interval, said pulse suppression circuit having an input terminal and an output terminal, said desired and undesired signals being applied to said input terminal, the improvement comprising:

- triggerable pulse generator means for producing a first signal in response to pulse edges of one polarity of said desired signal, said triggerable pulse generator means having a time constant characteristic wherein the interval of time of said time constant is less than the pulse width of each of said desired signal pulses and greater than the pulse width of each of said undesired signal pulses;
- coupling means for producing a second signal opposite in polarity to said first signal in response to signals applied to said input;
- gate means responsive to said first and second signals for producing third signal pulses; and
- signal converter means for converting said third signal pulses to fourth signal pulses identical to said desired signal pulses applied to said input terminal and free of undesired signal pulses mixed therein.

3,970,945

METHOD AND APPARATUS FOR DEMODULATING PSK MODULATED OSCILLATIONS

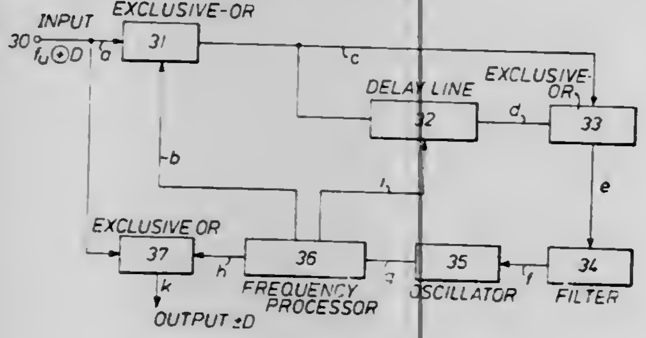
Siegbert Knapp, Ulm (Danube), Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 29, 1974, Ser. No. 519,780

Claims priority, application Germany, Nov. 2, 1973, 2354718

Int. Cl.^{2} H03K *7/04*

U.S. Cl. 329—104 **3 Claims**



1. A method of demodulating an input signal modulated according to the phase shift keying method comprising the steps of:

a. combining the input signal with a first reference signal of the same frequency as said input signal but which leads the input signal in phase by one-quarter of the period duration of said input signal;

b. delaying the output signal from said step (a) in time by one-half of the period duration of said input signal;

c. combining the undelayed output signal from said step (a) with the delayed output signal from step (b) to produce a control voltage;

d. controlling the phase of an oscillator with said control voltage to set the phase of said first reference signal and of a second reference signal of the same phase and frequency as said input signal; and

e. combining said second reference signal with said input signal to produce the demodulated output voltage.

3,970,946

DEMODULATOR FOR AMPLITUDE-AND-PHASE MODULATED SIGNALS HAVING CONTROL MEANS FOR REDUCING PHASE AND AMPLITUDE ERRORS

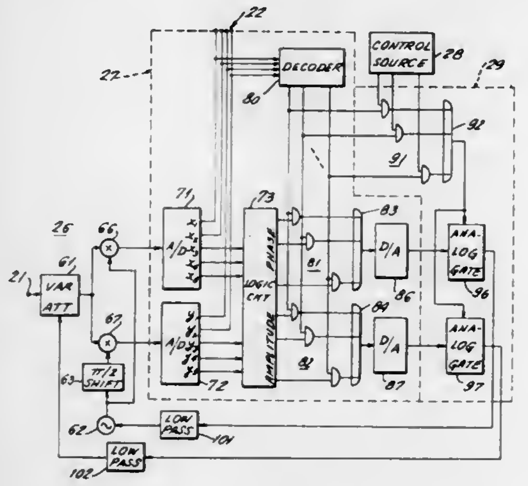
Yoshio Matsuo, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 10, 1974, Ser. No. 487,003

Claims priority, application Japan, July 12, 1973, 48-79004

Int. Cl.^{2} H03D *5/00*

U.S. Cl. 329—104 **13 Claims**



1. A demodulator for deriving demodulated signals from received signals which have been subjected to amplitude-and-phase modulation, comprising:

- a detector comprising first means responsive to said received signals for producing position signals representative of signal points corresponding to said received signals on a reference signal plane of points to which results of demodulation, phase errors of said position signals, and amplitude errors of said position signals are preliminarily assigned in consideration of a predetermined amplitude scale and a predetermined phase reference;
- a demodulation and error-detection circuit responsive to said position signals for producing result signals, phase error signals, and amplitude error signals representative of those results of demodulation, phase errors, and amplitude errors which are assigned to said signal points;
- means for producing control signals specifying a predetermined area of said reference signal plane; and
- a selection circuit responsive to said control, position, phase error, and amplitude error signals for producing those selected phase and amplitude error signals which are representative of the phase and amplitude errors assigned to the points placed in said predetermined area;
- said detector further comprising second means responsive to said selected phase and amplitude error signals for varying said amplitude scale and phase reference to reduce the phase and amplitude errors represented by said phase and amplitude error signals, said result signals thereby becoming said demodulated signals.

3,970,947

MULTI-STAGE DIFFERENTIAL AMPLIFIER CIRCUIT WITH MEANS FOR COMPENSATING THE TEMPERATURE DRIFT OF A CONSTANT CURRENT SOURCE TRANSISTOR

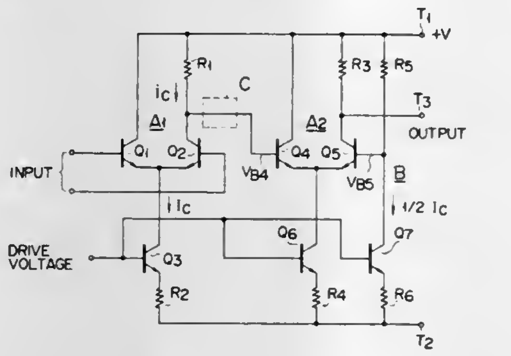
Itsuzo Sato, and Kikuo Saito, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 21, 1975, Ser. No. 579,703

Claims priority, application Japan, May 30, 1974, 49-61162

Int. Cl.^{2} H03F *1/32*

U.S. Cl. 330—23 **8 Claims**



8. A multi-stage differential amplifier circuit comprising:

- a first differential amplifier means having an output, and a current source transistor means which causes a DC voltage variation at the output with temperature variation;
- a second differential amplifier means including first and second transistor means each having a base, collector and emitter and connected in differential configuration and means connected with the base of said first transistor means and operative to produce a DC voltage variation with temperature variation which is substantially the same as that at the output of said first differential amplifier means; and
- means for direct-coupling the output of said first differential amplifier means with the base of said second transistor means.

3,970,948

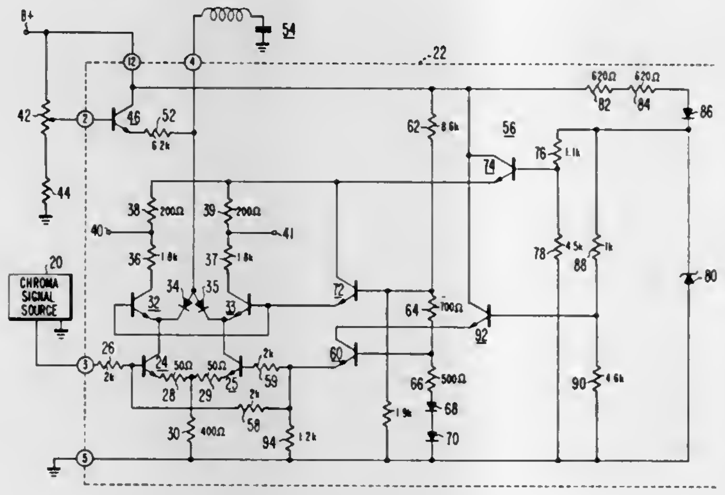
CONTROLLER GAIN SIGNAL AMPLIFIER

Leopold Albert Harwood, Somerville, and Erwin Johann Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,405

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—29 **8 Claims**



1. A controllable gain signal amplifier comprising:

- a source of signals,
- a first signal amplification stage comprising at least a first transistor having a signal input electrode coupled to said source of signals and a main current conduction path including second and third electrodes,
- a source of quiescent operating current coupled to said second electrode,
- a first current splitter circuit comprising at least a first semiconductor rectifier device providing a first current path and a second transistor having a main current conduction path, said main conduction path of said second transistor and said first current path of said first rectifier device being coupled to said third electrode of said first transistor and being similarly poled for current conduction with respect to said third electrode,
- at least one output load circuit coupled to said main conduction path of said second transistor, and
- gain controlling means direct current coupled to said first rectifier device for proportioning the relative flow of current of said first transistor through said first current path and said main conduction path of said second transistor, said means comprising
  - a source of direct voltage,
  - a variable voltage divider coupled across said direct voltage source and having an output terminal at which a selected portion of said voltage is provided,
  - coupling means comprising at least a third transistor having a base electrode direct current coupled to said output terminal and an emitter electrode, said coupling means further comprising a resistance direct current coupled between said last-named emitter electrode and said first rectifier device for supplying a controllable direct current to said device and thereby proportioning the flow of current through said first rectifier device and said second transistor, whereby the signal gain associated with said second transistor and said load circuit is varied.

3,970,949

HIGH-FREQUENCY AUTOMATIC GAIN CONTROL CIRCUIT

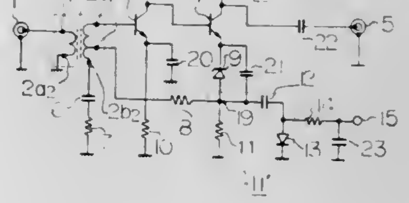
Michio Higuchi, Tokyo, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Nov. 19, 1974, Ser. No. 525,189

Claims priority, application Japan, Nov. 21, 1973, 48-130175

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—29 **3 Claims**

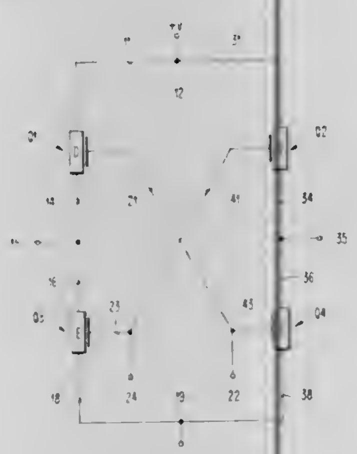


1. A high-frequency automatic gain control circuit for an emitter earthed amplifier wherein a hybrid negative feedback is applied to an input stage thereof from the emitter of an output stage transistor through a hybrid circuit connected to the base of an input stage transistor and a series negative feedback is applied to the output stage thereof, characterized in that a series connection of a diode and a capacitor is connected in shunt with an emitter resistor of the output stage transistor, and that an automatic gain control signal is applied to said diode between said diode and said capacitor for regulating the gain of said amplifier by controlling the negative feedback ratio of said negative feedback.

3,970,950
HIGH COMMON MODE REJECTION DIFFERENTIAL AMPLIFIER UTILIZING ENHANCEMENT DEPLETION FIELD EFFECT TRANSISTORS

Leo B. Freeman, Jr.; Robert J. Incerto, both of Poughkeepsie, and Joseph A. Petrosky, Jr., Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,919
Int. Cl.² H03F *3/45*
U.S. Cl. 330—30 D **2 Claims**

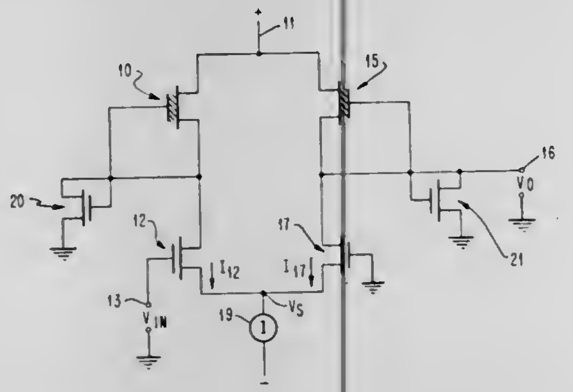


1. A differential amplifier comprising:
a first depletion mode field effect transistor coupling a drain voltage terminal to a first output terminal, a second depletion mode field effect transistor coupling a drain voltage terminal to a second output terminal;
a first enhancement mode field effect transistor coupling said first output terminal to a source voltage terminal and having a gate coupled to a first input terminal and a gate electrode of said second depletion mode transistor; and
a second enhancement mode field effect transistor coupling a second output terminal to its source voltage terminal, and having a gate couple to a second input terminal and a gate electrode of said first depletion mode transistor.

3,970,951
DIFFERENTIAL AMPLIFIER WITH CONSTANT GAIN

Charles Reeves Hoffman, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,353
Int. Cl.² H03F *3/16*
U.S. Cl. 330—30 D **4 Claims**

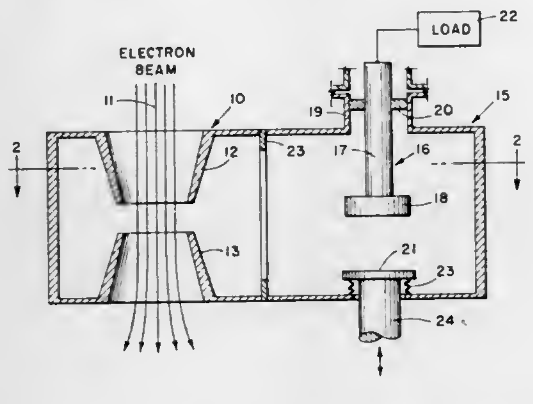


1. A constant gain differential amplifier circuit for integrated circuit use, said circuit comprising:
a semi-conductive substrate;
a source of voltage having a drain supply terminal and a source supply terminal;
a pair of depletion type transistors deposited in said substrate and having their drain electrodes connected to said drain supply;
a pair of enhancement type transistors also deposited in said substrate, and each having its drain connected to the source and gate of an associated one of said depletion type transistors;
a connection from the gate of one of said enhancement type transistors to a source of a reference voltage;
a connection from the gate of the other of said enhancement type transistors to an input signal voltage to be amplified;
a constant current control interposed between said source supply terminal and the sources of both said enhancement type transistors; and
a gain control transistor for each pair of associated depletion-enhancement type transistors, each said gain control transistor having its drain and its gate connected to the source-drain junction of its associated pair of transistors and its source connected to said reference voltage source.

3,970,952
BROADBAND OUTPUT CIRCUIT FOR KLYSTRON AMPLIFIER

Albert Mizuhara, San Mateo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1975, Ser. No. 577,960
Int. Cl.² H03F *3/56*
U.S. Cl. 330—45 **6 Claims**



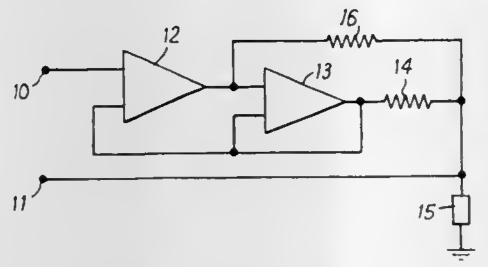
6. A broadband output circuit for a high power klystron tube comprising, in combination
a first cavity resonator adapted to be excited by the modulated electron beam of said klystron tube;
a second cavity resonator;
an inductive iris coupling said second cavity resonator to said first cavity resonator;
first and second conductors supported by said second cavity resonator in spaced coaxial alignment with their confronting end portions positioned within said second cavity resonator,
one of said conductors being electrically insulated from said second cavity resonator so as to provide a means for extracting an output signal from said second cavity resonator; and
means for displacing the other of said conductors so as to vary the separation between said confronting end portions of said conductors.

3,970,953
DISTORTION-FREE AMPLIFIERS

Peter James Walker, Hemingford Abbots, and Michael Peter Albinson, Over, both of England, assignors to The Acoustical Manufacturing Company Limited, London, England

Filed Jan. 10, 1975, Ser. No. 539,954
Claims priority, application United Kingdom, Jan. 17, 1974, 2278/74
Int. Cl.² H03F *1/34*
U.S. Cl. 330—99 **4 Claims**

4. Apparatus for amplifying electric signals comprising,
a first amplifier of relatively small power,
a load,
means connecting the output of said first amplifier to said load,
a second amplifier of relatively large power connected to said load to be turned on by output from said first amplifier and contribute current to the load,

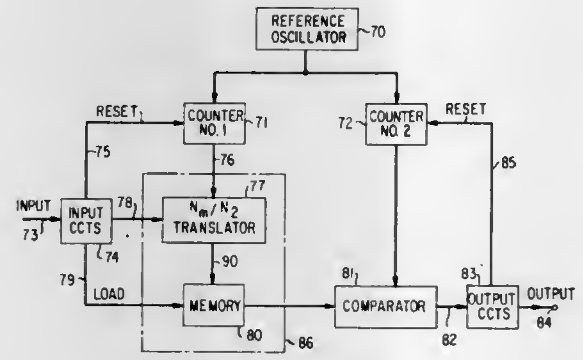


means to monitor current flowing from said second amplifier to said load,
and means to feed back a signal from said monitoring means to the inputs of both said amplifiers to maintain the transfer characteristic of the apparatus independent of the performance of said second amplifier.

3,970,954
DIGITAL FREQUENCY MULTIPLIER

Reed Kamenetzky Even, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 3, 1975, Ser. No. 564,650
Int. Cl.² H03B *19/00*
U.S. Cl. 331—53 **8 Claims**



1. A frequency multiplication circuit comprising
means for receiving input signals,
a reference oscillator,
a first counter for counting the number of cycles of said reference oscillator in each period of said input signals,
means for systematically translating each of the output counts of said first counter into a different translated count,
a second counter for counting the number of cycles of said reference oscillator in each period of an output signal, and
a comparator circuit for determining from signals derived from both said first and second counters the termination of each period of said output signal.

3,970,955
GAS DYNAMIC-TRANSFER CHEMICAL LASER

Lester A. Lee, 405 River Road Drive, Oxon Hill, Md. 20022

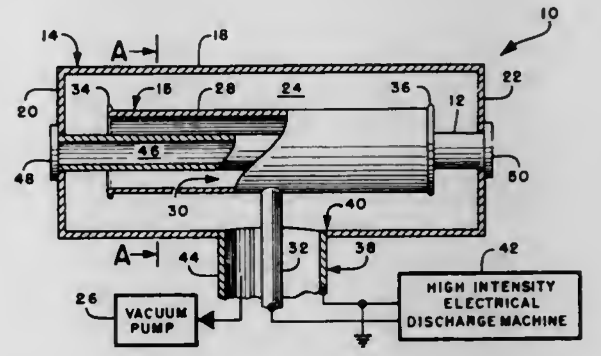
Filed Dec. 6, 1974, Ser. No. 530,259
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 G **3 Claims**

1. In a method of producing a laser beam in a gas dynamic-transfer chemical laser which comprises the steps of subjecting a mixture of a fuel and an oxidizer to combustion in a combustion chamber to produce a mixture of gases consisting essentially of N_2, CO_2, HF, and F, expanding the mixture of gases through a supersonic nozzle, and passing the gas mixture through an optical cavity wherein stimulated emission of radiation from the gas molecules occurs the improvement wherein the fuel is
5-trifluoromethyltetrazole, and a secondary stream of cold D_2 or H_2 is injected into the expanded mixture of gases.

3,970,956
CYLINDRICAL ELECTRON BEAM DIODE

Paul E. Bolduc, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,973
Int. Cl.² H01S *3/09*
U.S. Cl. 331—94.5 PE **10 Claims**



1. An electron beam diode comprising an elongated generally tubular anode essentially transparent to relativistic electrons; a generally tubular cathode electrode coaxially encircling and spaced from said anode electrode with ends intermediate the ends of said anode electrode; a conductive housing including a generally tubular wall coaxially encircling said cathode and anode electrodes and spaced further from said cathode electrode than said cathode-anode electrode spacing and end walls connected to said anode electrode to substantially enclose said cathode electrode and form an evacuable region between said cathode electrode and said anode electrode and housing; and means for connecting a high energy electrical pulse through said tubular housing wall to said cathode electrode at a location intermediate its ends.

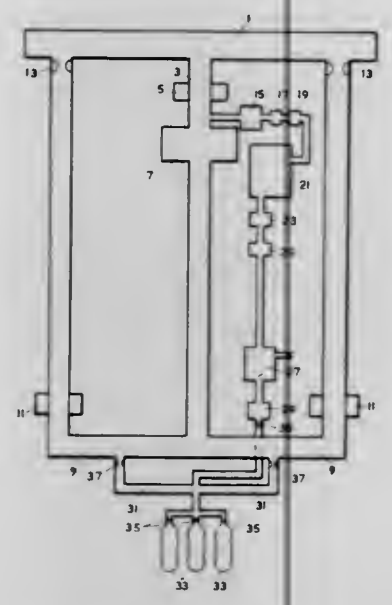
3,970,957
FLOWING GAS LASER GAS REGENERATION SYSTEM

Albert John Regan, Hoddesdon, England, assignor to BOC Limited, London, England

Filed Oct. 21, 1974, Ser. No. 516,495
Claims priority, application United Kingdom, Oct. 23, 1973, 49318/73
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 G **15 Claims**

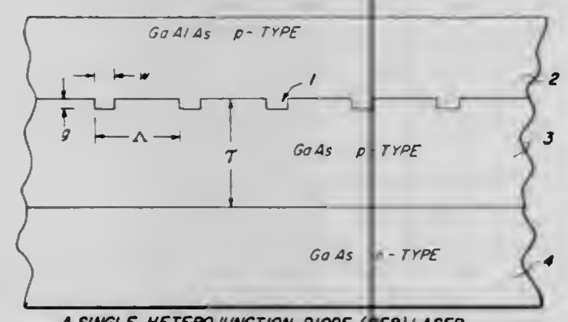
1. In a recirculating path electric discharge type gas laser having at least a main recirculation path in which the active laser gas is dissociated into chemical constituents by said discharge and in which the exhausted laser gases are passed through a chemical reactor means for treatment by a catalyst for recombining the constituents into the active laser gas, the improvement comprising means for flowing the gas laser medium fast enough to minimize active laser gas dissociation and means for diverting a very minor portion of the laser gases exhausted from the discharge region from said main recirculation path and for passing only that very minor portion of gases

through said chemical reactor means for catalytically recombining only those constituents in the very minor portion of exhaust gases, for conserving the amount of catalyst used in said reaction vessel.



3,970,958
ELECTRICALLY PUMPED, SOLID-STATE DISTRIBUTED FEEDBACK LASER WITH PARTICULAR GRATING SPACING

William Streifer, Palo Alto; Donald R. Scifres, Los Altos, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 15, 1974, Ser. No. 515,121
Int. Cl.^{2} H01S *3/082*
U.S. Cl. 331—94.5 C **8 Claims**



A SINGLE HETEROJUNCTION DIODE (DFB) LASER

1. An electrically pumped, distributed feedback, diode laser for producing a single, high order mode laser output beam having a selected free space wavelength comprising:

a plurality of layers of semiconductor material, one of said layers of semiconductor material being a light wave guide layer and at least one other of said layers of semiconductor material bordering said light wave guide layer, said light wave guide layer being of a material having an index of refraction greater than the material of said at least one other layer,

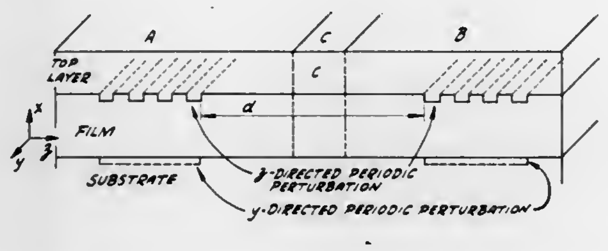
said light wave guide layer and a layer in contact with said light wave guide layer being doped such that a rectifying junction is formed at the interface therebetween,

a periodic structure at the interface between two of said plurality of layers of semiconductor material, said periodic structure having a periodicity such that the free space wavelength of each of the higher order modes immediately adjacent said single, higher order mode producing said selected free space wavelength is outside of the spectral width of the gain produced by said periodic structure, whereby only light of said selected free space wavelength experiences a net gain in said laser and said laser output beam is substantially only at said selected free space wavelength, and

means for forward biasing said rectifying junction to produce an injection of minority carriers into said light wave guide layer to produce said laser output beam having said selected free space wavelength.

3,970,959
TWO DIMENSIONAL DISTRIBUTED FEEDBACK DEVICES AND LASERS

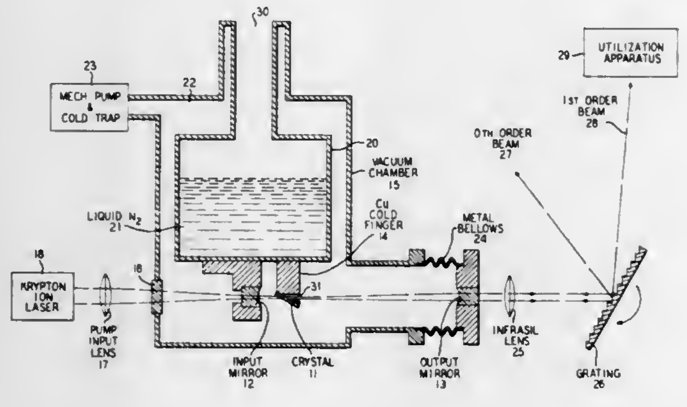
Shyh Wang, El Cerrito, and Sang K. Sheem, Albany, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Division of Ser. No. 355,454, April 30, 1973, Pat. No. 3,884,549. This application Dec. 4, 1974, Ser. No. 529,538
Int. Cl.^{2} H01S *3/08*
U.S. Cl. 331—94.5 C **3 Claims**


A
C
B
TOP LAYER
C
d
FILM
x
y
z
SUBSTRATE
x-DIRECTED PERIODIC PERTURBATION
y-DIRECTED PERIODIC PERTURBATION

1. A method for forming a thin film optical device including the steps of disposing an upper and lower boundary layers in optical contact with a thin film optical waveguide, imposing fixed perturbations onto one of said boundary layers in regions thereof which are interacted with upon propagation of light in said waveguide, and imposing variable perturbation in the other of said boundary layers for the purpose of varying the frequency response of said device.

3,970,960
BROADLY TUNABLE CONTINUOUS-WAVE LASER USING COLOR CENTERS

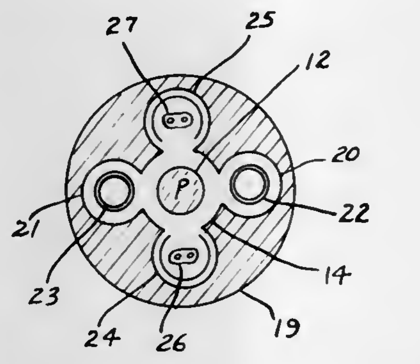
Linn Frederick Mollenauer, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation-in-part of Ser. No. 438,200, Jan. 31, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,467
Int. Cl.^{2} H01S *3/16*
U.S. Cl. 331—94.5 F **14 Claims**



1. Apparatus for the stimulated emission of radiation of the type comprising a body of an alkali halide crystal having color centers capable of substantial absorption of a particular band of radiation, means for supplying the band of radiation to the crystal to produce a population inversion between radiatively coupled energy levels, and means including reflective surfaces associated with the crystal for stimulating the emission of coherent radiation from the inverted population of color centers, characterized in that the apparatus includes means for cooling the crystal by conduction from the crystal, said cooling means including a substantial solid body contacting said crystal and providing an optical path within said body of negligible loss for the stimulated radiation.

3,970,961
THERMIONIC CATHODE TRANSVERSE-DISCHARGE GAS LASER TUBE

Onezime P. Breaux, and Gustav K. Medicus, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed May 9, 1975, Ser. No. 576,058
Int. Cl.^{2} H01S *3/22, 3/097*
U.S. Cl. 331—94.5 PE **5 Claims**



1. A thermionic cathoe transverse-discharge gas laser tube comprising:

a. an electrically conductive substantially tubular envelope having a longitudinal axis, containing a gas for lasing, terminated at each end by a Brewster-angle window, and providing an electric potential surface on the said envelope;

b. a first thermionic cathode positioned in axis-parallel relationship with the said envelope axis within the said electric potential surface.

c. a second thermionic cathode in axis-parallel relationship with the said envelope axis, positioned diametrically opposite the said first thermionic cathode and within the said electric potential surface;

d. a first anode positioned in axis-parallel relationship with the said envelope axis and positioned within the said electric potential surface;

e. a second anode positioned in axis-parallel relationship with the said envelope axis and positioned within the said electric potential surface diametrically opposite the said first anode;

f. means for providing a relative positive electric potential on the said first and second anodes with respect to an electric potential on the said first and second cathodes;

g. means for heating the said first and second thermionic cathodes to provide an emission of electrons from the said cathodes; and

h. means for providing a negative potential on the said electrically conductive envelope with respect to the said cathode potential whereby the said potential surface on the said envelope is electron repelling.

3,970,962
HIGH POWER ELECTRICALLY EXCITED FLOWING GAS LASER

Eugene R. Peressini, Palos Verdes Peninsula; Robert A. Hill, and James M. Kallis, both of Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Nov. 7, 1974, Ser. No. 521,715
Int. Cl.^{2} H01S *3/09, 3/22*
U.S. Cl. 331—94.5 PE **12 Claims**

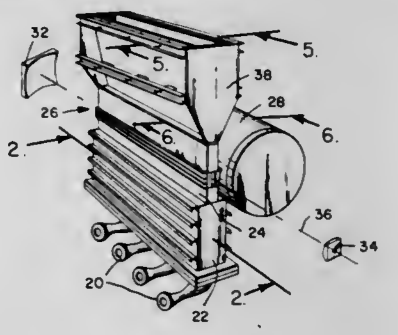
1. A high power electrically excited flowing gas laser comprising in combination:

gas supply means including a plenum chamber for supplying a laser gas at a pressure substantially greater than atmospheric pressure;

means defining a gas flow channel including an excitation region for said laser gas;

means for introducing a cw electron beam into said excitation region in a direction perpendicular to the direction of gas flow and for applying a cw DC electric field across said excitation region in a direction parallel to the direction of said electron beam to provide an electric current sufficient to excite said laser gas to a condition of population inversion;

nozzle means disposed between said plenum chamber and said gas flow channel and spaced from said excitation region for controlling the flow velocity of said laser gas in said flow channel such that said laser gas enters said excitation region at a predetermined subsonic velocity maximizing laser efficiency without causing gas flow instability and at a pressure slightly greater than atmospheric pressure;

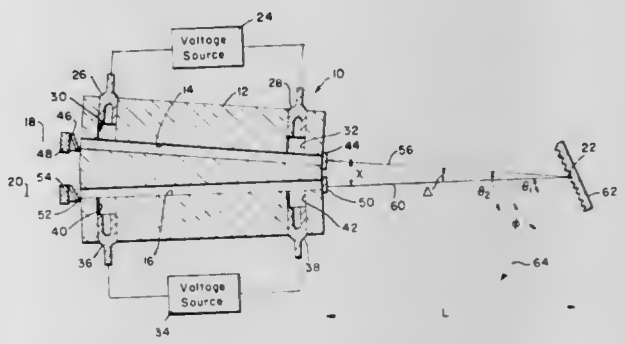


diffuser means in gas flow communication with the downstream end of said flow channel and with the ambient atmosphere for decelerating and compressing said laser gas before exhausting into the ambient atmosphere such that said laser gas leaves said excitation region at a pressure slightly less than atmospheric pressure; and

optical resonator means in optical communication with said excitation region and having an optical axis passing through said excitation region in a direction perpendicular to both the gas flow and electron beam directions for providing a cw laser beam along said axis.

3,970,963
WAVEGUIDE LASER ARRANGEMENT FOR GENERATING AND COMBINING A PLURALITY OF LASER BEAMS

Arthur N. Chester, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed May 1, 1975, Ser. No. 573,715
Int. Cl.^{2} H01S *3/082*
U.S. Cl. 331—94.5 C **8 Claims**



1. A waveguide laser arrangement for generating and combining a plurality of laser beams comprising:

means for generating a plurality of said laser beams of differing wavelengths and for emitting said beams along respective paths converging upon an intersection point, said means including a body of dielectric material defining a plurality of capillary bores therethrough of a diameter suitable for guiding laser light, a laser gas disposed in each of said bores, a plurality of optical resonators independently operatively associated with respective ones of said bores and tuned to different wavelengths, each resonator including a partially transmissive reflector near the end of the associated bore closer to said intersection point, and means for exciting the laser gas in each of said bores to a condition of stimulated emission; and dispersive optical means positioned at said intersection point for combining the laser beams emitted along said respective paths into a composite beam along a coincident path.

3,970,964

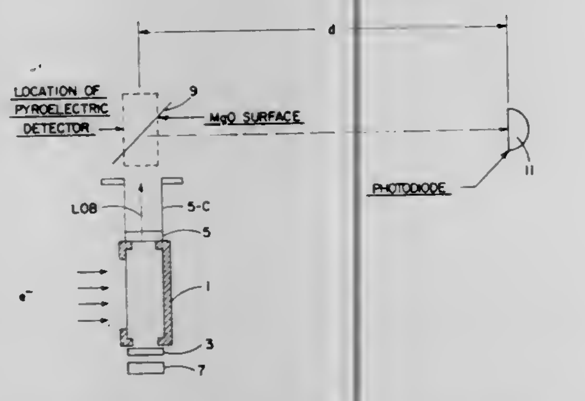
HIGH-POWER ARGON/NITROGEN TRANSFER LASER

N. Thomas Olson, Los Angeles; Earl R. Ault, Rolling Hills Estates, and Mani L. Bhaumik, Malibu, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Sept. 5, 1974, Ser. No. 503,454

Int. Cl.^{2} H01S *3/22*

U.S. Cl. 331—94.5 G **7 Claims**



1. A gas laser having an output at 3577A comprising:
means for forming a resonant optical path for stimulating a coherent beam of radiation at,
a gas cell positioned in said optical path,
a lasing gas mixture in said cell having a total absolute pressure of 20 psia - 260 psia, and comprising 4–16% nitrogen and the balance argon,
means for exciting said gas mixture to create a population inversion between the upper and lower energy levels of the 3577A transition of nitrogen by both populating said upper energy level and depopulation said lower energy level via collisions between argon and nitrogen so as to form an oscillating laser light beam at 3577A in said resonant optical path, and
means for coupling a portion of said beam out of said path to provide said output.

3,970,965

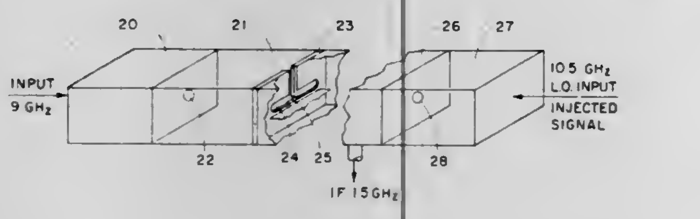
INJECTION LOCKED JOSEPHSON OSCILLATOR SYSTEMS

Sidney Shapiro, and Charles V. Stancampiano, both of Rochester, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1975, Ser. No. 562,294

Int. Cl.^{2} H03B *7/12*

U.S. Cl. 331—107 S **2 Claims**



1. A mixer comprising, in combination
a first rectangular waveguide cavity resonant at a frequency f_i,
said first waveguide cavity having one end wall with an aperture formed therein for coupling electromagnetic wave energy into said first cavity;
a second rectangular waveguide cavity resonant at a frequency f_c,
said second waveguide cavity having one end wall with an aperture formed therein for coupling electromagnetic wave energy into said second cavity,
said first and second cavities sharing a common second end wall,
said common end wall having a capacitive slot formed therein at a location intermediate the top and bottom walls of said waveguide cavities;
a Josephson junction positioned within said slot and biased with a DC voltage equal to $hf_c/2e$;
means for coupling an input signal of frequency f_i to said first cavity and a mixing signal of a frequency which is at or near f_c to said second cavity,
said mixing signal injection locking the Josephson oscillator formed by said Josephson junction and said second cavity; and
an output resonator formed in part by said common wall and portions of the walls of said second rectangular waveguide that are adjacent thereof for extracting a signal from said second waveguide cavity whose frequency corresponds to the difference in frequency of f_i and f_c.

3,970,966

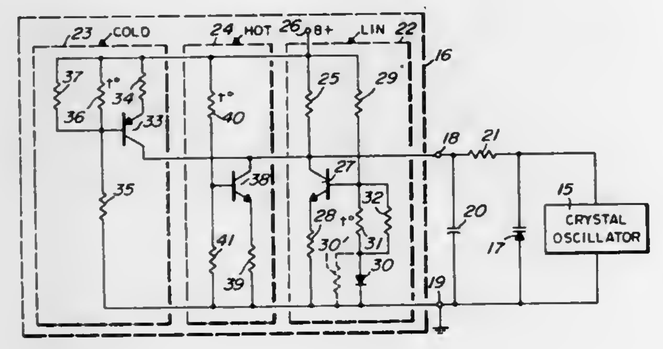
CRYSTAL OSCILLATOR TEMPERATURE COMPENSATING CIRCUIT

Anthony Francis Keller, Chicago, and Dennis Fisher Marvin, Bensenville, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1975, Ser. No. 571,663

Int. Cl.^{2} H03B *5/04, 5/36*

U.S. Cl. 331—116 R **22 Claims**



1. A temperature compensating circuit for an oscillator having a frequency determining crystal and operative in cold, middle, and hot temperature ranges, comprising:
voltage variable reactance means coupled to the cyrstal of the oscillator for varying the oscillator frequency in response to a voltage applied to said reactance means;
compensating means for generating a control voltage with a voltage versus temperature characteristic having a substantially linear variation in said middle temperature range and a substantially non-linear variation in at least one of said hot and cold temperature ranges; and
means for coupling said control voltage to said reactance means whereby said oscillator frequency is maintained at a substantailly constant value over all of said temperature ranges;
said compensating means including first circuit means for independently creating said linear variation in said middle range and second circuit means for substantailly creating said non-linear variation in said one of said temperature ranges, said second circuit means including circuitry for independently determining the operative temperature range in which said second circuit means produces any substantial variation in said control voltage as a function of temperature.

3,970,967

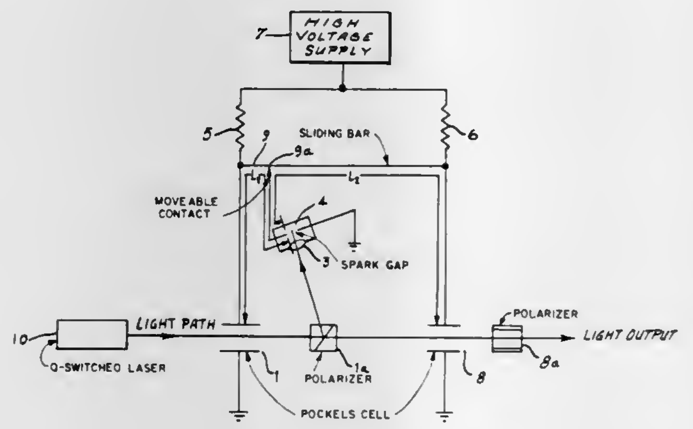
CONTROLLABLE ULTRAFAST LIGHT SHUTTER

Robert L. Iliff, Canton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,935

Int. Cl.^{2} H01S *3/10*

U.S. Cl. 332—7.51 **1 Claim**



1. A controllable ultrafast light shutter to provide an ultrashort laser pulse of selectable duration in the picosecond region consisting essentially of a Q switched laser providing a polarized light pulse of a first preselected duration to be reduced to a second preselected duration in said picosecond region, a first Pockels cell having a high voltage side, a first polarizer associated with said first Pockels cell to provide a first combination, a second Pockels cell having a high voltage side, a second polarizer associated with said second Pockels cell to provide a second combination, said Q switched laser, said first Pockels cells, said first polarizer, said second Pockels cells, said second polarizer being arranged on a common longitudinal axis and in the recited sequence with said polarized light pulse being the input light pulse to said first Pockels cell and said second polarizer providing the output pulse of said second preselected duration, a spark gap having first and second electrodes, said second electrode being grounded, a lens associated with said spark gap, a sliding bar having first and second ends, a high voltage supply, first and second current limiting resistors, said first current limiting resistor connected between said high voltage supply and said first end of said sliding bar, said second current limiting resistor connected between said high voltage supply and said second end of said sliding bar, a sliding contact for said sliding bar connected to said first electrode of said spark gap, a first cable consisting of the electrical connection from said high voltage side of said first Pockels cell to said first end of said sliding bar to said first electrode of said spark gap, a second cable consisting of the electrical connection from the high voltage side of said second Pockels cell to said second end of said sliding bar to said first electrode of said spark gap, said second cable being of greater length than said first cable, said input light pulse to said first Pockels cell passing through said first combination with said first polarizer rotating the input light pulse 90° during the passage therethrough and also simultaneously deflecting the light pulse to said lens, said lens focusing the deflected light pulse between said electrodes of said spark gap and upon breakdown thereof grounding said high voltage sides of said first and second Pockels cells causing the remainder of the light pulse to pass through said first and second combinations unaffected, said first combination being now in the on condition allowing the remainder of the pulse to pass through while said second combination goes to the off condition closing the light shutter, said light shutter being open for the length of time determined by the length of said second cable subtracted from the length of said first cable with the difference in length being divided by the velocity in the cables.

3,970,968

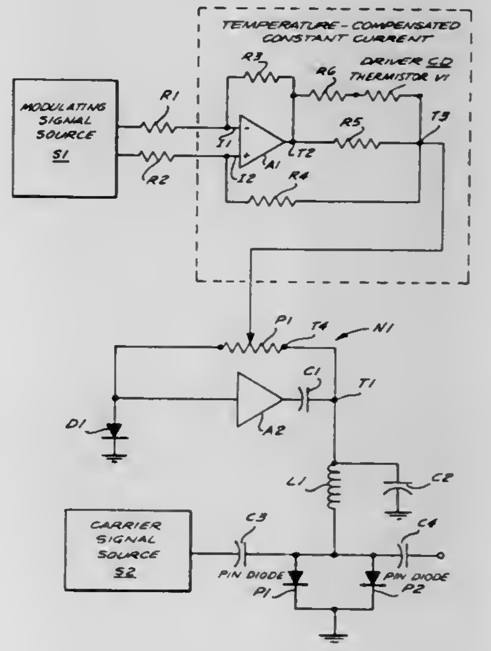
SIGNAL MODULATOR APPARATUS

Thomas L. Sly, Clay, N.Y., assignor to Anaren Microwave, Incorporated, Syracuse, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,378

Int. Cl.^{2} H03C *1/14*

U.S. Cl. 332—37 D **7 Claims**



1. Apparatus for use in signal modulators comprising: a constant current amplifier having temperature compensating means, an input adapted to receive a modulating signal and an output for transmitting a temperature-compensated modulating current; a reference diode having first and second terminals first connecting means for connecting a first terminal of said reference diode to the output of said constant current amplifier; grounding means for signal grounding the second terminal of said reference diode; a modulating current output terminal; second connecting means for connecting the output of said constant current amplifier to said modulating current output terminal; a signal amplifier with unity gain and a coupling capacitor connected in series; and means for connecting the first terminal of said reference diode via the series circuit of said signal amplifier and coupling capacitor to said modulating current output terminal.

3,970,969

DEVICE FOR THE ELECTRICAL PROTECTION OF A COAXIAL CABLE BY TWO CONNECTED CIRCUITS

Michel Sirel, and Francois Taille, both of Paris, France, assignors to Les Cables de Lyon, Lyon Cedex, France

Filed Dec. 13, 1974, Ser. No. 532,482

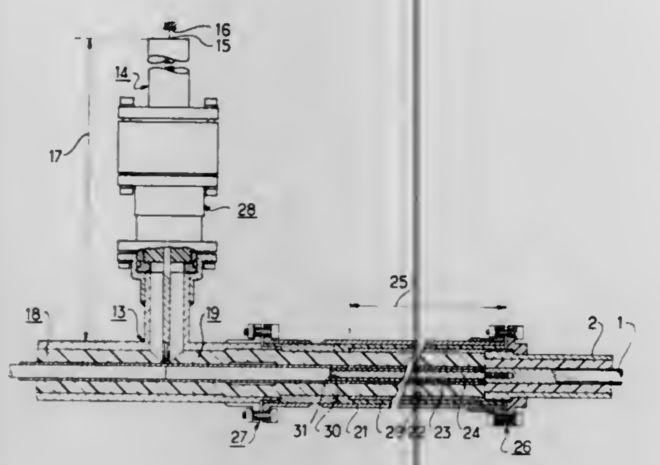
Claims priority, application France, Dec. 18, 1973, 73.45204

Int. Cl.^{2} H01P *1/00*

U.S. Cl. 333—12 **3 Claims**

1. A device providing double protection for a coaxial transmission line having two conductors, said device comprising two circuits, one of said circuits being connected in parallel to said line for equipotentiality and being formed by a T-connection including arms equal to one quarter of the wavelength to be transmitted, the other of said circuits being connected in series to said line for decoupling the line from spurious low frequencies, both of said circuits having parameters for providing high frequency coupling in said line, the decoupling circuit being integrated into one of said arms of said equipotentiality circuit, a cut being provided in each of the conduc-

tors of said transmission line for connection with said circuits, the decoupling circuit being a quarter-wave line having an open end and connected in series with each of said conductors of said coaxial transmission line.



3,970,970

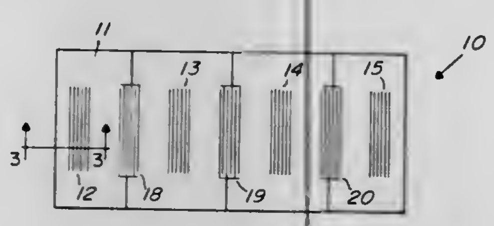
MULTIPLE ACOUSTICALLY COUPLED SURFACE ACOUSTIC WAVE RESONATORS

James C. Worley, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 591,588

Int. Cl.² H03H *9/26, 9/32*; H01L *41/04*

U.S. Cl. 333—72 **8 Claims**



1. Multiple acoustically coupled surface acoustic wave resonators comprising:

a. a base of piezoelectrically active material;

b. a first surface wave acoustic resonator having a resonant frequency and including a first transducer affixed to said base for propagating surface waves on said base along a predetermined axis of said base upon proper energization of said first transducer, and first reflectors formed on said base on each side of said first transducer along the predetermined axis and spaced from each other a multiple of one-half wavelength of the resonant frequency of said first resonator for producing a standing wave between said first reflectors when said first transducer is properly energized;

c. a second surface wave acoustic resonator positioned on said base along the predetermined axis in spaced relation from said first resonator and having a resonant frequency and including a second transducer for propagating surface waves on said base upon proper energization of said second transducer, and second reflectors formed on said base on each side of said second transducer along the predetermined axis and spaced from each other a multiple of one-half wavelengths of the resonant frequency of said second resonator for producing a standing wave between said second reflectors when said second transducer is properly energized; and

d. the outermost first and second reflectors being constructed with substantially one hundred percent reflectivity of energy at the resonant frequency of the first and second resonators, respectively, and the innermost or adjacent first and second reflectors being constructed with less reflectivity for providing acoustical coupling between said first and second resonators.

3,970,971

PARASITIC WAVE ATTENUATOR USEABLE IN HIGH FREQUENCY ELECTRONIC TUBES

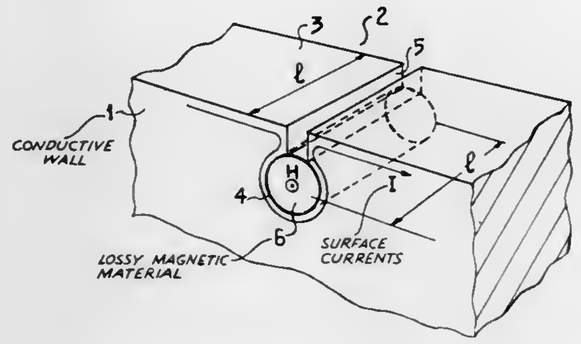
Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 5, 1975, Ser. No. 583,970

Claims priority, application France, June 11, 1974, 71.20155

Int. Cl.² H01P *1/22*

U.S. Cl. 333—81 R **8 Claims**



1. A device for attenuation very short parasitic waves generating surface currents at a surface of a conductive wall of a high frequency circuit, said device comprising an element made of a material which is electrically non-conductive and which exhibits magnetic losses when subjected to an alternating magnetic field, said element being arranged in an opening formed in said conductive wall, said opening being so designed and disposed related to said conductive wall that it creates an electrical discontinuity at said surface of said wall, said surface electrical discontinuity forcing said surface currents to make a loop around said element, said current loop generating inside said element an alternating magnetic field.

3,970,972

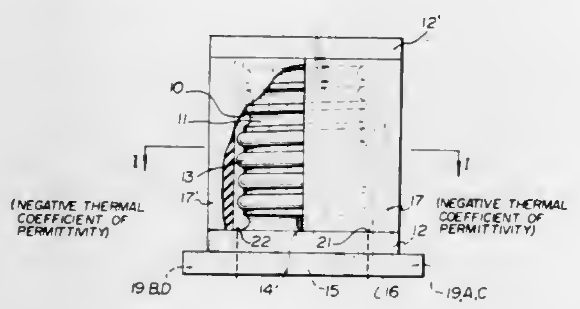
SHOCK RESISTANT, TEMPERATURE COMPENSATED HELICAL RESONATOR

Charles Brian David Bunner, Carp, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed May 12, 1975, Ser. No. 576,277

Int. Cl.² H01P *1/30, 7/04*

U.S. Cl. 333—82 BT **12 Claims**


12'
10
11
11
11
13
17'
(NEGATIVE THERMAL COEFFICIENT OF PERMITTIVITY)
17
(NEGATIVE THERMAL COEFFICIENT OF PERMITTIVITY)
12
22
21
19 B,D
14'
15
16
19A,C

1. A helical resonator structure, comprising:

a. a housing having inside walls and an end portion, and being of a conductive material having a first positive thermal coefficient of expansion;

b. a form of dielectric material inside said housing spaced from the inside walls and supported by said end portion, said form supporting a thereon wound helical conductor of a material having a second positive thermal coefficient of expansion; and

c. rigid dielectric filling disposed in selected locations contiguous said helical conductor and the inside walls in the space therebetween, said dielectric filling being of a predetermined amount to produce an average permittivity of the total of said space that is larger than that of air but less than that of the dielectric filling material, and said dielectric filling material having a negative thermal coefficient of permittivity.

3,970,973

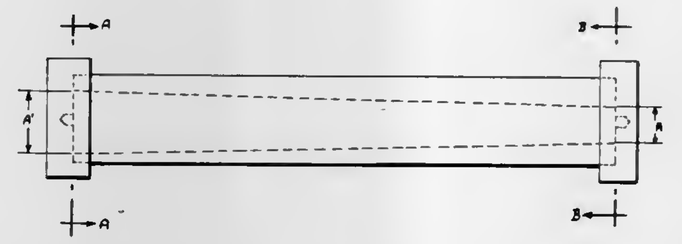
IMPEDANCE STANDARD APPARATUS

Frank Lazzaro, Lancaster, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 25, 1974, Ser. No. 509,200

Int. Cl.² H01P *1/24, 3/12, 1/04*

U.S. Cl. 333—97 R **7 Claims**



1. An impedance standard apparatus for producing known reflections comprising in combination:

taper forming means having a predetermined length, said taper forming means having a first and second end, said first and second end respectively having the same cross-sectional area and shape, said first end having a first predetermined dimension, said second end having a second predetermined dimension, said first predetermined dimension being larger than said second predetermined dimension, said taper forming means with said first and second end provides a two-port device with a mathematically predictable VSWR, said two-port device being inserted between a matched generator and load, and

means for connecting joined to said taper forming means, said connecting means attached to said first and second end respectively of said taper forming means, said connecting means being substantially identical.

3,970,974

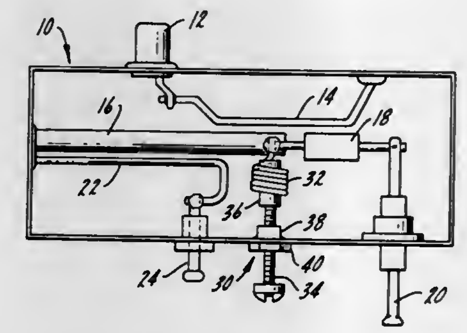
TRIMMER FOR A TUNED UHF LINE

Elmer Bastian, Union, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Continuation of Ser. No. 307,929, Nov. 20, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,782

Int. Cl.² H03J *3/20*

U.S. Cl. 334—45 **6 Claims**



1. In a UHF tuner, a chassis, at least two cavities in the chassis, shields between said cavities, one of said cavities including an antenna resonator, another of said cavities including mutually coupled RF amplifier and mixer resonators, a shield between said mutually coupled RF amplifier and mixer resonators, a trimmer capacitor having minimum capacity near the upper end of the UHF band in each of said cavities having a resonator, said trimmer capacitor including a fixed electrode connected to said resonator and formed from a plurality of helically arranged insulated turns of wire, an insulating sleeve mounted inside said turns of wire and defining a central passage, a movable electrode positioned to move in and out of the central passage of said fixed electrode, and support means for said movable electrode.

3,970,975

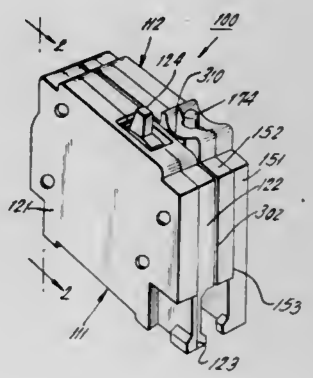
GROUND FAULT CIRCUIT BREAKER WITH GROUND FAULT TRIP INDICATOR

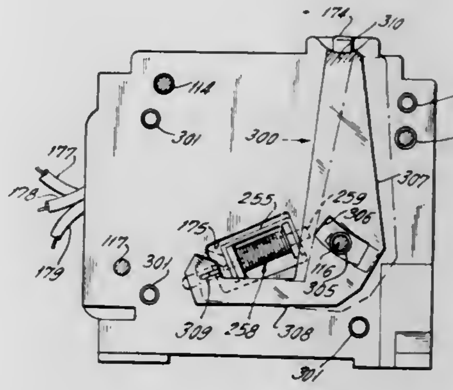
Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed May 5, 1975, Ser. No. 574,596

Int. Cl.² H01H *83/02*

U.S. Cl. 335—18 **10 Claims**





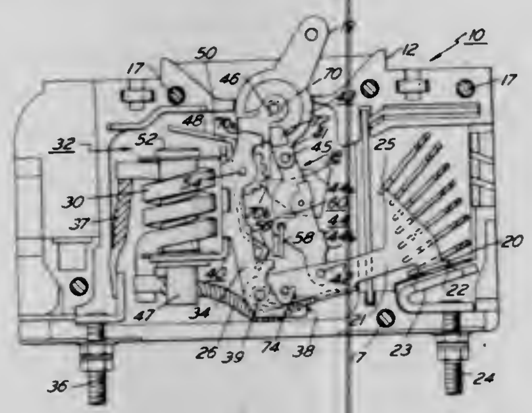
1. Electrical protective equipment comprising a circuit breaker including a set of cooperating contacts, an operating means connected to said set of contacts and including an operating handle and a latchable member, latch means for maintaining said latchable member in latched position wherin said operating means through manual operation of said handle is effective to open and close said set of contacts, overload sensing means for actuating said operating means to open said contacts by automatically operating said latch means to release said latchable member upon the occurrence of predetermined overload conditions; fault responsive means including a fault detecting means and an electromagnet energized by said fault detecting means upon the occurrence of predetermined fault conditions; said electromagnet including a relatively stationary magnetic yoke and an armature movable relative to said yoke; trip means operated by said armature means upon energization of said electromagnet to move said latch means and thereby release said latchable member whereby said operating means opens said set of contacts; indicator means operated by said armature means upon energization of said electromagnet to move said indicator means from a retracted to an indicating position wherein an indicating portion thereof is readily viewable to indicate that said predetermined fault condition has occurred.

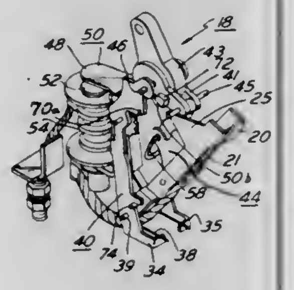
3,970,976
CIRCUIT BREAKER WITH CENTER TRIP POSITION
Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Filed Apr. 4, 1975, Ser. No. 565,271

Int. Cl.² H01H *73/00, 75/00*

U.S. Cl. 335—21 **8 Claims**





1. A circuit breaker comprising
a case,
a stationary contact mounted within said case,
a movable contact within said case and movable into and out of engagement with said stationary contact,
a collapsible and automatically resettable mechanism for manually opening and closing said contacts and for electrically tripping "open" said contacts on predetermined conditions comprising
an operator pivotally mounted within said case,
a collapsible and automatically relatchable linkage for interconnecting said operator and said movable contact, and
means for collapsing said collapsible and automatically relatchable linkage upon predetermined electrical overloads to move said contacts from the contacts "closed" position to the contacts "open" position,
restraining means movable as part of said mechanism upon electrical tripping "open" of said contacts to a position for restraining said operator in a position intermediate the "open" and "closed" positions of said operator to defeat said collapsible and automatically relatchable linkage, whereby said operator is maintained in a position intermediate the "open" and "closed" positions of said contacts upon electrical tripping of said contacts and said collapsible and automatically relatchable linkage is prevented from automatically relatching until the restraint is removed.

3,970,977
ARRANGEMENT FOR MOUNTING THE NON-SWITCHING MAGNET PART
Günther Weissberger, Riedenburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

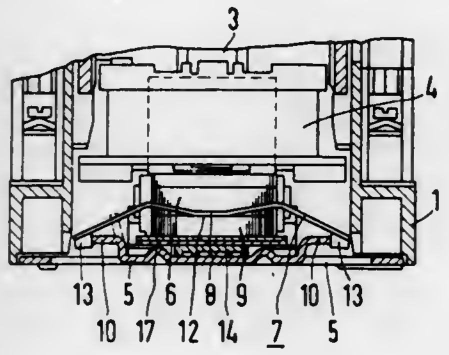
Filed Feb. 26, 1975, Ser. No. 553,137

Claims priority, application Germany, Mar. 11, 1974, 2411539

Int. Cl.² H01H *50/04*

U.S. Cl. 335—132 **10 Claims**

1. Apparatus for use in the elastic, resilient mounting of a non-switching magnet part of an electromagnetic switching device to the base plate thereof and in the direction of the magnetic force thereof comprising:
a ring-shaped leaf spring which is closed in itself;
at least two contact areas provided on said magnet part upon which a first side of said spring rests;



and members fixed relative to the housing of said device which provide two further contact areas upon which the side of said spring opposite said first side rests.

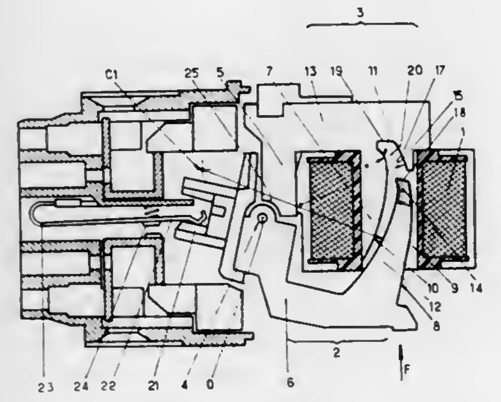
3,970,978
ELECTROMAGNET
Michel Langree, Poitiers, France, assignor to La Telemecanique Electrique, France

Filed Jan. 3, 1975, Ser. No. 538,384

Claims priority, application France, Jan. 31, 1974, 74.03255

Int. Cl.² H01H *50/18*

U.S. Cl. 335—203 **5 Claims**



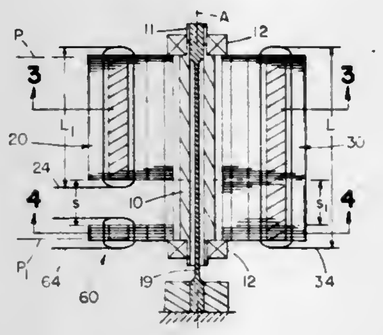
1. An electromagnet constituted by (i) a coil the inner zone of which has a certain axial length, and (ii) a magnetic structure, said magnetic structure comprising (a) a fixed core in the form of a "U" having a base joining a first fixed arm placed externally of the coil, and a second fixed arm having a convex external surface disposed over substantially the whole of its length, in the interior of the coil, and (b) a movable armature in the form of a "U" having a first movable arm of which one end mounted on a pivot is associated with the first fixed arm by a small air gap and a second movable arm having a first internal curved surface which is spaced by a first variable air gap from the external curved surface of the second fixed arm, and of which the end is provided with a pole surface which is transverse with respect to said first variable air gap and which is spaced by a second variable air gap from a transverse fixed surface on an extension of the base, the said extension comprising an auxiliary concave surface disposed over a portion of its length within the coil and directed towards the external convex surface, the end of the second movable arm becoming disposed, when the coil is energised, in a space between the curved external surface of the second fixed arm, the auxiliary concave surface and the transverse fixed surface, the magnetic attraction of the said end becoming effective when it is engaged substantially half way into said space.

3,970,979
LIMITED ROTATION MOTOR WITH VELOCITY SENSING SYSTEM
Jean I. Montagu, Brookline, Mass., assignor to General Scanning Inc., Watertown, Mass.

Filed July 2, 1975, Ser. No. 592,620

Int. Cl.² H01F *7/14*

U.S. Cl. 335—229 **9 Claims**



1. In a limited rotation motor comprising:
a rotor which is elongated in the direction of its axis of rotation and has faces for interaction with stator faces,
magnet means extending lengthwise of the rotor and adapted to produce bias flux,
stator means extending lengthwise of the rotor constructed to conduct said bias flux between stator faces, thereby to complete with said rotor a magnetic circuit for said bias flux,
a drive system comprising a plurality of drive structures extending lengthwise of the rotor, each comprising a drive coil for producing drive flux and a stator constructed to conduct said drive flux between stator faces thereby to complete with said rotor magnetic circuits for said drive flux,
the rotor adapted to be driven by interaction of said drive and bias fluxes;
the improvement wherein:
one of said drive structures is shorter in axial dimension than another and
a velocity sensor structure is disposed on the same side of the rotor as said shorter drive structure and spaced axially therefrom,
said sensor structure comprising a discrete sensor stator associated with a sensing coil and constructed to conduct flux from a magnet means between sensor stator faces, thereby to complete with said rotor a magnetic circuit for said flux,
and said sensor coil disposed to receive an induced current in response to modulation of flux in the latter magnetic circuit caused by movement of said rotor,
whereby said sensor structure can be compactly arranged with said drive system and produce useful velocity information.

3,970,980
ROTARY ACTUATOR HAVING STATIONARY ARMATURE AND ROTARY FIELD
Victor Nelson, 10 Redwood Drive, Dix Hills, N.Y. 11746

Filed May 15, 1975, Ser. No. 577,720

Int. Cl.² H01F *7/08*

U.S. Cl. 335—253 **11 Claims**

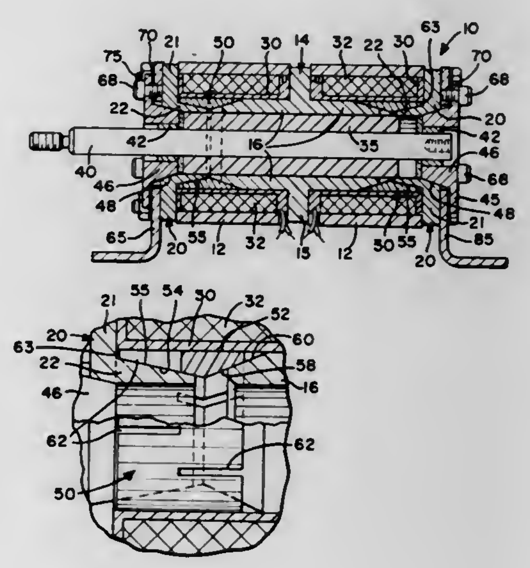
1. A rotary actuator comprising:
a stationary armature having a plurality of magnetic arms defining fixed poles angularly disposed with respect to each other;
a cylindrical rotor having a first and second cylindrically curved permanently magnetized field pole of opposite polarity circumferentially spaced apart and surrounding said armature;
a mechanical stop means for limiting the angular rotation of said rotor, said mechanical stop means comprising:
a first and second stop member fixed in position with respect to said rotor and spaced apart angularly; and
an arm means projecting from said rotor and arranged to contact said stop members and thereby end angular rotation of said rotor; and
a motive means connected to said armature for applying torque to said rotor thereby angularly rotating same whereby the application of torque to said rotor cause rotation of said rotor so that said arm means rotates from said first stop member through an angle whereby said first rotor field pole remains latched to one of said armature magnetic arms and when the torque is removed from said rotor, said rotor rotates toward said first stop member until said arm means contacts said first stop member and when the application of torque to said rotor is such that said rotor rotates through an angle whereby said first rotor field pole is latched to a second of said armature poles and when torque from said motive means is removed from said rotor said arm means will contact said second stop member.

3,970,981
ELECTRIC SOLENOID STRUCTURE
George T. Coors, Tipp City, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed May 8, 1975, Ser. No. 575,510

Int. Cl.² H01F *7/18*

U.S. Cl. 335—266 **2 Claims**



1. In a proportional type solenoid having a hub with a cylindrical extending portion and a base having an annular tapered portion, said hub and said base each being provided with a coaxial cylindrical opening therethrough, and means mounting a cylindrical armature for movement within said hub and said base portion, and in which said hub and base are magnetically, axially separated, the improvement for providing and assuring coaxial alignment of said hub and base comprising:
means on said hub cylindrical portion defining an external taper at the end thereof adjacent said base portion, and
an annular alignment piece formed of non-magnetic material provided with a pair of internal tapers which are proportioned respectively to mate with the external tapers of siad base and hub portions and having an outside diameter which is substantially coincidental with the outside diameter of said hub, to maintain said hub in coaxial alignment with said base.

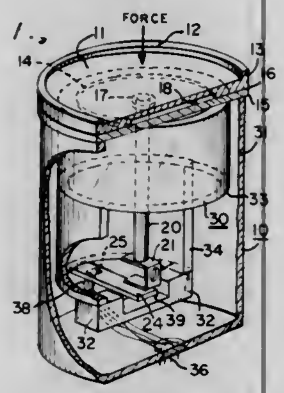
3,970,982
BEAM TYPE TRANSDUCERS EMPLOYING ACCURATE, INTEGRAL FORCE LIMITING

Anthony D. Kurtz, Englewood; Joseph R. Mallon, Alpine; Amnon Brosh, Demarest, and James William Bice, Wayne, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed July 7, 1975, Ser. No. 593,631

Int. Cl.² G01L ***1/22***

U.S. Cl. 338—4 **18 Claims**



1. In a beam type transducer of the type employing a deflectable beam having positioned on a surface thereof, at least one force responsive element, in combination therewith means for transmitting a force to said beam employing means for accurately stopping said beam for all forces in excess of a predetermined force, comprising:

a. a silicon member having a central shallow depression on a surface thereof, said depression being of a predetermined depth selected according to said predetermined force,

b. a glass cover member having a central aperture of a given dimension coupled to said silicon member to cover said depression,

c. a rod having one end coupled to said silicon member within said depression and extending through said central aperture in said glass with said other end coupled to said beam for deflecting the same upon application of a force to said silcon member, such that all forces in excess of said predetermined force cause said silicon member to impinge upon said glass and thus stopping said silicon member and said rod coupled thereto according to the depth of said depression.

3,970,983
RESISTOR WITH LOW TEMPERATURE COEFFICIENT

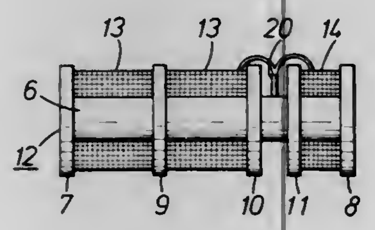
Isao Hayasaka, Kounosu, Japan, assignor to Takeda Riken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1975, Ser. No. 544,451

Claims priority, application Japan, Jan. 30, 1974, 49-12457

Int. Cl.² H01C ***7/06***

U.S. Cl. 338—9 **5 Claims**



1. A resistor having a low thermal coefficient comprising a main wire resistor having a thermal coefficient of α_1, and an auxiliary resistor having a value of resistance less than that of said main resistor connected in series with the main wire resistor, said auxiliary resistor having a thermal coefficient of α_2 which is of opposite sign to that of α_1, the resistance value of said auxiliary resistor being $R_0\ \alpha_1/\alpha_2$, where R_0 represents the composite series resistance of the main wire resistor and the auxiliary resistor, and where the ratio α_1/α_2 does not exceed 0.01.

3,970,984
SWITCH HAVING HEMISPHERICAL PIVOTAL COVER ACTUATOR FOR MOVABLE LEVER CONTACT MEMBER

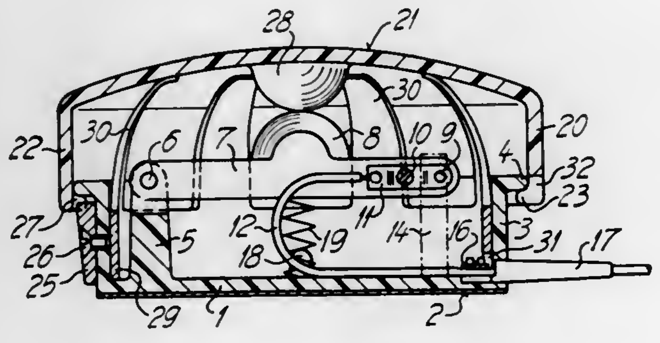
Manfred Grubenmann, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik, Switzerland

Filed Dec. 16, 1974, Ser. No. 533,210

Claims priority, application Switzerland, Jan. 10, 1974, 274/74

Int. Cl.² H01C ***10/30;*** **H01H** ***3/14***

U.S. Cl. 338—153 **8 Claims**



7. A foot control operated rheostat, comprising the fixed support base, a spring member having an annular base for the plurality of upstanding hemispherical curved wall portions, each wall portion terminating in tops which are spaced apart to leave a central opening, a generally hemispherically formed cover foot actuator member overlying said spring and having a hemispherical portion centered within the tops of said spring, the lever contact member having one end pivotally supported on said support base and having an opposite movable contact end, electrically conductive contact insulatably supported on said lever member contact end, said lever member having an intermediate portion with a hemispherical part cooperatively engaged with the hemispherical portion of said cover and cooperating with said spring to provide a universal support for said cover, an upstanding fixed contact member arranged alongside said movable contact end and engageable with said electrically conductive contact, spring means urging said lever member to an inoperative position, said lever member being movable by depression of said cover member to advance said movable contact along said fixed contact.

8. A switch construction according to claim 7, wherein said fixed contact comprises a variable resistance element, said movable contact being advanceable along said element for changing the setting thereof.

3,970,985
LINEAL CONTROLLED RESISTANCE DEVICE

William S. Sage, 1922 Grovehaven, Memphis, Tenn. 38116

Filed July 30, 1975, Ser. No. 600,439

Int. Cl.² H01C ***10/32***

U.S. Cl. 338—162 **10 Claims**

1. Linear controlled resistance means for controlling the amount of resistance in an electric circuit, said resistance means comprising:

a. body means;

b. guide rod means fixedly attached to said body means;

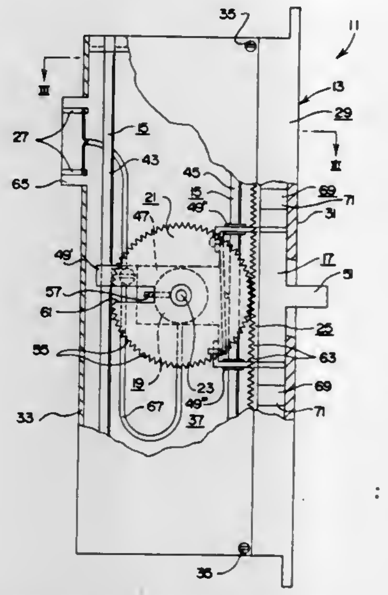
c. carriage means slidably mounted on said guide rod means;

d. variable resistor means fixedly attached to said carriage means, said variable resistor means including a shaft for allowing the resistance of said variable resistor means to be varied by rotary movement thereof;

e. a pinion gear fixedly attached to said shaft of said variable resistor means;

f. a rack gear fixedly attached to said body means in engagement with said pinion gear whereby manual linear movement of said carriage means back and forth upon said guide rod means will cause rotary movement of said shaft of said variable resistor means thereby varying the resistance of said variable resistor means; and

g. terminal means attached to said variable resistor means for connecting said variable resistor means to the electric circuit.



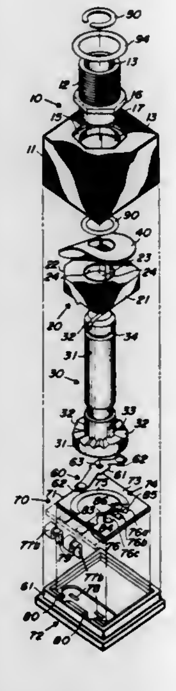
3,970,986
THICK FILM ROTARY SWITCH

Gerard Seyler, Des Plaines, and Kenneth J. Roback, Niles, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 30, 1975, Ser. No. 545,456

Int. Cl.² H01C ***10/00, 10/06***

U.S. Cl. 338—171 **18 Claims**



1. An electrical switch comprising

a housing having a central aperture therethrough and having a shaped, recessed opening at one end,

a thrust plate having

a central aperture therethrough, and

a shaped exterior cross section,

the thrust plate being mounted within the recessed opening of the housing for limited axial movement therein, the shaped recessed opening of the housing and the shaped exterior cross section of the thrust plate cooperating to prevent rotational movement of the thrust plate relative to the housing,

a rotor rotatably mounted within the housing having

a shaft at one end extending outwardly of the switch through the central aperture of the housing and thrust plate and adapted for imparting rotational movement to the rotor, and

an enlarged base at the other end,

indexing means formed between the thrust plate and rotor base for positioning the rotor in a predetermined position within the arc of rotation of the rotor,

means for axially biasing the indexing means into engagement,

means securing the shaft to the housing,

contact means secured to the base of the rotor for rotation therewith and electrically isolated therefrom, and

an end plate secured to the recessed opening of the housing for closing the end thereof and having interior and exterior surfaces, electrical circuit elements mounted on the interior surface electrically isolated therefrom and terminating in a pair of output terminals extending outwardly of the housing,

the electrical circuit elements being predeterminedly arranged in a geometric configuration having portions in alignment with the contact means for selectively being contacted by the contact means in relation to the selected rotational position of the rotor to complete the electrical circuit between the output terminals,

the contacting means being of continuous conductive material for shunting non-selected portions of the circuit elements,

whereby selected portions of the electrical circuit elements are electrically connected between the output terminals.

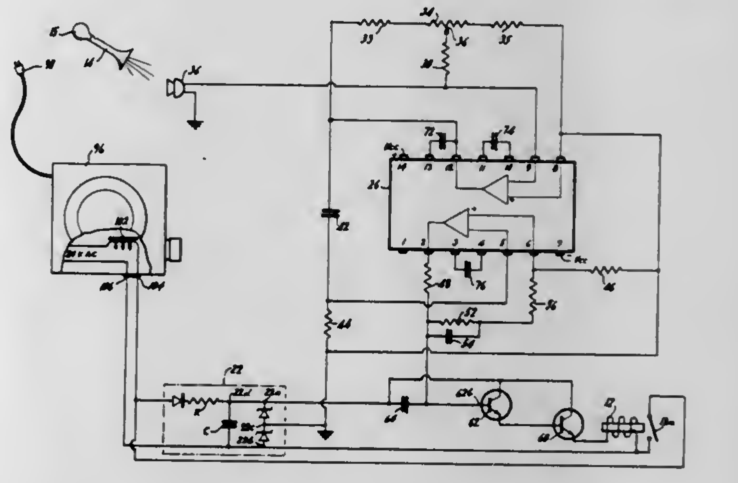
3,970,987
ACOUSTICAL SWITCH

Eric A. Kolm, Brookline, Mass., assignor to Signal Science, Inc., Holliston, Mass.

Continuation of Ser. No. 281,420, Aug. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 225,230, Feb. 10, 1972, abandoned. This application May 31, 1974, Ser. No. 474,875

Int. Cl.² H04B ***11/00***

U.S. Cl. 340—15 **18 Claims**



1. An acoustical switch comprising

A. an acoustical transducer for converting sounds into AC signals,

B. an amplifying circuit connected to amplify a selected band of AC signals received from said transducer in the upper audible or ultrasonic frequency range,

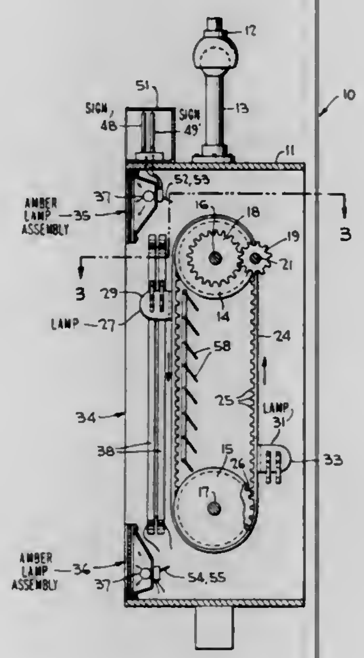
C. means for connecting said switch to a power source, and

D. a switching circuit

1. operative in response to the AC output of said amplifying circuit, and
2. arranged to alternately connect said power source to and disconnect it from an appliance upon the occurrence of successive outputs from said transducer, said switching circuit including

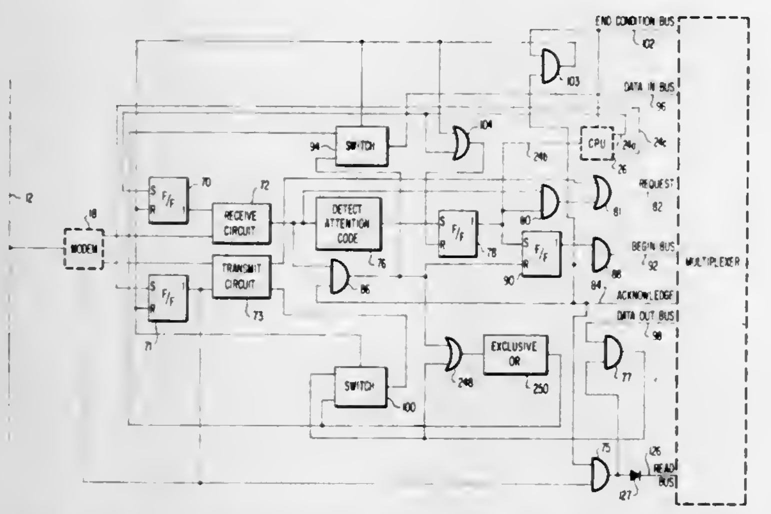
- a. an operational amplifier,
- b. means for applying the AC signal to one input of the amplifier,
- c. means for coupling the output voltage of the amplifier to another input thereof so that the output voltage tends to fluctuate with the a.c. signal, and
- d. means associated with the amplifier for temporarily desensitizing the switching circuit during selected half-cycles of the AC signal so that the amplifier output voltage remains substantially at the value it first changed to on commencement of the AC signal.

3,970,988
CONVEYOR-TYPE TRAFFIC SIGNAL DEVICE
Ralph W. Gilmore, P.O. Box 426, Brundidge, Ala. 36010
Filed May 15, 1975, Ser. No. 577,861
Int. Cl.^{2} G08G *1/00*
U.S. Cl. 340—43 **5 Claims**



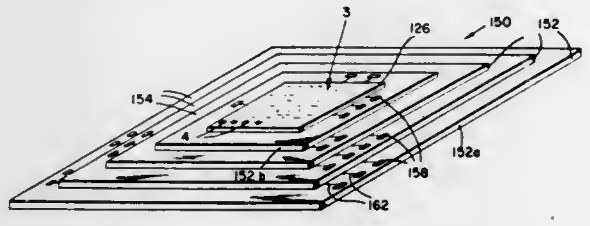
1. A traffic signal device capable of being suspended from an overhead support, comprising:
- a casing having an opening at a front side thereof;
- upper and lower vertically spaced sprocket wheels mounted in said casing for rotation about horizontal axes;
- an endless belt mounted about said sprocket wheels for movement during rotation thereof;
- a red colored and a green colored traffic lamp fixedly mounted on said belt;
- said lamps being disposed on said belt at equal distances apart;
- an amber lighted traffic lamp fixedly mounted on said casing above and adjacent said upper sprocket wheel, and another amber lighted traffic lamp fixedly mounted on said casing below and adjacent said lower sprocket wheel, said amber traffic lamps facing toward said front side of said casing and respectively defining upper and lower edges of said front side;
- electrical, elongated contact elements on said front side of said casing extending vertically between and slightly outwardly of the horizontal axes of said sprocket wheels;
- electric circuit means, said contact elements being connected to said means; and
- electric contact elements on each of said red colored and green colored lamps respectively disposed for contacting engagement with said elongated contact elements;
- whereby said red colored and green colored lamps are respectively lighted only upon downward movement between said sprocket wheels when their said contact elements are in contact with said elongated contact elements thereby permitting a viewer to readily observe the time remaining for a traffic light change.

3,970,989
DATA TRANSFER ERROR CHECK
David Ophir, Melville; Marvin Shapiro, Huntington, and Bruce Komusin, Middle Island, all of N.Y., assignors to Ontel Corporation, Plainview, N.Y.
Division of Ser. No. 448,759, March 6, 1974, Pat. No. 3,921,148. This application Mar. 6, 1975, Ser. No. 555,944
Int. Cl.^{2} G06F *11/10*
U.S. Cl. 340—146.1 AG **3 Claims**



1. In a method of transferring coded characters including in sequence at least one initial control character, a plurality of data characters, an end control character, and a true block check character wherein normally the true block check character is derived from the plurality of data characters and the end control character, the improvement comprising the steps of:
- a. forming a modified block check character from initial control characters, the data characters, the end control character and the true block check character;
- b. forming a compensating block check character from all transferred characters normally not included in the true block check character;
- c. combining the modified block check character with the compensating block check character; and
- d. generating an error signal in the event the result of step (c) indicates an incorrect transfer.

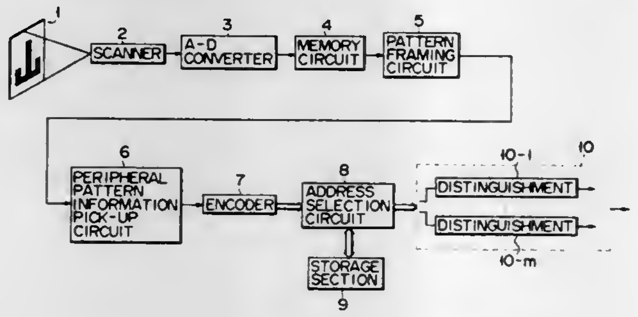
3,970,990
ADAPTIVE IMAGING SYSTEM
John C. Carson, Newport Beach, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Division of Ser. No. 265,144, June 22, 1972, Pat. No. 3,852,714. This application Nov. 11, 1974, Ser. No. 522,476
Int. Cl.^{2} G06K *9/00;* H01J *39/12*
U.S. Cl. 340—146.3 F **8 Claims**



1. A method for making sensor module for use in an adaptive imaging system comprising
- forming various patterns of metalized via holes in various wafers, and forming various patterns of conductors and coupling terminals on said wafers such that each said conductor extends from one of said via holes to one of said terminals;

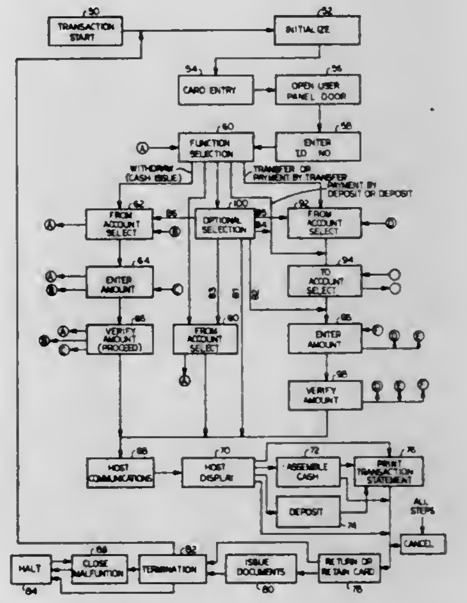
- stacking and cofiring said wafers with said via holes aligned to form a mesa structure with exposed shelves and with continuous vias of various lengths therein, said terminals being disposed along said exposed shelves;
- forming a pattern of metalized dots in, and a pattern of reference terminals and signal terminals on, a substrate, said reference terminals and said signal terminals being connected to respective dots;
- forming an array of electro-optic detectors on said substrate with each said detector connected at one end to a reference terminal and at its opposite end a signal terminal; and
- bonding said substrate to a surface of said mesa structure with said reference terminals and said signal terminals coupled to said vias through said dots.

3,970,991
CHARACTER RECOGNITION SYSTEM
Tsutomu Kawada, Yokohama; Kunio Sakai, Tokyo, and Kenichi Mori, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Nov. 6, 1974, Ser. No. 521,449
Claims priority, application Japan, Nov. 8, 1973, 48-124956
Int. Cl.^{2} G06K *9/12*
U.S. Cl. 340—146.3 AC **4 Claims**



1. A character recognition system for recognizing a character pattern on a character document having an actual character area including four peripheral sections corresponding to the respective four sides of the character pattern including character line portions and a blank area surrounding the actual character area comprising:
- scanning means for scanning the character documents to generate character pattern analogue signals;
- binary coding means for converting the character pattern signals from the scanning means into a plurality of character pattern digital signals including digital signals constituting four peripheral information units corresponding to the four peripheral sections, each of the four peripheral information units including at least one continuous digital signal train corresponding to the length of the character line portion;
- memory means for storing the character pattern binary coded digital signals obtained from the binary coding means;
- pattern framing means for framing the actual character area of the character document on the basis of the character pattern binary coded digital signals stored in the memory means;
- peripheral pattern information unit pick-up means for reading out from the memory means the four peripheral information units in accordance with the framing data from the character pattern framing means;
- length information detecting means for detecting the continuous digital signal train included in each of the four peripheral information units to code the digital signal train into a length information code;
- a storage section for storing a plurality of character groups each including a plurality of different characters;
- an address selection circuit addressing a corresponding character group to the character being recognized from the storage section in accordance with the four length information codes corresponding to the four peripheral information units; and
- recognizing means for recognizing the character being recognized from a plurality of different characters included in the detected character groups.

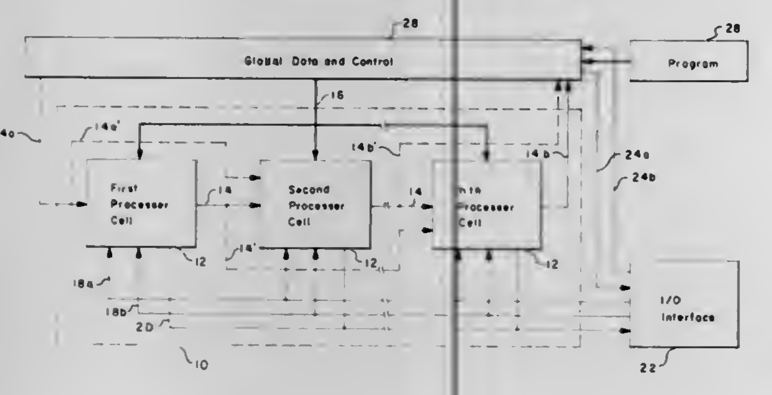
3,970,992
TRANSACTION TERMINAL WITH UNLIMITED RANGE OF FUNCTIONS
William A. Boothroyd, and Boyd W. Sorensen, both of San Jose, Calif., assignors to IBM Corporation, Armonk, N.Y.
Filed June 25, 1974, Ser. No. 483,058
Int. Cl.^{2} G06K *7/01;* H04Q *5/00*
U.S. Cl. 340—172.5 **20 Claims**



1. A transaction execution terminal comprising:
- a car handling subsystem which receives cards and reads information stored on received cards under control of a control subsystem;
- a selectively variable display operating under control of a control subsystem and displaying information commanded by a control subsystem;
- a user keyboard having keys arranged in a plurality of keyboard fields with each keyboard field being related to a predetermined category of user transaction request information and including a plurality of keys each defining different mutually exclusive information states for the cetegory of user transaction request information to which the field relates, one key within at least one field being a variable information state key, the activation of which indicates that the information state indicated thereby is to be determined by a combination of at least one subsequent keyboard key activation in conjunction with a predeteremined schecule correlating key activation combinations with information states; and
- a control subsystem which controls the operation of the card handling subsystem and receives account card information therefrom, which commands the display of information on the variable display to aid a terminal user in the use of the terminal, and which receives keyboard key activtion information in a predetermined sequence requiring one information state indication from each of a plurality of successive keyboard fields.

3,970,993
COOPERATIVE-WORD LINEAR ARRAY PARALLEL PROCESSOR

Charles A. Finnila, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Jan. 2, 1974, Ser. No. 430,304
Int. Cl.^{2} G06F *15/16*
U.S. Cl. 340—172.5 **17 Claims**



1. In an array processor having a chaining channel for connection of individual processing cells into a linear processing array:

a data storage register in each of said processing cells for storing data for processing by said cell;

chaining channel input means in each of said processing cells for receiving signals from a preceding cell;

chaining channel output means in each of said processing cells for providing output signals to a succeeding processing cell;

control source for generating a plurality of control signals;

a plurality of flag flip-flops in each of said processing cells for storing flag data in response to said control source, said flag data including data representative of three mutually exclusive data transfer operations;

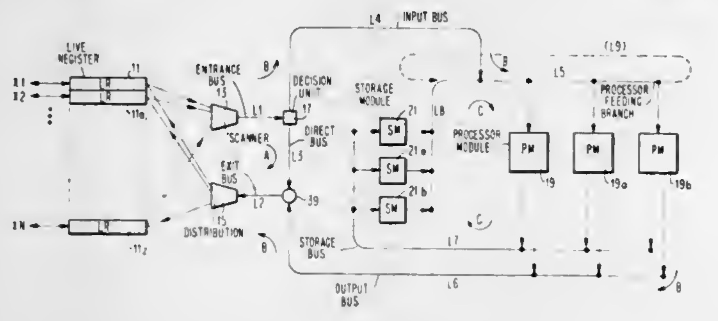
first gating means in each of said cells coupling said chaining channel input means and said chaining channel output means, said first gating means for decoding said flag data representative of said first data transfer operation and for enabling said cell to transfer data from said chaining channel input means to said chaining channel output means in response to a first control signal from said control souce;

second gating means in each of said processing cells coupling said chaining channel input means, said data storage register and said chaining channel output means, said second gating means for decoding said flag data representative of said second data transfer operation and for enabling said cell to transfer data simultaneously from said chaining channel input means to said data storage register and for enabling data transfer from said data storage register to said chaining channel output means in response to said first control signal from said control source; and

third gating means in each of said processing cells coupling said chaining channel input means, said first flag flip-flops and said chaining channel output means, said third gating means for decoding said flag data representative of said third data transfer operation and for enabling said cell to transfer data from said chaining channel input means to said first flag flip-flop and for enabling data transfer from said first flag flip-flop to said chaining channel output means in response to said first control signal from said control source.

3,970,994
COMMUNICATION SWITCHING SYSTEM

Christian Jakob Jenny, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 28, 1974, Ser. No. 447,177
Claims priority, application Switzerland, Mar. 21, 1973, 4095/73
Int. Cl.^{2} G06F *15/16;* **H04J** *3/02;* **H04Q** *3/42, 3/64*
U.S. Cl. 340—172.5 **11 Claims**



1. A modular communication switching system with distributive controls for frame processing comprising:

a plurality of line registers each having the capacity to store at least one frame, each of said line registers being associated with a particular communication line to be connected;

a scanning means connected to said line registers for sequentially extracting frames from said line registers and transferring said frames to an entrance bus;

a decision means connected to said entrance bus for transferring said frames to an input bus depending on the value of a particular indicator bit in said frames, said input bus being connected to a processor feeding bus;

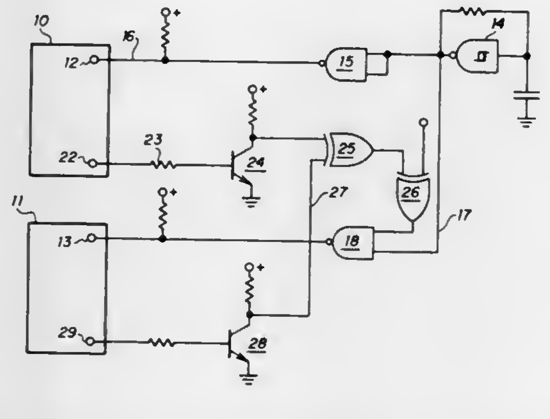
a plurality of identical processor modules connected in parallel to said processor feeding bus enabling said frames to sequentially interrogate the inputs of said processor modules, each module accepting one of said frames for processing when said processor module does not contain a frame, and after processing, transferring a processed frame to an output bus;

interfacing means connected to said output bus for transferring said frame from said output bus to an exit bus; and

a distributor means connected to said exit bus for sequentially forwarding said frames back to said line registers for distribution to said communication lines.

3,970,995
SLAVING CALCULATOR CHIPS

Daniel Adrian Baudouin, Houston, Tex., and John R. Dumas, Tempe, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 27, 1974, Ser. No. 446,176
Int. Cl.^{2} G06F *11/00*
U.S. Cl. 340—172.5 **7 Claims**



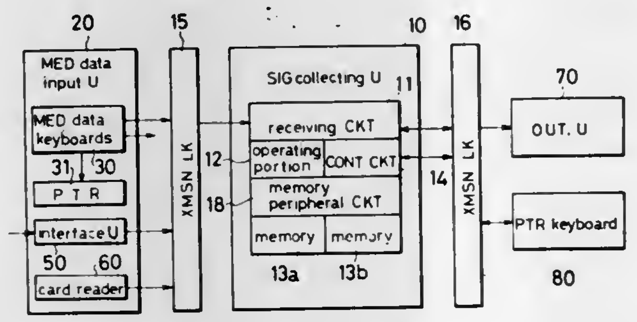
1. In an electronic system implemented on semiconductor chips where it is desired to operate in synchronism more than one chip in the system where at least one element common to the operation of both or all chips is responsive to sequentially generated operating states, the combination which comprises:

a master clock for applying clock pulses to the clock input terminals of said chips,

means connected to selected operating state output terminals from both or all of said chips for inhibiting flow of clock signals to one of the chips so long as said selected operating states differ.

3,970,996
APPARATUS FOR COLLECTING MEDICAL DATA

Toshio Yasaka; Ryuzo Ito, and Sadao Takagi, all of Tondabayashi, Japan, assignors to Perfect Liberty, Japan
Filed Jan. 7, 1974, Ser. No. 431,232
Claims priority, application Japan, Feb. 28, 1973, 48-23233
Int. Cl.^{2} G06F *3/02, 3/04, 3/12*
U.S. Cl. 340—172.5 **3 Claims**



1. Apparatus for collecting medical data comprising,

a plurality of medical data input units each including a medical data keyboard with keys that can be set to establish desired medical tests, each of said input units including an identification card reader for receiving a patient identification means and including locking means for holding said identification means until a release signal is received,

a plurality of patient test stations electrically connected to each of said medical data input unit to collect medical data from the patient whose identification means has been placed into said card reader,

a central signal collecting and processing unit including a receiving circuit electrically connected to each of said plurality of medical data input units and including an identification register electrically connected to each of said identification card readers of said input units,

a data comparison circuit connected to said identification register and comparing the information from said patient identification means with the desired patients identification and electrically connected to said input units to produce an enable signal or an identification error signal,

an error indicator at each of said input units connected to said data comparison circuit,

a control circuit in said processing unit connected to said receiving circuit,

a plurality of memory cells in said processing unit and connected to said control circuit and said receiving circuit so as to store medical test data from said patient test stations,

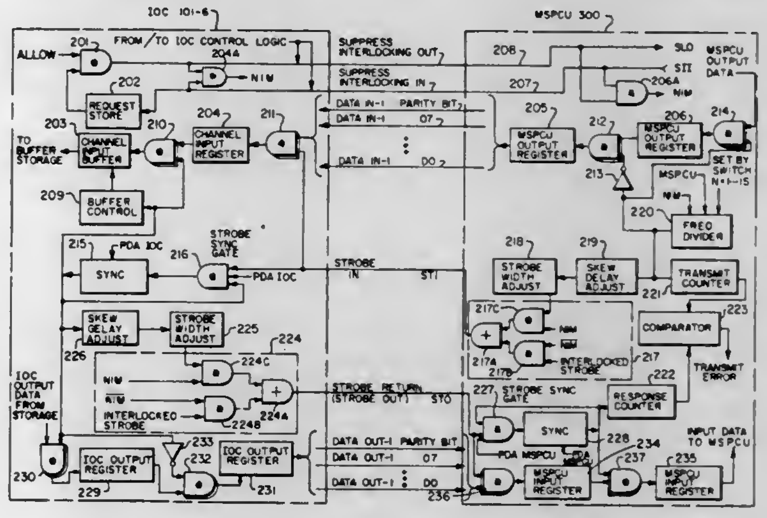
an end of test signal generator in said processing unit connected to said medical data input units and supplying an electrical signal to said card reader locking means to release said identification means at the end of medical tests,

data output means connected to said processing means, and

said control circuit connecting said memory cells to said output means to supply medical and identification data thereto which is reproduced by said output means.

3,970,997
HIGH SPEED PERIPHERAL SYSTEM INTERFACE

Robert M. Daly, Westford; John E. Mekota, Jr., Belmont, and Gary J. Goss, Acton, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Aug. 29, 1974, Ser. No. 501,583
Int. Cl.^{2} G06F *3/00*
U.S. Cl. 340—172.5 **16 Claims**



1. An improved demand response interface in which a data processing unit is capable of demanding the transfer of information up to a maximum asynchronous byte transfer rate from another unit by energizing a demand line connecting the two units and in which each data byte is transferred to said data processing unit in synchronization with the energization of a response line connecting the two units and energizable by said another unit and wherein the receipt of each data byte is signalled by said data processing unit by de-energizing said demand line, said interface further including apparatus for enabling said interface for exceeding said maximum asynchronous byte transfer rate, said apparatus comprising:

at least first and second control lines connecting said data processing unit and said another unit;

first means included in said another unit and connected to said first line, to said demand line and to said response line, said first means including means for generating a first control signal on said first control line requesting that data bytes are to be transferred at a rate greater than said maximum asynchronous rate;

second means included in said data processing unit and connected to said second lines, to said response line and to said demand line, said second means being responsive to said first control signal to generate a second control signal on said second control line signalling allowance of byte transfer at said rate greater than said maximum asynchronous rate; and,

enabling means included in each of said units and connected to said first and second control lines and to said first and second means, each said enabling means being jointly responsive to said first and second signals for generating a signal enabling said first and second means of said units to transfer data bytes across said interface at said rate greater than said maximum asynchronous rate by applying signals to said demand and response lines.

3,970,998
MICROPROCESSOR ARCHITECTURE

Joseph A. Weisbecker, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Oct. 15, 1974, Ser. No. 514,937
Int. Cl.^{2} G06F *15/20*
U.S. Cl. 340—172.5 **4 Claims**

1. A microprocessor architecture comprising, in combination:

first bus means for providing external device addresses;

second bus means for providing data signals to, and accepting data signals from external devices;

first register means for receiving and storing a control word from the second bus;

control means responsive to the word stored in said first register means for providing a sequence of control signals to execute a predetermined operation indicated by the word in said first register means;

word storage means for storing a plurality of words, including input means, output means, and decoding means for decoding a plurality of signals to address one of said plurality of words to be read out to said output means in response to one of said control signals and to address the location at which a word is to be stored from said input means in response to another one of said control signals;

means responsive to one of said control signals for coupling said second bus means to the input means of said word storage means;

second register means for storing a word from the output means of said word storage means in response to one of said control signals;

modification means responsive to one of said control signals and to the contents of said second register for changing the value of the word stored in said second register including means for coupling said modification means to the input means of said word storage means;

means responsive to one of said control signals for coupling said second register means to said first bus means;

third, fourth, and fifth register means, each having input means and output means, coupled to receive signals from said second bus means for selectively supplying said plurality of signals to the decoding means of said word storage means in response to one of said control signals;

sixth register means responsive to one of said control signals for receiving and storing the contents of said third and fourth register means;

means responsive to one of said control signals for coupling said sixth register means to said second bus means; and

means responsive to one of said control signals for coupling the output means of said fifth register means to said second bus means.

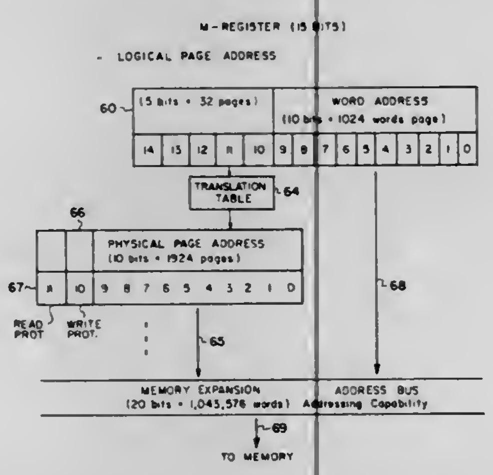
3,970,999
MEMORY EXPANSION APPARATUS

John S. Elward, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 24, 1975, Ser. No. 561,470

Int. Cl.² G06F *9/20*

U.S. Cl. 340—172.5 **11 Claims**



1. An apparatus for translating a logical memory address, each having a logical page address portion and a word address portion, from a central processing unit into a physical memory address, having a physical page address portion and the word address portion, said apparatus comprising:

a plurality of translating means having enabled and disabled states for providing the physical page address portion of the physical memory address in response to the logical page address portion of the logical memory address; and

an enabling and addressing circuit coupled to the central processing unit for receiving command signals and the logical page address portion of the logical memory address therefrom, and coupled to the translating means for providing control signals and the logical page address portion of the logical memory address thereto, said enabling and addressing circuit including a state circuit for storing electrical signals representing the present state of said translating means whenever that state is altered to a new state by said command signals, said electrical signals being useful for subsequently restoring the translating means to the present state.

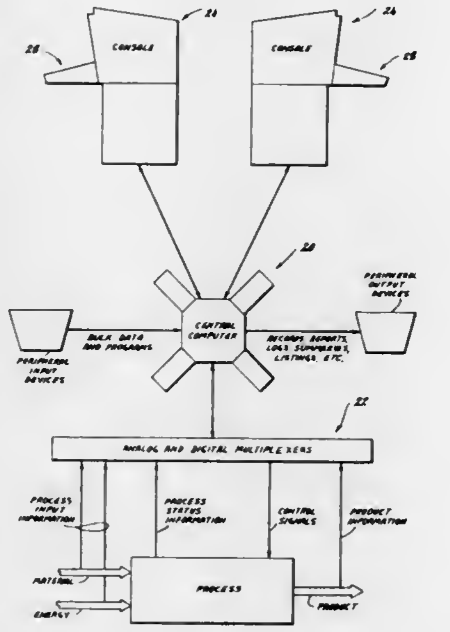
3,971,000
COMPUTER-DIRECTED PROCESS CONTROL SYSTEM WITH INTERACTIVE DISPLAY FUNCTIONS

Nicholas O. Cromwell, Sharon, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 481,180, June 20, 1974, which is a continuation of Ser. No. 419,444, Nov. 27, 1973, which is a continuation of Ser. No. 229,077, Feb. 24, 1972. This application Aug. 13, 1975, Ser. No. 604,092

Int. Cl.² G06F *3/14*

U.S. Cl. 340—172.5 **11 Claims**



24
26
CONSOLE
CONSOLE
28
28
20
CENTRAL COMPUTER
BULK DATA AND PROGRAMS
PERIPHERAL INPUT DEVICES
RECORDS REPORTS, LOGS SUMMARIES, LISTINGS, ETC.
PERIPHERAL OUTPUT DEVICES
22
ANALOG AND DIGITAL MULTIPLEXERS
PROCESS INPUT INFORMATION
PROCESS STATUS INFORMATION
CONTROL SIGNALS
PRODUCT INFORMATION
MATERIAL
ENERGY
PROCESS
PRODUCT

1. In an industrial process instrumentation system for use with complex processes having a number of variable process conditions such as temperature, flow rate, and the like, said system comprising:

data processor means arranged to receive signals representing the values of various process conditions, said processor means having data storage means with processor control data stored therein comprising programs and operational base data such as set-point values for performing sequential computations respecting said process conditions so as to produce corresponding output signals for use in controlling the process;

an operating console;

signal transmission means coupling said console to said data processor means to transmit signals thereto and receive signals therefrom;

display means forming part of said console for producing visual images in the form of symbols for inspection by an operator;

memory means storing data signals for controlling said display means, said memory means having a plurality of separate storage locations each adapted to store data signals for establishing the symbolic image in a corresponding position of said display means;

said storage means of said data processor means having data stored therein representing a plurality of sets of display data words to be transmitted over said signal transmission means to said memory means for storage therein to control said display means with each of said sets of display data words defining a respective display presentation symbolically presenting the present status of selected portions of said processor control data respecting at least one corresponding process condition for which computations are being performed by said data processor means and including as part of said presentation preselected symbols identifying display positions where characters may selectively be entered;

memory write in means responsive to said sets of display words received over said transmission means from said data processor means to store in said memory means data signals identifying the selected symbols to be displayed on said display means and stored in memory means storage locations corresponding to display positions where the symbols are to be displayed, thereby to present on said display means for operator inspection the display presentation corresponding to the selected set of display data words transmitted to said console;

manually-operable data entry means coupled to said memory means for inserting therein data signals representing symbols desired to be displayed on said display means;

said data entry means including means operable while any one of said display presentations is presented on said display means to enter into at least one predetermined location in said memory means as identified by at least one of said preselected symbols signals representing changed data for at least a part of said processor control data respecting a particular condition of said process about which information is then presented on said display means responsive to the set of display words received by said memory means from said data processor means, said entered data signal serving to develop a corresponding symbol on said display in a position corresponding to said predetermined location; and

manually-controllable read out means coupled to said memory means to direct said changed data signals entered by said data entry means into said predetermined location of said memory means to said transmission means for transmittal on to said data processor means to alter correspondingly said processor control data for said particular process condition thereby to alter correspondingly the subsequent computations respecting said particular condition, whereby the processing carried out by said processor means is readily controllable by data inserted by an operator into selected locations of said memory means as determined by symbolic information presented on said display means by signals from said central data processor.

3,971,001
REPROGRAMMABLE READ ONLY VARIABLE THRESHOLD TRANSISTOR MEMORY WITH ISOLATED ADDRESSING BUFFER

Robert J. Lodi, Tewksbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,723

Int. Cl.² G11C *5/06, 11/40*

U.S. Cl. 340—173 R **9 Claims**

1. A digital memory comprising

semiconductor substrate means,

an array of variable threshold field effect transistors formed on said substrate means,

each said variable threshold transistor having a source and a drain formed in said substrate means with a gate electrode therebetween insulated from said substrate means,

each said variable threshold transistor having a first conduction threshold established by applying a clearing potential to said gate electrode with respect to said substrate means and a second conduction threshold established by applying a writing potential to said gate electrode with respect to said substrate means, said clearing and writing potentials being of opposite polarity with respect to each other,

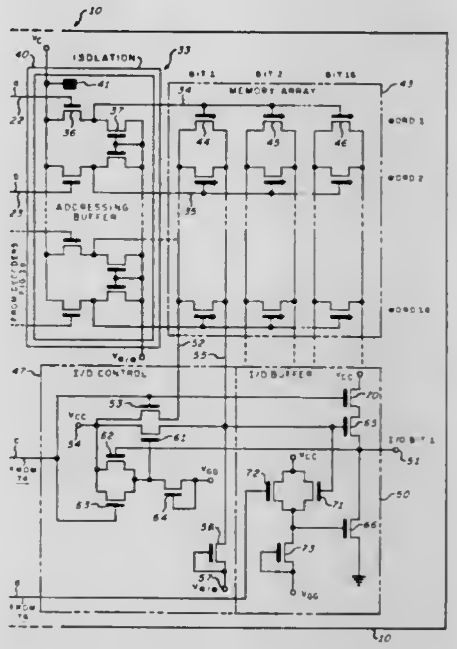
first terminal means for applying said clearing potential to said memory,

second terminal means for applying said writing potential to said memory,

third terminal means for applying addressing signals to said memory,

said addressing signals being coded for selection of predetermined groups of said variable threshold transistors,

address decoder circuit means having a plurality of decoder outputs and coupled to said third terminal means for selectively energizing said decoder outputs in accordance with said addressing signals,



address buffer circuit means coupled to said decoder outputs and including fixed threshold transistors coupling said first and second terminal means to said gate electrodes of said variable threshold transistors,

said fixed threshold transistors being formed in said substrate means whereby one of said clearing and writing potentials is of a polarity to be coupled to said substrate means through forward biased junctions of said fixed threshold transistors, and

isolation means surrounding said addressing buffer circuit means for electrically isolating the portion of said substrate means associated with said address buffer circuit means from the remainder of said substrate means whereby both said clearing and writing potentials can be established between said gate electrodes of said variable threshold transistors and said substrate means associated therewith.

3,971,002
DEVICE FOR THE OPTICAL READ-OUT OF A DIFFRACTIVE TRACK BELONGING TO A DATA CARRIER IN THE FORM OF A DISC OR TAPE

Claude Bricot, and Jean Claude Lehureau, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed June 26, 1974, Ser. No. 483,433

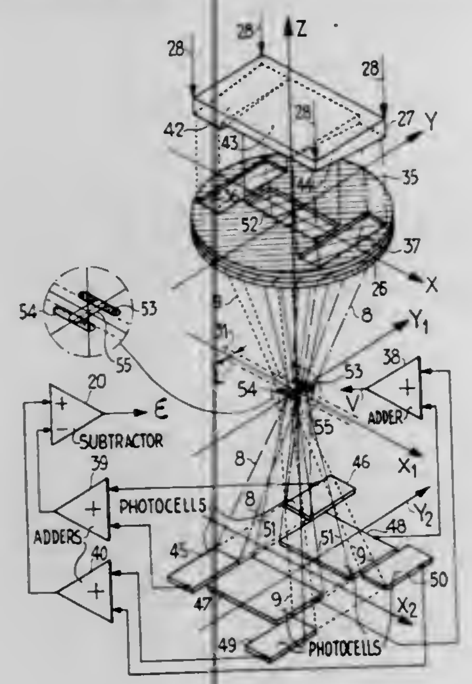
Claims priority, application France, June 29, 1973, 73.24004

Int. Cl.² G11C *7/00, 13/04;* **G11B** *21/10*

U.S. Cl. 340—173 LT **14 Claims**

1. An optical read-out device for the read-out of a data-carrier having a read-out surface wherein is formed a succession of diffractive elements building up a track of predetermined width, said optical read-out device including an optical read-out assembly comprising: a source of radiant energy for illuminating said read-out surface, optical projection means arranged between said source and said data-carrier for concen-

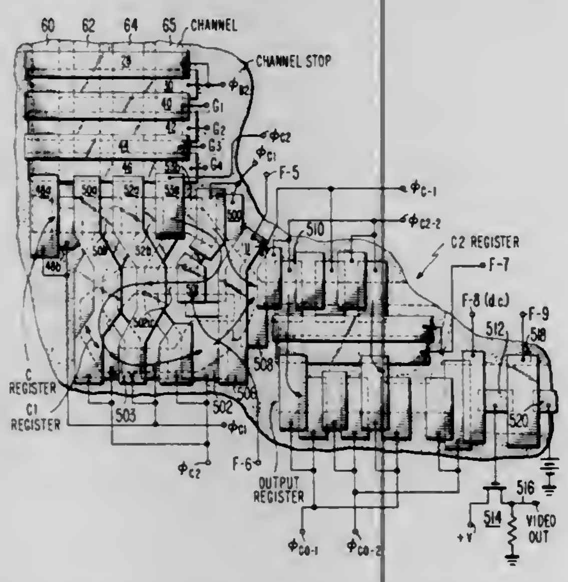
trating said radiant energy upon said read-out surface, and photoelectric means arranged for collecting radiant energy emerging from the portion of said read-out surface illuminated by said source; said optical projection means forming at said read-out surface two collateral read-out spots respectively formed by elementary beams supplied from said optical projection means; said read-out spots being aligned along an axis intersecting the longitudinal axis of said track for scanning said surface during the course of read-out over a width interval greater than said predetermined width; said photoelectric



means being subdivided into at least two groups respectively sensing any spread of said elementary beams arising from the scattering action of anyone of said diffractive elements; said photoelectric means being associated with subtractor means having two inputs respectively coupled to said groups; said optical projection means comprising lens means for focussing said radiant energy upon said read out surface and refringent means with plane major faces for imparting to at least one of said elementary beams a deviation separating said read out spots from one another in said read out surface.

3,971,003
CHARGE COUPLED DEVICE IMAGER

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 18, 1974, Ser. No. 524,829
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **8 Claims**



1. In a charge coupled imager having A and B registers with M channels extending in the column direction, and a C register which includes M charge storage sites generally aligned with said M channels, respectively, said register operated by a N phase voltage, the improvement comprising:

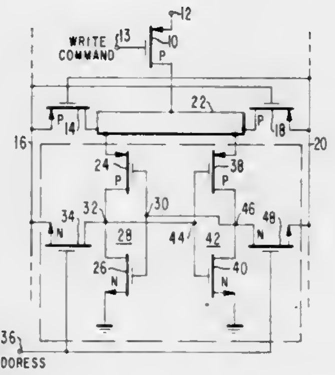
means coupling each channel of the B register to a different storage site in said C register, said means including during one portion of a row time, means for shifting 1/N'th of a row of charge signals into 1/N'th of said storage sites in said C register and during each following portion of the same row time, means for shifting 1/N'th of the remaining charge signals of said row into a different 1/N'th of said storage sites in said C register, until N/N parts of the row have been transferred;

means for reading out said C register comprising means for reading from the C register the one of the charge signals transferred from one of the 1/N'th parts of the row which is the first in position in that 1/N'th of a row followed by the first in position of the charge signals transferred from another 1/N'th part of the row, and so on until all N of the first in position charge signals have been read out, and for continuing the same process for the second through the M/N'th in position charge signals, until all NM/N = M charge signals have been read from the C register, whereby the row of charge signals read from the B to the C register is reconstructed during the readout of the C register; and

said means for shifting including electrode means between the last row of the B register and the C register, said electrode means comprising storage electrode means for temporarily storing the entire row of charge signals, and transfer electrode means for transferring during spaced time intervals, 1/N'th of said row from said storage electrode means to said C register and for providing a potential barrier between the remaining charge, if any, stored beneath said storage electrode means and said C register during the periods between said spaced time intervals.

3,971,004
MEMORY CELL WITH DECOUPLED SUPPLY VOLTAGE WHILE WRITING

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 13, 1975, Ser. No. 558,145
Int. Cl.² G11C *7/00, 11/42*
U.S. Cl. 340—173 FF **12 Claims**



8. Memory means having read and write modes comprising, in combination:

a terminal for a voltage at a given level;

a bus;

switch means connected between said bus and said terminal for connecting said bus to said terminal during said read mode;

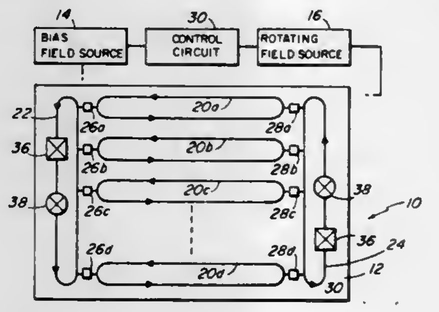
a memory cell having first and second states connected between said bus and a point of reference potential, said cell, when in said first state, exhibiting a low impedance between said bus and a first node of the cell and when in said second state, exhibiting a high impedance between said bus and node;

means for writing information into said cell thereby switching the cell from its first to its second state comprising means for connecting said first node through a first path having an impedance which is much higher than said low impedance and much lower than said high impedance to said point of reference potential and means for concurrently opening said switch means, whereby the voltage on said bus drops towards the reference potential level, said cell switching to said second state when the voltage on said bus reduces to a particular value; and

means for automatically supplying a voltage having a given level to said bus after the cell has switched state comprising a path between said bus and a point at a given voltage level, said path having an impedance which is much higher than that of said first path and which is much lower than the impedance of said cell between said bus and said point of reference potential when said cell has assumed either said first or said second state.

3,971,005
DUAL ACCESS MAGNETIC DOMAIN MEMORY

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Jan. 17, 1975, Ser. No. 541,898
Int. Cl.² G11C *11/14, 19/00*
U.S. Cl. 340—174 TF **8 Claims**



1. A cylindrical magnetic domain memory, comprising:

a. a domain sustaining platelet and bias magnetic field means for creating stable cylindrical magnetic domains in the platelet,

b. a domain propagation structure including a propagation track made of a layer of magnetic elements of a desired pattern and rotating magnetic field means for creating unidirectional motion of the domains along the track, the propagation track including a plurality of closed minor loops of equal domain capacity and first and second closed major loops of equal domain capacity,

the major loops having a domain bit length selected to accommodate a predetermined number of bits from each of the minor loops,

c. first and second transfer switch means connecting each minor loop to the first and second major loops respectively for transferring domains between the major and minor loops,

the length of the minor loops and the major loops and domain switch means being selected to provide domain position synchronization between the minor loops and each major loop for each full domain circulation around the major loop and

d. a domain detector, generator and annihilator disposed in each major loop.

3,971,006
MULTI DIRECTIONAL MOTION AND VIBRATION TRIGGERING DEVICE

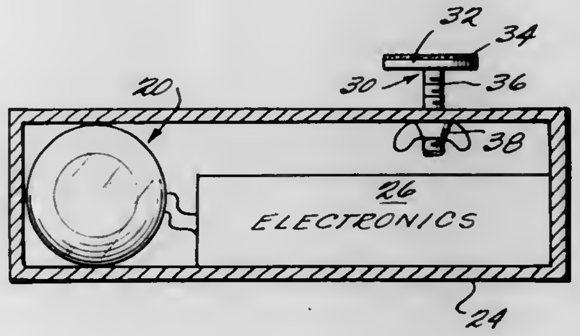
Palmer W. Pressly, Jr., 111 N. Burlingame Ave., Temple Terrace, Fla. 33617
Filed June 24, 1975, Ser. No. 590,011
Int. Cl.² G08B *13/08*
U.S. Cl. 340—224 **6 Claims**

1. A motion detector for producing a motion signal comprising:

switch means for producing said motion signal when shifted from a first to a second orientation with respect to a horizontal plane,

case means defining an interior space in which said switch means is mounted in a position fixed with respect to said case means

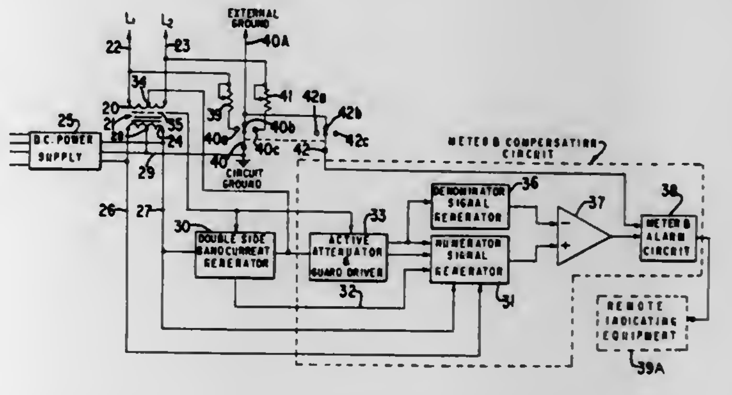
means mounted within said casing and connected to said switch means for transmitting a signal when said motion signal is produced and



means for pivotably mounting said case means to a fixed planer surface about an axis which passes through said interior space but does not pass through the center of gravity of said case means so that pivotable movement of said case means shifts said switch means from said first to said second orientation by an external force applied to said case means so that said switch means produces said motion signal.

3,971,007
LINE ISOLATION MONITOR

Henry S. Borkovitz, Skokie, and Wesley G. Peterson, Mount Prospect, both of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.
Continuation of Ser. No. 364,860, May 29, 1973. This application Mar. 27, 1975, Ser. No. 562,767
Int. Cl.² G08B *21/00*
U.S. Cl. 340—255 **6 Claims**


EXTERNAL GROUND
D.C. POWER SUPPLY
CIRCUIT GROUND
DOUBLE SIDE BANDCURRENT GENERATOR
ACTIVE ATTENUATOR & GUARD DRIVER
DENOMINATOR SIGNAL GENERATOR
NUMERATOR SIGNAL GENERATOR
METER & COMPENSATING CIRCUIT
METER & ALARM CIRCUIT
REMOTE INDICATING EQUIPMENT
39A

1. A line isolation monitor for sensing hazard current, said monitor being connected to power lines isolated from ground having a predetermined power line frequency, said monitor comprising a current generator for generating a first electrical signal, first means for applying said first electrical signal between said isolated power lines and ground, and means connected to said first means for generating a second electrical signal related to the phase angle of said sensed first electrical signal with reference to the power line and related to the amplitude of said sensed first electrical signal, wherein said second signal is proportional to the hazard current.

3,971,008
CRANE OVERLOAD DETECTOR USING A BOOM BENDING MOMENT DETECTOR

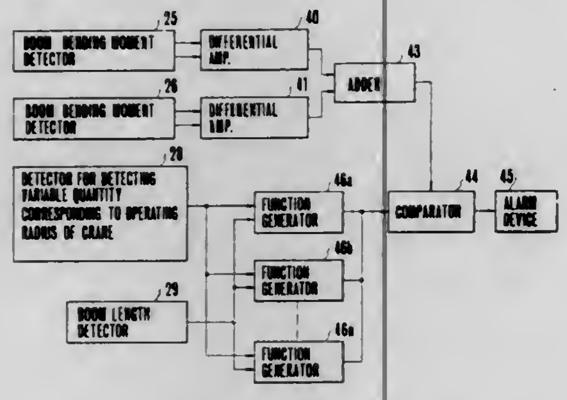
Hiroshi Nishizaki; Kanji Yonekura, both of Tamano, and Yuichi Tsuji, Tokyo, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1975, Ser. No. 555,179

Claims priority, application Japan, Mar. 5, 1974, 49-25254

Int. Cl.² G08B *21/00*

U.S. Cl. 340—267 C **10 Claims**



1. Apparatus for detecting overload of a crane having a boom for hanging loads, comprising a boom bending moment set value generator which is determined by a variable quantity corresponding to the operating radius of the crane, a pair of boom bending moment detectors mounted on said boom at two points spaced transversely symmetrical to a plane containing a longitudinal axis of said boom, means for producing a mean value of the outputs of said two detectors, a comparator for comparing the output of said boom bending moment set value generator with said mean value, and means operated by the output of said comparator which is produced when said mean value exceeds the output of said boom bending moment set value generator.

3,971,009
KEY RELEASE TYPE BURGLAR ALARM

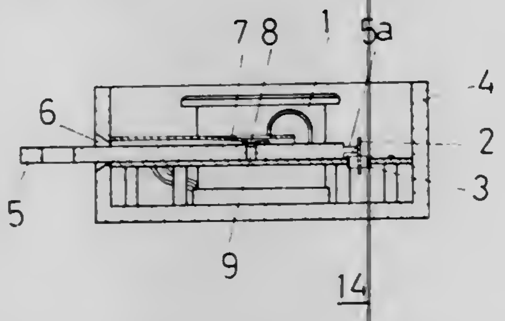
Akinobu Fujiwara, No. 593-38, Naganuma-cho, Hachioji, Tokyo, Japan

Filed Jan. 31, 1975, Ser. No. 546,122

Claims priority, application Japan, Sept. 17, 1974, 49-111859[U]

Int. Cl.² G08B *13/00*

U.S. Cl. 340—276 **4 Claims**



1. An electrical switching device for use in an alarm system circuit, said device comprising:

ring-like cylindrical element of electrically conductive material electrically connected to said alarm circuit;

contact means of electrically conductive material fitted through said cylindrical element and electrically connected to said alarm circuit for resiliently contacting the inside surface of said cylindrical element and forming a completed alarm circuit;

a key removably positioned against said contact means for forcing said contact means away from said inside surface of said cylindrical element and breaking said completed alarm circuit; and

retainer means adjacent said key for retaining said key in a predetermined position against said contact means, whereby the alarm circuit is held open.

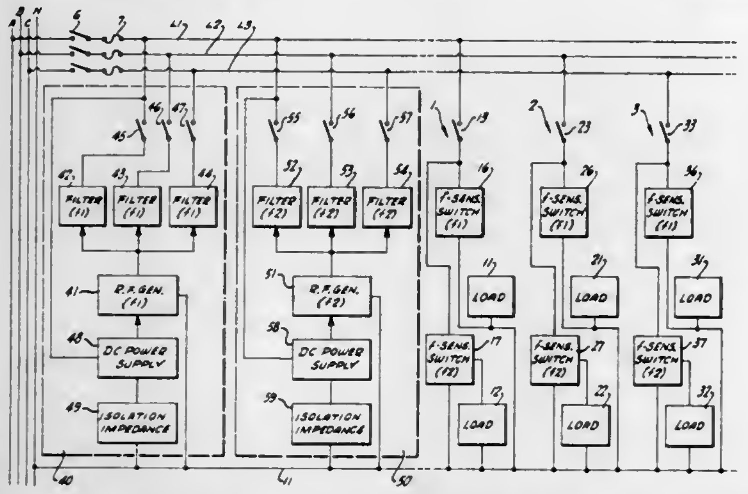
3,971,010
BALLASTED LOAD CONTROL SYSTEM AND METHOD

Robert C. Foehn, Novato, Calif., assignor to FF & L Industries Inc., South San Francisco, Calif.

Filed May 28, 1974, Ser. No. 473,744

Int. Cl.² H04Q *9/00*

U.S. Cl. 340—310 R **7 Claims**



1. In a system for controlling the energization of a ballasted load with a radio frequency control signal imposed on power circuit conductors carrying operating power for the load: means for connecting one side of the ballasted load to a first one of the power circuit conductors, a solid state switching device having first and second terminals and a control gate for controlling conductivity between the terminals, means for connecting the first and second terminals of the switching device respectively to a second side of the ballasted load and to a second one of the power circuit conductors, an impedance element connected between the control gate and the second terminal of the switching device, a series resonant circuit adapted to pass the control signal and block the operating power, and means for connecting the resonant circuit between the control gate of the switching device and the first power circuit conductor whereby the radio frequency control signal is developed across the impedance element and applied to the gate of the switching device to actuate the same.

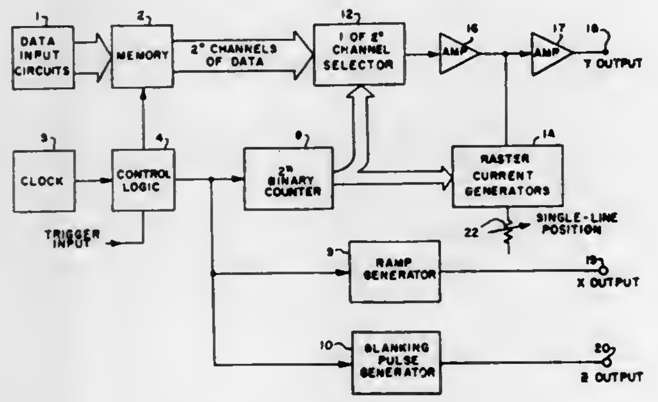
3,971,011
MULTIPLE-LINE DISPLAY SIGNAL GENERATING APPARATUS HAVING A SINGLE LINE POSITION CONTROL

Marshall Bond Borchert, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 7, 1975, Ser. No. 602,630

Int. Cl.² G08B *5/36*; G06F *3/14*

U.S. Cl. 340—324 A **11 Claims**



1. A display signal generating apparatus, comprising:

programming means for producing program logic in a predetermined manner;

programmable current generator means responsive to said program logic for sequentially producing a plurality of current steps having different fixed magnitudes;

variable current generator means for producing current having a variable magnitude;

control circuit means for substituting said variable current for a selectable one of said fixed current steps; and

output circuit means including current to voltage conversion means responsive to said fixed and variable currents for producing a voltage signal having a plurality of fixed voltage steps and a single variable step to be applied to the vertical axis of a display device.

3,971,012
DISPLAY DEVICE EMPLOYING SPECIAL-PURPOSE MONOGRAMS

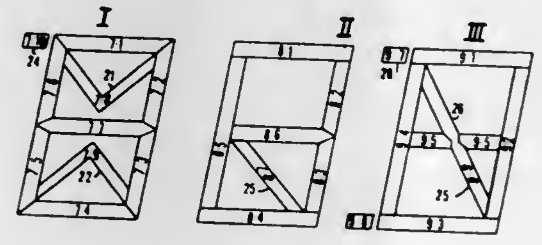
Shigeru Morokawa; Katsuo Nishimura, and Yasushi Nomura, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,625

Claims priority, application Japan, June 18, 1973, 48-68438

Int. Cl.² G09F *9/32*

U.S. Cl. 340—336 **3 Claims**



1. A device for displaying at least the initials of the days of the week, comprising:

a first array of electrically controllable elongate display elements selectively energizable in different combinations corresponding to the first letter of any day of the week; and

a second array of electrically controllable elongate display elements selectively energizable in different combinations corresponding to the second letter of any day of the week;

said elements of said first and said second arrays including six linear elements forming an oblong substantially upright frame and a seventh linear element extending horizontally across said frame to divide same into an upper and a lower half, said first array further including two V-shaped elements disposed in said halves in mutually inverted relationship with vertices pointing toward said seventh element, said second array further including an eighth linear element extending obliquely from upper left to lower right within said lower half.

3,971,013
TOUCH KEYBOARD

Francis Loyola Challoner, Chandlers Ford, England, and Hemmige Desikachar Varadarajan, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,990

Claims priority, application United Kingdom, Oct. 1, 1974, 42541/74

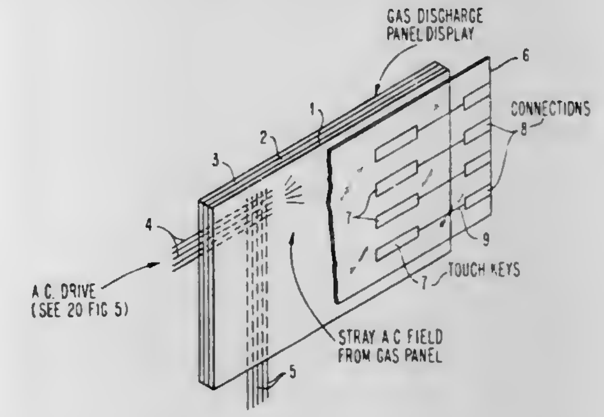
Int. Cl.² G08C *1/00*

U.S. Cl. 340—337 **10 Claims**

1. A touch operated keyboard comprising:

an AC driven gas discharge panel display;

at least one conductive touch key located proximate said display to pick up an AC voltage from said stray field generated by the gas discharge panel; and


GAS DISCHARGE PANEL DISPLAY
6
CONNECTIONS
8
1
2
3
4
7
9
TOUCH KEYS
A.C. DRIVE (SEE 20 FIG 5)
STRAY A.C FIELD FROM GAS PANEL
5

means to detect the drop in AC voltage level of said at least one key due to the proximity of an operator's finger.

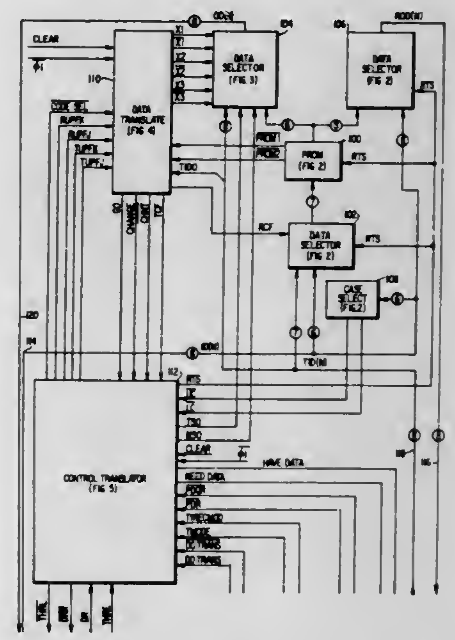
3,971,014
BI-DIRECTIONAL TRANSLATOR

Simon Korowitz, Hatfield, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,921

Int. Cl.² G06F *3/00*

U.S. Cl. 340—347 DD **22 Claims**



1. A code translator responsive to input data characters in a first code for selectively producing output data characters in said first or a second code, said translator comprising:

a data selector means;

read only memory means having addressing inputs responsive to said input data characters and outputs connected to said data selector means, said memory means having stored therein data characters in said second code at addresses addressable by data characters in said first code, whereby each data character read out of said memory means is the translation in said second code of the addressing character;

means for applying the input data characters to said data selector means and the inputs of said memory means;

translate control means operating in a first or a second mode and including means to produce a first or a second select signal, respectively; and,

means for applying said first or said second select signal to said data selector means to select as the output therefrom either the data character in said first code or the translation of said data character in said second code;

each character in said first code including a binary bit representing the case of that character and said second code including two case characters with each case character determining the case of the characters following it, said translate control means including:

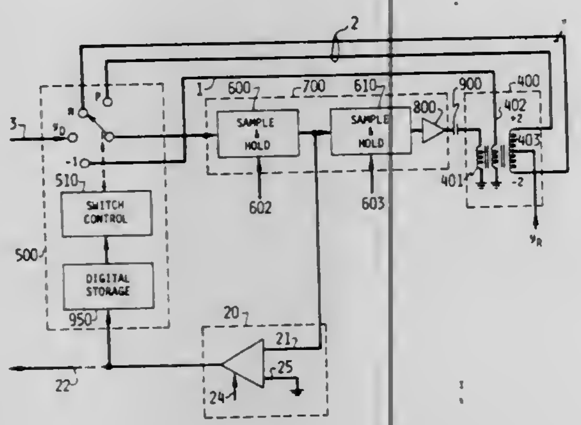
bistable indicating means operative when said translate control means is operating in said second mode for producing an output indicating the case of the last character selected out of said data selector means;

comparing means for comparing the case of each input data character with the output of said case indicating means, said comparing means including means producing a comparison signal or a non-comparison signal;

means responsive to said non-comparison signal for changing the state of said bistable indicating means and inhibiting the means producing said first and second select signals whereby the input data character and its translation are both blocked by said data selector means:

means responsive to the absence of both said select signals and the output of said bistable indicating means for forcing said data selector means to produce, in said second code, output signals representing a case character, said case character being the same case as that represented by the changed state of said bistable indicating means.

3,971,015
RECIRCULATING TYPE ANALOG TO DIGITAL CONVERTER
Thomas Hornak, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 10, 1975, Ser. No. 548,315
Int. Cl.^{2} H03K *13/02*; 324 99 *D*
U.S. Cl. 340—347 AD **27 Claims**



1. An analog to digital converter comprising:

a time delay having an input and an output;

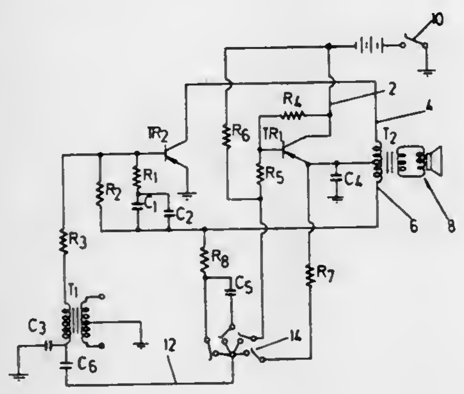
algorithmic means having an input for generating a first and second signal, the first signal being an inverse of a signal appearing at the time delay input and the second signal being a selected function of the time delay input signal corresponding to a desired conversion of an applied analog signal;

switch means for coupling the time delay input to receive the applied analog signal and for repetitively coupling the time delay input to receive the first and second signals;

means for coupling the time delay output to the algorithmic means input; and

comparator means coupled to the time delay for producing a digital output signal.

3,971,016
ELECTRONIC CHIRPER
Fong Pui, Kennedy Town, Hong Kong, assignor to Playart Ltd., Hong Kong
Filed Mar. 3, 1975, Ser. No. 554,766
Claims priority, application United Kingdom, Apr. 22, 1974, 17597/74
Int. Cl.^{2} G08B *3/10*
U.S. Cl. 340—384 E **8 Claims**



1. An audio frequency signal generating circuit for producing repeated tones comprising

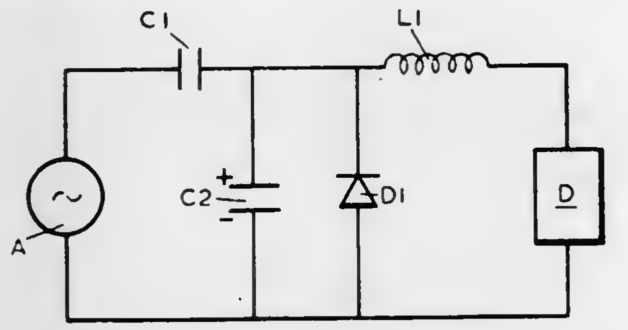
a pair of transistors,

the first transistor having one of its collector and emitter connected to a voltage supply line, having a capacitor connected between the other of its collector and emitter and the other side of the supply, and also having an inductance connected to that other of its collector and emitter,

the second transistor having one of its collector and emitter connected to the other side of the inductance, and having the other of its collector and emitter also connected to the other side of the supply,

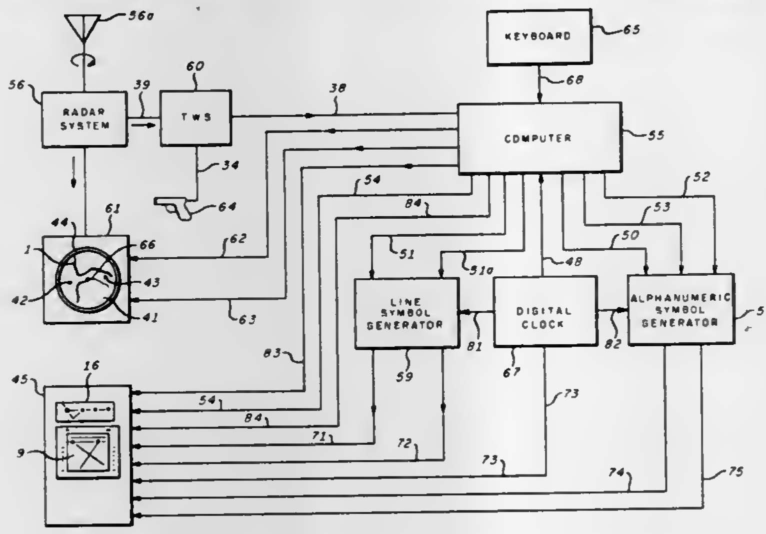
the first transistor having biasing means to bias it into an operating condition and the second transistor being arranged with reactive feedback to cause oscillation.

3,971,017
METHOD AND APPARATUS FOR EXCITING THE DRIVING COILS OF AUDIBLE WARNING DEVICES
Henry Sutcliffe, Worsley, and Edward Ball, Chadderton, both of England, assignors to Penelopegay Rowland Absalom, Great Missenden, England
Filed Apr. 30, 1975, Ser. No. 573,229
Int. Cl.^{2} G08B *3/00*
U.S. Cl. 340—384 E **5 Claims**



1. A circuit arrangement means for exciting an audible device, comprising first and second capacitor means, the effective capacitance of the two means being in series for connection across an alternating current mains supply, said second capacitor means having connected across it a rectifier and also the series combination of an electronic voltage sensitive switch and the operaing means of the warning device, the arrangement being such that, in operation, the charge on the second capacitor means is periodically discharged through said operating means.

3,971,018
MARINE TRAFFIC CONFLICT ASSESSMENT SYSTEM
Eric J. Isbister, Greenlawn, and James P. O'Sullivan, Sea Cliff, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.
Filed June 24, 1974, Ser. No. 483,182
Int. Cl.^{2} G01S *9/02*
U.S. Cl. 343—5 CD **13 Claims**



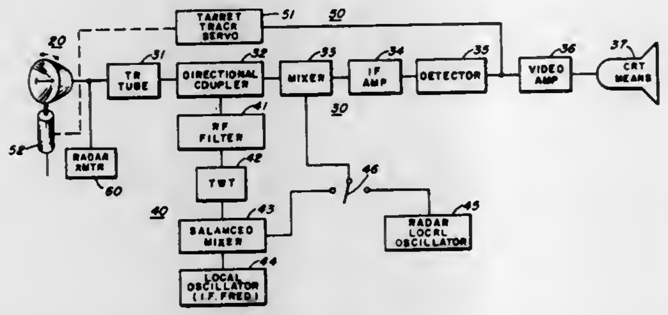
1. Apparatus for the predictive display of the navigation characteristics of craft relative to at least first and second way points of a confined navigation channel with respect to time, at least one of said way points being characterized as a locality within which it is hazardous for craft to pass one another, comprising:

fixed location sensor means for generating coordinate and velocity component data of craft with respect to said fixed location sensor means,

computing means responsive to said coordinate and velocity component data for computing the predicted distance of travel of at least a first of said craft along said confined navigation channel with respect to said way points at a predetermined future time, and

display means responsive to said computing means for displaying, in distance of travel and time coordinates, the present and predicted distance of travel and the corresponding present and future time coordinates of said first craft as first and second time-distance points on said display.

3,971,019
RECEIVER APPARATUS
William H. Rymes, Center Ossipee, N.H. 03864
Filed June 14, 1973, Ser. No. 370,139
Int. Cl.^{2} G01S *3/38*, *9/02*
U.S. Cl. 343—7.4 **1 Claim**



1. Apparatus for processing an electromagnetic signal of unknown frequency comprising, in combination:

means for receiving said signal;

directing means for directing said signal into two channels;

first channel means comprising local oscillator means set at a predetermined IF frequency, and first mixer means receiving as inputs the output of said local oscillator means and the output of said directing means; and

second channel means comprising

second mixer means receiving as inputs the outputs of said first mixer means and said directing means,

means connected to said second mixer means for amplifying signals of the IF frequency,

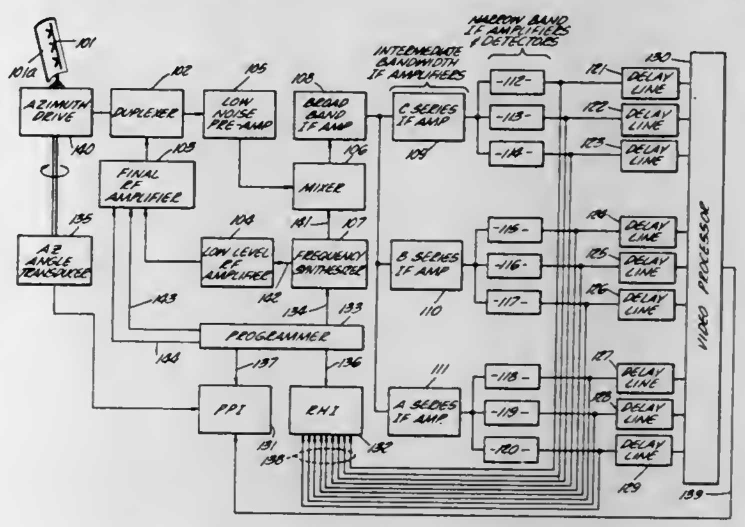
detection means connected to said amplifier means for detecting its output signal, and

means connected to said detecting means for utilizing said detected signal,

said apparatus further including filter means connected between said directing means and said first mixer means for blocking the passage of signals in a narrow band of frequencies, and

further including a radar local oscillator and single-pole, double-throw switch means, the pole of said switch being connected to one input of said second mixer means, one switch terminal being coupled to receive the output of said first mixer means and the other switch terminal being coupled to receive the output of said radar local oscillator, so that either the first mixer means or the radar local oscillator may be coupled to said second mixer means at any given time.

3,971,020
THREE DIMENSIONAL RADAR SYSTEM WITH INTEGRATED PPI PRESENTATION
Shirly Lavar Howard, Rolling Hills Estates, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 2, 1966, Ser. No. 599,348
Int. Cl.^{2} G01S *7/20*, *7/28*, *9/02*
U.S. Cl. 343—7.9 **10 Claims**



2. A pulsed radar system for displaying at least plan position indicator information, comprising: a directive antenna for radiating a pencil beam of electromagnetic energy which is directable in the elevation plane as a function of frequency of excitation and which is directable at a relatively slower rate in the azimuth plane in response to separate azimuth scan means; means for cyclically exciting said antenna with pulses of high frequency electrical energy, said pulses each comprising a plurality of successive bursts each beginning with a different first frequency which is modified progressively with each of said bursts throughout each of said pulses to produce a series of multi-beam groups each covering a corresponding sector in the vertical plane with at least some angular overlap of the beams within said multi-beam groups; means operative to permit reception of echo signals between said transmitted pulses in the same angle versus frequency relationship as transmitted through said antenna to produce a plurality of separate output signals; delay means responsive to said separate output signals to produce time correspondence of said separate output signals; and summation means for algebraically summing said delayed separate output signals over each interval of reception to produce a composite signal, thereby to provide an improved signal-to-noise ratio in said composite signal.

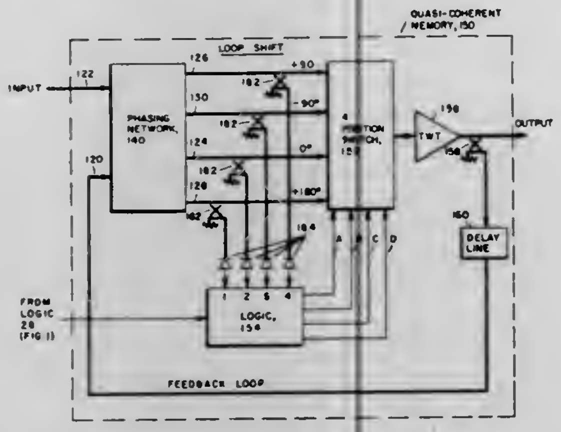
3,971,021
COHERENT FREQUENCY MEMORY

Alfred J. Cann, Wilton, N.H., assignor to Sanders Associates, Inc., South Nashua, N.H.

Filed Apr. 14, 1975, Ser. No. 567,973

Int. Cl.^{2} G01S *7/38*

U.S. Cl. 343—18 E **10 Claims**



6. A quasi-coherent memory for use in a deceptive jamming system in which an incoming pulse is gated to the memory upon detection and wherein a reset signal is generated upon detection of an incoming signal, comprising:

a two input terminal, four output terminal phasing network for providing at each of its four output terminals a signal having an amplitude related to the phase difference between signals at its two input terminals and for providing at its four output terminals the signal at one of its input terminals, respectively shifted by four different amounts;
means for coupling said gated input signal to said one input terminal;
an amplifier;
means for initially switching one of said output terminals to the input of said amplifier responsive to said reset signal;
means for coupling the output of said amplifier with a fixed delay to the other of the input terminals of said phasing network;
means for providing four separate d.c. voltages corresponding respectively to the amplitudes of the signals at said four output terminals; and
means responsive to the amplitudes of said d.c. signals for switching to said amplifier that output terminal of said phasing network carrying a signal the phase of which differs from that of the signal at said one input terminal by no more than a predetermined number of degrees after two signals are simultaneously applied to the two input terminals of the phasing network.

3,971,022
PHASED-ARRAY ANTENNA EMPLOYING AN ELECTRICALLY CONTROLLED LENS

Karl-Ludwig Lenz, Krailling, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

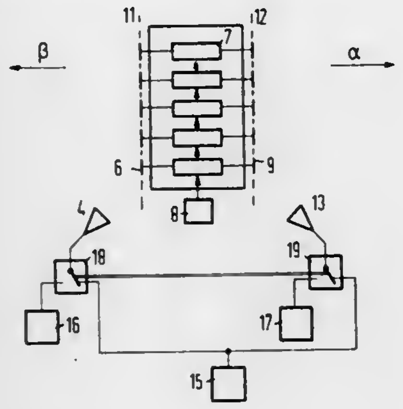
Filed Jan. 20, 1975, Ser. No. 542,365

Claims priority, application Germany, Feb. 6, 1974, 2405520

Int. Cl.^{2} H01Q *3/26*

U.S. Cl. 343—754 **15 Claims**

1. In a phased-array antenna in which transmitting energy from a primary feed system is radiated through free space as a primary wave to a plurality of first radiator elements, arranged in rows and columns in a single plane where they are received, and conducted over a plurality of phase shift elements, which may be electronically controlled, and which convert the primary wave into a planar wave and additionally effect a desired beam deflection, with such waves being radiated by a plurality of second radiator elements, in the form of a planar wave, which second radiator elements are likewise arranged in rows and columns in a single plane and are correspondingly disposed with respect to the first radiator elements, and in which received energy passes in the opposite direction along the same path, a second primary feed system being disposed at the second radiator elements with said second primary feed system being supplied with transmitting energy which is radiated through free space, as a primary wave, to the second radiator elements where it is received, conducted over said phase shift elements and radiated by the first radiator elements in the form of a planar wave, said second primary feed system being geometrically positioned relative to the plane of the second radiator elements in exactly the same relation as the first primary feed system is positioned relative to the plane of the first radiator elements, with each of the two primary feed systems being geometrically arranged off-center relative to the particular face of the associated radiator elements, in particular disposed therebelow, the combination of respective delay lines connected in series with the associated phase shift elements, which lines are so designed that they balance the transit time differences associated with the oblique positioning of the primary feed systems and possibly for focusing, and which extend between each of the primary feed systems and the radiator elements associated with the respective phase shift elements.



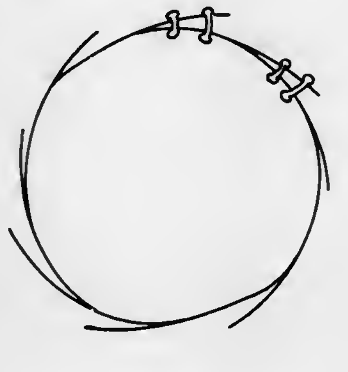
3,971,023
PARABOLIC REFLECTOR ASSEMBLED FROM TRIANGULAR SHAPED PETALS

Robert B. Taggart, 1789 Lark Lane, Sunnyvale, Calif. 94087

Filed Dec. 30, 1974, Ser. No. 537,094

Int. Cl.^{2} H01Q *15/16, 15/20*

U.S. Cl. 343—840 **8 Claims**



1. A reflector for high-gain antenna comprising:

a plurality of generally planar triangular electromagnetically reflective petals having a longitudinal axis and rectilinear major edge shape; and
means connecting the petals in edgewise substantially overlapping relation to form a reflector having a shape of a surface of revolution, each petal taking the form along its longitudinal axis of the line that generates the surface of revolution and generally curvilinear transverse form;
the connecting means including a plurality of paired fasteners coupling the overlapping edges of said petals through holes therein at predetermined locations with respect to the longitudinal axis of the petals which define the conformation of the assembled reflector.

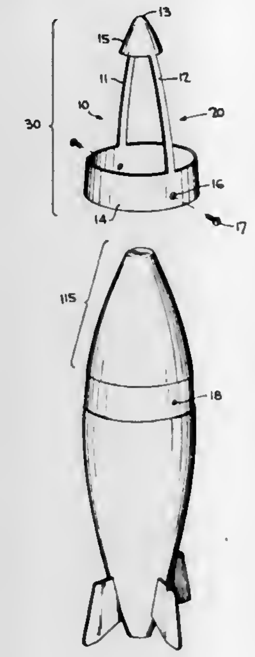
3,971,024
PROTECTIVE METAL SHIELD FOR PLASTIC FUZE RADOMES

Samuel A. Clark, Jr., Wheaton; George K. Lucey, Jr., Colesville, both of Md., and Thomas H. Zimmerman, Reston, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 29, 1973, Ser. No. 364,576

Int. Cl.^{2} H01Q *1/42;* **F42C** *13/04*

U.S. Cl. 343—872 **7 Claims**



1. In combination with a thermoplastic fuze radome, a protective structure for internal fuze components comprising a conductive cap in contact with the forward surface of said radome, means for preventing relative movement of said cap and said radome, and means for allowing radiation to be emitted from the interior of said radome, wherein said cap is a hollow cone of sheet metal comprising an umbrella located at the nose thereof, means for reducing triboelectric charging located at the base thereof, and means for connection of said umbrella to said means for reducing triboelectric charging.

3,971,025
AIRPORT GROUND SURVEILIANCE SYSTEM WITH AIRCRAFT TAXI CONTROL FEATURE

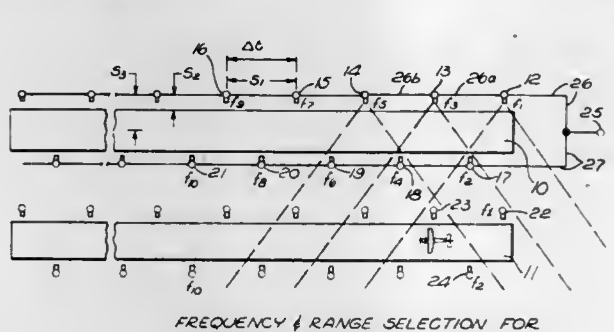
Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 320,089, Jan. 2, 1973, Pat. No. 3,872,474.

This application Jan. 27, 1975, Ser. No. 544,194

Int. Cl.^{2} G01S *1/16, 1/18*

U.S. Cl. 343—108 R **7 Claims**



1. A system particularly for traffic control on at least one vehicular pathway over a predetermined portion of the surface of an airport, comprising:

a symmetrical arrangement of sources of short duration microwave pulses, each of said sources comprising a pair of transmitters oppositely disposed, one on each side of said pathway, a line between said transmitters of said pair being generally normal to the direction of said pathway at the corresponding transmitter pair location;
a source of timing pulses;
cable means for conveying said timing pulses successively to said source pairs to cause substantially simultaneous transmission from said transmitters of each of said sources, said sources transmitting in succession along said pathway as a function of the inherent delay provided by said cable;
and receiving and steering means within a vehicle to be controlled along said path, for detecting said microwave pulses and for controlling said steering means to tend to cause said vehicle to follow said pathway by steering to maintain time coincidence of the detected microwave pulses.

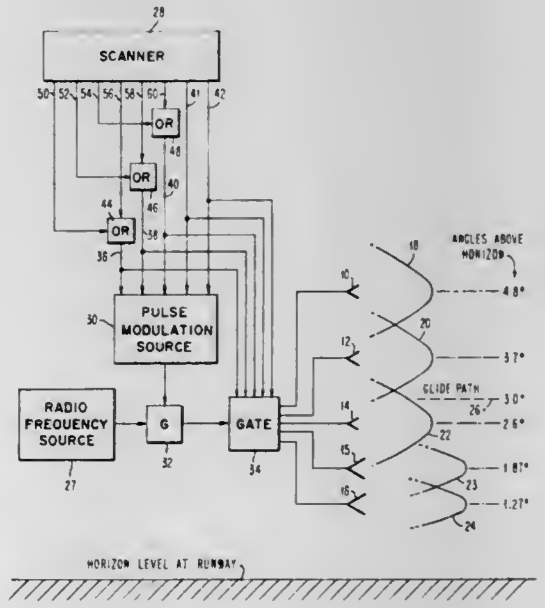
3,971,026
MULTIPLE BEAM GLIDE SLOPE RADIO NAVIGATION METHOD WITH TWO CLASSES OF BEAMS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed Feb. 14, 1975, Ser. No. 549,946

Int. Cl.^{2} G01S *1/18, 1/44*

U.S. Cl. 343—108 M **16 Claims**



1. A method of radiating a pattern of navigation guidance signals to an aircraft to define a glide path with a minimum of distortion from the terrain and structures beneath the guidance signal pattern comprising

transmitting the signals in a pattern of beams of radio carrier frequency energy with different beams positioned at different angles above and below the guidance path,
switching carrier frequency energy in a sequence from one beam to another to radiate energy in all of the beam positions to establish the pattern of beams,
applying a program of modulation to the radio carrier frequency energy for each of said beams to define the glide slope path,
said beams comprising a class of upper beams and a class of lower beams positioned beneath said upper beams,
said class of upper beams consisting of a plurality of beams of uniform angular width in elevation and having a uniform angular center-to-center beam spacing in elevation,
said class of lower beams consisting of at least one beam,
each beam of said lower beams having a reduced angular width in elevation which is a single predetermined fraction of the width of each of said upper beams,
each of said lower beams having a center line angular spacing in elevation beneath the center line of the next higher beam which is generally reduced from the spacing between said upper beams in proportion to the reduced beam width,

the peak energy radiated at the center lines of each of said upper beams being substantially uniform,

the peak energy radiated at the center lines of each of said lower beams being proportional to the peak energy radiated in each of said upper beams,

the proportion being an inverse function of the respective beam widths.

3,971,027
RADIO INTERFEROMETER SECTOR-DEFINITION

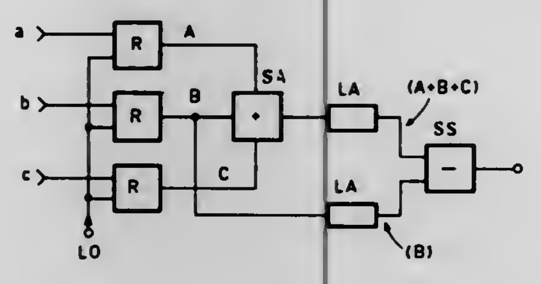
Robert Nicholas Alcock, Reigate; Richard Paul Vincent, Crawley, and Stephen Joseph Robinson, South Godstone, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,328

Claims priority, application United Kingdom, Nov. 21, 1973, 53983/73

Int. Cl.² G01S *3/48*

U.S. Cl. 343—113 R **4 Claims**



3. System for defining a vertical sector by means of radiointerferometry, comprising an array of at least three aerials arranged in a vertical straight line, radio receiver means to obtain from each aerial an information signal which contains both the amplitude information and the phase information of the received signal and is a function of the elevation angle θ and of the ground reflection coefficient p, first means for forming a linear vector combination of at least two information signals obtained from a first group of aerials which comprises at least two aerials from the said array to provide a first auxiliary signal, second means to derive from information signals obtained from a second group of aerials which is symmetrically disposed relative to the centre point of the first group and comprises at least one aerial of the said array to provide a second auxiliary signal, and a dividing device to divide one auxiliary signal by the other to provide a quotient signal which is a function of θ but is independent of p.

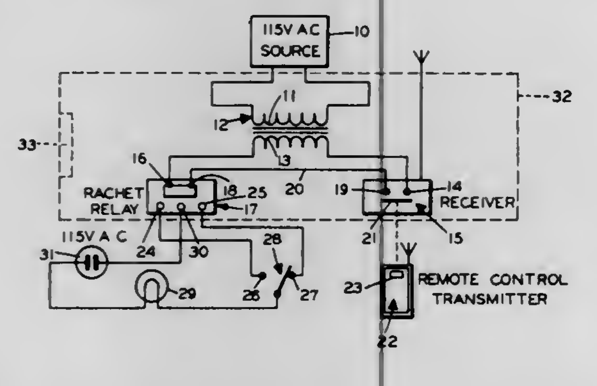
3,971,028
REMOTE LIGHT CONTROL SYSTEM

Larry L. Funk, Boonsboro, Md., assignor to Larry L. Funk and James P. Oliver, Greencastle, Pa.

Filed Dec. 26, 1974, Ser. No. 536,649

Int. Cl.² H04Q *7/00*

U.S. Cl. 343—225 **2 Claims**



1. A remote control apparatus for home lighting and the like comprising a portable radio signal transmitter adapted for manual operation at a remote point, a coacting radio signal receiver adapted for placement in a home or the like having contacts which close upon reception of a radio signal by the receiver, a step down transformer having a primary coil adapted for coupling to a source of alternating house current and a secondary coil having first and second terminals, one secondary coil terminal coupled with one contact of said receiver, a ratchet relay having first and second terminals, a normally open contact, a normally closed contact and a common contact, one terminal of the ratchet relay being coupled with the second terminal of said transformer secondary coil and the secondary terminal of the ratchet relay being coupled with a second terminal of said receiver, a house lighting circuit including a manual light switch having a pair of contacts which are electrically coupled to said normally open and normally closed ratchet relay contacts, and said house lighting circuit having a conductor coupled with said common contact of the ratchet relay, said common contact having power thereon.

3,971,029
WINDOW ANTENNA DEVICE FOR USE IN MOTOR VEHICLE

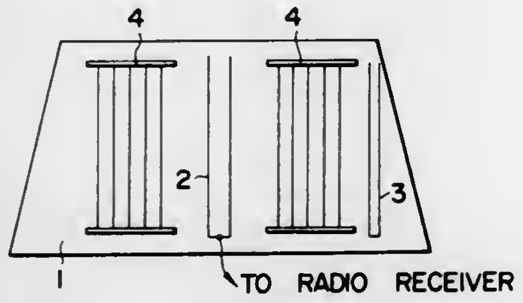
Taketsugu Torii, Kasugai, and Minoru Nishio, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 3, 1974, Ser. No. 511,935

Claims priority, application Japan, Jan. 14, 1974, 49-7433[U]

Int. Cl.² H01Q *1/32, 1/02*

U.S. Cl. 343—704 **5 Claims**



3. A window antenna device, comprising an elongated antenna wire fixed to a window, coupling means for electrically connecting said antenna wire to a receiver remote from said window, and auxiliary means for increasing the gain of said antenna wire including an electrically isolated elongated wire spaced from said antenna wire and fixed to said window substantially in parallel with said antenna wire, and isolated wire being electrically floating.

3,971,030
ANTENNA WINDOW

Gerd Sauer, Broichweiden, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

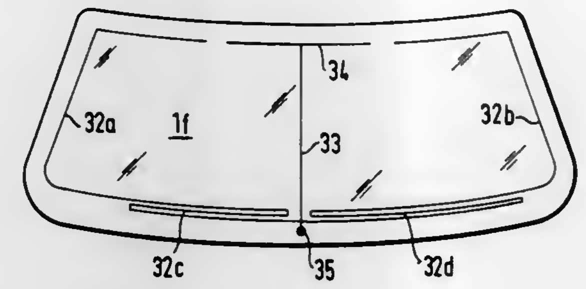
Continuation of Ser. No. 322,606, Jan. 11, 1973, abandoned. This application Oct. 1, 1974, Ser. No. 511,019

Claims priority, application France, Jan. 14, 1972, 72.01249

Int. Cl.² H01Q *1/32*

U.S. Cl. 343- -713 **3 Claims**

1. AM-FM window antenna comprising a transparent window, two conductors applied to the window, each of said conductors being adapted to receive amplitude modulated signals having frequencies of the order of 1,000 kilocycles per second and frequency modulated signals havng frequencies of the order of 100 megacycles per second, each of said conductors being moreover tuned for half-wave resonance within the band of said frequency modulated signals, a terminal applied to said window, at least one of said conductors connecting to said terminal on said window, said conductors connecting to each other at a point on said window between and at unlike distances from the ends of one of said conductors, whereby the directivity of said antenna may be optimized.



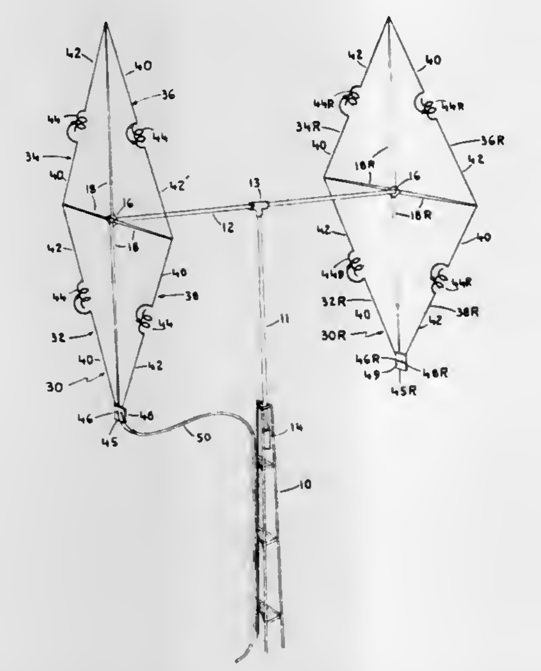
3,971,031
LOADED QUAD ANTENNA

Emmett F. Burke, 4501 Vallacher Ave., Minneapolis, Minn. 55416

Filed Oct. 31, 1975, Ser. No. 627,525

Int. Cl.² H01Q *7/00*

U.S. Cl. 343—744 **12 Claims**



1. An antenna structure comprising first, second, third and fourth antenna elements, each element having a loading coil serially connected therein, and means for supporting said elements in a substantially common plane with each element oriented generally perpendicular to the other.

3,971,032
DUAL FREQUENCY MICROSTRIP ANTENNA STRUCTURE

Robert E. Munson, Boulder, Colo., and Harold T. Buscher, Oakland, Calif., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Aug. 25, 1975, Ser. No. 607,418

Int. Cl.² H01Q *13/18*

U.S. Cl. 343—770 **8 Claims**

1. A dual frequency antenna structure comprising:

an electrically conducting ground surface;

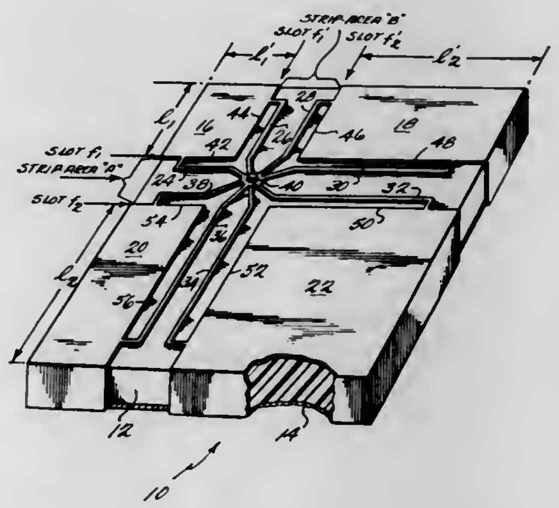
a dielectric layer extending on top of said ground surface;

a plurality of separated electrically conducting elements disposed on top of said dielectric layer in a spaced-apart configuration leaving intersecting strip areas therebetween and defining:

first and second intersecting means for transmitting/receiving electromagnetic waves of a first predetermined frequency, and

third and fourth intersecting means for transmitting/receiving electromagnetic waves of a second predetermined frequency,

input/output electrical connection means disposed on top of said dielectric layer within said intersecting strip areas, and



microstrip electrical conductors also disposed on top of said transmitting/receiving layer within said intersecting strip areas, said conductors defining transmitting/receivving electrical transmission circuits connected individually to said first, second, third and fourth intersecting means and connected in common to said input/output electrical connection means.

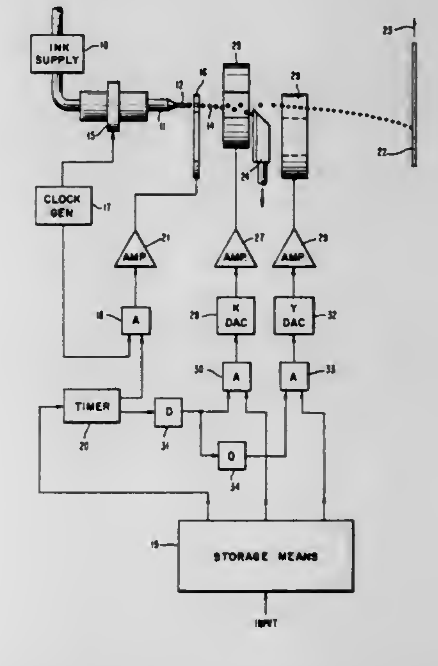
3,971,033
METHOD AND APPARATUS FOR APPLYING MAGNETIC LIQUID DROPLETS TO A RECORDING SURFACE

George J. Fan, Ossining, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed May 27, 1975, Ser. No. 580,655

Int. Cl.² G01D *15/18*

U.S. Cl. 346—1 **22 Claims**



14. A method for applying droplets of a magnetic liquid to a recording surface to form characters thereon including:

producing a stream of magnetic liquid droplets and projecting same toward the recording surface in a first direction;

selecting one or a series of droplets from the stream for application to the recording surface to form thereon a character or a portion of a character when there is a discontinuity in the formation of the character;

directing the selected droplets through orthogonal magnetic field gradients;

selecting the length of the orthogonal magnetic field gradients to have at least two of the series selected droplets within the orthogonal magnetic field gradients at any time;

selectively varying the gradient along at least one of the orthogonal axes with respect to time during the passage of each of the series selected droplets therethrough in accordance with the desired position of the series selected droplet on the recording surface with respect to the position of the prior series selected droplet on the recording surface to change the position of the series selected droplet on the recording surface with respect to the prior series selected droplet in either direction along at least the one orthogonal axis;

and causing a series of droplets equal to the maximum number of the series selected droplets that can be within the orthogonal magnetic field gradients at any time and subjected to a varying gradient along one of the orthogonal axes to be diverted from application to the recording surface when a character is completed or there is a discontinuity in the formation of a character after forming a portion of the character.

3,971,034

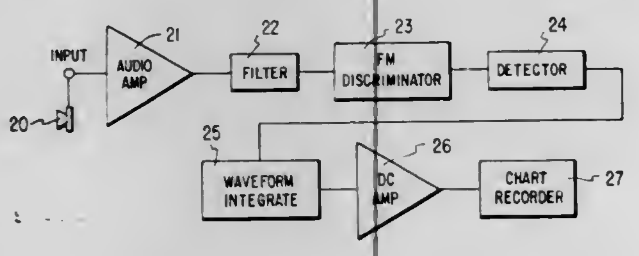
PHYSIOLOGICAL RESPONSE ANALYSIS METHOD AND APPARATUS

Allan D. Bell, Jr., Annandale; Wilson H. Ford, Arlington, and Charles R. McQuiston, Falls Church, all of Va., assignors to Dektor Counterintelligence and Security, Inc., Springfield, Va.

Continuation of Ser. No. 113,949, Feb. 9, 1971, abandoned. This application Sept. 5, 1972, Ser. No. 286,426

Int. Cl.² G01D ***1/04***

U.S. Cl. 346—1 **9 Claims**



1. A method of identifying physiological manifestations of psychological stress in a human subject comprising the steps of

converting an oral utterance by the subject from sound energy into electrical signals;

emphasizing those portions of the electrical signals which represent inaudible variations in the infrasonic frequency modulation of the voice of the subject;

recording signals representative of the emphasized portions of the electrical signals on a visually observable medium; and

observing the visual record of the utterance to determine increases and decreases in modulation variations, the degree of presence of the modulation constituting an inverse measure of the stress.

3,971,035

THERMOGRAPH WITH REMOVABLE CARTRIDGE

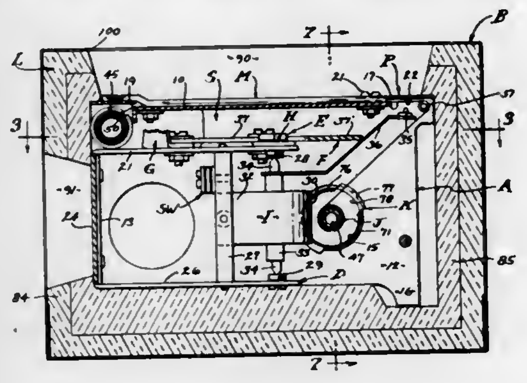
William H. Maxwell, West Los Angeles, Calif., assignor to Cargo Graphics Corporation

Filed May 17, 1974, Ser. No. 470,901

Int. Cl.² G01D ***9/10;*** **G01K** ***5/70;*** **B65D** ***85/38***

U.S. Cl. 346—33 TP **3 Claims**

1. A thermograph including in combination; an instrument supporting a thermometer means with a stylus positioned in response to temperature and normally pressed into engagement against a removable strip chart, drive means for said strip chart, said instrument adapted to be pre set and loaded with said removable strip chart for time-temperature recording and having means exposing the chart to be written upon and having means for manipulated control by a shipper and receiver respectively and having an on condition for transporting the chart when engaged by the stylus and having an off condition, and logic means having an actuator shiftable from an on position to an off position for off conditioning the drive means and lifting the stylus from the chart and having a frictionally positionable start lever shifting the actuator into the on condition of the drive means and having a releasable stop lever shifting the actuator into the off condition of the drive means, a liner of depressible low density material having walls of substantial thickness protectively embracing the instrument and having separate access openings to the exposed chart and start lever and to the removable strip chart and stop lever respectively, and a box permanently enveloping the liner when the combination is prepared for use and having separate reclosable doors coextensive with the aforesaid separate access openings in the liner for independent use by the shipper and receiver to write upon the chart and start the instrument and to stop the instrument and remove the chart respectively.



3,971,036

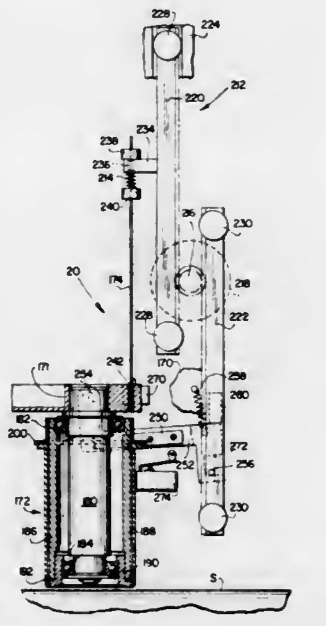
PLOTTING HEAD FOR CONSUMABLE MARKING MATERIAL

Heinz Joseph Gerber, West Hartford, Conn., and Earle Merritt Chase, Wilbraham, Mass., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Division of Ser. No. 353,117, April 30, 1973, Pat. No. 3,857,527. This application Oct. 30, 1974, Ser. No. 519,072

Int. Cl.² G01D ***15/24***

U.S. Cl. 346—139 C **16 Claims**



1. In a plotting system in which a recording medium and a plotting head are moved relative to one another to generate graphical information on the medium, the plotting head employing slender shafts of consumable marking material comprising:

support means including a magazine for holding a plurality of shafts of consumable material with one shaft in a plotting position and with one end of said one shaft adjacent the recording medium; the magazine being rotatably mounted about an axis on the plotting head and having a plurality of compartments distributed circumaxially about the axis for holding the plurality of shafts in parallel relationship with the axis and said one shaft in the plotting position;

means registering with said one shaft in said plotting position in the magazine for pressing said one end of said one shaft in the plotting position against the recording medium and for feeding said shaft toward the recording medium as said one end of said shaft is consumed; and

means for indexing the rotatable magazine to bring another consumable shaft in a magazine compartment into the plotting position in precise registration with the means for pressing and feeding when said shaft in the plotting position is substantially consumed.

3,971,037

MAGNETIC BUBBLE SHIFT REGISTER

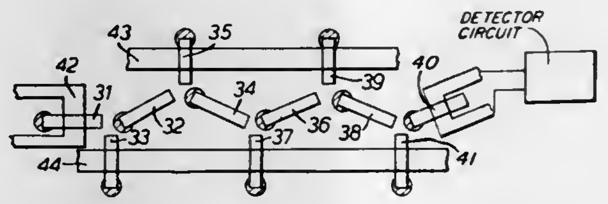
Reginald David Enoch, Pinner, and Mervyn Evan Jones, London, both of England, assignors to The Post Office, London, England

Continuation of Ser. No. 385,725, Aug. 6, 1973, abandoned. This application May 14, 1975, Ser. No. 577,460

Claims priority, application United Kingdom, Aug. 8, 1972, 36895/72

Int. Cl.² G11C ***11/14***

U.S. Cl. 340—174 TF **12 Claims**



1. A shifting register having an ordered plurality of binary digital storage elements each formed by an elongate pattern of high permeability magnetic material on a film of magnetic material common to the patterns and having means for providing a magnetic field across which the film is disposed so as to sustain cylindrical magnetic domains within the film, the pattern being such as to retain a cylindrical magnetic domain at one end or the other of the pattern and to permit transfer of the domain between the ends thereof, each pattern retaining a respective domain, the register further including means coupling adjacent storage elements for causing in response to a shifting pulse the domains in the storage elements to be moved to ends thereof corresponding respectively to the ends of the immediately preceding storage elements at which domains were located prior to the shifting pulse.

3,971,038

COERCIVITY CONTROL AND DETECTION SIGNAL GENERATING PATTERN FOR UNIAXIALLY ANISOTROPIC FERROMAGNETIC CRYSTAL PLATELETS

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 29, 1974, Ser. No. 492,390

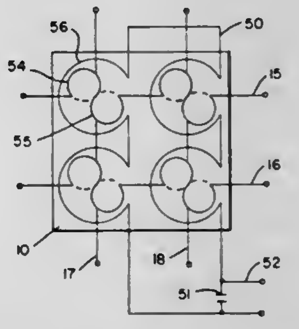
Int. Cl.² G11C ***11/14***

U.S. Cl. 340—174 TF **8 Claims**

1. In a digital signal translating device of the type having at least one uniaxially anisotropic ferromagnetic crystal platelet having its major plane surface cut perpendicularly to the easy axis of magnetization of said crystal and being capable in the presence of an externally applied magnetic biasing field of sustaining movable cylindrical magnetic domains having their cylindrical axes lying along said easy axis of magnetization, means to apply said magnetic biasing field to said crystal, and conductor access array means to control the positions of said movable domains in said platelet comprising magnetic field generating conductor means to define an array of cylindrical domain retaining positions in said crystal, the improvement comprising:

a two-dimensional lattice array of dots of magnetically susceptible material in intimate physical contact with said major plane surface of said crystal platelet, said material of said dots having a higher permeability than that of said crystal platelet and said array extending over a predetermined area comprising the entire portion of the plane of said major plane surface of said crystal platelet which is to be positioned adjacent said access conductor array means:

each of said dots having a maximum dimension in said plane which is no greater than one-fifth of the minimum diameter of the cylindrical domains which can be sustained in said platelet and each of said dots having a center-to-center spacing from the nearest other dot in said array which is less than one-half said minimum diameter, said center-to-center spacing being uniform between all dots lying on a straight line drawn through any two dots to form a symmetrical array having no predetermined alignment relationship with any individual conductor of said conductor access array but extending uniformly and symmetrically over said entire predetermined area adjacent said conductor access array;



said dots forming in said predetermined area an orderly array positioned to provide a predetermined localized coercivity in said predetermined area of said crystal platelet; and

means to detect the motion of said cylindrical magnetic domains in said crystal, said means comprising means inductively coupled to said platelet to detect the motion of field of at least one of said magnetic domains, said inductively coupled means being tuned to resonance at a frequency equal to the frequency at which said magnetic domain is expanded and contracted by said array of dots when said cylindrical domain is moved by a predetermined drive field resulting from a current applied to said conductor access means.

3,971,039

INK JET SYSTEM PRINTER WITH TEMPERATURE COMPENSATION

Rikuo Takano, Gusashino; Yuji Sumitomo, Nara; Yoichi Yamamoto, Nara; Tomoo Makita, Nara, and Masahiko Aiba, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Nov. 25, 1974, Ser. No. 526,824

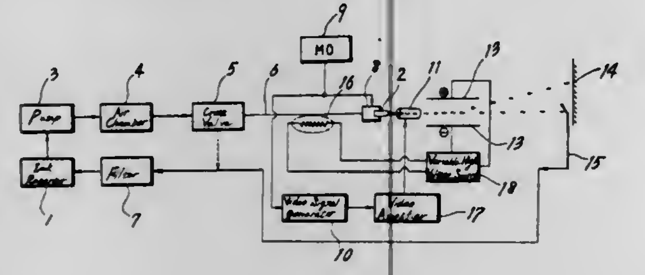
Claims priority, application Japan, Nov. 24, 1973, 48-135821

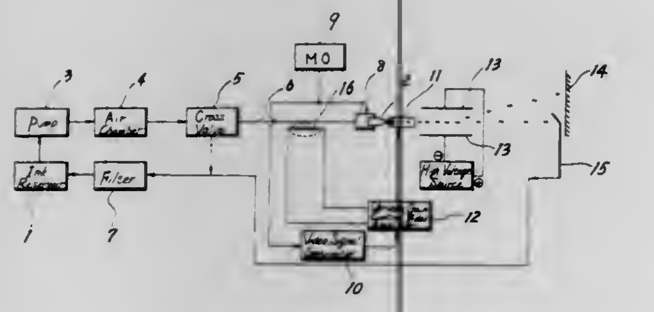
Int. Cl.² G01D ***18/00***

U.S. Cl. 346—75 **8 Claims**

1. In an ink jet system printer including a nozzle unit for emitting ink droplets toward a recording paper, a conduit for conducting ink liquid to the nozzle, a charging electrode for charging the ink droplets and deflection electrodes for estab-

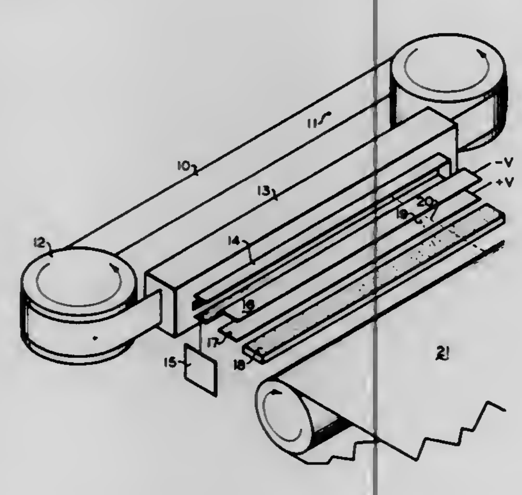
lishing an electric field in order to deflect the charged ink droplets, the improvement comprising:
- a temperature sensor attached directly to or adjacent to the conduit for detecting ink liquid temperature;
- compensation means coupled with the temperature sensor for compensatively varying a voltage level applied to the charging electrode in accordance with the variations of the ink liquid temperatre, said compensation means including a differential amplifier adapted to receice the video signals through the temperature sensor at one receive terminal thereof and voltage amplifying means including a transistor, the base of which is connected to receive the output signals of the differential amplifier, the output signals of the amplifying means being applied to the charging electrode;
- a video signal generator for generating video signals in accordance with printing information; and
- wiring means for coupling the video signals with the charging electrode via said compensation means.





3,971,040
INK DROP PRINTER WITH TRAVERSING ORIFICE BAND

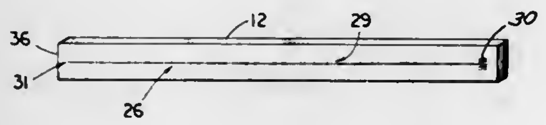
Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402
Continuation-in-part of Ser. No. 421,425, Dec. 3, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 605,993
Int. Cl.² G01D *15/18, 9/00*
U.S. Cl. 346—75 7 Claims



1. A method of printing by selectively depositing ink drops under pressure onto a receiving surface in response to graphic information from a signal source including the steps of positioning a body of liquid ink to contact a portion of a flexible endless band having a plurality of uniformly spaced orifices,
- moving the orifice band to provide a traversing motion for ink passing through the orifices, said ink forming traversing ink drops which project toward a receiving surface,
- modulating said ink so that the ink drops approaching the receiving surface deposit thereon in a graphic pattern in accordance with said graphic information from said signal source.

3,971,041
CHART RECORDER USING A FIXED THERMAL PRINT HEAD

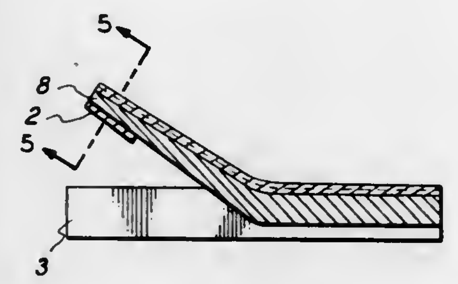
Charles F. Mason, Indianapolis, Ind., assignor to Esterline Corporation, New York, N.Y.
Continuation of Ser. No. 403,249, Oct. 3, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,269
Int. Cl.² G01D *9/34, 15/10*
U.S. Cl. 346—76 R 3 Claims



1. A chart recorder for graphically displaying data comprising:
- a chassis;
- a print head mounted on the chassis and having a single row of heat-generating dots along a first face, the first face including an array of heat-generating dots adjacent the row of dots, the dimensions of the array of heat-generating dots being significantly less than the length of the row of heat-generating dots;
- a strip of heat sensitive medium;
- drive means for advancing the strip of heat sensitive medium across the row of dots and the array of dots, the heat sensitive medium advanced past the print head being marked by dots in the row of heat generating dots to produce graphical representations and by the array of dots to produce a symbolic character.

3,971,042
WRITING APPARATUS HAVING WEAR RESISTANT MATERIAL

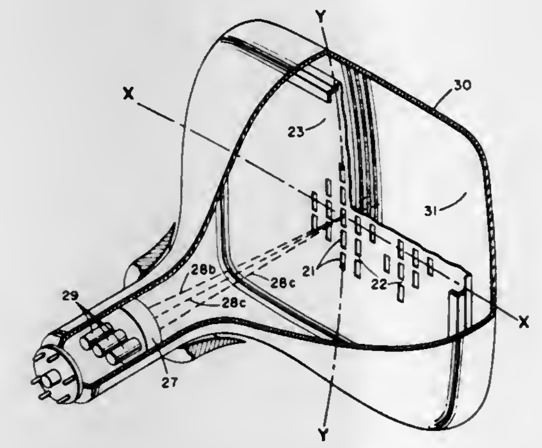
Howard D. Ring, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 14,138, Feb. 25, 1970, abandoned. This application Oct. 12, 1972, Ser. No. 297,107
Int. Cl.² G01D *15/06*
U.S. Cl. 346—139 C 1 Claim



1. A stylus for forming images on the recording medium of a printing apparatus comprising:
- a base adapted to be inserted in a connector socket of said printing apparatus to receive control signals, one end of said stylus mounted on said base,
- a writing edge formed at the free end of said stylus, and
- a chip of wear resistant material attached to the free end of said stylus initially on the side opposite from the writing edge whereby said writing edge is eventually protected from excessive wear in sweeping across said recording medium.

3,971,043
APPARATUS FOR MAKING ELECTROLUMINESCENT SCREENS FOR COLOR CATHODE RAY TUBES

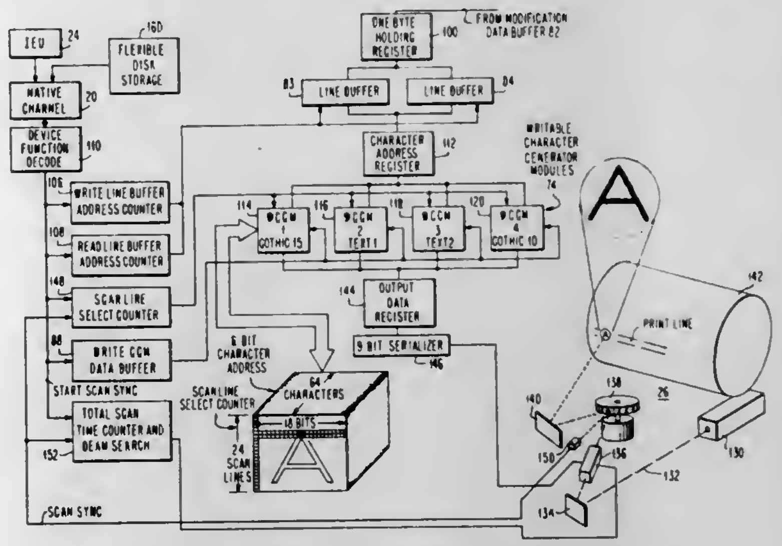
Takeshi Suzuki, Fukaya; Shigeo Takenaka, Kanagawa; Hiroshi Tanaka, Fukaya, and Masanori Akiyama, Honjo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Division of Ser. No. 390,253, Aug. 21, 1973, Pat. No. 3,888,673. This application May 5, 1975, Ser. No. 574,637
Claims priority, application Japan, Aug. 21, 1972, 47-82832; Aug. 22, 1972, 47-83711
Int. Cl.² G03B *41/00*
U.S. Cl. 354—1 15 Claims



1. An apparatus for preparing a developable pattern comprising continuous vertical stripes on a panel for a cathode ray tube having a film comprising photosensitive material having a predetermined response to incident light, said panel having a concave shadow mask attached thereto, said shadow mask having on its concave face a number of beam-passable apertures separated by bridge members and arranged in rows parallel with each other, comprising:
- a. a light source placed at a predetermined position with respect to said panel on the opposite side of said mask from said panel for projecting light on said film on said panel in a pattern comprising images defined by the apertures of said shadow mask, said light source having an effective length in the lengthwise direction of the rows of the apertures greater than the length of one of the beam-passable apertures in the shadow mask to extend the image of each aperture on said panel in the lengthwise direction to reduce the effects of the shadow cast by said bridge members on said film and form said continuous vertical stripes; and
- b. means for vibrating said light source at least along a direction perpendicular to the longitudinal axis of said light source and parallel to said panel with predetermined amplitude and frequency to create a superposed image on said screen from said light source through each of said apertures and thereby substantially reduce diffraction phenomena effects created by the edges of each such aperture on the pattern of radiation on said screen.

3,971,044
ELECTRONIC HORIZONTAL SHIFTING AND VARIABLE PRINT WIDTH IN A BUFFERED PRINTER

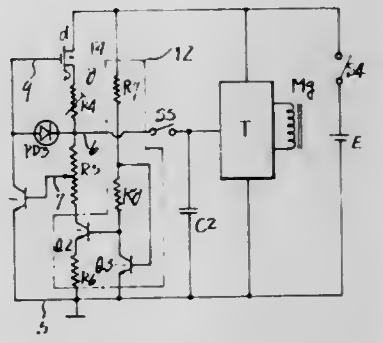
Gerald Ivan Findley, Morgan Hill, and Teddy Lee Anderson, San Jose, both of Calif., assignors to IBM Corporation, Armonk, N.Y.
Filed Nov. 11, 1974, Ser. No. 522,997
Int. Cl.² G03B *15/24*
U.S. Cl. 354—9 14 Claims



1. A printing system comprising the combination of:
- means for providing data representing characters to be printed;
- a printable medium;
- means for undergoing successive scans across the width of the printable medium;
- means associated with the means for undergoing scans and responsive to the data for printing characters represented by the data on the printable medium as the scans are made when the means for printing is turned on; and
- means responsive to the start of each scan of the means for undergoing scans for turning on the means for printing after the means for undergoing scans has scanned a selected, adjustable distance across the width of the medium.

3,971,045
LIGHT MEASURING CIRCUIT

Yasuhiro Nanba, Osaka, and Motonobu Matsuda, Izumi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan
Filed Aug. 21, 1975, Ser. No. 606,542
Claims priority, application Japan, Aug. 21, 1974, 49-95902
Int. Cl.² G03B *7/08;* G01J *1/44*
U.S. Cl. 354—23 R 3 Claims



1. A light measuring circuit comprising:
- a power source;
- a photo-diode for generating photo-electric current as a function of light incident thereon;
- a transistor having a base, an emitter and a collector, said collector being connected to one terminal of said photo-diode for receiving the photo-electric current therefrom;

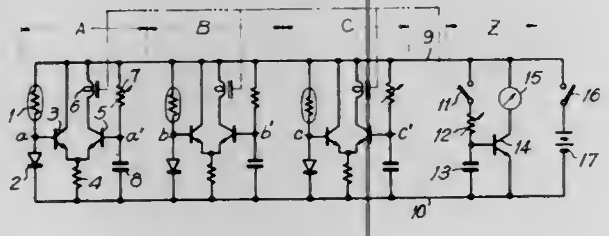
an electrical load circuit;
- a field effect transistor having its source connected to said power source through said electric load circuit, said field effect transistor having its gate coupled to the joint connection of said photo-diode and said collector of said transistor, said field effect transistor further having its source connected to the other terminal of said photodiode;
- a negative feedback circuit including said gate and source of said field effect transistor and said base of said transistor, said negative feedback circuit controlling the base potential of said transistor by a voltage signal produced at said source of said field effect transistor so as to counteract potential changes at the common junction point among said gate of said field effect transistor, said collector of said transistor and said one terminal of said photodiode.

3,971,046

SYSTEMS FOR RESPONDING TO NON-UNIFORM SCENE BRIGHTNESS

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 456,380, March 29, 1974.
This application June 27, 1974, Ser. No. 483,711
Claims priority, application Japan, July 2, 1973, 48-73650
Int. Cl.² G03B *7/08*
U.S. Cl. 354—24 **12 Claims**



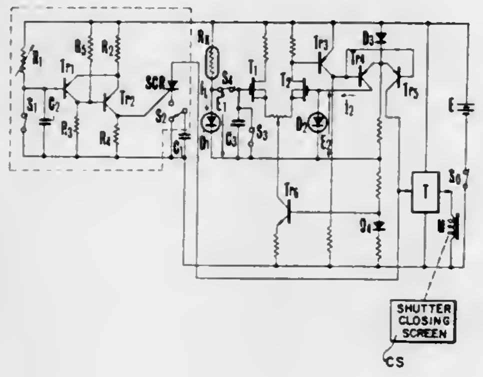
1. In a system for responding to non-uniform scene brightness, a plurality of identical photosensitive means for respectively receiving light from different parts of a scene, for respectively providing, from the received light, inputs which vary according to a geometric progression in accordance with variation in light brightness, and for providing at a pair of said photosensitive means, respectively, maximum and minimum inputs when the scene has light of non-uniform brightness to be received by the plurality of photosensitive means, output means for providing an output from at least one of said pair of photosensitive means, and electrical connecting means electrically connecting said plurality of photosensitive means with said output means for providing at said output means an output determined by said one of said pair of photosensitive means and for converting the geometric progression of said input of each photosensitive means into an arithmetic progression so that the output provided by said output means varies according to an arithmetic progression, said electrical connecting means including a timing circuit means having a resistor and capacitor connected in series with said capacitor of said timing circuit means having a charge which progressively changes during an interval when said plurality of photosensitive means respond to light from different parts of a scene, and said electrical connecting means further including a relay switch means operatively connected with said timing circuit means as well as with said plurality of photosensitive means for automatically opening said timing circuit means and terminating the change in the charge of said capacitor thereof in response to said light input of said one of said pair of photosensitive means, and the charge of said capacitor upon opening of said timing circuit means providing, at least in part, said output at said output means.

3,971,047

SINGLE LENS REFLEX CAMERA HAVING AN ELECTRIC SHUTTER

Yasuo Isobe, Kawasaki; Tadashi Ito, and Fumio Ito, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,473
Claims priority, application Japan, May 9, 1973, 48-51376
Int. Cl.² G03B *7/08, 9/62*
U.S. Cl. 354—50 **10 Claims**



6. A single lens reflex camera, comprising shutter means having a focal plane opening screen and a focal plane closing screen, retaining means for retaining said opening screen and then releasing it, magnet means for retaining said closing screen and then releasing it, shutter release means coupled to said retaining means for actuating said retaining means so as to release said opening shutter, first timing means responsive to ambient light and coupled to said magnet means for establishing a time interval on the basis of the ambient light and for causing said magnet to release said shutter closing screen subsequent to actuation of said first timing means and the elapse of the interval, second timing means actuated by said release means prior to actuation of said retaining means for establishing a second interval and actuating said first timing means after the actuation of said second timing means and elapse of the second interval.

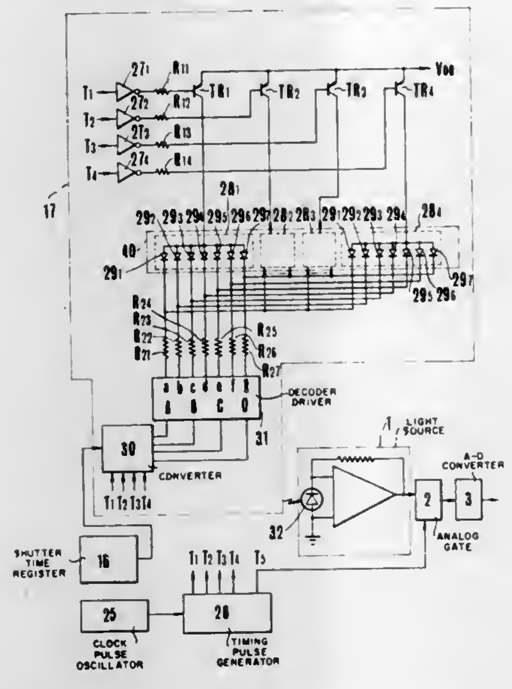
3,971,048

EXPOSURE VALUE DISPLAY SYSTEM FOR A CAMERA

Tadashi Ito, Yokohama; Soichi Nakamoto, Machida, and Youichi Okuno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,711
Claims priority, application Japan, Oct. 2, 1973, 48-110731
Int. Cl.² G01J *1/44;* **G03B** *17/20*
U.S. Cl. 354—60 L **5 Claims**

1. An exposure value display system for a camera of TTL type comprising in combination:
- a. a finder optical system, said finder optical system being associated with an objective lens;
- b. sensor means arranged in said finder optical system to receive light passing through said objective lens;
- c. first control means for controlling the light-metering operation of said sensor means;
- d. display means arranged in said finder optical system to display an exposure value;
- e. second control means for controlling the display operation of said display means; and
- f. pulse generator means connected to said first and second control means for supplying output pulses which control the operation periods of said first and second control means in time-displaced relation with respect to each other in sequence.

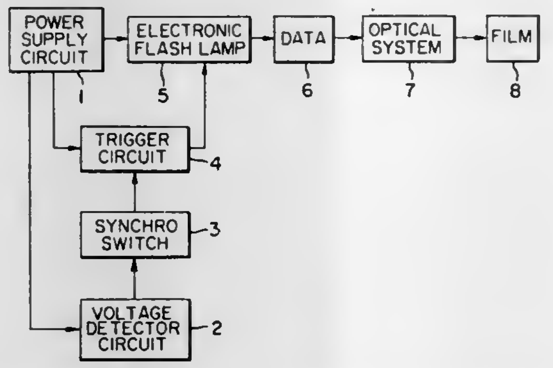


3,971,049

SYSTEM FOR RECORDING ON THE FILM OF A CAMERA DATA RELATING TO THE SCENE BEING PHOTOGRAPHED

Sachio Ohmori, Yokohama, and Kouichi Takahata, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,532
Claims priority, application Japan, May 17, 1973, 48-57278[U]
Int. Cl.² G03B *15/02*
U.S. Cl. 354—127 **16 Claims**



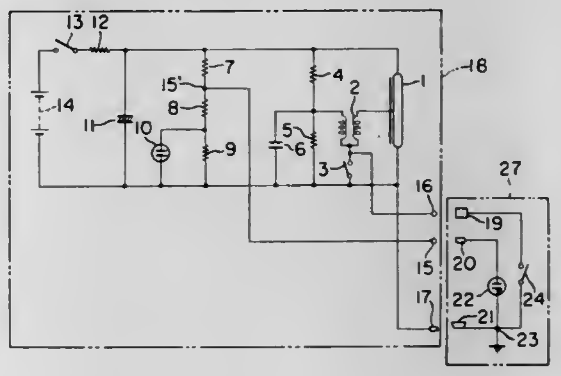
1. A data photographing system for recording on the film of a camera, on which a scene is photographed, data illuminated by flash, the system comprising:
- capacitor means;
- means for applying a charge to said capacitor means;
- electronic flash means adapted to discharge said capacitor means to illuminate the data at a brightness dependent upon the voltage level to which said capacitor means is charged; and
- control means for causing said electronic flash means to discharge said capacitor means upon actuation of the shutter release mechanism of the camera if the voltage on said capacitor means hasreachedapredetermined voltage level required for providing a flash of predetermined brightness and for preventing said electronic flash means from discharging said capacitor means when the voltage on said capacitor means is less than said predetermined level and is thus incapable of producing a flash of said predetermined brightness, and predetermined voltage level being substantially higher than the minimum voltage level which would permit said electronic flash means to provide a flash.

3,971,050

ELECTRONIC FLASHLIGHT SYSTEM FOR CAMERAS

Keno Okuno, Kawasaki, and Kouichi Takahata, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 315.451, Dec. 15, 1972, abandoned.
This application July 24, 1974, Ser. No. 491,514
Claims priority, application Japan, Dec. 25, 1971, 46-2928[U]
Int. Cl.² G03B *15/05*
U.S. Cl. 354—128 **1 Claim**

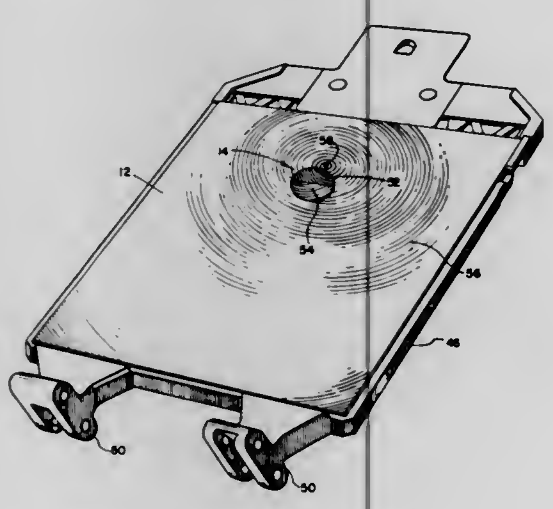


1. The combination of a camera body and an electronic flashlight comprising:
- a main discharge tube in said electronic flashlight for flashing;
- a main capacitor in said electronic flashlight for discharging said main discharge tube;
- a first group of contacts on said electronic flashlight;
- a second group of contacts on said camera body;
- a first mounting member on said electronic flashlight;
- a second mounting member on said camera body removably engageable with said first mounting member to secure said electronic flashlight to said camera body;
- said first and second groups of contacts being arranged for automatic connection to each other when said first and second mounting members are engaged with each other;
- a first indicator lamp of the glow discharge tube type in said electronic flashlight for indicating the readiness of said electronic flashlight to flash;
- a second indicator lamp of the glow discharge tube type in said camera body for indicating the readiness of said electronic flashlight to flash, said second indicator lamp being connected to two contacts of said second group;
- a trigger circuit in said electronic flashlight for triggering said main discharge tube, said trigger circuit being connected in parallel with said main capacitor between ground and a battery voltage terminal;
- a voltage divider circuit in said electronic flashlight, said voltage divider circuit being connected in parallel with said main capacitor, between ground and said battery voltage terminal, independently of said trigger circuit and comprising a plurality of resistors connected in series with each other;
- said first indicator lamp being connected between ground and a first voltage dividing resistance location on said voltage divider circuit; and
- two contacts of said first group being connected between ground and a second voltage dividing resistance portion of said voltage divider circuit and said second voltage dividing resistance location has higher resistance to ground than said first voltage dividing resistance portion,
- whereby when said first and second groups of contacts are connected to each other to produce current flow through said second indicator lamp, the voltage across said first voltage dividing resistance is reduced to turn off the first indicator lamp.

3,971,051
FOCUSING SCREEN

Philip G. Baker, Peabody, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 29, 1973, Ser. No. 375,015
Int. Cl.^{2} G03B *13/28, 19/12*
U.S. Cl. 354—201 **14 Claims**

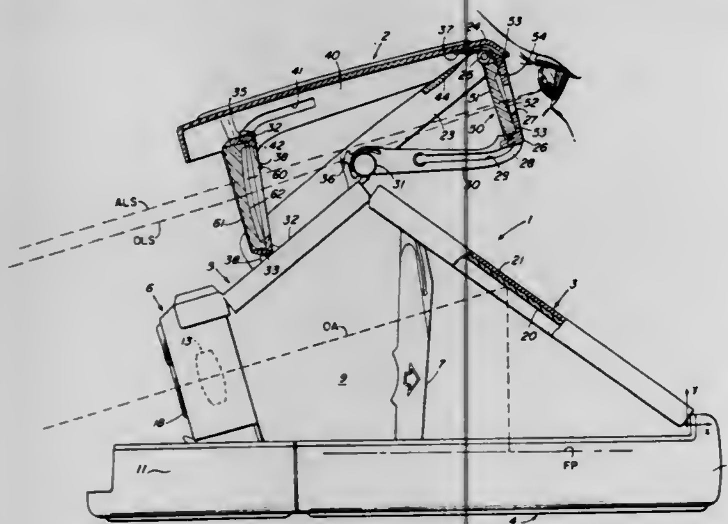


1. A photographic camera comprising:
an exposure chamber;
an objective lens to form a real image of a subject at a focal plane inside said exposure chamber;
a focusing screen, at said focal plane, for receiving said real image;
viewing means for enabling an observer to see said real image formed on said focusing screen;
an optical surface, on said focusing screen;
vernier focusing means located on said optical surface a predetermined distance eccentric from the geometrical center of said optical surface;
light diffusing means on said focusing screen surrounding said vernier focusing means;
a first Fresnel echelon on said optical surface surrounding said vernier focusing means for controlling the redistribution of light incident on said optical surface; and
a second Fresnel echelon and a third Fresnel echelon constituting said vernier focusing means.

3,971,052
COMPACT GALILEAN VIEWFINDER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1975, Ser. No. 569,763
Int. Cl.^{2} G03B *13/06*
U.S. Cl. 354—219 **5 Claims**

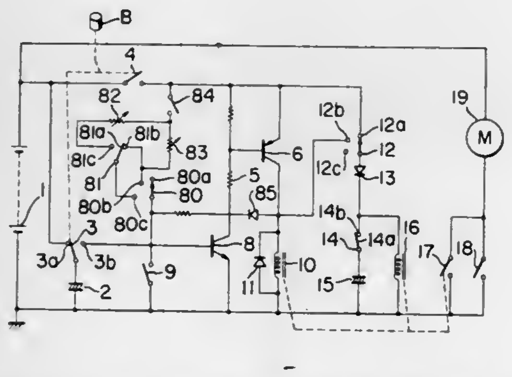


1. In a Galilean finder, a negative de-centered objective lens and a positive de-centered eye lens, said lenses being de-centered in the same sense to cause refractions in opposite senses of parallel rays entering said finder.

3,971,053
ELECTROMAGNETIC TRIGGER DEVICE FOR USE WITH CAMERA CAPABLE OF AUTOMATIC TIME EXPOSURE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,649
Claims priority, application Japan, Jan. 25, 1974, 49-10089
Int. Cl.^{2} G03B *9/08, 17/26, 21/38*
U.S. Cl. 354—234 **27 Claims**

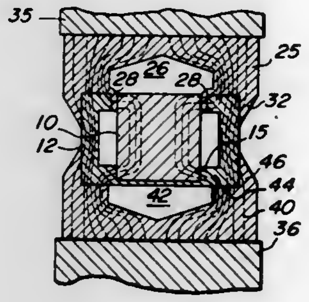


1. An electromagnetic trigger device for use with a camera of the type capable of automatic time exposure comprising:
a. a power supply;
b. a motor;
c. a trigger switch;
d. shutter driving means driven by said motor for driving a shutter and movable between a fully closed position and a fully open position, said shutter driving means fully opening the shutter when it is at the fully open position and fully closing the shutter when it is at the fully closed position;
e. engaging means movable between a latching position and a non-latching position, said engaging means being adapted, when moved to said latching position, to latch said shutter driving means which occupies the fully open or fully closed position;
f. a motor switch which is closed for electrically connecting said motor to said power supply, when said engaging means is in said non-latching position;
g. a starting coil for attracting said engaging means, when energized, to move said engaging means to said non-latching position;
h. a switching circuit for connecting said starting coil to said power supply when turned on;
i. a starting capacitor connected to said power supply so as to be charged when said trigger switch is opened and connected to said switching circuit to render said circuit conductive when said trigger switch is closed;
j. reset means for rendering said switching circuit non-conductive for a predetermined period during an interval beginning with the closing operation of said trigger switch, said predetermined period being shorter than the shorter of the time interval required for said shutter driving means to move from the fully closed position to the fully open position and the time interval required for said driving means to move from the fully open position to the fully closed position; and
k. a charging circuit interlocked with said shutter driving means for charging said starting capacitor connected to said switching circuit to thereby render said switching circuit conductive when said shutter driving means is in the fully open position, whereby conduction of the switching circuit by the charge of said starting capacitor through said charging circuit energizes said starting coil and then said motor to move the shutter driving means from the fully open position to the fully closed position.

3,971,054
METHOD AND APPARATUS FOR MAGNETIZING PERMANENT MAGNET IN MAGNETIC STRUCTURE

Leon Jasinski, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 12, 1974, Ser. No. 488,612
Int. Cl.^{2} H01F *13/00*
U.S. Cl. 335—284 **10 Claims**

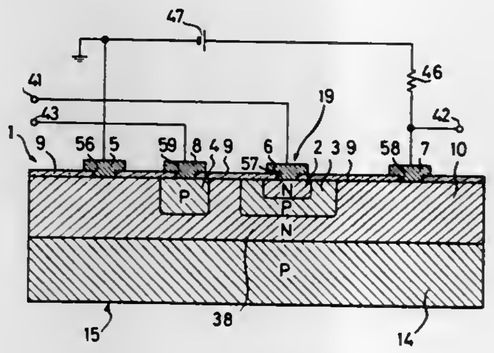


1. The method of magnetizing the cylindrical permanent magnet of a magnetic structure which has an annular magnetic return path element connected to and in physical contact with the permanent magnet at one end thereof and which element forms an annular air gap with the permanent magnet adjacent the opposite end thereof, which method includes the steps of:
applying magnetic flux from the air gap through the periphery of the cylindrical permanent magnet and axially therein to the return path element adjacent the one end of the permanent magnet and through a parallel flux path in the return path element, and
increasing the flux applied until the parallel flux path in the return path element is saturated and the magnetizing flux through the permanent magnet provides the desired magnetization thereof.

3,971,055
ANALOG MEMORY CIRCUIT UTILIZING A FIELD EFFECT TRANSISTOR FOR SIGNAL STORAGE

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 373,731, June 26, 1973, Pat. No. 3,868,718. This application Aug. 21, 1974, Ser. No. 499,220
Claims priority, application Japan, Aug. 25, 1973, 48-95391
Int. Cl.^{2} H01L *29/80*
U.S. Cl. 357—22 **8 Claims**

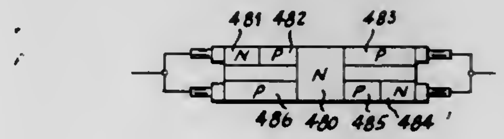


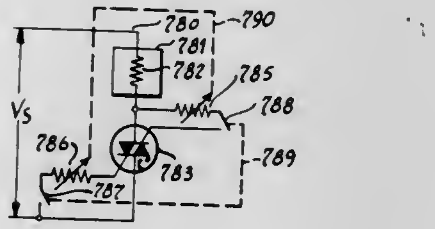
1. An analogue memory circuit comprising,
a substrate of a first conductivity type,
first and second electrodes connected to said substrate and spaced apart to form a current channel therebetween,
a first region of opposite conductivity type formed in said substate between said first and second electrodes and forming a first PN junction,
a second region of first conductivity type formed in said first and forming a second PN junction,
means for applying a signal of a first polarity to said second region so as to forward bias said second PN junction and to reverse bias said first PN junction so that a charge proportional so said input signal is stored in said first region,
means for applying a blanking signal to said memory circuit to neutralize said charge stored in said first region, and
an output terminal connected to said memory circuit to remove a signal proportional to said stored input signal.

3,971,056
SEMICONDUCTOR TEMPERATURE SWITCHES

Stanley V. Jaskolski, Sussex; Robert W. Lade, Waukesha; Herman P. Schutten, Elm Grove; Gordon B. Spellman, Milwaukee, and Lawrence E. Van Horn, Greendale, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 18, 1975, Ser. No. 550,838
Int. Cl.^{2} H01L *23/56, 29/74;* **H03K** *3/35;* **H02P** *1/44*
U.S. Cl. 357—28 **45 Claims**





1. A semiconductor temperature switch actuatable at a predetermined temperature within a temperature range up to about 55°C and adapted for operating at voltages up to about 400 volts, comprising a semiconductor device formed of first, second, third and fourth layers defining therebetween first, second and third junctions:
said first layer being of one conductivity type of germanium and having a first current-carrying electrode attached thereto;
said second layer being a thin stratum of opposite conductivity type of germanium with a transfer efficiency of minority charge carriers thereacross of at least about 50%;
said third layer being of said one conductivity type of germanium and having a resistivity greater than 0.01 ohm-centimeter and a minority carrier diffusion length, L_d, between about 0.5 mils and about 5 mils, and a thickness equal to between about 0.1 L_d and about $10L_d$;
said fourth layer being of said opposite conductivity type and having a second current-carrying electrode attached thereto;
said first junction having an injection efficiency of charge carriers into said second layer between about 50% and about 90%;
said second junction having a breakover voltage essentially equal to said operating voltage at said predetermined switching temperature within said temperature range when a voltage is applied to said electrode on said first layer with respect to said electrode on said fourth layer of such polarity as to reverse bias said second junction, and a low impedance subsequent to said switching at said predetermined temperature when said second junction becomes forward biased; and
said third junction having an injection efficiency of charge carriers into said third layer of at least about 80%; whereby when said switch reaches said predetermined

temperature, said second junction changes from a reversed biased to a forward biased junction to permit a marked increase in the flow of current therethrough.

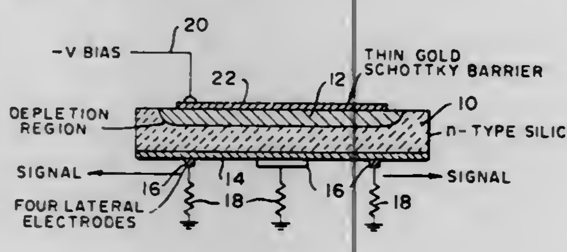
3,971,057
LATERAL PHOTODETECTOR OF IMPROVED SENSITIVITY

William P. Connors, Florissant; Richard H. Glaenzer, Bridgeton; George A. Saum, Florissant, St. Louis County, and Robert G. Wagner, University City, all of Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1973, Ser. No. 391,404

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **9 Claims**



1. In the process of making a lateral photodetector including the steps of applying a Schottky barrier to one face of a semiconductor wafer, connecting a lead wire to the Schottky barrier, and connecting four electrodes to the opposite face of said wafer, the improvement comprising:
   - lowering, isotropically, the lateral resistivity of the opposite face of the semiconductor wafer; and
   - exposing said wafer to a source of nuclear radiation for a predetermined period before applying the Schottky barrier.

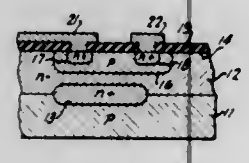
3,971,058
DUAL EMITTER PROGRAMMABLE MEMORY ELEMENT AND MATRIX

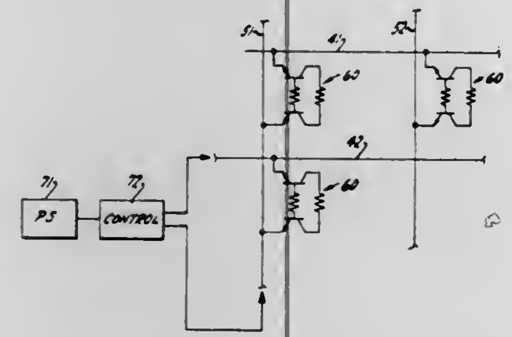
Lloyd D. Fagan, Santa Clara, and Gareth A. Tripp, Mountain View, both of Calif., assignors to Intersil Incorporated, Cupertino, Calif.

Filed Jan. 7, 1974, Ser. No. 431,394

Int. Cl.^{2} G11C *11/44;* **H01L** *29/72, 27/10*

U.S. Cl. 357—36 **8 Claims**





1. An improved integrated circuit field programmable read only memory matrix comprising
   - a plurality of dual emitter transistor elements disposed in a single substrate with each transistor having, a high conductivity burried collector region,
   - a base region having no electrical contact thereto disposed above said burried collector region and having a PN junction therebetween,
   - and a pair of separate emitter regions extending into said base region from an upper surface thereof,
   - first electrical conductors connecting pluralities of first emitters of said transistors in separate rows; and
   - second electrical conductors connecting pluralities of second emitters of said transistors in separate columns to form a matrix having a programmable address at each crossover of row and column
   - whereby application of electrical power between a selected row and column to electrically short a base-emitter junction of an element connected therebetween programs an address of the matrix.

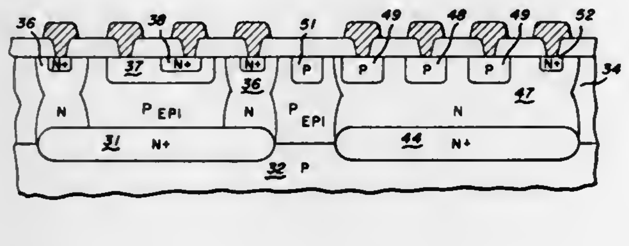
3,971,059
COMPLEMENTARY BIPOLAR TRANSISTORS HAVING COLLECTOR DIFFUSED ISOLATION

James L. Dunkley, Scottsdale, and Victor K. C. Liang, Phoenix, both of Ariz., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 23, 1974, Ser. No. 508,159

Int. Cl.^{2} H01L *27/04, 29/08*

U.S. Cl. 357—44 **7 Claims**



1. A semiconductor device comprising:
   - a first buried layer of a first conductivity type diffused into a substrate of a second conductivity type,
   - a first region of said first conductivity type formed in a frame-like pattern overlapping the periphery of said first buried layer region,
   - an epitaxial layer of said second conductivity type grown over said substrate, and said buried layer,
   - a second region of said first conductivity type formed in a frame-like pattern in the surface of said epitaxial layer and aligned with said first region, said first and second regions being diffused toward each other through said grown epitaxial layer until said first and second regions overlap,
   - a base region of said second conductivity type formed in the surface of said epitaxial region within said diffusion region and extending from the surface only part way through said epitaxial layer and being spaced at its bottom from said buried layer and an emitter region of said first conductivity type diffused into said base region,
   - a second buried layer region of said first conductivity type in said substrate and spaced from said first buried layer,
   - a third region of said first conductivity type in said second buried layer,
   - said epitaxial layer being grown over said second buried layer,
   - a fourth region of said first conductivity type in the surface of said grown epitaxial layer over said second buried layer region, said third and fourth regions diffused together to form a continuous base region of said first conductivity type extending from the surface of said grown epitaxial layer and down to said buried layer,
   - an emitter region of said second conductivity type diffused into said base region at the surface of said grown epitaxial layer, and
   - a collector region of said second conductivity type diffused into said base region at the surface of said grown epitaxial layer.

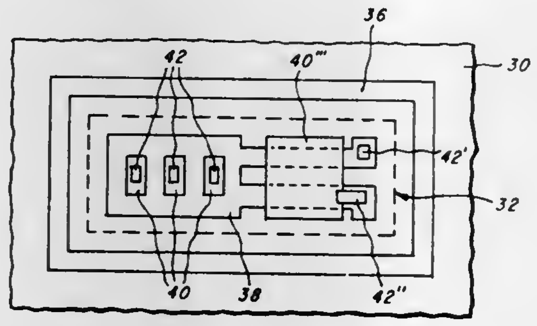
3,971,060
TTL COUPLING TRANSISTOR

Horst Leuschner, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 12, 1974, Ser. No. 486,706

Int. Cl.^{2} H01L *27/04, 29/08*

U.S. Cl. 357—51 **1 Claim**



1. A transistor device comprising:
   - a. a single crystal body of semiconductor materials;
   - b. a first region of one conductivity type adjacent one surface of said body and of a resistivity suitable to act as the collector of the transistor;
   - c. a second region of the opposite type conductivity adjacent said one surface of said body entirely within and surrounded by said first region and of a resistivity suitable to act as the base of the transistor;
   - d. a plurality of third regions of said one type conductivity adjacent said one surface, each entirely within and surrounded by said second region;
   - e. a pair of elongated extensions of said second regions extending in substantially the same direction from said second region and terminating in areas remote from said third regions;
   - f. a fourth region of said one type conductivity adjacent said one surface having a resistivity approximately that of said third regions and contacting a length of each of said elongated extensions and said first region;
   - g. an ohmic base contact to one of said elongated extensions near the area of its termination; and
   - h. a collector contact making ohmic connection to both said fourth region and the other of said elongated extensions near the area of termination of said other elongated extension.

3,971,061
SEMICONDUCTOR DEVICE WITH A HIGH BREAKDOWN VOLTAGE CHARACTERISTIC

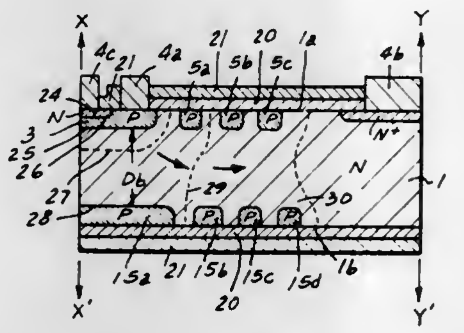
Takeshi Matsushita, Sagamihara; Hisao Hayashi, and Yoshiyuki Kawana, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,153

Claims priority, application Japan, May 19, 1973, 48-55965

Int. Cl.^{2} H01L *29/34*

U.S. Cl. 357—52 **5 Claims**



1. A semiconductor device comprising a semiconductor substrate having two major surfaces comprising a first region of one impurity type and a second region of the opposite conductivity type, said first and second regions forming a PN junction therebetween which junction extends to one major surface of said substrate, said PN junction being arranged to be reversely biased by an applied voltage, said substrate including at least one field limiting ring of opposite conductivity type semiconductor material formed therein adjacent said one major surface and spaced from said PN junction by a distance such that the depletion layer of said PN junction is spread to said ring by said voltage, which voltage is less than the breakdown voltage, and a polycrystalline silicon layer covering an entire surface end of said PN junction, the said field limiting ring and an area of said one major surface where said depletion layer spreads, said polycrystalline silicon layer having a resistivity greater than 10^4 ohms-centimeters, a layer of silicon dioxide overlying said polycrystalline silicon layer, and in which said silicon dioxide layer has a gradually changing oxygen concentration between its top and bottom.

3,971,062
SEMICONDUCTOR ARRANGEMENT

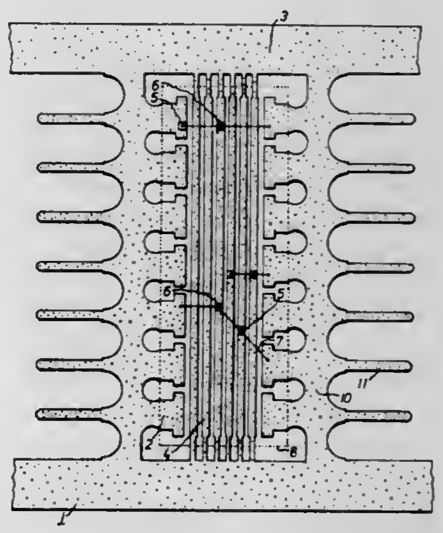
Rolf Merkle, Meimsheim, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Continuation of Ser. No. 401,008, Sept. 26, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 606,193

Claims priority, application Germany, Sept. 28, 1972, 2247580

Int. Cl.^{2} H01L *23/48, 29/44, 29/46*

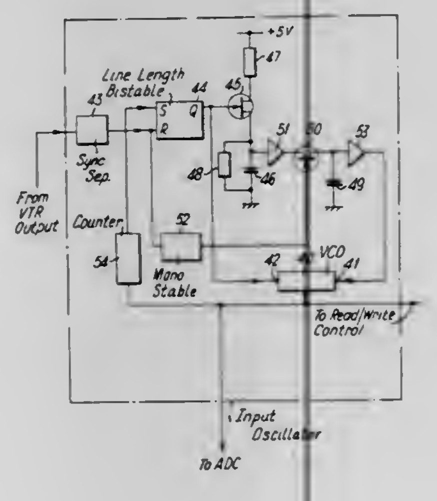
U.S. Cl. 357—70 **7 Claims**



1. In a semiconductor circuit arrangement including a metal contacting strip which is provided with a plurality of notches and/or recesses which divide said strip into a pattern of spaced connecting parts, including the external leads for the circuit arrangement, for receiving the semiconductor components or their connecting wires, a plurality of semiconductor components mounted on selected ones of said connecting parts, a plurality of connecting wires interconnecting the contact points of said semiconductor components with the contact points of selected ones of said connecting parts to form a desired circuit arrangement, and a housing which encloses said semiconductor wafers, said connecting wires and the portions of said contact strip other than said external leads; the improvement comprising means for providing a bridging connection between two contact points which are spaced relatively far apart whereby relatively short lengths of connecting wire may be utilized, said means including an insulating platelet mounted on and having one surface thereof connected to one of said connecting parts which is situated between said two contact points, a metal coating on the surface of said platelet opposite said one surface, and a pair of connecting wires, each electrically connected between said metal coating and a respective one of said two contact points.

3,971,063
DIGITAL TIME BASE CORRECTOR OSCILLATORS

Peter Colin Michael, and Anthony Donald Stalley, both of Newbury, England, assignors to Quantel Limited, England
Filed Mar. 13, 1975, Ser. No. 558,090
Claims priority, application United Kingdom, Mar. 16, 1974, 11793/74
Int. Cl.^{2} H04N *5/76*
U.S. Cl. 358—8 **4 Claims**



1. A digital time base corrector for television equipment comprising:

a. an analogue to digital converter for receiving successive lines of an analogue video signal having horizontal sync pulse information thereon and for converting said signal into digital form,

b. a store for receiving the video information in digital form from the output of the analogue to digital converter,

c. control means for writing in and reading out the digital information in said store,

d. a digital to analogue converter for receiving the stored signal read out from said store,

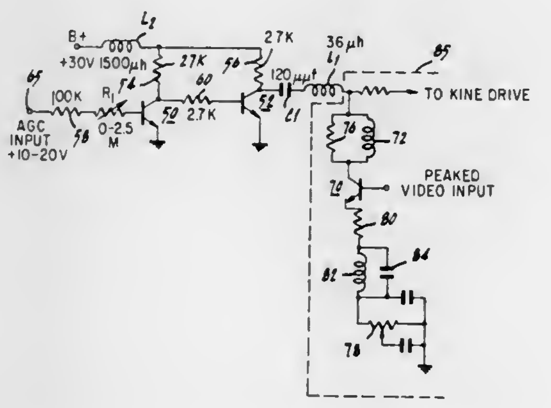
e. a voltage controlled input oscillator for determining the rate of conversion of said analogue signal into digital form and the rate of writing in of said digital information into said store,

f. a fixed frequency output oscillator for determining the rate of reading out of the digital information from said store and the rate of conversion of the digial information into analogue form,

g. said input oscillator including a triggered oscillator having an input connected to said incoming video signal which triggered oscillator is triggered into oscillation in timed relationship with the incoming horizontal sync pulse information and, including means connected to said triggered oscillator for switching off said triggered oscillator after emission of a predetermined number of oscillations therefrom which are sufficient to cause all the video information in one line to be converted into digital form and stored, and control voltage means operating to develop a voltage which is dependent on the time interval between the switching off of the triggered oscillator after the predetermined number of oscillations and the start of said oscillator on receipt of the sync pulse information at the start of the next line, said triggered oscillator being coupled to said control voltage means to have its frequency varied according to the level of said developed voltage.

3,971,064
VIDEO DE-PEAKING CIRCUIT IN LUMINANCE CHANNEL IN RESPONSE TO AGC SIGNAL

Edward Marshall Milbourn, Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.
Continuation of Ser. No. 115,304, Feb. 16, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 434,950
Int. Cl.^{2} H04N *9/00*
U.S. Cl. 358—38 **2 Claims**



1. In a color television receiver of the type including signal translating stages for processing radio frequency and intermediate frequency signals, a luminance channel for processing luminance signals, a chrominance channel for processing chrominance signals, an image reproducing kinescope, an output stage coupled between said luminance channel and said image reproducing kinescope and apparatus for developing an AGC voltage to control the gain of said signal translating stages as an inverse function of the amplitude of a received signal, said luminance channel including a peaking circuit for accentuating high frequency components of said luminance signals, the combination therewith of:

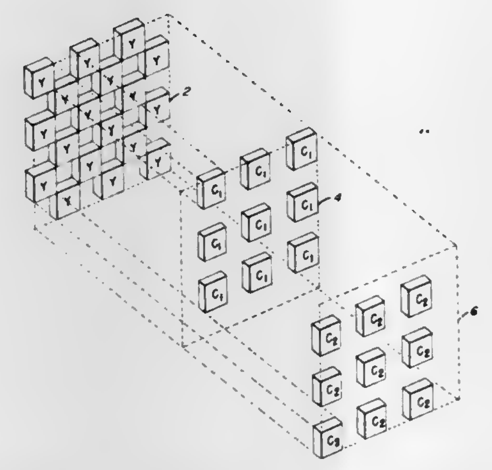
means coupled intermediate said luminance channel peaking circuit and said kinescope at said output stage and being also responsive to said AGC voltage but for automatically de-emphasizing said accentuated high frequency components of said luminance signals, also as an inverse function of said received signal amplitude;

said means being independently operative of said peaking circuit and so configured and arranged that the degree of de-emphasis provided said accentuated high frequency components of said luminance signals increases with decreases in received strength to reduce the presence of higher frequency noise in a reproduced image under weak signal conditions while the degree of de-emphasis provided said accentuated high frequency components of said luminance signals decreases with increases in received signal strength where the signal-to-noise ratio of an incoming signal is correspondingly greater;

said means including an impedance path for bypassing said accentuated high frequency components of said luminance signals away from said image reproducing kinescope, said AGC varying the impedance of said path in the same direction as variations in said received signal strength, said impedance path comprising the series connection of a capacitive and inductive reactance and a variable resistance, said capacitive and inductive reactance being selected so as to pass said accentuated high frequency components of said luminance signals with said resistance being controllably varied in the same direction as variations in said AGC voltage to change the loading of said output stage in the frequency range of said high frequency components of said luminance signals, also as an inverse function of received signal strength.

3,971,065
COLOR IMAGING ARRAY

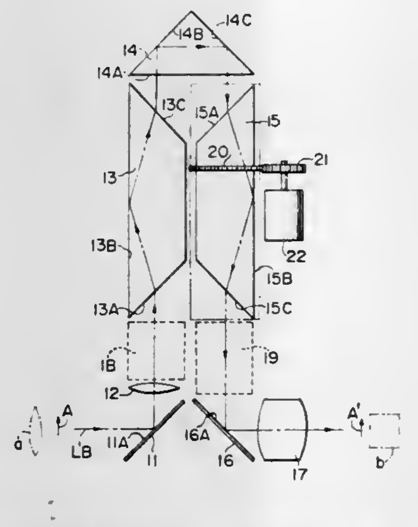
Bryce E. Bayer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 5, 1975, Ser. No. 555,477
Int. Cl.^{2} H04N *9/24*
U.S. Cl. 358—41 **11 Claims**



1. A color imaging device comprising an array of light-sensitive elements, which array includes at least (1) a first type of element sensitive to a spectral region corresponding to luminance, (2) a second type of element sensitive to one spectral region corresponding to chrominance, and (3) a third type of element sensitive to a different spectral region corresponding to chrominance, the three types of elements occurring in repeating patterns which are such that over at least a major portion of said array luminance-type elements occur at every other element position along both of two orthogonal directions of said array.

3,971,066
SPECIAL EFFECT GENERATION SYSTEM IN AN IMAGE PICKUP SYSTEM

Kikuo Toda, Tokyo, Japan, assignor to Nippon Educational Television Company, Ltd., Tokyo, Japan
Filed Feb. 11, 1974, Ser. No. 441,567
Claims priority, application Japan, Mar. 1, 1973, 48-24567; Mar. 1, 1973, 48-24568; June 27, 1973, 48-72620; June 27, 1973, 48-72621
Int. Cl.^{2} H04N *9/04*; **G02B** *17/00*
U.S. Cl. 358—55 **4 Claims**



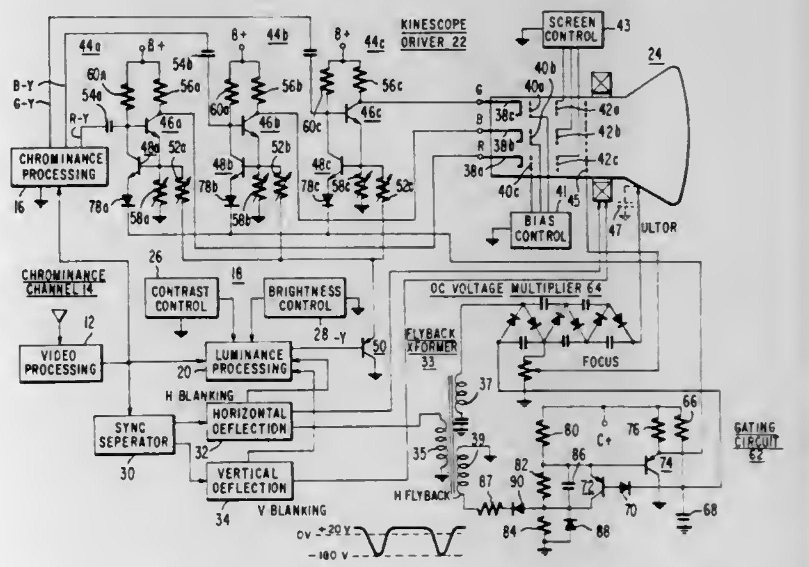
1. A special effect generation arrangement for a color television pickup system, comprising:

reflection means disposed between a taking lens and a three color split optical device for directing light from said lens to the optical device along a path lying in a plane normal to an axis extending between the lens and the optical device, said reflection means including an even numbered reflecting member integrally disposed with an odd numbered reflecting member; and

means for moving said reflecting members in a direction normal to said plane to selectively introduce said members into the light path thereby permitting variation between normal and inverted states of images conveyed by said light to the optical device.

3,971,067
AUTOMATIC BEAM CURRENT LIMITER

Marvin Neil Norman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed May 23, 1975, Ser. No. 580,356
Int. Cl.^{2} H04N *9/52*
U.S. Cl. 358—74 **14 Claims**



1. In a system for processing television video signals, said signals including chrominance, luminance and synchronizing signals, said system including a luminance channel for processing said luminance signals, a chrominance channel for deriving color difference signals from said chrominance signals, an image reproducing device, high voltage supplying means for providing operating potential for said image reproducing device, and deflection means responsive to said synchronizing signals for scanning said device in a regular pattern including trace and retrace intervals, an apparatus comprising:

means for deriving a control voltage representing the magnitude of current drawn by said image reproducing device from said high voltage supplying means;

amplifying means for combining said luminance signals and said chrominance signals to derive color signals, said amplifying means coupling said color signals to said image reproducing device;

clamping means coupled to said amplifying means for clamping a predetermined circuit point of said amplifying means to said control voltage and thereby control the operating point of said amplifying means, said operating point being controlled so as to reduce the amplitude of said color signals in direct relationship to the magnitude of said current drawn by said image reproducing device.

3,971,068
IMAGE PROCESSING SYSTEM

Lester A. Gerhardt, Elnora; Nelson R. Corby, Jr., and Edward M. Sims, both of Troy, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 22, 1975, Ser. No. 607,081
Int. Cl.^{2} H04N *9/02*
U.S. Cl. 358—82 **8 Claims**

1. An image processing system comprising, in combination

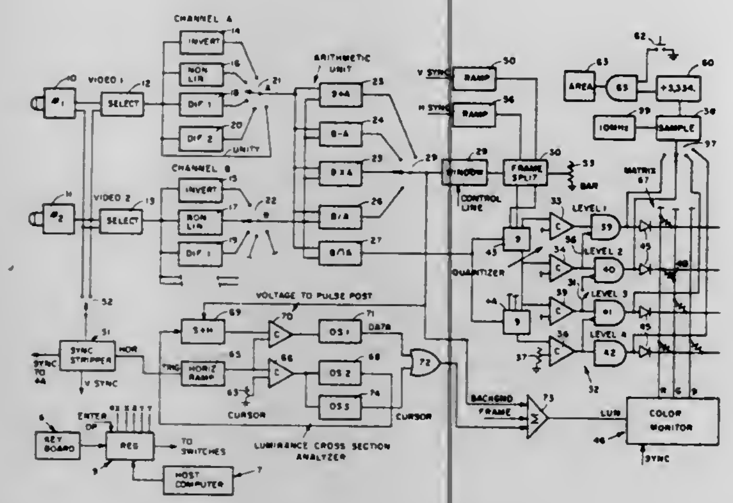
a first and second source of video signals which represent one or more images,

each of said sources producing a signal sequence which duplicates the format generated by a television camera so that appropriate vertical and horizontal sync pulses are included therein;

means for subjecting the video signals from both sources to a preliminary wave shaping operation which involves unity gain, logarithmic amplification or differentiation so as to produce first and second modified video signals;

means for performing a preselected arithmetic operation with said first and second modified video signals which involves addition, subtraction, multiplication or division so as to produce processed video signals;

means for comparing the amplitude of said processed video signals to a plurality of successively higher threshold levels and for developing quantized signals which correspond to the number of threshold levels that are exceeded by said processed video signals;



means for combining selected ones of said quantized signals to form first, second and third encoded signals which designate those corresponding processed video signals that exceed predetermined combinations of said threshold levels;

a monitor adapted to provide a color television type display on its screen,

said monitor being synchronized by the horizontal and vertical sync pulses from said sources and having three electron guns adapted to produce a like number of different colors on said screen; and

means for coupling said first, second and third encoded signals to different ones of said electron guns thereby to form on the screen of said monitor a color encoded image.

3,971,069
THERMAL PRINTING APPARATUS

Ichiro Hanai, Ichikawa; Toshiharu Kobayashi, and Kazuo Takahashi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,957

Claims priority, application Japan, Nov. 27, 1973, 48-133274

Int. Cl.² G11B *5/86*

U.S. Cl. 360—16 **9 Claims**

1. A thermal printing apparatus comprising:

a slave tape;

a master tape;

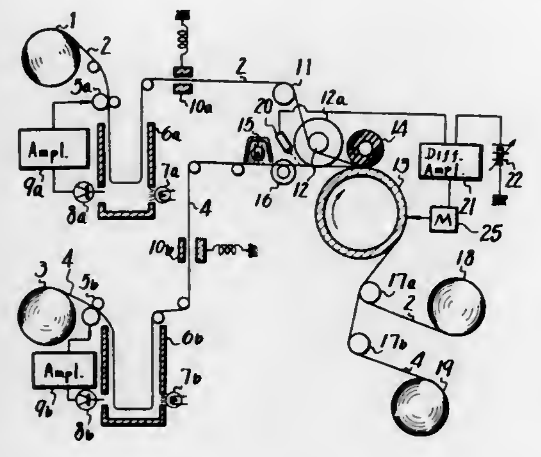
means transporting the master tape;

heating means mounted adjacent said slave tape for heating said tape above its Curie point before printing;

means for bringing said slave tape into contact with said master tape and maintaining said tapes in contact until the slave tape cools substantially below its Curie temperature;

a temperature detecting means mounted adjacent means for bringing said slave tape into contact with said master tape to detect the temperature of said slave tape;

means for driving said slave tape relative to said heating means; and



the output of said detecting means connected to said means for driving said slave tape to vary its speed and said drive means responsive to the output of said detecting means to maintain said slave tape at a desired temperature.

3,971,070
HEATING MEANS FOR HEATING A MAGNETIC TAPE ABOVE ITS CURIE POINT PRIOR TO DUPLICATION BY CONTACT WITH A MASTER TAPE

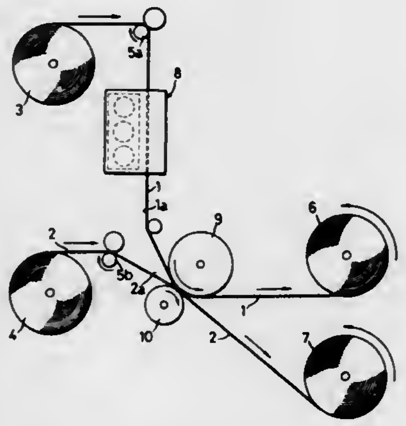
Ichiro Hanai, Ichikawa; Toshiharu Kobayashi, and Kazuo Takahashi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,308

Claims priority, application Japan, Oct. 1, 1973, 48-110339

Int. Cl.² G11B *5/86*

U.S. Cl. 360—16 **5 Claims**



1. A thermal printing apparatus for duplicating magnetic data on a slave tape from a master tape, comprising:

a. means for transporting said master tape on which said data is recorded;

b. means for transporting said slave tape;

c. means for bringing said master and slave tapes into contact with each other so as to print said data on said master tape onto said slave tape;

d. means for heating said slave tape to a predetermined temperature above its Curie point prior to bringing said slave tape into contact with said master tape and said master and slave tapes held in contact until said slave tape cools below its Curie point;

e. a housing substantially enclosing said heating means and formed with a slot into which said slave tape is received such that when in said slot it is heated by said heating means, and

f. means for moving said heating means relative to said housing to a first position so that said slave tape and said heating means are separated so that said slave tape is not heated by said heating means and to a second position where said slave tape is heated by said heating means within said housing.

3,971,071
TAPE CASSETTE WITH GUIDE MEANS FOR UNIDIRECTIONAL INSERTION AND HOLDER THEREFORE

Kiyoshi Urayama, Sendai, Japan, assignor to Sony Corporation, Tokyo, Japan

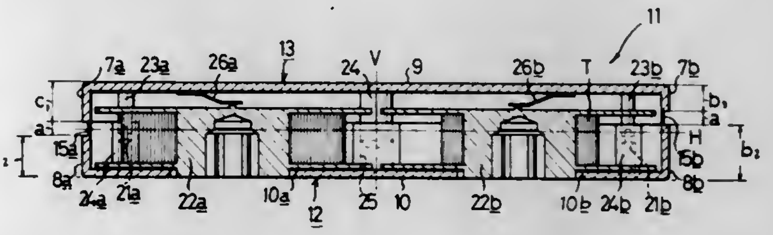
Filed Mar. 10, 1975, Ser. No. 557,069

Claims priority, application Japan, Mar. 11, 1974, 49-28128[U]

Int. Cl.² G11B *23/08;* **G03B** *1/04, 23/02*

U.S. Cl. 360—132 **12 Claims**

1. A tape cassette comprising a housing of generally rectangular configuration containing a supply of tape; said housing including top and bottom walls defining top and bottom surfaces of the housing, a perpheral wall extending between said top and bottom walls, and first and second guiding means extending along said peripheral wall at opposite sides, respectively, of said housing, each of said first and second guiding means having upper and lower guiding surfaces which are substantially parallel with, and at predetermined first and second distances from said top and bottom surfaces, respectively, of the housing, said first and second distances from said top and bottom surfaces of the housing to said upper and lower guiding surfaces, respectively, of at least one of said guiding means being unequal, and at least one of said first and second distances for said first guiding means being unequal to the other of said first and second distances for said second guiding means.



DESIGN PATENTS

GRANTED JULY 20, 1976

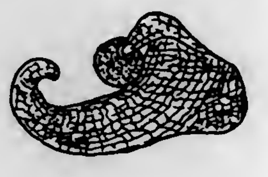
ERRATA

For CLASS	See PATENT NO.
033-009 D	240,573
008-047	240,598
008-271	240,599
025-010	240,617
016-002	240,664
016-021	240,665

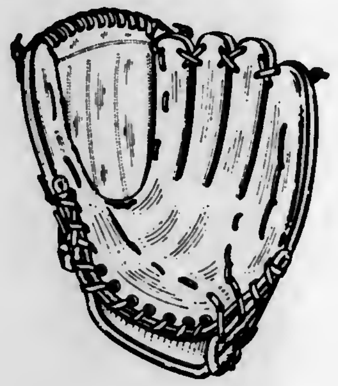
DESIGNS

JULY 20, 1976

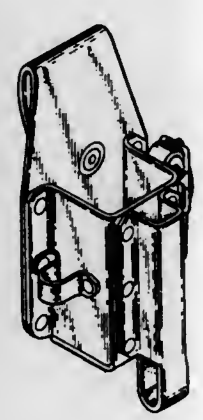
240,570
KNITTED SLIPPER
Esther C. Karna, 1996 Camino al los Cerros,
Menlo Park, Calif. 94025
Filed Sept. 12, 1974, Ser. No. 505,589
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—282



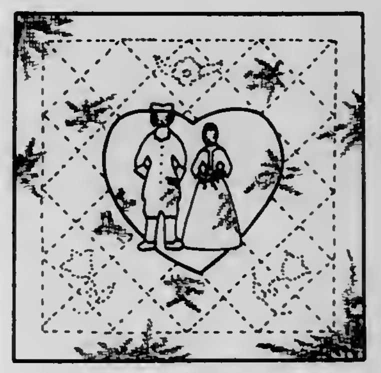
240,571
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,521
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



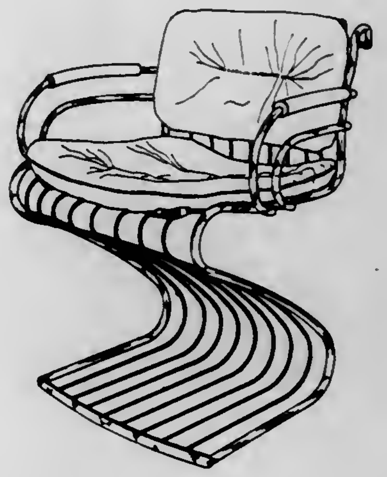
240,572
BELT-ATTACHED TOOL HOLDER
Paul E. Worsham, 3433 Calvin Ave.,
San Jose, Calif. 95124
Filed Dec. 9, 1974, Ser. No. 530,513
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



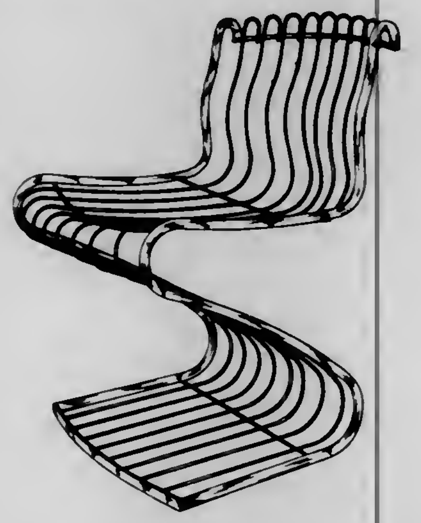
240,573
QUILTED FABRIC APPLIQUE BLOCK
Mary Louise Brion, 415 High St.,
Bethlehem, Pa. 18018
Filed Apr. 25, 1974, Ser. No. 464,139
Term of patent 14 years
Int. Cl. D5—*04*
U.S. Cl. D33—9 D



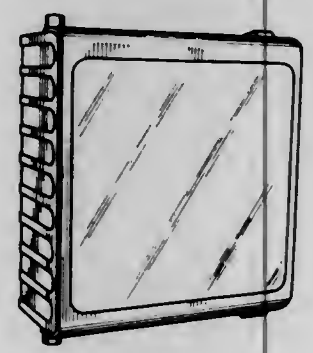
240,574
ARMCHAIR
Giorgio Rinaldi, Via Tombelle 9,
Saonara, Padova, Italy
Filed Nov. 25, 1974, Ser. No. 526,752
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70



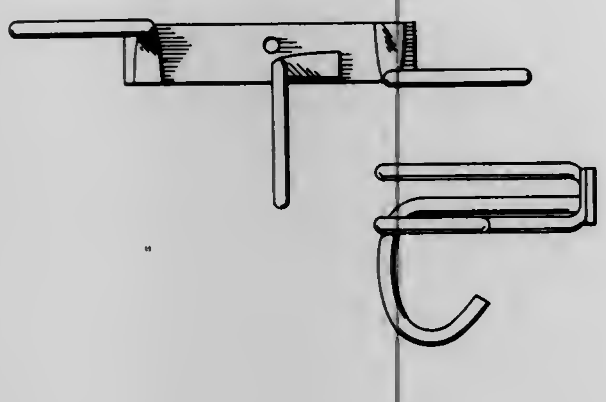
240,575
CHAIR
Giorgio Rinaldi, Via Tombelle 9,
Saonara, Padova, Italy
Filed Oct. 11, 1974, Ser. No. 513,973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76



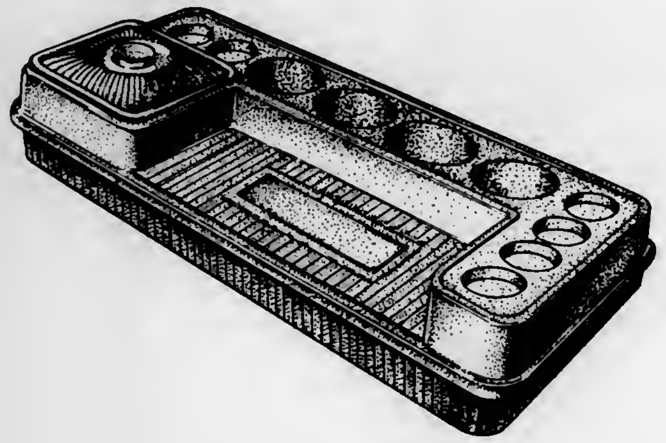
240,576
MEDICINE CABINET
William Jonathan Goodwin, Shoeburyness, England, assignor to Pye Limited, Cambridge, England
Filed Feb. 27, 1975, Ser. No. 553,535
Claims priority, application Great Britain Aug. 30, 1974
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—104



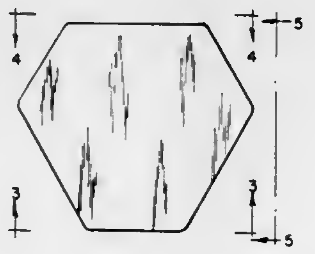
240,577
SUPPORT FOR GARDEN TOOLS OR THE LIKE
Fred D. Newman, 2708 NW. 60th,
Oklahoma City, Okla. 73112
Filed Dec. 23, 1974, Ser. No. 535,547
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



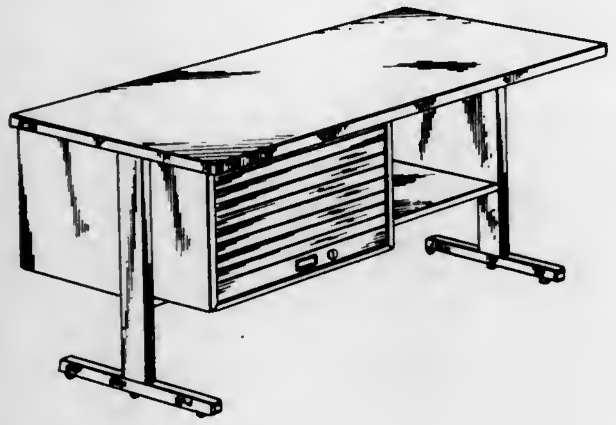
240,578
PORTABLE BAR
Marten Gottsegen, 1212 Lake Shore Drive,
Chicago, Ill. 61610
Filed July 29, 1974, Ser. No. 492,773
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—144



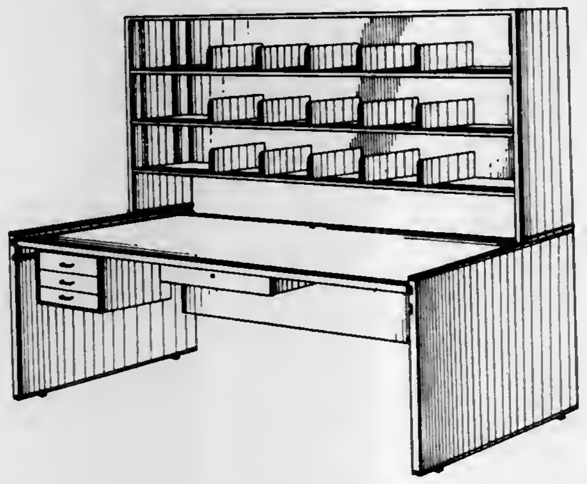
240,579
STORAGE CABINET FOR MAGNETIC TAPES OR OTHER SIMILAR ARTICLES
John Bower, Shelby, N.C., assignor to
American Greetings Corporation
Filed May 1, 1974, Ser. No. 465,872
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—149



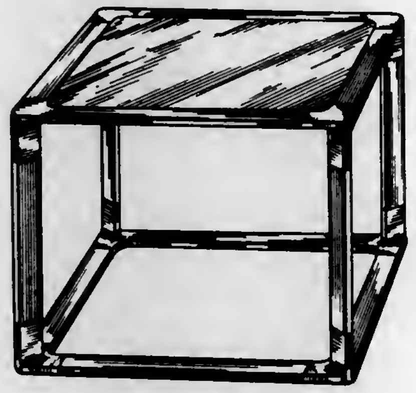
240,580
WORK TABLE OR SIMILAR ARTICLE
George W. Podell, Newburgh, N.Y., assignor to Monarch Metal Products, Inc., New Windsor, N.Y.
Filed Feb. 28, 1975, Ser. No. 554,302
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150



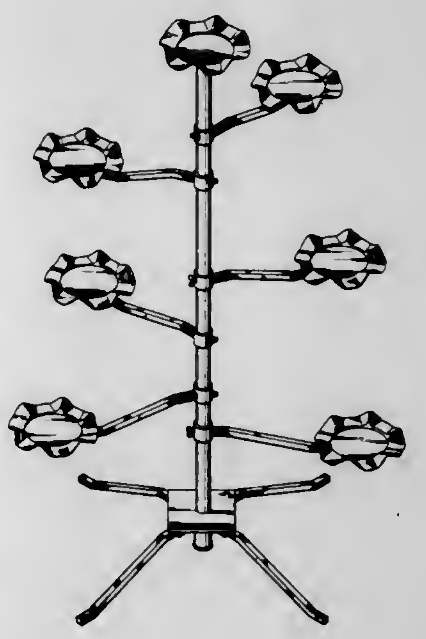
240,581
WORK STATION
Jan N. Ostborg, Ballwin, and Philip K. Bevelacqua, St. Ann, Mo., and Richard L. Hirsch, Collinsville, Ill., assignors to Harvard Industries, Inc.
Filed Aug. 15, 1974, Ser. No. 497,764
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



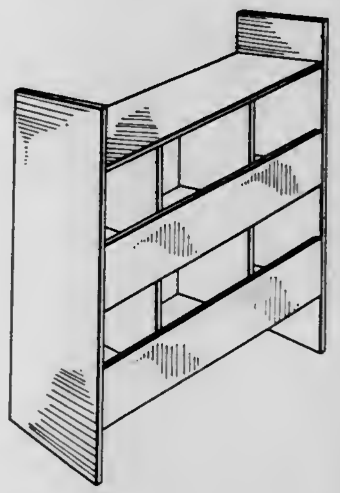
240,582
TABLE
Ira Friedman, Somerset, N.J., assignor to Rowe Furniture Corporation, Arlington, Va.
Filed Apr. 10, 1975, Ser. No. 567,020
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



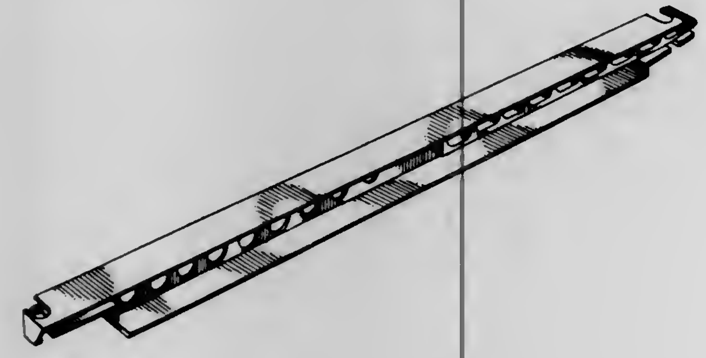
240,583
STAND FOR POTTED PLANTS AND THE LIKE
Michael Bohomoletz, R.D. 3, Box 312, Perrineville Road,
Robbinsville, N.J. 08691
Filed June 11, 1975, Ser. No. 586,098
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—183



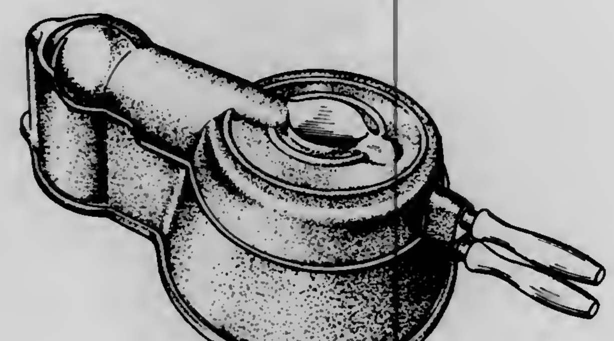
240,584
SHELF UNIT OR SIMILAR ARTICLE
John McGrann, 5851A Lincoln,
Morton Grove, Ill. 60053
Filed Nov. 16, 1973, Ser. No. 416,634
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



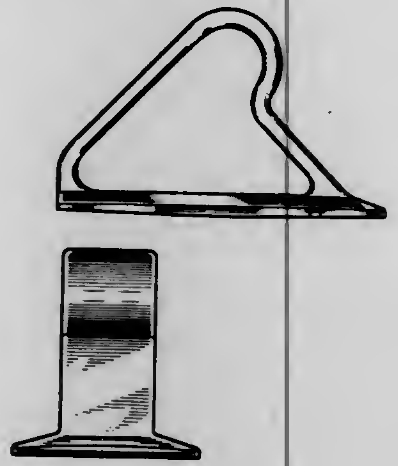
240,585
GUIDE FOR A DRAWER
Edward L. Kaplan, Northbrook, and Gerhard Cless, Skokie, Ill., assignors to Kenneth H. Gutner
Filed Aug. 23, 1974, Ser. No. 500,145
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



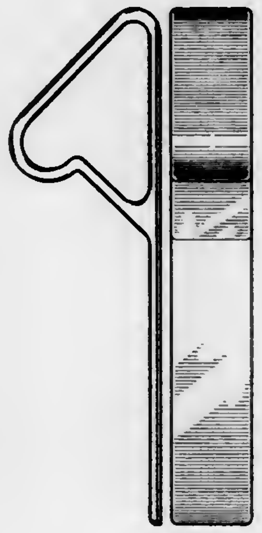
240,586
WAFFLE BAKER OR SIMILAR ARTICLE
Fred S. Carbon, 105 Days Ave., Buchanan, Mich. 49107
Filed July 24, 1974, Ser. No. 491,362
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88



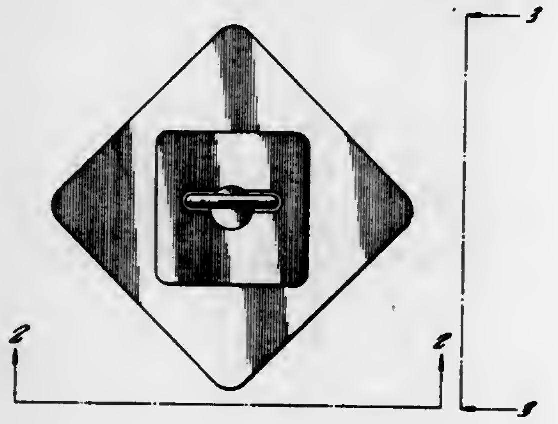
240,587
ABRADER
Hans Franzen, Vendelso, and Johnny Lind, Alvsjo, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed May 23, 1975, Ser. No. 580,226
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



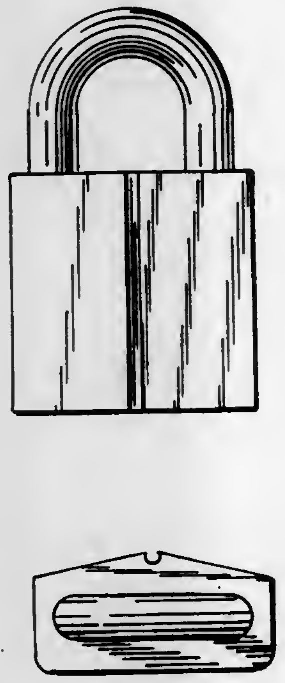
240,588
ABRADER
Hans Franzen, Vendelso, and Johnny Lind, Alvsjo, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed May 23, 1975, Ser. No. 580,227
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



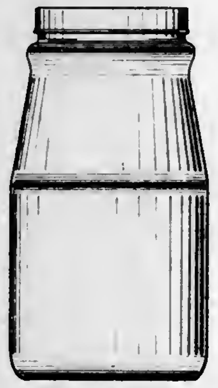
240,589
ROTATABLE LOCKING JOINT
Lonnie D. Cooper, Hawthorne, Calif., assignor to Revell, Incorporated, Venice, Calif.
Filed Sept. 23, 1974, Ser. No. 508,106
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—108



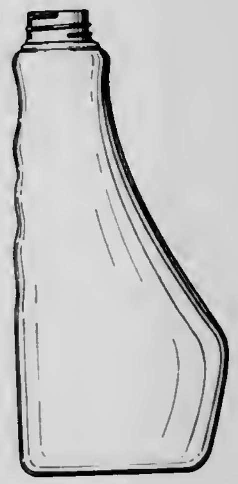
240,590
PADLOCK
Edward Herman Meisner, Wyckoff, N.J., assignor to Eaton Corporation
Filed Oct. 29, 1974, Ser. No. 518,917
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114



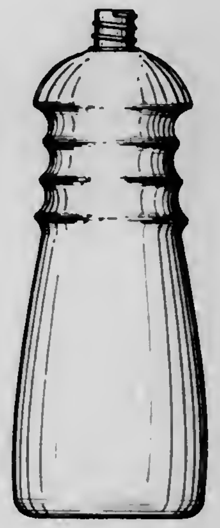
240,591
JAR
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed May 16, 1974, Ser. No. 470,530
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—1



240,592
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 10, 1975, Ser. No. 566,899
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—61



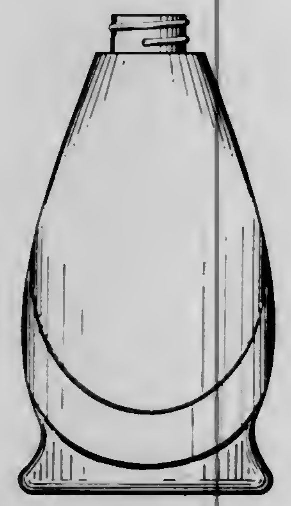
240,593
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,907
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116



240,594

BOTTLE

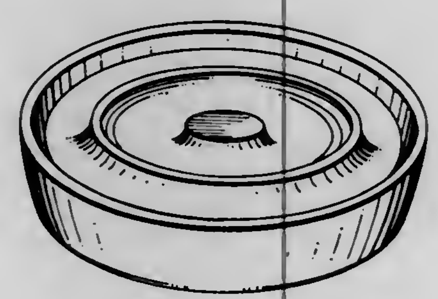
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 24, 1975, Ser. No. 561,597
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143



240,595

CONTAINER CLOSURE

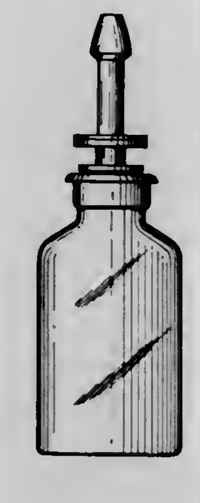
Elmer E. Kress, 933B Heritage Village, Southbury, Conn. 06488
Filed Mar. 25, 1974, Ser. No. 454,230
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—164



240,596

METERED DISPENSING CONTAINER

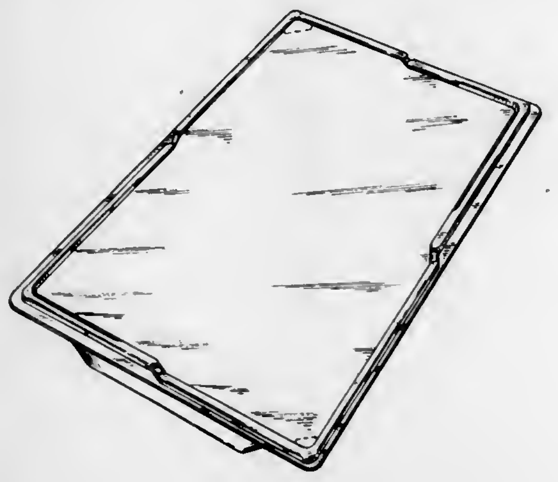
Frank E. Brown, Burbank, Calif., assignor to SmithKline Corporation, Philadelphia, Pa.
Filed Jan. 24, 1975, Ser. No. 543,806
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169



240,597

COMBINED PACKAGING TRAY AND COVER

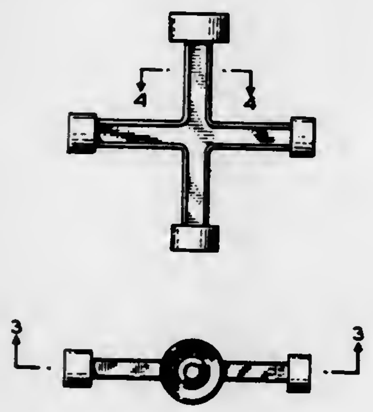
Karl Rune Persson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed Mar. 6, 1974, Ser. No. 448,696
Claims priority, application Sweden Sept. 10, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



240,598

STUD SETTER

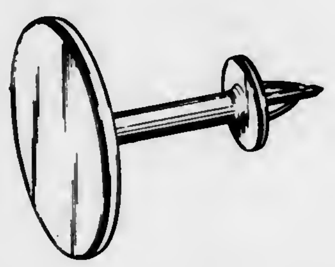
Harold Isaacs, 2750 Homecrest Ave., Brooklyn, N.Y. 11235
Filed Feb. 18, 1975, Ser. No. 550,819
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—47



240,599

MOLDED WALL FASTENER

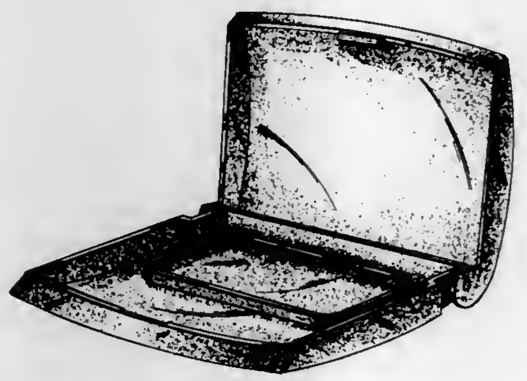
Alan J. Solo, Brooklyn, N.Y., assignor to Knock-N-Lok International, Inc., Brooklyn, N.Y.
Filed Jan. 8, 1975, Ser. No. 539,275
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—271



240,600

HINGED BOX

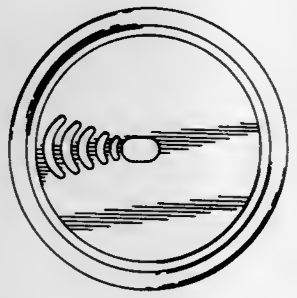
Donald K. Takacs, Wheaton, Ill., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Jan. 7, 1975, Ser. No. 539,112
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231



240,601

CONTAINER END PANEL

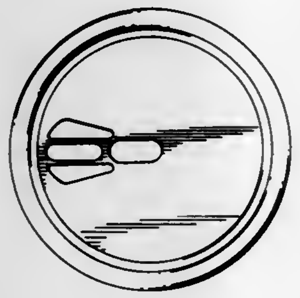
Fred C. Newman, La Grange Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Oct. 11, 1974, Ser. No. 514,038
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



240,602

CONTAINER END PANEL

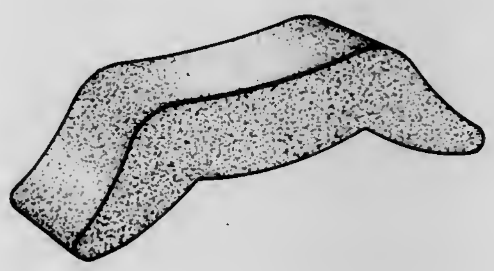
Fred C. Newman, La Grange Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Oct. 11, 1974, Ser. No. 514,046
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



240,603

LOOSE FILL PACKING ELEMENT

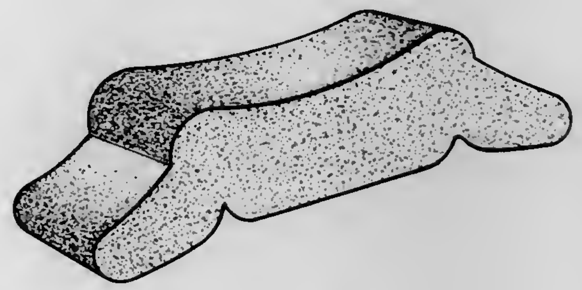
Harry Bussey, Jr., P.O. Box 115, Serpentine Road, Navesink, N.J. 07752
Filed Jan. 30, 1975, Ser. No. 545,561
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294



240,604

LOOSE FILL PACKING ELEMENT

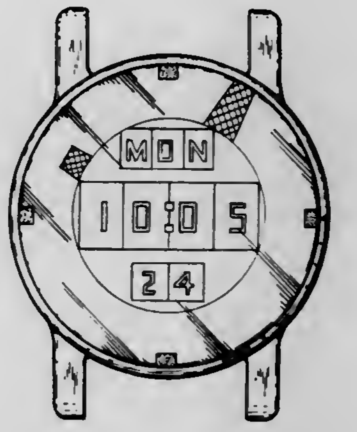
Harry Bussey, Jr., P.O. Box 115, Serpentine Road, Navesink, N.J. 07752
Filed Jan. 30, 1975, Ser. No. 545,567
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294



240,605

WATCH

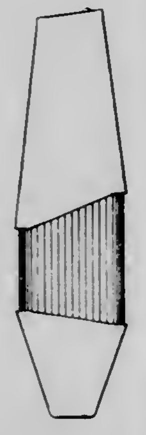
William Sticker, Hastings House 2A, Hastings-on-Hudson, N.Y. 10706
Filed Dec. 26, 1974, Ser. No. 536,574
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



240,606
HAND HELD OPTICAL CHARACTER RECOGNITION SCANNING UNIT

Robert B. Koenig, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.
Filed Sept. 26, 1974, Ser. No. 509,712
Term of patent 14 years
Int. Cl. D10—*07*

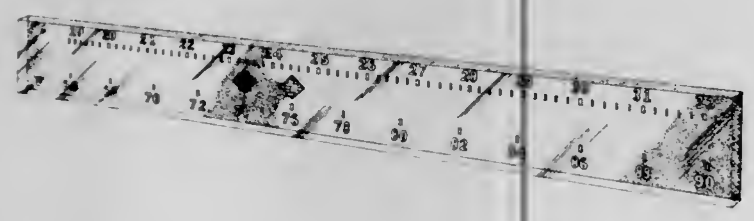
U.S. Cl. D10—46



240,607
LIQUID CRYSTAL CONVERTER THERMOMETER

Neil R. Riley, Livermore, Calif., assignor to Thermoptics, Inc., Livermore, Calif.
Filed Oct. 4, 1974, Ser. No. 512,216
Term of patent 14 years
Int. Cl. D10—*04*

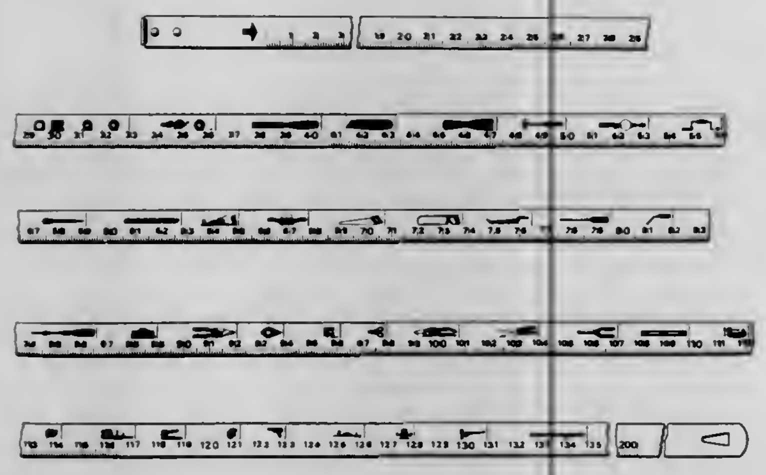
U.S. Cl. D10—57



240,608
TAPE MEASURE BLADE

Michel Quenot, Besancon, France, assignor to Stanley-Mabo
Filed Mar. 12, 1974, Ser. No. 450,396
Claims priority, application France Oct. 1, 1973
Term of patent 14 years
Int. Cl. D10—*04*

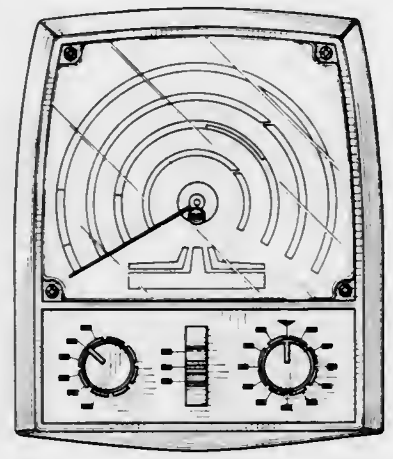
U.S. Cl. D10—71



240,609
IGNITION ANALYZER

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation
Filed Nov. 6, 1974, Ser. No. 521,364
Term of patent 14 years
Int. Cl. D10—*04*

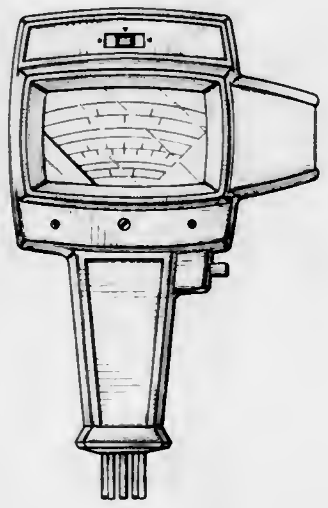
U.S. Cl. D10—78



240,610
COMBINED ENGINE ANALYZER AND TIMING LIGHT

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation
Filed Nov. 6, 1974, Ser. No. 521,365
Term of patent 14 years
Int. Cl. D10—*04*

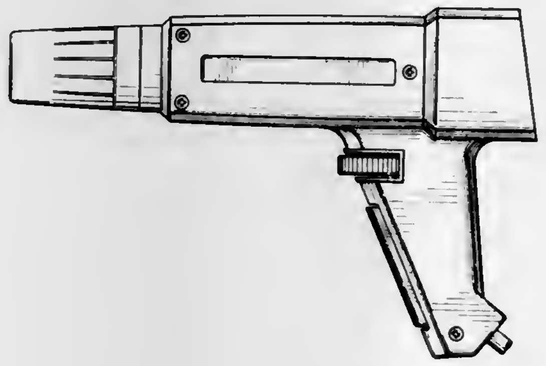
U.S. Cl. D10—78



240,611
COMBINED TACHOMETER, ADVANCE METER AND TIMING LIGHT

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation
Filed Nov. 18, 1974, Ser. No. 524,475
Term of patent 14 years
Int. Cl. D10—*04*

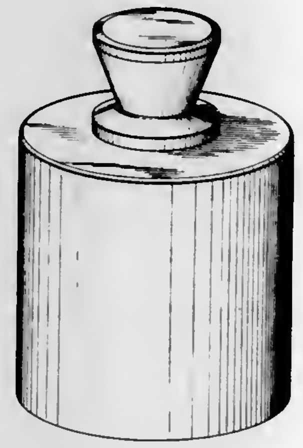
U.S. Cl. D10—78



240,612
WEIGHT

Harry C. Becker, 190 Broadview Ave., New Rochelle, N.Y. 10804
Filed Jan. 8, 1975, Ser. No. 539,540
Term of patent 14 years
Int. Cl. D10—*07*

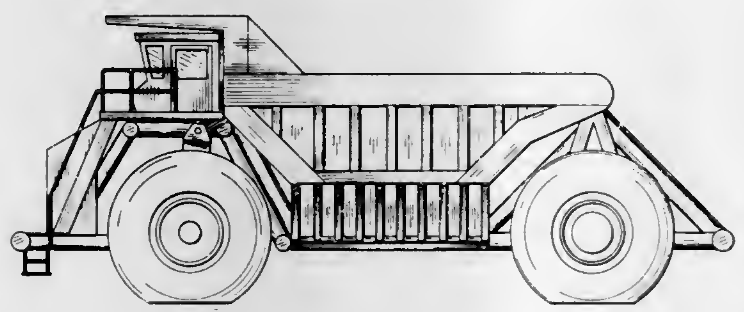
U.S. Cl. D10—94



240,613
MATERIAL HAULING AND DUMPING VEHICLE

Richard L. Thomas, Billy M. Lewis, Francis A. Bartley, Walter I. Myers, and Edgar R. Goodbary, Tulsa, Okla., assignors to Goodbary Engineering Co.
Filed Nov. 22, 1974, Ser. No. 526,315
Term of patent 14 years
Int. Cl. D12—*08*

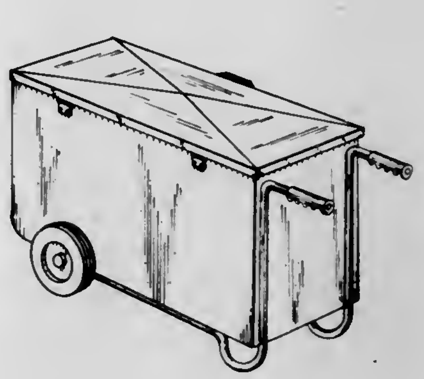
U.S. Cl. D12—15



240,614
REFUSE CAN STORAGE UNIT

Samuel Paterno, Des Moines, Iowa, assignor to Paterno Enterprises, Des Moines, Iowa
Filed Jan. 29, 1975, Ser. No. 544,938
Term of patent 14 years
Int. Cl. D12—*02*

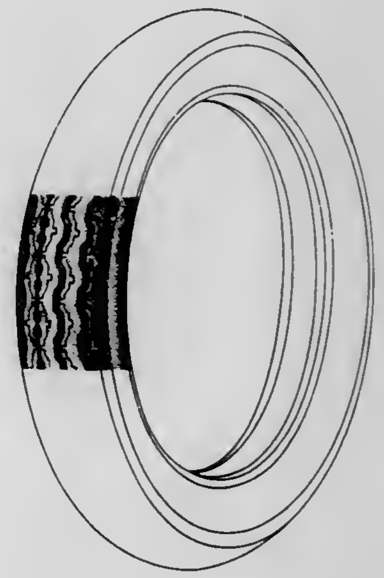
U.S. Cl. D12—33



240,615
TIRE

David C. Kleeh, Kent, Charles W. Roberts, Akron, William M. Hopkins, Kent, and James D. Glenn, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Dec. 23, 1974, Ser. No. 535,897
Term of patent 14 years
Int. Cl. D12—*15*

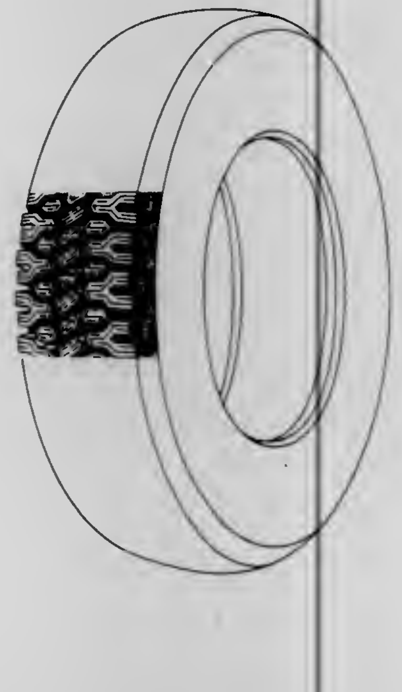
U.S. Cl. D12—142



240,616

TIRE

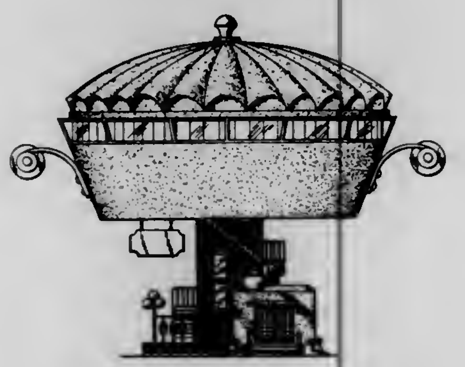
Chester J. Gasowski, North Canton, and Dennis B. Granger, Norton, Ohio, John A. Hutz, Orlando, Fla., and Terrence M. Ruip, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Jan. 23, 1975, Ser. No. 543,398
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



240,617

BUILDING

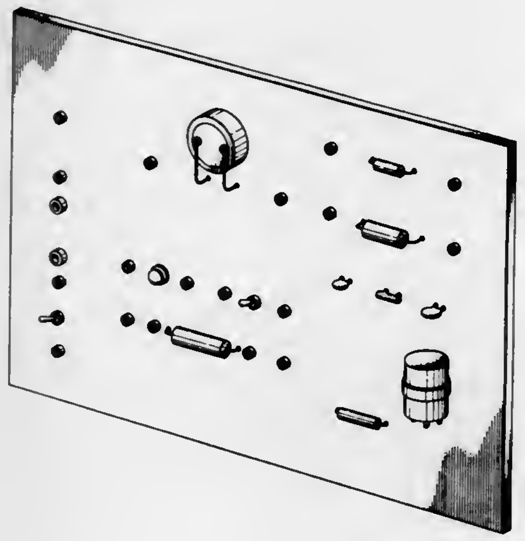
A. F. R. Svensson, 5655 Old National Highway, College Park, Ga. 30349
Filed Sept. 11, 1974, Ser. No. 504,865
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—10



240,618

CONDUCTOR EDUCATIONAL BOARD

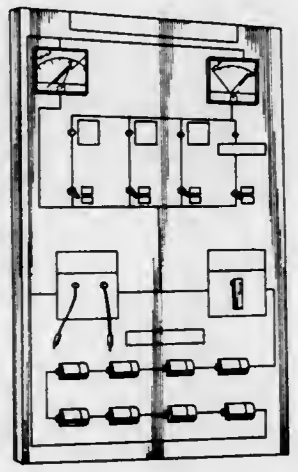
Douglas C. Covert, Royal Oak, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 27, 1973, Ser. No. 428,646
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



240,619

BATTERY OVERLOAD EDUCATIONAL BOARD

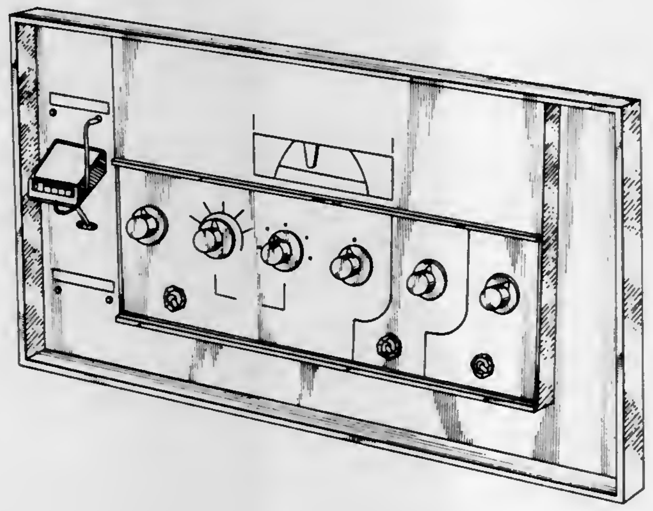
Jack N. Holcomb, Fort Lauderdale, Fla., assignor to National Intelligence Academy
Filed Oct. 15, 1974, Ser. No. 514,901
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



240,620

AUDIO-FILTER EDUCATIONAL BOARD

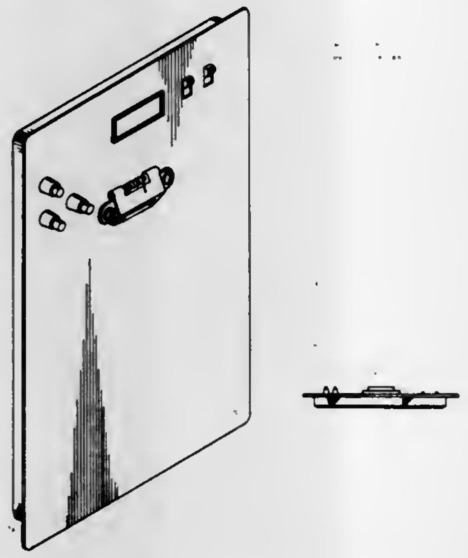
Jack N. Holcomb, Fort Lauderdale, Fla., assignor to National Intelligence Academy
Filed Oct. 15, 1974, Ser. No. 514,900
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



240,621

COMBINED CLIP BOARD AND TIMER

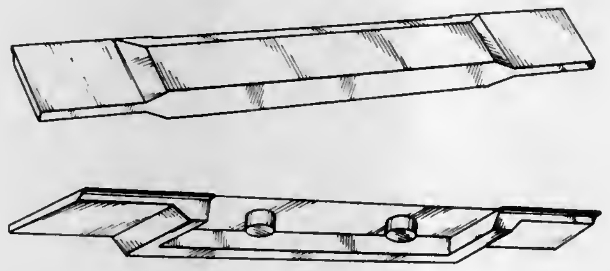
Philip M. Houser, 4445 Pacific Coast Highway, Apt. 1202, Torrance, Calif. 90505
Filed June 24, 1974, Ser. No. 481,990
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—88



240,622

INDEXING TAB

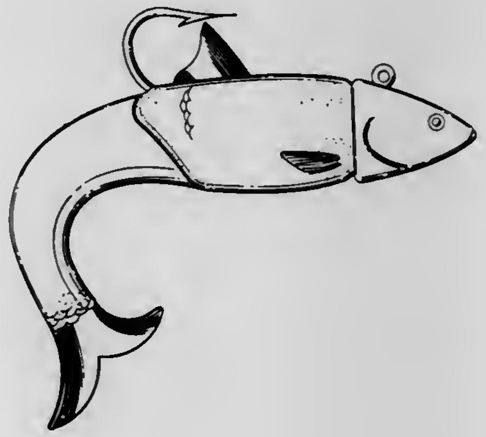
Kenneth E. Thornton, Rte. 1, Box 345, Colton, Oreg. 97017
Filed Sept. 27, 1974, Ser. No. 510,044
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—99



240,623

ARTIFICIAL FISHING LURE

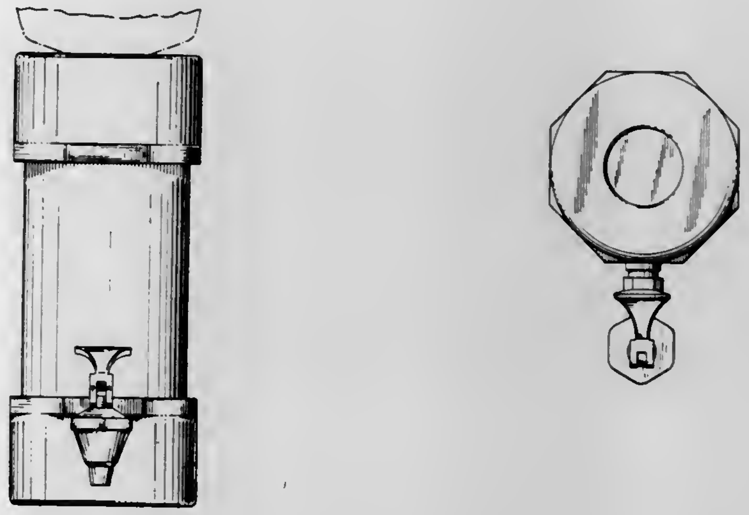
Bingham A. McClellan, Traverse City, Mich., assignor to McClellan Industries, Inc., Traverse City, Mich.
Filed May 8, 1975, Ser. No. 575,637
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



240,624

PORTABLE WATER PURIFIER

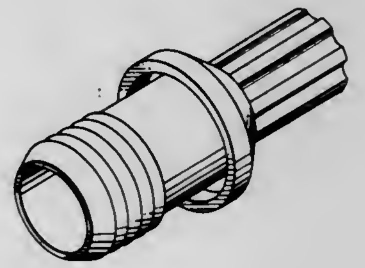
Harry Grant MacMurray, 900 NE. 45th St., Apt. 74, Pompano Beach, Fla. 33064
Filed May 10, 1974, Ser. No. 468,823
Term of patent 3½ years
Int. Cl. D23—*01*
U.S. Cl. D23—3



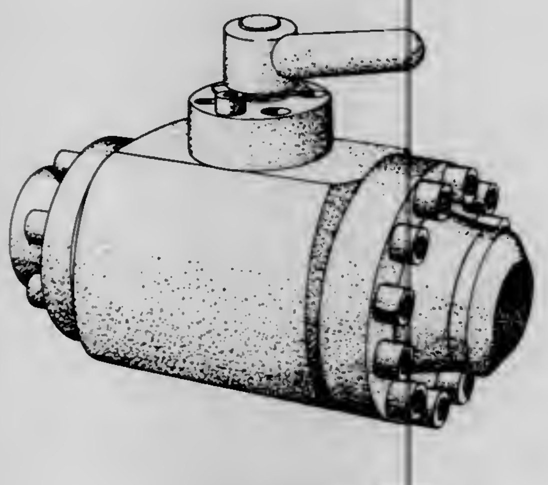
240,625

FLUSHING VALVE FOR AN IRRIGATION SYSTEM

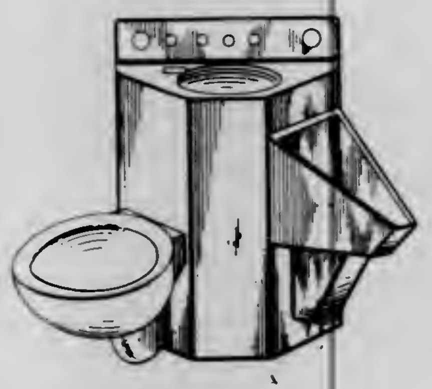
Frank R. Anderson, Hacienda Heights, and Albert J. Castro, Cudahy, Calif., assignors to Westates Space-Era Products, Inc., South El Monte, Calif.
Filed Oct. 2, 1974, Ser. No. 511,459
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



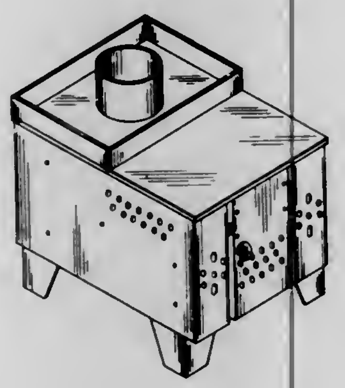
240,626
BALL VALVE
William J. Baker, Orange, Calif., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Apr. 23, 1975, Ser. No. 570,806
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



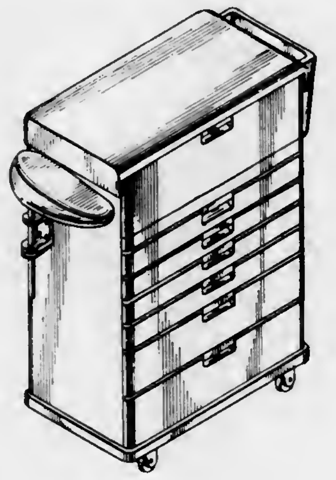
240,627
COMBINATION LAVATORY, TOILET AND URINAL
Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering, City of Industry, Calif.
Filed Mar. 10, 1975, Ser. No. 557,023
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



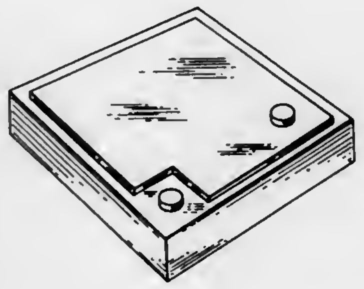
240,628
HEATING STOVE
Alexander T. Kapustin, 4602 Park Blvd., Oakland, Calif. 94602
Filed Nov. 21, 1974, Ser. No. 525,760
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93



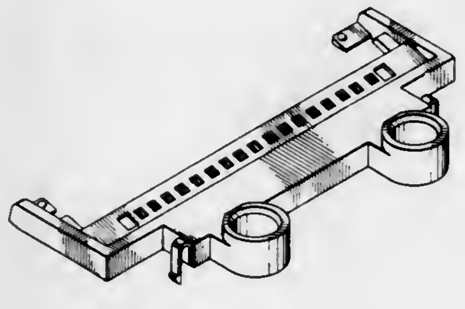
240,629
DENTAL ARM REST CABINET
Raymond Cope, 4285 3rd Ave. S. (or P.O. Box 31053), Birmingham, Ala. 35222
Filed Jan. 29, 1975, Ser. No. 545,178
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 B



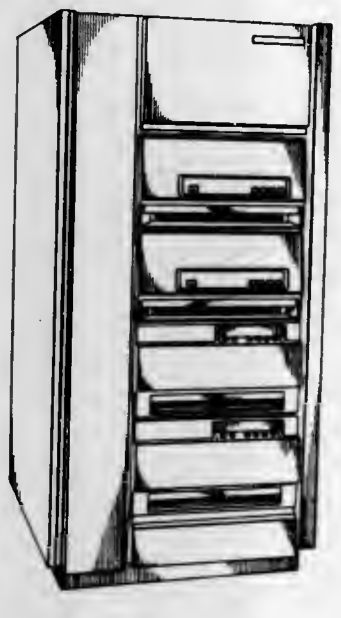
240,630
SILICON SOLAR CELL
Toshinobu Matsutani, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed July 26, 1974, Ser. No. 492,256
Claims priority, application Japan Feb. 1, 1974
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—1 R



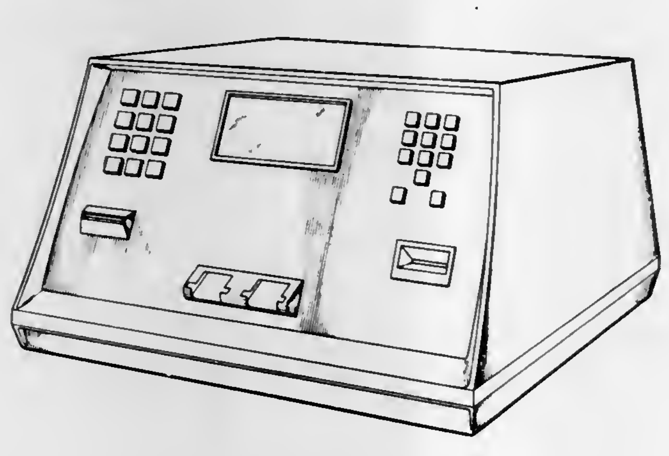
240,631
INTERCONNECTING MEMBER FOR ELECTRICALLY AND MECHANICALLY CONNECTING THE DISPLAY BOARD OF A MICROELECTRONIC CALCULATOR TO THE MAIN LOGIC CIRCUIT BOARD THEREOF
Roger D. Lang, 5175 Thorntree, Irvine, Calif. 92664; Philip J. Thomas, 3952 Patrick Henry Place, Agoura, Calif. 91301; and John A. McAllister, 26661 Las Tunas, Mission Viejo, Calif. 92675
Filed Jan. 27, 1975, Ser. No. 544,381
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



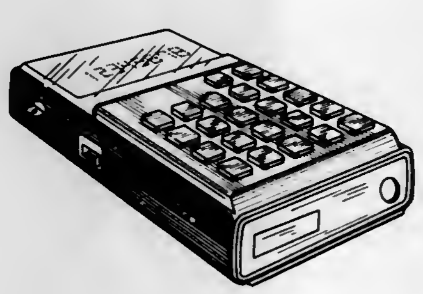
240,632
CABINET FOR ELECTRONIC EQUIPMENT
Robert Edward Kalvitis and Donald Agnew Robertson, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed July 29, 1974, Ser. No. 492,386
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



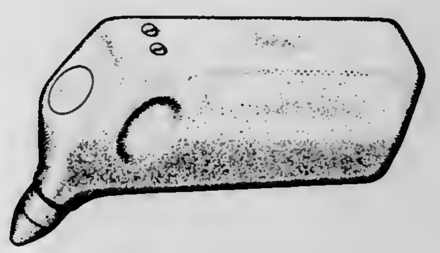
240,633
BANKING MACHINE TERMINAL
Herbert H. Haufler, Richardson, Tandy P. Watson, Grand Prairie, and Edward H. McCauley, Dallas, Tex., assignors to Docutel Corporation, Dallas, Tex.
Filed Oct. 31, 1974, Ser. No. 519,587
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



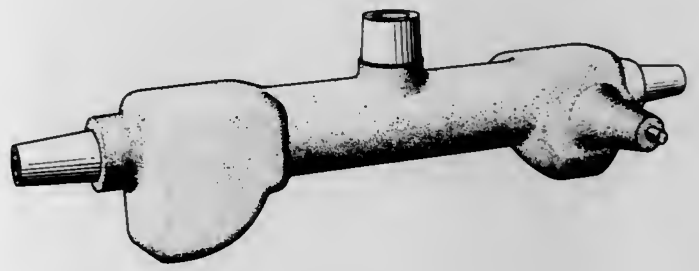
240,634
ELECTRONIC CALCULATING MACHINE
Shigetoshi Hazama, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed Nov. 20, 1974, Ser. No. 525,346
Claims priority, application Japan June 25, 1974
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



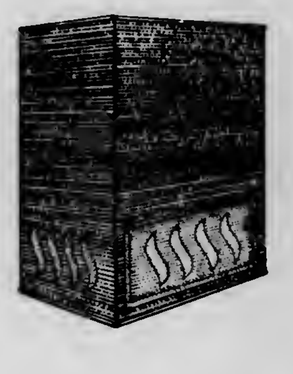
240,635
HAND-HELD OPTICAL CODE SCANNER OR SIMILAR ARTICLE
Thomas A. Peterson, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Dec. 6, 1974, Ser. No. 530,256
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



240,636
ENCAPSULATED VACUUM SWITCH
Harold Dennis Haubein, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.
Filed Mar. 28, 1975, Ser. No. 563,141
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



240,637
SPEAKER CABINET
Robert A. O'Neil, Glen Ellyn, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.
Filed Aug. 21, 1974, Ser. No. 499,166
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



240,638

RECORD TURNTABLE UNIT

Nigel Mark Hobden, Leamington Spa, Kenneth Freivokh, London; Michael Taylor and Ronald David Carter, Warwick, and Ira Dennis Gale, London, England, assignors to Gale Electronics & Design Limited, London, England

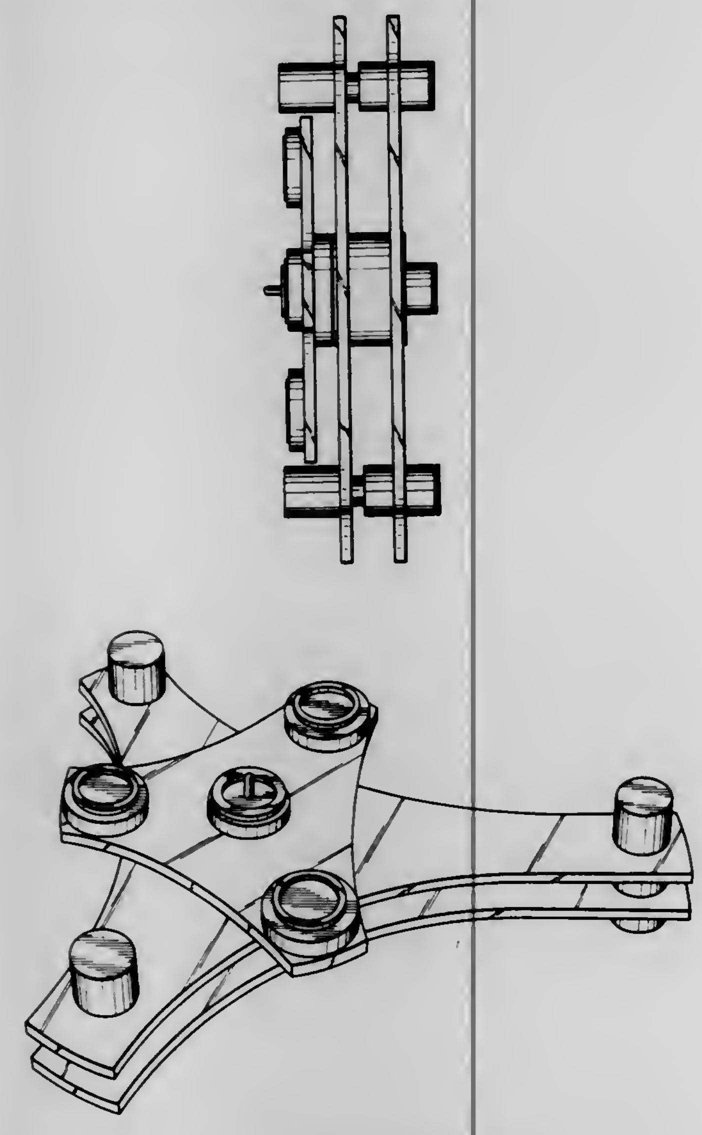
Filed Apr. 23, 1975, Ser. No. 570,761

Claims priority, application Great Britain Oct. 25, 1974

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D26—14 D



240,639

ASHTRAY LINING

Alf Borje Magnusson, Goteborg, Sweden, assignor to Bengt Petersson New Products Investment AB

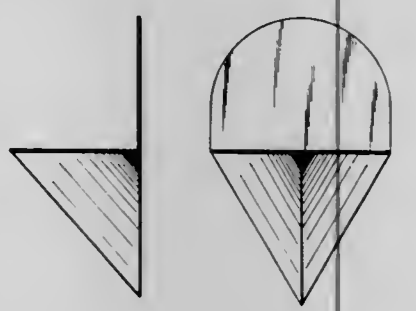
Filed Dec. 9, 1974, Ser. No. 531,109

Claims priority, application Sweden June 14, 1974

Term of patent 14 years

Int. Cl. D27—*03*

U.S. Cl. D27—8



240,640

BURIAL VAULT LINER

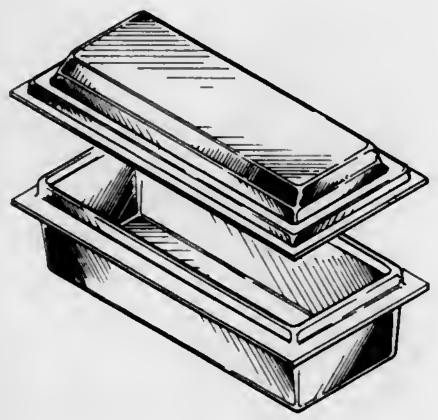
Robert E. Clark, Rocky Mount, and Arlen G. Harris, Winston-Salem, N.C., assignors to Electronic Data Controls Corporation, Winston-Salem, N.C.

Filed Jan. 13, 1975, Ser. No. 540,324

Term of patent 14 years

Int. Cl. D31—*00*

U.S. Cl. D31—1



240,641

DOLL

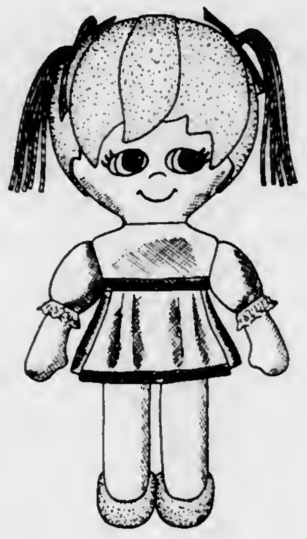
Linda Haupt, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

Filed Oct. 7, 1974, Ser. No. 512,569

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—4 R



240,642

GOLF PUTTER HEAD

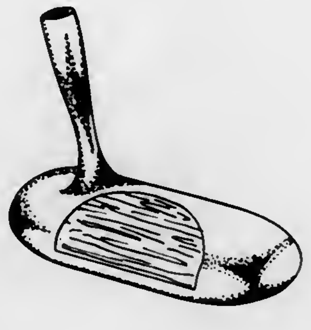
James J. Manfrin, 4 Mira Monte Road, Orinda, Calif. 94563

Filed July 10, 1974, Ser. No. 487,098

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D34—5 GH



240,643

GOLF PUTTER HEAD

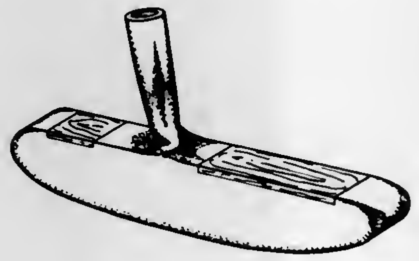
James J. Manfrin, 4 Mira Monte Road, Orinda, Calif. 94563

Filed July 10, 1974, Ser. No. 487,407

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D34—5 GH



240,644

GOLF PUTTER HEAD

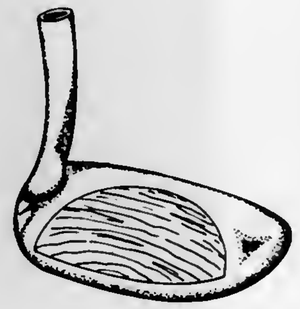
James J. Manfrin, 4 Mira Monte Road, Orinda, Calif. 94563

Filed July 10, 1974, Ser. No. 487,408

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D34—5 GH



240,645

TOY BANK

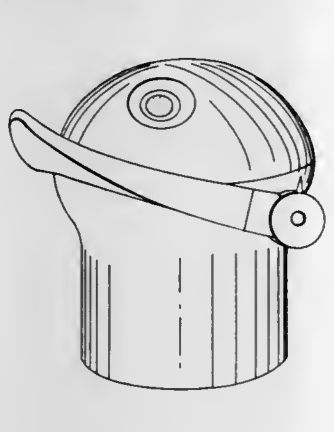
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan

Filed Jan. 6, 1975, Ser. No. 538,860

Term of patent 14 years

Int. Cl. D31—*00*

U.S. Cl. D34—11 R



240,646

WORM PUZZLE TOY

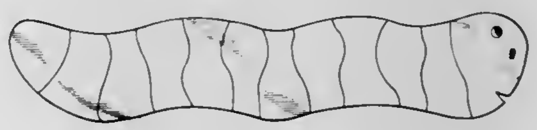
Charles B. Root, Mechanicsville, Md., assignor to Educational Design Associates

Filed Dec. 17, 1974, Ser. No. 533,543

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 M



240,647

WORM PUZZLE TOY

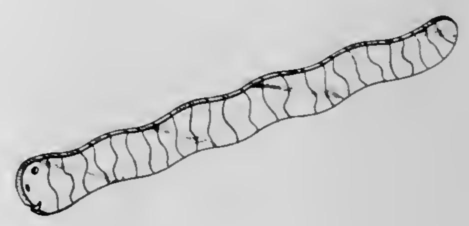
Charles B. Root, Mechanicsville, Md., assignor to Educational Design Associates

Filed Dec. 17, 1974, Ser. No. 533,544

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 M



240,648

MACHINE FOR PROCESSING CROP STACKS

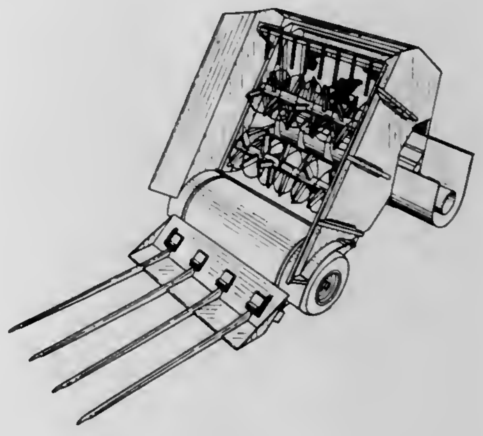
Allen Andrew White, Peabody, and Ray Addison Adee, Ronald Henry Knopp, and Bruce Lynn White, Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 19, 1974, Ser. No. 534,909

Term of patent 14 years

Int. Cl. D15—*03*

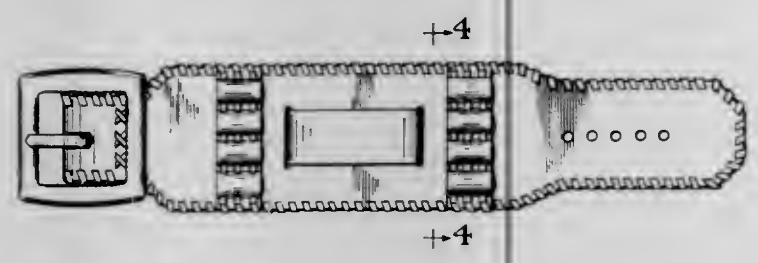
U.S. Cl. D40—1 E



240,649

WRIST WATCH STRAP

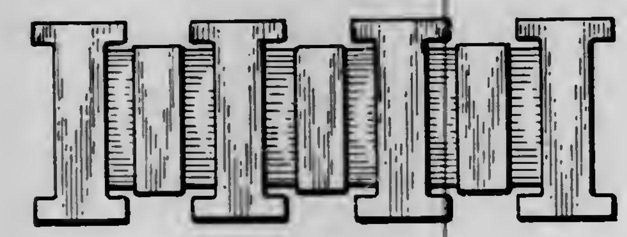
Theodore L. Ashworth, 2128 N. Lynhurst, Apt. B, Indianapolis, Ind. 46224
Filed Aug. 28, 1974, Ser. No. 501,230
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E



240,650

EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE

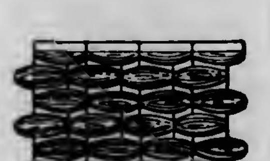
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Sept. 27, 1974, Ser. No. 509,792
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E



240,651

CHAIN FOR A BRACELET OR SIMILAR ARTICLE

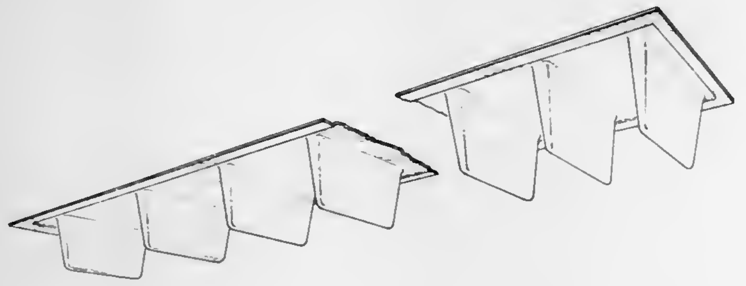
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Oct. 2, 1974, Ser. No. 511,386
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E



240,652

LIGHT DIFFUSER

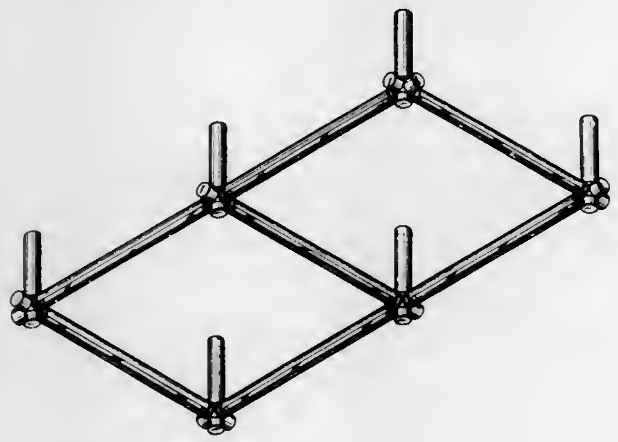
Wilfred W. Wilson, 1055 Bloor St. E., Penthouse 12, Mississauga, Ontario, Canada
Filed Apr. 11, 1975, Ser. No. 567,270
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



240,653

LIGHTING FIXTURE

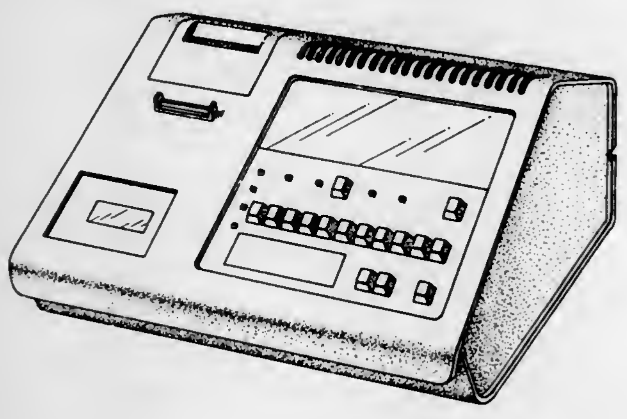
Zia Eftekhar, Glendale, Calif., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed June 20, 1975, Ser. No. 588,802
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



240,654

CASH REGISTER

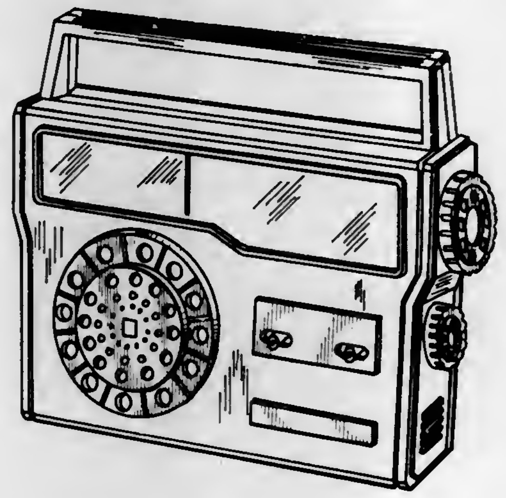
Takaaki Dobashi and Toshio Kurokawa, Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Dec. 2, 1974, Ser. No. 528,618
Claims priority, application Japan Aug. 7, 1974
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—4 A



240,655

RADIO

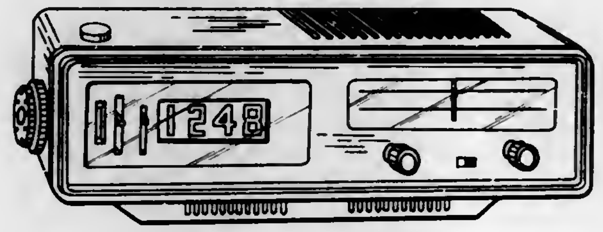
Shogo Imai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed May 9, 1974, Ser. No. 468,395
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



240,656

CLOCK RADIO

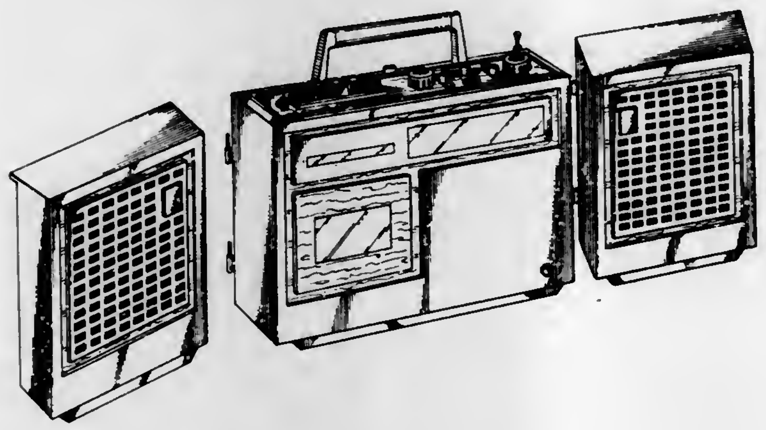
Shogo Imai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation)
Filed May 9, 1974, Ser. No. 468,462
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



240,657

COMBINED RADIO, CASSETTE RECORDER AND SPEAKERS

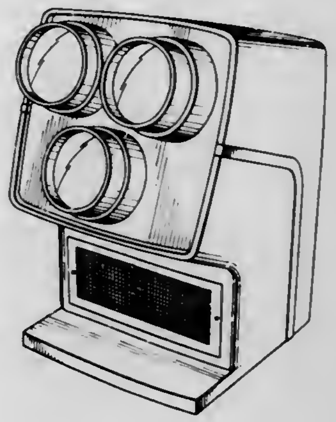
Yutaka Sugawara, Kanagawa, Japan, assignor to Superscope, Inc., Chatsworth, Calif.
Filed May 22, 1974, Ser. No. 472,433
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 B



240,658

COMBINED TELEVISION RECEIVER AND PROJECTOR

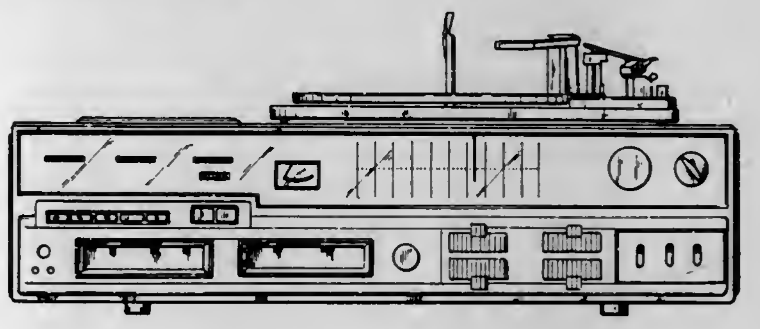
David E. Roche, Nashua, N.H., assignor to Advent Corporation, Cambridge, Mass.
Filed Aug. 9, 1974, Ser. No. 496,049
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



240,659

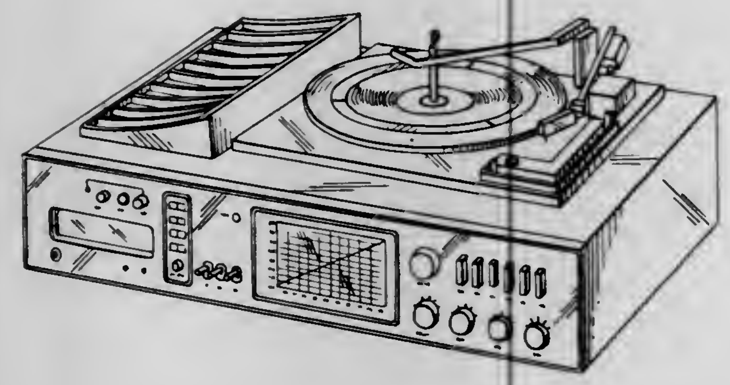
COMBINED PHONOGRAPH, RADIO AND CARTRIDGE RECORDER AND PLAYER

Minol Araki, Tokyo, Japan, assignor to Yorx Corporation, Englewood Cliffs, N.J.
Filed Nov. 8, 1974, Ser. No. 522,138
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 R



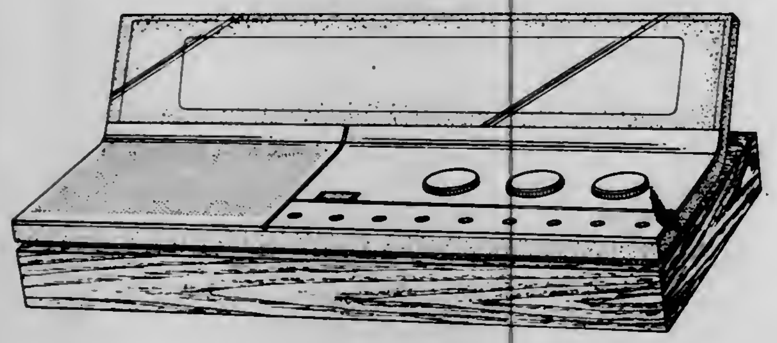
240,660
COMBINED PHONOGRAPH AND CARTRIDGE PLAYER

Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 25, 1974, Ser. No. 526,522
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



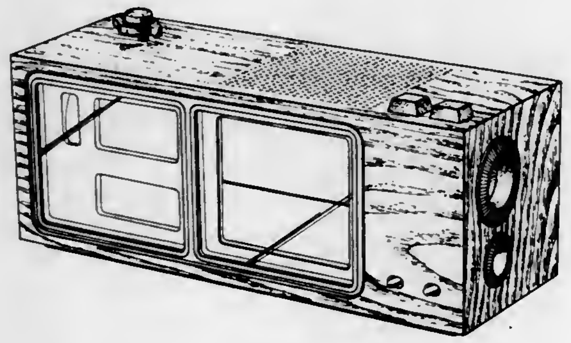
240,661
DIGITAL CLOCK RADIO

Tomio Fujiwara, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,729
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



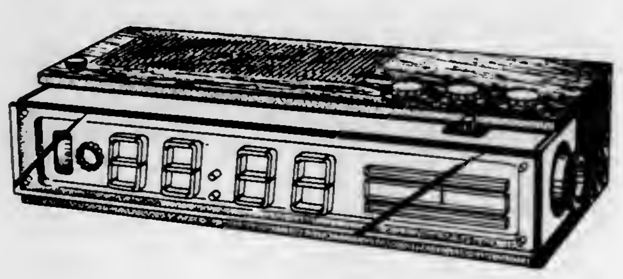
240,662
DIGITAL CLOCK RADIO

Kunio Hoshino, Kadoma, Osaka, and Benito Mishiro, Sakai, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,732
Claims priority, application Japan July 19, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



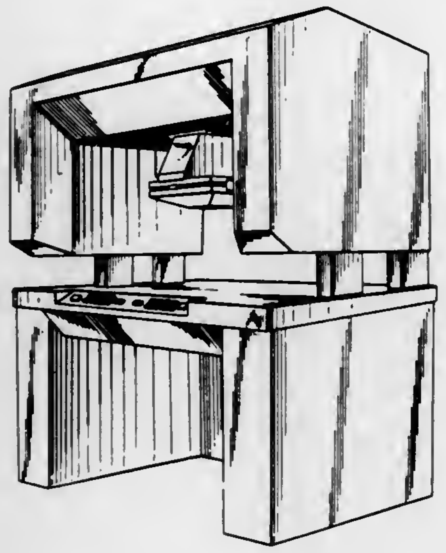
240,663
DIGITAL CLOCK RADIO

Masanori Hamada, Moriguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 18, 1974, Ser. No. 534,115
Claims priority, application Japan July 9, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



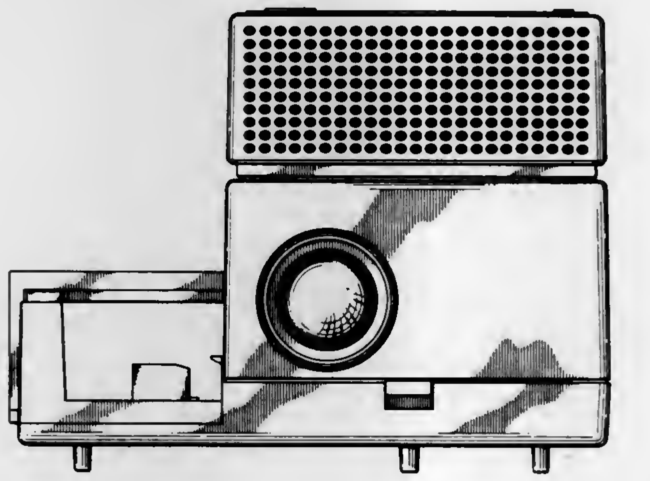
240,664
MICROFICHE CAMERA

Harry Arthur Hele Spence-Bate, Lot 115, Cheam Place, Morley, Western Australia, Australia
Filed Dec. 5, 1974, Ser. No. 529,851
Claims priority, application Great Britain June 14, 1974
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—2



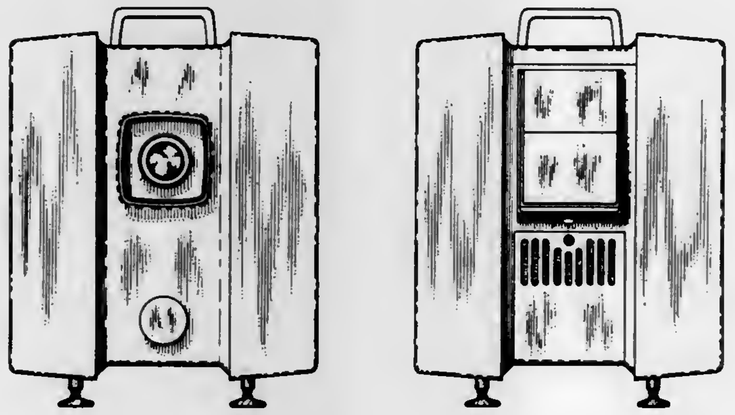
240,665
SOUND PROJECTOR

Jochen Kramer, Wolfsburg, Claus Prochnow, Braunschweig, and Reinhard Sobotta, Mascherode, Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Jan. 17, 1975, Ser. No. 541,930
Claims priority, application Germany July 25, 1974
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21



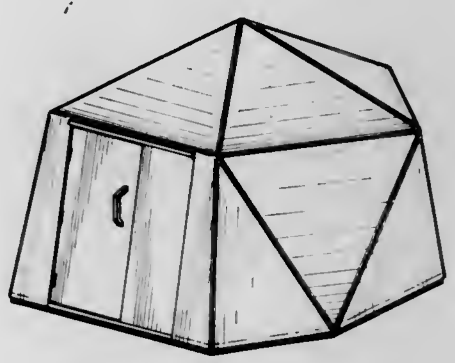
240,666
LARGE SCREEN TELEVISION PROJECTOR

Reynolds B. Winslow, 104 Concord Place, Syracuse, N.Y. 13210, and Richard E. Lee, 4665 Ridge Road, Cazenovia, N.Y. 13035
Filed Feb. 5, 1975, Ser. No. 547,267
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D56—4 D



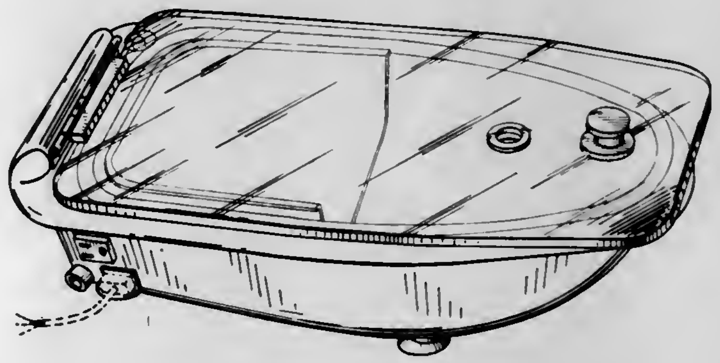
240,667
SAUNA

Joseph G. Hall, 102 Geary Ave., Kentfield, Calif. 94904
Filed May 6, 1974, Ser. No. 466,959
Term of patent 14 years
Int. Cl. D24—*99*; D25—*02*
U.S. Cl. D83—1 C



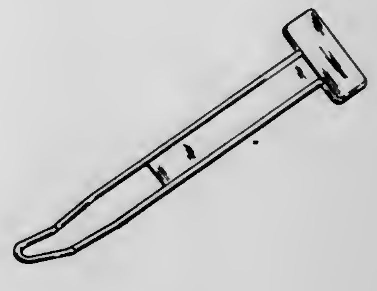
240,668
VACUUM DEVICE FOR ADDING A FLOWABLE MATERIAL TO AN EXPANDABLE MEDICAL CONTAINER

Herbert Fred D'Alo, Oakwood Hills-Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Mar. 6, 1975, Ser. No. 555,762
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 F



240,669
BUTTONER

Clyde H. Pifer, R.R. 1, Box 379, Devine, Tex. 78016
Filed Oct. 24, 1974, Ser. No. 517,638
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D86—10 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Christiaens Societe Anonyme: *See—*
  - Vanhoof, Pierre M., 3,970,650.
- AB Carbox: *See—*
  - Jonsson, Finn L.; and Adolfsson, Rune G., 3,969,921.
  - Wiberg, Robert, 3,969,916.
- AB Inventing: *See—*
  - Wallsten, Hans Ivar, 3,970,328.
- Abbott Laboratories: *See—*
  - Freiberg, Leslie Alan, 3,970,642.
  - Wolownik, Stephen, 3,970,710.
- Abe, Keiji: *See—*
  - Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 3,970,553.
- Abildskov, Dale P.: *See—*
  - Ashton, Larry J.; and Abildskov, Dale P., 3,970,495.
- Acoustical Manufacturing Company Limited, The: *See—*
  - Walker, Peter James; and Albinson, Michael Peter, 3,970,953.
- Ad-One, Inc.: *See—*
  - Alford, Lauritz Lauritzen, Jr., 3,970,332.
- Adachi, Takayoshi: *See—*
  - Kishikawa, Hiroshi; Adachi, Takayoshi; and Usami, Tamio, 3,970,863.
- Addressograph Multigraph Corporation: *See—*
  - Wu, Alexander Chiang-Hsia; and Hou, Shou Ling, 3,970,452.
- Adkins, Larry R., to Rockwell International Corporation. Monolithic acoustoelectric image pick-up device. 3,970,778, Cl. 178-7.100.
- Adolfsson, Rune G.: *See—*
  - Jonsson, Finn L.; and Adolfsson, Rune G., 3,969,921.
- Aeschlimann, Hans-Peter, to Dr. Molter GmbH. Universal centrifuge. 3,970,245, Cl. 233-24.000.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
  - Julia, Marc, 3,970,706.
- Aguet, Emile, to Sulzer Brothers Limited. Combined gas turbine and steam powder plant. 3,969,891, Cl. 60-39.18B.
- Ahlstrand, Bengt Erik; and Carlsson, Rune Henry, to Aktiebolaget Stille-Werner. Separating and filtering device. 3,970,565, Cl. 210-359.000.
- Aiba, Masahiko: *See—*
  - Takano, Rikuo; Sumitomo, Yuji; Yamamoto, Yoichi; Makita, Tomoo; and Aiba, Masahiko, 3,971,039.
- Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; Kranz, Eckart; and Reisdorff, Josef, to Bayer Aktiengesellschaft. Coccidiocidal compositions utilizing 1-phenyl-substituted 1,3,5-triazine. 3,970,752, Cl. 424-249.000.
- Ailshie, Roger Howard, to Cross Manufacturing, Inc. Priority hydraulic control valve. 3,970,108, Cl. 137-596.130.
- Aisin Seiki Kabushiki Kaisha: *See—*
  - Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Sakai, Toshimitsu, 3,969,958.
- Aislantes Leon, S.A.: *See—*
  - Silveyra, Salvador, 3,970,279.
- Ajinomoto Co., Inc.: *See—*
  - Tsuchida, Takayasu; Momose, Haruo; and Hirose, Yoshio, 3,970,519.
- Akiyama, Masanori: *See—*
  - Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, 3,971,043.
- Aksu, Akin. Printed circuit board testing means. 3,970,934, Cl. 324-158.00F.
- Aktiebolaget Stille-Werner: *See—*
  - Ahlstrand, Bengt Erik; and Carlsson, Rune Henry, 3,970,565.
- Aktiebolaget Svenska Kullagerfabriken: *See—*
  - Andersson, Per Ulf, 3,970,165.
- Aktiengesellschaft Gebruder Loepfe: *See—*
  - Kenk, Erhard; and Kenk, Theo, 3,970,115.
- Aktieselskabet Grindstedvaerket: *See—*
  - Nedenskov, Poul, 3,970,645.
- Akutagawa, Susumu: *See—*
  - Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,970,593.
- Albers, Ernst-August: *See—*
  - Ruchlak, Kasimir; Albers, Ernst-August; and Fester, Walter, 3,970,610.
- Alberto Culver Company: *See—*
  - Ginn, Martin E.; and Liebman, Irwin, 3,970,595.
- Albinson, Michael Peter: *See—*
  - Walker, Peter James; and Albinson, Michael Peter, 3,970,953.
- Alco Standard Corporation: *See—*
  - Niemeyer, Robert W., 3,970,337.
- Alcock, Robert Nicholas; Vincent, Richard Paul; and Robinson, Stephen Joseph, to U.S. Philips Corporation. Radio interferometer sector-definition. 3,971,027, Cl. 343-113.00R.
- Alderman, Robert J. Roof system. 3,969,863, Cl. 52-407.000.
- Alford, Lauritz Lauritzen, Jr., to Ad-One, Inc. Airline ticket and information folder. 3,970,332, Cl. 281-31.000.
- Allen, Edgar Robert, to Post Office, The. Measurement of noise in a communication channel. 3,970,795, Cl. 179-15.0BF.
- Allen, W. Henry, to Kockum Industries, Inc. Log debarker. 3,970,126, Cl. 144-208.00E.
- Allen, William W.; and Stopper, Herbert, to Burroughs Corporation. Voltage and temperature compensation circuitry for current mode logic. 3,970,876, Cl. 307-310.000.
- Allied Chemical Corporation: *See—*
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  - Hardy, William Baptist; and Savides, Christos, 3,970,644.
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  - Laliberte, Norman U., 3,970,362.
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- Amico, Peter. Expansion unit. 3,969,976, Cl. 85-75.000.
- Amoroso, Michael J., to M.A.T. Industries, Inc. Torque limiting adaptor. 3,969,961, Cl. 81-52.40R.
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- Anaren Microwave, Incorporated: *See—*
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- Anbar, Michael; McMillen, Donald F.; Weaver, Robert D.; and Jorgensen, Paul J., to Stanford Research Institute. Method and apparatus for electrochemical generation of power from carbonaceous fuels. 3,970,474, Cl. 136-86.00A.
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Bianchi, Nereo, to Necchi S.p.A. Sewing threads trimming device for sewing machines. 3,970,020, Cl. 112-252.000.
Bibaut, Gilbert Abel. Earth moving machinery made amphibious. 3,970,029, Cl. 115-1.00R.
Bice, James William: *See—*
  Kurtz, Anthony D.; Mallon, Joseph R.; Brosh, Amnon; and Bice, James William, 3,970,982.
Bio-Medicus, Inc.: *See—*
  Rafferty, Edson Howard; and Kletschka, Harold D., 3,970,408.
Birckhead, Lennox, Jr., to Vitek Research Corporation. Powder deposition system. 3,970,035, Cl. 118-7.000.
Birtcher Corporation, The: *See—*
  Prater, Earle Francis, 3,970,198.
Birzanescu, Mihai: *See—*
  Mogos, Ion; Ionescu, Cornel; Angelescu, Dionisie; Dumitrescu, Nicolae; Andreescu, Millo; Neascu, Constantin; Brozici, Mircea; Birzanescu, Mihai; Puie, Alexandru; and Vasilica, Gheorghe, 3,970,074.
Bissonette, Vernon Leon, to Eastman Kodak Company. Imagewise hardening with inert transition metal complex oxidizing agents. 3,970,458, Cl. 96-55.000.
Black, Bill Adby; and Eenink, Johannes Gerardus Leon, to Hughes Tool Company. Tooth loading for earth boring bits. 3,970,158, Cl. 175-410.000.
Black Clawson Company, The: *See—*
  Seifert, Peter; and Chupka, David E., 3,970,548.
Black Clawson Fibreclaim, Inc.: *See—*
  Marsh, Paul G., 3,970,254.
Black, James A.: *See—*
  Porth, Frank L., 3,970,040.
Blackwood, Everett E. Technique for strengthening steering column shift sockets. 3,969,951, Cl. 74-473.0SW.
Blau, Henry H., Jr.; and Kebabian, Paul L., to Environmental Research & Technology, Inc. Light equalizer. 3,970,375, Cl. 350-312.000.
Blood, Alden E.: *See—*
  Snapp, Thomas C., Jr.; Blood, Alden E.; and Johnson, Sam H., Jr., 3,970,619.
Blowsky, Frank C., to Luis Mestre Development Corporation. Sheet withdrawing mechanism and its combination with a collator. 3,970,297, Cl. 270-58.000.
Blum Gesellschaft m.b.H.: *See—*
  Rock, Erich; and Mages, Bernhard, 3,969,787.
Blust, Henry Leo; Lindburg, Norman Lee; and Henry, Dale Vernon, to RCA Corporation. Method of anchoring metallic coated leads to ceramic bodies and lead-ceramic bodies formed thereby. 3,970,235, Cl. 228-122.000.
BOC Limited: *See—*
  Regan, Albert John, 3,970,957.
Bock, Erich: *See—*
  Deisinger, Franz; Husges, Gert; Bock, Erich; Niestroj, Heinrich; and Henzgen, Detlef, 3,969,910.
Bock, Heinrich: *See—*
  Steinhart, Gilbert; and Bock, Heinrich, 3,970,189.
Bode, Wolfgang W.; Fein, Michael E.; and Hinson, David C., to Owens-Illinois, Inc. Multiple gas discharge device having improved photon conditioning. 3,970,886, Cl. 313-223.000.
Boggs, George L. Veterinary surgical method. 3,970,046, Cl. 119-103.000.
Bohler, Hans; and Griesser, Rolf, to Sandoz Ltd. Bisazomethine metal complexes. 3,970,649, Cl. 260-240.00G.
Bohm, Richard: *See—*
  Trojan, Gunter; and Bohm, Richard, 3,970,470.
Bohrdt, Joaquin: *See—*
  Grieger, Gerhard; and Bohrdt, Joaquin, 3,969,985.
Boisrayon, Gerald Marc Albert; Martin, Gilbert Marius Henri; and Fagnen, Edmond G., to Etat Francais. Underwater escape apparatus. 3,969,903, Cl. 61-70.000.
Boldrini, Luigi. Machines for the production of chenille yarns and spooling thereof. 3,969,881, Cl. 57-24.000.
Bolduc, Paul E., to United States of America, Energy Research and Development Administration. Cylindrical electron beam diode. 3,970,956, Cl. 331-94.5PE.
Bollyky, Laszlo Joseph, to American Cyanamid Company. Chemiluminescence. 3,970,660, Cl. 260-295.00L.
Bommes, Willi, to Jagenberg Werke AG. Method for the application of glued labels to bottles or the like. 3,970,499, Cl. 156-227.000.
Bongert, Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and means for separation of liquids from a mixture of solids and liquids. 3,970,552, Cl. 210-19.000.
Bongertman, Pieter Jan Willem, to Cindu N.V. Method of preparing electrode pitches. 3,970,542, Cl. 208-22.000.
Boothroyd, William A.; and Sorensen, Boyd W., to International Business Machines Corporation. Transaction terminal with unlimited range of functions. 3,970,992, Cl. 340-172.500.
Borchert, Marshall Bond, to Tektronix, Inc. Multiple-line display signal generating apparatus having a single line position control. 3,971,011, Cl. 340-324.00A.
Borg-Warner Corporation: *See—*
  Dockus, Kostas F., 3,970,237.
  Hechenbleikner, Ingenuin; and Enlow, William Palmer, 3,970,532.
  Wiese, Winfred J., 3,970,320.
Borkovitz, Henry S.; and Peterson, Wesley G., to Sola Basic Industries, Inc. Line isolation monitor. 3,971,007, Cl. 340-255.000.
Boroffka, Hartmut; Krimmel, Eberhard; and Runge, Hartmut, to Siemens Aktiengesellschaft. High speed ion beam switching arrangement for use in the production of determinate solid body dopings by means of ion implantation. 3,970,854, Cl. 250-492.00A.
Borsuk, Alvin; and Johnson, Charles H., to Oscar Mayer & Co. Inc. Walking beam conveyer. 3,970,008, Cl. 104-162.000.
Borucki, Eugene W.; and Zaloga, Peter P. Test apparatus for use with a heating system. 3,970,929, Cl. 324-73.00R.
Boshagen, Horst: *See—*
  Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,970,665.
Boswank, Stuart E.; Jones, Robert H.; and Whaley, Newton P., to Southwest Wheel and Manufacturing Company. Tank vent. 3,970,098, Cl. 137-39.000.
Bouton, Thomas C.; and Futamura, Shingo, to Firestone Tire & Rubber Company, The. Controlled high temperature polymerization of butadiene. 3,970,607, Cl. 526-335.000.
Bouvet, Jean. Mill roll. 3,969,802, Cl. 29-121.00R.
Bouyoucos, John V., to Hydroacoustics Inc. Hydroacoustic apparatus and valving mechanisms for use therein. 3,969,984, Cl. 91-276.000.
Bovier, Edward M.: *See—*
  Voight, John E.; Bovier, Edward M.; and Liebman, Clarence J., 3,970,467.
Bower, Allen M., to Emco Ltd. Roll over valve for tank truck. 3,970,107, Cl. 137-587.000.
Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,970,688, Cl. 260-484.00R.
Boyd, Gerald K., to Production Service & Equipment Incorporated. Standing valve assembly. 3,970,145, Cl. 166-188.000.
Boyd, Robert Lee. Hazardous leakage current preventing for refractory-encased heater elements. 3,970,817, Cl. 219-209.000.
Boykin, Robert O., Jr. Subsurface shutoff valve and control means. 3,970,144, Cl. 166-53.000.
BP Chemicals International Limited: *See—*
  Goldie, Brian Peter Forsyth; Kirkwood, Kenneth Clark; and Lightbody, Alan William, 3,970,613.
Bradford, Robert S.; and Amass, Peter, to Minnesota Mining and Manufacturing Company. Apparatus for adjusting video pedestal and peak white level. 3,970,777, Cl. 178-7.100.
Brady, William J. Paint applicator. 3,970,396, Cl. 401-208.000.
Brandstatter, Hubertus; and Tscholl, Oswald, to American International Corporation. Machine gun. 3,969,980, Cl. 89-33.00D.
Brandstatter, Hubertus; and Tscholl, Oswald, to American International Corporation. Machine gun cartridge magazine. 3,969,981, Cl. 89-33.00D.
Brandt, Michael W. Liquid injector. 3,970,121, Cl. 141-2.000.
Branton, Tom Wendell, to RCA Corporation. Method for preparing a viewing-screen structure for a CRT having temperature-compensated mask-mounting means, including cooling mask during exposure. 3,970,456, Cl. 96-36.100.
Braun, Franz, to Gema AG Apparatebau. Measuring arrangement for an apparatus for electrostatic coating of grounded objects for measuring the ground resistence. 3,970,920, Cl. 324-32.000.
Braun, Robert A., to Du Pont de Nemours, E. I., and Company. Polyesters with substituted amine end groups. 3,970,687, Cl. 260-482.00C.
Braunbeck, Werner, to Siemens Aktiengesellschaft. Switching arrangement for ascertaining overlap prior to transfer of code digits in a telephone exchange. 3,970,800, Cl. 179-18.0AD.
Braunschweigische Maschinenbauanstalt: *See—*
  Hentschel, Volkmar, 3,970,243.
  Matusch, Siegfried, 3,970,469.
Bray Oil Company: *See—*
  Pratt, Robert Eugene; and Habzansky, John, 3,970,570.
Breaux, Onezime P.; and Medicus, Gustav K., to United States of America, Air Force. Thermionic cathode transverse-discharge gas laser tube. 3,970,961, Cl. 331-94.5PE.
Breglia, John E. Target, projectile and centrifugal projector. 3,970,307, Cl. 273-95.00R.
Brett, Oliver C., Jr.: *See—*
  Babson, Edward S.; Brett, Oliver C., Jr.; Cavicchi, Warren A.; and Lutts, Carlton G., 3,970,017.
Brettman, William M.; and White, David L., to Motorola, Inc. Housing arrangement for miniaturized electronic devices. 3,970,902, Cl. 317-120.000.
Bricot, Claude; and Lehureau, Jean Claude, to Thomson-Brandt. Device for the optical read-out of a diffractive track belonging to a data carrier in the form of a disc or tape. 3,971,002, Cl. 340-173.0LT.
Bridgestone Tire Company Limited: *See—*
  Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, 3,970,608.
Briggs & Stratton Corporation: *See—*
  Heindl, Kenneth J., 3,970,913.
Bristol-Myers Company: *See—*
  Kaplan, Murray Arthur; and Granatek, Alphonse Peter, 3,970,651.
Brock, Thomas W.: *See—*
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Brockemeyer, Eugene W.; and Rodell, Michael B., to Sandoz, Inc. Effervescent potassium chloride composition. 3,970,750, Cl. 424-153.000.
Brockington, James W.; and Bennett, Richard H., to Texaco Inc. Alkylation process for production of motor fuels utilizing sulfuric acid catalyst with trifluoromethane sulfonic acid. 3,970,721, Cl. 260-683.630.
Brody, Frederick; and Pohl, Stanley, to Clairol Incorporated. Oxidative hair dye compositions. 3,970,423, Cl. 8-10.200.

Brongersma, Hidde Herman; and Walinga, Jacob, to U.S. Philips Corporation. Device for mass analysis and structure analysis of a surface layer by means of ion scattering. 3,970,849, Cl. 250-281.000.
Bronswerk Apparatenbouw B.V.: *See—*
  Van Diepenbroek, Alfred Erich Wibrandt; Wormgoor, Jan Hendrik; and Schilperoort, Cornelis, 3,970,437.
Brookes, Malcolm J.: *See—*
  Benham, Edward Edmund; Menn, Walter A.; Spranger, Douglas M.; and Brookes, Malcolm J., 3,970,792.
Brooks, Frank. Metering device and mixing apparatus. 3,970,288, Cl. 259-7.000.
Brooks, Joseph J.: *See—*
  Sievers, Robert E.; and Brooks, Joseph J., 3,970,561.
Brooks & Perkins, Incorporated: *See—*
  Mollon, Leslie; and Kline, John E., 3,970,001.
Brosh, Amnon: *See—*
  Kurtz, Anthony D.; Mallon, Joseph R.; Brosh, Amnon; and Bice, James William, 3,970,982.
Brotz, Walter; Engelmann, Manfred; and Rieger, Klaus, to Hoechst Aktiengesellschaft. Coating composition. 3,970,624, Cl. 260-28.50A.
Brotzmann, Karl; Fassbinder, Hans Georg; Hofer, Friedrich Karl; and Mantey, Paul-Gerhard, to Eisenwerk-Gesellschaft Maximiliansnutte mbH. Method for pouring steel during continuous casting. 3,970,444, Cl. 75-46.000.
Broux, Roland, to S.T. Dupont. Method of forming a calibrated aperture in a molded article. 3,970,734, Cl. 264-219.000.
Brown, Henry, to Oxy Metal Industries Corporation. Electroformation of the running track of a rotary internal combustion engine. 3,970,527, Cl. 204-9.000.
Brown, Leonard A.: *See—*
  Barto, Robert W.; and Brown, Leonard A., 3,969,909.
Brown, Omar L., to Fraze, Ermal C. Easy opening ecology end with retained tear strips. 3,970,212, Cl. 220-269.000.
Brown, Ralph A.; and Snow, Wilford W., to Sperry Rand Corporation. Quick-release hub. 3,970,262, Cl. 242-68.300.
Brown & Williamson Tobacco Corporation: *See—*
  Banks, Jon F.; Livesay, Eugene F.; and Martin, Reynold W., 3,970,091.
Brozici, Mircea: *See—*
  Mogos, Ion; Ionescu, Cornel; Angelescu, Dionisie; Dumitrescu, Nicolae; Andreescu, Millo; Neascu, Constantin; Brozici, Mircea; Birzanescu, Mihai; Puie, Alexandru; and Vasilica, Gheorghe, 3,970,074.
Bruderer, Werner: *See—*
  Schmid, Markus; and Bruderer, Werner, 3,970,135.
Bruggisser, Klaus; Graf, Felix; Mandl, Gerhard; and Ruegg, Albert, to Rieter Machine Works, Ltd. Apparatus for building a rotationally symmetrically evened bobbin package and method of operating the apparatus. 3,970,260, Cl. 242-18.0DD.
Brune, Gerhard; Staib, Helmut; Kochendorfer, Heinrich; Hans, Waldemar; Ropstorff, Walter; Leiber, Heinz; and Kirstein, Lothar, to Robert Bosch G.m.b.H. Electromagnetic 3-way valve arrangement. 3,970,111, Cl. 137-627.500.
Bruno, Salvatore A., to Du Pont de Nemours, E. I., and Company. Navy-blue nitrophenylazonaphthylamino dyes. 3,970,617, Cl. 260-152.000.
Bryant, Doyle D., to Strand Century Incorporated. Apparatus for controlling the intensity of lights. 3,970,893, Cl. 315-293.000.
Bryant, James T.: *See—*
  Schneider, Abraham; Wood, Stanley E.; and Bryant, James T., 3,969,979.
Bryant, Robert L. Music activated chromatic roulette generator. 3,969,972, Cl. 84-464.000.
Bucher, Albert, to Escher Wyss Limited. Clearing centrifuge. 3,970,244, Cl. 233-22.000.
Buchta, Siegfried: *See—*
  Mayr, Theodor; Buchta, Siegfried; Kleeberger, Rudolf; and Bauer, Otto, 3,970,063.
Bucksch, Manfred, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Speed-changing system with two fluid-actuated clutches. 3,970,176, Cl. 192-87.110.
Buckson, Gerald Irving, to Du Pont de Nemours, E. I., and Company. Apparatus for web defect detection including a web swatch that contains a defect. 3,970,857, Cl. 250-563.000.
Buhler AG: *See—*
  Ruegger, Edgar; and Meister, Stefan, 3,970,256.
Buhrer, Carl F., to GTE Laboratories Incorporated. Dual access magnetic domain memory. 3,971,005, Cl. 340-174.0TF.
Buhrer, Erwin. Pattern device including an upper trough pattern for the manufacture of the upper part of a foundry mold. 3,970,138, Cl. 164-244.000.
Builders Brass Works: *See—*
  Peak, Ben, 3,969,786.
Bulten-Kanthal Aktiebolag: *See—*
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Bunker Ramo Corporation: *See—*
  Dorrell, Robert Francis; and Janatka, Joseph, 3,970,352.
  Kwan, Okum; and Ottersen, William A., 3,970,506.
  McCaughey, William S., 3,969,806.
  Nijman, John Peter, 3,970,802.
Bunner, Charles Brian David, to Northern Electric Company Limited. Shock resistant, temperature compensated helical resonator. 3,970,972, Cl. 333-82.0BT.
Burke, Emmett F. Loaded quad antenna. 3,971,031, Cl. 343-744.000.
Burke, George K.: *See—*
  Raines, Kenneth; and Burke, George K., 3,970,084.
  Raines, Kenneth; and Burke, George K., 3,970,490.
Burkes, William M.; and Miller, William H., to Rockwell International Corporation. Flow area modulator and flow deflector. 3,970,253, Cl. 239-265.190.
Burkley, Thomas E.: *See—*
  Kraft, Louis Seelbach; and Burkley, Thomas E., 3,970,733.
Burnham, Robert D.: *See—*
  Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 3,970,958.
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  Raines, Kenneth; and Burke, George K., 3,970,084.
  Raines, Kenneth; and Burke, George K., 3,970,490.
Burroughs Corporation: *See—*
  Allen, William W.; and Stopper, Herbert, 3,970,876.
  Beery, Jack; and Wisner, Daniel A., 3,970,935.
Burroway, Gary L.: *See—*
  Feeney, George W.; and Burroway, Gary L., 3,970,623.
Burton, Grady, to MacGregor-Comarain, Inc. Portable tween deck. 3,970,026, Cl. 114-85.000.
Buscher, Harold T.: *See—*
  Munson, Robert E.; and Buscher, Harold T., 3,971,032.
Busker, Leroy H., to Beloit Corporation. Controlled sequence pressure nip. 3,970,515, Cl. 162-360.00R.
Butcher, Alan George, to Dresser Europe, S.A. Fluid flow meter. 3,969,940, Cl. 73-253.000.
Butcher, Daryl T., to United States of America, Air Force. Regulating digital power supply. 3,970,919, Cl. 323-19.000.
Butler Manufacturing Company: *See—*
  Stephenson, Fred J.; and Rush, Donald J., 3,969,864.
C.A.V. Limited: *See—*
  Mowbray, Dorian Farrar, 3,970,414.
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  Debaigt, Jean, 3,970,276.
C.M.T. Co.: *See—*
  Campbell, Theodore A., 3,969,962.
Calderazzo, Franklin J., to Pitney-Bowes, Inc. Method of fastening sheet material. 3,969,992, Cl. 93-1.100.
Caldwell, Roland B., to Ranco Incorporated. Control system for exhaust gas recirculating valve. 3,970,061, Cl. 123-119.00A.
Caldwell, Thurman T.: *See—*
  Swafford, Clifton S.; Caldwell, Thurman T.; and Dungan, William J., 3,970,242.
Calspan Corporation: *See—*
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Cambardella, Mario: *See—*
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Campagna, Benjamin J.; and Campagna, Samuel A., Jr., to Campagna, Benjamin J. Combination manhole closure assembly and separate support ring. 3,969,847, Cl. 52-1.000.
Campagna, Samuel A., Jr.: *See—*
  Campagna, Benjamin J.; and Campagna, Samuel A., Jr., 3,969,847.
Campbell, Max L., to Hydro-Flex Corporation, Inc. Connectors for coupling meters with meter bars. 3,970,334, Cl. 285-30.000.
Campbell, Theodore A., to C.M.T. Co. Friction drive wrench. 3,969,962, Cl. 81-60.000.
Canadian Industries, Ltd.: *See—*
  Connelly, William; Khan, Hamid Iqbal; and McEwan, Ian Hugh, 3,970,628.
Canadian Patents and Development Limited: *See—*
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Canevari, Roger: *See—*
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  Regnier, Gilbert; Canevari, Roger; and Pascaud, Xavier, 3,970,663.
Cann, Alfred J., to Sanders Associates, Inc. Coherent frequency memory. 3,971,021, Cl. 343-18.00E.
Cannell, John Corjeag; Leaper, Rodney Seymour; and Parratt, Noel James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method of manufacturing composite materials. 3,970,136, Cl. 164-108.000.
Cannon, Frances G. H.: *See—*
  Cannon, Thomas; Cannon, Frances G. H.; Cowan, Jane E. H.; and McCarthy, Bernard, 3,970,559.
Cannon, Thomas; Cannon, Frances G. H.; Cowan, Jane E. H.; and McCarthy, Bernard. Drain guard. 3,970,559, Cl. 210-166.000.
Canon Kabushiki Kaisha: *See—*
  Ashida, Akira; Ishikawa, Kazuo; Takahashi, Kiyoshi; Komine, Yoshio; and Hosoe, Kazuya, 3,970,380.
  Isobe, Yasuo; Ito, Tadashi; and Ito, Fumio, 3,971,047.
  Ito, Tadashi; Nakamoto, Soichi; and Okuno, Youichi, 3,971,048.
  Sekiguchi, Takeshi, 3,970,366.
  Tsuji, Sadahiko, 3,970,367.
  Yamamoto, Eisuke; Sugiura, Susumu; and Sawamura, Osamu, 3,970,384.
Cantley, Ross H. Safe deposit box system. 3,970,010, Cl. 109-56.000.
Carabateas, Philip M.; and Williams, Gordon L., to Sterling Drug Inc. 4-(3-Nitrophenyl)-2,3,5,6-pyridinetetracarboxylic acid and intermediates. 3,970,662, Cl. 260-295.50R.

- Carborundum Company, The: *See—*
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- Cargo Graphics Corporation: *See—*
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- Carlsson, Rune Henry: *See—*
  - Ahlstrand, Bengt Erik; and Carlsson, Rune Henry, 3,970,565.
- Carmello, Robert; Salka, Barry A.; and Corey, Garland G., to American Home Products Corporation. Bacteriostatic toilet bowl cleaner compositions. 3,970,576, Cl. 252-106.000.
- Carpco, Inc.: *See—*
  - Webb, Clyde B.; and Knoll, Frank S., 3,970,546.
- Carrigan, Gordon R. Ankle support. 3,970,083, Cl. 128-166.000.
- Carroll, Charles D.; and Meginnis, George B., to General Motors Corporation. Seal structure. 3,970,319, Cl. 277-53.000.
- Carroll, James J.; and Mitchell, Graham R., to General Electric Company. Electric circuit breaker comprising parallel-connected vacuum interrupters. 3,970,810, Cl. 200-144.00B.
- Carson, John C., to Grumman Aerospace Corporation. Adaptive imaging system. 3,970,990, Cl. 340-146.30F.
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  - Sears, Karl David; and Casebier, Ronald Leroy, 3,970,691.
- Casey, Everett Randolph. Ticket holder. 3,970,130, Cl. 150-39.000.
- Cashin Systems Corporation: *See—*
  - Dillon, Oscar W., 3,969,966.
- Castaneda, Rosa Maria, to Colgate-Palmolive Company. Hygienic napkin. 3,970,087, Cl. 128-290.00H.
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  - Dezelan, Joseph E., 3,970,327.
  - Gale, Preston L.; Helton, Eugene L.; and Mueller, Robert C., 3,970,445.
  - Grawey, Charles E., 3,970,493.
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  - Lutz, Karl Treasure, 3,970,204.
  - Shoup, Stephen G., 3,970,557.
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- Celanese Corporation: *See—*
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- Centronics Data Computer Corporation: *See—*
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- Cerfon, Pierre, to Compagnie Industrielle des Piles Electriques "Cipel". Electrochemical cell containing corrosion inhibitor. 3,970,476, Cl. 136-103.000.
- Ceskoslovenska akademie ved: *See—*
  - Lochman, Lubomir; Rodova, Miroslava; and Trekoval, Jiri, 3,970,609.
- CHA Industries: *See—*
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- Chall, Steven Barry: *See—*
  - Pitchon, Esra; Chall, Steven Barry; and Schulman, Marvin, 3,970,765.
- Challoner, Francis Loyola; and Varadarajan, Hemmige Desikachar, to International Business Machines Corporation. Touch keyboard. 3,971,013, Cl. 340-337.000.
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  - Garrigues, Claude; Signouret, Jean Baptiste; and Chambu, Claude, 3,970,468.
- Chano, Takashi; and Masuda, Koji, to Kayabakoyo-Kabushiki-Kaisha. Automatic sewing machine. 3,970,014, Cl. 112-121.110.
- Chapman, Everett E.; Crocker, Thomas H.; and Levitt, Barry N., to United States of America, Air Force. Analog-to-pulse integrating converter. 3,970,943, Cl. 328-151.000.
- Chapman, Russell W.: *See—*
  - Halcomb, Walter C.; Eastman, Naomi A.; Eastman, Robert D.; VanMeter, Harvey A.; and Chapman, Russell W., 3,969,874.
- Charcon Tunnels Limited: *See—*
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- Charron, John R. E. Fishing lure. 3,969,840, Cl. 43-42.060.
- Chase, Earle Merritt: *See—*
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- Chase, Vance A.: *See—*
  - Copeland, Robert L.; Greene, Ralph F.; Beeler, David R.; Eastridge, Robert A.; and Chase, Vance A., 3,970,006.
- Chatham, Cyril Gordon; and Long, Kenneth, to National Research Development Corporation. Spoil removal devices for tunnelling machines. 3,970,224, Cl. 222-370.000.
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- Chen, Jeffrey J.: *See—*
  - Savage, Elton Stuart; and Chen, Jeffrey J., 3,970,555.
- Cheslow, Ernest, to Johnson & Johnson. Disposable diaper having tab fastening means with one end thereof releasably adhered to diaper. 3,970,086, Cl. 128-287.000.
- Chester, Arthur N., to Hughes Aircraft Company. Waveguide laser arrangement for generating and combining a plurality of laser beams. 3,970,963, Cl. 331-94.50C.
- Chevron Research Company: *See—*
  - Bacskai, Robert, 3,970,631.
  - Hotten, Bruce W., 3,970,568.
  - Katsumoto, Kiyoshi, 3,970,708.
- Chicago Pneumatic Tool Company: *See—*
  - Schaedler, Raymond J.; and Marcantonio, Livio F., 3,970,110.
- Chipchase, Frank D., to International Multifoods Corporation. Heating means for comestible kettle. 3,970,072, Cl. 126-391.000.
- Christensen, Donald Ragnvald. Latchable matchbook with dividing striking strip. 3,970,193, Cl. 206-104.000.
- Christie, Donald M., to Lawrence Peska Associates, Inc., a part interest. Ring, ball and cone retrieval apparatus. 3,970,308, Cl. 273-95.00A.
- Chupka, David E.: *See—*
  - Seifert, Peter; and Chupka, David E., 3,970,548.
- Ciba-Geigy AG: *See—*
  - Hiestand, Armin; and Jager, Horst, 3,970,669.
- Ciba-Geigy Corporation: *See—*
  - Dengler, Siegfried; Loew, Peter; Zickendraht, Christian; and Schwander, Hansrudolf, 3,970,675.
  - Jung, Hans Wolf; Maul, Rudolf; and Wehner, Hermann Wolfgang, 3,970,679.
  - Schutz, Hans Ulrich; Back, Gerhard; and Beffa, Fabio, 3,970,615.
  - Vlattas, Isidoros, 3,970,670.
- Cibie Projecteurs: *See—*
  - Ricard, Jacques, 3,970,836.
- Ciliberti, Frank, to P. R. Mallory & Co., Inc. Mercury trap and contact. 3,970,477, Cl. 136-107.000.
- Cilloniz Oberti, Manuel. Process and apparatus for fiber wetting in spinning device of the ring-spindle-traveler type. 3,969,882, Cl. 57-35.000.
- Cincinnati Milacron Chemicals, Inc.: *See—*
  - Molt, Kenneth R., 3,970,678.
- Cindu N.V.: *See—*
  - Bongertman, Pieter Jan Willem, 3,970,542.
- Cirri, Gianfranco, to Fabbrica Italiana Magneti Marelli, S.p.A. Sensor for accelerometers. 3,969,944, Cl. 73-516.0LM.
- Citizen Watch Co., Ltd.: *See—*
  - Morokawa, Shigeru; Nishimura, Katsuo; and Nomura, Yasushi, 3,971,012.
- Clairol Incorporated: *See—*
  - Brody, Frederick; and Pohl, Stanley, 3,970,423.
- Clark, Charles B.: *See—*
  - Baer, James A.; Clark, Charles B.; and Schaefer, Louis F., 3,970,036.
- Clark, George Reed; and Winkleblack, Kenneth Charles, to Hewlett-Packard Company. Apparatus for measuring sheet resistivity of semiconductor materials and diffused layers. 3,970,923, Cl. 324-64.000.
- Clark, Melville, Jr.; and Luce, David A., to Clark, Melville, Jr. Musical instrument with means for scanning keys. 3,969,968, Cl. 84-1.010.
- Clark, Melville, Jr.; and Luce, David A., to Clark, Melville, Jr. Musical instrument with means for scanning keys. 3,969,969, Cl. 84-1.260.
- Clark, Samuel A., Jr.; Lucey, George K., Jr.; and Zimmerman, Thomas H., to United States of America, Army. Protective metal shield for plastic fuze radomes. 3,971,024, Cl. 343-872.000.
- Clay, Charles L. Quick opening/closing compression latch. 3,970,213, Cl. 220-324.000.
- Claybaugh, Gene W., to Procter & Gamble Company, The. Hard surface cleaning compositions. 3,970,594, Cl. 252-524.000.
- Clements, Ivor K.; and Spencer, George R., to Raytheon Company. Phase comparator. 3,970,868, Cl. 307-232.000.
- Clemix Co.: *See—*
  - Andoh, Akira, 3,970,052.
- CMI Corporation: *See—*
  - Swisher, George William, Jr.; Smith, Donald W.; and Phillips, John F., 3,970,405.
- Coal Industry (Patents) Limited: *See—*
  - Williams, Derek Farnham; and Whitehead, John Charles, 3,970,541.
- Coats, Charles L., Jr., to United States of America, Navy. Low power driver. 3,970,869, Cl. 307-251.000.
- Cobb, G. Harold, to Tektronix, Inc. Erasure means for charge storage device. 3,970,889, Cl. 313-396.000.
- Cobbe, George H., Jr. Safety device for use with chlorine cylinder valves. 3,970,284, Cl. 251-149.900.
- Cochard, Pierre: *See—*
  - Henault, Claude; and Cochard, Pierre, 3,970,054.
- Codo, Edward A., to Caterpillar Tractor Co. Filter and bypass valve arrangement. 3,970,563, Cl. 210-237.000.
- Cohen, Choua; Durif Varambon, Durif; Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole, es Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petroliers Elf. 2,4-Quinazoline dione-polyamide-ester resins. 3,970,630, Cl. 260-30.200.
- Coleman, Joe E.: *See—*
  - Jessup, Robert L.; and Coleman, Joe E., 3,970,147.
- Colgate-Palmolive Company: *See—*
  - Barth, Jordan B., 3,970,747.
  - Castaneda, Rosa Maria, 3,970,087.
  - Klisch, Stephen Cajetan; and Martin, Charles Andrew, 3,970,596.
- Collins, Paul W.; and Pappo, Raphael, to G. D. Searle & Co. 11,15-Dihydroxy-9-oxoprost-13-ynoic acid. 3,970,683, Cl. 260-468.00D.
- Collins, Stephen M.; and Schweickart, Albert J., to BASF Wyandotte Corporation. End connector for filter press cell. 3,970,539, Cl. 204-254.000.

- Collins, Stephen M.: *See—*
  - Barkel, Barry M.; Collins, Stephen M.; and Herring, William M., 3,970,516.
- Colorflo Leasing Inc.: *See—*
  - Doane, Frank A., 3,970,119.
- Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Common control signaling extraction circuit. 3,970,799, Cl. 179-15.0BY.
- Combustion Engineering, Inc.: *See—*
  - Palmer, David Nelson, 3,970,504.
  - Thrash, Sammy DeWitt, 3,970,143.
- Compagnie Francaise de Produits Industriels: *See—*
  - Askienazy, Alexandre; Melki, Georges; and Stevenin, Jean, 3,970,762.
- Compagnie Honeywell Bull (Societe Anonyme): *See—*
  - Venker, Hilrich Jan Matthijs, 3,969,998.
- Compagnie Industrielle des Piles Electriques "Cipel": *See—*
  - Cerfon, Pierre, 3,970,476.
- Complexul Pentru Prelucrarea Lemnului Reghin: *See—*
  - Delu, Ion, 3,969,971.
- Comstock, Donald W.; and Marchetti, Peter B., to Bellofram Corporation. Rolling diaphragm and rolling diaphragm devices. 3,969,991, Cl. 92-99.000.
- Concast AG: *See—*
  - Schmid, Markus; and Bruderer, Werner, 3,970,135.
- Cone-Blanchard Machine Company: *See—*
  - White, Philip H.; Wilterdink, Bernard W.; and Andrews, Guy J., 3,970,830.
- Conforti, Robert F., to Hughes Aircraft Company. Arithmatic circuit for bang-bang seekers. 3,970,269, Cl. 244-3.160.
- Connelly, William; Khan, Hamid Iqbal; and McEwan, Ian Hugh, to Canadian Industries, Ltd. Aqueous dispersions of thermosettable synthetic addition polymers with 1,2-epoxy resin plasticizer. 3,970,628, Cl. 260-29.6NR.
- Connors, William P.; Glaenzer, Richard H.; Saum, George A.; and Wagner, Robert G., to United States of America, Navy. Lateral photodetector of improved sensitivity. 3,971,057, Cl. 357-30.000.
- Continental Can Company, Inc.: *See—*
  - Herbst, Edward J.; and Peyser, Harry A., 3,970,023.
  - LaCross, George D., 3,970,211.
  - Pelton, Peter G.; and Ostrem, Obert M., 3,970,105.
- Contraves AG: *See—*
  - Nowack, Klaus, 3,970,812.
  - Voellmy, Hans Rudolf; and Gahwiler, Hermann, 3,970,097.
- Control Data Corporation: *See—*
  - Procter, Samuel Anderson; and Younger, Robert Dewitt, 3,970,925.
  - Warmka, Gary Paul; and Hill, James Dan, 3,970,433.
- Cooper, Cleveland N., to Pandjiris Weldment Co., The. Pipe fitting locator apparatus. 3,970,295, Cl. 269-17.000.
- Cooper, Duane H. Monaural and stereo compatible multidirectional sound matrixing. 3,970,788, Cl. 179-1.0GQ.
- Cooper, Edward. High speed, step-switching AC line voltage regulator with half-cycle step response. 3,970,918, Cl. 323-6.000.
- Cooper, Rey W.: *See—*
  - Kopatz, William H.; Cooper, Rey W.; and Watson, Russell W., 3,970,022.
- Coors, George T., to Ledex, Inc. Electric solenoid structure. 3,970,981, Cl. 335-266.000.
- Copar Corporation: *See—*
  - Schmidt, Robert W.; Gallet, John R.; and Czyz, Thomas L., 3,970,489.
- Copeland, Robert L.; Greene, Ralph F.; Beeler, David R.; Eastridge, Robert A.; and Chase, Vance A., to United States of America, Air Force. Protective cover for a missile nose cone. 3,970,006, Cl. 102-105.000.
- Copenhefer, John E.; and House, Robert M., to United States Gypsum Company. Compact air filter. 3,970,440, Cl. 55-501.000.
- Copp, John C. Optical visual communication system. 3,970,374, Cl. 350-301.000.
- Corby, Nelson R., Jr.: *See—*
  - Gerhardt, Lester A.; Corby, Nelson R., Jr.; and Sims, Edward M., 3,971,068.
- Cordes, Claus: *See—*
  - Horn, Peter; Cordes, Claus; and Pflueger, Richard, 3,970,634.
- Cordes, William F., III; and Diehl, Robert E., to American Cyanamid Company. Ethyl α-cyano β-(N-methyl-N-cyclohexylamino) acrylate stabilizer. 3,970,639, Cl. 260-45.85A.
- Corey, Garland G.: *See—*
  - Carmello, Robert; Salka, Barry A.; and Corey, Garland G., 3,970,576.
- Corning Glass Works: *See—*
  - Gossie, Mijo A., 3,970,508.
  - Hollis, David L.; and Magner, Richard G., 3,970,845.
- Costruzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Faust, Tiberio) S.n.c.: *See—*
  - Lonati, Francesco, 3,969,911.
- Cotton Incorporated: *See—*
  - Leblanc, Robert Bruce; and Leblanc, Destin A., 3,970,425.
- Cotton, Larry G., to Iowa Mold Tooling Co., Inc. Tire servicing apparatus. 3,970,342, Cl. 294-86.00R.
- Coulombe, Lionel J.; and Giaimo, Anthony, to Singer Company, The. Threading apparatus for sewing machines. 3,970,019, Cl. 112-245.000.
- Coulter Electronics, Inc.: *See—*
  - Figueroa, David Richard; and Ginsberg, Guenter, 3,970,392.
- Cowan, Jane E. H.: *See—*
  - Cannon, Thomas; Cannon, Frances G. H.; Cowan, Jane E. H.; and McCarthy, Bernard, 3,970,559.
- Crabbe, Pierre; Fried, John H.; and Guzman, Angel, to Syntex (U.S.A.) Inc. Polyunsaturated prostaglandin derivatives. 3,970,684, Cl. 260-468.00D.
- Crabtree, Terence Edward: *See—*
  - Fry, Sidney; Crabtree, Terence Edward; and Rothery, Brian, 3,970,550.
- Crandell, Walter R., to Fast Heat Element Manufacturing Co., Inc. Electrically heated torpedo. 3,970,821, Cl. 219-523.000.
- Crete, Richard C. Photographic light support apparatus. 3,970,835, Cl. 240-1.300.
- Crociata, Vincent J.: *See—*
  - Fisher, Donald H.; and Crociata, Vincent J., 3,970,382.
- Crocker, Thomas H.: *See—*
  - Chapman, Everett E.; Crocker, Thomas H.; and Levitt, Barry N., 3,970,943.
- Cromwell, Nicholas O., to Foxboro Company, The. Computer-directed process control system with interactive display functions. 3,971,000, Cl. 340-172.500.
- Crosby, Lawton H., to Morley Furniture Spring Corporation. Spring construction. 3,969,793, Cl. 24-84.00B.
- Crosfield Electronics Limited: *See—*
  - Dalton, Brian L.; and Judd, Edward J., 3,970,781.
- Cross Manufacturing, Inc.: *See—*
  - Ailshie, Roger Howard, 3,970,108.
- Cross, Peter E.; Dickinson, Roger P.; and Kemp, John E. G., to Pfizer Inc. Tetrahydro-carbazole derivatives as gastric anti-secretory agents. 3,970,757, Cl. 424-274.000.
- Crowe, Lloyd L., to Depke, Shirley L. Method of making reversible hooked articles. 3,970,338, Cl. 289-1.500.
- Cruse, Teddy Howard: *See—*
  - Murphy, Frank W., Jr.; Nunneley, J. David; and Cruse, Teddy Howard, 3,970,099.
- Culbertson, Linda R.: *See—*
  - Culbertson, William E.; and Culbertson, Linda R., 3,970,217.
- Culbertson, William E.; and Culbertson, Linda R., to Lawrence Peska Associates, Inc., a part interest. Coin-operable packaged diaper dispensing machine. 3,970,217, Cl. 221-80.000.
- Curington, Alfred R.; and Roscoe, Theodore J., Jr., to Bakerdrill, Inc. Dual concentric pipes. 3,970,335, Cl. 285-133.00A.
- Cutler-Hammer, Inc.: *See—*
  - Hansen, James E.; and Schmit, Eugene R., 3,970,908.
  - Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; Spellman, Gordon B.; and Van Horn, Lawrence E., 3,971,056.
- Czaja, Robert F.: *See—*
  - Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,970,693.
- Czyz, Thomas L.: *See—*
  - Schmidt, Robert W.; Gallet, John R.; and Czyz, Thomas L., 3,970,489.
- Dachicourt, Augustin; and Krin, Rene, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Oil and air suspension devices. 3,970,292, Cl. 267-64.00R.
- Dahl, Flemming. Support for patients in beds or chairs. 3,970,077, Cl. 128-33.000.
- Dahmen, Manfred; Ritzhaupt, Anneliese; and Zurheide, Manfred, to International Business Machines Corporation. Method of manufacturing a power transistor. 3,970,487, Cl. 148-187.000.
- Dai Nippon Toryo Co., Ltd.: *See—*
  - Tugukuni, Hideyoshi; and Kano, Masafumi, 3,970,725.
- D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids. 3,970,727, Cl. 260-932.000.
- Dalton, Brian L.; and Judd, Edward J., to Crosfield Electronics Limited. Apparatus for maintaining the position of a working head in relation to a cylindrical workpiece. 3,970,781, Cl. 178-7.600.
- Daly, Robert M.; Mekota, John E., Jr.; and Goss, Gary J., to Honeywell Information Systems, Inc. High speed peripheral system interface. 3,970,997, Cl. 340-172.500.
- Dalzell, Chester G.; and Pace, Burton D., to TRW Inc. Tape dispenser and method of dispensing tape. 3,970,507, Cl. 156-446.000.
- Danfoss A/S: *See—*
  - Hansen, Egon Jorgen, 3,970,282.
  - Ohrberg, Carl Verner, 3,969,986.
- Dare Products, Incorporated: *See—*
  - Wilson, Robert M., 3,970,101.
- Darling, Robert D. Ladder bridging device. 3,970,170, Cl. 182-230.000.
- Date, Masakazu: *See—*
  - Maeda, Kozo; and Date, Masakazu, 3,970,422.
- Datlow, Bernard J., to Datlow, Bernard J. Additive composition for textile bleaching baths. 3,970,578, Cl. 252-186.000.
- Davidson, Raymond John. Metal, particularly gold, recovery from adsorbed cyanide complexes. 3,970,737, Cl. 423-27.000.
- Davies, Terrence Ardern, to Square D Company. Electrical contact materials and methods of making the same. 3,970,451, Cl. 75-173.00R.
- Davis, Lee A., to I-T-E Imperial Corporation. Integrated circuit linear time delay extender for static relays. 3,970,899, Cl. 317-33.00R.
- Davison, Sol, to Shell Oil Company. Substrate coated with mixed resin primer coat comprising a block copolymer. 3,970,771, Cl. 428-425.000.
- Day, Paul L., to Park-Ohio Industries, Inc. Apparatus for inductively heating the end of an elongated workpiece. 3,970,813, Cl. 219-10.570.

- Dayton-Hudson Corporation: *See—*
  - Moore, Charles T., 3,969,838.
- Deaton, Charles U. Baffle assembly and illuminator grid. 3,969,870, Cl. 52-645.000.
- Debaigt, Jean, to C.G.E.E.-Alsthom. Device for fixing an object. 3,970,276, Cl. 248-223.000.
- De Bruine, Carl, to Lear Siegler, Inc. Control circuitry for vehicle guidance mechanism. 3,970,840, Cl. 250-202.000.
- DEC International, Inc.: *See—*
  - Huang, Min-Nan; and Walter, Neil F., 3,969,996.
- Dechavanne, Jacques. Dynamic-static shaft seal. 3,970,321, Cl. 277-188.00A.
- Decker, Maurice S.; and Downey, George T., to Midland-Ross Corporation. Fuel filter bypass valve with condition preliminary indicator and secondary indicator. 3,970,104, Cl. 137-494.000.
- Deering Milliken Research Corporation: *See—*
  - Stark, Sven Olof Soren; Rauser, Jan Axel Ingemar; and Rauser, Irma Marita, 3,970,426.
  - Stewart, William H., Jr., 3,969,779.
- De Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Closed-loop type disc brake. 3,970,172, Cl. 188-73.400.
- Dehne, Wilfried E. Index drive system cam follower assembly. 3,969,954, Cl. 74-569.000.
- Deike, Robert F., to Foresight Industries. Torque fin anchor. 3,969,853, Cl. 52-156.000.
- Deike, Robert F., to Foresight Industries. Planing fin anchor. 3,969,854, Cl. 52-163.000.
- Deisinger, Franz; Husges, Gert; Bock, Erich; Niestroj, Heinrich; and Henzgen, Detlef, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Selection apparatus for pattern control elements. 3,969,910, Cl. 66-50.00R.
- Dektor Counterintelligence and Security, Inc.: *See—*
  - Bell, Allan D., Jr.; Ford, Wilson H.; and McQuiston, Charles R., 3,971,034.
- DeLalio, George M. Synchronously shiftable dual range planetary transmission with coaxial input shafts. 3,969,957, Cl. 74-687.000.
- Del Puppo, Louis, to Societe Anonyme: SABLA. Apparatus for handling large and heavy objects. 3,970,205, Cl. 214-652.000.
- Delu, Ion, to Complexul Pentru Prelucrarea Lemnului Reghin. Instrument system and stringed-instruments therefor. 3,969,971, Cl. 84-274.000.
- Demag Aktiengesellschaft: *See—*
  - von Wendt, Karl Freiherr; and Becker, Klaus, 3,970,300.
- DeMusis, Ralph T. Turbine blade air seal edge grinder. 3,969,848, Cl. 51-141.000.
- Dengler, Siegfried; Loew, Peter; Zickendraht, Christian; and Schwander, Hansrudolf, to Ciba-Geigy Corporation. Disperse dyestuffs. 3,970,675, Cl. 260-364.000.
- Dennen, Robert S., to Recreational & Scientific Devices, Inc. Flexible cord locking device. 3,969,914, Cl. 70-234.000.
- Densow, Ulrich O., to Outboard Marine Corporation. Chain saw clutch with engaging and releasing centrifugal weights. 3,970,178, Cl. 192-105.0BA.
- Depke, Shirley L.: *See—*
  - Crowe, Lloyd L., 3,970,338.
- Derrick Manufacturing Corporation: *See—*
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- Derrick, Robert G.: *See—*
  - Ennis, Robert E.; and Derrick, Robert G., 3,970,549.
- Detex Corporation: *See—*
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- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
  - Fischer, Joachim; Knorre, Helmut; and Pohl, Gerhard, 3,970,554.
- Deutschmann, William B.; Livenick, Corwin E.; Paulsen, Robert W.; Tyler, Len A.; and Rose, Clifford L., to Motorola, Inc. Crystal mounting structure and method of assembly. 3,970,880, Cl. 310-9.400.
- Dezelan, Joseph E., to Caterpillar Tractor Co. Suspension and load leveling for an urban hauler. 3,970,327, Cl. 280-683.000.
- Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Wire coated with fluorocarbon polymers cross-linked with dialyl ester of 4,4'-dicarboxydiphenyl ester. 3,970,770, Cl. 428-379.000.
- Diamond International Corporation: *See—*
  - Peppler, William S.; Keen, Everett M.; and Siciliano, Anthony J., 3,970,044.
- Diamond Shamrock Corporation: *See—*
  - Gunn, Walter H., 3,970,482.
  - Holm, Robert E.; and Schuldt, Paul H., 3,970,443.
  - Horn, Herman; Greenbaum, Sheldon B.; Ely, Charles M.; Hacke, Walter; and Olle, David A., 3,970,648.
  - Ihde, Frederick J., Jr., 3,970,620.
  - Stillman, Neil W., 3,970,462.
- DiBuono, Frank M. Shaving moisturizer device. 3,969,817, Cl. 30-41.000.
- Dickens, Elmer Douglas, Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,970,638, Cl. 260-45.75N.
- Dickinson, Roger P.: *See—*
  - Cross, Peter E.; Dickinson, Roger P.; and Kemp, John E. G., 3,970,757.
- Diehl, Robert E.: *See—*
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- Diesel Kiki Co., Ltd.: *See—*
  - Kaibara, Nobuhiro; and Nishizawa, Kazuro, 3,970,065.
- Dieterich, Dieter: *See—*
  - Weber, Karl-Arnold; Reiff, Helmut; and Dieterich, Dieter, 3,970,601.
- Diggs, Richard E. System for energy storage and DC to AC conversion. 3,970,917, Cl. 322-4.000.
- Dillon, Oscar W., to Cashin Systems Corporation. Apparatus for slicing meat products. 3,969,966, Cl. 83-340.000.
- Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., to Dynell Electronics Corporation. Three-dimensional display system. 3,970,361, Cl. 350-144.000.
- Dingwall, Andrew Gordon Francis, to RCA Corporation. Memory cell with decoupled supply voltage while writing. 3,971,004, Cl. 340-173.0FF.
- Director-General of the Agency of Industrial Science and Technology: *See—*
  - Takeuchi, Norio, 3,970,745.
  - Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 3,970,553.
- Distler, Jack Edward, to Bell Telephone Laboratories, Incorporated. Multiple switch. 3,970,806, Cl. 200-5.00R.
- Dittmar, Bruce Ivor, to Du Pont de Nemours, E. I., and Company. Dialkyl 1,1'-(optionally substituted hydrocarbylenebiscarbamoyl)bis(2-benzimidazolecarbamates). 3,970,668, Cl. 260-309.200.
- Diversified Products, Inc.: *See—*
  - Westmoreland, James P., Jr., 3,970,316.
- Doane, Frank A., to Colorflo Leasing Inc. Method and apparatus for manufacture of disposable thermometers. 3,970,119, Cl. 141-1.00R.
- Dockus, Kostas F., to Borg-Warner Corporation. Method of brazing aluminum parts. 3,970,237, Cl. 228-208.000.
- Dr. Molter GmbH: *See—*
  - Aeschlimann, Hans-Peter, 3,970,245.
- Doherty, Thomas E.: *See—*
  - Amberg, Stephen W.; and Doherty, Thomas E., 3,970,492.
- Doi, Muneharu: *See—*
  - Sasajima, Ken-ichi; Doi, Muneharu; Fukuhara, Teruo; Yokota, Akira; Nakao, Yoshio; and Yoneda, Masahiko, 3,970,522.
- Doin, Bernard J.; Plantif, Bernard E.; and Tillac, Jean-Francois, to Societe Nationale des Poudres et Explosifs. Device for winding a seat belt in vehicles. 3,970,266, Cl. 242-107.40R.
- Dolenc, Anton; and Herter, Anton, to Escher Wyss Limited. Flexure compensating roll. 3,969,801, Cl. 29-116.0AD.
- Dollhausen, Manfred: *See—*
  - Muller-Albrecht, Horst; Quiring, Bernd; Dollhausen, Manfred; and Wulff, Jochen, 3,970,717.
- Dolza, Claudio. Method and apparatus for laying pipelines. 3,969,905, Cl. 61-111.000.
- Doody, Richard D., to United States of America, Air Force. Cold cylinder assembly for cryogenic refrigerator. 3,969,907, Cl. 62-6.000.
- Dornier System GmbH: *See—*
  - Hepp, Wolfgang; and Wirtzfeld, Alexander, 3,970,076.
- Dorrell, Robert Francis; and Janatka, Joseph, to Bunker Ramo Corporation. Electrical connector having improved contact retention system. 3,970,352, Cl. 339-59.00M.
- Doser, Manfred; and Jones, Frederick G., to Hitachi Magnetics Corporation. Sintering methods for cobalt-rare earth alloys. 3,970,484, Cl. 148-103.000.
- Doser, Manfred, to Hitachi Magnetics Corporation. Binder and lubricant removal from cobalt-rare earth alloys. 3,970,485, Cl. 148-103.000.
- Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See—*
  - Stoffelsma, Jan; and Pypker, Jacob, 3,970,689.
- Downey, George T.: *See—*
  - Decker, Maurice S.; and Downey, George T., 3,970,104.
- Dowty Rotol Limited: *See—*
  - Hunt, John Owen, 3,970,410.
- Doyle, William C., Jr., to Gulf Research & Development Company. Selectively herbicidal 2-substituted-4H-3,1-benzoxazin-4-ones. 3,970,652, Cl. 260-244.00R.
- Drabert Sohne: *See—*
  - Riedel, Dieter; Rathert, Horst; and Grannemann, Gerhard, 3,969,797.
- Dravo Corporation: *See—*
  - Karnofsky, George B., 3,970,764.
  - Pelzer, Franz, 3,970,333.
  - Savage, Elton Stuart; and Chen, Jeffrey J., 3,970,555.
- Dresser Europe, S.A.: *See—*
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- Drews, Wolf-Dietrich, to Siemens Aktiengesellschaft. Ultrasonic liquid atomizer. 3,970,250, Cl. 239-102.000.
- Droske, Klaus, to Volkswagenwerk Aktiengesellschaft. Lock. 3,969,915, Cl. 70-364.00R.
- DuBois, Donald E. Buckle with removable display insert. 3,969,836, Cl. 40-21.00C.
- Duffield, Peter Leonard, to Mead Corporation, The. Apparatus and method for initiating formation of a filament of coating liquid. 3,970,222, Cl. 222-148.000.
- Dumas, Guy H., to Silec-Semi-Conducteurs. Photosensitive junction devices having controllable sensitivity. 3,970,843, Cl. 250-211.00J.
- Dumas, John R.: *See—*
  - Baudouin, Daniel Adrian; and Dumas, John R., 3,970,995.
- Dumitrescu, Nicolae: *See—*
  - Mogos, Ion; Ionescu, Cornel; Angelescu, Dionisie; Dumitrescu, Nicolae; Andreescu, Millo; Neascu, Constantin; Brozici, Mircea; Birzanescu, Mihai; Puie, Alexandru; and Vasilica, Gheorghe, 3,970,074.

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- Dunkley, James L.; and Liang, Victor K. C., to National Semiconductor Corporation. Complementary bipolar transistors having collector diffused.isolation. 3,971,059, Cl. 357-44.000.
- Du Pont de Nemours, E. I., and Company: *See—*
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  - Braun, Robert A., 3,970,687.
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  - Reader, John R., Jr.; Seago, James L.; and Williamson, James A., Jr., 3,970,430.
  - Seymus, Herman Ernest, 3,970,627.
- Dupuis, Maurice Victor; and Hohman, Frederick William. Carbon brush assembly. 3,970,882, Cl. 310-245.000.
- Durant, Graham John, to Smith Kline & French Laboratories Limited. Imidazo[1,2-a]pyridines. 3,970,753, Cl. 424-263.000.
- Durif Varambon, Durif: *See—*
  - Cohen, Choua; Durif Varambon, Durif; Salle, Robert; and Sillion, Bernard, 3,970,630.
- Duveau, Francois. Fluid distribution apparatus and method. 3,970,413, Cl. 417-7.000.
- Dygos, John H., to G. D. Searle & Co. 5-(1,2,3,4-Tetrahydro-6-methoxy-2-naphthyl)-2-hydroxy-1-methylcyclopentaneethanols and esters. 3,970,686, Cl. 260-476.00C.
- Dynell Electronics Corporation: *See—*
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- Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Concealed zipper fastener. 3,969,794, Cl. 24-205.11F.
- Ebstein, John W.; and Cambardella, Mario, to Gabriel Industries, Inc. Basketball backboard and support. 3,970,304, Cl. 273-1.50R.
- Echterhoff, Heinrich: *See—*
  - Beck, Kurt-Gunther; Rohde, Wolfgang; Echterhoff, Heinrich; and Nashan, Gerd, 3,970,523.
- Edelman, Seymour; Roth, Steven C.; and Mayo-Wells, John F., to United States of America, Navy. Polymeric sensor of vibration and dynamic pressure. 3,970,862, Cl. 307-88.0ET.
- Edmonds, James T., Jr., to Phillips Petroleum Company. Preparation of block copolymers. 3,970,719, Cl. 260-878.00B.
- Edwards, Roy Q.: *See—*
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- Eenink, Johannes Gerardus Leon: *See—*
  - Black, Bill Adby; and Eenink, Johannes Gerardus Leon, 3,970,158.
- Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, to Robert Bosch G.m.b.H. RPM regulator for fuel injection pumps. 3,970,064, Cl. 123-139.0ST.
- Eisenwerk-Gesellschaft Maximiliansnutte mbH: *See—*
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- Elion, Glenn R.; and Klink, Arthur E., to Merck & Co., Inc. Preparation of cyanopyridines. 3,970,657, Cl. 260-294.900.
- Elion, Glenn R.; and Klink, Arthur E., to Merck & Co., Inc. Preparation of cyanopyridines. 3,970,659, Cl. 260-294.900.
- Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
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- Elliott, Douglas Ernest: *See—*
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- Ellis, Paul H., to United States of America, Army. Folding weapon sight. 3,969,827, Cl. 33-255.000.
- Elward, John S., to Hewlett-Packard Company. Memory expansion apparatus. 3,970,999, Cl. 340-172.500.
- Ely, Charles M.: *See—*
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- English Electric Valve Company Limited: *See—*
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- Englund, G. Roland, to Svenska Dataregister AB. Indexing mechanism. 3,969,945, Cl. 74-128.000.
- Enlow, William Palmer: *See—*
  - Hechenbleikner, Ingenuin; and Enlow, William Palmer, 3,970,532.
- Ennis, Robert E.; and Derrick, Robert G., to Linatex Corporation of America; and Derrick Manufacturing Corporation. Screen assembly and dewatering technique. 3,970,549, Cl. 209-341.000.
- Enoch, Reginald David; and Jones, Mervyn Evan, to Post Office, The. Magnetic bubble shift register. 3,971,037, Cl. 340-174.0TF.
- Enriki, Kiyoshi: *See—*
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- Enterprise Machine and Development Corporation: *See—*
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- Environmental Research & Technology, Inc.: *See—*
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- Epenoy, Gabriel; and Vautier, Remi, to International Business Machines Corporation. Time division multiplex data transmission system. 3,970,798, Cl. 179-15.0AF.
- Erdelyan, Steven, to International Harvester Company. Lockable suspension system for a scraper. 3,969,835, Cl. 37-129.000.
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- Erwin Sick Optik-Elektronik: *See—*
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- Esaki, Shigeru; Murata, Shigeru; Ishida, Matsuhiko; and Kito, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Safety device for passenger conveyor. 3,970,187, Cl. 198-16.00R.
- Escher Wyss Limited: *See—*
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  - Dolenc, Anton; and Herter, Anton, 3,969,801.
- Esposito, Vito M.; and Weinstein, Stanley B., to American Hospital Supply Corporation. Process for reducing sticking of blood cells to glass in blood testing procedures. 3,970,427, Cl. 23-230.00B.
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- Etablissements Lardenois: *See—*
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- Etudes et Fabrications Aeronautiques: *See—*
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- Etzbach, Volker; Forg, Wolfgang; and Grimm, Peter, to Linde Aktiengesellschaft. Cascaded refrigeration cycles for liquefying low-boiling gaseous mixtures. 3,970,441, Cl. 62-28.000.
- Euchner, William H., Jr.: *See—*
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- Even, Reed Kamenetzky, to Bell Telephone Laboratories, Incorporated. Digital frequency multiplier. 3,970,954, Cl. 331-53.000.
- Evers, Carl A.; Wolf, Harold G., Jr.; and Kravitz, Howard S., to Uniroyal, Inc. Flame resistant thermoplastic blend. 3,970,716, Cl. 260-859.00R.
- Evers, William J.: *See—*
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- Ewers, Ronald L., to Toro Company, The. Fastening construction for playground equipment. 3,969,871, Cl. 52-721.000.
- Exxon Research and Engineering Company: *See—*
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  - Reeder, Perry E.; and Williams, Leonard M., 3,970,740.
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- Fagan, Lloyd D.; and Tripp, Gareth A., to Intersil Incorporated. Dual emitter programmable memory element and matrix. 3,971,058, Cl. 357-36.000.
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- Falkenstein, Georg; Palm, Richard; and Wolff, Dietrich, to BASF Aktiengesellschaft. Stable, liquid solutions of isocyanurate-polyisocyanates containing amide and/or acylurea groups. 3,970,600, Cl. 260-77.5NC.
- Fan, Albert K.; and Tecotzky, Melvin, to United States Radium Corporation. Alpha barium zinc cadmium sulfide phosphors and method. 3,970,582, Cl. 252-301.60S.
- Fan, George J., to International Business Machines Corporation. Method and apparatus for applying magnetic liquid droplets to a recording surface. 3,971,033, Cl. 346-1.000.
- Farley, David L.: *See—*
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- Faulhaber, Reimar; Ascherfeld, Margareta; and Fabinski, Walter, to Hartmann & Braun Aktiengesellschaft. Nondispersion, two beam, infrared gas analyzer. 3,970,387, Cl. 356-51.000.
- Faulstich, George W., to Three Sisters Ranch Enterprises. Plastic stopper for wine bottle or the like. 3,970,207, Cl. 215-296.000.
- Faulstich, Marga, to Jenaer Glaswerk Schott & Gen. Chemically stable optical glass. 3,970,466, Cl. 106-54.000.
- Fazekas, Josef: *See—*
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- Featherstone, Sammie W. Horseshoe. 3,970,149, Cl. 168-25.000.
- Fedder, Tobe T. Animation method and system. 3,970,379, Cl. 352-52.000.
- Feeney, George W.; and Burroway, Gary L., to Goodyear Tire & Rubber Company, The. Adhesive composition containing a copolymer of butadiene, styrene, and acrylonitrile, plus a tackifying resin. 3,970,623, Cl. 260-27.0BB.
- Fein, Michael E.: *See—*
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- Feingold, Michael H.: *See—*
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- Feldman, Jacob Richard; Haas, Gerhard Julius; and Lugay, Joaquin Castro, to General Foods Corporation. Nutritionally improved foodstuffs. 3,970,520, Cl. 195-29.000.
- Fenn, John B., Jr; and Welkowsky, Murray S., to Xonics, Inc. Direct charge readout electron-radiography chamber. 3,970,844, Cl. 250-213.0VT.
- Fenne, Kenneth R., to Quasar Electronics Corporation. Modular control panel device for audio-visual receiving apparatus. 3,970,782, Cl. 178-7.900.
- Fester, Walter: *See—*
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- Fiber Science, Inc.: *See—*
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- Field, Nathan D.; and Williams, Earl P., to GAF Corporation. N-vinyl lactam interpolymers useful as thickening agents. 3,970,606, Cl. 526-260.000.
- Fields, Ellis K., to Standard Oil Company. Nitrile process. 3,970,658, Cl. 260-294.900.
- Fierz, Max: *See—*
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- Figueroa, David Richard; and Ginsberg, Guenter, to Coulter Electronics, Inc. Analog to digital to analog storage and retrieval for a plurality of photometric blanking values. 3,970,392, Cl. 356-179.000.
- Findley, Gerald Ivan; and Anderson, Teddy Lee, to International Business Machines Corporation. Electronic horizontal shifting and variable print width in a buffered printer. 3,971,044, Cl. 354-9.000.
- Finger, John F.; and Pachop, Merle E., to Sioux Steam Cleaner Corporation. Low pressure steam generator. 3,970,048, Cl. 122-328.000.
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- Finnila, Charles A., to Hughes Aircraft Company. Cooperative-word linear array parallel processor. 3,970,993, Cl. 340-172.500.
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- Fischer, Joachim; Knorre, Helmut; and Pohl, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for detoxification of cyanides and nitriles with peroxygen compounds. 3,970,554, Cl. 210-62.000.
- Fischli, Albert Eduard: *See—*
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- Fisher, Donald H.; and Crociata, Vincent J., to Xerox Corporation. Spatially selective optical system. 3,970,382, Cl. 355-4.000.
- Fisher, John A. Modular floating load-supporting assemblage. 3,970,024, Cl. 114-.50F.
- Fleck, Fritz: *See—*
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- Fleischer, Barry. Applicator system for fluids. 3,970,221, Cl. 222-145.000.
- Flint, Theodore R. Hot-melt adhesive with self-melting capability. 3,970,395, Cl. 401-1.000.
- Fluidfire Development Limited: *See—*
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- Foehn, Robert C., to FF & L Industries, Inc. Ballasted load control system and method. 3,971,010, Cl. 340-310.00R.
- Fogel, Samuel; Foster, Patricia L.; Schenck, Paula; and Walker, William W., Jr., to American Bioculture, Inc. Soil treatment methods. 3,969,844, Cl. 47-58.000.
- Ford, Wilson H.: *See—*
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- Frankenfeld, John W.; and Wright, Donald L., to Exxon Research and Engineering Company. Aliphatic diols as preservatives for cosmetics and related products. 3,970,759, Cl. 424-343.000.
- Franklin, D. E. Self-supporting lighting fixture. 3,969,849, Cl. 52-28.000.
- Franklin, Veatrice. Crochet needle storage and dispensing device. 3,970,195, Cl. 206-380.000.
- Fraze, Ermal C.: *See—*
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- Fredriksson, Henning; and Helde, Sven Ake. Reel for storing an elongated pliable member. 3,970,264, Cl. 242-96.000.
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- Freeman, Leo B., Jr.; Incerto, Robert J.; and Petrosky, Joseph A., Jr., to International Business Machines Corporation. High common mode rejection differential amplifier utilizing enhancement depletion field effect transistors. 3,970,950, Cl. 330-30.00D.
- Freiberg, Leslie Alan, to Abbott Laboratories. Process for the conversion of niddamycin to leucomycin A_1, leucomycin A_3, carbomycin B and other antibiotics and related 3-O-esters. 3,970,642, Cl. 536-17.000.
- Fried, John H.: *See—*
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- Friedman, Jerome. Die holder. 3,970,179, Cl. 192-138.000.
- Friedrichs, Jerome Peter, to Motorola, Inc. Method and apparatus for a thermistor compensated oven. 3,970,818, Cl. 219-210.000.
- Friese, Hermann, to Sud-Chemie AG. Hydrolysis of oat husks. 3,970,712, Cl. 260-635.00C.
- Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik: *See—*
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- Froman, Griff W.; and Mullins, Albert Ray, to Inland Steel Company. Electrolytic treating apparatus. 3,970,537, Cl. 204-211.000.
- Frost, W. Wade: *See—*
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- Fry, Sidney; Crabtree, Terence Edward; and Rothery, Brian, to BBA Group Limited. Moulded elastomeric screen mat for sieving devices. 3,970,550, Cl. 209-399.000.
- Fuji Photo Film Co., Ltd.: *See—*
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- Fujiwara, Akinobu. Key release type burglar alarm. 3,971,009, Cl. 340-276.000.
- Fujiwara, Hiroshi; Asano, Koichi; Sugishita, Akio; and Takahashi, Asao, to Maruzen Oil Co. Ltd. Graft copolymer and process for preparation thereof. 3,970,534, Cl. 204-159.170.
- Fukasawa, Toshiro: *See—*
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- Fukumoto, Shigeru, to Kabushiki Kaisha Suncrux Research Office. Electronically controlled timepieces using liquid crystal display elements. 3,969,887, Cl. 58-50.00R.
- Fukusen, Hiroshi: *See—*
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- Fukuyama, Hiromasa, to Nippon Seiko Kabushiki Kaisha. Porous, static pressure air bearing device in a dentist's handpiece. 3,969,822, Cl. 32-27.000.
- Fukuyama, Yoshinobu, to Takatori Machinery Works Ltd. Automatic seaming method and long seamer therefor. 3,970,015, Cl. 112-121.120.
- Fulkerson, David E., to Honeywell Inc. Logic gate circuits. 3,970,866, Cl. 307-218.000.
- Fulmer, Keith H.; Kosarski, Raymond, Jr.; and Hughes, Harold W., to Bendix Corporation, The. Reserve reservoir cover. 3,969,898, Cl. 60-534.000.
- Funk, Harald F. Treating waste materials to produce usable gases. 3,970,524, Cl. 201-2.500.
- Funk, Larry L., to Funk, Larry L.; and Oliver, James P. Remote light control system. 3,971,028, Cl. 343-225.000.
- Furukawa Electric Co., Ltd., The: *See—*
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- Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, to Bridgestone Tire Company Limited. Epoxidized acetylene-conjugated diene random copolymer and the curable composition comprising the same. 3,970,608, Cl. 526-19.000.
- Furukawa, Tetsuhisa: *See—*
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- Gahwiler, Hermann: *See—*
  - Voellmy, Hans Rudolf; and Gahwiler, Hermann, 3,970,097.
- Gale, Preston L.; Helton, Eugene L.; and Mueller, Robert C., to Caterpillar Tractor Co. Wear-resistant alloy, and method of making same. 3,970,445, Cl. 75-0.50B.
- Gall, Martin, to Upjohn Company, The. 3,5-Disubstituted-4-(α-amino-α-phenyl-o-tolyl)-4H-1,2,4-triazoles. 3,970,666, Cl. 260-308.00R.
- Gallagher, Timothy W.: *See—*
  - Schott, John R.; and Gallagher, Timothy W., 3,970,848.
- Gallet, John R.: *See—*
  - Schmidt, Robert W.; Gallet, John R.; and Czyz, Thomas L., 3,970,489.
- Gardineer, Bayard G.; and Panissidi, Hugh A., to International Business Machines Corporation. Self-snubbing miniature piston assembly. 3,969,990, Cl. 92-85.00B.
- Gardner-Denver Company: *See—*
  - Workman, William, Jr., 3,970,151.
- Garrett, Roy Peter; and Parkins, Derek Ray, to SKF Trading and Development Co. B.V. Hydraulic release mechanism for clutches. 3,970,177, Cl. 192-91.00A.
- Garrigues, Claude; Signouret, Jean Baptiste; and Chambu, Claude, to Societe Nationale des Petroles d'Aquitaine. Sulfur emulsion in bituminous material. 3,970,468, Cl. 106-274.000.
- Garruto, Peter G. Teaching aid. 3,969,832, Cl. 35-75.000.
- Gasior, Stanley J.; Forney, Albert J.; Haynes, William P.; and Kenny, Richard F., to United States of America, Energy Research and Development Administration. Process for reducing sulfur in coal char. 3,970,434, Cl. 44-1.00F.
- Gates, Gerald Alan; and Ryan, William John, to International Business Machines Corporation. Backside laser dicing system. 3,970,819, Cl. 219-121.0LM.
- Gateway Machine & Design, Inc.: *See—*
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- Gatton, William R.: *See—*
  - Widecrantz, Kaj; and Gatton, William R., 3,970,415.
- Gaylord, John F., Jr., to Medical Specialties, Inc. Body support binder and method of fabricating same. 3,970,079, Cl. 128-78.000.
- Gaynor, Joseph, to Bell & Howell Company. Image transfer layers for infrared transfer processes. 3,970,002, Cl. 101-463.000.
- Gazzard, Edward George; and Singer, Michael, to Imperial Chemical Industries Limited. Biocidal compositions. 3,970,755, Cl. 424-270.000.
- Gebr. Hofmann KG: *See—*
  - Himmler, Gunther, 3,969,933.
- Gehl Company: *See—*
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- Gehweiler, William Frederick; and Pridgen, Junius Isaac, to United States of America, Navy. High-speed adder. 3,970,833, Cl. 235-175.000.
- Geier, Viktor Georgievich; Gruba, Vladimir Ivanovich; Logvinov, Nikolai Grigorievich; Uskov, Evgeny Vasilievich; Kostanda, Viktor Semenovich; and Mirgorodsky, Vladimir Georgievich. Airlift. 3,969,834, Cl. 37-58.000.
- Geils, Frederick W.: *See—*
  - Haselton, Philip H.; and Geils, Frederick W., 3,970,339.
- Gema AG Apparatebau: *See—*
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  - Giaever, Ivar, 3,970,518.
  - Hodgins, Robert G., 3,970,900.
  - Hodsdon, Roy F.; and Mann, Friedrich H., 3,969,796.
  - Jeter, Donald Wayne; and Keith, Walter Gill, 3,970,581.
  - Mees, Robert D.; and Bell, Gordon M., 3,970,723.
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  - Rist, Donald Hammond; and Turley, Barry Jay, 3,970,858.
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- General Foods Corporation: *See—*
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  - Pitchon, Esra; Chall, Steven Barry; and Schulman, Marvin, 3,970,765.
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  - Carroll, Charles D.; and Meginnis, George B., 3,970,319.
  - Nelson, Robert E., 3,969,890.
  - Smale, Charles H.; and Pyne, James A., Jr., 3,970,252.
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- General Staple Company, Inc.: *See—*
  - Zahn, Irwin, 3,969,811.
- Gengnagel, Kurt; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of pure tolutriazoles. 3,970,667, Cl. 260-308.00B.
- George, Douglas Franklin; and Yowell, Wayne Lester. Hand tool for holding an elongated member while simultaneously moving a second member axially along the elongated member. 3,969,964, Cl. 81-310.000.
- George Hyman Construction Co.: *See—*
  - Goetjen, Ted G., 3,970,200.
- Gerbal, Claude Fernand Marcel, to Eastman Kodak Company. Photographic developing agents. 3,970,454, Cl. 96-29.00D.
- Gerber, Heinz Joseph; and Chase, Earle Merritt, to Gerber Scientific Instrument Company, The. Plotting head for consumable marking material. 3,971,036, Cl. 346-139.00C.
- Gerber Scientific Instrument Company, The: *See—*
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- Gerbier, Gerard; and Rivault, Jean-Paul, to Saft-Societe des Accumulateurs Fixes et de Traction. Primary cell, in which the positive active material is silver chromate. 3,970,475, Cl. 136-100.00R.
- Gerhardt, Lester A.; Corby, Nelson R., Jr.; and Sims, Edward M., to United States of America, Navy. Image processing system. 3,971,068, Cl. 358-82.000.
- Gerresheim, Jost: *See—*
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- Gerson, Robert; and Bell, Robert J., to University of Missouri, The Curators of the. Depletion layer laser beam modulator and deflector. 3,970,364, Cl. 350-160.00R.
- Geyer, Hans; Rotter, Christoph; and Welsch, Wolfgang, to Siemens Aktiengesellschaft. Liquid crystal cell for a liquid crystal display screen. 3,970,363, Cl. 350-160.0LC.
- Giaever, Ivar, to General Electric Company. Magnetic separation of biological particles. 3,970,518, Cl. 195-1.500.
- Giaimo, Anthony: *See—*
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- Giannone, Victor S. Tire chain assembly. 3,970,132, Cl. 152-233.000.
- Gibson, Robert R., Jr.; and Kim, Joo I. Method and apparatus for harvesting crops. 3,970,150, Cl. 171-56.000.
- Gien, Abraham; and Gien, Bernard Lionel. Pneumatic percussion machines. 3,970,153, Cl. 173-17.000.
- Gien, Bernard Lionel: *See—*
  - Gien, Abraham; and Gien, Bernard Lionel, 3,970,153.
- Giglia, Robert Domenico, to American Cyanamid Company. Additives that increase the stability of electrochromic films in electrochromic devices. 3,970,365, Cl. 350-160.00R.
- Gildea, Robert. Water lounge. 3,969,776, Cl. 4-172.000.
- Gilliam, Edward T.: *See—*
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- Gilmore, Ralph W. Conveyor-type traffic signal device. 3,970,988, Cl. 340-43.000.

- Gimaret, Pierre Louis, to Etablissements Metallurgiques du Val d'Ambv. Method of manufacturing hollow elements from thermoplastic materials. 3,970,736, Cl. 264-310.000.
- Ginn, Martin E.; and Liebman, Irwin, to Alberto Culver Company. Heavy duty alkaline liquid surfactant concentrate. 3,970,595, Cl. 252-545.000.
- Ginsberg, Guenter: *See—*
  - Figueroa, David Richard; and Ginsberg, Guenter, 3,970,392.
- Giulie, Joe D., to Minnesota Mining and Manufacturing Company. Binder element. 3,970,331, Cl. 281-21.00R.
- Givaudan Corporation: *See—*
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- Glanemann, Rudolf; and Schlaupitz, Wolfgang, to Vacu-Lift Machinenbau GmbH. Vacuum lifting unit including a suction cup. 3,970,341, Cl. 294-64.00R.
- Glover, Clinton G.; Markley, Jack H.; and Young, Patrick J., to Potlatch Corporation. End trim plywood process. 3,970,497, Cl. 156-182.000.
- Gluck, Wolfgang; and Benek, Lothar, to Messrs. Eckart-Werke Standard-Bronzepulver-Werke Carl Eckart. Water-dispersible aluminium pastes. 3,970,577, Cl. 252-182.000.
- Goeke, Alfons, to Th. Kieserling & Albrecht. Workpiece feed channel. 3,969,919, Cl. 72-405.000.
- Goetjen, Ted G., to George Hyman Construction Co. Gantry. 3,970,200, Cl. 214-1.00H.
- Goetzewerke-Friedrich Goetze AG: *See—*
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- Golden, John P. Portable X-ray device. 3,970,884, Cl. 313-55.000.
- Goldie, Brian Peter Forsyth; Kirkwood, Kenneth Clark; and Lightbody, Alan William, to BP Chemicals International Limited. Polymerization process. 3,970,613, Cl. 526-104.000.
- Goldstein, Leon: *See—*
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- Goldsworthy Engineering, Inc.: *See—*
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- Goodacre, Charles Lindsay, to Fiat Societa per Azioni. Internal combustion engines. 3,970,053, Cl. 123-30.00D.
- Goodsmith, Dale H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener installation head. 3,969,808, Cl. 29-208.00D.
- Goodwin, Frank E.; and Graves, Ross E., to Hughes Aircraft Company. Dual channel phase locked optical homodyne receiver. 3,970,838, Cl. 250-199.000.
- Goodwin, William D., to Athlon Corporation, The. Nutrient protein from keratinaceous material solubilized with N,N,-dimethylformamide. 3,970,614, Cl. 260-123.700.
- Goodyear Aerospace Corporation: *See—*
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  - McNenney, William; and Sponseller, John R., 3,970,261.
  - Schoenberg, Emanuel; and Hanlon, Thomas L., 3,970,724.
- Gore, Douglas John. Floating skimmer for cleaning the surface of a body of liquid, method and apparatus. 3,970,556, Cl. 210-83.000.
- Goss, Gary J.: *See—*
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- Gossie, Mijo A., to Corning Glass Works. Decal smoothing apparatus. 3,970,508, Cl. 156-477.00R.
- Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Actuating arrangements for a cigarette lighter. 3,970,420, Cl. 431-255.000.
- Gouda, Keijiro: *See—*
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- Goyer, Andre; and Smadja, Rene, to Mobil Oil Corporation. Anisotropic road surface. 3,970,403, Cl. 404-27.000.
- Graf, Felix: *See—*
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- Graf, Robert: *See—*
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- Graham, Joseph A., Jr. Portable animal pen and gate structure. 3,970,045, Cl. 119-20.000.
- Granatek, Alphonse Peter: *See—*
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- Gray, Don N., to Owens-Illinois, Inc. Amino acid derivatives of chloromethylated polymers and methods of making the same. 3,970,603, Cl. 526-12.000.
- Gray, Stephen R.: *See—*
  - Meyer, Stanley A.; and Gray, Stephen R., 3,970,070.
- Graybill, Clinton L. Variable venturi carburetor. 3,970,730, Cl. 261-41.00D.
- Green, James E. Method and apparatus for dual resolution analysis of a scene. 3,970,841, Cl. 250-201.000.
- Greenbaum, Sheldon B.: *See—*
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- Greene, Ralph F.: *See—*
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- Greenfield, Howard J.: *See—*
  - Sindelar, Frank J.; and Greenfield, Howard J., 3,970,075.
- Gregg, Michael J. W., to Goodyear Tire & Rubber Company, The. Circular side positive drive belt teeth. 3,969,946, Cl. 74-230.500.
- Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Fluid actuating device for an electric circuit breaker. 3,969,985, Cl. 91-416.000.
- Griesser, Rolf: *See—*
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- Grigg, James H.: *See—*
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- Grolla, Herbert, to Heinrich Wagner Maschinenfabrik. Apparatus for producing and transferring casting moulds. 3,970,137, Cl. 164-160.000.
- Grolla, Herbert, to Heinrich Wagner Maschinenfabrik. Vacuum control valving apparatus for a vacuum sealed molding apparatus. 3,970,139, Cl. 164-253.000.
- Grove, Marvin H., to M & J Valve Company. Fluid flow control apparatus and method. 3,969,924, Cl. 73-46.000.
- Gruba, Vladimir Ivanovich: *See—*
  - Geier, Viktor Georgievich; Gruba, Vladimir Ivanovich; Logvinov, Nikolai Grigorievich; Uskov, Evgeny Vasilievich; Kostanda, Viktor Semenovich; and Mirgorodsky, Vladimir Georgievich, 3,969,834.
- Grubenmann, Manfred, to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik. Switch having hemispherical pivotal cover actuator for movable lever contact member. 3,970,984, Cl. 338-153.000.
- Grumman Aerospace Corporation: *See—*
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- Gryctko, Carl E.; Ball, Kenneth D.; and McGinnis, Peter J., to I-T-E Imperial Corporation. Circuit interrupter having rotary switch operator and interlocking structure with two position mounting plate. 3,970,808, Cl. 200-50.00A.
- Gryctko, Carl E., to I-T-E Imperial Corporation. Ground fault circuit breaker with ground fault trip indicator. 3,970,975, Cl. 335-18.000.
- Gryschuk, Danny, to Lawrence Peska Associates, Inc., a part interest. Electrical targets irregularly illuminated. 3,970,310, Cl. 273-102.20R.
- Grzeslo, Ignacy John. Temperature compensator for gas flow meter. 3,969,939, Cl. 73-194.00M.
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- Guanella, Gustav, to Patelhold Patentverwertungs & Elektro-Holding AG. Method and device for the coded transmission of messages. 3,970,790, Cl. 179-1.50S.
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- Gunn, Walter H., to Diamond Shamrock Corporation. Simplified metal treating compositions formed from precursor components. 3,970,482, Cl. 148-6.200.
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- Guttinger, Urs; and Hofer, Hans, to Motorwagenfabrik Berna AG. Bimetal multiple cylinder for extruders in plastics processing machinery. 3,970,113, Cl. 138-157.000.
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- Hacke, Hans-Jurgen; and Graf, Robert, to Siemens Aktiengesellschaft. Process for forming a through connection between a pair of circuit patterns disposed on opposite surfaces of a substrate. 3,969,815, Cl. 29-625.000.
- Hacke, Walter: *See—*
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- Hacker, Charles L. Liquid stopped-flow apparatus. 3,970,388, Cl. 356-72.000.
- Hager, Walter, to Pfaff Industriemaschinen GmbH. Work feeding mechanism for sewing machines. 3,970,018, Cl. 112-206.000.
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- Halasa, Adel Farhan: *See—*
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- Halcomb, Walter C.; Eastman, Naomi A.; Eastman, Robert D.; VanMeter, Harvey A.; and Chapman, Russell W. Packaging machine. 3,969,874, Cl. 53-183.000.
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- Hamilton, Douglas D., to Logging Development Corporation. Method and apparatus for severing and marking trees. 3,970,124, Cl. 144-3.00D.
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- Hanai, Ichiro; Kobayashi, Toshiharu; and Takahashi, Kazuo, to Sony Corporation. Thermal printing apparatus. 3,971,069, Cl. 360-16.000.
- Hanai, Ichiro; Kobayashi, Toshiharu; and Takahashi, Kazuo, to Sony Corporation. Heating means for heating a magnetic tape above its Curie point prior to duplication by contact with a master tape. 3,971,070, Cl. 360-16.000.
- Hanaoka, Akio; and Yoshimochi, Ken, to Sony Corporation. Teaching system. 3,969,831, Cl. 35-8.00A.
- Hanlon, Thomas L.: *See—*
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- Hansen, Egon Jorgen, to Danfoss A/S. Magnetic valve. 3,970,282, Cl. 251-129.000.
- Hansen, James E.; and Schmit, Eugene R., to Cutler-Hammer, Inc. A.C. motor starting system. 3,970,908, Cl. 318-221.00E.
- Hanslik, Wilhelm, to Krauss-Maffei Aktiengesellschaft. Transmission for multiscrew extruder. 3,969,956, Cl. 74-665.0GD.
- Hansmann, Hermann: *See—*
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- Hanson, Violet M. Flat bottom bag. 3,970,241, Cl. 229-58.000.
- Hardy, Gilbert F. Spring loop key ring and belt attachment. 3,970,227, Cl. 224-5.00R.
- Hardy, William Baptist; and Savides, Christos, to American Cyanamid Company. Heat stabilizers for polyvinyl chloride (β-amino-β-arylacrylonitriles). 3,970,622, Cl. 260-23.0XA.
- Hardy, William Baptist; and Susi, Peter Vincent, to American Cyanamid Company. Tetramethylpiperidinylphosphine oxides as light stabilizers for polymers. 3,970,636, Cl. 260-45.8NE.
- Hardy, William Baptist; and Savides, Christos, to American Cyanamid Company. Heat stabilizers for polyvinyl chloride (β-amino-β-arylacrylamides). 3,970,644, Cl. 260-23.0XA.
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- Harmony, Richard C., to Harmony Emitter Company, Inc. Pipe insertable emitter for irrigation systems. 3,970,251, Cl. 239-107.000.
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  - Krygeris, Algirdas J.; and Manring, John M., 3,970,393.
  - Stanton, Arthur J., 3,970,394.
- Harris, Jesse, to Reed Tool Company. Collapsible ball valve. 3,970,106, Cl. 137-843.000.
- Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, to Bassinger Tool Enterprises, Ltd. Mud actuated drilling tool. 3,970,152, Cl. 173-15.000.
- Harris, Robert C., to Bendix Corporation, The. Electrical discharge device comprising an insulator body having an electrically semiconducting coating formed thereon. 3,970,591, Cl. 252-521.000.
- Harris Trust and Savings Bank, executor: *See—*
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- Hart, John W.; and Rolfson, Thomas C., to S. C. Johnson & Son, Inc. Aerosol package containing a foam-forming emulsion and propellent system. 3,970,584, Cl. 252-305.000.
- Hartless, Ray Lawson; and Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Stabilized polymeric composition and product using same. 3,970,637, Cl. 260-45.9NC.
- Hartmann & Braun Aktiengesellschaft: *See—*
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  - Bender, Martin; Knappstein, Johannes; and Stratmann, Josef, 3,970,526.
- Harvey, Horace A., to I-T-E Imperial Corporation. Hot line detection system for high voltage switchgear. 3,970,932, Cl. 324-133.000.
- Harvey, Vernon Bryan William, to Wright Rain Limited. Pipe-following irrigation machine. 3,970,102, Cl. 137-344.000.
- Harwood, Leopold Albert; and Wittmann, Erwin Johann, to RCA Corporation. Controller gain signal amplifier. 3,970,948, Cl. 330-29.000.
- Haselton, Frederick R. Water closet flushing device. 3,969,775, Cl. 4-67.00A.
- Haselton, Philip H.; and Geils, Frederick W., to Detex Corporation. Double swinging latchbolt. 3,970,339, Cl. 292-227.000.
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- Hattori, Kenji. Buckle for strapping parcel or the like with tape. 3,969,792, Cl. 24-74.00A.
- Hauser, Martin; and Malofsky, Bernard M., to Loctite Corporation. Anaerobic compositions and surface activator therefor. 3,970,505, Cl. 156-331.000.
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- Hawkins, Ernest C., to Gateway Machine & Design, Inc. Multiple mold forming machine. 3,969,965, Cl. 82-3.000.
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- Hawkins, Luther M. Athletic wrist support. 3,970,305, Cl. 273-54.00B.
- Hayasaka, Isao, to Takeda Riken Kogyo Kabushiki Kaisha. Resistor with low temperature coefficient. 3,970,983, Cl. 338-9.000.
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- Hayashi, Takao: *See—*
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- Heckman, Jerry A.: *See—*
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- Heeb, Anton, to Balzers Patent und Betelligungs AG. Vacuum valve construction. 3,970,281, Cl. 251-77.000.
- Heflinger, Lee O.; and Wuerker, Ralph F., to TRW Inc. Multifrequency laser oscillator for holographic contouring. 3,970,390, Cl. 356-109.000.
- Hegyi, Tim T., to Goldsworthy Engineering, Inc. Digitizing system for tape placement apparatus. 3,970,831, Cl. 235-151.100.

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Esaki, Shigeru; Murata, Shigeru; Ishida, Matsuhiko; and Kito, Katsumi, 3,970,187.
Ishikawa, Kazuo: *See—*
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Matsudaira, Tadashi; and Mishina, Yoshihiro, 3,969,901.
Ishizuka, Akio; and Ogata, Yasuhiro, to Fuji Photo Film Co., Ltd. Process for separating a number of sheets into groups. 3,970,500, Cl. 156-305.000.
Isley, Reggald E. Wood trimming machine. 3,969,967, Cl. 83-435.200.
Isobe, Yasuo; Ito, Tadashi; and Ito, Fumio, to Canon Kabushiki Kaisha. Single lens reflex camera having an electric shutter. 3,971,047, Cl. 354-50.000.
Isono, Atsuya: *See—*
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Istituto Luso Farmaco d'Italia S.r.l.: *See—*
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Itek Corporation: *See—*
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Iten, Clemens A., to Philip Morris Incorporated. Razor blade cartridge and display article. 3,970,194, Cl. 206-228.000.
Ito, Fumio: *See—*
Isobe, Yasuo; Ito, Tadashi; and Ito, Fumio, 3,971,047.
Ito, Hiroshi, to Sumitomo Electric Industries, Ltd. Method and apparatus for measuring the length of long length materials. 3,970,921, Cl. 324-34.00L.
Ito, Ryuzo: *See—*
Yasaka, Toshio; Ito, Ryuzo; and Takagi, Sadao, 3,970,996.
Ito, Tadashi; Nakamoto, Soichi; and Okuno, Youichi, to Canon Kabushiki Kaisha. Exposure value display system for a camera. 3,971,048, Cl. 354-60.00L.
Ito, Tadashi: *See—*
Isobe, Yasuo; Ito, Tadashi; and Ito, Fumio, 3,971,047.
Itoga, Hiroyoshi: *See—*
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Itoh, Tsutomu; Sakurai, Munekazu; Yamamoto, Masahiro; and Okamoto, Yasunari, to Onoda Cement Company, Ltd. Thin wire type of electric field curtain system. 3,970,905, Cl. 317-262.00E.
Itschner, Bruno, to Siemens Aktiengesellschaft. Apparatus and method for obtaining an electrical signal corresponding to the specific enthalpy of steam. 3,970,832, Cl. 235-151.300.
Iuchi, Tohru: *See—*
Ohno, Jiro; Iuchi, Tohru; Tokita, Yasuo; Karasima, Hisanori; Watanabe, Kunitoshi; and Murashima, Seiichhiro, 3,969,943.
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Izaki, Nobujiro; Nakayama, Masashi; Mishiba, Saburo; and Sekiguchi, Sadao, to Sumitomo Naugatuck Co., Ltd. Composition for paper coating. 3,970,629, Cl. 260-29.70T.
Izumi, Hisashi: *See—*
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J. Bobst & Fils S.A.: *See—*
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Jabs, Gert; Loew, Gunther; and Niggemann, Johannes, to Bayer Aktiengesellschaft. Process for the production of polyurethane foams. 3,970,618, Cl. 260-2.5AD.
Jackson, William M. Priming means for bow steering pumps. 3,970,027, Cl. 114-151.000.
Jacob, Ingolf: *See—*
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Jager, Horst: *See—*
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Japan Servo Co., Ltd.: *See—*
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Jarowenko, Wadym: *See—*
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Jarrett, Graham, to Imperial Chemical Industries Limited. Thermoplastic polyurethanes mixed with ethylene copolymers. 3,970,715, Cl. 260-859.00R.
Jasinski, Leon, to Motorola, Inc. Method and apparatus for magnetizing permanent magnet in magnetic structure. 3,971,054, Cl. 335-284.000.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; Spellman, Gordon B.; and Van Horn, Lawrence E., to Cutler-Hammer, Inc. Semiconductor temperature switches. 3,971,056, Cl. 357-28.000.
Javan, Ali, to Massachusetts Institute of Technology. Generating and using coherent optical radiation. 3,970,839, Cl. 250-199.000.
Jeal, Harvey Philip; and Sheffield, David John, to Avdel Limited. Valve for a fluid dispenser. 3,970,225, Cl. 222-529.000.
Jenaer Glaswerk Schott & Gen.: *See—*
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Jenny, Christian Jakob, to International Business Machines Corporation. Communication switching system. 3,970,994, Cl. 340-172.500.
Jessup, Robert L.; and Coleman, Joe E., to Halliburton Company. Method and apparatus for annulus pressure responsive circulation and tester valve manipulation. 3,970,147, Cl. 166-250.000.
Jeter, Donald Wayne; and Keith, Walter Gill, to General Electric Company. Multiple gas streams in the post oxidation step in a process for converting uranium hexafluoride to uranium oxide rich compositions. 3,970,581, Cl. 252-301.10R.
Jezl, James L.; and Peters, Edwin F., to Standard Oil Company. Melt finishing process for polymers produced by vapor state polymerization processes. 3,970,611, Cl. 526-65.000.
Jidosha Kogyo Kabushiki Kaisha: *See—*
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Johnson, David A.; and Towle, William C., to GTE Sylvania Incorporated. Digital conference bridge. 3,970,797, Cl. 179-15.0AT.
Johnson, George B., to United States of America, Navy. Voice controlled disappearing audio delay line. 3,970,791, Cl. 179-1.50S.
Johnson & Johnson: *See—*
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Johnson, Philip M.; and Northrup, Richard M., to Sanders Associates, Inc. Direction determining method and apparatus. 3,970,391, Cl. 356-152.000.
Johnson & Phillips (Capacitors) Limited: *See—*
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Johnson, Sam H., Jr.: *See—*
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Jolles, Georges; and Ponsinet, Gerard, to Rhone-Poulenc S.A. Antibiotic 27,706 RP and salt thereof. 3,970,641, Cl. 536-17.000.
Joly, Jean, to La Telemecanique Electrique. Socket for busbars. 3,970,356, Cl. 339-252.00P.
Jones, Donald F., Sr. Soil agitating device. 3,970,012, Cl. 111-6.000.
Jones, Frederick G.: *See—*
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Jones, Loyd W.; and Holman, George B., to Standard Oil Company. Method for stimulating wells completed in oil bearing earth formations. 3,970,148, Cl. 166-307.000.
Jones, Mervyn Evan: *See—*
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Jonsson, Finn L.; and Adolfsson, Rune G., to AB Carbox. Metal bending press with removable upper beam. 3,969,921, Cl. 72-453.060.
Jordan, William D., to United States of America, Army. Pool cooling infrared telescope. 3,970,850, Cl. 250-352.000.
Jordan, William D., to United States of America, Army. Spray cooling for infrared telescope. 3,970,851, Cl. 250-352.000.
Jorgensen, Paul J.: *See—*
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Joseph, Lancelot, to Lawrence Peska Associates, Inc., a part interest. Boxing toy. 3,969,841, Cl. 46-268.000.
Journee, Paul. Pression sector windscreen-wiper blade for motor vehicles. 3,969,784, Cl. 15-250.420.
Judd, Edward J.: *See—*
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Judge, John S.: *See—*
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Julia, Marc, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for synthesizing cis-α-santalene and cis-α-santalol. 3,970,706, Cl. 260-617.00F.
Jung, Hans Wolf; Maul, Rudolf; and Wehner, Hermann Wolfgang, to Ciba-Geigy Corporation. Process for the production of organotin halides in sulphones as reaction medium. 3,970,679, Cl. 260-429.700.
Jurva, Edsel O., to Medtronic, Inc. Venting of electrochemical cell. 3,970,478, Cl. 136-133.000.
Kabat, Richard W.: *See—*
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Kachel, Volker, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electrical apparatus for the calibration of equipment used in the measurement of particle volume. 3,970,928, Cl. 324-71.0CP.
Kaesgen, Juergen, to MTD Products Inc. Engine mounting. 3,970,272, Cl. 248-9.000.
Kaibara, Nobuhiro; and Nishizawa, Kazuro, to Diesel Kiki Co., Ltd. Fuel injection pump control system. 3,970,065, Cl. 123-140.0CC.
Kaiwa, Yataro; and Saito, Hiroshi, to Japan Servo Co., Ltd. Apparatus for chopping light beam. 3,970,371, Cl. 350-273.000.
Kallis, James M.: *See—*
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Kaneko, Ryutaro; and Kaneko, Yoshio. Apparatus for forming ring-shaped foodstuffs. 3,969,994, Cl. 99-450.600.
Kaneko, Yoshio: *See—*
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Kansai Paint Company, Ltd.: *See—*
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Kaplan, Murray Arthur; and Granatek, Alphonse Peter, to Bristol-Myers Company. Crystalline cephalosporin derivative. 3,970,651, Cl. 260-243.00C.
Karasima, Hisanori: *See—*
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Karnofsky, George B., to Dravo Corporation. Process for preparing a protein concentrate with minimal protein denaturation. 3,970,764, Cl. 426-430.000.
Kasima, Osamu, to Nippondenso Co., Ltd. Ignition plug for internal combustion engines. 3,970,885, Cl. 313-141.000.
Katayama, Shizuo: *See—*
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Kato, Takaaki: *See—*
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Katsumoto, Kiyoshi, to Chevron Research Company. Process for removing aluminum phenoxide catalyst from phenol alkylation products. 3,970,708, Cl. 260-624.00C.
Katsuta, Kihei, to Mitsubishi Jukogyo Kabushiki Kaisha. Heat insulation lined tank for low temperature liquids and methods of manufacturing the same. 3,970,210, Cl. 220-9.0LG.
Kaufman, John Wilson, to AMP Incorporated. Locking clip. 3,970,353, Cl. 339-75.0MP.
Kawada, Tsutomu; Sakai, Kunio; and Mori, Kenichi, to Tokyo Shibaura Electric Co., Ltd. Character recognition system. 3,970,991, Cl. 340-146.3AC.
Kawagoe, Takahiro: *See—*
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Kawaki, Takao: *See—*
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Kawamoto, Tamio; and Ii, Mitugu, to Nissan Motor Co., Ltd. Synchronous ring in a synchronous device. 3,970,294, Cl. 267-161.000.
Kawana, Yoshiyuki: *See—*
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Kawano, Mak S., to American Tara Corporation. High speed carbonizing machine. 3,970,039, Cl. 118-60.000.
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Kee Woo, Peter Wing; and Haskell, Theodore Herbert, to Parke, Davis & Company. 5″-Amino-3′,5″-dideoxybutirosin A and derivatives. 3,970,643, Cl. 536-17.000.
Keeling, Boyd E.; and Hawkins, Harold R. Conservation of energy heater. 3,970,247, Cl. 237-12.30B.
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Kenk, Erhard; and Kenk, Theo, to Aktiengesellschaft Gebruder Loepfe. Device for monitoring the yarn travel in the shuttle of a shuttle loom. 3,970,115, Cl. 139-371.000.
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Kersten, Ralf; Mahlein, Hans; and Oberbacher, Rudolf, to Siemens Aktiengesellschaft. Wave-guide structure with a multi-layer system and methods for producing same. 3,970,360, Cl. 350-96.0WG.
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Kiehl, William C.; Moore, Thomas F.; and Teague, Jimmie C., to Rockwell International Corporation. Multiple coin parking meter. 3,970,182, Cl. 194-84.000.
Kienscherf, Eckhard, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for producing an alternating voltage. 3,970,916, Cl. 321-27.00R.

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Kinoshita, Keijiro, to Nissan Motor Co., Ltd. Automotive vehicle drive. 3,970,163, Cl. 180-65.00A.

Kinuhata, Koji; Amano, Kitsutaro; Sasaki, Hiroshi; Yamamoto, Hideo; Shibata, Kosho; and Yamada, Kazuo, to Kokusai Denshin Denwa Kabushiki Kaisha. System for converting the number of lines of a television signal. 3,970,776, Cl. 178-6.800.

Kinzie, George R., Jr.; and Gravereaux, Daniel, to CBS Inc. Printed sound track system. 3,970,803, Cl. 179-100.30B.

Kircher, Morton S., to Olin Corporation. Apparatus for depositing fibrous diaphragms. 3,970,041, Cl. 118-428.000.

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Kishino, Shigeo; Kudamatsu, Akio; Sumi, Shozo; and Shiokawa, Kozo, to Bayer Aktiengesellschaft. O-Aryl-alkoxyethyl-thiolphosphoric acid ester. 3,970,728, Cl. 260-949.000.

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Klar, Paul Gerhard. Machine for making bag-like two-compartment packages particularly tea bags. 3,969,873, Cl. 53-134.000.

Klaus, Michael Josef: *See—*

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Kleimeyer, Vermon T.; and Schinner, Thomas J., to General Signal Corporation. Electro-mechanical card reader head. 3,970,826, Cl. 235-61.11C.

Klein, Albert M., to International Telephone and Telegraph Corporation. System for precision time measurement. 3,970,828, Cl. 235-92.00T.

Klein, Joseph R., to United States of America, Air Force. Salvage switch. 3,970,007, Cl. 102-70.20P.

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Elion, Glenn R.; and Klink, Arthur E., 3,970,659.

Klisch, Stephen Cajetan; and Martin, Charles Andrew, to Colgate-Palmolive Company. Non-gelling alpha-olefin sulfonate liquid detergent. 3,970,596, Cl. 252-546.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*

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Knappe, Kurt: *See—*

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Kolb, William A.; and Sigh, Jack F., to United States Steel Corporation. Method of refining an iron base melt. 3,970,446, Cl. 75-60.000.

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Kolm, Eric A., to Signal Science, Inc. Acoustical switch. 3,970,987, Cl. 340-15.000.

Komatsubara, Masahiro, to Pioneer Electronic Corporation. Braking device for three-motor type tape recorder. 3,970,906, Cl. 318-7.000.

Komine, Yoshio: *See—*

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Kondo, Kiyosi; Matsumoto, Masakatsu; and Mori, Fumio, to Sagami Chemical Research Center. Process for preparing bicyclic γ-lactone. 3,970,673, Cl. 260-343.30R.

Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, to Kanzaki Paper Manufacturing Co., Ltd. Chromogenic compounds and method for preparation thereof. 3,970,671, Cl. 260-335.000.

Kondo, Taizo; Matsui, Komaharu; and Yamamoto, Kunio, to Kansai Paint Company, Ltd. Powder coating composition for electrodeposition. 3,970,621, Cl. 260-18.0EP.

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Kooi, Else, to U.S. Philips Corporation. Methods of producing a semiconductor device and a semiconductor device produced by said method. 3,970,486, Cl. 148-187.000.

Kopatz, William H.; Cooper, Rey W.; and Watson, Russell W., to W. R. Grace & Co. Method and apparatus for stitching string to foam used in tampons. 3,970,022, Cl. 112-265.000.

Kopke, Wilfried; and Hoffmann, Gunter, to Volkswagenwerk Aktiengesellschaft. Safety belt winding device. 3,970,265, Cl. 242-107.40A.

Korowitz, Simon, to Sperry Rand Corporation. Bi-directional translator. 3,971,014, Cl. 340-347.0DD.

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Kouklik, Ivo, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Patterning memory for circular knitting machine. 3,969,912, Cl. 66-154.00A.

Kovats, Lawrence H. G., to Mayfran Incorporated. Roller chain conveyor belt. 3,970,190, Cl. 198-189.000.

Kozma, Adam, to Harris Corporation. Coherent, quasi-monochromatic light source. 3,970,358, Cl. 350-3.500.

Kraft, Louis Seelbach; and Burkley, Thomas E., to Goodyear Tire & Rubber Company, The. Method of making an encapsulated chain. 3,970,733, Cl. 264-135.000.

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Krol, Harry J., to King-Koral, Inc. Heavy duty staple. 3,969,975, Cl. 85-49.000.

Krueger, Grant Edward; and Leitner, Richard John, to Kraftco Corporation. Apparatus for making large sized blocks of cheese. 3,969,995, Cl. 99-458.000.

Krygeris, Algirdas J.; and Manring, John M., to Harris Corporation. Automatic compensation for densitometer imbalance. 3,970,393, Cl. 356-195.000.

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Kuhl, David E.; and Edwards, Roy Q., to United States of America, Energy Research and Development Administration. Transverse section radionuclide scanning system. 3,970,853, Cl. 250-363.00S.

Kuhn, Klaus Roland; and Stigler, Viktor, to Siemens Aktiengesellschaft. Circuit for generating a trigger blanking voltage for use in analysis of the ignition voltage waveform of an internal combustion engine. 3,970,872, Cl. 307-265.000.

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Kumon, Osamu, to Sumitomo Electric Industries, Ltd. Piezoelectric acoustic device. 3,970,879, Cl. 310-9.100.

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Kurtz, Anthony D.; Mallon, Joseph R.; Brosh, Amnon; and Bice, James William, to Kulite Semiconductor Products, Inc. Beam type transducers employing accurate, integral force limiting. 3,970,982, Cl. 338-4.000.

Kuss, Robert. Building construction and method. 3,969,862, Cl. 52-404.000.

Kwan, Okum; and Ottersen, William A., to Bunker Ramo Corporation. Magnetic patch arrangement apparatus. 3,970,506, Cl. 156-351.000.

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Ladbrooke, Peter Howard; Torlesse, Arthur Timothy; and Newman, John David, to Plessey Handel und Investments A.G. Method and apparatus including a sensing head with a pair of strip transmission lines for detecting metallic objects. 3,970,927, Cl. 324-67.000.

Lade, Robert W.: *See—*

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Lamb, Glentworth, to American Cyanamid Company. Fungitoxic compositions containing 2,2′-dihydroxydinaphthylmethane. 3,970,760, Cl. 424-346.000.

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Lanagan, John B.; and Tilson, Stephen H., to New Folding System Incorporated, The. Apparatus and method for holding one end of a sheet to be folded. 3,970,226, Cl. 223-37.000.

Lang, Francis Harold, to International Nickel Company, Inc., The. Ferritic steel welding material. 3,970,447, Cl. 75-124.000.

Langree, Michel, to La Telemecanique Electrique. Electromagnet. 3,970,978, Cl. 335-203.000.

Lannert, Kent P., to Monsanto Company. Hydroxy ether carboxylates. 3,970,698, Cl. 260-535.00P.

Lanning, Charles T. Power tester for outboard drive assemblies. 3,969,931, Cl. 73-117.100.

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- Lee, Henry L., Jr.; and Orlowski, Jan A. Orthodontic bracket. 3,969,821, Cl. 32-14.00A.
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- Lee, Kai Sing. Frying grease reclaimer. 3,970,558, Cl. 210-138.000.
- Lee, Lester A. Gas dynamic-transfer chemical laser. 3,970,955, Cl. 331-94.50G.
- Lee, Wing J. Cap selecting and feeding mechanism. 3,970,218, Cl. 221-157.000.
- Leehan, Gerald William, to International Business Machines Corporation. LSI chip compensator for process parameter variations. 3,970,875, Cl. 307-304.000.
- Legge, Earl N. Method and apparatus for securing a bicycle on a bicycle rack. 3,970,196, Cl. 211-5.000.
- Lehmann, Conrad Roland. Three-dimensional network. 3,970,301, Cl. 272-113.000.
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- Lemelson, Jerome H. System for scanning information recorded on a plurality of magazine contained filmstrips. 3,970,775, Cl. 178-6.800.
- Lemke, Timothy Allen: *See—*
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- Lendi, Ulrich, to Mageba S.A. Movable platform for parking one vehicle above another. 3,969,855, Cl. 52-177.000.
- Lenz, Karl-Ludwig, to Siemens Aktiengesellschaft. Phased-array antenna employing an electrically controlled lens. 3,971,022, Cl. 343-754.000.
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- Le Salver, Robert; and Poupard, Dominique, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Device for suspending the body and the engine-drive unit in an automobile vehicle. 3,970,162, Cl. 180-64.00R.
- Leuschner, Horst, to Texas Instruments Incorporated. Synchronous counter/divider using only four NAND or NOR gates per bit. 3,970,867, Cl. 307-225.00R.
- Leuschner, Horst, to Texas Instruments Incorporated. Fast programmable divider with a new 5-gate flip-flop. 3,970,941, Cl. 328-41.000.
- Leuschner, Horst, to Texas Instruments Incorporated. TTL coupling transistor. 3,971,060, Cl. 357-51.000.
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- Levering, Richard M., to Lawrence Peska Associates, Inc., a part interest. Game and toy apparatus. 3,970,303, Cl. 273-1.00R.
- Levine, Arnold M., to International Telephone and Telegraph Corporation. Airport ground surveiliance system with aircraft taxi control feature. 3,971,025, Cl. 343-108.00R.
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- Lindsay, James E. Inflation valve gauge. 3,969,936, Cl. 73-146.800.
- Linssen, Henricus Wilhelmus Maria, to U.S. Philips Corporation. Plural beam cathode ray tube including an astigmatic electron lens and self-converging. 3,970,890, Cl. 313-413.000.
- Litt, Kenneth C.; and Siegel, William J., to Pace, Incorporated. Vacuum desoldering device for soldering irons. 3,970,234, Cl. 228-20.000.
- Liu, Chain T.; and Inouye, Henry, to United States of America, Energy Research and Development Administration. Modified iridium-tungsten alloy. 3,970,450, Cl. 75-172.00R.
- Livemore, Gerald Sydney Victor. Gas producer arrangements. 3,970,436, Cl. 48-76.000.
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- Lohr, Raymond J. Impact gun with pellet positioning lever. 3,970,311, Cl. 273-101.000.
- Loiacono, Vincent R., to Physio Medics, Inc. Catheter. 3,970,090, Cl. 128-349.00R.
- Lonati, Francesco, to Costruzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Faust, Tiberio) S.n.c. Toe closer. 3,969,911, Cl. 66-95.000.
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- Long, Otto V. Uniflow-type external combustion engine featuring double expansion and rotary drive. 3,970,055, Cl. 123-43.00A.
- Longinotti, Enrico, to Longinotti S.p.A. Material metering units. 3,970,223, Cl. 222-306.000.
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- Louis, Joseph E., to Sundstrand Corporation. Transmission ratio control system. 3,969,896, Cl. 60-431.000.
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- Lubeck, Donald. Tubular structures. 3,970,401, Cl. 403-265.000.
- Lucas, Joseph G., to Avco Corporation. Apparatus for electrochemical milling of turbine blade edges. 3,970,538, Cl. 204-224.00M.
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  - Clark, Melville, Jr.; and Luce, David A., 3,969,969.
- Lucey, George K., Jr.: *See—*
  - Clark, Samuel A., Jr.; Lucey, George K., Jr.; and Zimmerman, Thomas H., 3,971,024.
- Luchuk, George, to Lawrence Peska Associates, Inc., a part interest. Wind power and flywheel apparatus. 3,970,409, Cl. 416-145.000.
- Lugay, Joaquin Castro: *See—*
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- Lutts, Carlton G.: *See—*
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- Lutz, Karl Treasure, to Caterpillar Tractor Co. Skewed roller conveyor. 3,970,204, Cl. 214-339.000.
- M.A.T. Industries, Inc.: *See—*
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- MacDonald, George James; and Bartley, Bryan Allen. Apparatus for reducing the size of discrete material. 3,970,257, Cl. 241-275.000.
- MacGregor-Comarain, Inc.: *See—*
  - Burton, Grady, 3,970,026.
- MacInnes, Hugh; and Uitti, Paul M., to Rajay Industries, Inc. Bearing housing assembly method for high speed rotating shafts. 3,969,804, Cl. 29-156.40R.
- MacKenzie, James A. Constructional element. 3,969,867, Cl. 52-633.000.
- Mador, Irving L.: *See—*
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- Maeda, Hiroaki: *See—*
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- Maeda, Kozo; and Date, Masakazu, to Toyo Boseki Kabushiki Kaisha. Method of improvement in coloring glass fabrics. 3,970,422, Cl. 8-8.000.
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- Mahaffey, James W.; and Ziegler, Charles J., to Cavitron Corporation. Ultraviolet light applicator. 3,970,856, Cl. 250-493.000.
- Mahl, Gunard O. B., to CHA Industries. Wire fed flash evaporation source. 3,970,820, Cl. 219-271.000.
- Mahlein, Hans: *See—*
  - Kersten, Ralf; Mahlein, Hans; and Oberbacher, Rudolf, 3,970,360.
- Maida, Osamu, to Nippon Kogaku K.K. Electromagnetic trigger device for use with camera capable of automatic time exposure. 3,971,053, Cl. 354-234.000.
- Maillefer, Charles; and Schlaeppi, Rene, to Maillefer S.A. Machine for manufacturing cables by stranding individual wires. 3,969,880, Cl. 57-6.000.
- Maillefer S.A.: *See—*
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- Makinsky, Ismail Zulfugarovich; and Baksht, Samuil Petrovich. Falling film evaporator. 3,970,512, Cl. 159-13.00R.
- Makita, Tomoo: *See—*
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- Mallory, Robert A.; and Settepani, Joseph A., to Ortho Pharmaceutical Corporation. Halo-steroidal thioketals. 3,970,646, Cl. 260-239.55D.
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- Manghisi, Elso; Salimbeni, Aldo; and Mennella, Pietro, to Istituto Luso Farmaco d'Italia S.r.l. 2,2 Disubstituted-benzodioxoles. 3,970,672, Cl. 260-340.500.
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- Mann, Henry: *See—*
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- Marino, Francis C., to Redactron Corporation. Vertical deflection circuit. 3,970,896, Cl. 315-387.000.
- Markham, Robert D., to H C Products Co. Press brake safety device. 3,969,955, Cl. 74-613.000.
- Markley, Jack H.: *See—*
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- Marsden, Ronald Eric; Webb, Franklyn Walter; and Rukavina, George, to Stricon Products Limited. Splicer for reinforcing bars. 3,969,920, Cl. 72-415.000.
- Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Method for separating glass from heat resistant materials. 3,970,254, Cl. 241-1.000.
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- Martin, Sylvia, to Oxy Metal Industries Corporation. Electropolishing aluminum and aluminum alloys. 3,970,529, Cl. 204-129.900.
- Martin, Virgil B.; and Villers, Roger L., to Gehl Company. Tapered tooth sprocket. 3,969,947, Cl. 74-243.00R.
- Martonair Limited: *See—*
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- Marukawa, Hiromasa: *See—*
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- Maskery, Arthur, to Westinghouse Brake & Signal Co. Ltd. Electrical control system for pneumatic brakes. 3,970,348, Cl. 303-22.00R.
- Maslowski, Bohdan; and Tzanos, Dimitri, to Battelle Memorial Institute. Method of and system for the destruction and/or limitation of the reproduction of micro-organisms in nutritive media. 3,970,530, Cl. 426-237.000.
- Mason, Charles F., to Esterline Corporation. Chart recorder using a fixed thermal print head. 3,971,041, Cl. 346-76.00R.
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- Matsuda, Michihiko: *See—*
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- Matsudaira, Tadashi; and Mishina, Yoshihiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Floating breakwaters. 3,969,901, Cl. 61-5.000.
- Matsui, Goro; Toda, Koji; Horiishi, Nanao; Wakimoto, Kazuyoshi; Nishiyama, Yoshifumi; Taketa, Tsuneyoshi; and Takama, Kazushi, to Toda Kogyo Corporation. Process for producing iron oxide products from waste liquids containing ferrous salts. 3,970,738, Cl. 423-140.000.
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- Matsuo, Yoshio, to Nippon Electric Company, Ltd. Demodulator for amplitude-and-phase modulated signals having control means for reducing phase and amplitude errors. 3,970,946, Cl. 329-104.000.
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- Matsuyama Petrochemicals Inc.: *See—*
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- Matthews, Russell B., to Johnson Service Company. Control arrangement fail-safe timing circuit. 3,970,864, Cl. 307-141.000.
- Mattson, William F., to B. F. Goodrich Company, The. Reinforced membrane. 3,970,416, Cl. 425-52.000.
- Matusch, Siegfried, to Braunschweigische Maschinenbauanstalt. Extraction tower. 3,970,469, Cl. 127-5.000.
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- Maurer, Werner, to Karl M. Reich Maschinenfabrik GmbH. Arresting device for impact drive tools. 3,969,988, Cl. 92-19.000.
- Maurer, Werner; and Skuthan, Erich, to Karl M. Reich Maschinenfabrik GmbH. Impact buffer for impact drive tools. 3,969,989, Cl. 92-85.00R.
- Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
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- Maxwell, William H., to Cargo Graphics Corporation. Thermograph with removable cartridge. 3,971,035, Cl. 346-33.0TP.
- May, Everette Lee, to United States of America, United States. 1-Alkyl-4-m-hydroxyphenyl-4-propionyl piperidines. 3,970,656, Cl. 260-293.800.
- Mayer, Hans Johann; Fischli, Albert Eduard; Klaus, Michael Josef; and Wick, Alexander Eduard, to Hoffmann-La Roche Inc. Certain hexahydro-2-loweralkoxy-5-oxycyclopenta [b] furans containing an olefinic substituent in the 4-position. 3,970,674, Cl. 260-346.20R.
- Mayer, Robert, to Sun Oil Company of Pennsylvania. Anti-hunting system for valve operator circuit. 3,970,942, Cl. 328-133.000.
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- Mayr, Gert Michael; and Schofl, Wolfgang, to Hansmann, Hermann. Interengaging rings puzzle. 3,970,314, Cl. 273-156.000.
- Mayr, Theodor; Buchta, Siegfried; Kleeberger, Rudolf; and Bauer, Otto, to Robert Bosch G.m.b.H. Fuel injection system. 3,970,063, Cl. 123-139.0AW.
- Maytham, Walter J., to Speed Systems, Inc. Cable insulation stripping tool. 3,969,818, Cl. 30-90.100.
- McBain, William Lander, to Mitchell-Bate Company, The. Clamping device for use in electroplating. 3,970,540, Cl. 204-297.00W.
- McBean, Rupert John Sidney, to Charcon Tunnels Limited. Tunnelling shields. 3,969,906, Cl. 61-85.000.
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- McCaughey, William S., to Bunker Ramo Corporation. Apparatus and method for crimping terminals. 3,969,806, Cl. 29-203.0DS.
- McCloskey, Albert R., to Heim Universal Corporation. Method of manufacturing spherical bearing. 3,969,803, Cl. 29-149.50C.
- McCollum, Samuel C., to Sangamo Electric Company. Demand controller. 3,970,861, Cl. 307-35.000.
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- McIntosh, Herbert A., to Texaco Inc. Production of lubricating oils. 3,970,543, Cl. 208-86.000.
- McKee, Albert E., deceased (Harris Trust and Savings Bank, executor), to Oxequip Health Industries Inc. Retractable gas line connecting apparatus. 3,970,103, Cl. 137-357.000.
- McKee, Clyde M.; and Scott, Ward. Mirror actuator. 3,969,952, Cl. 74-501.00M.
- McLaren, Edwin C.; and Schneider, Howard R., to Hoerner Waldorf Corporation. Dispensing package for moistened tissues. 3,970,215, Cl. 221-45.000.
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- Meadows, James L.; Smith, Donald H.; Ellington, Gordon H.; Mitchell, William O.; and Frost, W. Wade, to Oxford Industries, Inc. Method of fabricating shirt cuffs. 3,970,021, Cl. 112-262.000.
- Meagher, Thomas; and Michatek, Robert J., to Xerox Corporation. Method and apparatus for xerographic reproduction. 3,970,381, Cl. 355-3.00R.
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- Mecca, Sebastian B., to Schuylkill Chemical Company. Aluminum chlorhydroxy glycinate complexes. 3,970,748, Cl. 424-68.000.
- Mecca, Sebastian B., to Schuylkill Chemical Company. Medicinal or cosmetic composition containing allantoin glycinate. 3,970,756, Cl. 424-273.000.
- Medical Specialties, Inc.: *See—*
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- Meginnis, George B.: *See—*
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- Melton, Vernon L. Welding machine. 3,970,232, Cl. 228-7.000.
- Melvin, William W. Composite situation analyzer and instrument flight system. 3,970,829, Cl. 235-150.220.
- Mendrin, Michael J.; and Taylor, Richard H. Variable frequency interferometer. 3,970,389, Cl. 356-106.00R.
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- Mennella, Pietro: *See—*
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- Menschik, Alfred. Prosthetic knee joint for attachment to a natural or prosthetic leg. 3,969,773, Cl. 3-1.911.
- Menzies, John Ian, to Heatshield Research and Development Pty. Ltd. Manufacture of laminates of sheet metal, polythene and aluminium foil. 3,970,496, Cl. 156-162.000.
- Merck & Co., Inc.: *See—*
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- Merkle, Rolf, to Licentia Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement. 3,971,062, Cl. 357-70.000.
- Mersan, Elayne R., to Marsan Manufacturing Company, Inc. Ostomy appliances and sealing elements. 3,970,085, Cl. 128-283.000.

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- Meyer, Charles R., to United States of America, Air Force. Tone count audiometric computer. 3,970,785, Cl. 179-1.00N.
- Meyer, Stanley A.; and Gray, Stephen R. Solar heating system. 3,970,070, Cl. 126-271.000.
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- Meyers, Theodore F., to Hobart Corporation. Pulsating torque apparatus and method. 3,970,907, Cl. 318-207.00C.
- Michael, Peter Colin; and Stalley, Anthony Donald, to Quantel Limited. Digital time base corrector oscillators. 3,971,063, Cl. 358-8.000.
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- Miller, John J.; Baus, Richard E.; and Lewis, Sheldon N., to Rohm and Haas Company. Thermosetting powder coatings composition. 3,970,633, Cl. 260-42.290.
- Miller, Russell A.; and Schmidgall, Earl R. Surface heater and dryer. 3,970,071, Cl. 126-271.100.
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- Minai, Masayoshi; Suzuki, Yoshio; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Cycloalkyl phenoxy carboxylic acid derivatives. 3,970,694, Cl. 260-520.00C.
- Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Constant speed regulator for DC motor. 3,970,909, Cl. 318-341.000.
- Minetti, Richard Henry; and Strickland, Robert Walter, to Bell Telephone Laboratories, Incorporated; and Western Electric Company. Method and apparatus for removal of semiconductor chips from hybrid circuits. 3,969,813, Cl. 29-575.000.
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- Mitchell, Graham R., to General Electric Company. Electric circuit breaker comprising parallel-connected vacuum interrupters. 3,970,809, Cl. 200-144.00B.
- Mitchell, Graham R.: *See—*
  - Carroll, James J.; and Mitchell, Graham R., 3,970,810.
- Mitchell, William A.; Stahl, Howard D.; and Seidel, William C., to General Foods Corporation. Fixed volatile flavors and method for making same. 3,970,766, Cl. 426-534.000.
- Mitchell, William O.: *See—*
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- Mitrovich, Svetislav: *See—*
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- Mitsubishi Chemical Industries Ltd.: *See—*
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- Mitsubishi Gas Chemical Company, Inc.: *See—*
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- Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
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- Miyake, Masao: *See—*
  - Yoshiura, Hirohisa; Arai, Toshiharu; Miyake, Masao; and Enriki, Kiyoshi, 3,970,632.
- Miyamoto, Akio; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Process for separating a number of sheets into groups. 3,970,501, Cl. 156-305.000.
- Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Sakai, Toshimitsu, to Aisin Seiki Kabushiki Kaisha; and Jidosha Kogyo Kabushiki Kaisha. Output split type hydrostatic transmission. 3,969,958, Cl. 74-687.000.
- Mizuhara, Albert, to United States of America, Navy. Broadband output circuit for klystron amplifier. 3,970,952, Cl. 330-45.000.
- Mizusawa, Mitsutoyo, to Nisshin Kogyo Kabushiki Kaisha. Fluid pressure control device with a failure alarm for a vehicle brake system. 3,970,347, Cl. 303-6.00C.
- Mizutani, Zempei: *See—*
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- Mobil Oil Corporation: *See—*
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- Moldenhauer, Kurt; and Stolz, Heinrich, to Hartmann & Braun Aktiengesellschaft. Motor driven light chopper. 3,970,372, Cl. 350-274.000.
- Mollenauer, Linn Frederick, to Bell Telephone Laboratories, Incorporated. Broadly tunable continuous-wave laser using color centers. 3,970,960, Cl. 331-94.50F.
- Moller, Wolfgang: *See—*
  - Schaffeler, Alois; and Moller, Wolfgang, 3,970,807.
- Mollon, Leslie; and Kline, John E., to Brooks & Perkins, Incorporated. Lock-up for thin printing plate. 3,970,001, Cl. 101-415.100.
- Molt, Kenneth R., to Cincinnati Milacron Chemicals, Inc. Organotin mercaptide process. 3,970,678, Cl. 260-429.700.
- Molyneux, George. Combined rail clip and anchorage. 3,970,248, Cl. 238-349.000.
- Momose, Haruo: *See—*
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  - Turek, Michael H., 3,970,418.
  - Wentworth, Gary, 3,970,604.
  - Wentworth, Gary, 3,970,605.
- Montagu, Jean I., to General Scanning Inc. Limited rotation motor with velocity sensing system. 3,970,979, Cl. 335-229.000.
- Montemayor, Ernest A. Ancestral educational game apparatus. 3,970,313, Cl. 273-134.0AD.
- Moore, Charles T., to Dayton-Hudson Corporation. Sign. 3,969,838, Cl. 40-140.000.
- Moore, Lawrence A., to Beloit Corporation. Blow moulding method. 3,970,421, Cl. 432-11.000.
- Moore, Thomas F.: *See—*
  - Kiehl, William C.; Moore, Thomas F.; and Teague, Jimmie C., 3,970,182.
- Moore, William Percy; Sansing, James Earl; and Williamson, Harold Daniel, to Allied Chemical Corporation. Production of urea-formaldehyde concentrates. 3,970,625, Cl. 260-29.40R.
- Moran, David Patrick Joseph; and Pennings, Henricus Jacobus, to Lever Brothers Company. Heat pasteurized cake batter. 3,970,763, Cl. 426-324.000.
- Morash, Paule Gisele. Stackable feeding assemblies. 3,970,206, Cl. 215-11.00R.

- Moraw, Roland; Schadlich, Gunther; and Horn, Klaus, to Hoechst Aktiengesellschaft. Apparatus for holographic recording. 3,970,357, Cl. 350-3.500.
- Morganeier, Herman C. Fruit picking technique. 3,969,878, Cl. 56-328.00R.
- Mori, Fumio: *See—*
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- Mori, Kenichi: *See—*
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- Morley Furniture Spring Corporation: *See—*
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- Morokawa, Shigeru; Nishimura, Katsuo; and Nomura, Yasushi, to Citizen Watch Co., Ltd. Display device employing special-purpose monograms. 3,971,012, Cl. 340-336.000.
- Morooka, Shigeaki: *See—*
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- Morrice, Anthony Ronald Seaton, to Hudswell Morrice Ltd. Method of laying a pipeline in a trench. 3,969,904, Cl. 61-106.000.
- Morris, Kenneth B. Variable compression ratio control system for internal combustion engines. 3,970,056, Cl. 123-48.00D.
- Morrisett, O. L.: *See—*
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- Morsbach, Martin: *See—*
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- Moss, Robert J.; and Hurst, Forrest G. Edger attachments. 3,969,877, Cl. 56-256.000.
- Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, to Nippon Oil Company Ltd.; and Miwa Shokai Company, Ltd. Vessel mooring system. 3,970,028, Cl. 114-230.000.
- Motorola, Inc.: *See—*
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  - Deutschmann, William B.; Livenick, Corwin E.; Paulsen, Robert W.; Tyler, Len A.; and Rose, Clifford L., 3,970,880.
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- Motozawa, Saburo; Itoga, Hiroyoshi; Wada, Hirobumi; and Marukawa, Hiromasa, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (TDK Electronics Co., Ltd.). Aggregation treatment apparatus for waste water. 3,970,562, Cl. 210-205.000.
- Moulinex, Societe Anonyme: *See—*
  - Mantelet, Jean, 3,970,258.
- Mourier, Georges, to Thomson-CSF. Parasitic wave attenuator useable in high frequency electronic tubes. 3,970,971, Cl. 333-81.00R.
- Mowbray, Dorian Farrar, to C.A.V. Limited. Liquid fuel injection pumping apparatus. 3,970,414, Cl. 417-252.000.
- MTD Products Inc.: *See—*
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- Mueller, James M.: *See—*
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- Muirhead, Aubrey S.; Martin, John; Martin, Patrick J.; and Rigler, Ross H., to Muirhead Machinery Ltd. Tree cutting apparatus. 3,970,125, Cl. 144-34.00R.
- Muirhead Machinery Ltd.: *See—*
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- Muller-Albrecht, Horst; Quiring, Bernd; Dollhausen, Manfred; and Wulff, Jochen, to Bayer Aktiengesellschaft. Saturated hydroxy polyester urethanes and styrene copolymers. 3,970,717, Cl. 260-859.00R.
- Muller, Rudolf: *See—*
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- Munson, Robert E.; and Buscher, Harold T., to Ball Brothers Research Corporation. Dual frequency microstrip antenna structure. 3,971,032, Cl. 343-770.000.
- Murashima, Seiichhiro: *See—*
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- Murayama, Naohiro: *See—*
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- Murfitt, John Edward; and Pitt, Alastair Martin, to Johnson & Phillips (Capacitors) Limited. Impregnated capacitor and method of manufacture. 3,970,904, Cl. 317-258.000.
- Murphy, Frank W., Jr.; Nunneley, J. David; and Cruse, Teddy Howard, to Frank W. Murphy Manufacturer, Inc. Liquid level responsive vent valve. 3,970,099, Cl. 137-101.250.
- Murphy, Joseph P., to Avco Corporation. Particle separator. 3,970,439, Cl. 55-306.000.
- Muterspaugh, Max Ward, to RCA Corporation. Frequency selective circuit for automatic frequency control and sound signals. 3,970,773, Cl. 178-5.80R.
- Myer, Jon H., to Hughes Aircraft Company. Coercivity control and detection signal generating pattern for uniaxially anisotropic ferromagnetic crystal platelets. 3,971,038, Cl. 340-174.0TF.
- Myers, John W., to Phillips Petroleum Company. Activation and treatment during cooling of platinum/alumina catalyst with HCl. 3,970,589, Cl. 252-466.0PT.
- Myers, Larry K.: *See—*
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- Nabisco, Inc.: *See—*
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- Nadeau, Raymond R.; and Wyman, John E., to Itek Corporation. Electrostatic lithographic printing process utilizing hydrophilizing composition. 3,970,455, Cl. 96-33.000.
- Nagahara, Yasumori: *See—*
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- Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, to Takasago Perfumery Co., Ltd. Tricyclic hydrocarbon and process for producing the same. 3,970,593, Cl. 252-522.000.
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- Nagase, Tsuneyuki; Suzukamo, Gohu; and Suzuki, Yoshio, to Sumitomo Chemical Company, Limited. Racemization of optically active amines. 3,970,700, Cl. 260-570.80R.
- Naidus, Edward Sidney, to RCA Corporation. Explosion vent construction. 3,969,858, Cl. 52-232.000.
- Nakabe, Ryuhei: *See—*
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- Nakada, Masahiko; and Maekawa, Takehiko, to Toyota. Arrangement for heating the suction gases of an internal combustion engine. 3,970,062, Cl. 123-122.0AC.
- Nakai, Muneaki, to Yashima Chemical Engineering Co., Ltd. Method and apparatus for converting a liquid material into a powder. 3,970,510, Cl. 159-6.0WH.
- Nakamoto, Soichi: *See—*
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- Nakanishi, Toshimasa, to Nakanishi Dental Manufacturing Co., Ltd. Dental handpiece for a motor driven reamer. 3,969,823, Cl. 32-27.000.
- Nakao, Yoshio: *See—*
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- Nakazawa, Sadaharu; and Izumi, Hisashi. Fuel burning apparatus and heat engine incorporating the same. 3,969,899, Cl. 60-670.000.
- Nanba, Yasuhiro; Imura, Toshinori; and Saito, Mitsuru, to Minolta Camera Kabushiki Kaisha. Automatic focus control device. 3,970,842, Cl. 250-201.000.
- Nanba, Yasuhiro; and Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Light measuring circuit. 3,971,045, Cl. 354-23.00R.
- Nashan, Gerd: *See—*
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- Necchi S.p.A.: *See—*
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- Nedenskov, Poul, to Aktieselskabet Grindstedvaerket. 1,4-Benzodiazepine derivative. 3,970,645, Cl. 260-239.30D.
- Nelson, Arthur L., to Townsend and Townsend. Method and apparatus for molding splices in cables. 3,970,488, Cl. 156-49.000.
- Nelson, Arthur L., to Townsend and Townsend. Molding method for splicing electrical cable. 3,970,735, Cl. 264-272.000.
- Nelson, Charles W. Method of attaching a hairpiece. 3,970,092, Cl. 132-5.000.
- Nelson, Paul T.: *See—*
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- Nelson, Robert E., to General Motors Corporation. Helicopter power plant control. 3,969,890, Cl. 60-39.150.
- Nelson, Victor. Rotary actuator having stationary armature and rotary field. 3,970,980, Cl. 335-253.000.
- Nerem, Marvin E.: *See—*
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- Neufang, Karlheinz, to Siemens Aktiengesellschaft. PCM time-division multiplex telecommunication network. 3,970,794, Cl. 179-15.0AQ.
- Neveux, Jacques, to Chavanoz S.A. Spindle for false twist by friction. 3,969,883, Cl. 57-77.400.
- New Folding System Incorporated, The: *See—*
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- Nicol, Ronald, to Heinemann Electric Company. Circuit breaker with center trip position. 3,970,976, Cl. 335-21.000.
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- Nishizaki, Hiroshi; Yonekura, Kanji; and Tsuji, Yuichi, to Mitsui Shipbuilding and Engineering Co., Ltd. Crane overload detector using a boom bending moment detector. 3,971,008, Cl. 340-267.00C.
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- Niskin, Shale Jack, to United States of America, Navy. In situ oceanographic sample separator. 3,969,925, Cl. 73-61.00R.
- Niskin, Shale Jack, to United States of America, Navy. Water weighted corer. 3,970,156, Cl. 175-6.000.
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- Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Systems for responding to non-uniform scene brightness. 3,971,046, Cl. 354-24.000.
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- Nomura, Osami: *See—*
  - Kano, Saburo; Nomura, Osami; Asada, Mitsuo; Ando, Meiki; Matsuda, Michihiko; Yamada, Tomio; Watanabe, Hitoshi; and Taniguchi, Takuzo, 3,970,751.
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- Norcross, Barry, to Myers, Larry K. Kickstand base for two-wheeled vehicles. 3,970,330, Cl. 280-301.000.
- Norinsky, Sidney. Convertible saddle brief case. 3,970,229, Cl. 224-31.000.
- Norman, Marvin Neil, to RCA Corporation. Automatic beam current limiter. 3,971,067, Cl. 358-74.000.
- Norrbottens Jarnverk AB: *See—*
  - Santen, Sven; and Grip, Carl Erik, 3,970,290.
- Northern Electric Company Limited: *See—*
  - Bunner, Charles Brian David, 3,970,972.
  - Lukas, Helmut H., 3,970,783.
- Northrop Corporation: *See—*
  - Olson, N. Thomas; Ault, Earl R.; and Bhaumik, Mani L., 3,970,964.
- Northrup, Richard M.: *See—*
  - Johnson, Philip M.; and Northrup, Richard M., 3,970,391.
- Novak, Ivan, to U.S. Philips Corporation. Method of indicating and/or recording electrical quantities and indicating respectively recording apparatus embodying said method. 3,970,931, Cl. 324-99.00R.
- Nowack, Klaus, to Contraves AG. Plural, stacked side by side switch housing array having discrete housing coupling elements. 3,970,812, Cl. 200-307.000.
- Nowick, William. Control means for electrically powered transportation means. 3,970,160, Cl. 180-6.500.
- Nunneley, J. David: *See—*
  - Murphy, Frank W., Jr.; Nunneley, J. David; and Cruse, Teddy Howard, 3,970,099.
- N.V. Technische Maatschappij Marchand-Andriessen: *See—*
  - Pezarro, Salomon, 3,970,491.
- Nykopp, Erik Albert, to Oy Tampella AB. Combination-paper machine. 3,970,514, Cl. 162-303.000.
- Oak Industries Inc.: *See—*
  - Bastian, Elmer, 3,970,974.
- Obara, Hiroshi: *See—*
  - Yoshida, Masafumi; Murayama, Naohiro; and Obara, Hiroshi, 3,969,927.
- Oberbacher, Rudolf: *See—*
  - Kersten, Ralf; Mahlein, Hans; and Oberbacher, Rudolf, 3,970,360.
- O'Brien, Catherine H., executrix: *See—*
  - O'Brien, Jerry, deceased; and O'Brien, Catherine H., executrix, 3,970,804.
- O'Brien, Jerry, deceased; and O'Brien, Catherine H., executrix. Electro-mechanical amplifier sound transducer. 3,970,804, Cl. 179-131.000.
- Ogata, Yasuhiro: *See—*
  - Ishizuka, Akio; and Ogata, Yasuhiro, 3,970,500.

- Ogawa, Akira: *See—*
  - Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Kato, Hirotetu, 3,970,461.
- Ogawa, Masao: *See—*
  - Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, 3,970,718.
- Ogawa, Masaya; and Furukawa, Tetsuhisa, to Minolta Camera Kabushiki Kaisha. Residual toner removing apparatus. 3,969,785, Cl. 15-301.000.
- Ogawa, Toshio; Munekata, Mutsuo; Ozawa, Kenji; and Minai, Kiichi, to Murata Manufacturing Co., Ltd. Ferroelectric ceramic composition. 3,970,572, Cl. 252-62.900.
- Ogihara, Sadahide; Nakamura, Yoichi; and Fukui, Osamu, to UBE Industries, Ltd. Method for preparing a modified crystalline propylene polymer. 3,970,722, Cl. 260-878.00R.
- O'Hanlon, Edward J. Leakproof roof and method of constructing same. 3,969,861, Cl. 52-309.000.
- Ohio Nuclear, Inc.: *See—*
  - Richey, Joseph B.; Wake, Robert H.; and Keller, John T., 3,970,852.
- Ohmori, Sachio; and Takahata, Kouichi, to Nippon Kogaku K.K. System for recording on the film of a camera data relating to the scene being photographed. 3,971,049, Cl. 354-127.000.
- Ohnishi, Tatsuo, to Tsubakimoto Chain Co. Fillerless welded chain. 3,969,949, Cl. 74-255.00R.
- Ohno, Jiro; Iuchi, Tohru; Tokita, Yasuo; Karasima, Hisanori; Watanabe, Kunitoshi; and Murashima, Seiichhiro, to Nippon Steel Corporation. Method of measuring the temperature of furnace hot stock and apparatus therefor. 3,969,943, Cl. 73-355.0EM.
- Ohrberg, Carl Verner, to Danfoss A/S. Radial piston pump. 3,969,986, Cl. 91-492.000.
- Ohrin, Leonard J.: *See—*
  - Lawless, John F.; Ohrin, Leonard J.; and Emery, William M., 3,969,908.
- Oishi, Sachio: *See—*
  - Shiraishi, Tatsuo; Fukusen, Hiroshi; Oishi, Sachio; Shimizu, Shinkichi; Nishikawa, Hiroyuki; and Wakabayashi, Tetsu, 3,970,739.
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  - Itoh, Tsutomu; Sakurai, Munekazu; Yamamoto, Masahiro; and Okamoto, Yasunari, 3,970,905.
- Oki Electric Industry Company, Ltd.: *See—*
  - Higuchi, Michio, 3,970,949.
- Oksman, Erkki Olavi. Bubble-generating aerator. 3,970,731, Cl. 261-122.000.
- Okuno, Keno; and Takahata, Kouichi, to Nippon Kogaku K.K. Electronic flashlight system for cameras. 3,971,050, Cl. 354-128.000.
- Okuno, Yositosi: *See—*
  - Kitamura, Shigeyoshi; Okuno, Yositosi; and Hirano, Masachika, 3,970,703.
- Okuno, Youichi: *See—*
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- Okura, Takao: *See—*
  - Sakurai, Yoshitoshi; and Okura, Takao, 3,969,893.
- Oldfield, Derek; and Postlethwaite, Dennis, to Wean United, Inc. Transfer apparatus. 3,970,191, Cl. 198-219.000.
- Olin Corporation: *See—*
  - Kircher, Morton S., 3,970,041.
- Oliver, James P.: *See—*
  - Funk, Larry L., 3,971,028.
- Olle, David A.: *See—*
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- Olson, James R.; and Storey, Robert C., to Eastman Kodak Company. Method for producing improved electrographic developer. 3,970,571, Cl. 252-62.10P.
- Olson, N. Thomas; Ault, Earl R.; and Bhaumik, Mani L., to Northrop Corporation. High-power argon/nitrogen transfer laser. 3,970,964, Cl. 331-94.50G.
- Onoda Cement Company, Ltd.: *See—*
  - Itoh, Tsutomu; Sakurai, Munekazu; Yamamoto, Masahiro; and Okamoto, Yasunari, 3,970,905.
- Ontel Corporation: *See—*
  - Ophir, David; Shapiro, Marvin; and Komusin, Bruce, 3,970,989.
- Opdahl, Everett W.; and Kim, Chang K., to United States of America, Navy. Hull module weapon or equipment system. 3,969,977, Cl. 89-1.810.
- Ophir, David; Shapiro, Marvin; and Komusin, Bruce, to Ontel Corporation. Data transfer error check. 3,970,989, Cl. 340-146.1AG.
- Optische Werke G. Rodenstock: *See—*
  - Ledl, Hanne-Lore, 3,970,376.
- Orlowski, Jan A.: *See—*
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- Oscar Mayer & Co. Inc.: *See—*
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- Oshima, Kazuyuki: *See—*
  - Takizawa, Jun; Oshima, Kazuyuki; Yamamoto, Hikaru; Kuribayashi, Kooji; and Suzuki, Toshio, 3,969,807.
- O'Sickey, Lawrence B.; and Koski, Jerry V., to Parker-Hannifin Corporation. Tube coupling joint. 3,970,336, Cl. 285-341.000.
- Osipow, Lloyd I.: *See—*
  - Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 3,970,219.
- Osterhaus, Elmer John: *See—*
  - Wenger, La Von Gene; Osterhaus, Elmer John; and Smith, Oak Birchard, 3,970,761.
- Ostrem, Obert M.: *See—*
  - Pelton, Peter G.; and Ostrem, Obert M., 3,970,105.
- Osuka, Hiroshi: *See—*
  - Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, 3,970,718.
- O'Sullivan, James P.: *See—*
  - Isbister, Eric J.; and O'Sullivan, James P., 3,971,018.
- Ottenhues, Ludger; and Meyer, Willi, to Windmoller & Holscher. Apparatus for pre-adjusting the plate cylinders of printing presses. 3,969,826, Cl. 33-184.500.
- Ottersen, William A.: *See—*
  - Kwan, Okum; and Ottersen, William A., 3,970,506.
- Otto, William M., to Jo-Line Tools, Inc. Electronic torque wrench. 3,970,155, Cl. 73-139.000.
- Outboard Marine Corporation: *See—*
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- Overton, David E.: *See—*
  - Slaats, Mathew A.; and Overton, David E., 3,970,732.
- Owens-Illinois, Inc.: *See—*
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  - Bode, Wolfgang W.; Fein, Michael E.; and Hinson, David C., 3,970,886.
  - Gray, Don N., 3,970,603.
  - Planchock, Jerry L.; Stewart, Daniel R.; and Brock, Thomas W., 3,970,463.
  - Shell, James Allen, 3,970,464.
  - Taylor, Lynn J., 3,970,579.
- Owston, William J., to Lord Corporation. Adhesive formulations for bonded metal assemblies with resistance to aggressive environments. 3,970,709, Cl. 260-827.000.
- Oxequip Health Industries Inc.: *See—*
  - McKee, Albert E., deceased, 3,970,103.
- Oxford Industries, Inc.: *See—*
  - Meadows, James L.; Smith, Donald H.; Ellington, Gordon H.; Mitchell, William O.; and Frost, W. Wade, 3,970,021.
- Oxy Metal Industries Corporation: *See—*
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  - Martin, Sylvia, 3,970,529.
- Oy Tampella AB: *See—*
  - Nykopp, Erik Albert, 3,970,514.
- Ozawa, Kenji: *See—*
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- P.J.K. Projects Limited: *See—*
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- P. R. Mallory & Co., Inc.: *See—*
  - Ciliberti, Frank, 3,970,477.
- Pace, Burton D.: *See—*
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- Pace, Incorporated: *See—*
  - Litt, Kenneth C.; and Siegel, William J., 3,970,234.
- Pachop, Merle E.: *See—*
  - Finger, John F.; and Pachop, Merle E., 3,970,048.
- Pagano, Dominick A. Method for tightening a bolt to exert a predetermined tension force by monitoring bolt elongation while the bolt is being installed. 3,969,810, Cl. 29-407.000.
- Pagano, Dominick A. Method and apparatus for tightening a bolt to exert a predetermined tension force by monitoring bolt elongation while the bolt is being installed. 3,969,960, Cl. 81-52.40R.
- Page, Robert E., to Beloit Corporation. Twin triple chambered gas distribution system for melt blown microfiber production. 3,970,417, Cl. 425-72.00S.
- Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., to Stauffer Chemical Company. Certain geranyl phenyl ethers and their epoxides and their use in controlling insects. 3,970,758, Cl. 424-278.000.
- Palm, Richard: *See—*
  - Falkenstein, Georg; Palm, Richard; and Wolff, Dietrich, 3,970,600.
- Palmer, David Nelson, to Combustion Engineering, Inc. Ultrasonic coupling method. 3,970,504, Cl. 156-329.000.
- Palumbo, Nunzio J., to Louis Marx & Co., Inc. Fastener assembly and fastener thereof. 3,970,399, Cl. 403-231.000.
- Pandapas, George, Jr. Devices for selective display of information. 3,969,973, Cl. 84-474.000.
- Pandjiris Weldment Co., The: *See—*
  - Cooper, Cleveland N., 3,970,295.
- Panek-Finda, Helena, to U.S. Philips Corporation. Isotope generator provided with a carrier material which in addition to Al_2O_3 contains fully or partly hydrated MnO_2. 3,970,583, Cl. 252-301.150.
- Panissidi, Hugh A.: *See—*
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- Papenfuhs, Theodor: *See—*
  - Gengnagel, Kurt; and Papenfuhs, Theodor, 3,970,667.
- Pappo, Raphael: *See—*
  - Collins, Paul W.; and Pappo, Raphael, 3,970,683.
- Park-Ohio Industries, Inc.: *See—*
  - Day, Paul L., 3,970,813.
- Parke, Davis & Company: *See—*
  - Kee Woo, Peter Wing; and Haskell, Theodore Herbert, 3,970,643.
- Parker-Hannifin Corporation: *See—*
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  - O'Sickey, Lawrence B.; and Koski, Jerry V., 3,970,336.

- Parker, Patrick A.: *See—*
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  - Garrett, Roy Peter; and Parkins, Derek Ray, 3,970,177.
- Parratt, Noel James: *See—*
  - Cannell, John Corjeag; Leaper, Rodney Seymour; and Parratt, Noel James, 3,970,136.
- Parsonage, Harry N., to Mead Corporation, The. Automatic replenishment method and apparatus for photographic processes. 3,970,457, Cl. 96-50.00R.
- Partridge, Arthur F. Building truss. 3,969,869, Cl. 52-639.000.
- Pascaud, Xavier: *See—*
  - Regnier, Gilbert; Canevari, Roger; and Pascaud, Xavier, 3,970,661.
  - Regnier, Gilbert; Canevari, Roger; and Pascaud, Xavier, 3,970,663.
- Patelhold Patentverwertungs & Elektro-Holding AG: *See—*
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- Paterson, Malcolm M.: *See—*
  - Theodore, Michael J.; Paterson, Malcolm M.; and Schrimper, Vernon L., 3,970,547.
- Patouillet, Jean J.: *See—*
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- Paulsen, Robert W.: *See—*
  - Deutschmann, William B.; Livenick, Corwin E.; Paulsen, Robert W.; Tyler, Len A.; and Rose, Clifford L., 3,970,880.
- Pavonet, Engelhard Wilhelm, to "Societe de Prayon". Method for purifying phosphoric acid. 3,970,741, Cl. 423-321.00S.
- Peak, Ben, to Builders Brass Works. Wall bumper. 3,969,786, Cl. 16-86.00A.
- Pelton, Peter G.; and Ostrem, Obert M., to Continental Can Company, Inc. Toroidal pressure regulator. 3,970,105, Cl. 137-498.000.
- Pelzer, Franz, to Dravo Corporation. Extension compensation and explosion protection device. 3,970,333, Cl. 285-9.00R.
- Pendleton, Wesley William; and Thompson, Robert Clifton, to Anaconda Wire & Cable Company. Apparatus for detecting faults in magnet wire insulation without thermally damaging the insulation and which does not respond to impedance indications above a predetermined threshold value. 3,970,924, Cl. 324-54.000.
- Penelopegay Rowland Absalom: *See—*
  - Sutcliffe, Henry; and Ball, Edward, 3,971,017.
- Pennings, Henricus Jacobus: *See—*
  - Moran, David Patrick Joseph; and Pennings, Henricus Jacobus, 3,970,763.
- Pepera, Frank R. Hair trimmer attachment. 3,969,819, Cl. 30-200.000.
- Peppler, William S.; Keen, Everett M.; and Siciliano, Anthony J., to Diamond International Corporation. Controlled feeding of livestock. 3,970,044, Cl. 119-18.000.
- Peressini, Eugene R.; Hill, Robert A.; and Kallis, James M., to Hughes Aircraft Company. High power electrically excited flowing gas laser. 3,970,962, Cl. 331-94.5PE.
- Perfect Fit Industries, Inc.: *See—*
  - Vitale, Joseph, 3,970,509.
- Perfect Liberty: *See—*
  - Yasaka, Toshio; Ito, Ryuzo; and Takagi, Sadao, 3,970,996.
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- Peterson, Gary Ray: *See—*
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- Peterson, Wesley G.: *See—*
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- Petrosky, Joseph A., Jr.: *See—*
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- Peyser, Harry A.: *See—*
  - Herbst, Edward J.; and Peyser, Harry A., 3,970,023.
- Pezarro, Salomon, to N.V. Technische Maatschappij Marchand-Andriessen. Method for mutually connecting two strips of a thermoplastic material. 3,970,491, Cl. 156-73.500.
- Pfaff Industriemaschinen GmbH: *See—*
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- Pfizer Inc.: *See—*
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- Phillips, John F.: *See—*
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- Phillips Petroleum Company: *See—*
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  - Myers, John W., 3,970,589.
- Phillips, Wayne R. Paddle. 3,970,032, Cl. 115-24.100.
- Physio Medics, Inc.: *See—*
  - Loiacono, Vincent R., 3,970,090.
- Pickett, John. Solar heater/cooler assembly. 3,970,069, Cl. 126-271.000.
- Pier-Amory, Jacques; and Koch, Beat, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for damping the forward and return movements of an automatic firing weapon. 3,969,982, Cl. 89-178.000.
- Pines, Seemon H.: *See—*
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- Pioneer Electronic Corporation: *See—*
  - Komatsubara, Masahiro, 3,970,906.
- Pipenhagen, Charles A., Jr. Automatic bicycle transmission. 3,969,948, Cl. 74-244.000.
- Pisar, Robert J. Engine speed control for an internal combustion engine adapted for operation with L.P. gas. 3,970,059, Cl. 123-103.00B.
- Pitchon, Esra; Chall, Steven Barry; and Schulman, Marvin, to General Foods Corporation. Method for producing sucrose fixed volatile flavors. 3,970,765, Cl. 426-534.000.
- Pitney-Bowes, Inc.: *See—*
  - Calderazzo, Franklin J., 3,969,992.
  - Irvine, Robert; and Kanning, L. Neil, 3,970,298.
- Pitschi, Franz, to Spinner GmbH, Elektrotechnische Fabrik. Coaxial cable fitting. 3,970,355, Cl. 339-177.00R.
- Pitt, Alastair Martin: *See—*
  - Murfitt, John Edward; and Pitt, Alastair Martin, 3,970,904.
- Pittet, Alan O.: *See—*
  - Sanderson, Anne; Schreiber, William L.; van Praac, Michel; Pittet, Alan O.; and Evers, William J., 3,970,701.
- Pittet, Rene E., Jr. Low speed aircraft. 3,970,270, Cl. 244-5.000.
- Planchock, Jerry L.; Stewart, Daniel R.; and Brock, Thomas W., to Owens-Illinois, Inc. Glasses and glass-ceramics and products made therefrom. 3,970,463, Cl. 106-39.700.
- Plantif, Bernard E.: *See—*
  - Doin, Bernard J.; Plantif, Bernard E.; and Tillac, Jean-Francois, 3,970,266.
- Plattier, Marcel; and Teisseire, Paul Jose, to Societe Anonyme Roure Bertrand DuPont. Novel cyclopentanone odoriferous agent. 3,970,682, Cl. 260-468.00K.
- Playart Ltd.: *See—*
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- Pledger, Richard Payne, to United States of America, Air Force. Mirror steering system. 3,970,373, Cl. 350-285.000.
- Plessey Handel und Investments A.G.: *See—*
  - Ladbrooke, Peter Howard; Torlesse, Arthur Timothy; and Newman, John David, 3,970,927.
- Plockl, Johann, to Erwin Sick Optik-Elektronik. Apparatus and a method for reading light-dark or color-contrast codes on articles. 3,970,825, Cl. 235-61.11E.
- Plodowski, Tomasz, to Raymond International, Inc. Breakwater construction. 3,969,900, Cl. 61-4.000.
- Ploner, Klaus-Jurgen, to Givaudan Corporation. Unsaturated hydrocarbons and process for making same. 3,970,592, Cl. 252-522.000.
- Plummer, William T., to Polaroid Corporation. Compact galilean viewfinder. 3,971,052, Cl. 354-219.000.
- Pohl, Gerhard: *See—*
  - Fischer, Joachim; Knorre, Helmut; and Pohl, Gerhard, 3,970,554.
- Pohl, Stanley: *See—*
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- Polak's Frutal Works B.V.: *See—*
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- Polaroid Corporation: *See—*
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  - Plummer, William T., 3,971,052.
  - Scholz, Donald T., 3,970,377.
- Pollozec, Francois A.: *See—*
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- Polney, Richard J., to Enterprise Machine and Development Corporation. Turbulence generator for yarn texturing air jet. 3,969,799, Cl. 28-1.400.
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- Porth, Frank L., to Black, James A. Coating tray. 3,970,040, Cl. 118-406.000.
- Post Office, The: *See—*
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  - Enoch, Reginald David; and Jones, Mervyn Evan, 3,971,037.
- Postlethwaite, Dennis: *See—*
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- Potlatch Corporation: *See—*
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- Pouch, Thomas M.; and Ladouceur, Harold A., to Multifastener Corporation. Self-fastening nut, panel assembly and apparatus. 3,969,809, Cl. 29-243.500.
- Poulton, Barrie Armstrong; and Bayne, Robert Paton, to Simon-Barron Limited. Handling of materials. 3,970,123, Cl. 141-351.000.
- Poupard, Dominique: *See—*
  - Le Salver, Robert; and Poupard, Dominique, 3,970,162.
- PPG Industries, Inc.: *See—*
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  - Reiche, Charles Ronald; and Heckman, Jerry A., 3,970,711.
  - Sopko, John F., 3,970,037.
- Prater, Earle Francis, to Birtcher Corporation, The. Printed circuit board retainer. 3,970,198, Cl. 211-41.000.
- Pratt, Robert Eugene; and Habzansky, John, to Bray Oil Company. Antiwear additive mixture. 3,970,570, Cl. 252-49.900.
- Pravaz, Marcel, to Etudes et Fabrications Aeronautiques. Jumping garment for a parachutist. 3,969,772, Cl. 2-79.000.

- Precitec GmbH: *See—*
  - Schmall, Karl Heinz, 3,970,911.
- Premachandra, Bhartur, to Premachandra, Bhartur. Immunoassay for the measurement of total thyroxine in blood serum. 3,970,746, Cl. 424-1.500.
- Pressly, Palmer W., Jr. Multi directional motion and vibration triggering device. 3,971,006, Cl. 340-224.000.
- Prevorsek, Dusan Ciril; Kwon, Young Doo; Sharma, Raj Kumar; and Gilliam, Edward T., to Allied Chemical Corporation. Testing viscoelastic solids. 3,969,930, Cl. 73-91.000.
- Pridgen, Junius Isaac: *See—*
  - Gehweiler, William Frederick; and Pridgen, Junius Isaac, 3,970,833.
- Prince, Zodell W.; Weatherholt, Dallas D.; and Reistino, Adelene Trombatore. Disposable hair roller. 3,970,095, Cl. 132-39.000.
- Pritchard, Edwin J., to Western Electric Co., Inc. Method for adhering one surface to another. 3,970,494, Cl. 156-155.000.
- Procter & Gamble Company, The: *See—*
  - Claybaugh, Gene W., 3,970,594.
- Procter, Samuel Anderson; and Younger, Robert Dewitt, to Control Data Corporation. Direct reading reactance meter. 3,970,925, Cl. 324-57.00Q.
- Production Service & Equipment Incorporated: *See—*
  - Boyd, Gerald K., 3,970,145.
- Profitt, Leslie M.; and Lehmer, Merle E., Jr. Telephone-call toll monitor and indicator. 3,970,793, Cl. 179-7.10R.
- Pryor, Clyde Robert: *See—*
  - Hollingsead, Robert Allen; and Pryor, Clyde Robert, 3,970,351.
- PSC Technology, Inc.: *See—*
  - Wohlrab, Hans Chr., 3,970,386.
- Pui, Fong, to Playart Ltd. Electronic chirper. 3,971,016, Cl. 340-384.00E.
- Puie, Alexandru: *See—*
  - Mogos, Ion; Ionescu, Cornel; Angelescu, Dionisie; Dumitrescu, Nicolae; Andreescu, Millo; Neascu, Constantin; Brozici, Mircea; Birzanescu, Mihai; Puie, Alexandru; and Vasilica, Gheorghe, 3,970,074.
- Purdy, James P. Electrical apparatus to connect towing vehicle light circuits to a trailer light circuit when the towing vehicle has separate circuits respectively for turning and stop lights and the trailer has a common light circuit for both turning and stop lights. 3,970,860, Cl. 307-10.0LS.
- Purex Corporation: *See—*
  - Barrett, John H., Jr., 3,970,575.
- Pyne, James A., Jr.: *See—*
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- Raduchel, Bernd; Skuballa, Werner; and Vorbruggen, Helmut, to Schering Aktiengesellschaft. Process for the preparation of prostaglandin F_2 and the analogs thereof. 3,970,692, Cl. 260-514.00D.
- Raes, Herman, to National Forge Company. Protective shield for pressure vessels. 3,970,208, Cl. 220-3.000.
- Raether, Roger J., to Wellendorf, Erwin F. Dislodging device. 3,970,141, Cl. 165-47.000.
- Rafferty, Edson Howard; and Kletschka, Harold D., to Bio-Medicus, Inc. Apparatus for use with delicate fluids. 3,970,408, Cl. 415-60.000.
- Raines, Kenneth; and Burke, George K., to Burron Medical Products, Inc. Intravenous injection apparatus and needle adapter with filter and method of making same. 3,970,084, Cl. 128-214.00C.
- Raines, Kenneth; and Burke, George K., to Burron Medical Products, Inc. Intravenous injection apparatus and needle adapter with filter and method of making same. 3,970,490, Cl. 156-73.100.
- Rainey, Don E. Coin controlled vending apparatus. 3,970,216, Cl. 221-125.000.
- Rajay Industries, Inc.: *See—*
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  - Caldwell, Roland B., 3,970,061.
- Randmere, Uno, to Stromberg-Carlson Corporation. Loudspeaking telephone with improved receive sensitivity. 3,970,786, Cl. 179-1.0VC.
- Rapp, Eugen, to E. Rapp Electronik GmbH. Level detector for liquids and other flowable masses. 3,969,941, Cl. 73-290.00R.
- Raskin, Seymour H. Load cell amplifier. 3,969,934, Cl. 73-141.00A.
- Rat, Roger M.; Pollozec, Francois A.; and Patouillet, Jean J., to Societe Nationale des Poudres et Expolsifs, Antar Petroles de l'Atlantique: Antargaz. Process and installation for concentrating dilute solutions of corrosive products. 3,970,511, Cl. 159-13.00C.
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- Recht, Howard L., to Rockwell International Corporation. Decreasing the cyanide and heavy metal content of an aqueous solution. 3,970,531, Cl. 204-149.000.
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- Rees, James D., to Xerox Corporation. Color development apparatus. 3,970,042, Cl. 118-637.000.
- Regan, Albert John, to BOC Limited. Flowing gas laser gas regeneration system. 3,970,957, Cl. 331-94.50G.
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- Regnier, Gilbert; Canevari, Roger; and Pascaud, Xavier, to Science Union et Cie, Societe Francaise de Racherche Medical. 2-Amino, 5-carbamoyl pyridine compounds. 3,970,661, Cl. 260-295.50A.
- Regnier, Gilbert; Canevari, Roger; and Pascaud, Xavier, to Science Union et Cie, Societe Francaise de Recherche Medical. Certain amino-nicotinamide derivatives. 3,970,663, Cl. 260-295.50A.
- Reiche, Charles Ronald; and Heckman, Jerry A., to PPG Industries, Inc. Method of producing glycols. 3,970,711, Cl. 260-635.00E.
- Reid, Robert John, to Reid, Robert John. Deformingly interlocked structural joint. 3,970,400, Cl. 403-242.000.
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- Richards, Derek John, to Mecanaids Limited. Toilet aids. 3,969,778, Cl. 4-254.000.
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- Rieger, Franz; Linder, Ernst; and Schmidt, Peter Jurgen, to Robert Bosch G.m.b.H. Method and apparatus for monitoring the activity of catalytic reactors. 3,969,932, Cl. 73-118.000.
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- Riesenfeld, Fred C., to Ralph M. Parsons Company. Process for the production of sulfur from sulfur dioxide extracted from gas streams. 3,970,744, Cl. 423-574.00R.
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- Ring, Howard D., to Xerox Corporation. Writing apparatus having wear resistant material. 3,971,042, Cl. 346-139.00C.
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- Robinson, Prentice; and Ramsden, Paul S., Jr., to Centronics Data Computer Corporation. Random access line printer. 3,970,183, Cl. 197-1.00R.
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- Rosinski, Edward Joseph; and Rubin, Mae Koenig, to Mobil Oil Corporation. Hydrocarbon conversion with ZSM-12. 3,970,544, Cl. 208-111.000.
- Ross, Arthur W. Apparatus for use in stringing power lines. 3,970,286, Cl. 254-134.30R.
- Ross, Danny E.; and Mueller, James M., to Motorola, Inc. Dialing apparatus for a portable radio telephone. 3,970,801, Cl. 179-41.00A.
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- Sahlin, Anders Lennart, to Anders Sahlin AB. Blanks for coffins. 3,969,798, Cl. 27-4.000.
- Saice, Dwayne D. Cardiovascular catheter seal device. 3,970,089, Cl. 128-348.000.
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- Salzmann, Theodor; Wesselak, Franz; and Timpe, Wolfgang, to Siemens Aktiengesellschaft. Circuit arrangement including a number of converters, in particular direct converters, in Y connection. 3,970,914, Cl. 321-2.000.
- Sama, Claudio, to Sandoz Ltd. Deaerating arrangement for dialyzer. 3,970,438, Cl. 55-190.000.
- Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Device in a fluid pressure actuated brake unit for enabling the outgoing push rod to be brought back from the outside. 3,970,173, Cl. 188-203.000.
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- Sasaki, Hiroshi: *See—*
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- Sato, Masamichi; and Tezuka, Shigeru, to Xerox Corporation. Electrophotographic device for liquid development. 3,970,043, Cl. 118-637.000.
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- Schaedler, Raymond J.; and Marcantonio, Livio F., to Chicago Pneumatic Tool Company. Safety inlet air valve control arrangement for air powered hand held tool. 3,970,110, Cl. 137-613.000.
- Schaefer, Louis F.: *See—*
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- Schafer, Clarence E.: *See—*
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- Schaffeler, Alois; and Moller, Wolfgang, to J. & J. Marquardt. Electric switch having a time-delay mechanism. 3,970,807, Cl. 200-34.000.
- Schaper, Karl. Contra-flow washing machine. 3,969,913, Cl. 68-143.000.
- Scharfe, Gerhard; Schwerdtel, Wulf; Swodenk, Wolfgang; Engelhard, Bruno; Grolig, Johann; Martin, Manfred; and Reissinger, Karl-Hermann, to Bayer Aktiengesellschaft. Process for the production of allyl alcohol. 3,970,713, Cl. 260-638.00R.
- Schauer, George A. Internal combustion engine. 3,970,057, Cl. 123-51.0BA.
- Scheben, John A.; Hinnenkamp, James A.; and Mador, Irving L., to National Distillers and Chemical Corporation. Oxidation of ethylene to acetic acid. 3,970,697, Cl. 260-533.00R.
- Schelkmann, Wilhelm, to Vakuum Vulk Holdings Ltd. Tread for the recapping of tires and method of making the same. 3,970,131, Cl. 152-185.000.
- Schenck, Paula: *See—*
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- Schindler, Donald G., to United States Steel Corporation. Weld tracking mechanism. 3,970,910, Cl. 318-576.000.
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- Schliebs, Reinhard; Wechsberg, Manfred; and Meussdoerffer, Johann Nikolaus, to Bayer Aktiengesellschaft. Perfluoroalkane sulfonamidoalkane phosphonic and phosphonic acid derivatives. 3,970,586, Cl. 252-355.000.
- Schlottmann, Herman; and Melchior, John G. Retractable stop. 3,970,180, Cl. 193-35.00A.
- Schmall, Karl Heinz, to Precitec GmbH. Apparatus for distance control. 3,970,911, Cl. 318-607.000.
- Schmid, Hans, to Meteor AG. Device for applying adhesive tape to a wire coil. 3,970,259, Cl. 242-7.080.
- Schmid, Hans-Rudolf: *See—*
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- Schmid, Markus; and Bruderer, Werner, to Concast AG. Method for applying flux powder to the bath level in a continuous casting mold during continuous casting. 3,970,135, Cl. 164-4.000.
- Schmidgall, Earl R.: *See—*
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- Schmidt, Paul, to Tracto-Technik. Ram-borer apparatus. 3,970,157, Cl. 175-22.000.
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- Schmidt, Robert W.; Gallet, John R.; and Czyz, Thomas L., to Copar Corporation. Corrugator control system. 3,970,489, Cl. 156-64.000.
- Schmit, Eugene R.: *See—*
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- Schmitt, Edgar; and Konrath, Karl, to Robert Bosch G.m.b.H. RPM regulator for fuel injection pumps. 3,970,066, Cl. 123-140.00A.
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- Schnizler, Albrecht, Jr., to Metabowerke KG Closs, Rauch, & Schnitzler. Chuck for drill. 3,970,323, Cl. 279-64.000.
- Schoenberg, Emanuel; and Hanlon, Thomas L., to Goodyear Tire & Rubber Company, The. Processing method for synthetic rubbers. 3,970,724, Cl. 260-894.000.
- Schofield, George L., Jr.; and Lignell, James L., to Xenex Corporation. Presence detecting system with self-checking. 3,970,846, Cl. 250-221.000.
- Schofl, Wolfgang: *See—*
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- Schott, John R.; and Gallagher, Timothy W., to Calspan Corporation. Profile technique for calibrating infrared thermal imaging systems. 3,970,848, Cl. 250-252.000.
- Schreiber, William L.: *See—*
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- Schultz, John C., to Houdaille Industries, Inc. Fluid railroad passenger car suspension. 3,970,009, Cl. 105-164.000.
- Schultz, Thomas J.; and Hemsath, Klaus H., to Midland-Ross Corporation. Apparatus and method for methanation. 3,970,435, Cl. 48-61.000.
- Schulz, Hans Peter: *See—*
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- Schweickart, Albert J.: *See—*
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- Schwerdtel, Wulf: *See—*
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- Searle, Campbell L., to Massachusetts Institute of Technology. Auditorium simulator and the like employing different pinna filters for headphone listening. 3,970,787, Cl. 179-1.0AT.
- Sears, Karl David; and Casebier, Ronald Leroy, to International Telephone and Telegraph Corporation. Etherification of bark extracts. 3,970,691, Cl. 260-507.00R.
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- Seifert, Kerry D.; and Smiley, Parker C., to United States of America, Air Force. Direct injection liquid propellant gun system. 3,969,978, Cl. 89-7.000.
- Seifert, Peter; and Chupka, David E., to Black Clawson Company, The. Apparatus for screening paper fiber stock. 3,970,548, Cl. 209-240.000.
- Sekiguchi, Sadao: *See—*
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- Seyler, Gerard; and Roback, Kenneth J., to Motorola, Inc. Thick film rotary switch. 3,970,986, Cl. 338-171.000.
- Seymour, Shaun A., to Sperry Rand Corporation. Hay rolling machine with improved roll starting and compression means. 3,969,879, Cl. 56-341.000.
- Seymus, Herman Ernest, to Du Pont de Nemours, E. I., and Company. Fluorocarbon polymer coating compositions containing mica particles. 3,970,627, Cl. 260-29.60F.
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- Shamsutdinov, Ural Gilyazitdinovich; Gutin, Jury Viktorovich; and Kupriyanov, Alexandr Sergeevich. Vertical vibratory liquid filter. 3,970,564, Cl. 210-323.00R.
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- Shaw, Garrett D.; and Williamson, Clyde E., to TRW Inc. Drill module for borehole stress measuring instrument. 3,969,929, Cl. 73-88.00E.
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- Sheetz, George A., to Kline, Larry Harold. Reel comprising reel halves. 3,970,268, Cl. 242-115.000.
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- Sheppard, Richard H. Axle mounting of integral power steering gear. 3,970,166, Cl. 180-163.000.
- Shettel, Don L., to Hydromation Filter Company. Liquid treating method and apparatus. 3,970,536, Cl. 204-180.00R.
- Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Kato, Hirotetu, to Fuji Photo Film Co., Ltd. Fogged, direct-positive silver halide emulsion containing carbocyanine dye having indolenine nucleus. 3,970,461, Cl. 96-101.000.
- Shibata, Kosho: *See—*
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- Shigeyasu, Motoo; and Kuki, Michio, to Matsuyama Petrochemicals Inc. Process for producing aromatic carboxylic acid. 3,970,696, Cl. 260-524.00R.

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  - Shiraishi, Tatsuo; Fukusen, Hiroshi; Oishi, Sachio; Shimizu, Shinkichi; Nishikawa, Hiroyuki; and Wakabayashi, Tetsu, 3,970,739.
- Shinnar, Reuel; Snyder, Paul W., Jr.; and Weekman, Vern W., Jr., to Mobil Oil Corporation. Combustion regeneration of hydrocarbon conversion catalyst with recycle of high temperature regenerated catalyst. 3,970,587, Cl. 252-417.000.
- Shiokawa, Kozo: *See—*
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- Shipman, William A. Combination windshield washer/wiper. 3,969,783, Cl. 15-250.040.
- Shiraishi, Tatsuo; Kishiwada, Susumu; Shimizu, Shinkichi; Honmaru, Shigern; Ichihashi, Hiroshi; and Nagaoka, Yoshihiko, to Sumitomo Chemical Company, Limited. Catalytic process for the preparation of acrolein. 3,970,702, Cl. 260-604.00R.
- Shiraishi, Tatsuo; Fukusen, Hiroshi; Oishi, Sachio; Shimizu, Shinkichi; Nishikawa, Hiroyuki; and Wakabayashi, Tetsu, to Sumitomo Chemical Company, Limited. Process for concurrently treating process waste waters and flue gases from ammonia synthesis process plants. 3,970,739, Cl. 423-23.00S.
- Shirn, George A., to Sprague Electric Company. Solid electrolytic capacitor with embedded counterelectrode. 3,970,903, Cl. 317-230.000.
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- Siciliano, Anthony J.: *See—*
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- Silveyra, Salvador, to Aislantes Leon, S.A. Mold assembly for producing multi-partitioned containers having metal connectors through the partitions. 3,970,279, Cl. 249-96.000.
- Simmons, Ryden R., Sr. Telephone service control device. 3,970,789, Cl. 179-1.0HS.
- Simon-Barron Limited: *See—*
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- Singer, Alfred Richard Eric, to National Research Development Corporation. Spraying atomized particles. 3,970,249, Cl. 239-102.000.
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- Sirel, Michel; and Taille, Francois, to Les Cables de Lyon. Device for the electrical protection of a coaxial cable by two connected circuits. 3,970,969, Cl. 333-12.000.
- Skala, Stephen F. Ink drop printer with traversing orifice band. 3,971,040, Cl. 346-75.000.
- SKF Compagnie d'Applications Mecaniques: *See—*
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- Slaats, Mathew A.; and Overton, David E., to Kimball International, Inc. Method of molding rigid foamed polyurethane articles. 3,970,732, Cl. 264-40.500.
- Sly, Thomas L., to Anaren Microwave, Incorporated. Signal modulator apparatus. 3,970,968, Cl. 332-37.00D.
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- Smale, Charles H.; and Pyne, James A., Jr., to General Motors Corporation. Cooled exhaust duct. 3,970,252, Cl. 239-127.300.
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- Smith, Donald O.; and Judge, John S., to Micro-Bit Corporation. Micro-structure field emission electron source. 3,970,887, Cl. 313-309.000.
- Smith, Donald W.: *See—*
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- Smith, Marion Joseph. Artificial tree. 3,970,834, Cl. 240-10.00Q.
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- Smorenburg, Johannes Jacobus, to Stork Brabant, B.V. Poultry processing equipment. 3,969,790, Cl. 17-11.10R.
- Smorenburg, Johannes Jacobus, to Stork-Amsterdam, B.V. Carrier element for a hydrastatic cooker. 3,970,188, Cl. 198-30.000.
- Snapp, Thomas C., Jr.; Blood, Alden E.; and Johnson, Sam H., Jr., to Eastman Kodak Company. Polymeric hydroxylated polyesterethers and polyurethane flexible foam prepared therefrom. 3,970,619, Cl. 260-2.5AN.
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- "Societe de Prayon": *See—*
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- Societe Nationale des Petroles d'Aquitaine: *See—*
  - Garrigues, Claude; Signouret, Jean Baptiste; and Chambu, Claude, 3,970,468.
- Societe Nationale des Poudres et Explosifs: *See—*
  - Doin, Bernard J.; Plantif, Bernard E.; and Tillac, Jean-Francois, 3,970,266.
- Societe Nationale des Poudres et Expolsifs, Antar Petroles de l'Atlantique: Antargaz: *See—*
  - Rat, Roger M.; Pollozec, Francois A.; and Patouillet, Jean J., 3,970,511.
- Sohl, Gordon; Mitrovich, Svetislav; and Staples, Ernest L., to Xerox Corporation. Damper for a composite print wheel. 3,970,186, Cl. 197-54.000.
- Sokolovsky, Mordechai; Freeman, Amihay; and Goldstein, Leon. Novel substituted polyamides and process for producing them. 3,970,597, Cl. 260-72.00N.
- Sola Basic Industries, Inc.: *See—*
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- Solid State Technology, Inc.: *See—*
  - Willis, John G., 3,970,939.
- Sony Corporation: *See—*
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  - Hanai, Ichiro; Kobayashi, Toshiharu; and Takahashi, Kazuo, 3,971,069.
  - Hanai, Ichiro; Kobayashi, Toshiharu; and Takahashi, Kazuo, 3,971,070.
  - Hanaoka, Akio; and Yoshimochi, Ken, 3,969,831.
  - Horichi, Tetsuya, 3,970,870.
  - Matsushita, Takeshi; Hayashi, Hisao; and Kawana, Yoshiyuki, 3,971,061.
  - Takahashi, Shigenori, 3,970,779.
  - Urayama, Kiyoshi, 3,971,071.
- Sopko, John F., to PPG Industries, Inc. Coating composition vaporizer. 3,970,037, Cl. 118-48.000.
- Sorensen, Boyd W.: *See—*
  - Boothroyd, William A.; and Sorensen, Boyd W., 3,970,992.
- Southard, Robert Keith: *See—*
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  - Boswank, Stuart E.; Jones, Robert H.; and Whaley, Newton P., 3,970,098.
- Sovia, Cedric C.; and Krengel, Kenneth W. Catamaran. 3,970,025, Cl. 114-61.000.
- Spaeder, Gerald J., to United States Steel Corporation. Normalized alloy steel for use at elevated temperature. 3,970,483, Cl. 148-36.000.
- Spears, Cecil Julius. Collapsible tube squeezing device. 3,970,220, Cl. 222-102.000.
- Speed Systems, Inc.: *See—*
  - Maytham, Walter J., 3,969,818.
- Speggiorin, Mariano; and Wiedemann, Friedrich, to J. Bobst & Fils S.A. Apparatus for stacking folded boxes. 3,970,202, Cl. 214-6.500.
- Spellman, Gordon B.: *See—*
  - Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; Spellman, Gordon B.; and Van Horn, Lawrence E., 3,971,056.
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- Sperry Rand Corporation: *See—*
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  - Brown, Ralph A.; and Snow, Wilford W., 3,970,262.
  - Isbister, Eric J.; and O'Sullivan, James P., 3,971,018.
  - Korowitz, Simon, 3,971,014.
  - Lodi, Robert J., 3,971,001.
  - Seymour, Shaun A., 3,969,879.
- Spierings, Ferdinand Hubert Franciscus Gerardus. Hall-voltage device. 3,970,922, Cl. 324-45.000.
- Spinner GmbH, Elektrotechnische Fabrik: *See—*
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- Spitalul Clinic Filantropia Bucuresti: *See—*
  - Mogos, Ion; Ionescu, Cornel; Angelescu, Dionisie; Dumitrescu, Nicolae; Andreescu, Millo; Neascu, Constantin; Brozici, Mircea; Birzanescu, Mihai; Puie, Alexandru; and Vasilica, Gheorghe, 3,970,074.
- Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C. Aerosol containers for foaming and delivering aerosols and process. 3,970,219, Cl. 222-1.000.
- Sponberg, Gerald E., to Sponberg, Gerald E. Tractor foot pedal guide. 3,969,953, Cl. 74-560.000.
- Sponseller, John R.: *See—*
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- Sprague Electric Company: *See—*
  - Shirn, George A., 3,970,903.
- Spranger, Douglas M.: *See—*
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  - Brune, Gerhard; Staib, Helmut; Kochendorfer, Heinrich; Hans, Waldemar; Ropstorff, Walter; Leiber, Heinz; and Kirstein, Lothar, 3,970,111.
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  - Wise, Henry, 3,970,431.
- Stangeland, Maynard L., to Rockwell International Corporation. Internal thrust reverser. 3,970,030, Cl. 115-12.00R.
- Stanton, Arthur J., to Harris Corporation. Densitometer head with fiber optics. 3,970,394, Cl. 356-195.000.
- Staples, Ernest L.: *See—*
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- Stark, Carroll G., to Anemostat Products Division Dynamics Corporation of America. Tamper-proof window unit. 3,969,857, Cl. 52-208.000.
- Stark, Sven Olof Soren; Rauser, Jan Axel Ingemar; and Rauser, Irma Marita, to Deering Milliken Research Corporation. Method and apparatus for the presterilization of packing machines. 3,970,426, Cl. 21-54.00R.
- Starkweather, Gary K., to Xerox Corporation. Flying spot flat field scanner. 3,970,359, Cl. 350-7.000.
- Stauffer Chemical Company: *See—*
  - Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 3,970,758.
  - Walsh, Edward N.; and Shim, Kyung Sup, 3,970,729.
- Stecher, Friedhelm; Fazekas, Josef; Johren, Paul; and Morsbach, Martin, to Goetzewerke-Friedrich Goetze AG. Cylinder head gasket for internal-combustion engine. 3,970,322, Cl. 277-235.00A.
- Steffensen, John, to McGraw-Edison Company. Rechargeable battery with zinc negative and dendrite barrier. 3,970,472, Cl. 136-3.000.
- Steinhart, Gilbert; and Bock, Heinrich, to Nabisco, Inc. Conveyor system for manufactured articles, particularly confections. 3,970,189, Cl. 198-34.000.
- Stephenson, Fred J.; and Rush, Donald J., to Butler Manufacturing Company. Fire resistant ceiling construction. 3,969,864, Cl. 52-475.000.
- Stephenson, Robert L., to Allied Chemical Corporation. Safety belt buckle. 3,969,795, Cl. 24-203.0AL.
- Sterling Drug Inc.: *See—*
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- Stern, Howard K.: *See—*
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- Sternbach, Leo Henryk; and Walser, Armin, to Hoffmann-La Roche Inc. Preparation of triazolo benzodiazepines. 3,970,664, Cl. 260-296.00T.
- Stettler, Richard J.; and Verdouw, Albert T., to General Motors Corporation. Combustion system. 3,969,892, Cl. 60-39.51R.
- Stevenin, Jean: *See—*
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- Stewart, Daniel R.: *See—*
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- Stewart, William H., Jr., to Deering Milliken Research Corporation. Dyeing and printing of materials. 3,969,779, Cl. 8-149.000.
- Stigler, Viktor: *See—*
  - Kuhn, Klaus Roland; and Stigler, Viktor, 3,970,872.
- Stillman, Neil W., to Diamond Shamrock Corporation. Self setting molding process. 3,970,462, Cl. 106-38.350.
- Stobb, Anton R., to Stobb, Inc. Separator for a sheet stacker. 3,969,993, Cl. 93-93.00C.
- Stobb, Inc.: *See—*
  - Stobb, Anton R., 3,969,993.
- Stoffelsma, Jan; and Pypker, Jacob, to Polak's Frutal Works B.V.; and Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Mercapto alcohols and mercaptoalkyl esters. 3,970,689, Cl. 260-488.00F.
- Stolberg, Hermann-Josef: *See—*
  - Uerlichs, Johannes; Muller, Rudolf; and Stolberg, Hermann-Josef, 3,970,109.
- Stolz, Heinrich: *See—*
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- Stoneman, Estel McKinley: *See—*
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- Stonner, Hans-Martin; Scholtz, Berthold; and Hartmann, Rainer, to Metallgesellschaft Aktiengesellschaft. Multistage vertical extractor for liquid-liquid counterflow extraction. 3,970,432, Cl. 23-270.50T.
- Stopper, Herbert: *See—*
  - Allen, William W.; and Stopper, Herbert, 3,970,876.
- Storey, Robert C.: *See—*
  - Olson, James R.; and Storey, Robert C., 3,970,571.
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- Stowell Industries Inc.: *See—*
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- Strand Century Incorporated: *See—*
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- Stratford Engineering Corporation: *See—*
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- Stratmann, Josef: *See—*
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- Streifer, William; Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Electrically pumped, solid-state distributed feedback laser with particular grating spacing. 3,970,958, Cl. 331-94.50C.
- Strickland, Robert Walter: *See—*
  - Minetti, Richard Henry; and Strickland, Robert Walter, 3,969,813.
- Stricon Products Limited: *See—*
  - Marsden, Ronald Eric; Webb, Franklyn Walter; and Rukavina, George, 3,969,920.
- Stroik, Edward R., to Tudor Technology, Inc. Thermocouple. 3,970,481, Cl. 136-230.000.
- Stromberg-Carlson Corporation: *See—*
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- Structural Stoneware Incorporated: *See—*
  - Whitacre, Daniel C., 3,969,851.
- Strutz, Hans-Jurgen; and Jacob, Ingolf, to Hoechst Aktiengesellschaft. Method and device for starting up injector nozzles. 3,970,231, Cl. 226-7.000.
- Studer, Altee C. Jack stand. 3,970,278, Cl. 248-352.000.
- Sturwold, Robert J.; and Barrett, Fred O., to Emery Industries, Inc. Water soluble triglyceride compositions and method for their preparation. 3,970,569, Cl. 252-49.300.
- Suchecki, Josef. Machine and a method for fabricating a helicoidal tube. 3,970,233, Cl. 228-17.500.
- Suchko, Adam John, to RCA Corporation. Fault detector and interrupt circuit useful in a television signal processing system. 3,970,915, Cl. 321-21.000.
- Sud-Chemie AG: *See—*
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- Sugio, Akitoshi: *See—*
  - Yonemitsu, Eiichi; Sugio, Akitoshi; Kawaki, Takao; Konishi, Akihiko; and Mizutani, Zempei, 3,970,640.
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- Sugiura, Susumu: *See—*
  - Yamamoto, Eisuke; Sugiura, Susumu; and Sawamura, Osamu, 3,970,384.
- Sukman, Edwin L.; and Touval, Irving, to M & T Chemicals Inc. Flame retardant compositions derived from difunctional carboxylic acids containing a halogenated thiophere ring and methods for their preparation. 3,970,598, Cl. 260-75.00S.
- Sulzer Brothers Limited: *See—*
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- Sumi, Shozo: *See—*
  - Kishino, Shigeo; Kudamatsu, Akio; Sumi, Shozo; and Shiokawa, Kozo, 3,970,728.
- Sumitomo Chemical Company, Limited: *See—*
  - Kishikawa, Hiroshi; Adachi, Takayoshi; and Usami, Tamio, 3,970,863.
  - Kitamura, Shigeyoshi; Okuno, Yositosi; and Hirano, Masachika, 3,970,703.
  - Minai, Masayoshi; Suzuki, Yoshio; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 3,970,694.
  - Nagase, Tsuneyuki; Suzukamo, Gohu; and Suzuki, Yoshio, 3,970,700.
  - Shiraishi, Tatsuo; Kishiwada, Susumu; Shimizu, Shinkichi; Honmaru, Shigern; Ichihashi, Hiroshi; and Nagaoka, Yoshihiko, 3,970,702.
  - Shiraishi, Tatsuo; Fukusen, Hiroshi; Oishi, Sachio; Shimizu, Shinkichi; Nishikawa, Hiroyuki; and Wakabayashi, Tetsu, 3,970,739.
  - Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,970,654.
- Sumitomo Electric Industries, Ltd.: *See—*
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  - Kumon, Osamu, 3,970,879.
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- Sumitomo Naugatuck Co., Ltd.: *See—*
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- Sumitomo, Yuji: *See—*
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- Sun Oil Company of Pennsylvania: *See—*
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  - Mayer, Robert, 3,970,942.
- Sun Ventures, Inc.: *See—*
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- Sundstrand Corporation: *See—*
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- Sundt, Cornelius V., to United Technologies Corporation. Closed channel disk for a gas turbine engine. 3,970,412, Cl. 416-219.00R.
- Surgical Appliance Industries, Inc.: *See—*
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- Susi, Peter Vincent: *See—*
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- Sutcliffe, Henry; and Ball, Edward, to Penelopegay Rowland Absalom. Method and apparatus for exciting the driving coils of audible warning devices. 3,971,017, Cl. 340-384.00E.
- Suter, Xaver, to Werkzeugmaschinenfabrik Oerlikon-Buhrle. Spinning projectile. 3,970,004, Cl. 102-56.0SC.
- Suzukamo, Gohu: *See—*
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- Suzuki, Keisuke, to Yamaha Hatsudoki Kabushiki Kaisha. Small-sized snowmobile. 3,970,164, Cl. 180-68.00R.
- Suzuki, Shigeyuki; Yamauchi, Akira; Kiyama, Shoji; and Yamaki, Kiyoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for preparing dispersing agent. 3,970,690, Cl. 260-505.00C.
- Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Apparatus for making electroluminescent screens for color cathode ray tubes. 3,971,043, Cl. 354-1.000.
- Suzuki, Toshio: *See—*
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- Suzuki, Yasuo: *See—*
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- Suzuki, Yoshio: *See—*
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  - Nagase, Tsuneyuki; Suzukamo, Gohu; and Suzuki, Yoshio, 3,970,700.
- Svenska Aktiebolaget Bromsregulator: *See—*
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- Svenska Dataregister AB: *See—*
  - Englund, G. Roland, 3,969,945.
- Swafford, Clifton S.; Caldwell, Thurman T.; and Dungan, William J., to Rexham Corporation. Hosiery envelope. 3,970,242, Cl. 229-80.000.
- Swandiak, Steve, to Artcraft Wire Goods, Inc. Display rack hook. 3,970,275, Cl. 248-223.000.
- Sweet, David L.: *See—*
  - Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 3,970,293.
- Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment. Suspension system. 3,970,293, Cl. 267-31.000.
- Swengel, Robert Charles, Sr.; Lemke, Timothy Allen; and Villiard, Frederick Phillip, to AMP Incorporated. Bonded wire interconnection system. 3,969,816, Cl. 29-625.000.
- Swift, Harold E.: *See—*
  - Taylor, Brian W.; and Swift, Harold E., 3,970,705.
- Swift, Howard R.; and Livingston, Kenneth C., to Libbey-Owens-Ford Company. Transparent grand piano tops. 3,969,970, Cl. 84-177.000.
- Swisher, George William, Jr.; Smith, Donald W.; and Phillips, John F., to CMI Corporation. Slipform paving apparatus. 3,970,405, Cl. 404-105.000.
- Swodenk, Wolfgang: *See—*
  - Scharfe, Gerhard; Schwerdtel, Wulf; Swodenk, Wolfgang; Engelhard, Bruno; Grolig, Johann; Martin, Manfred; and Reissinger, Karl-Hermann, 3,970,713.
- Syllographic Machines, Inc.: *See—*
  - Shelton, Dothan L., 3,970,185.
- Sylten, Hans D., to Holcomb, Jack N. Method and apparatus for determining motion and speed. 3,970,938, Cl. 325-117.000.
- Syntex (U.S.A.) Inc.: *See—*
  - Crabbe, Pierre; Fried, John H.; and Guzman, Angel, 3,970,684.
  - Untch, Karl G.; and Stork, Gilbert J., 3,970,685.
- Sytina, Evgenia Nikolaevna: *See—*
  - Shvedov, Vasily Ivanovich; Grinev, Alexei Nikolaevich; and Sytina, Evgenia Nikolaevna, 3,970,707.
- Taft, Kenneth E., to Lawrence Peska Associates, Inc., a part interest. Hinge pin locks. 3,970,340, Cl. 292-300.000.
- Taggart, Robert B. Parabolic reflector assembled from triangular shaped petals. 3,971,023, Cl. 343-840.000.
- Taille, Francois: *See—*
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- Takada, Juichiro, legal authorized heir: *See—*
  - Takada, Takezo, deceased; and Takada, Juichiro, legal authorized heir, 3,970,116.
- Takada, Takezo, deceased; and by Takada, Juichiro, legal authorized heir. Method of weaving a composite tube and web and resulting article. 3,970,116, Cl. 139-387.00R.
- Takagi, Katsuhide; and Fukasawa, Toshiro, to Sankyo Kogaku Kogyo Kabushiki-Kaisha. Movie camera capable of magnetic recording simultaneously with filming. 3,970,378, Cl. 352-30.000.

- Takagi, Sadao: *See—*
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- Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, to Showa Denko Kabushiki Kaisha. Method of producing polymer compositions based on chlorinated polyethylene. 3,970,718, Cl. 260-876.00R.
- Takahashi, Asao: *See—*
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- Takahashi, Kazuo: *See—*
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- Takahashi, Kiyoshi: *See—*
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- Takahashi, Shigenori, to Sony Corporation. Power supply circuit. 3,970,779, Cl. 178-7.30R.
- Takahashi, Tooru, to Yamaichi Denki Kogyo Kabushiki Kaisha. Matrix pin board. 3,970,350, Cl. 339-18.00P.
- Takahata, Kouichi: *See—*
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  - Okuno, Keno; and Takahata, Kouichi, 3,971,050.
- Takama, Kazushi: *See—*
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- Takano, Rikuo; Sumitomo, Yuji; Yamamoto, Yoichi; Makita, Tomoo; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Ink jet system printer with temperature compensation. 3,971,039, Cl. 346-75.000.
- Takasago Perfumery Co., Ltd.: *See—*
  - Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,970,593.
- Takatori Machinery Works Ltd.: *See—*
  - Fukuyama, Yoshinobu, 3,970,015.
- Takeda Chemical Industries, Ltd.: *See—*
  - Sasajima, Ken-ichi; Doi, Muneharu; Fukuhara, Teruo; Yokota, Akira; Nakao, Yoshio; and Yoneda, Masahiko, 3,970,522.
- Takeda Riken Kogyo Kabushiki Kaisha: *See—*
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- Takenaka, Shigeo: *See—*
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- Taketa, Tsuneyoshi: *See—*
  - Matsui, Goro; Toda, Koji; Horiishi, Nanao; Wakimoto, Kazuyoshi; Nishiyama, Yoshifumi; Taketa, Tsuneyoshi; and Takama, Kazushi, 3,970,738.
- Takeuchi, Norio, to Director-General of the Agency of Industrial Science and Technology. Method for producing hydrogen from water. 3,970,745, Cl. 423-657.000.
- Takizawa, Jun; Oshima, Kazuyuki; Yamamoto, Hikaru; Kuribayashi, Kooji; and Suzuki, Toshio, to Nippon Telegraph and Telephone Public Corporation; Fujikura Cable Works, Ltd., The; Furukawa Electric Co., Ltd., The; and Sumitomo Electric Industries, Ltd. Core wire-connecting device. 3,969,807, Cl. 29-203.0DT.
- Tamir, David; and Erlicki, Michael S., to Technion Research and Development Foundation Ltd. Detector and apparatus incorporating the same for detecting phase-asymmetry and protecting three-phase motors against dangerous operating conditions. 3,970,897, Cl. 317-13.00R.
- Tanaka, Hiroshi: *See—*
  - Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, 3,971,043.
- Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Process for developing a direct reversal silver halide photographic light-sensitive material. 3,970,459, Cl. 96-64.000.
- Taniguchi, Takuzo: *See—*
  - Kano, Saburo; Nomura, Osami; Asada, Mitsuo; Ando, Meiki; Matsuda, Michihiko; Yamada, Tomio; Watanabe, Hitoshi; and Taniguchi, Takuzo, 3,970,751.
- Tanner, Jimmy D., to Arundale, Inc. Appliance foot with secure resilient pad. 3,970,273, Cl. 248-24.000.
- Tanney, John W., to Canadian Patents and Development Limited. Apparatus for measuring the velocity and/or density of a fluid stream. 3,969,938, Cl. 73-189.000.
- Taylor, Brian W.; and Swift, Harold E., to B. F. Goodrich Company, The. Preparation of unsaturated ethers. 3,970,705, Cl. 260-614.00R.
- Taylor, Lynn J., to Owens-Illinois, Inc. Low melting liquid-crystal mixtures. 3,970,579, Cl. 252-299.000.
- Taylor, Richard H.: *See—*
  - Mendrin, Michael J.; and Taylor, Richard H., 3,970,389.
- Taylor, Ronald W.: *See—*
  - Bates, Wayne J.; Berenson, Walter L.; Euchner, William H., Jr.; Grigg, James H.; Stern, Morton; and Taylor, Ronald W., 3,970,937.
- Taylor, William F.; and Lieberman, Martin, to Exxon Research and Engineering Company. Catalyst for hydrazine decomposition. 3,970,588, Cl. 252-459.000.
- Teague, Jimmie C.: *See—*
  - Kiehl, William C.; Moore, Thomas F.; and Teague, Jimmie C., 3,970,182.
- Technion Research and Development Foundation Ltd.: *See—*
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- Tecotzky, Melvin: *See—*
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- Tepfer, Barry. Sales slip wallet. 3,970,129, Cl. 150-39.000.
- Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, to Director-General of the Agency of Industrial Science and Technology. Heavy metal adsorbent process. 3,970,553, Cl. 210-36.000.
- Teramoto, Toyokazu: *See—*
  - Yamada, Takeo; Kunioka, Kazuo; and Teramoto, Toyokazu, 3,970,291.
- Tessler, Martin M.; and Jarowenko, Wadym, to National Starch and Chemical Corporation. Retort starches products prepared from blends of starch and high amylose starch components. 3,970,767, Cl. 426-579.000.
- Texaco Inc.: *See—*
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  - McIntosh, Herbert A., 3,970,543.
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  - Leuschner, Horst, 3,970,941.
  - Leuschner, Horst, 3,971,060.
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- Th. Kieserling & Albrecht: *See—*
  - Goeke, Alfons, 3,969,919.
- Theodore, Michael J.; Paterson, Malcolm M.; and Schrimper, Vernon L., to Raytheon Company. Air classification apparatus. 3,970,547, Cl. 209-136.000.
- Thettu, Raghulinga R., to Xerox Corporation. Roll fuser. 3,970,038, Cl. 118-60.000.
- Thiele, Siegfried, to Wilhelm Altendorf, Maschinenbau. Machine tool workpiece feed carriage. 3,970,127, Cl. 144-242.00R.
- Thimot, George W., to Hudson Lock, Inc. Method and apparatus for handling coiled springs. 3,970,214, Cl. 221-1.000.
- Thomas, Herbert: *See—*
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- Thomson-CSF: *See—*
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- Timpe, Wolfgang: *See—*
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- Toda, Kikuo, to Nippon Educational Television Company, Ltd. Special effect generation system in an image pickup system. 3,971,066, Cl. 358-55.000.
- Toda Kogyo Corporation: *See—*
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  - Suzuki, Takeshi; Takenaka, Shigeo; Tanaka, Hiroshi; and Akiyama, Masanori, 3,971,043.
- Toman, Donald J., to Tull Aviation Corporation. Multiple beam glide slope radio navigation method with two classes of beams. 3,971,026, Cl. 343-108.00M.
- Tomita, Shigeru: *See—*
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- Tomy Kogyo Co., Inc.: *See—*
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- Toyo Boseki KK: *See—*
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- Toyo Boseki Kabushiki Kaisha: *See—*
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- Trattner, Hermann, to Siemens Aktiengesellschaft. Tungsten-thorium dioxide-aluminum oxide mass for a high-temperature-resistant emission electrode and process for the production thereof. 3,970,888, Cl. 313-346.00R.
- Trekoval, Jiri: *See—*
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- Troiano, Joseph. Fuel saving device. 3,970,142, Cl. 165-163.000.
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- Tsuchida, Takayasu; Momose, Haruo; and Hirose, Yoshio, to Ajinomoto Co., Inc. Process for producing L-leucine. 3,970,519, Cl. 195-29.000.
- Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Zoom lens system. 3,970,367, Cl. 350-184.000.
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- Tsukasaki, Hidaka; and Inoue, Tetsuya, to Nippondenso Co., Ltd. Revolution control circuit for internal combustion engine. 3,970,058, Cl. 123-102.000.
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- Tuley, Eugene N., to General Electric Company. Sealing means for a segmented ring. 3,970,318, Cl. 277-26.000.
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- Uerlichs, Johannes; Muller, Rudolf; and Stolberg, Hermann-Josef, to Hermann Rappold & Co. GmbH. Shutoff and control slide. 3,970,109, Cl. 137-601.000.
- Uffman, Leroy E. Rotary cutter. 3,970,407, Cl. 408-204.000.
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- Van Diepenbroek, Alfred Erich Wibrandt; Wormgoor, Jan Hendrik; and Schilperoort, Cornelis, to Bronswerk Apparatenbouw B.V. Electric Dust Separator. 3,970,437, Cl. 55-127.000.
- Vanhoof, Pierre M., to A. Christiaens Societe Anonyme. Derivatives of tetralone and the preparation thereof. 3,970,650, Cl. 260-240.00B.
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- Venker, Hilrich Jan Matthijs, to Compagnie Honeywell Bull (Societe Anonyme). Printing actuator. 3,969,998, Cl. 101-93.480.
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- Veuilleumier, Cyril; Triponez, Andre; Schindler, Jean-Pierre; and Schwab, Michel. Driving mechanism for day-date calendar device. 3,969,888, Cl. 58-58.000.
- Vian, Joel Dimas, to Rich, Joseph, Jr.; and Alvarez, Adolf, part interest to each. Variable rate opposing rotational mixer and feeder. 3,970,289, Cl. 259-103.000.
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- Virr, Michael John; and Elliott, Douglas Ernest, to Fluidfire Development Limited. Combustion with fluidizable bed. 3,970,011, Cl. 110-8.00F.
- Vitale, Joseph, to Perfect Fit Industries, Inc. Apparatus for simultaneously cutting, sealing and stitching thermoplastic material. 3,970,509, Cl. 156-580.000.
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- Voellmy, Hans Rudolf; and Gahwiler, Hermann, to Contraves AG. Apparatus for measuring a volume of liquid and method of operating said apparatus. 3,970,097, Cl. 137-1.000.
- Voight, John E.; Bovier, Edward M.; and Liebman, Clarence J., to Anheuser-Busch, Incorporated. Method for making corrugating adhesives with flexographic press waste water. 3,970,467, Cl. 106-213.000.
- Volk, Joseph A., Jr., to Beta Corporation of St. Louis. Electric heater. 3,970,823, Cl. 219-546.000.
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- von Wendt, Karl Freiherr; and Becker, Klaus, to Demag Aktiengesellschaft. Recreational facility slide. 3,970,300, Cl. 272-56.50R.
- von Wolffradt, Carl, to von Wolffradt, Carl. Nozzle apparatus for a conveyor belt system. 3,970,192, Cl. 198-230.000.
- Vorbruggen, Helmut: *See—*
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- Voss, Andrew P.: *See—*
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- W. R. Grace & Co.: *See—*
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  - Lowther, Frank Eugene, 3,970,567.
- Wachsman, Phyllis. Corrective makeup and employing prescription lenses. 3,970,369, Cl. 350-202.000.
- Wada, Hirobumi: *See—*
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- Wahler, Hans: *See—*
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- Wakabayashi, Tetsu: *See—*
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- Walinga, Jacob: *See—*
  - Brongersma, Hidde Herman; and Walinga, Jacob, 3,970,849.

Walker, Peter James; and Albinson, Michael Peter, to Acoustical Manufacturing Company Limited, The. Distortion-free amplifiers. 3,970,953, Cl. 330-99.000.
Walker, Philip A.; and Walther, Karl G., to Krautkramer-Branson, Incorporated. Alignment of ultrasonic transducer probe in pulse-echo testing. 3,969,926, Cl. 73-67.80S.
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Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkyl-3(or 3,5)-N-heterocyclic pyrazolium salts of derivatives thereof as fungicidal agents. 3,970,754, Cl. 424-267.000.
Wang, Shyh; and Sheem, Sang K., to University of California, The Regents of the. Two dimensional distributed feedback devices and lasers. 3,970,959, Cl. 331-94.50C.
Warmka, Gary Paul; and Hill, James Dan, to Control Data Corporation. Recording surface substrate. 3,970,433, Cl. 29-194.000.
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Wentworth, Gary, to Monsanto Company. Method for recovering vinyl sulfonate monomers. 3,970,605, Cl. 260-79.30M.
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- Zellmer, Neale A., to GTE Automatic Electric Laboratories Incorporated. Negative DC to positive DC converter. 3,970,871, Cl. 307-262.000.
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- Ziegler, Charles J.: *See—*
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- Ziegler, Moses. Portable electric light device. 3,969,839, Cl. 43-17.600.
- Zimmer, Erich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of making spherical metallic oxide and metallic carbide particles. 3,970,580, Cl. 252-301.10S.
- Zimmer, Peter. Dyestuff applicator for screen printer. 3,969,999, Cl. 101-120.000.
- Zimmerman, Thomas H.: *See—*
  - Clark, Samuel A., Jr.; Lucey, George K., Jr.; and Zimmerman, Thomas H., 3,971,024.
- Zirngiebl, Eberhard; and Irlenkauser, Alfred, to Bayer Aktiengesellschaft. Process for the purification of electrolysis brine. 3,970,528, Cl. 204-98.000.
- Zoecon Corporation: *See—*
  - Henrick, Clive A.; and Siddall, John B., 3,970,704.
- Zurheide, Manfred: *See—*
  - Dahmen, Manfred; Ritzhaupt, Anneliese; and Zurheide, Manfred, 3,970,487.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Automated Building Components, Inc.: *See—*
  - Jureit, John Calvin, Re. 28,908.
- BRK Shareholders' Committee: *See—*
  - Ogden, Wilbur L.; and Henderson, Clarence Glenn, Re. 28,915.
- Broken Hill Proprietary Company Limited, The: *See—*
  - Dalli, Alan George; Debenham, Michael; and Schackleford, Ralph Edward, Re. 28,910.
- Bump, Edward L.: *See—*
  - Jespersen, Paul W.; and Bump, Edward L., Re. 28,911.
- Cincinnati Milacron, Inc.: *See—*
  - Kelly, Ralph; and Ritter, Edmond Jean, Re. 28,913.
- Dalli, Alan George; Debenham, Michael; and Schackleford, Ralph Edward, to Broken Hill Proprietary Company Limited, The. Push-in easy-opening closures. Re. 28,910, Cl. 113-121.00C.
- Debenham, Michael: *See—*
  - Dalli, Alan George; Debenham, Michael; and Schackleford, Ralph Edward, Re. 28,910.
- Deering Milliken Research Corporation: *See—*
  - Marco, Francis W., Re. 28,914.
- Eibes, Carl B. H., deceased; by Eibes nee Waschau, Ursula, legal heir; by Eibes, Christian, legal heir; by Eibes, Carl-Herwig, legal heir; and by Wagner nee Eibes, Maria-Theresia, legal heir. Self-tapping threaded bushings. Re. 28,907, Cl. 85-47.000.
- Eibes, Carl-Herwig, legal heir: *See—*
  - Eibes, Carl B. H., deceased; Eibes nee Waschau, Ursula, legal heir; Eibes, Christian, legal heir; Eibes, Carl-Herwig, legal heir; and Wagner nee Eibes, Maria-Theresia, legal heir, Re. 28,907.
- Eibes, Christian, legal heir: *See—*
  - Eibes, Carl B. H., deceased; Eibes nee Waschau, Ursula, legal heir; Eibes, Christian, legal heir; Eibes, Carl-Herwig, legal heir; and Wagner nee Eibes, Maria-Theresia, legal heir, Re. 28,907.
- Eibes nee Waschau, Ursula, legal heir: *See—*
  - Eibes, Carl B. H., deceased; Eibes nee Waschau, Ursula, legal heir; Eibes, Christian, legal heir; Eibes, Carl-Herwig, legal heir; and Wagner nee Eibes, Maria-Theresia, legal heir, Re. 28,907.
- Georgia-Pacific Corporation: *See—*
  - Jespersen, Paul W.; and Bump, Edward L., Re. 28,911.
- Henderson, Clarence Glenn: *See—*
  - Ogden, Wilbur L.; and Henderson, Clarence Glenn, Re. 28,915.
- Hoglund, Edward: *See—*
  - Stade, Bertil; and Hoglund, Edward, Re. 28,912.
- Holbert, Dimitry, to Standard Alliance Industries, Inc. Conveyor. Re. 28,909, Cl. 104-172.00B.
- Indian Head Inc.: *See—*
  - McKinney, Donald W.; and Sinski, Henry A., Re. 28,906.
- Jespersen, Paul W.; and Bump, Edward L., to Georgia-Pacific Corporation. Dispenser for flexible sheet material and a perforating mechanism adapted to be used therein. Re. 28,911, Cl. 225-96.000.
- Jureit, John Calvin, to Automated Building Components, Inc. Fluid actuated press. Re. 28,908, Cl. 100-100.000.
- Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron; Inc. Mildness additive. Re. 28,913, Cl. 252-547.000.
- Marco, Francis W., to Deering Milliken Research Corporation. Treatment of a cellulosic-containing textile with a fluorocarbon, an aminoplast, and a synthetic acid copolymer, and textile obtained therefrom. Re. 28,914, Cl. 428-272.000.
- McKinney, Donald W.; and Sinski, Henry A., to Indian Head Inc. Crimping apparatus with heating and cooling cage. Re. 28,906, Cl. 28-1.700.
- Mercury Metal Products, Inc.: *See—*
  - Stade, Bertil; and Hoglund, Edward, Re. 28,912.
- Ogden, Wilbur L.; and Henderson, Clarence Glenn, to BRK Shareholders' Committee. Detection of products of combustion. Re. 28,915, Cl. 340-237.00S.
- Ritter, Edmond Jean: *See—*
  - Kelly, Ralph; and Ritter, Edmond Jean, Re. 28,913.
- Schackleford, Ralph Edward: *See—*
  - Dalli, Alan George; Debenham, Michael; and Schackleford, Ralph Edward, Re. 28,910.
- Sinski, Henry A.: *See—*
  - McKinney, Donald W.; and Sinski, Henry A., Re. 28,906.
- Stade, Bertil; and Hoglund, Edward, to Mercury Metal Products, Inc. Emission-free exhaust pipe joint and clamp therefor. Re. 28,912, Cl. 285-367.000.
- Standard Alliance Industries, Inc.: *See—*
  - Holbert, Dimitry, Re. 28,909.
- Wagner nee Eibes, Maria-Theresia, legal heir: *See—*
  - Eibes, Carl B. H., deceased; Eibes nee Waschau, Ursula, legal heir; Eibes, Christian, legal heir; Eibes, Carl-Herwig, legal heir; and Wagner nee Eibes, Maria-Theresia, legal heir, Re. 28,907.

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- Jackson & Perkins Co.: *See—*
  - Warriner, William A. 3,937.
- Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,937, 7–20–76, Cl. 29.

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- Abbott Laboratories: *See—*
  - D'Alo, Herbert F. 240,668.
- Acorn Engineering: *See—*
  - Morris, Earl L. 240,627.
- Adee, Ray A.: *See—*
  - White, Allen A., Adee, Knopp, and White. 240,648.
- Advent Corp.: *See—*
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- American Greetings Corp.: *See—*
  - Bower, John. 240,579.
- Araki, Minol, to Yorx Corp. Combined phonograph, radio and cartridge recorder and player. 240,659, 7–20–76, Cl. D56—4.
- Armco Steel Corp.: *See—*
  - Baker, William J. 240,626.
- Anderson, Frank R., and A. J. Castro, to Westates Space-Era Products, Inc. Flushing valve for an irrigation system. 240,625, 7–20–76, Cl. D23—19.
- Ashworth, Theodore L. Wrist watch strap. 240,649, 7–20–76, Cl. D45—4.
- Baker, William J., to Armco Steel Corp. Ball valve. 240,626, 7–20–76, Cl. D23—19.
- Bartley, Francis A.: *See—*
  - Thomas, Richard L., Lewis, Bartley, Myers, and Goodbary. 240,613.
- Becker, Harry C. Weight. 240,612, 7–20–76, Cl. D10—94.
- Bevelacqua, Philip K.: *See—*
  - Ostborg, Jan N., Bevelacqua, and Hirsch. 240,581.
- Bohomoletz, Michael. Stand for potted plants and the like. 240,583, 7–20–76, Cl. D6—183.
- Bower, John, to American Greetings Corp. Storage cabinet for magnetic tapes or other similar articles. 240,579, 7–20–76, Cl. D6—149.
- Brion, Mary L. Quilted fabric applique block. 240,573, 7–20–76, Cl. D33—9.
- Brown, Frank E., to Smithkline Corp. Metered dispensing container. 240,596, 7–20–76, Cl. D9—169.
- Bussey, Harry, Jr. Loose fill packing element. 240,603, 7–20–76, Cl. D9—294.
- Bussey, Harry, Jr. Loose fill packing element. 240,604, 7–20–76, Cl. D9—294.
- Capehart Corp.: *See—*
  - Kaye, Leonard. 240,660.
- Carbon, Fred S. Waffle baker or similar article. 240,586, 7–20–76, Cl. D7—88.
- Carter, Ronald D.: *See—*
  - Hobden, Nigel M., Freivokh, Taylor, Carter, and Gale. 240,638.
- Castro, Albert J.: *See—*
  - Anderson, Frank R., and Castro. 240,625.
- Chance, A. B., Co.: *See—*
  - Haubein, Harold D. 240,636.
- Clark, Robert E., and A. G. Harris, to Electronic Data Controls Corp. Burial vault liner. 240,640, 7–20–76, Cl. D31—1.
- Cless, Gerhard: *See—*
  - Kaplan, Edward L., and Cless. 240,585.
- Colgate-Palmolive Co.: *See—*
  - Koenigsberg, Victor. 240,592.
  - Koenigsberg, Victor. 240,593.
  - Koenigsberg, Victor. 240,594.

- Continental Can Co., Inc. : *See—*
  - Newman, Fred C. 240,601.
  - Newman, Fred C. 240,602.
- Cooper, Lonnie D., to Revell, Inc. Rotatable locking joint. 240,589, 7–20–76, Cl. D8—108.
- Cope, Raymond. Dental arm rest cabinet. 240,629, 7–20–76, Cl. D24—1.
- Covert, Douglas C., to Xerox Corp. Conductor educational board. 240,618, 7–20–76, Cl. D19—62.
- Cowan, Murray L., to Textron Inc. Expansible link chain for a bracelet or similar article. 240,650, 7–20–76, Cl. D45—4.
- Cowan, Murray L., to Textron Inc. Chain for a bracelet or similar article. 240,651, 7–20–76, Cl. D45—4.
- D'Alo, Herbert F., to Abbott Laboratories. Vacuum device for an expandable container. 240,668, 7–20–76, Cl. D83—1.
- Dobashi, Takaaki, and T. Kurokawa, to Fuji Electric Co., Ltd. Cash register. 240,654, 7–20–76, Cl. D52—4.
- Docutel Corp. of Dallas, Texas : *See—*
  - Haufler, Herbert H., Watson, and McCauley. 240,633.
- Duni Bila AB : *See—*
  - Persson, Karl R. 240,597.
- Eaton Corp. : *See—*
  - Meisner, Edward H. 240,590.
- Educational Design Associates : *See—*
  - Root, Charles B. 240,646.
  - Root, Charles B. 240,647.
- Eftekhar, Zia, to Lightolier Inc. Lighting fixture. 240,653, 7–20–76, Cl. D48—23.
- Electronic Data Controls Corp. : *See—*
  - Clark, Robert E., and Harris. 240,640.
- Franzen, Hans, and J. Lind, to Sandvik Aktiebolag. Abrader. 240,587, 7–20–76, Cl. D8—90.
- Franzen, Hans, and J. Lind, to Sandvik Aktiebolag. Abrader. 240,588, 7–20–76, Cl. D8—90.
- Freivokh, Kenneth : *See—*
  - Hobden, Nigel M., Freivokh, Taylor, Carter, and Gale. 240,638.
- Friedman, Ira, to Rowe Furniture Corp. Table. 240,582, 7–20–76, Cl. D6—177.
- Fuji Electric Co., Ltd. : *See—*
  - Dobashi, Takaaki, and Kurokawa. 240,654.
- Fujiwara, Tomio, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 240,661, 7–20–76, Cl. D56—4.
- Gale Electronics & Design Ltd. : *See—*
  - Hobden, Nigel M., Freivokh, Taylor, Carter, and Gale. 240,638.
- Gale, Ira D. : *See—*
  - Hobden, Nigel M., Freivokh, Taylor, Carter, and Gale. 240,638.
- Gasowski, Chester J., D. B. Granger, J. A. Hutz, and T. M. Ruip, to The Goodyear Tire & Rubber Co. Tire. 240,616, 7–20–76, Cl. D12—146.
- General Mills Fun Group, Inc. : *See—*
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- Goodbary Engineering Co. : *See—*
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- Goodwin, William J., to Pye Ltd. Medicine cabinet. 240,576, 7–20–76, Cl. D6—104.
- Goodyear Tire & Rubber Co., The : *See—*
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  - Kleeh, David C., Roberts, Hopkins, and Glenn. 240,615.
- Gottsegen, Marten. Portable bar. 240,578, 7–20–76, Cl. D6—144.
- Granger, Dennis B. : *See—*
  - Gasowski, Chester J., Granger, Hutz, and Ruip. 240,616.
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  - Kaplan, Edward L., and Cless. 240,585.
- Hall, Joseph G. Sauna. 240,667, 7–20–76, Cl. D83—1.
- Hamada, Masanori, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 240,663, 7–20–76, Cl. D56—4.
- Harris, Arlen G. : *See—*
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- Harvard Industries, Inc. : *See—*
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- Haubein, Harold D., to A. B. Chance Co. Encapsulated vacuum switch. 240,636, 7–20–76, Cl. D26—13.
- Haufler, Herbert H., T. P. Watson, and E. H. McCauley, to Docutel Corp. of Dallas, Texas. Banking machine terminal. 240,633, 7–20–76, Cl. D26—5.
- Haupt, Linda, to General Mills Fun Group, Inc. Doll. 240,641, 7–20–76, Cl. D34—4.
- Hazama, Shigetoshi, to Sharp Kabushiki Kaisha. Electronic calculating machine. 240,634, 7–20–76, Cl. D26—5.
- Hesston Corp. : *See—*
  - White, Allen A., Adee, Knopp, and White. 240,648.
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- Hobden, Nigel M., K. Freivokh, M. Taylor, R. D. Carter, and I. D. Gale, to Gale Electronics & Design Ltd. Record turntable unit. 240,638, 7–20–76, Cl. D20—14.
- Holcomb, Jack N., to National Intelligence Academy. Battery overload educational board. 240,619, 7–20–76, Cl. D19—64.
- Holcomb, Jack N., to National Intelligence Academy. Audiofilter educational board. 240,620, 7–20–76, Cl. D19—64.
- Hopkins, William M. : *See—*
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- Hoshino, Kunio, and B. Mishiro, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 240,662, 7–20–76, Cl. D56—4.
- Houser, Philip M. Combined clip board and timer. 240,621, 7–20–76, Cl. D19—88.
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  - Gasowski, Chester J., Granger, Hutz, and Ruip. 240,616.
- Iami, Shogo, to Sharp Kabushiki Kaisha. Radio. 240,655, 7–20–76, Cl. D56—4.
- Iami, Shogo, to Sharp Kabushiki Kaisha. Clock radio. 240,656, 7–20–76, Cl. D56—4.
- Isaacs, Harold. Stud setter. 240,598, 7–20–76, Cl. D8—47.
- Kalvitis, Robert E., and D. A. Robertson, to Xerox Corp. Cabinet for electronic equipment. 240,632, 7–20–76, Cl. D26—5.
- Kaplan, Edward L., and G. Cless, to Kenneth H. Gutner. Guide for a drawer. 240,585, 7–20–76, Cl. D6—191.
- Kapustin, Alexander T. Heating stove. 240,628, 7–20–76, Cl. D23—93.
- Karna, Ester C. Knitted slipper. 240,570, 7–20–76, Cl. D2—282.
- Kaye, Leonard, to Capehart Corp. Combined phonograph and cartridge player. 240,660, 7–20–76, Cl. D56—4.
- Kleeh, David C., C. W. Roberts, W. M. Hopkins, and J. D. Glenn, to The Goodyear Tire & Rubber Co. Tire. 240,615, 7–20–76, Cl. D12—142.
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- Koenigsberg, Victor, to Colgate-Palmolive Co. Bottle. 240,592, 7–20–76, Cl. D9—61.
- Koenigsberg, Victor, to Colgate-Palmolive Co. Bottle. 240,593, 7–20–76, Cl. D9—116.
- Koenigsberg, Victor, to Colgate-Palmolive Co. Bottle. 240,594, 7–20–76, Cl. D9—143.
- Kramer, Jochen, C. Prochnow, and R. Sobotta, to Rollei-Werke Franke & Heidecke. Sound projector. 240,665, 7–20–76, Cl. D16—21.
- Kress, Elmer E. Container closure. 240,595, 7–20–76, Cl. D9—164.
- Kretz, Edward J., to Owens-Illinois, Inc. Jar. 240,591, 7–20–76, Cl. D9—1.
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- Lang, Roger D., P. J. Thomas, and J. A. McAllister. Interconnecting member for electrically and mechanically connecting the display board of a microelectronic calculator to the main logic circuit board thereof. 240,631, 7–20–76, Cl. D26—1.
- Lee, Richard E. : *See—*
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  - Franzen, Hans, and Lind. 240,588.
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- Magnusson, Alf B., to Bengt Petersson New Products Investment AB. Ashtray lining. 240,639, 7–20–76, Cl. D27—8.
- Manfrin, James J. Golf putter head. 240,642, 7–20–76, Cl. D34—5.
- Manfrin, James J. Golf putter head. 240,643, 7–20–76, Cl. D34—5.
- Manfrin, James J. Golf putter head. 240,644, 7–20–76, Cl. D34—5.
- Matsushita Electric Industrial Co., Ltd. : *See—*
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- Matsutani, Toshinobu, to Sharp Kabushiki Kaisha. Silicon solar cell. 240,630, 7–20–76, Cl. D26—1.
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  - McClellan, Bingham A. 240,623.
- McGrann, John. Shelf unit or similar article. 240,584, 7–20–76, Cl. D6—186.
- McTear, James R. Baseball glove. 240,571, 7–20–76, Cl. D2—361.
- Meisner, Edward H., to Eaton Corp. Padlock. 240,590, 7–20–76, Cl. D8—114.
- Mishiro, Benito : *See—*
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- Newman, Fred C., to Continental Can Co., Inc. Container end panel. 240,602, 7–20–76, Cl. D9—253.
- Newman, Fred D. Support for garden tools or the like. 240,577, 7–20–76, Cl. D6—114.
- O'Neil, Robert A., to The Seeburg Corp. of Delaware. Speaker cabinet. 240,637, 7–20–76, Cl. D26—14.
- Ostborg, Jan N., P. K. Bevelacqua, and R. L. Hirsch, to Harvard Industries, Inc. Work station. 240,581, 7–20–76, Cl. D6—161.
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- Paterno, Samuel, to Paterno Enterprises. Refuse can storage unit. 240,614, 7–20–76, Cl. D12—33.
- Persson, Karl R., to Duni Bila AB. Combined packaging tray and cover. 240,597, 7–20–76, Cl. D9—219.
- Peterson, Thomas A., to Monarch Marking Systems, Inc. Hand-held optical code scanner or similar article. 240,635, 7–20–76, Cl. D26—5.
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- Podell, George W., to Monarch Metal Products, Inc. Work table or similar article. 240,580, 7–20–76, Cl. D6—150.
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- Root, Charles B., to Educational Design Associates. Worm puzzle toy. 240,647, 7–20–76, Cl. D34—15.
- Rowe Furniture Corp. : *See—*
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  - Franzen, Hans, and Lind. 240,588.
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- Schwartz, Edwin L., to Rite Autotronics Corp. Combined engine analyzer and timing light. 240,610, 7–20–76, Cl. D10—78.
- Schwartz, Edwin L., to Rite Autotronics Corp. Combined tachometer, advance meter and timing light. 240,611, 7–20–76, Cl. D10—78.
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- Sugawara, Yutaka, to Superscope, Inc. Combined radio, cassette recorder and speakers. 240,657, 7–20–76, Cl. D56—4.
- Superscope, Inc. : *See—*
  - Sugawara, Yutaka. 240,657.
- Svensson, A. F. R. Building. 240,617, 7–20–76, Cl. D25—10.
- Takacs, Donald K., to Richardson-Merrell Inc. Hinged box. 240,600, 7–20–76, Cl. D9—231.
- Taylor, Michael : *See—*
  - Hobden, Nigel M., Freivokh, Taylor, Carter, and Gale. 240,638.
- Textron Inc. : *See—*
  - Cowan, Murray L. 240,650.
  - Cowan, Murray L. 240,651.
- Thermoptics, Inc. : *See—*
  - Riley, Neil R. 240,607.
- Thomas, Philip J. : *See—*
  - Lang, Roger D., Thomas, and McAllister. 240,631.
- Thomas, Richard L., B. M. Lewis, F. A. Bartley, W. I. Myers, and E. R. Goodbary, to Goodbary Engineering Co. Material hauling and dumping vehicle. 240,613, 7–20–76, Cl. D12—15.
- Thornton, Kenneth E. Indexing tab. 240,622, 7–20–76, Cl. D19—99.
- Watson, Tandy P. : *See—*
  - Haufler, Herbert H., Watson, and McCauley. 240,633.
- Westates Space-Era Products, Inc. : *See—*
  - Anderson, Frank R., and Castro. 240,625.
- White, Allen A., R. A. Adee, R. H. Knopp, and B. L. White, to Hesston Corp. Machine for processing crop stacks. 240,648, 7–20–76, Cl. D40—1.
- White, Bruce L. : *See—*
  - White, Allen A., Adee, Knopp, and White. 240,648.
- Wilson, Wilfred W. Light diffuser. 240,652, 7–20–76, Cl. D48—16.
- Winslow, Reynolds B., and R. E. Lee. Large screen television projector. 240,666, 7–20–76, Cl. D56—4.
- Worsham, Paul E. Carry all pounch. 240,572, 7–20–76, Cl. D2—400.
- Xerox Corp. : *See—*
  - Covert, Douglas C. 240,618.
  - Kalvitis, Robert E., and Robertson. 240,632.
- Yorx Corp. : *See—*
  - Araki, Minol. 240,659.

CLASSIFICATION OF PATENTS

ISSUED JULY 20, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
79	3,969,772
CLASS 3	
1.911	3,969,773
CLASS 4	
41	3,969,774
67A	3,969,775
172	3,969,776
172.17	3,969,777
254	3,969,778
CLASS 8	
8	3,970,422
10.2	3,970,423
149	3,969,779
149.1	3,969,780
185	3,970,424
195	3,970,425
CLASS 9	
8P	3,969,781
CLASS 15	
53AB	3,969,782
250.04	3,969,783
250.42	3,969,784
301	3,969,785
CLASS 16	
86A	3,969,786
129	3,969,787
144	3,969,788
145	3,969,789
CLASS 17	
11.1R	3,969,790
CLASS 21	
54R	3,970,426
CLASS 23	
230EP	3,970,428
230B	3,970,427
230.6	3,970,429
232E	3,970,431
232R	3,970,430
270.5T	3,970,432
CLASS 24	
56	3,969,791
74A	3,969,792
84B	3,969,793
203AL	3,969,795
205.11F	3,969,794
270	3,969,796
CLASS 26	
15R	3,969,797
CLASS 27	
4	3,969,798
CLASS 28	
1.4	3,969,799
1.7	Re.28,906
71.3	3,969,800
CLASS 29	
116AD	3,969,801
121R	3,969,802
149.5C	3,969,803
156.4R	3,969,804
156.8R	3,969,805
194	3,970,433
203DS	3,969,806
203DT	3,969,807
208D	3,969,808
243.5	3,969,809
407	3,969,810
417	3,969,811
421R	3,969,812
575	3,969,813
600	3,969,814
625	3,969,815
	3,969,816
CLASS 30	
41	3,969,817
90.1	3,969,818
200	3,969,819
CLASS 32	
11	3,969,820
14A	3,969,821
27	3,969,822
	3,969,823
69	3,969,824
CLASS 33	
180R	3,969,825
184.5	3,969,826
255	3,969,827
CLASS 34	
14	3,969,828
93	3,969,829
CLASS 35	
2	3,969,830
8A	3,969,831
75	3,969,832
CLASS 36	
117	3,969,833
CLASS 37	
58	3,969,834
129	3,969,835
CLASS 40	
21C	3,969,836
126R	3,969,837
140	3,969,838
CLASS 43	
17.6	3,969,839
42.06	3,969,840
CLASS 44	
1F	3,970,434
CLASS 46	
268	3,969,841
CLASS 47	
2	3,969,842
6	3,969,843
58	3,969,844
CLASS 48	
61	3,970,435
76	3,970,436
CLASS 49	
394	3,969,845
504	3,969,846
CLASS 51	
141	3,969,848
268	3,969,856
CLASS 52	
1	3,969,847
28	3,969,849
97	3,969,850
98	3,969,851
155	3,969,852
156	3,969,853
163	3,969,854
177	3,969,855
208	3,969,857
232	3,969,858
233	3,969,859
261	3,969,860
309	3,969,861
404	3,969,862
407	3,969,863
475	3,969,864
483	3,969,865
588	3,969,866
622	3,969,868
633	3,969,867
639	3,969,869
645	3,969,870
721	3,969,871
745	3,969,872
CLASS 53	
134	3,969,873
183	3,969,874
CLASS 55	
127	3,970,437
190	3,970,438
306	3,970,439
501	3,970,440
CLASS 56	
10.2	3,969,875
202	3,969,876
256	3,969,877
328R	3,969,878
341	3,969,879
CLASS 57	
6	3,969,880
24	3,969,881
35	3,969,882
58.54	3,969,884
77.4	3,969,883
157R	3,969,885
CLASS 58	
23R	3,969,886
50R	3,969,887
58	3,969,888
CLASS 59	
8	3,969,889
CLASS 60	
39.15	3,969,890
39.18B	3,969,891
39.51R	3,969,892
282	3,969,893
307	3,969,894
312	3,969,895
431	3,969,896
456	3,969,897
534	3,969,898
670	3,969,899
CLASS 61	
4	3,969,900
5	3,969,901
35	3,969,902
70	3,969,903
85	3,969,906
106	3,969,904
111	3,969,905
CLASS 62	
6	3,969,907
28	3,970,441
74	3,969,908
179	3,969,909
CLASS 65	
32	3,970,442
CLASS 66	
50R	3,969,910
95	3,969,911
154A	3,969,912
CLASS 68	
143	3,969,913
CLASS 70	
234	3,969,914
364R	3,969,915
CLASS 71	
94	3,970,443
CLASS 72	
56	3,969,916
69	3,969,917
337	3,969,918
405	3,969,919
415	3,969,920
453	3,969,921
CLASS 73	
35	3,969,922
40.5R	3,969,923
46	3,969,924
61R	3,969,925
67.8S	3,969,926
71.4	3,969,927
88E	3,969,929
88R	3,969,928
91	3,969,930
117.1	3,969,931
118	3,969,932
133R	3,969,933
139	3,970,155
141A	3,969,934
	3,969,935
146.8	3,969,936
151	3,969,937
189	3,969,938
194M	3,969,939
253	3,969,940
290R	3,969,941
302	3,969,942
355EM	3,969,943
516LM	3,969,944
CLASS 74	
128	3,969,945
230.5	3,969,946
243R	3,969,947
244	3,969,948
255R	3,969,949
391	3,969,950
473SW	3,969,951
501M	3,969,952
560	3,969,953
569	3,969,954
613	3,969,955
665GD	3,969,956
687	3,969,957
	3,969,958
CLASS 75	
.5B	3,970,445
46	3,970,444
60	3,970,446
124	3,970,447
129	3,970,448
170	3,970,449
172R	3,970,450
173R	3,970,451
CLASS 81	
3R	3,969,959
52.4R	3,969,960
	3,969,961
60	3,969,962
66A	3,969,963
310	3,969,964
CLASS 82	
3	3,969,965
CLASS 83	
340	3,969,966
435.2	3,969,967
CLASS 84	
1.01	3,969,968
1.26	3,969,969
177	3,969,970
274	3,969,971
464	3,969,972
474	3,969,973
CLASS 85	
45	3,969,974
47	Re.28,907
49	3,969,975
75	3,969,976
CLASS 89	
1.81	3,969,977
7	3,969,978
	3,969,979
33D	3,969,980
	3,969,981
178	3,969,982
185	3,969,983
CLASS 91	
276	3,969,984
317	3,969,987
416	3,969,985
492	3,969,986
CLASS 92	
19	3,969,988
85B	3,969,990
85R	3,969,989
99	3,969,991
CLASS 93	
1.1	3,969,992
93C	3,969,993
CLASS 96	
1R	3,970,452
1.4	3,970,453
29D	3,970,454
33	3,970,455
36.1	3,970,456
50R	3,970,457
55	3,970,458
64	3,970,459
91R	3,970,460
101	3,970,461
CLASS 99	
450.6	3,969,994
458	3,969,995
476	3,969,996
646S	3,969,997
CLASS 100	
100	Re.28,908
CLASS 101	
93.48	3,969,998
120	3,969,999
181	3,970,000
415.1	3,970,001
463	3,970,002
CLASS 102	
37.8	3,970,003
56SC	3,970,004
67	3,970,005
70.2P	3,970,007
105	3,970,006
CLASS 104	
162	3,970,008
172B	Re.28,909
CLASS 105	
164	3,970,009
CLASS 106	
38.35	3,970,462
39.7	3,970,463
47R	3,970,464
53	3,970,465
54	3,970,466
213	3,970,467
274	3,970,468
CLASS 109	
56	3,970,010
CLASS 110	
8F	3,970,011
CLASS 111	
6	3,970,012
CLASS 112	
67	3,970,013
121.11	3,970,014
121.12	3,970,015
	3,970,016
	3,970,017
206	3,970,018
245	3,970,019
252	3,970,020
262	3,970,021
265	3,970,022
CLASS 113	
1F	3,970,023
121C	Re.28,910
CLASS 114	
.5F	3,970,024
61	3,970,025
85	3,970,026
151	3,970,027
230	3,970,028
CLASS 115	
1R	3,970,029
12R	3,970,030
21	3,970,031
24.1	3,970,032
CLASS 116	
63P	3,970,033
124D	3,970,034
CLASS 118	
7	3,970,035
	3,970,036
48	3,970,037
60	3,970,038
	3,970,039
406	3,970,040
428	3,970,041
637	3,970,042
	3,970,043
CLASS 119	
18	3,970,044
20	3,970,045
103	3,970,046
CLASS 122	
13R	3,970,047
328	3,970,048
CLASS 123	
8.05	3,970,049
	3,970,050
8.09	3,970,051
25R	3,970,052
30D	3,970,053
32ST	3,970,054
43A	3,970,055
48D	3,970,056
51BA	3,970,057
102	3,970,058
103B	3,970,059
119A	3,970,061
119R	3,970,060
122AC	3,970,062
139AW	3,970,063
139ST	3,970,064
140CC	3,970,065
140A	3,970,066
CLASS 126	
120	3,970,067
263	3,970,068
271	3,970,069
	3,970,070
271.1	3,970,071
391	3,970,072
CLASS 127	
5	3,970,469
19	3,970,470
CLASS 128	
1.2	3,970,073
2H	3,970,074
20	3,970,075
24.5	3,970,076
33	3,970,077
57	3,970,078
78	3,970,079
82	3,970,080
95	3,970,081
152	3,970,082
166	3,970,083
214C	3,970,084
283	3,970,085
287	3,970,086
290H	3,970,087
303.14	3,970,088
348	3,970,089
349R	3,970,090
CLASS 131	
122	3,970,091
CLASS 132	
5	3,970,092
9	3,970,093
	3,970,094
39	3,970,095
CLASS 134	
6	3,970,471
CLASS 135	
14V	3,970,096
CLASS 136	
3	3,970,472
83R	3,970,473
86A	3,970,474
100R	3,970,475
103	3,970,476
107	3,970,477
133	3,970,478
	3,970,479
177	3,970,480
230	3,970,481
CLASS 137	
1	3,970,097
39	3,970,098
101.25	3,970,099
112	3,970,100
216	3,970,101
344	3,970,102
357	3,970,103
494	3,970,104
498	3,970,105
587	3,970,107
596.13	3,970,108
601	3,970,109
613	3,970,110
627.5	3,970,111
807	3,970,112
843	3,970,106
CLASS 138	
157	3,970,113
CLASS 139	
91	3,970,114
371	3,970,115
387R	3,970,116
CLASS 140	
93A	3,970,117
93C	3,970,118
CLASS 141	
1R	3,970,119
	3,970,120
2	3,970,121

349	3,970,122
351	3,970,123
CLASS 144	
3D	3,970,124
34R	3,970,125
208E	3,970,126
242R	3,970,127
245A	3,970,128
CLASS 148	
6.2	3,970,482
36	3,970,483
103	3,970,484
	3,970,485
187	3,970,486
	3,970,487
CLASS 150	
39	3,970,129
	3,970,130
CLASS 152	
185	3,970,131
233	3,970,132
353R	3,970,133
CLASS 156	
49	3,970,488
64	3,970,489
73.1	3,970,490
73.5	3,970,491
85	3,970,492
96	3,970,493
155	3,970,494
162	3,970,495
	3,970,496
182	3,970,497
211	3,970,498
227	3,970,499
305	3,970,500
	3,970,501
310	3,970,502
323	3,970,503
329	3,970,504
331	3,970,505
351	3,970,506
446	3,970,507
477R	3,970,508
580	3,970,509
CLASS 159	
6WH	3,970,510
13C	3,970,511
13R	3,970,512
CLASS 160	
133	3,970,134
CLASS 162	
272	3,970,513
303	3,970,514
360R	3,970,515
382	3,970,516
CLASS 164	
4	3,970,135
108	3,970,136
160	3,970,137
244	3,970,138
253	3,970,139
CLASS 165	
45	3,970,140
47	3,970,141
163	3,970,142
CLASS 166	
53	3,970,143
	3,970,144
188	3,970,145
249	3,970,146
250	3,970,147
307	3,970,148
CLASS 168	
25	3,970,149
CLASS 171	
56	3,970,150
CLASS 173	
12	3,970,151
15	3,970,152
17	3,970,153
24	3,970,154
CLASS 174	
53	3,970,772
CLASS 175	
6	3,970,156
22	3,970,157
410	3,970,158
CLASS 176	
66	3,970,517
CLASS 177	
123	3,970,159
CLASS 178	
5.8R	3,970,773
6	3,970,774
6.8	3,970,775
	3,970,776
7.1	3,970,777
	3,970,778
7.3R	3,970,779
	3,970,780
7.6	3,970,781
7.9	3,970,782
46	3,970,783
58A	3,970,784
CLASS 179	
1AT	3,970,787
1GQ	3,970,788
1HS	3,970,789
1VC	3,970,786
1N	3,970,785
1.5S	3,970,790
	3,970,791
2TV	3,970,792
7.1R	3,970,793
15AF	3,970,796
	3,970,798
15AQ	3,970,794
15AT	3,970,797
15BF	3,970,795
15BY	3,970,799
18AD	3,970,800
41A	3,970,801
98	3,970,802
100.3B	3,970,803
131	3,970,804
170NC	3,970,805
CLASS 180	
6.5	3,970,160
54A	3,970,161
64R	3,970,162
65A	3,970,163
68R	3,970,164
155	3,970,165
163	3,970,166
CLASS 181	
58	3,970,167
60	3,970,168
CLASS 182	
1	3,970,169
230	3,970,170
CLASS 187	
9E	3,970,171
CLASS 188	
73.4	3,970,172
203	3,970,173
251A	3,970,174
CLASS 192	
22	3,970,175
87.11	3,970,176
91A	3,970,177
105BA	3,970,178
138	3,970,179
CLASS 193	
35A	3,970,180
CLASS 194	
63	3,970,181
84	3,970,182
CLASS 195	
1.5	3,970,518
29	3,970,519
	3,970,520
63	3,970,521
112	3,970,522
CLASS 197	
1R	3,970,183
	3,970,184
9	3,970,185
54	3,970,186
CLASS 198	
16R	3,970,187
30	3,970,188
34	3,970,189
189	3,970,190
219	3,970,191
230	3,970,192
CLASS 200	
5R	3,970,806
34	3,970,807
50A	3,970,808
144B	3,970,809
	3,970,810
148A	3,970,811
307	3,970,812
CLASS 201	
1	3,970,523
2.5	3,970,524
CLASS 202	
174	3,970,525
227	3,970,526
CLASS 204	
9	3,970,527
98	3,970,528
129.9	3,970,529
149	3,970,531
158R	3,970,532
159.14	3,970,533
159.17	3,970,534
159.18	3,970,535
180R	3,970,536
211	3,970,537
224M	3,970,538
254	3,970,539
297W	3,970,540
CLASS 206	
104	3,970,193
228	3,970,194
380	3,970,195
CLASS 208	
8	3,970,541
22	3,970,542
86	3,970,543
111	3,970,544
212	3,970,545
CLASS 209	
3	3,970,546
136	3,970,547
240	3,970,548
341	3,970,549
399	3,970,550
458	3,970,551
CLASS 210	
19	3,970,552
36	3,970,553
62	3,970,554
80	3,970,555
83	3,970,556
130	3,970,557
138	3,970,558
166	3,970,559
167	3,970,560
198C	3,970,561
205	3,970,562
237	3,970,563
323R	3,970,564
359	3,970,565
452	3,970,566
CLASS 211	
5	3,970,196
	3,970,197
41	3,970,198
128	3,970,199
CLASS 214	
1BT	3,970,201
1H	3,970,200
6.5	3,970,202
85.1	3,970,203
339	3,970,204
652	3,970,205
CLASS 215	
11R	3,970,206
296	3,970,207
CLASS 219	
10.57	3,970,813
76	3,970,814
98	3,970,815
121LM	3,970,819
205	3,970,816
209	3,970,817
210	3,970,818
271	3,970,820
523	3,970,821
541	3,970,822
546	3,970,823
CLASS 220	
3	3,970,208
6	3,970,209
9LG	3,970,210
267	3,970,211
269	3,970,212
324	3,970,213
CLASS 221	
1	3,970,214
45	3,970,215
80	3,970,217
125	3,970,216
157	3,970,218
CLASS 222	
1	3,970,219
102	3,970,220
145	3,970,221
148	3,970,222
306	3,970,223
370	3,970,224
529	3,970,225
CLASS 223	
37	3,970,226
CLASS 224	
5H	3,970,228
5R	3,970,227
31	3,970,229
CLASS 225	
65	3,970,230
96	Re.28,911
CLASS 226	
7	3,970,231
CLASS 228	
	3,970,232
17.5	3,970,233
20	3,970,234
122	3,970,235
196	3,970,236
207	3,970,238
208	3,970,237
220	3,970,239
CLASS 229	
22	3,970,240
58	3,970,241
80	3,970,242
CLASS 233	
19R	3,970,243
22	3,970,244
24	3,970,245
CLASS 235	
61.11C	3,970,826
61.11E	3,970,825
61.11H	3,970,824
92TC	3,970,827
92T	3,970,828
150.22	3,970,829
151.1	3,970,831
151.11	3,970,830
151.3	3,970,832
175	3,970,833
CLASS 236	
44C	3,970,246
CLASS 237	
12.3B	3,970,247
CLASS 238	
349	3,970,248
CLASS 239	
102	3,970,249
	3,970,250
107	3,970,251
127.3	3,970,252
265.19	3,970,253
CLASS 240	
1.3	3,970,835
10Q	3,970,834
41R	3,970,836
52.15	3,970,837
CLASS 241	
1	3,970,254
186R	3,970,255
231	3,970,256
275	3,970,257
282.1	3,970,258
CLASS 242	
7.08	3,970,259
18DD	3,970,260
55	3,970,261
68.3	3,970,262
84.2A	3,970,263
96	3,970,264
107.4A	3,970,265
107.4R	3,970,266
115	3,970,267
	3,970,268
CLASS 244	
3.16	3,970,269
5	3,970,270
CLASS 246	
34R	3,970,271
CLASS 248	
9	3,970,272
24	3,970,273
185	3,970,274
223	3,970,275
	3,970,276
246	3,970,277
352	3,970,278
CLASS 249	
96	3,970,279
CLASS 250	
199	3,970,838
	3,970,839
201	3,970,841
	3,970,842
202	3,970,840
211J	3,970,843
213VT	3,970,844
214R	3,970,845
221	3,970,846
234	3,970,847
252	3,970,848
281	3,970,849
352	3,970,850
	3,970,851
363S	3,970,852
	3,970,853
492A	3,970,854
493	3,970,855
	3,970,856
533	3,970,567
563	3,970,857
CLASS 251	
58	3,970,280
77	3,970,281
129	3,970,282
144	3,970,283
149.9	3,970,284
214	3,970,285
CLASS 252	
48.6	3,970,568
49.3	3,970,569
49.9	3,970,570
62.1P	3,970,571
62.9	3,970,572
73	3,970,573
79	3,970,574
95	3,970,575
106	3,970,576
182	3,970,577
186	3,970,578
299	3,970,579
301.1R	3,970,581
301.1S	3,970,580
301.15	3,970,583
301.6S	3,970,582
305	3,970,584
316	3,970,585
355	3,970,586
417	3,970,587
459	3,970,588
466PT	3,970,589
514	3,970,590
521	3,970,591
522	3,970,592
	3,970,593
524	3,970,594
545	3,970,595
546	3,970,596
547	Re.28,913
CLASS 254	
134.3R	3,970,286
190R	3,970,287
CLASS 259	
7	3,970,288
103	3,970,289
CLASS 260	
2.5AD	3,970,618
2.5AN	3,970,619
2.5P	3,970,620
18EP	3,970,621
23XA	3,970,622
	3,970,644
27BB	3,970,623
28.5A	3,970,624
29.4R	3,970,625
29.6NR	3,970,628
29.6WB	3,970,626
29.6F	3,970,627
29.7T	3,970,629
30.2	3,970,630
31.6	3,970,631
42.21	3,970,632
42.29	3,970,633
45.7S	3,970,634
45.75N	3,970,638
45.8NE	3,970,636
45.8R	3,970,635
45.85A	3,970,639
45.9NC	3,970,637
47ET	3,970,640
72N	3,970,597
75S	3,970,598
77.5CH	3,970,599
77.5NC	3,970,600
77.5Q	3,970,601
78.41	3,970,602
79.3M	3,970,604
	3,970,605
123.7	3,970,614
145B	3,970,615
147	3,970,616
152	3,970,617
239.3D	3,970,645
239.55D	3,970,646
240A	3,970,648
240B	3,970,647
	3,970,650
240G	3,970,649
243C	3,970,651
244R	3,970,652
247.1E	3,970,653
251QB	3,970,654
290P	3,970,655
293.8	3,970,656
294.9	3,970,657
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295L	3,970,660
295.5A	3,970,661
	3,970,663
295.5R	3,970,662
296T	3,970,664
307DA	3,970,665
308B	3,970,667
308R	3,970,666
309.2	3,970,668
309.5	3,970,669
332.2A	3,970,670
335	3,970,671
340.5	3,970,672
343.3R	3,970,673
346.2R	3,970,674
364	3,970,675
397.2	3,970,676
404.5	3,970,677
429.7	3,970,678
	3,970,679
453SP	3,970,680
465F	3,970,681
468D	3,970,683
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468K	3,970,682
470	3,970,685
476C	3,970,686
482C	3,970,687
484R	3,970,688
488F	3,970,689
505C	3,970,690
507R	3,970,691
514D	3,970,692
515A	3,970,693
520C	3,970,694
524R	3,970,696
533R	3,970,697
534R	3,970,695
535P	3,970,698
562R	3,970,699
570.8R	3,970,700
601R	3,970,701
604R	3,970,702
611A	3,970,703
614R	3,970,704
	3,970,705
617F	3,970,706
620	3,970,707
624C	3,970,708
633	3,970,710
635C	3,970,712
635E	3,970,711
638R	3,970,713
683.62	3,970,720
683.63	3,970,721
827	3,970,709
857PE	3,970,714
859R	3,970,715
	3,970,716
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876R	3,970,718
878B	3,970,719
878R	3,970,722
880R	3,970,723
894	3,970,724
901	3,970,725
927R	3,970,726
932	3,970,727
949	3,970,728
978	3,970,729
CLASS 261	
41D	3,970,730
122	3,970,731
CLASS 264	
40.5	3,970,732
135	3,970,733
219	3,970,734
272	3,970,735
310	3,970,736
CLASS 266	
138	3,970,290
193	3,970,291
CLASS 267	
31	3,970,293
64R	3,970,292
161	3,970,294
CLASS 269	
17	3,970,295
32	3,970,296
CLASS 270	
58	3,970,297
CLASS 271	
34	3,970,298
250	3,970,299
CLASS 272	
56.5R	3,970,300
113	3,970,301
130	3,970,302
CLASS 273	
1R	3,970,303
1.5R	3,970,304
54B	3,970,305
85F	3,970,306
86B	3,970,309
95A	3,970,308
95R	3,970,307
101	3,970,311
102.2R	3,970,310
130A	3,970,312
134AD	3,970,313
156	3,970,314
161	3,970,315
189R	3,970,316
CLASS 274	
105	3,970,317
CLASS 277	
26	3,970,318
53	3,970,319
74	3,970,320

188A	3,970,321
235A	3,970,322
CLASS 279	
64	3,970,323
CLASS 280	
87.02W	3,970,325
301	3,970,330
610	3,970,324
626	3,970,326
683	3,970,327
731	3,970,328
733	3,970,329
CLASS 281	
21R	3,970,331
31	3,970,332
CLASS 285	
9R	3,970,333
30	3,970,334
133A	3,970,335
341	3,970,336
342	3,970,337
367	Re.28,912
CLASS 289	
1.5	3,970,338
CLASS 290	
14	3,970,858
54	3,970,859
CLASS 292	
227	3,970,339
300	3,970,340
CLASS 294	
64R	3,970,341
86R	3,970,342
CLASS 296	
137E	3,970,343
CLASS 297	
189	3,970,344
195	3,970,345
CLASS 301	
37R	3,970,346
CLASS 303	
6C	3,970,347
22R	3,970,348
CLASS 307	
10LS	3,970,860
35	3,970,861
88ET	3,970,862
116	3,970,863
141	3,970,864
218	3,970,865
	3,970,866
225R	3,970,867
232	3,970,868
251	3,970,869
261	3,970,870
262	3,970,871
265	3,970,872
276	3,970,873
293	3,970,874
304	3,970,875
310	3,970,876
CLASS 310	
8.3	3,970,877
8.6	3,970,878
9.1	3,970,879
9.4	3,970,880
68D	3,970,881
245	3,970,882
CLASS 312	
268	3,970,349
CLASS 313	
39	3,970,883
55	3,970,884
141	3,970,885
223	3,970,886
309	3,970,887
346R	3,970,888
396	3,970,889
413	3,970,890
CLASS 315	
3.5	3,970,891
111.3	3,970,892
293	3,970,893
370	3,970,894
381	3,970,895
387	3,970,896
CLASS 317	
13R	3,970,897
25	3,970,898
31	3,970,900
33R	3,970,899
49	3,970,901
120	3,970,902
230	3,970,903
258	3,970,904
262E	3,970,905
CLASS 318	
7	3,970,906
207C	3,970,907
221E	3,970,908
341	3,970,909
576	3,970,910
607	3,970,911
CLASS 320	
2	3,970,912
48	3,970,913
CLASS 321	
2	3,970,914
21	3,970,915
27R	3,970,916
CLASS 322	
4	3,970,917
CLASS 323	
6	3,970,918
19	3,970,919
CLASS 324	
32	3,970,920
34L	3,970,921
45	3,970,922
54	3,970,924
57Q	3,970,925
57R	3,970,926
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67	3,970,927
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73R	3,970,929
98	3,970,930
99R	3,970,931
133	3,970,932
	3,970,933
158F	3,970,934
166	3,970,935
CLASS 325	
26	3,970,936
49	3,970,937
117	3,970,938
185	3,970,939
363	3,970,940
CLASS 328	
41	3,970,941
133	3,970,942
151	3,970,943
162	3,970,944
CLASS 329	
104	3,970,945
	3,970,946
CLASS 330	
23	3,970,947
29	3,970,948
	3,970,949
30D	3,970,950
	3,970,951
45	3,970,952
99	3,970,953
CLASS 331	
53	3,970,954
94.5PE	3,970,956
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94.5C	3,970,958
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94.5F	3,970,960
94.5G	3,970,955
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107S	3,970,965
116R	3,970,966
CLASS 332	
7.51	3,970,967
37D	3,970,968
CLASS 333	
12	3,970,969
72	3,970,970
81R	3,970,971
82BT	3,970,972
97R	3,970,973
CLASS 334	
45	3,970,974
CLASS 335	
18	3,970,975
21	3,970,976
132	3,970,977
203	3,970,978
229	3,970,979
253	3,970,980
266	3,970,981
284	3,971,054
CLASS 338	
4	3,970,982
9	3,970,983
153	3,970,984
162	3,970,985
171	3,970,986
CLASS 339	
18P	3,970,350
49R	3,970,351
59M	3,970,352
75MP	3,970,353
113R	3,970,354
177R	3,970,355
252P	3,970,356
CLASS 340	
15	3,970,987
43	3,970,988
146.1AG	3,970,989
146.3AC	3,970,991
146.3F	3,970,990
172.5	3,970,992
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	3,970,994
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	3,970,997
	3,970,998
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173FF	3,971,004
173LT	3,971,002
173R	3,971,001
	3,971,003
174TF	3,971,005
	3,971,037
	3,971,038
224	3,971,006
237S	Re.28,915
255	3,971,007
267C	3,971,008
276	3,971,009
310R	3,971,010
324A	3,971,011
336	3,971,012
337	3,971,013
347AD	3,971,015
347DD	3,971,014
384E	3,971,016
	3,971,017
CLASS 343	
5CD	3,971,018
7.4	3,971,019
7.9	3,971,020
18E	3,971,021
108M	3,971,026
108R	3,971,025
113R	3,971,027
225	3,971,028
704	3,971,029
713	3,971,030
744	3,971,031
754	3,971,022
770	3,971,032
840	3,971,023
872	3,971,024
CLASS 346	
1	3,971,033
	3,971,034
33TP	3,971,035
75	3,971,039
	3,971,040
76R	3,971,041
139C	3,971,036
	3,971,042
CLASS 350	
3.5	3,970,357
	3,970,358
7	3,970,359
96WG	3,970,360
144	3,970,361
155	3,970,362
160LC	3,970,363
160R	3,970,364
	3,970,365
184	3,970,366
	3,970,367
187	3,970,368
202	3,970,369
255	3,970,370
273	3,970,371
274	3,970,372
285	3,970,373
301	3,970,374
312	3,970,375
CLASS 351	
35	3,970,376
CLASS 352	
14	3,970,377
30	3,970,378
52	3,970,379
130	3,970,380
CLASS 354	
1	3,971,043
9	3,971,044
23R	3,971,045
24	3,971,046
50	3,971,047
60L	3,971,048
127	3,971,049
128	3,971,050
201	3,971,051
219	3,971,052
234	3,971,053
CLASS 355	
3R	3,970,381
4	3,970,382
	3,970,383
14	3,970,384
50	3,970,385
111	3,970,386
CLASS 356	
51	3,970,387
72	3,970,388
106R	3,970,389
109	3,970,390
152	3,970,391
179	3,970,392
195	3,970,393
	3,970,394
CLASS 357	
22	3,971,055
28	3,971,056
30	3,971,057
36	3,971,058
44	3,971,059
51	3,971,060
52	3,971,061
70	3,971,062
CLASS 358	
8	3,971,063
38	3,971,064
41	3,971,065
55	3,971,066
74	3,971,067
82	3,971,068
CLASS 360	
16	3,971,069
	3,971,070
132	3,971,071
CLASS 401	
1	3,970,395
208	3,970,396
CLASS 402	
79	3,970,397
CLASS 403	
26	3,970,398
231	3,970,399
242	3,970,400
265	3,970,401
338	3,970,402
CLASS 404	
27	3,970,403
77	3,970,404
105	3,970,405
CLASS 408	
127	3,970,406
204	3,970,407
CLASS 415	
60	3,970,408
CLASS 416	
145	3,970,409
154	3,970,410
178	3,970,411
219R	3,970,412
CLASS 417	
7	3,970,413
252	3,970,414
332	3,970,415
CLASS 423	
23S	3,970,739
27	3,970,737
140	3,970,738
242	3,970,740
321S	3,970,741
365	3,970,742
574R	3,970,743
	3,970,744
657	3,970,745
CLASS 424	
1.5	3,970,746
52	3,970,747
68	3,970,748
85	3,970,749
153	3,970,750
200	3,970,751
249	3,970,752
263	3,970,753
267	3,970,754
270	3,970,755
273	3,970,756
274	3,970,757
278	3,970,758
343	3,970,759
346	3,970,760
CLASS 425	
52	3,970,416
72S	3,970,417
140	3,970,418
242B	3,970,419
CLASS 426	
237	3,970,530
250	3,970,761
287	3,970,762
324	3,970,763
430	3,970,764
534	3,970,765
	3,970,766
579	3,970,767
CLASS 427	
50	3,970,768
145	3,970,769
CLASS 428	
272	Re.28,914
379	3,970,770
425	3,970,771
CLASS 431	
255	3,970,420
CLASS 432	
11	3,970,421
CLASS 526	
12	3,970,603
19	3,970,608
62	3,970,610
65	3,970,611
86	3,970,612
89	3,970,609
104	3,970,613
260	3,970,606
335	3,970,607
CLASS 536	
17	3,970,641
	3,970,642
	3,970,643

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D2—	282	240,570
	361	240,571
	400	240,572
D6—	70	240,574
	76	240,575
	104	240,576
	114	240,577
	144	240,578
	149	240,579
	150	240,580
	161	240,581
	177	240,582
	183	240,583
	186	240,584
	191	240,585
D7—	88	240,586
D8—	47	240,598
	90	240,587
		240,588
	108	240,589
	114	240,590
	271	240,599
D9—	1	240,591
	61	240,592
	116	240,593
	143	240,594
	164	240,595
	169	240,596
	219	240,597
	231	240,600
	253	240,601
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	294	240,603
		240,604
D10—	38	240,605
	46	240,606
	57	240,607
	71	240,608
	78	240,609
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	94	240,612
D12—	15	240,613
	33	240,614
	142	240,615
	146	240,616
D16—	2	240,664
	21	240,665
D19—	62	240,618
	64	240,619
		240,620
	88	240,621
	99	240,622
D22—	27	240,623
D23—	3	240,624
	19	240,625
		240,626
	49	240,627
	93	240,628
D24—	1B	240,629
D25—	10	240,617
D26—	1A	240,631
	R	240,630
	5C	240,632
		240,633
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	13R	240,636
	14D	240,638
	G	240,637
D27—	8	240,639
D31—	1	240,640
D33—	9D	240,573
D34—	4R	240,641
	5GH	240,642
		240,643
		240,644
	11R	240,645
	15M	240,646
		240,647
D40—	1E	240,648
D45—	4	240,649
		240,650
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D48—	16A	240,652
	23R	240,653
D52—	4A	240,654
D56—	B	240,655
		240,656
		240,657
		240,661
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		240,663
	D	240,658
		240,666
	R	240,659
		240,660
D83—	1C	240,667
	F	240,668
D86—	A	240,669

CLASSIFICATION OF PLANTS

P. —	29	3,937

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PATENTS

1 : 3,969,828
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2 : 3,970,247
4 : 3,970,251
3,970,284
3,970,307
3,970,681
3,971,059
5 : 3,970,182
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DESIGN PATENTS

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3,958,183
3,958,401
3,959,243
3,959,517
3,959,630
3,960,157
3,960,787

Disclaimer and Dedication

3,949,226.—*James A. Dugan,* Lake Forest, and *Yong S. Park,* Hanover Park, Ill. AUTOMATIC LIGHT INTENSITY CONTROLLER FOR CRT LIGHTHOUSE. Patent dated Apr. 6, 1976. Disclaimer and dedication filed June 1, 1976, by the assignee, *Zenith Radio Corporation.*

Hereby disclaims and dedicates to the Public claims 1, 3, and 7–12 of said patent.

Dedications

2,998,430.—*Frank J. Sevigne,* Tarrytown, N.Y. PROCESS FOR PREPARATION OF ALPHA TOCOPHEROL. Patent dated Aug. 29, 1961. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,035,981.—*Frank J. Sevigne,* Tarrytown, N.Y. PROCESS FOR EXTRACTING VITAMIN A FROM SOURCE OILS. Patent dated May 22, 1962. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,187,011.—*Frank J. Sevigne,* Tarrytown, N.Y. PREPARATION OF TOCOPHEROLS. Patent dated June 1, 1965. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,267,934.—*William E. Thornton,* Chapel Hill, N.C. ELECTROCARDIAC COMPUTER. Patent dated Aug. 23, 1966. Disclaimer, filed June 1, 1976, by the assignee, *Del Mar Engineering Laboratories.*

Hereby enters this disclaimer to claims 15 and 16 of said patent.

3,580,748.—*William T. Delong,* Manchester Township, York County, Pa. WELDING FLUX COMPONENT. Patent dated May 25, 1971. Disclaimer filed June 1, 1976, by the assignee, *Teledyne, Inc.*

Hereby enters this disclaimer to claim 4 of said patent.

3,611,910.—*John S. Hughes,* East Rochester, N.Y. CORN POPPER. Patent dated Oct. 12, 1971. Disclaimer filed May 25, 1976, by the assignee, *Ropat Corporation.*

The term of this patent subsequent to Jan. 9, 1981, has been disclaimed.

3,890,460.—*Lee C. Haas* and *Lynn Parker West,* Raleigh, N.C. COMMUNICATIONS ENABLING METHOD AND APPARATUS. Patent dated June 17, 1975. Disclaimer filed June 4, 1976, by the assignee, *International Business Machines Corporation, Inc.*

Hereby enters this disclaimer to claims 1 through 15 of said patent.

3,931,382.—*Donald E. Witkin,* Warren, Pa. METHOD FOR RAPID ISOSTATIC PRESSING. Patent dated Jan. 6, 1976. Disclaimer filed June 1, 1976, by the assignee, *National Forge Company.*

Hereby enters this disclaimer to all claims of said patent.

3,951,960.—*James C. Heath,* Norwood, *Raymond E. Werner,* Wyoming, Ohio; *John W. Delaney,* Fort Mitchell, Ky., and *Nathan N. Crounse,* Cincinnati, Ohio. NOVEL CRYSTALLINE FORMS OF OPTICAL BRIGHTENERS. Patent dated Apr. 20, 1976. Disclaimer filed May 26, 1976, by the assignee, *Sterling Drug Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 30, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-1-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-17-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-3-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	9-19-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-2-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-6-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	4-14-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-24-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-15-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,893,005 to 2,897,499 inclusive
Plant Patents	Numbers 1,850 to 1,855 inclusive

REISSUES

JULY 27, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

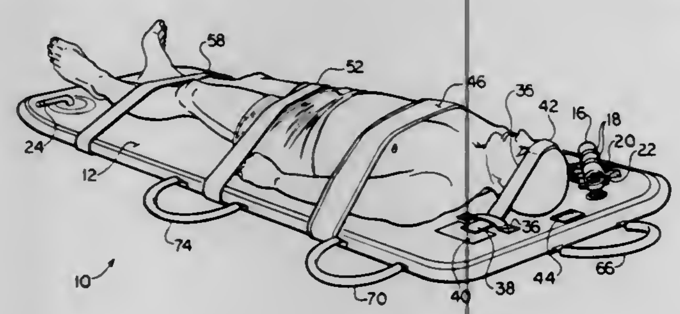
Re. 28,916
INFLATABLE AQUATIC RESCUE BOARD AND METHOD OF RESCUE

Charles A. Rice, R.D. No. 4, Chambersburg, Pa. 17201, and Michael L. Foust, 205 W. Church St., Lock Haven, Pa. 17745

Original No. 3,775,782, dated Dec. 4, 1973, Ser. No. 239,732, Mar. 30, 1972. Application for reissue Aug. 8, 1974, Ser. No. 495,761

Int. Cl.^{2} A47B *83/42*

U.S. Cl. 5—82 R **9 Claims**



1. An inflatable aquatic rescue board comprising:

an inflatable bag of impervious material having two substantially parallel broad faces in alignment with each other and constrained to be separated by not more than a maximum distance, [by internal members] said bag being generally rectangular and having two longitudinally extending sides and transverse head and foot ends respectively;

said bag being rolled up from the foot end to the head end in the deflated condition;

manually actuable means disposed adjacent the head end and coupled to inflate the bag when activated; and

arm receiving means disposed adjacent the head end for enabling a rescuer, while the bag is uninflated and partially rolled and while positioned at the unrolled end, to place the unrolled portion of said bag adjacent the back of an injured person with the arm extending along the spine, the bag unrolling fully under the injured person [during inflation] *and being inflated.*

Re. 28,917
WIRE UNREELING SYSTEM

Marvin E. Harris, Jr., Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Original No. 3,879,978, dated Apr. 29, 1975, Ser. No. 431,084, Jan. 7, 1974. Application for reissue Sept. 18, 1975, Ser. No. 614,365

Int. Cl.^{2} B21F *1/02*

U.S. Cl. 72—183 **10 Claims**

1. Apparatus for unreeling wire from a coil in a direction along an extension of the axis of the coil which comprises:

a. a first annular constriction through which the wire is initially withdrawn from the coil,

b. rotatable means around which the wire is entrained in frictional engagement before it is withdrawn under tension,

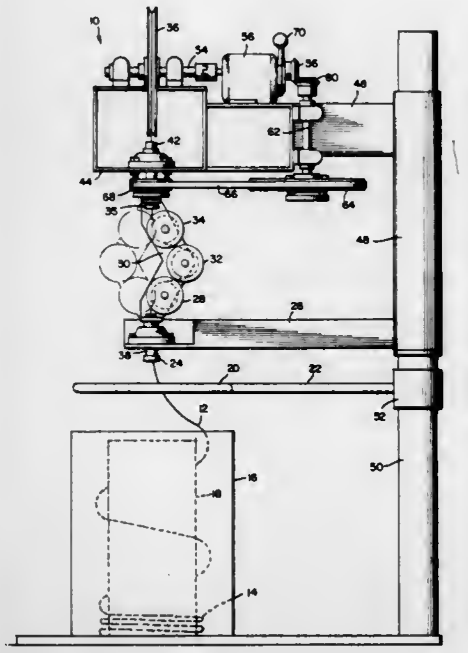
c. a second annular constriction through which said wire passes after said first annular constriction but prior to being entrained on said rotatable means,

d. untwisting means for untwisting the wire located between said first and second annular constrictions,

e. and motor drive means for positively driving said untwisting means regardless of the tension on said wire,

f. said untwisting means comprising:
  1. several rollers about which said wire is entrained to travel in a sinuous path so that said wire is bent first in one direction and then the other,
  2. a common support on which said rollers are journaled with said common support being driven by said motor drive means and swung about an axis passing between said first and second annular constrictions,

g. said motor drive means being a variable speed means with means for varying said speed independently of the rotation of said rotatable means during the operation of said apparatus.



Re. 28,918
COMPONENTS OF A ROTARY PISTON MACHINE

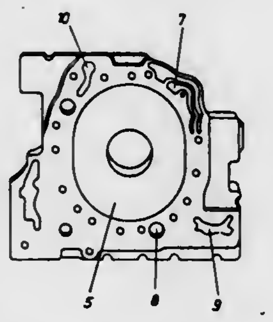
Gerhard Philipp Humbert, Margarethenhohe Uber Konigswinter, Germany, assignor to Electrophysikaische Anstalt Bernard Berghaus, Vaduz, Liechtenstein

Original No. 3,728,051, dated Apr. 17, 1973, Ser. No. 89,589, Nov. 16, 1970. Application for reissue Mar. 11, 1974, Ser. No. 449,997

Claims priority, application Switzerland, Dec. 12, 1969, 18507/69

Int. Cl.^{2} B01K *1/00;* **C23C** *11/16*

U.S. Cl. 418—178 **2 Claims**



3. *Trochoid housings, side and central units for a rotary piston machine, made of a material selected from the group consisting of iron and steel, particularly cast iron, and provided with ionitrided hardened areas limited to the wiped surfaces; characterized in that the hardened areas throughout the wiped areas are provided with an iron nitride zone reduced to less than 10 microns thickness, with a surface roughness not exceeding* $R_a = 0.8$ *micron, with a corrosion resistance relative to fuel combustion residues by at least 300 percent, with a thermal resistance up to 500°C over long periods and, respectively, up to 800°C over short periods and with a ductility reduced by not more than 100 percent as compared to the basic material.*

Re. 28,919
SPEECH PROCESSOR USING CONTROLLED CENTER CLIPPING

David Arthur Berkley, New York, N.Y.; Olga Mary Mracek Mitchell, Summit, N.J., and John Robinson Pierce, Pasadena, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,699,271, dated Oct. 17, 1972, Ser. No. 89,633, Nov. 16, 1970. Application for reissue Oct. 11, 1974, Ser. No. 513,991

Int. Cl.^{2} H04B *3/20*

U.S. Cl. 179—170.8 **12 Claims**

1. For a voice communications system containing imperfectly isolated transmit and receive paths, apparatus for reducing echo caused by leakage therebetween, comprising:

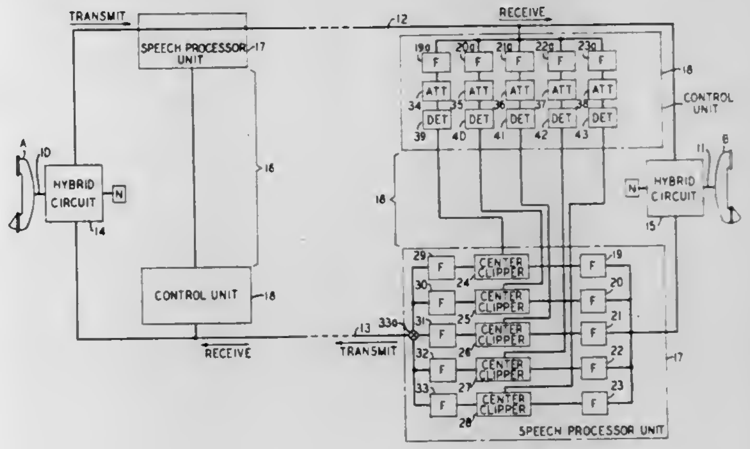
means for dividing the transmit path signal into plural contiguous subbands,

means for producing, from an incoming voice signal in the receive path, a replica of the echo of said voice signal occurring in each of said transmit path subbands,

means for continuously detecting the peak level of each said echo replica,

means for center-clipping the signal in each transmit path subband a varying amount in response to the concurrent said peak level value, sufficient to [just] *substantially* overcome said echo in the respective subband, and

means for combining the outputs of each center-clipping means for transmission.



PATENTS

GRANTED JULY 27, 1976

ERRATA

For CLASS	See PATENT NO.
004-173 R	3,971,080
017-025	3,971,088
053-029	3,971,173
056-370	3,971,203
089-014 C	3,971,285
104-135	3,971,314
114-032	3,971,421
176-032	3,971,444
351-058	3,971,542
272-056.5 R	3,971,561
297-452	3,971,587
308-238	3,971,606
229-037 R	3,971,612
156-104	3,971,668
156-181	3,971,669
156-196	3,971,670
428-537	3,971,680
162-226	3,971,689
526-317	3,971,766
526-065	3,971,767
526-068	3,971,768
424-347	3,971,810
174-041	3,971,894
235-054 R	3,971,914
235-061 NV	3,971,915
328-206	3,971,960
357-039	3,972,014

PATENTS

GRANTED JULY 27, 1976

GENERAL AND MECHANICAL

3,971,072

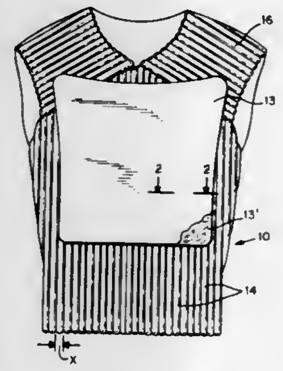
LIGHTWEIGHT ARMOR AND METHOD OF FABRICATION

Richard A. Armellino, 17 Forestdale Drive, Huntington, N.Y. 11746

Continuation-in-part of Ser. No. 157,555, June 28, 1971, which is a continuation-in-part of Ser. No. 710,407, March 4, 2968, abandoned. This application Apr. 18, 1972, Ser. No. 245,111

Int. Cl.² F41H *1/02*

U.S. Cl. 2—2.5 **13 Claims**



1. A protective material comprising:

1. a plurality of layers of flexible ballistic material,
2. said layers of material being formed of woven continuous filament synthetic yarns,
3. securing means extending along spaced continuous paths interconnecting said layers,
4. said securing means comprising a plurality of continuous uninterrupted stitches at least through a substantial portion of each path with each stitch interconnecting said layers together,
5. said paths being spaced a distance no greater than three-fourths of an inch and no less than one-eighth of an inch, and
6. a sheet of relatively hard non-woven anti-ballistic material secured to one side of the secured layers of ballistic material.

3,971,073

ARTIFICIAL INTRAOCULAR LENS

William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 9, 1975, Ser. No. 566,468

Int. Cl.² A61F *1/16*

U.S. Cl. 3—13 **10 Claims**

1. A pseudophakos comprising:

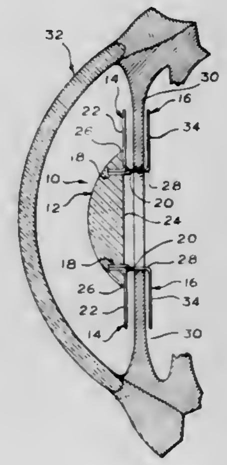
a lens;

an array of wire anterior and posterior iris clips;

a number of openings extending into one side of said lens, each located a substantial distance inwardly of the lens edge;

each anterior iris clip of said array having its opposite ends extended into and anchored within one of a preselected pair of said openings, said anterior clip being bent adjacent said lens surface to extend from said pair of openings laterally of said lens;

each posterior iris clip of said array having its opposite ends also extended into and anchored within one of a preselected pair of said openings, said posterior clip being further extended a substantial distance away from said side of said lens and thence bent to extend laterally of said lens.



3,971,074

SHOWER-BATH ARRANGEMENT

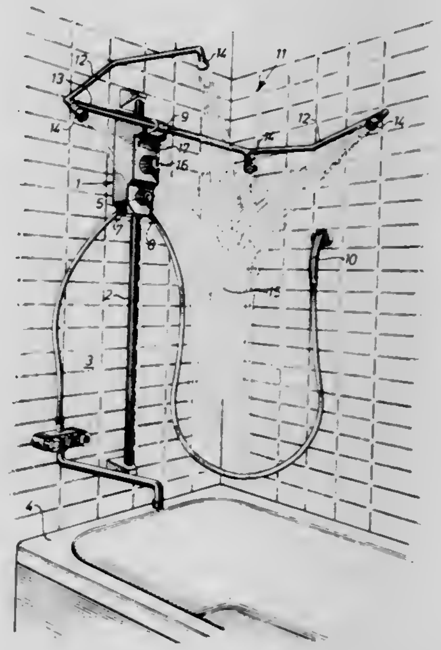
Leif Johan Yxfeldt, Storgatan 59, 115 23 Stockholm, Sweden

Filed Oct. 29, 1974, Ser. No. 518,634

Claims priority, application Sweden, Oct. 29, 1973, 7314675

Int. Cl.² A47K *3/22, 3/08*

U.S. Cl. 4—145 **22 Claims**



1. Shower-bath arrangement, comprising:

a vertical support member;

a slidable member which is displaceable on said vertical support member and which is adjustable upwardly and downwardly on said vertical support member, said slidable member being provided with means for connection to a source of water supply;

a shower arm comprising at least two shower nozzles mounted thereon, said shower nozzles being arranged to emit substantially conical water jets, said nozzles being adjustable to direct said water jets to strike one another angularly within a mixing zone located between said nozzles, as seen in a horizontal projection; and pivotable mounting means for mounting said shower arm to said slidable member and defining with said shower arm a substantially horizontal axis about which at least a portion of said shower arm is swingable for adjustable setting of the inclination of at least said portion of said shower arm relative to the horizontal plane.

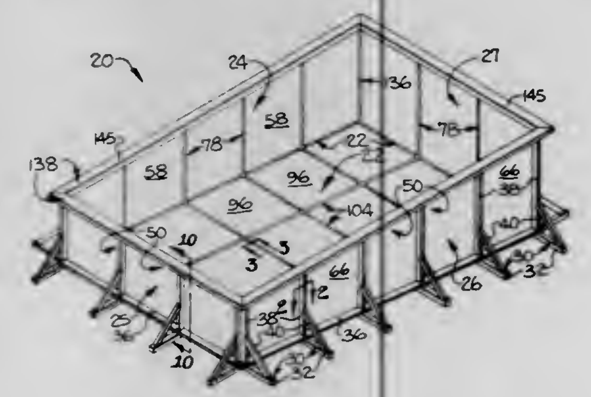
3,971,075
SWIMMING POOL STRUCTURE

Kenneth D. Heinbaugh, 144 Canterbury Road - South, Charlotte, N.C. 28211, and Carl F. Selbert, Jr., 3208 Frederick Place, Charlotte, N.C. 28210

Filed May 8, 1974, Ser. No. 467,894

Int. Cl.^{2} E14H *3/18;* **E04C** *2/00;* **F16B** *5/00*

U.S. Cl. 4—172.19 **25 Claims**



1. A fluid tight joint assembly suitable for use in swimming pools or the like and comprising

a pair of adjacent waterproof panels, each of said panels including a side edge positioned in a predetermined orientation adjacent the side edge of the adjacent panel, a front face defining a forwardly facing edge portion extending along the length of the associated side edge, and a rear face defining a rearwardly facing edge portion extending along the length of the associated side edge and beneath said forwardly facing edge portion,

an elongated resilient sealing member bridging the adjacent panels and extending along the length of the side edges thereof, said sealing member including a medial portion and pair of laterally directed extensions, each of said extensions sealably contacting the forwardly facing edge portion of one of the adjacent panels to form a seal therebetween which extends along the length of the edge portion,

a relatively rigid cover member overlying said resilient sealing member and including a generally flat upper portion extending laterally beyond said sealing member and contacting the forwardly facing edge portions of the adjacent panels, and a pair of downwardly directed laterally spaced arms, and

means operatively associated with said pair of arms of said cover member for securing said cover member in its position overlying said sealing member to thereby maintain the assembly of the cover member and sealing member with the adjacent panels, and including a relatively rigid base member positioned between said side edges of the panels and including lateral side arms overlying the rearwardly facing edge portion of the adjacent panels and an upright flange having a generally T-shaped cross-section to define a bulbous end, and with said arms of said cover member substantially surrounding said bulbous end of said flange to operatively engage the same and with said medial portion of said sealing member positioned intermediate said flange and arms.

18. A fluid tight joint assembly suitable for use in swimming pools or the like and comprising

a pair of adjacent waterproof panels, each of said panels including a side edge positioned in a predetermined orientation adjacent the side edge of the adjacent panel and a front face defining a forwardly facing edge portion extending along the length of the associated side edge, and

an elongated resilient sealing member of translucent elastomeric material bridging the adjacent panels and extending along the length of the side edges thereof, said sealing member including a medial portion and pair of laterally directed extensions with each of said extensions overlying one of the forwardly facing edge portions of one of the adjacent panels, and a layer of translucent adhesive positoned intermediate each extension and the associated forwardly facing edge portion to form a seal therebetween which extends along the length of the edge portion,

whereby the effectiveness of the seal between the adjacent panels may be visually checked by observing the appearance of the edge portions of the panels which show through the extensions of the sealing member.

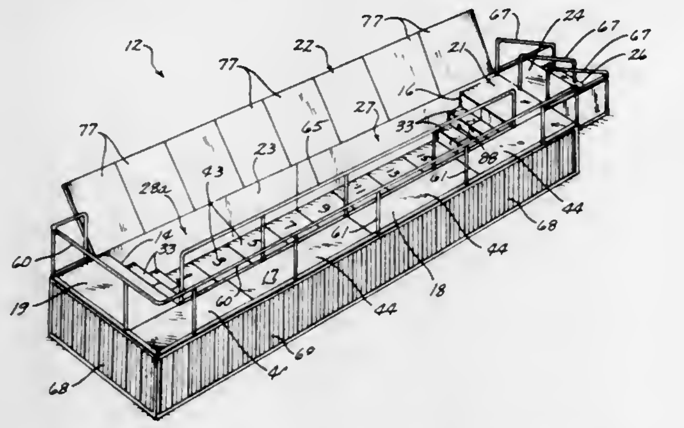
3,971,076
POOL FOR TEACHING SWIMMING TO A CHILD

Claude W. Ahrens, Box 275, Grinnell, Iowa 50112

Division of Ser. No. 422,349, Dec. 6, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,492

Int. Cl.^{2} E04H *3/16, 3/18;* **F16L** *4/02*

U.S. Cl. 4—172.19 **1 Claim**



1. A learning pool for child swimmers comprising:
- a. an elongated tank of a substantially U-shape in transverse cross section integrally formed with a bottom wall, side walls and end walls,
- b. a continuous horizontal walkway extended laterally outwardly from the upper edge of said end walls and from one of said side walls,
- c. each of said end walls comprised of a series of step members leading from said walkway to said bottom wall,
- d. a combination cover and splash board assembly for said tank,
- e. means pivotally connecting said combination assembly at one side thereof to the upper end of the other one of said tank side walls for pivotal movement to a first position extended upwardly and outwardly from said other tank side wall, and to a second horizontal position extended across said tank between the side walls thereof,
- f. coacting means on said combination assembly and tank for limiting the pivotal movement of said combination assembly to said first position therefor, and
- g. means on said tank one side wall engageable with the opposite side of said combination assembly to define said second position therefor.

3,971,077
ADJUSTABLE HEIGHT CLOSET SEAT ASSEMBLY

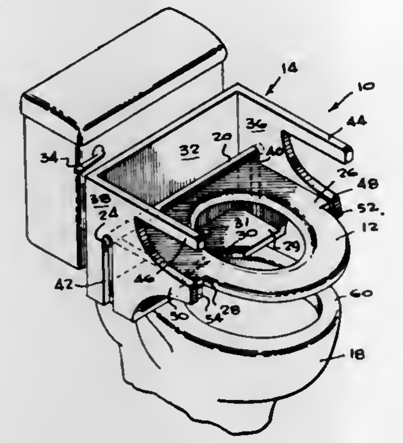
Robert O'Neil, Wheaton, Ill., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.

Filed Mar. 10, 1975, Ser. No. 557,168

Int. Cl.^{2} A47K *13/00*

U.S. Cl. 4—239 **14 Claims**

1. A closet seat assembly providing the conventional position and an elevated position of the seat for use on the receptacle of a water closet with the closet seat tiltable rearwardly, said seat assembly comprising a support structure, connecting means for attaching said support structure to the water closet, a closet seat having a central opening providing access to said receptacle, a means operatively connected between the seat and support structure for moving the closet seat from the conventional position to the elevated position, means integral with the moving means for permitting the closet seat to be tilted rearwardly to provide easy access to the receptacle for cleaning and the like and a positioning means on the support structure for engagement with a portion of the closet seat to maintain said seat in the elevated position.



3,971,078
DEVICE FOR CHANGING THE POSITION OF THE HEAD SECTION OF HIDE-AWAY BED FRAMES

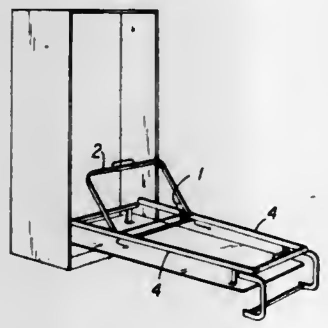
Jose Pardo Herrera, Carretera de Logrono, Km. 1, 7 Zaragoza, Spain

Filed Apr. 23, 1975, Ser. No. 570,835

Claims priority, application Spain, Apr. 30, 1974, 202693[U]

Int. Cl.^{2} A61G *7/06*

U.S. Cl. 5—66 **5 Claims**



1. A position changing device for changing the position of a head section of a bed frame, wherein the bed frame comprises:

a bed frame; a first pivot axis on said bed frame; a head section pivotally attached to said bed frame at said first pivot axis; said first pivot axis being so oriented as to enable said head section to pivot toward and away from an orientation generally aligned with the orientation of said bed frame;

said position changing device comprising:

a slide bar rigidly attached to said head section; said slide bar extending in a direction that is generally along the length of said head section; said slide bar being spaced a distance from said head section; said slide bar extending past said pivot axis and extending along a path that is spaced a distance from said first pivot axis, whereby as said head section pivots about said first pivot axis, said slide bar both pivots around said first pivot axis along with said head section and moves longitudinally along the length of said slide bar itself with respect to said pivot axis;

a slide bar lock support attached to said bed frame; a slide bar lock that is supported on its said support; said slide bar lock including one side having a hole therethrough, through which said slide bar passes; said hole being defined by side walls in said slide bar lock one side and said hole being sized and shaped such that when said one side is at a first tilt orientation with respect to said slide bar, said slide bar can freely slide through said hole, but when said one side is at a second tilt orientation with respect to said slide bar, said hole side walls engage said slide bar and prevent movement thereof, thereby to halt movement of said head section;

first slide bar lock tilting means connected to said slide bar lock for tilting it to said first tilt orientation; second slide bar lock tilting means connected to said slide bar lock for tilting it to said second tilt orientation.

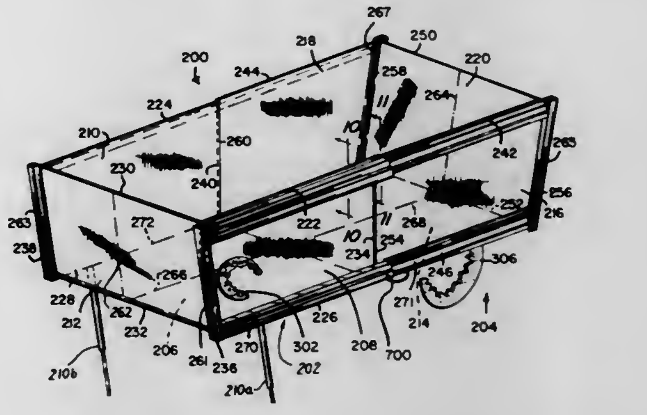
3,971,079
BABY HOLDING DEVICE

Henry Fleischer, 18 Notch Park Road, Little Falls, N.J. 07424

Division of Ser. No. 406,620, Oct. 15, 1973. This application Mar. 10, 1975, Ser. No. 556,554

Int. Cl.^{2} B62B *9/12;* **A47C** *27/08*

U.S. Cl. 5—97 **25 Claims**



1. A collapsible portable baby holding device comprising a first section and a second section, each of said sections including a bottom wall for supporting a baby, a pair of side walls and at least one of said sections including an end wall, said first section being adapted to be longitudinally telescopically positionable within said second section with the bottom walls of each being in telescopingly overlapping or contiguous relationship, the side and/or end walls of each of said first and second sections including a vertically-disposed hinge for collapsing said end walls, and a pair of vertically-disposed hinges connecting each of said side and/or end walls to said side and/or end walls, respectively.

3,971,080
RECESSED BATHTUB

Irene D. Walker, 206 Sostes Drive, Cleveland, Miss. 38732

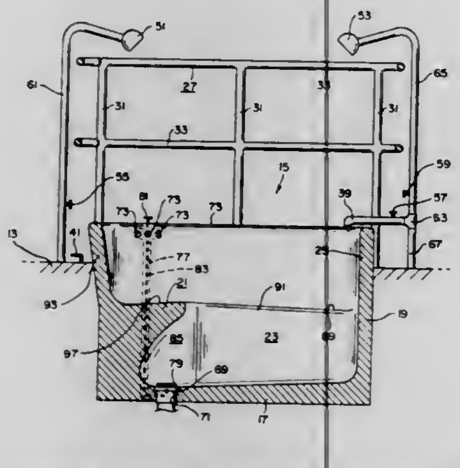
Filed Nov. 10, 1972, Ser. No. 305,489

Int. Cl.^{2} A47K *3/00, 3/04*

U.S. Cl. 4—173 R **1 Claim**

1. The combination with a bathroom having a floor, of a bathtub for facilitating the task of bathing and showering oneself selectively even though the user may be physically handicapped, said bathtub comprising a well including a bottom and having a first continuous wall encompassing said bottom and being tangentially disposed thereto, cresecent shaped bench means for supporting the user in a sitting position and for providing a step to accommodate ingress and egress of the user, a second continuous wall tangentially engaging said first wall and joining said bottom to said bench means, the diameter of said first wall being greater than the diameter of said second wall with the difference in diameters thereof defining said crescent shaped bench means, said bottom and said bench means being recessed below said floor and

said first wall extending a predetermined distance upwardly above the level of said floor for allowing said well to be of an optimum depth without requiring the user to step too far below the level of said floor, hand rail means for assisting the user into and out of said well and for providing a safety barrier thereabout, said hand rail means being disposed circumferentially about said well and supported a predetermined distance above said floor, means for controllably filling said well with water, shower head means supported a predetermined distance above said bottom and being communicated with said filling means, valve means for selectively interrupting the flow of water from said shower head means and said filler spout means, drain means for controllably disposing of the water, said bottom being provided with an aperture receiving said drain means and said bottom sloping downwardly towards said drain means, at least one mouthlike opening disposed adjacent the upper edge of said first wall for receiving the water which rises to that level, conduit means for communicating said mouthlike opening with said drain means whereby said well is prevented from overflowing, plug means for blocking said drain means, said plug means having blocked and unblocked positions thereto, handle means for remotely moving said plug means between said blocked and unblocked positions, and linkage means for mechanically connecting said handle means to said plug means with said linkage means being received in said conduit means and extending from a position below the level of said floor to a position above the level of said floor.



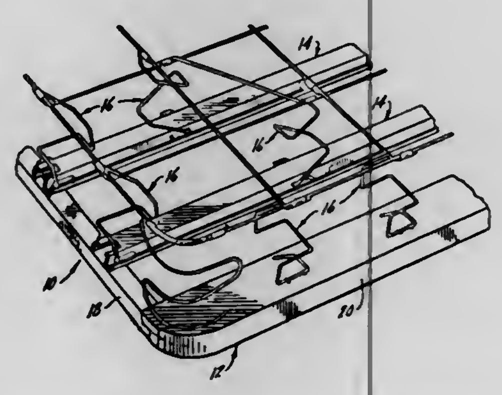
3,971,081
BOX SPRING UNIT WITH METAL SLATS

Richard C. Roe, Palatine, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

Continuation of Ser. No. 451,170, March 14, 1974, abandoned, which is a continuation of Ser. No. 216,701, Jan. 10, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,951

Int. Cl.² A47C *23/04*

U.S. Cl. 5—246 **4 Claims**



1. A frame for a box spring unit utilizing torsion bar springs comprising a generally rectangular wood frame member and a plurality of parallel transverse metal slats secured to said frame member, said slats having means to precisely position and firmly secure a torsion bar spring thereto, said metal slats providing the sole means of support for said torsion bar springs on said frame, said metal slats having an inverted U-shaped cross-section with leg portions extending downwardly, said leg portions having roll-back flanges extending upwardly along a part of said leg portions, said metal slats having a built-in crown.

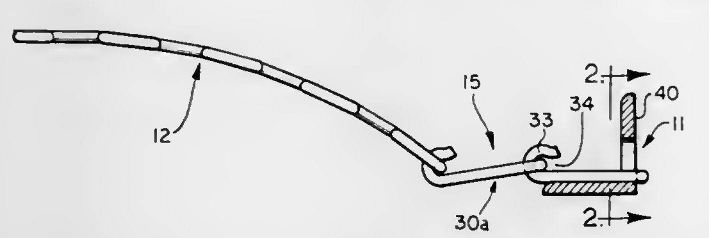
3,971,082
SPRING ATTACHMENT ASSEMBLIES

Lawton H. Crosby, Lake Bluff, Ill., and Thomas H. Keane, Morristown, Tenn., assignors to Morley Furniture Spring Corporation, Chicago, Ill.

Filed Aug. 28, 1974, Ser. No. 501,155

Int. Cl.² F16F *3/00;* **A61J** *19/00*

U.S. Cl. 5—260 **4 Claims**



1. An attachment assembly for attaching a sinuous spring band to a steel rail in a furniture frame or the like wherein the rail comprises a horizontal flange and a vertical flange, comprising:

a. a pair of openings formed in said vertical flange in spaced relationship along the length of the flange,

b. each of said openings comprising a vertically elongated aperture formed through said vertical flange immediately adjacent said horizontal flange,

c. a generally u-shaped anchor link having a base leg seated against the back surface of said vertical flange and a pair of attachment legs extending through said vertically elongated apertures and normally resting on said upper surface of said horizontal flange,

d. the free ends of said attachment legs each having an attachment clip formed thereon substantially in alignment with the free edge of the horizontal flange whereby one of a link member and a sinuous spring band segment may be seated in said attachment clips and free to pivot about a pivot axis defined by said attachment clips.

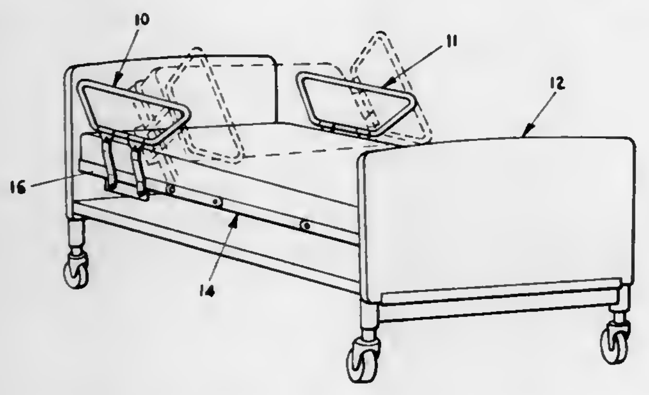
3,971,083
SIDE GUARD FOR BEDS

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Nov. 27, 1974, Ser. No. 527,522

Int. Cl.² A47C *21/00*

U.S. Cl. 5—331 **24 Claims**



1. A safety rail assembly for hospital beds comprising a safety rail; pivot means for supporting said rail and moving said rail between at least a raised position generally above the mattress of a bed and a lowered position generally below the said mattress; latch means for holding said safety rail in said raised position including release means extending from one end of said latch means for movement by a knee or other portion of a person's body to allow said pivotal movement of said rail between said positions, said release means avoiding the strict necessity of using only one's hand or hands to release the rail; and means for limiting pivotal movement of said rail to a pivotal direction away from said release means whereby said pivot means and rail are prevented from striking said person's knee or any other portion of a person's body used to operate the release means as said rail is raised or lowered.

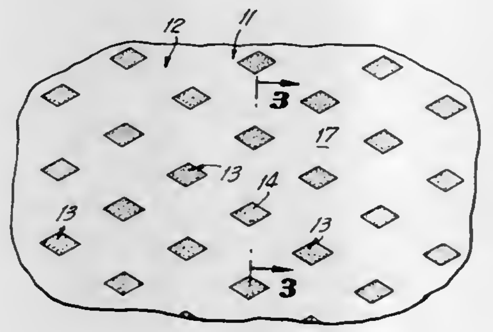
3,971,084
HULL CONSTRUCTION AND METHOD FOR FORMING SAME

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016

Filed Mar. 7, 1974, Ser. No. 449,188

Int. Cl.² B63B *5/24*

U.S. Cl. 9—6 P **16 Claims**



1. A hull construction formed of at least one fabricated layer defining the outer surface layer comprising a metal which inhibits the growth on or adherence to of marine life selected from the group consisting of copper and copper alloy, the metal defining a plurality of interstices on the outer surface; and plastic material being interleaved in said interstices defined by said metal to define an exterior surface which includes only said metal and plastic material.

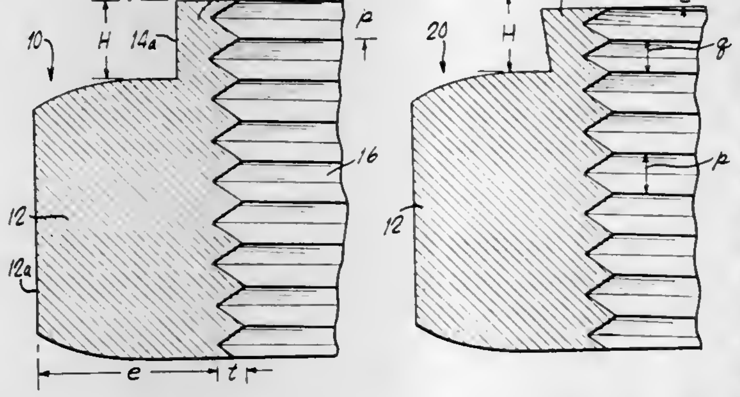
3,971,085
LOCK NUT

Wadsworth W. Mount, 154 Mountain Ave., Warren, N.J. 07060

Filed Apr. 21, 1975, Ser. No. 569,770

Int. Cl.² B21D *53/24*

U.S. Cl. 10—86 A **5 Claims**



1. The method of making a lock nut, comprising the steps of:

a. forming a blank including a relatively thick walled annular body and a relatively thin walled annular collar concentric with and integral with the body and projecting from one end thereof, said blank having a continuously threaded bore extending axially through both the body and the collar, the threads in said bore having a substantially constant pitch, said collar having a wall thickness not less than about three-fourths and not greater than about one and one-half times the thread depth, said collar also having an axial length between one and three times the thread pitch;

b. compressing only the collar of said blank only axially, with the collar free of all lateral restraint except at its connection to the body, until the collar is stressed in compression beyond its elastic limit; and

c. thereafter relieving the compression, said compressing and relieving steps cooperating to deform the collar by shortening it from about 0.1 to about 0.4 times the thread pitch, and by a tapered thickening of the collar so that its diameter decreases from its projecting end toward the body.

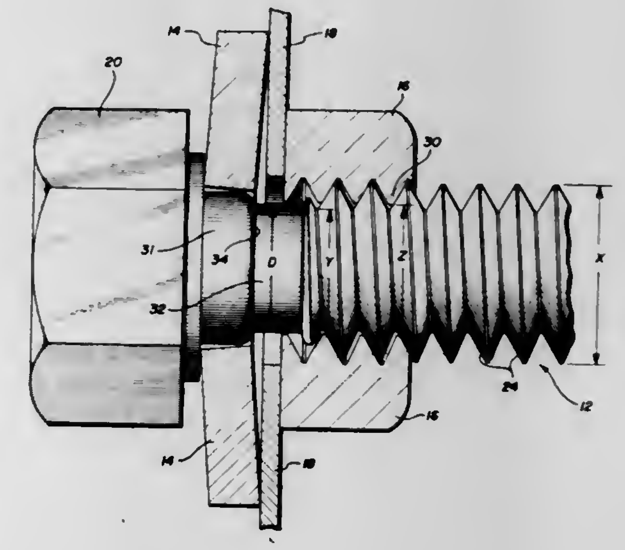
3,971,086
METHOD OF FABRICATING A FASTENER ASSEMBLY

Peter P. Stanaitis, Rockford, Ill., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 443,136, Feb. 14, 1974, Pat. No. 3,913,649. This application July 16, 1975, Ser. No. 596,320

Int. Cl.² B23P *19/08;* **B21H** *3/02*

U.S. Cl. 10—155 A **2 Claims**



1. A method of fabricating an externally threaded fastener unit of the type designed for mating engagement with an internally threaded element; said fastener unit being of the type which includes, a screw member having a head portion and an elongate shank, which shank has a threaded portion and an unthreaded portion disposed intermediate said head portion and said threaded portion, and an apertured, frusto-conical washer carried on said screw member, proximate the unthreaded portion thereof with the major diameter of said screw thread being greater than the minimum dimension of said washer aperture to maintain said washer in assembled relation thereon; said method comprising the steps of: providing a headed blank having an elongate shank, which includes, a first axial segment remote from said head and having a predetermined cross-sectional dimension, and a second axial segment immediately adjacent said first segment and of a lesser cross-sectional dimension, said second section being disposed intermediate said blank head and said first section; providing an apertured frusto-conical washer, said aperture having a minimum internal dimension greater than the cross-sectional dimension of said first shank segment; positioning said washer on said shank proximate said blank head; cold forming an external screw thread on said first shank segment only to produce a thread form having a major cross-sectional dimension greater than that of said washer aperture; and said step of forming including, the step of controlling the dimension of said external thread form such that the cross-sectional dimension of said second shank segment will be less than the minimum minor diameter of an internal thread designed in accordance with industry specified dimensions and tolerances for mating engagement with said external thread.

3,971,087
APPARATUS FOR APPLYING A SOLE TO AN UPPER IN THE MANUFACTURE OF SHOES

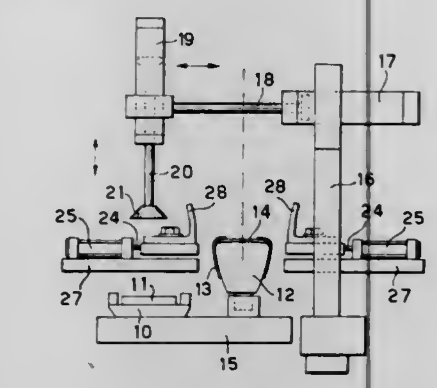
Antonio Giordano, Florence, Italy, assignor to Viges S.p.A., Vigevano (Pavia), Italy

Filed Nov. 11, 1974, Ser. No. 522,830

Claims priority, application Italy, Nov. 22, 1973, 31642/73

Int. Cl.² A43D *89/00*

U.S. Cl. 12—1 A **5 Claims**



1. An apparatus for applying a sole to an upper in the manufacture of shoes, comprising in combination a seat for containing a sole, a shoe last adapted to receive an upper completed with insole, a first double-acting cylinder, a suction means mounted on the free end of the stem of a piston of said cylinder, for lifting and for transporting the sole, said suction means being capable of controlled reciprocation between said seat and said shoe last, and guide means cooperating with the shoe last to guide the sole to a position centered on the upper.

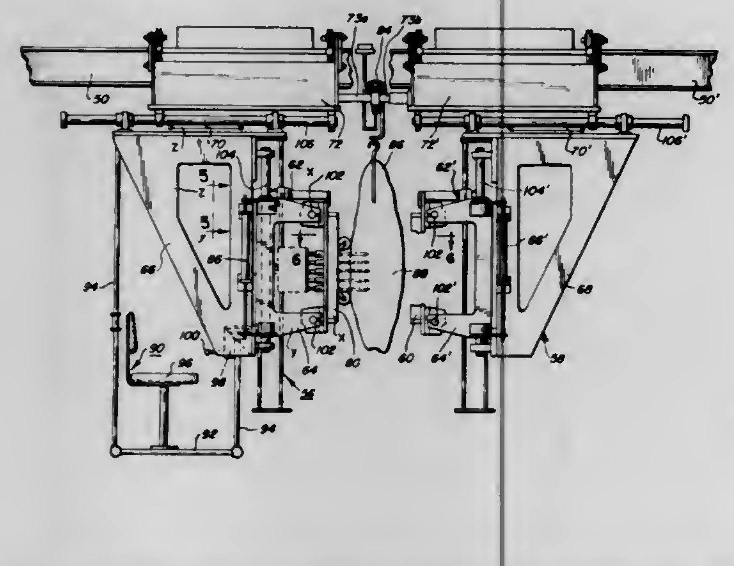
3,971,088
AUTOMATED MEAT TENDERIZATION SYSTEM

William J. Osiadacz, Hoffman Estates, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Dec. 9, 1974, Ser. No. 530,671

Int. Cl.² A22C *9/00*

U.S. Cl. 17—25 **22 Claims**



1. In a meat tenderizing system in which a tenderizing solution is injected into a carcass after slaughter at a tenderizing station, the improvement comprising, in combination: a carriage assembly carrying a needle manifold with a plurality of generally parallel injection needles for injecting tenderizing solution into the carcass; an overhead conveyor system for conveying the carcass to the tenderizing station along a path transverse to the axes of said injection needles; means for selectively moving the carriage assembly in at least two directions to position the injection needles relative to the carcass; and means for automatically injecting and withdrawing said needles into and out of said carcass.

3,971,089
SELF-ADJUSTING ROLL WIPERS FOR A SHOE LASTING MACHINE

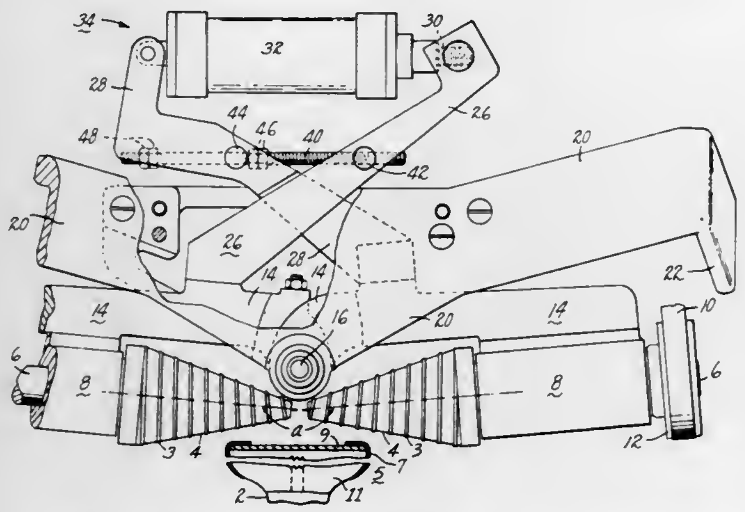
Ronald O. C. Gadd, Leicester; Robert C. Quarmby, Groby, and Frank R. Smith, Leicester, all of England, assignors to USM Corporation, Boston, Mass.

Filed Apr. 3, 1975, Ser. No. 564,673

Claims priority, application United Kingdom, May 7, 1974, 20175/74

Int. Cl.² A43D *21/00*

U.S. Cl. 12—8.3 **5 Claims**



1. A shoe upper conforming machine for simultaneously lasting opposite side portions of shoes in at least the waist region thereof, said machine comprising:

a pair of lasting rolls which are arranged to operate simultaneously to wipe marginal portions of an upper at opposite sides of a shoe assembly inwardly over the last bottom;

said rolls being relatively movable lengthwise of a shoe to cause the rolls progressively to operate along side portions of a shoe assembly;

each of said lasting rolls being supported by a roll carrying means so that axes about which said rolls rotate extend at least substantially widthwise of any shoe assembly being operated upon, wherein each of said roll carrying means is capable of individual programmable arcuate movement about an axis extending generally lengthwise of the bottom of said shoe assembly;

each of said rolls having a carrier provided with a bearing member for its associated lasting roll; and

said machine also having fluid pressure operated means for varying the angular disposition of one of said carriers with respect to the other on a common support about said axis extending generally lengthwise of the bottom of said shoe assembly while permitting both of said carriers together to partake of said arcuate movement about said axis.

3,971,090
LOADING RAMP SECURING SYSTEM

Radoje Vulovic, Swarthmore, Pa., assignor to Sun Shipbuilding and Dry Dock Company, Chester, Pa.

Filed Aug. 11, 1975, Ser. No. 603,884

Int. Cl.² B65G *11/00*

U.S. Cl. 14—71.3 **12 Claims**

7. Apparatus for flexibly coupling a loading ramp to a vessel and comprising:

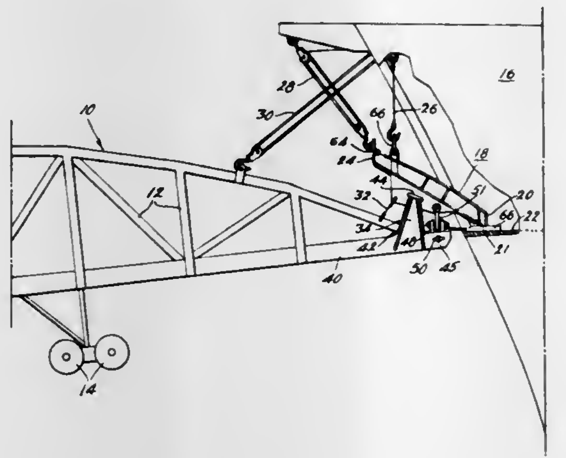
a. a vessel having a deck onto which cargo is to be loaded and unloaded;

b. a loading ramp having a vessel end adapted to be secured to the vessel;

c. first and second lever arms pivotally connected on opposite sides of the vessel end of said loading ramp, each lever arm being pivotally connected to the loading ramp at a location along the length of each lever arm between vessel and pier ends of the lever arm;

d. said vessel having means for supporting the vessel end of each lever arm at substantially the deck height of the vessel;

e. said vessel further including means for hangingly supporting the pier end of each lever arm from a location above the pier end of each lever arm when the loading ramp is secured to the vessel.



3,971,091
AUTOMATIC APPARATUSES, ROBOTS AND THE LIKE

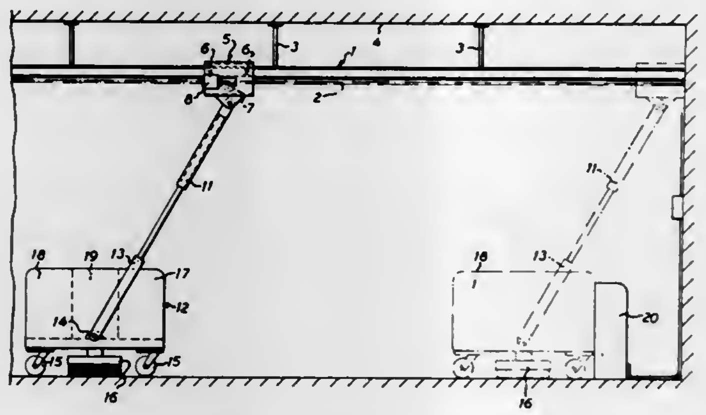
Karl Gunnar Magnus Perén, Saltsjobaden, and Stig Åke Gösta Svensson, Sodertalje, both of Sweden, assignors to AB Profila, Norrkoping, Sweden

Filed May 29, 1974, Ser. No. 474,339

Claims priority, application Sweden, May 30, 1973, 7307708

Int. Cl.² A47L *11/22*

U.S. Cl. 15—49 R **3 Claims**



1. An automatic apparatus primarily intended for cleaning floors and like surfaces and including a motor-actuated driving and steering unit, a guide track, a rod means, a yoke, and cleaning implements carried by the apparatus moving over the surface in question, wherein the apparatus proper for its advance is coupled with said motor-actuated driving and steering unit which is spaced from the machine proper and adapted to travel along said guide track which is spaced from the floor or like surface, said driving and steering unit and the apparatus proper connected by said yoke pivotally mounted to the apparatus and said rod means comprising one rod rigidly connected with said yoke and another rod mounted for swinging movement at said driving and steering unit, the length of said rod means being so dimensioned that said rod means will occupy a position inclined forwardly in the direction of travel, and said rod means being of the telescoping type to permit said driving and steering unit to move in the opposite direction of travel over and past the apparatus proper to a position in which said extended telescoping rod again tows the apparatus.

3,971,092
APPARATUS FOR CLEANING THE SEALING SURFACES OF COKE OVEN DOORS AND DOOR JAMBS

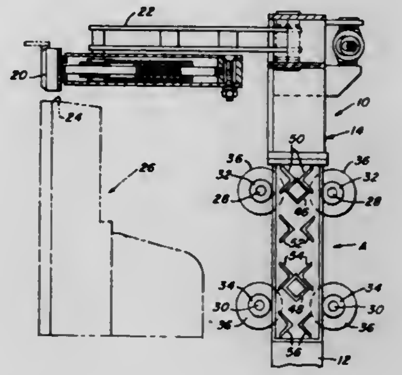
Walter Stanke, and Gottfried Mertens, both of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 28, 1974, Ser. No. 501,298

Claims priority, application Germany, Dec. 1, 1965, 2345212

Int. Cl.² C10B *43/04*

U.S. Cl. 15—93 A **7 Claims**



1. Apparatus for cleaning the sealing surface of coke oven doors comprising,

a frame member,

a support structure movably mounted on said frame member,

a cleaning tool secured to said support structure and extending forwardly therefrom, said cleaning tool arranged to move horizontally and clean a horizontal surface of a coke oven door,

means to move said support structure vertically so that said cleaning tool is operable to be positioned to clean coke oven doors of different vertical dimensions,

a second frame member movable vertically relative to said first frame member,

said second frame member having a support member extending forwardly therefrom,

a rotary column secured to said support member extending forwardly from said second frame member,

pairs of second cleaning tools secured to said rotary column and extending outwardly therefrom,

said second cleaning tools spaced at different dimensions from said rotary column, and

said second cleaning tools operable to move vertically and selectively clean the vertical sealing surface of coke oven doors having different transverse dimensions.

3,971,093
MOP HAVING A WASHING RESISTANCE

Toshiyoshi Komatsu, Osaka, and Keizo Chimura, Toyonaka, both of Japan, assignors to Duskin Franchise Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 180,141, Sept. 13, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,455

Int. Cl.² A47L *13/17, 13/20;* **D02G** *3/36*

U.S. Cl. 15—104.93 **2 Claims**

1. A mop having an excellent washing resistance, which comprises a fibrous substrate and piles fixed on said fibrous substrate, each of said piles having an apparent diameter ranging from 2 to 10 mm. and a length of 3 to 30 cm. as measured from the cut end point to the point fixed on the substrate; wherein each of said piles is obtained by subjecting a yarn composed of a loosely twisted fold yarn of a plurality of thick single yarns of cotton fibers or a mixture of at least 70% by weight of cotton fibers with up to 30% by weight of artificial fibers, to the mercerizing treatment substantially under no tension under such conditions that the yarn is contracted by 10 to 30% in the longitudinal direction, said starting yarn having a single yarn twist coefficient of 3 to 4 as calcu-

lated from the following formula

$$K = \frac{t_1}{\sqrt{S}}$$

wherein K designates the twist coefficient of the single yarn, t_1 stands for the twist number (twists/inch) of the single yarn and S designates the number of the count of the single yarn,

and having a folded yarn twist coefficient of 1 to 2 as calculated from the following formula

$$f = \frac{t_2}{t_1} \times \sqrt{N}.$$

wherein f designates the twist coefficient to the folded yarn, t_1 stands for the twist number (twists/inch) of the single yarn, t_2 designates the twist number (twists/inch) of the folded yarn and N stands for the number of single yarns constituting the folded yarn; each of said piles is substantially prevented completely from fraying from the cut end at the time of washing being owed to said mercerizing treatment; and wherein the mop is impregnated with 10 to 30% by weight, based on the mop, of an oil composition comprising as the main ingredient a non-drying mineral oil and containing 0.5 to 20% by weight bases on the total oil composition, of a catonic surfactant or a combination of a catonic surfactant and a non-ionic surfactant.

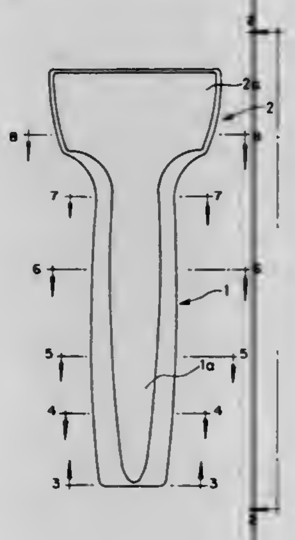
3,971,094
BRUSH HANDLES

Johannes Solf, Lindenstr. 39, 7031 Aidlingen, and Wolfgang Feine, Simoniussteige 16, 7988 Wangen, Allgau, both of Germany

Continuation-in-part of Ser. No. 350,938, April 13, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,203

Int. Cl.² A46B *5/02*

U.S. Cl. 15—143 R **2 Claims**



1. A brush handle which is proportioned to be of a length not substantially greater than an average adult hand width, said handle having two opposed convexly shaped sides which extend between opposite handle ends and arched in opposite directions to provide a maximum width approximately midway of the handle, a second pair of convex sides arched in opposite directions and proportioned to provide a maximum dimension approximately midway of the handle in length, such pair of opposed sides being joined by edges running in the direction of the axis of the handle length and adapted to form an eight cornered cross-sectional shape providing a ball-like configuration whereby substantially uniform pressure distribution is effected between the grip of the user and the confronting surfaces of the handle, recess means forming a contact surface for the thumb at that end of the handle forming a tool-mounting shank to absorb torque produced through the laterally off-set resultant forces which are non-collinear with the longitudinal axis of the handle, and trapezoidal flattened portions flaring in the direction of the brush end of said handle and disposed at the end of said handle which forms the base of the handle.

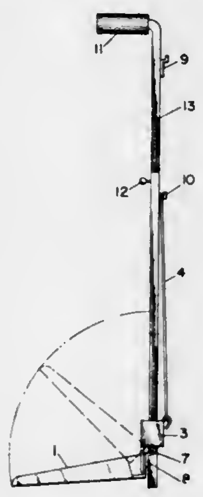
3,971,095
REMOTELY CONTROLLED COLLAPSIBLE DUST PAN

Paul R. Fish, Sr., P.O. Box 82, Port Deposit, Md. 21904

Continuation-in-part of Ser. No. 391,324, Aug. 28, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,242

Int. Cl.² A47L *13/52*

U.S. Cl. 15—257.7 **2 Claims**



1. A collapsible dust pan combination consisting of an upright member with a holding means located at the upper end of said upright member extending at substantially a 90° angle with respect to said upright member; a pan having a back, sides and bottom connected to the lower portion of said upright member through a hinge, said holding means extends in the same direction as said pan when said pan is in an open position; a rigid latch for engaging said pan in a horizontal position by engaging the back of said pan, said pan folding up and leaning against said upright member in a closed position being retained therein by the rigid latch engaging the front edge of the pan and said pan opening to the horizontal position and being stopped at said horizontal position by said hinge means coming into contact with an extension of a lower portion of the upright member preventing the pan from going beyond the horizontal position, said upright member containing a remotely operated control means disposed near the top of said upright member for controlling the rigid latch so that said pan can be released from its closed position and engaged in its open position without stooping by using the control means located near the top of said upright member, wherein said upright member is a shaft.

3,971,096
VACUUM CLEANER, OPERATED BY COMPRESSED AIR

Arnkjell Renholt, Sandefjord, Norway, assignor to A/S Norclean, Sandefjord, Norway

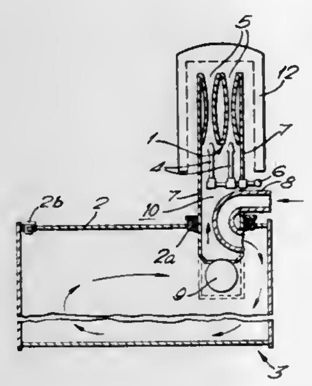
Filed May 23, 1974, Ser. No. 472,822

Claims priority, application Norway, May 25, 1973, 2154/73

Int. Cl.² A47L *9/00, 5/18*

U.S. Cl. 15—326 **6 Claims**

1. A pressurized air-operated vacuum cleaner apparatus having an ejector device with nozzle means and appurtenant venturi means for creating a vacuum in an oil drum type container, said ejector device including an inlet passage for conducting suction air and entrained debris from a location outside said container into said container and an outlet passage for conducting air from said container, said nozzle means being mounted in said outlet passage upstream from said venturi means, means for supplying high pressure operating air to said nozzle means for ejection thereof downstream into said venturi means to produce said vacuum, said container including an open plug hole and a closed plug hole, the improvement comprising, an elongated housing enclosing said ejector device and being mounted with a sealing fit through said open plug hole, said elongated housing including a first opening in a first end portion thereof extending into said container and a second opening at a second end portion thereof extending outwardly of said container, said elongated housing further including a third opening adjacent said first opening and a fourth opening in a side wall of said elongated housing outside of said container, said outlet passage extending between said first and second openings and said inlet passage extending between said third and fourth openings.



2. Apparatus as in claim 1 further comprising a muffler mounted over said second opening of said elongated housing.

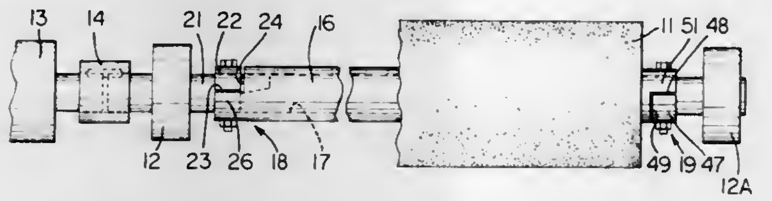
3,971,097
CYLINDRICAL BRUSH WITH STUB SHAFT SUPPORT

Gaylord J. Clark, 4679 Paw Paw Lake Road, Coloma, Mich. 49038

Continuation-in-part of Ser. No. 510,751, Sept. 30, 1974, Pat. No. 3,921,245. This application Aug. 21, 1975, Ser. No. 606,659

Int. Cl.² A46B *13/02*

U.S. Cl. 15—179 **14 Claims**



1. In combination, rotary brush means having a sleeve-like hub provided adjacent one end thereof and defining therein a bore coaxial of said brush means, a pair of bearing means positioned ajacent the opposite ends of said rotary brush means, and shaft means connected between said rotary brush means and said pair of bearing means for supporting said brush means for rotation about a rotational axis defined by said bearing means, said shaft means including a stub shaft connecting means connected to said hub and coacting with an adjacent one of said bearing means, said connecting means including a stub shaft having a first shaft portion rotatably supported within said one bearing means and a second shaft portion spaced from said first shaft portion and positioned within said bore and fixedly connected to said hub, comprising the improvement wherein said stub shaft connecting means includes first means defining a recess within said hub and extending axially inwardly a first preselected distance from the free end thereof, said recess extending circumferentially of said hub through an angle of at least approximately 180°, said second shaft portion including a first shaft part disposed within said hub and extending axially throughout said first preselected distance, said hub and said first shaft part having a first clamping area therebetween which is spaced diametrically opposite from said recess, said second shaft portion including a second shaft part disposed directly adjacent said first shaft part and defining the free end of said stub shaft, said second shaft part extending inwardly into said hub for a second preselected distance beyond said first preselected distance, and second means associated with said hub and said second shaft part for creating a clearance space therebetween which extends axially of said hub throughout at least said second preselected distance, said clearance space extending circumferentially of said hub through an angle of at least approximately 180°, said clearance space being diametrically opposite but axially spaced from said recess whereby said stub shaft and said hub can be relatively angularly displaced about a pivot axis which is substantially perpendicular to the rotational axis, said second shaft part and said hub having a second clamping area therebetween which is spaced circumferentially from said clearance space, whereby said first and second clamping areas are disposed on diametrically opposite sides of said stub shaft and are axially displaced relative to one another.

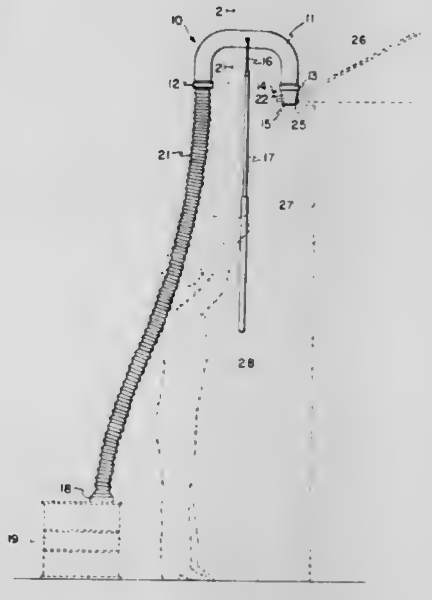
3,971,098
GUTTER CLEANING NOZZLE

Donald E. Davis, 2115 Cowper Drive, Raleigh, N.C. 27608

Filed Feb. 11, 1974, Ser. No. 441,019

Int. Cl.² A47L *9/32*

U.S. Cl. 15—410 **5 Claims**



1. A gutter and roof cleaning nozzle system for use with wet/dry vacuum devices comprising: an integral nozzle manifold; a special purpose nozzle head operatively connected to one end of said manifold whereby debris and other foreign matter can be readily contacted; a continuous, non-telescoping flexible hose means operatively connected at one end to the end of said manifold opposite said nozzle head and at its other end to the wet/dry vacuum source to allow for passage of debris therebetween; and an elongated telescopic handle means supportingly attached to said manifold to allow the height of the nozzle above the ground to be adjusted and the same can be manipulated into operative debris removing position.

3,971,099
HINGE ASSEMBLY STOP ATTACHMENT

David L. Wallace, 2924 Cresent Drive, Stillwater, Okla. 74074

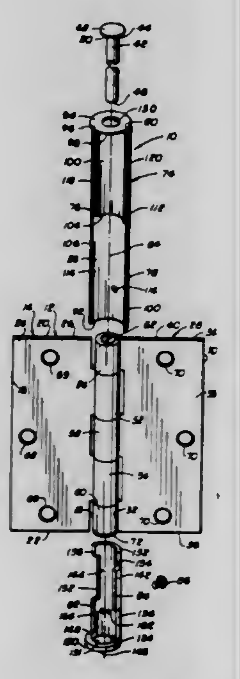
Filed June 23, 1975, Ser. No. 589,055

Int. Cl.² E05F *3/20*

U.S. Cl. 16—50 **17 Claims**

1. A stop attachment removably connectable to a hinge assembly having a first hinge leaf, a second hinge leaf and a pintle hingedly connecting the first hinge leaf and the second hinge leaf for pivotal movement of the first and the second hinge leaves about the pintle connection therebetween, comprising:

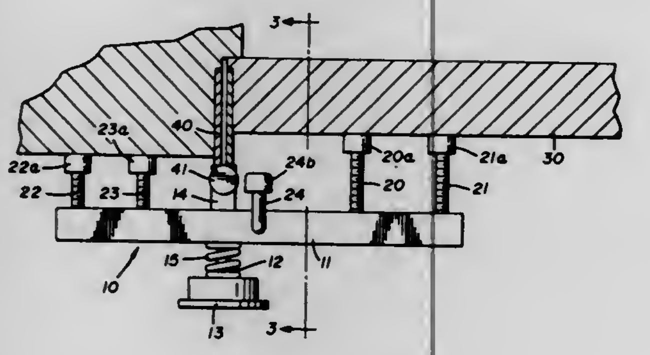
- a housing assembly having a first stop surface and a second stop surface formed on portions thereof, and a portion removably connectable to the hinge assembly;
- a stop sleeve having a first stop surface and a second stop surface formed on portions thereof, and a portion removably connectable to the hinge assembly; and



means connecting the housing assembly to the stop sleeve for positioning at least one of the first stop surfaces of the housing assembly and the stop sleeve to engage the first hinge leaf and for positioning at least one of the second stop surfaces of the housing assembly and the stop sleeve to engage the second hinge leaf in an operating position of the stop attachment, the housing assembly and the stop sleeve being connected to the hinge assembly in the operating position of the stop attachment.

3,971,100
AUXILIARY DOOR LOCK

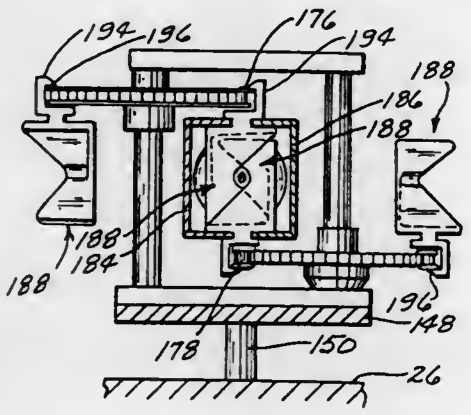
Ivan Anop, 639 Tuscarawas Ave., Barberton, Ohio 44203
Continuation-in-part of Ser. No. 474,517, May 30, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,863
Int. Cl.² E05F *5/02*
U.S. Cl. 16—82 **7 Claims**



1. An auxiliary lock for use in connection with a door hinge, comprising;
   - A. an elongate cross bar;
   - B. a plurality of adjustable stop members carried by and projecting from one side of said cross bar; and
   - C. spring-loaded connecting means
     1. carried by said cross bar between said stop members and
     2. adapted to engage the door hinge and normally urging said cross bar toward the door hinge.

3,971,101
APPARATUS FOR ENCASING A PRODUCT

Ray T. Townsend, and Donald L. Beasley, both of Des Moines, Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa
Filed Oct. 2, 1972, Ser. No. 294,214
Int. Cl.² A22C *11/00*
U.S. Cl. 17—33 **2 Claims**



1. Linking apparatus for use with a product encasing machine, said machine being adapted to expel an elongated casing filled with plastic product and being adapted to rotate said casing about its longitudinal axis; said linking apparatus comprising,

a support;

first and second sets of drive wheels rotatably mounted on said support;

means for rotating said drive wheels;

first and second loop members trained around said first and second sets of drive wheels respectively;

said first and second loop members having adjacent straight side portions defining a linking station;

said wheels being adapted to move said loop members past said linking station adjacent said casing;

a plurality of pinching members having pinching surfaces thereon carried around said first and second sets of drive wheels by said first and second loop members respectively, each of said pinching surfaces on said first loop member being positioned for cooperating with one of said pinching surfaces on said second loop member while passing said linking station so as to collapse said casing therebetween and reduce its cross-sectional size;

and elongated guide means rigidly mounted on said support between said adjacent straight side portions for at least partially embracing said casing as it moves through said linking station;

said pinching surfaces of said pinching members being received by said guide means and moving through said guide means as said casing moves through said linking station;

said elongated guide means extending substantially the entire length of said adjacent straight side portions for guiding said casing for substantially the entire time said casing is moving through said linking station.

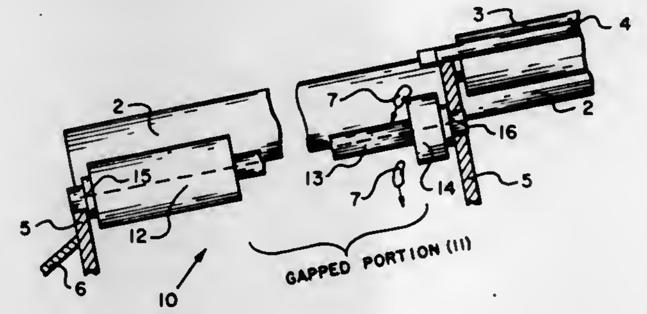
3,971,102
SHRIMP PEELER ROLLER SYSTEM

Raphael Q. Skrmetta, 4610 Press Drive, New Orleans, La. 70126
Filed Nov. 7, 1974, Ser. No. 521,785
Int. Cl.² A22C *29/00*
U.S. Cl. 17—73 **9 Claims**

1. The method of varying the effective peeling action of a shrimp peeling machine which peels shrimp by the action of at least two regular, mating rollers rotating in alternating, opposite directions forming a peeling section, the shrimp being supported on the rollers and being peeled by the rollers by means of the shells being pinched between the nips of the rollers as the shrimp move down the rollers, comprising the following steps:

a. providing at least one supplemental roller having an initial portion along its length of the same diameter as one

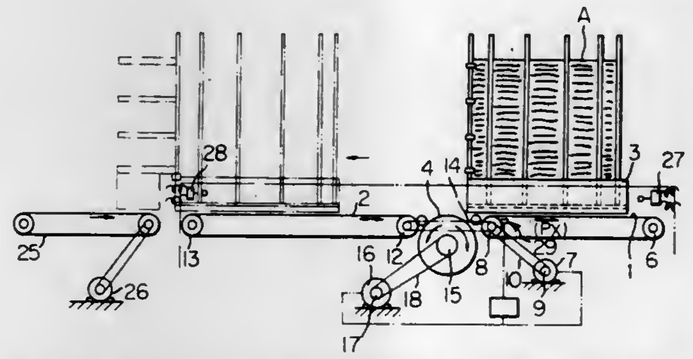
of said regular mating rollers and a subsequent gapped portion of a reduced diameter further down along its length of a size sufficient for all the shrimp to fall into without encountering any further peeling action when the shrimp is at said gapped portion to allow all the shrimp being peeled to then fall out of the peeling section and avoid any further peeling action; and



b. replacing said one of said regular rollers with said supplemental roller with said initial portion at the upstream end and in peeling engagement with the other of said regular rollers and said gapped portion being out of any peeling engagement with said other regular roller; whereby the effective peeling action of the machine is shortened by means of all of the shrimp falling into said gapped portion rather than being subject to peeling action along the full length of the rollers.

3,971,103
SAFETY DEVICE FOR STOPPING THE BALE PLUCKING OPERATION

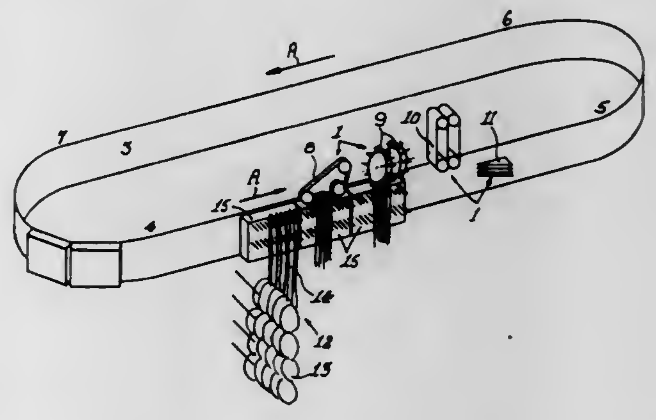
Kazuyoshi Ono, Chiryu; Osamu Suzuki, Kariya, and Hideo Hidaka, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan
Filed June 6, 1974, Ser. No. 476,792
Claims priority, application Japan, June 13, 1973, 48-69637[U]
Int. Cl.² D01G *31/00, 7/00*
U.S. Cl. 19—.2 **6 Claims**



1. A bale plucker for plucking fiber tufts from a highly compressed fiber bale by a plucking roller which is constructed to remove fibers with each reciprocating passage of said bale from the bottom of said bale, comprising conveying means for reciprocally shifting said fiber bale in a predetermined path to and from a working position of the plucking roller, driving mechanism for driving said reciprocally shifting device and for driving said plucking roller, an electric circuit which connects said driving mechanism to an electric source, and a safety device for stopping the bale plucking operation of said bale plucker, a device for detecting the existence of metallic substances which are contained in said fiber bale, said detecting device being disposed at a position adjacent said predetermined path of said carrying device and being positioned adjacent to the reciprocal shifting path of said bale to detect the existence of the metallic substance within an effective thickness of said bale from said conveying means, an electromagnetic relay arranged in said electric circuit, said electromagnetic relay being capable of actuation by an electric signal issued from said detecting device, whereby, when a portion of said fiber bale, which contains a metallic substance approaches an effective position of said detecting device according to the plucking operation and therefore said detecting device detects a metallic substance contained in said fiber bale before said bale is carried to said working position of said plucking roller, means connected for actuation of said electromagnetic relay by said signal issued from said detecting means so that said driving mechanism is stopped and displacement of said fiber bale to said working position of said plucking roller is prevented, and supplemental conveyor means adjacent said reciprocating path, to which said bale may be diverted after said driving mechanism is stopped.

3,971,104
TEXTILE FIBER COMBING

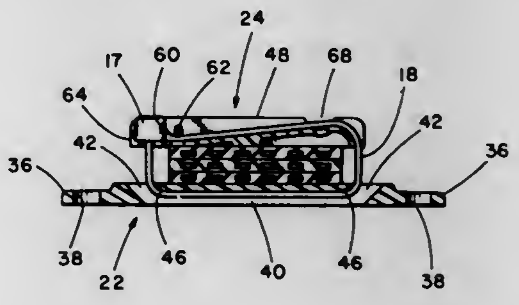
Derek W. F. Turpie, and Jaroslav Klazar, both of Port Elizabeth, South Africa, assignors to South African Inventions, Pretoria Transvaal, South Africa
Filed Aug. 13, 1974, Ser. No. 497,100
Claims priority, application South Africa, Aug. 14, 1975, 73/5552
Int. Cl.² D01G *19/10*
U.S. Cl. 19—115 R **19 Claims**



1. A method of combing textile and the like fibres including the steps of feeding a sliver of fibres into a position suitable for combing, said sliver having a free end or fringe, clamping the free end or fringe of the sliver, combing the portion of the thus clamped sliver which follows the clamped end thereof, releasing the free end or fringe, combing the sliver free end or fringe, the sliver thereby having uncombed a portion which adjacently follows the combed portion, combing said uncombed portion of the fibres adjacent and following the combed portion of the fibres, drawing off fibres from the thus combed sliver, and advancing the sliver for repetition of the cycle.

3,971,105
MOUNT FOR FLAT OBJECTS SUCH AS FLAT CABLES

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corporation, Tinley Park, Ill.
Filed Jan. 8, 1975, Ser. No. 539,373
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **21 Claims**



1. A mount for use with a cable tie having a locking head and a strap extending therefrom for holding at least one flat

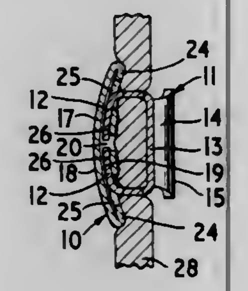
cable having opposed generally flat first and second sides, said mount comprising:

a first member comprising means for providing a substantially flat surface for engaging the first side of said flat cable and further having guide means for guiding said strap about a portion of said first member so that said strap extends beyond said substantially flat surface; and

a second member having holding means for captively holding the locking head and having means for providing a substantially flat surface for engaging the second side of said flat cable and further having guide means for guiding said cable tie about a portion of said second member so that said cable tie extends beyond the last-mentioned substantially flat surface, said substantially flat surfaces being positionable facing each other and in substantial registration with each other whereby after the locking head is positioned in the holding means and the strap is positioned in the respective guide means of the first member and the second member, respectively, the flat cable can be inserted between said flat surfaces and the strap inserted through the locking head and tightened thereby to firmly hold said flat cable without substantial deformation thereof.

3,971,106
PRONG-ATTACHED GARMENT FASTENERS DEVICES WITH BACKING MEMBERS

Brian Chambers, Birmingham, England, assignor to Thomas Walker Limited, Birmingham, England
Filed July 23, 1974, Ser. No. 491,089
Claims priority, application United Kingdom, Aug. 4, 1973, 37127/73
Int. Cl.² A44B *13/00*
U.S. Cl. 24—227 **10 Claims**



1. In a pronged garment fastener and backing member combination, a backing member comprising:

a. a sheet-metal disc constituting a body portion including a spherically curved shallow dished configuration having a convex exterior surface and a concave interior surface with a recess provided by the concavity of said concave interior surface;

b. tongue elements provided by diametrically opposed integral lugs extending radially inwards from the periphery towards the center of the disc;

c. said tongue elements lying within said recess and disposed at an angle with respect to each other;

d. apertures in said tongue elements to register with prongs of the pronged garment fastener; and

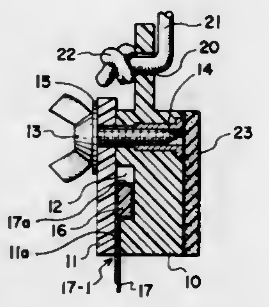
e. groove formations in said tongue elements extending longitudinally from said apertures and toward the center of said disc;

f. said tongue elements having continuous edge portions extending from said periphery in substantially close proximity of said interior surface and said groove formations co-operating with the opposed concave interior surface to provide pockets disposed at an angle with respect to each other and adapted to receive and closely confine outer end portions of the prongs and promote a flat surface contact between the prongs and said interior surface;

g. securing the fastener to garment material, said prongs being forced through the garment material so as to pass into said apertures and to be deflected into said pockets by forcible engagement with the opposed said concave interior surface of the disc and thereby to be clenched causing the outer end portions to be bent over the tongue elements at said apertures.

3,971,107
DEVICE FOR HOLDING FLEXIBLE MATERIAL

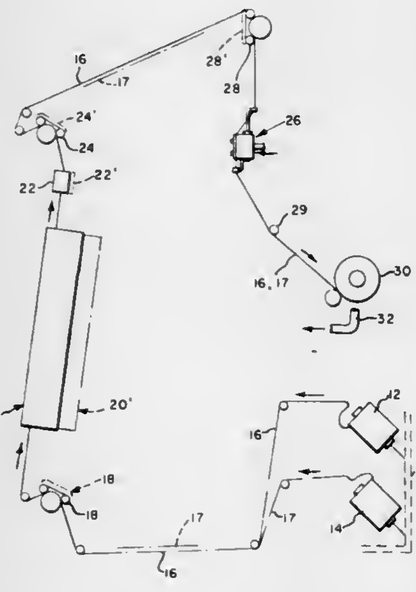
George Yim, 950 16th St., Ogden, Utah 84404
Filed Aug. 1, 1975, Ser. No. 601,029
Int. Cl.² A44B *21/00;* **A47C** *21/00*
U.S. Cl. 24—243 K **9 Claims**



1. A device for holding flexible sheet or strip material, comprising a loop holder formed by clamping jaws disposed in face-to-face relationship and having confronting faces configurated to provide a polygonal passage therebetween for the reception of a loop portion of flexible sheet or strip material to be held and of a loop-expanding element; jaw face portions adjacent to and at one end of the polygonal passage adapted to define therebetween a relatively shallow passage for said sheet or strip material when the clamping jaws are opened, said passage accommodating emergent portions of a received loop portion of flexible sheet or strip material to be held; means for applying clamping pressure to the clamping jaws of the loop holder; and a rigid, polygonal, loop-expanding element of size adapted to be non-rotatively accommodated by said polygonal passage and adapted for positioning within a loop portion of flexible sheet or strip material to be held that is positioned within said polygonal passage.

3,971,108
SET APPARATUS FOR TREATING YARN AND PROCESS FOR STRINGUP THEREOF

Adly Abdel-Moniem Gorrafa, Hockessin, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.
Filed Mar. 31, 1975, Ser. No. 563,403
Int. Cl.² D02G *1/16*
U.S. Cl. 28—1.4 **9 Claims**



1. A jet apparatus for treating yarn comprising:

a body member having a surface with a yarn passage in said surface extending from an entrance to an exit, said yarn passage having a semi-circular cross section;

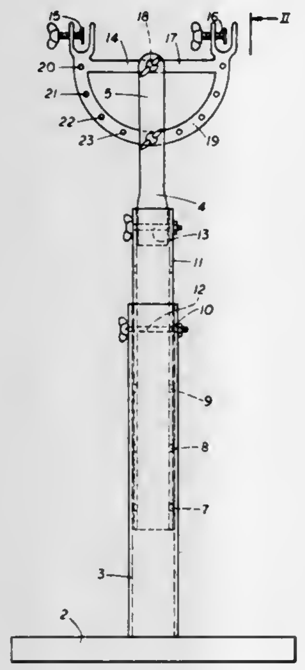
a conduit within said body member intercepting said passage for introducing fluid into said passage;

a removable cover enclosing said passage;

and guide means located in each quadrant of the semi-circle of said passage cross section and positioned with relation to said entrance for providing two separate yarn paths converging toward said entrance, said yarn paths converging at an included angle of from about 60° to about 90° and being at an acute angle with the axis of said yarn passage of from about 15° to about 60°.

3,971,109
WEAVING FRAME SUPPORTING DEVICE

Jose G. Garza, San Ysidro, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 10, 1975, Ser. No. 548,336
Int. Cl.² D03D *29/00*
U.S. Cl. 28—15 **2 Claims**



1. A weaving frame supporting device for supporting a weaving frame in a desired position, said weaving frame supporting device comprising

a base member;

a support member of adjustable variable length supported substantially vertically by the base member, said support member having an axis;

a bifurcated head member adjustably affixed to the free end of the support member and having a pair of spaced substantially parallel arms; and

a clamp member rotatably adjustably affixed to and between the arms of the head member and having clamping means thereon for releasably clamping a weaving frame thereto in a manner whereby the clamping member is adjustable angularly in a plane through the axis of the support member to position the clamping means at selected angles relative to horizontal, said clamp member comprising a substantially linear member rotatably affixed at its center between the arms of the head member at upper points between said arms and a substantially semicircular member affixed to the linear member to form a substantially D shape having a plurality of spaced holes formed therethrough and affixed at a selected one of the holes to lower points between said arms.

3,971,110
METHOD FOR FABRICATING AN ELECTRON-EMISSION CATHODE

Richard E. Thomas, Riverdale, Md., and George A. Haas, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 11, 1975, Ser. No. 612,517
Int. Cl.² H01J *9/12*
U.S. Cl. 29—25.18 **16 Claims**

1. A method for fabricating a thermionic cathode comprising:

uniformly mixing a quantity of noble metal powder with a quantity of silver powder;

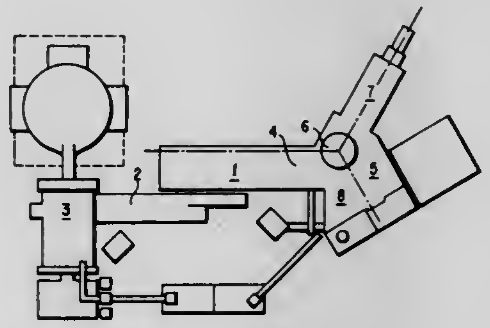
compressing said mixture under pressure to form a shaped article;

sintering said article at a temperature sufficient to evaporate said silver and form a porous matrix; and

impregnating said matrix with an active material to fill the matrix pores and form an electron-emissive cathode, said active material consisting of at least one material selected from the group Ba, Ca and Sr.

3,971,111
APPARATUS FOR TRANSFERRING AND FINISHING ITEMS CAST SEVERAL AT A TIME IN A CHILL MOLD

Andre Ballini, Arnouville-les-Gouesse, and Roger Bailly, Mendou, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Feb. 14, 1974, Ser. No. 442,649
Claims priority, application France, Feb. 14, 1973, 73.05210
Int. Cl.² B23P *15/10*
U.S. Cl. 29—38 C **7 Claims**



1. Apparatus for transferring and finishing parts cast several at a time in a chill-mold which comprises:

first means for transferring parts from the casting machine a cooling conveyor which is connected to receive said parts from said first means and which is connected to deliver said parts to a second transferring means; said cooling conveyor comprising:

a frame on which is mounted a series of inclined chutes which comprise parallel bars down which said parts are slidable, a plurality of rows of cooling-fluid sprayers and a hood for drawing off fumes above the chutes a vibrator means on said frame for facilitating the movement of said parts;

a turntable onto which said parts are mounted in turn from said second transferring means for machining upon passage before turning means and broaching means; and

two pivoting levers positioned at the lower end of each of said chutes, said levers separated angularly and joined to a common axis and actuated by a jack, said levers further being separated axially by a distance corresponding to one of the dimensions of said part, said levers utilized for the retention of a stack of said parts and for the release of one of said parts to said second transfer means.

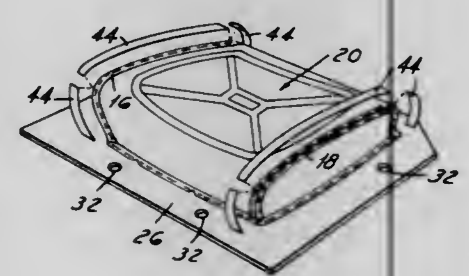
3,971,112
METHOD OF MAKING A COVERED ARTICLE

Frank M. Amato, Detroit, and Richard E. England, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 22, 1975, Ser. No. 615,640

Int. Cl.^{2} B68G *7/00*

U.S. Cl. 29—91.1 **9 Claims**



1. A method of making a covered article which comprises the steps of:

forming at least a pair of covering members of a covering material, said covering material being impervious to a foam material which is formed from a foamable composition;

sewing said covering members together along at least one sew line to form a cover having a peripheral edge portion therearound and an interior volume, said sewing operation placing openings through said cover which permit the passage of said foam material through said cover;

forming a locating member having both an inner peripheral edge portion therearound defining a central opening and locating portions between said inner peripheral edge portion and an outer peripheral edge portion, said locating member's inner peripheral edge portion having the same general configuration as said peripheral edge portion of said cover;

joining said peripheral edge portion of said cover to said inner peripheral edge portion of said locating member;

sealing said opening along said sew lines joining said covering members together so that said foam material produced upon foaming of said foamable composition cannot flow through said openings;

locating said cover and joined locating member in a foaming mold having a mold portion containing a die surface upon which a vacuum can be drawn and an openable cover portion, said locating portions of said locating member being aligned with locating positions on said foaming mold to align accurately said cover with said die surface of said foaming mold;

drawing a vacuum on said die surface of said foaming mold thereby to draw a facing surface of said cover into contact with said die surface;

placing a charge of said foamable composition into said interior volume of said cover defined between an inner surface of said cover and its peripheral edge when said cover is held in contact with said die surface by vacuum;

closing said cover portion of said foaming mold;

reacting said foamable composition to fill said interior volume of said cover with said foam material;

opening said foaming mold;

removing said cover, foam material and locating member from said foaming mold;

removing said locating member from said cover having said foam material therein thereby to form a covered article.

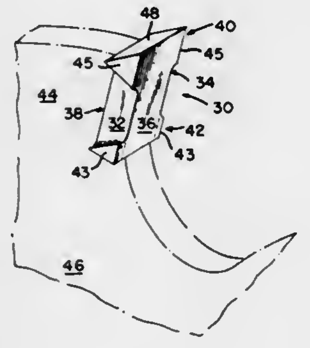
3,971,113
PRE-SHARPENED CUTTING TIP FOR SAW PLATE

Robert L. Budke, and Lowell C. Freeborn, both of Seattle, Wash., assignors to Systi-Matic Company, Seattle, Wash.

Filed July 2, 1975, Ser. No. 592,403

Int. Cl.^{2} B27B *33/12*

U.S. Cl. 29—95 R **6 Claims**



1. A pre-sharpened, integrally formed cutting tip for insertion into the working edge of a saw blade, said tip comprising:

a tip body having an axis defining the central axis of said tip;

a cutter end containing a cutter edge formed at one end of said tip body, said cutter end being wider than a portion of said tip body and terminating in a planar surface laterally offset from said central axis; and

a stabilizing end formed at the other end of said tip body, said stabilizer end having an alignment surface laterally offset from the central axis by a distance substantially equal to the lateral offset of said cutter end so that the central axis of said tip may be aligned parallel to the plane of a saw plate placed along a line.

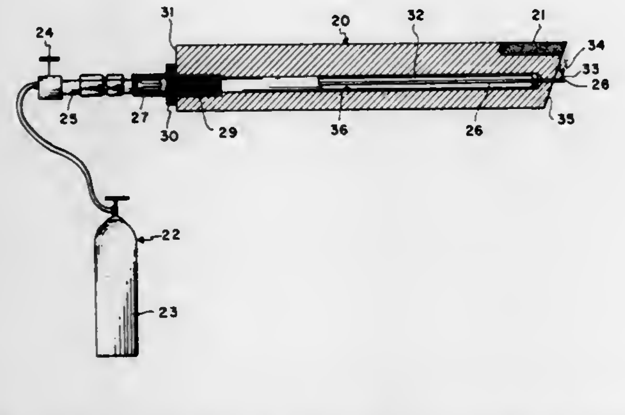
3,971,114
MACHINE TOOL HAVING INTERNALLY ROUTED CRYOGENIC FLUID FOR COOLING INTERFACE BETWEEN CUTTING EDGE OF TOOL AND WORKPIECE

George M. Dudley, 69 N. Boxwood St., Hampton, Va. 23369

Filed Jan. 27, 1972, Ser. No. 221,322

Int. Cl.^{2} B26D *1/00;* B23B *3/00*

U.S. Cl. 29—106 **2 Claims**



1. In a tool for operating on a workpiece, wherein a coolant is applied to the interface between the tool cutting edge and workpiece, the improvement comprising:

a source of cryogenic coolant; tool means;

means internally defined by the tool means to carry the cryogenic coolant from the coolant source to the cutting edge of the tool means;

said means having opening means at the region of the cutting edge of the tool means to direct a stream of the cryogenic coolant at the interface between the tool cutting edge and the workpiece in such a direction that the chip cutting from the workpiece does not interfere with the stream;

and insulation means within the tool preventing the cryogenic coolant from boiling until it reaches the tool cutting edge to obtain maximum heat dissipation;

said means internally defined by the tool comprising a bore with an interfitting tubular structure to carry the coolant from the coolant source to the cutting edge of the tool, wherein said tubular structure terminates inside the tool near the tool cutting edge and further comprising conduct means directed at a precise angle to carry the coolant from the termination of the interfitting tubular structure to the tool cutting edge.

3,971,115
METHOD OF MAKING ROLLER

Siegfried Schneider, Durrnhaar; Kurt Thate, Munich: Erwin Geyken, Munich; Horst Kempe, Munich, and Stephan Macher, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

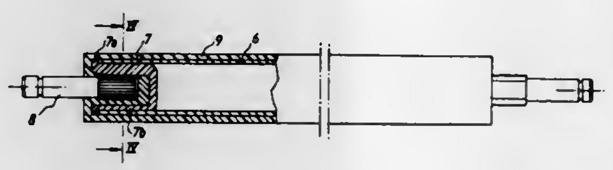
Division of Ser. No. 375,850, July 2, 1973, Pat. No. 3,823,456.

This application Feb. 28, 1974, Ser. No. 446,923

Claims priority, application Germany, July 1, 1972, 2232424

Int. Cl.^{2} B21H *1/14*

U.S. Cl. 29—148.4 D **9 Claims**



1. A method of producing chemically resistant rollers of the type having a tubular metallic core, comprising the steps of introducing portions of two inserts into the ends of a tubular core; confining the core and the inserts in the cavity of an injection mold; and injection-molding a chemically resistant coat about the exposed surfaces of the core and of the inserts, said coat bonding with said inserts, sealing the interior of the core and securing said inserts to the latter.

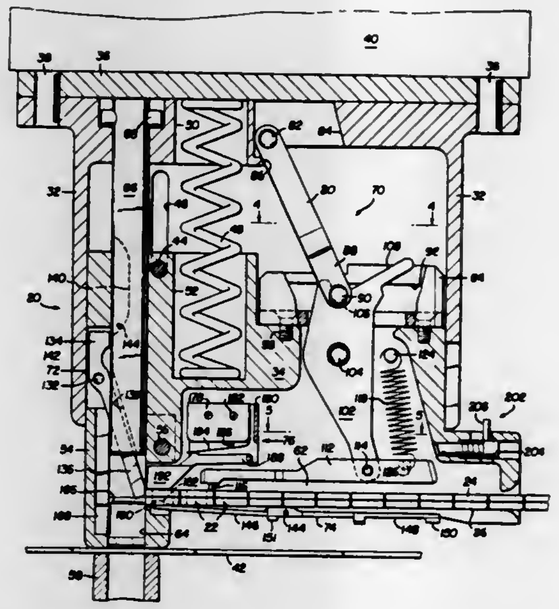
3,971,116
FASTENER INSTALLATION HEAD

Dale H. Goodsmith, and Harold A. Ladouceur, both of Livonia, Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed May 5, 1975, Ser. No. 574,773

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—208 D **4 Claims**



1. In a nut installation head having a nut passage receiving a plurality of nuts in side to side relation, said nuts having a bore, a transverse plunger passage communicating with said nut passage, a plunger reciprocating in said plunger passage through the intersection of said passages to install a nut received in said plunger passage from said nut passage and a feed means feeding nuts to said plunger passage, the improvement comprising:

said feed means including a pawl reciprocating in said nut passage, said feed means reciprocating said pawl to engage a nut spaced from said plunger passage, said feed means then reciprocating said pawl toward said plunger passage to feed a nut into said plunger passage, and a restrictor means preventing nuts from withdrawing into said nut passage from adjacent said plunger passage, said restrictor means including an arm pivotally connected between its free ends to said housing adjacent said first passage, said arm being convex in configuration facing said head, one end having a laterally extending finger projecting and resiliently biased into said nut passage through an opening in said nut passage adjacent said plunger passage, the opposed end biased against said head said finger receivable within the nut bores in said nut passage preventing nuts from withdrawing into said nut passage and having a camming face facing the nuts entering said plunger passage, whereby nuts entering said plunger passage resiliently biases said finger out of its restricting position, permitting the feeding of nuts into said plunger passage.

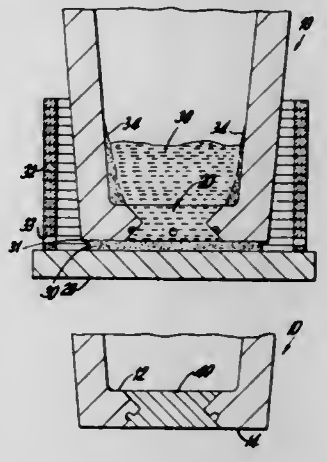
3,971,117
METHOD OF REPAIRING INGOT MOLD BOTTOMS

Richard E. Osterhout; Walter A. McCray, both of Berea, Ohio, and Mark J. Rudowicz, Griffith, Ind., assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed July 23, 1975, Ser. No. 598,221

Int. Cl.^{2} B23P *7/00;* B22D *41/00, 41/08*

U.S. Cl. 29—401 E **10 Claims**



1. A method for repairing an eroded bottom of an ingot mold which comprises:

a. removing the eroded portion of the bottom;

b. forming a casting space in the mold bottom by cutting a hole through the bottom of the mold, the cross-sectional area of the hole varying such that the diameter of the hole at the inner and outer surfaces of the bottom of the mold are larger than the cross-sectional area of the hole at the interior portion of the mold bottom, the sides of the hole tapering outwardly from the interior portion of the mold bottom towards the inner and outer surfaces of the mold bottom;

c. cutting one or more notches in a portion of the outwardly tapering side of said hole which is between the point of the hole having the smallest cross-sectional area and the outer surface of the mold bottom;

d. placing the mold in an upright position on a smooth layer of a compactable refractory material;

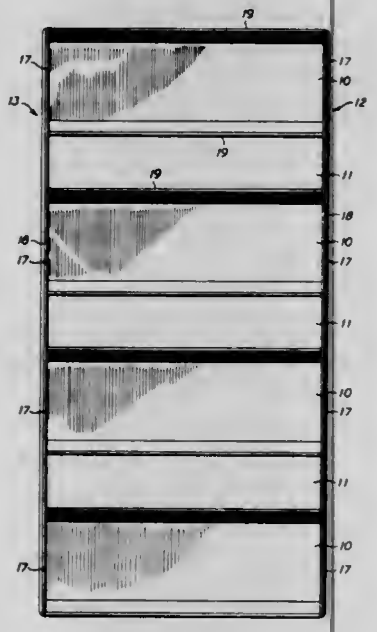
e. providing a protective layer of a refractory material about the inner walls of the mold; said layer beginning at the

interior entrance of said hole and tapering upwardly and outwardly along the inner walls of the mold;
- f. filling said casting space and a portion of the bottom interior volume of the mold with an alumino-thermic welding material in an amount effective to provide sufficient weld metal to fill said casting space;
- g. igniting said alumino-thermic mixture;

whereby molten metal is formed from the aluminum thermic reaction and gravitates downwardly into and filling the casting space to form, on cooling, an insert firmly welded and locked into the casting space.

3,971,118
METHOD OF MAKING A COMPOSITE BAKING MOLD

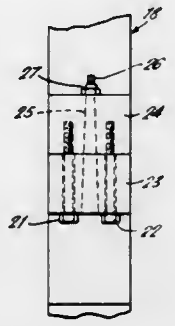
Magnus Allan Holmqvist, Amanuensvagen 2-114, S-104 05 Stockholm, Sweden
Filed Dec. 9, 1974, Ser. No. 531,003
Claims priority, application Sweden, Dec. 13, 1973, 7316830
Int. Cl.^{2} B23P *17/00*
U.S. Cl. 29—412 **8 Claims**



1. A method of making a composite baking mold having a plurality of individual mold spaces, said method comprising the steps of extruding light metal to form an elongated bar, extruding light metal to form an elongated section, cutting said bar perpendicular to its longitudinal axis to form a plurality of bars having the same longitudinal dimensions, said longitudinal dimension corresponding to the length of said composite baking mold, cutting said section perpendicular to its longitudinal axis to form a plurality of sections having the same longitudinal dimension, said longitudinal dimension corresponding to the width of said composite baking mold, affixing said sections to said bars at their engagement in a configuration such that said bars are spaced and are parallel to each other and said sections are spaced and are parallel to each other, said sections being disposed perpendicular to said bars and engaging said bars at each end thereof.

3,971,119
MANUFACTURE OF RINGS COMPRISING SEPARABLE SEGMENTS

Gordon Richard Walker, Leamington Spa, England, assignor to Filton Limited, Leamington Spa, England
Filed Aug. 25, 1975, Ser. No. 607,263
Claims priority, application United Kingdom, Aug. 27, 1974, 37431/74
Int. Cl.^{2} B23P *17/00*
U.S. Cl. 29—416 **8 Claims**



1. A method of manufacturing a ring comprising separable segments, with the improvement that said segments are formed and assembled to constitute the ring and are held together against relative displacement by tapered pins located in correspondingly tapered passageways formed across the joints between mating segments and a finishing operation is performed on at least one face of the ring common to all the segments while the segments are thus held and located by said pins.

3,971,120
DIRECT-ON CERAMIC COATING OF CARBON-RICH IRON

Clifford G. Ruderer, Brecksville, Ohio, assignor to Ferro Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 535,441, Dec. 23, 1974, Pat. No. 3,923,611. This application Sept. 2, 1975, Ser. No. 608,961
Int. Cl.^{2} B23P *3/02;* **C25D** *5/36, 5/48;* **C23D** *3/00*
U.S. Cl. 29—460 **25 Claims**

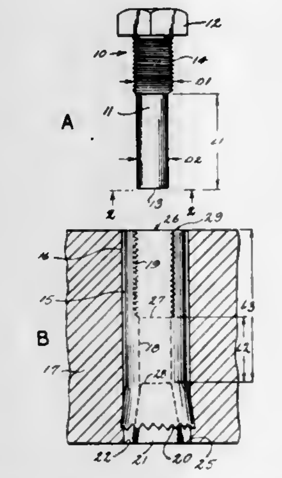
1. In a process for the direct-on, ceramic coating of a carbon-rich, iron workpiece, the improvements prior to depositing the ceramic coat of:
- a. pressure-bonding a substantially continuous layer of substantially pure iron onto said carbon-rich iron workpiece,
- b. placing the workpiece and bonded iron layer in an electroconducting liquid medium, and
- c. electrolytically removing some of the deposited iron using the workpiece as an anode to produce an exposed, fissured surface in said substantially continuous layer.

3,971,121
METHOD FOR EXTRACTING A MOUNTED ANCHOR BOLT AND ANCHOR BOLT EXTRACTOR THEREFOR

Jack C. Napper, 3815 Volt Ave., Long Beach, Calif. 90808
Continuation-in-part of Ser. No. 368,852, June 11, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,774
Int. Cl.^{2} B23P *19/02*
U.S. Cl. 29—427 **6 Claims**

1. A method for extracting a mounted anchor bolt secured to an anchor bolt cavity wall within a mounting member, said mounted anchor bolt comprising in combination a hollow cylindrical member and a conical wedge member, said hollow cylindrical member having a central cylindrical wall circumscribing an anchor bolt through-hole, said wall having screw threads cut into an upper wall portion extending from a top through-hole opening to a screw thread termination end intermediate said through-hole, said screw threads having an internal diameter substantially equal to or greater than the

through-hole diameter at said thread termination end, said thread termination end coinciding with an upper conical wedge seat wall portion said through-hole extending below said thread termination end and having seated therein said conical wedge, said conical wedge having a top small diameter portion seated within said seat and a conical wedge bottom large diameter portion resting on a bottom of said anchor bolt mounting cavity, said wedge bottom large diameter being smaller than said anchor bolt cavity diameter and larger than said through-hole, said anchor bolt thereby being secured within said cavity, said method for extracting said mounted anchor bolt comprising,
- inserting into said mounted anchor bolt through-hole through said top through-hole opening a tool having threaded portion matable with said anchor bolt threads, said threaded portion being intermediate a top external tool connecting means and a cylindrical unthreaded shank portion, said shank portion having a diameter smaller than said through hole and having a shank length greater than a distance between the anchor bolt screw thread termination and the conical wedge top small diameter portion seated within the anchor bolt conical wedge seat,

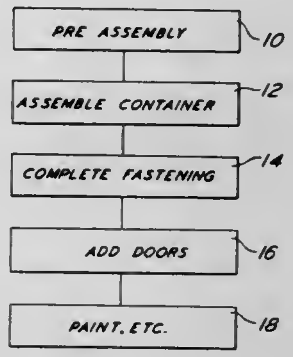


- screwing said tool into the anchor bolt thereby forcing a disengagement between the conical wedge member and the anchor bolt hollow cylindrical member, and further forcing upwardly said anchor bolt hollow cylindricl member from the conical wedge member thereby releasing said anchor bolt hollow cylindrical member from the conical wedge member thereby releasing said anchor bolt hollow cylindrical member from fixed engagement with the anchor bolt cavity wall, and
- lifting the anchor bolt hollow cylindrical member and the conical wedge member out of the cavity.

3,971,122
METHOD OF ASSEMBLING SHIPPING CONTAINER

William A. Bertolini, c/o Bertolini Engineering Co., Inc., Undercliff Terrace, Kinnelon, N.J. 07405, and Isadore Feinberg, c/o Bertolini Engineering Co., Inc., P.O. Box 338, Montgomeryville, Pa. 18936
Filed Oct. 31, 1974, Ser. No. 519,889
Int. Cl.^{2} B23P *21/00*
U.S. Cl. 29—469 **9 Claims**

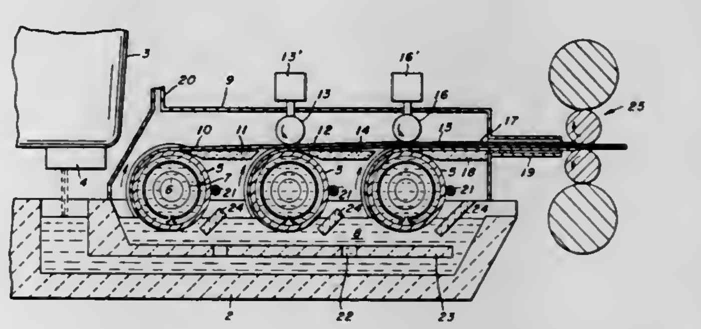
1. An assembly line method of making large containers comprising the steps of:
- a. preassembling rectangular front and rear assemblies having a header and a sill connected at corner posts at a first location,
- b. providing one of said sill and header on each assembly with two locater points in a surface thereon lying in a horizontal plane, providing each corner post with a locater point in a side surface lying in a vertical plane adjacent one end of the corner post, said side surfaces being parallel to each other and perpendicular to said horizontal plane,
- c. producing an open rectangular roof assembly having two locater points on each end thereof at a second location,
- d. producing a rectangular floor assembly with a locater point in a vertical surface at each corner thereof at a third location,
- e. rigidly joining said assemblies at a fourth location to form a rectangular skeleton in a manner so that each locater point on one assembly mates with another locater point on another assembly to thereby establish precise overall container dimensions,



- f. then applying panels to the front, side and top of said skeleton, and
- g. applying at least one door to said rear assembly after the rear assembly has been interconnected with other assemblies to form said skeleton.

3,971,123
PROCESS OF SOLIDIFYING MOLTEN METAL

Erik Allan Olsson, Zurich, Switzerland, assignor to Olsson International Inc., Pittsburgh, Pa.
Continuation of Ser. No. 337,931, March 5, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,561
Int. Cl.^{2} B22D *11/06*
U.S. Cl. 29—527.7 **8 Claims**



1. A metallurgical process for the production of a semi-finished product for subsequent rolling or forging into a finished product, wherein
- a. a melt of molten steel is simultaneously and continuously formed on moving chill surfaces into a plurality of layers of substantially uniformly fine grain structure throughout the thickness of each layer and stripping the layers from the chill surfaces as they are formed,
- b. bringing such layers together in face-to-face contact when they are at the solidus temperature where the metal in the layers shows no apparent liquid at the surface but before it has developed sufficient plasticity for hot rolling,
- c. pressing the contacting layers together with a pressure only sufficient to reduce the thickness of the combined layers not more than 2% of the combined thickness, and
- d. effecting the forming of the layers, the bringing them together and pressing them being effected in a common enclosure in which the hot metal is constantly protected by an inert atmosphere and removing the composite body so formed from said atmosphere only when it has cooled to at least a normal hot rolling temperature.

3,971,124

METHOD FOR MANUFACTURING CYLINDRICAL ARMATURE

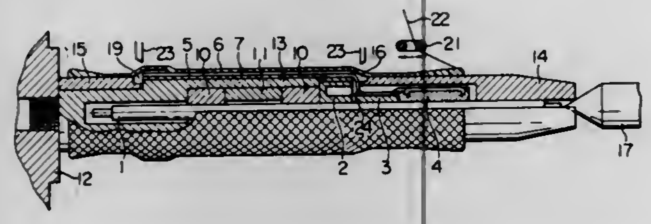
Shigeru Sasaki, Katsuta, and Kiichi Nakamura, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 5, 1975, Ser. No. 610,783

Claims priority, application Japan, Sept. 13, 1974, 49-105048

Int. Cl.² H02K *15/10*

U.S. Cl. 29—598 **2 Claims**



1. In a method for manufacturing a cylindrical armature comprising the step of forming an insulating layer by uniformly winding a glass filament impregnated with thermosetting resin at least onto the outer peripheral surface of a cylindrically arranged armature winding coupled with a rotor ring firmly fixed on the shaft of the armature, the improvement comprising the steps of mounting on the shaft of the armature a jig adapted to be separated into an effective part corresponding to said cylindrical armature winding and an ineffective part, arranging said cylindrical winding on the outer peripheral surfaces of said effective part of said jig and said rotor ring, winding uniformly said glass filament onto the outer peripheral surface of said cylindrical winding and said ineffective part, hardening said resin to form an insulating layer, and separating the part of the insulating layer on said ineffective part of said jig from the part of the insulating layer on said effective part and removing same, along with said jig, from the armature.

3,971,125

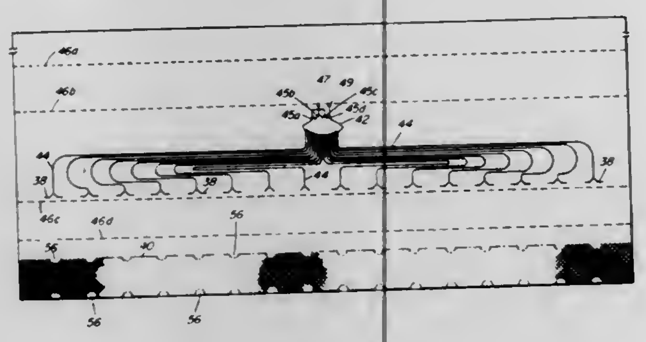
METHOD OF MAKING AN ANTENNA ARRAY USING PRINTED CIRCUIT TECHNIQUES

Wilbur H. Thies, Jr., Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1975, Ser. No. 554,390

Int. Cl.² H01Q *1/38, 13/10*

U.S. Cl. 29—601 **1 Claim**



1. The method of forming a conformal array antenna comprising the steps of:

a. forming a plurality of array modules, each one being formed by:
   i. etching simultaneously on one surface of a flexible dielectric sheet, an array of radiating elements, a ground plane for such elements, a corporate feed network for such elements and a portion of a parallel plate lens coupled to the feed network;
   ii. folding such dielectric sheet around a stiffener including: disposing the plurality of radiating elements in a first plane, and, positioning the ground plane behind the radiating elements in a plane orthogonal to the first plane; and
   iii. bonding such folded dielectric sheet to such stiffener; and

b. arranging the plurality of array modules around a predetermined conformal surface.

3,971,126

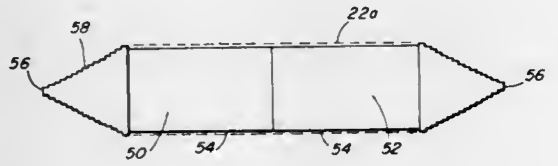
METHOD OF FABRICATING MAGNETIC FIELD DRIVE COILS FOR FIELD ACCESSED CYLINDRICAL DOMAIN MEMORIES

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 494,591, Aug. 5, 1974, Pat. No. 3,932,827. This application Sept. 18, 1975, Ser. No. 614,821

Int. Cl.² H01F *41/06*

U.S. Cl. 29—604 **1 Claim**



1. A method of fabricating a magnetic field drive coil arrangement for field accessed cylindrical domain memories including the steps of:

a. providing a coil form having a length which is substantially greater than the width, the form further having access openings formed therein at each lengthwise end of the form and having a longitudinal axis extending between the ends of the form,

b. positioning a first coil around the coil form such that the turns of the first coil in a central region of the coil form are parallel to the longitudinal axis and the turns of the first coil in a pair of peripheral regions of the coil form diverge away from the longitudinal axis, the step of positioning the first coil further including:
   i. positioning a coil winding block into each access opening of the coil form, each block having a triangular shaped member with a number of slots formed in the tapered surfaces of the members, the number of slots corresponding to the number of turns of the first coil,
   ii. winding a conductor around the triangular shaped members of both blocks, each turn being located in one of the slots,
   iii. bending the turns of the first coil at the triangular shaped members toward the sides of the coil form, and then
   iv. removing the coil winding blocks from the coil form, and

c. winding a second coil over the first coil such that the turns of the second coil and the first coil are perpendicular to each other in the central region.

3,971,127

METHOD OF FABRICATING A PRINTED WIRING BOARD ASSEMBLY

Winfield Joseph Giguere, Lincroft, and David Richard Padnes, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 10, 1975, Ser. No. 611,911

Int. Cl.² H05K *3/30*

U.S. Cl. 29—626 **6 Claims**

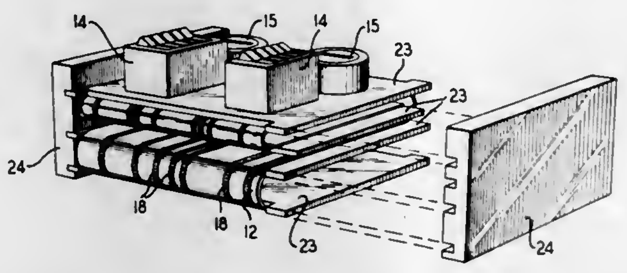
1. A method for fabricating a folded printed wiring board assembly comprising the following steps in the order named:

cutting at least one aperture into a rigid board,

bonding a flexible circuit tape to one side of the board so that the tape bridges the aperture,

perforating a plurality of holes through the board and the flexible tape,

inserting leads of electrical components through the holes, conductively bonding the compound leads to conductors on the flexible circuit tape,



cutting two edges of the board through the aperture, and folding the assembly in the area of the aperture.

3,971,128

METHOD FOR MAKING INSULATORS AND INSULATORS THUS OBTAINED

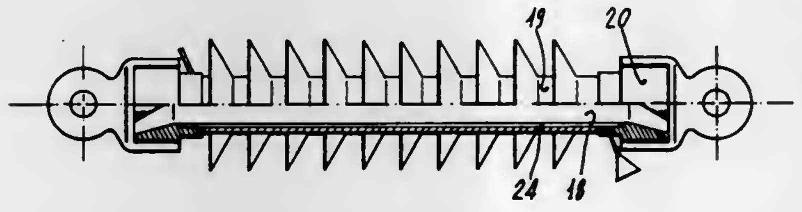
Sergio Rebosio, Via Mantegna, 82, 20096 Pioltello (Milan), Italy

Filed Mar. 3, 1975, Ser. No. 555,176

Claims priority, application Italy, Mar. 9, 1974, 86230/74

Int. Cl.² H01B *19/00*

U.S. Cl. 29—631 **5 Claims**



1. A method for making insulators including a resin bar reinforced with fibers, provided with an external covering of electrically insulating material and terminal elements, comprising the steps of forming the bar from a fiber glass mass impregnated with a thermosetting resin; carrying out the complete polymerization or curing substantially for the major portion of the bar length, maintaining at least one end thereof cooled at a lower temperature than the complete polymerization or curing temperature for said resin; inserting the bar so formed in an insulating covering; applying a terminal element to said uncured end of the bar; widening the fiber glasses of the uncured end of the bar against a divergent or flared surface of the terminal, and carrying out a successive step of complete polymerization or curing for the resin at the end of said bar.

3,971,129

TOOL FOR STRIPPING INSULATION FROM MULTICONDUCTOR CABLES AND INDIVIDUAL INSULATED CONDUCTORS

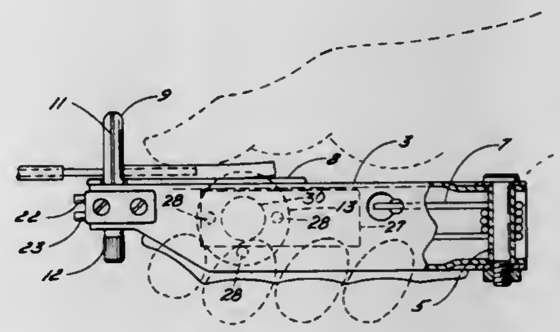
Francis A. Adams, 88 Manchester Ave., North Haledon, N.J. 07508

Filed Feb. 24, 1975, Ser. No. 552,770

Int. Cl.² H02G *1/12*

U.S. Cl. 30—90.1 **13 Claims**

1. A tool for stripping insulation from a multiconductor cable or individual conductor comprising a pair of rigid members, a pair of elongated blades each having a cutting edge, means for securing the blades to the rigid members with the cutting edges opposing one another and extending transversely from the same side of each of the members, the blades being arranged to receive the cable or conductor therebetween and to slice the insulation tangentially at opposite sides of the cable or conductor upon inserting the cable or conductor between the blades at one end thereof and moving the cable or conductor transversely between the blades toward the members and to slice the insulation circumferentially upon relative rotation of the tool and cable or conductor, the cutting edges being formed and arranged to engage the severed insulation and strip the severed insulation upon relative transverse movement of the blades and axial movement of the cable or conductor.



3,971,130

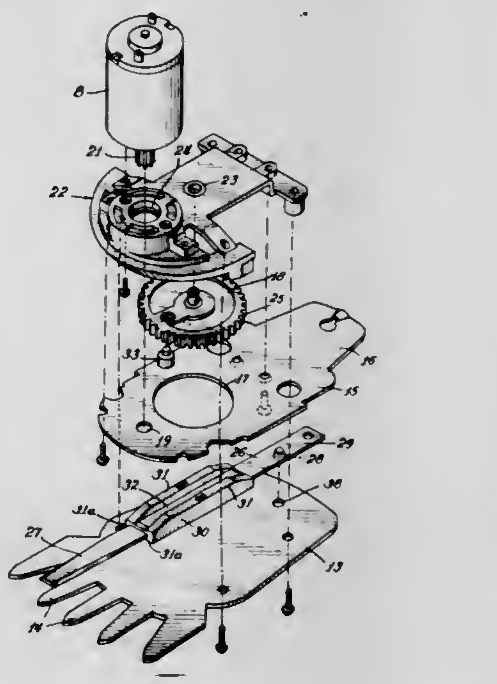
ELECTRIC GRASS SICKLE-SHEAR

William M. Querfurth, Niles, Ill.; Michael A. Schwartz, Willoughby Hills, Ohio, and Jon C. Wiltberger, Round Lake, Ill., assignors to Burgess Vibrocrafters, Inc., Grayslake, Ill.

Filed Sept. 30, 1974, Ser. No. 510,374

Int. Cl.² B26B *19/02*

U.S. Cl. 30—220 **16 Claims**



1. In a portable electric grass shear including a base plate having a plurality of spaced teeth, a cutting blade superjacent said base plate with a cutting tooth substantially in shearing engagement with said teeth, and motor and transmission means for driving said cutting blade, the improvement wherein said cutting blade is demountably pivoted for arcuate reciprocation at the rear end of said base plate and said transmission means includes a slide and a rotary crank having a crankpin drivingly engaging said slide, said slide being elongated and affixed to the blade and having a lengthwise groove into which the crankpin extends, said groove in the slide being open at least at its forward end whereby the slide and blade may be disengaged from the crankpin by withdrawing said blade rearwardly.

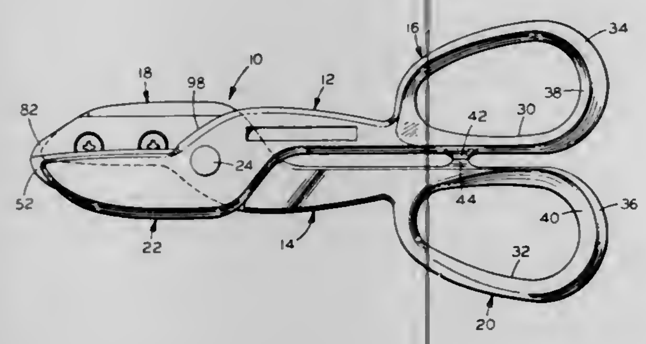
3,971,131
STRAIGHT PATTERN SNIPS

Alfred Z. Boyajian, Manhattan Beach, Calif., and Jules M. Don, Naugatuck, Conn., assignors to The Stanley Works, New Britain, Conn.

Filed May 27, 1975, Ser. No. 580,674

Int. Cl.^{2} B26B *13/04*

U.S. Cl. 30—260 **8 Claims**



1. A pair of straight pattern snips comprising:

a. a first member including a handle portion provided at one end thereof and a jaw portion provided at the other end thereof, said handle portion having a body portion and an ear portion skewed relative to the plane of said body portion to provide a comfortable hand hold for the user, said jaw portion having a blade pocket formed therein provided by a recess extending along one longitudinal edge and providing an elongated shoulder spaced from said longitudinal edge, said recess having a bottom surface sloping inwardly from said handle portion towards the outer end of said jaw portion;

b. a second member including a handle portion provided at one end thereof and a jaw portion provided at the other end thereof, said handle portion of said second member having body portion and an ear portion skewed relative to the plane of said body portion and in the same direction as said skewed ear portion of said first member and cooperating therewith to provide a comfortable hand hold for the user, said jaw portion of said second member having a blade pocket formed therein provided by a recess extending along one longitudinal edge adjacent said one longitudinal edge of said first member and providing an elongated shoulder spaced from said longitudinal edge, said recess having a bottom surface sloping upwardly from said handle portion towards the outer end of said jaw portion;

c. pivot means received in said first and second members for operatively connecting together said first and second members for pivotal movement of said longitudinal edges of said jaw portions relative to each other between an open and a closed position;

d. blade members supported in said blade pockets of each of said first and second members upon said inclined bottom surface thereof with a cutting edge extending longitudinally thereof beyond the said longitudinal edge of said jaw portion so as to be inclined upwardly from said handle portion and towards the other blade member whereby the blade set of said blade member is obtained from the inclined bottom surface of said recess and said cutting edge of one blade member abuts the surface of the blade member of the other member, each of said blade members having an elongated non-cutting edge spaced from said cutting edge and abutting said shoulder; and

e. fastening means for securing each of said blade members in said blade pocket of the cooperating one of said first and second members against movement therewithin.

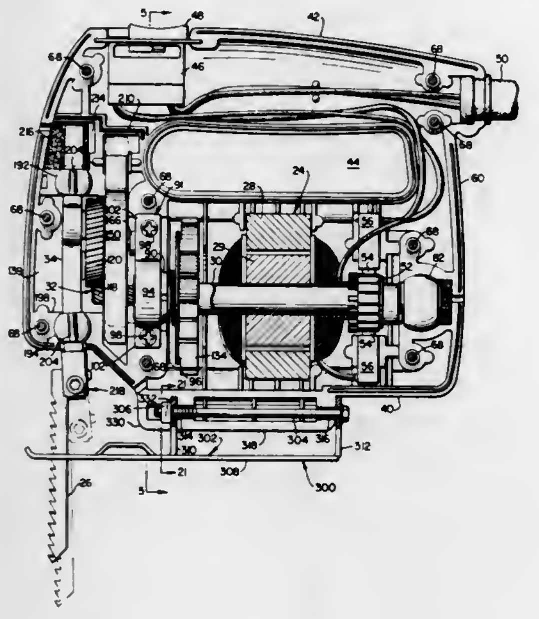
3,971,132
SABER SAW

David R. Griffies, Joppa, Md.; Russell O. Robison, Plymouth, Ohio, and Robert W. Taylor, Jackson, Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 181,471, Sept. 17, 1971, Pat. No. 3,863,342. This application Oct. 7, 1974, Ser. No. 512,789

Int. Cl.^{2} B27B *19/09*

U.S. Cl. 30—393 **8 Claims**



1. In a power-operated tool, a casing, a displaceable, tool-driving member for imparting motion to a tool, drive means disposed in said casing for driving said member and including a power driven shaft and means drive connecting said shaft to said member, and means rotatably mounting said shaft in said casing comprising a bearing receiving said shaft and bearing holder means supporting said bearing in said casing, said bearing holder means comprising first and second parts having seating surfaces that define segments of an annular seat for said bearing, said first part being fixed in said casing, fastening means securing said second part to said first part, and coacting protuberance and groove means on said first and second parts for locating said second part transversely of said first part.

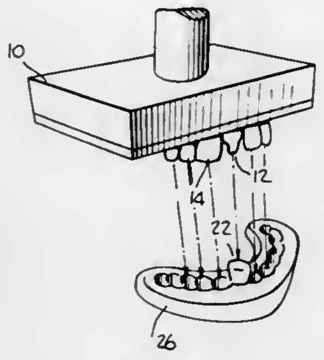
3,971,133
DENTAL RESTORATION

David R. Mushabac, 18 Graham Ave., Brooklyn, N.Y. 11206

Filed Oct. 29, 1974, Ser. No. 518,266

Int. Cl.^{2} A61C *13/00*

U.S. Cl. 32—2 **10 Claims**



1. A set of paired preform teeth comprising:

a first subset of preform teeth, each having a deformable body portion, a non-deformable front surface facing spaced from the proximal sides and gingival surface, and a non-deformable biting surface facing,

a second subset of non-deformable preform teeth, each member of said second subset corresponding to one of said first subset, said correspondence including congruence between the front surface facing and biting surface facing of corresponding preforms from said first and second subsets,

whereby, an impression model formed from a configuration including a member of said first subset will properly hold and align the corresponding member of said second subset for the purpose of drilling a socket in the member of said second subset for placement on a prepared tooth and whereby the adjustment of a member of said first subset on a prepared tooth will provide a configuration from which the impression for holding the corresponding member of said second subset can be made.

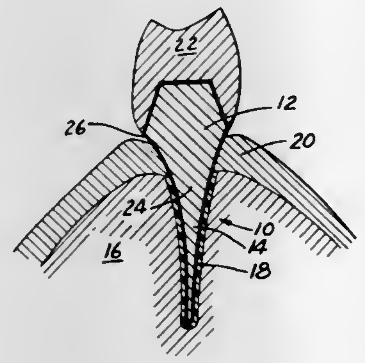
3,971,134
CARBON DENTAL IMPLANT WITH ARTIFICIAL PERIODONTAL LIGAMENT

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jan. 31, 1975, Ser. No. 545,996

Int. Cl.^{2} A61C *13/00*

U.S. Cl. 32—10 A **5 Claims**



1. A prosthesis for dental replacement in a living body comprising a carbon root having an abutment adapted for affixation of a dental crown thereto, and having a base portion shaped for insertion into a mandible tooth socket, said carbon root having a modulus of elasticity of from about 3×10^6 psi. to about 6×10^6 psi., a compressive strength along its axis sufficient to support a compressive load of at least 200 pounds, and a flexural strength along its axis to support a bending moment of at least 20 inch-pounds, said base portion of said carbon root having a biologically inert, porous organopolymeric coating thereon with a thickness of from about 0.1 to about 1.0 mm and a bulk modulus of elasticity of from about 1×10^5 psi. to about 5×10^5 psi., said organopolymeric coating having a pore structure extending at least 0.1 mm. into said organopolymeric coating and which permits attachment of tissue thereto through tissue ingrowth while retaining the resiliency of the polymer layer, the pore structure of said organopolymeric coating having a volume percentage of accessible porosity of from about 10 to about 50 percent, and said organopolymeric coating being limited to said base portion of said carbon root which is intended to interface with bone upon implantation.

3,971,135
DENTAL BUR

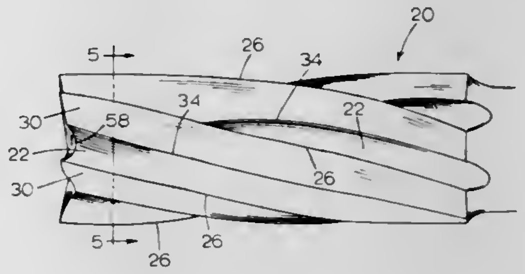
Robert F. Leu, Delta, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Continuation of Ser. No. 505,178, Sept. 11, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,206

Int. Cl.^{2} A61C *3/02*

U.S. Cl. 32—48 **16 Claims**

1. A helical dental bur comprising a shank and a head fixed to one end thereof, said head being provided with a plurality of similar teeth extending longitudinally therealong and having a sturdy sharp cutting edge outermost thereon, each of said teeth having a flat cutting face extending from the cutting edge radially toward the axis of the head, a relief surface which is convex in cross-section extending from said cutting edge partially toward the cutting face of the next succeeding tooth, and a chip-receiving gash having a concave surface in cross-section which extends between said relief surface and said flat cutting face, thereby to provide teeth on a dental bur which have a positive cutting rake afforded by said flat cutting face and a cutting edge rendered strong by said convex relief surface, in combination with a relatively deep chip gash adjacent said flat cutting face without sacrificing strength for the cutting edge of each tooth.



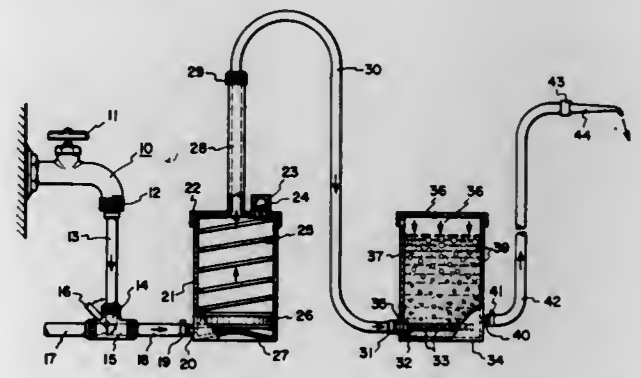
3,971,136
HYGIENIC SPRAY APPARATUS

Erik H. Madsen, 3230 S. 9th East, Salt Lake City, Utah 84106

Filed May 16, 1974, Ser. No. 470,365

Int. Cl.^{2} A61C *3/10*

U.S. Cl. 32—58 **6 Claims**



1. Hygienic apparatus for spraying cleansing slurries which include minute plastic particles, said apparatus including, in combination: a closed, pressurized, container having a premixed slurry therein, said slurry comprising a liquid carrier and plastic particles disposed therein, said container including an inlet, an outlet, and means for maintaining said particles in suspension in said carrier during slurry discharge through said outlet, for pressurizing said slurry within said container and for forcing a predetermined volumetric charge of said slurry through the outlet, a jettype discharge nozzle above said container, and a flexible elongate conduit coupled between said outlet and said nozzle.

3,971,137
SYSTEM FOR MILLESIMAL MEASURE

Pablo Martinez Fernandez, Madrid, Spain, assignor to Francisco Martin Martin, Burgos, Spain

Filed Dec. 17, 1973, Ser. No. 425,296

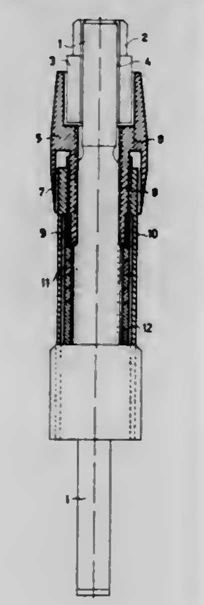
Claims priority, application Spain, Dec. 15, 1972, 409638

Int. Cl.^{2} G01B *3/18*

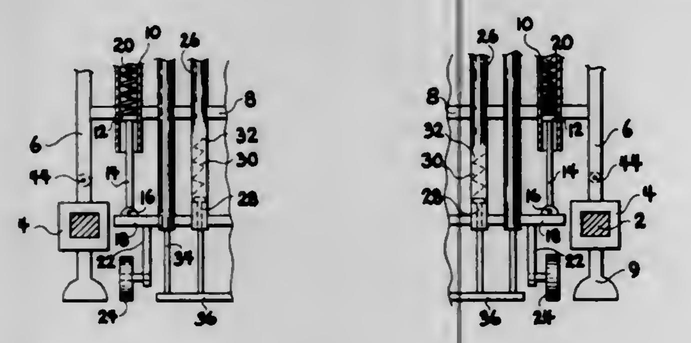
U.S. Cl. 33—164 R **3 Claims**

1. In a millesimal measure device having screw threads of different pitches which each produce a micrometric advance and in combination produce a differential advance of as small a pitch as desired by subtraction or addition of the pitches used, comprising: a differential cylinder; a first screw thread in the inner surface of said differential cylinder, said first screw thread having a first pitch; a principal screw having a principal screw thread which has a suitable pitch for micrometric measurement, said principal screw thread and said first

screw thread being in correspondence; a second screw thread on the outer surface of said differential cylinder, said second screw thread having a second pitch different than said first pitch; an outer frame having windows defined therein a third screw thread on said outer frame whose threads are of suitable pitch for differential measurement said second screw thread and third screw thread being in correspondance a double entry numerical counter means comprising on said principal screw in coaxial disposition with respect to said differential cylinder and enclosed within said frame, a plurality of sleeves each having numerals thereon, a plurality of auxiliary rings which are independent of each other and each associated with one of said sleeves, and means for moving said sleeves, said windows being located to reveal the numerals on said sleeves, each of said auxiliary rings receiving movement information which is substantially different from the movement information received by the other of said auxiliary ring transmitting said substantially different movement information to the sleeve associated therewith whereby said double entry numerical counter means receives information inputs from a plurality of sources and indicates through numerals appearing in said windows a result which represents a combination of the inputs received from said plurality of sources.

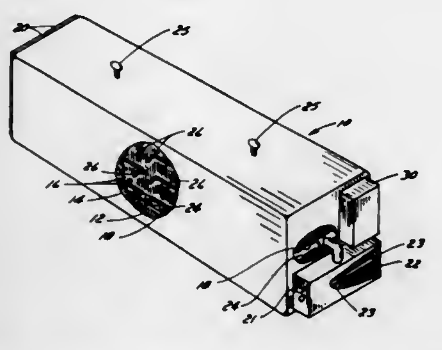


3,971,138
ADJUSTABLE MOLDING SYSTEM
Paul J. Worley, Box 23, Alto, Ga. 30510
Filed Aug. 7, 1975, Ser. No. 602,901
Int. Cl.² G01B *5/00*, *5/20*; B29C *23/00*
U.S. Cl. 33—174 L **6 Claims**



1. An adjustable molding system comprising a tracer mechanism and a copy mechanism, the tracer mechanism comprising a first frame defining a plane and having transverse and longitudinal directions, a first carrier, means mounting the first carrier for longitudinal sliding movement on the frame, a plurality of tracer splines, means slidably mounting said tracer splines on said first carrier for sliding movement transversely to the plane of the frame, said tracer splines being arranged side-by-side transversely of the frame, a tracer-shaping member of flexible material secured on the ends of the splines, the copy mechanism comprising a second frame defining a plane and having transverse and longitudinal directions, a second carrier, means mounting the second carrier for movement longitudinally of said second frame, a plurality of copy splines corresponding in number to said plurality of tracer splines on the copy side, means mounting said copy splines on said second carrier for sliding movement transversely to the plane of the second frame, said copy splines being arranged side-by-side transversely of the second frame, a copy-shaping member of flexible material secured on the ends of the copy splines remote from the carrier, first transmitting means responsive to longitudinal sliding movement of the first carrier to produce movement of the second carrier longitudinally of the second frame along the second frame in the same direction, and second transmitting means responsive to the movement of each of the tracer splines to move a corresponding one of the copy splines by a proportionally equal amount in the same direction with respect to the second frame.

3,971,139
PROCESS AND APPARATUS FOR DECREASING MOISTURE CONTENT IN WOOD
Marcel A. Rochon, 11 Forestier St., St.-Jean, Quebec, Canada (J3B 4P4)
Continuation-in-part of Ser. No. 397,407, Sept. 14, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,391
Int. Cl.² F26B *7/00*
U.S. Cl. 34—13.8 **13 Claims**



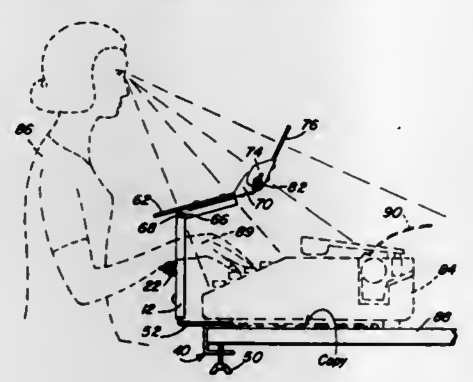
1. A process for decreasing the moisture content in wood which comprises the following consecutive steps:

a. placing the wood in an enclosure and introducing vapor made essentially of sap in said enclosure until the center of the wood has substantially reached the temperature of the vapor,
b. gradually raising the temperature of the vapor atmosphere to a temperature substantially above the boiling temperature and during a time sufficient to bake the resinous substances inside the wood and to reduce the moisture content to a predetermined percentage, and
c. subsequently reducing gradually the temperature of the vapor down to the boiling temperature by the introduction of a vapor of sap,

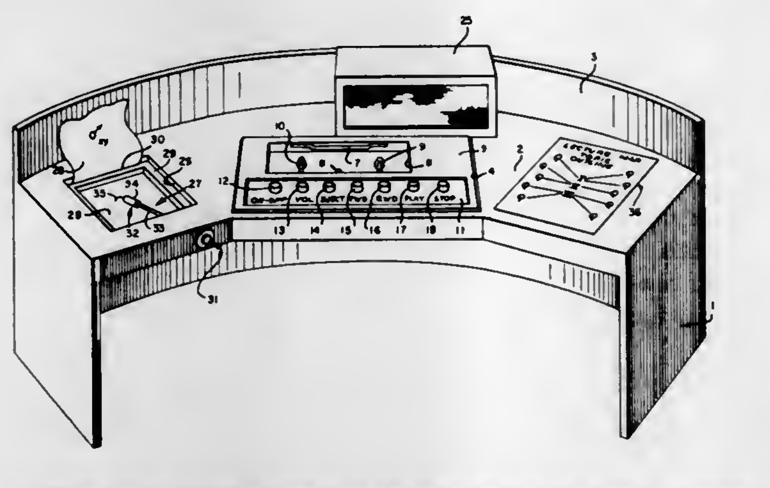
wherein the inside of the enclosure is maintained during the steps of the process at a pressure slightly above the atmospheric pressure.

3,971,140
KEYBOARD INTERCEPTOR ("INTERMEGRAF")
Arcadio Martinez, 140 SW. 12 Ave. (Apt. 11), Miami, Fla. 33130
Filed Feb. 28, 1975, Ser. No. 505,754
Int. Cl.² G09B *13/00*
U.S. Cl. 35—5 **5 Claims**

1. An upright standard having front and rear sides and mounting means on its lower end for releasable mounting from a support upon which a typewriter may be placed, a generally horizontal panel structure pivotally mounted from the upper end portion of said standard and projecting to the rear and outwardly beyond the lateral sides of the standard for overlying the keyboard of a typewriter disposed on said support immediately to the rear of and generally laterally centered relative to said standard for blocking the area of the keyboard from the area of forward and downward vision of a person seated in front of the support for typing on the typewriter, a horizontal transverse bar supported from the vertical mid-portion of said standard and vertically adjustable along the latter with the opposite end portions of said bar projecting outwardly from the corresponding sides of said standard, said bar being vertically adjustable along said standard for establishing the minimum desirable elevation of the wrists, positioned on opposite sides of said standard, of a person typing on said typewriter.



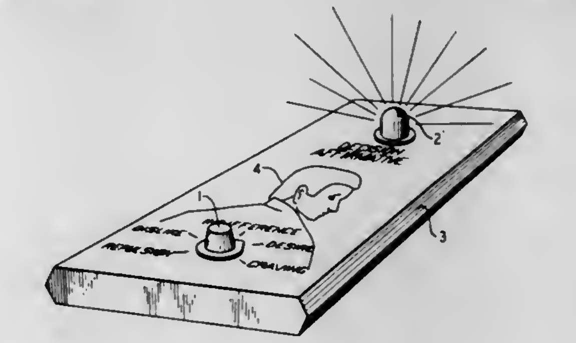
3,971,141
METHOD FOR INTERACTIVE COMMUNICATIONS
Stewart W. Wilson, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 294,487, Oct. 2, 1972, Pat. No. 3,942,268. This application Apr. 15, 1974, Ser. No. 460,730
Int. Cl.² G09B *5/06*
U.S. Cl. 35—8 A **6 Claims**



1. The method of preparing an interactive lecture, comprising the steps of audibly reproducibly recording a lecture on a record medium, reproducing the lecture from said record medium for a plurality of listeners, soliciting questions from the listeners relating to points in the lecture, assembling from the questions so solicited a list of questions to be answered, recording audible answers to the questions on said list in audibly reproducible form on a second record medium in a sequence corresponding to the order in which the questions would most probably be asked in the course of the lecture, marking the locations of said recorded answers on said second record medium to facilitate the location and audible reproduction of any desired answer on the recording, and preparing a visually interpretable guide to the lecture including a list of the questions to which answers have been recorded and instructions for identifying the answers to each question from the markings on said second recording medium.

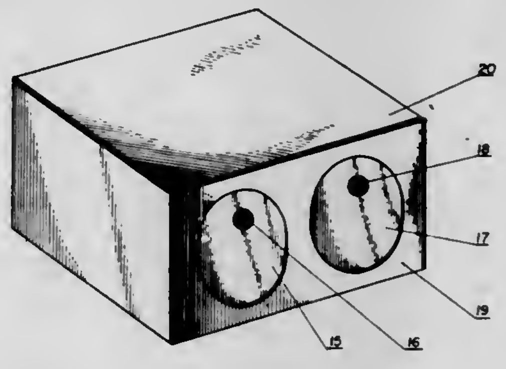
5. The method of preparing a set of sound recordings and a cooperative guide for use by an individual of a selected class to approximate a learning conversation between that individual and an expert, comprising the steps of making a reproducible sound recording of a discourse on a selected topic by the expert, soliciting questions related to the recording from listeners representative of said class, assembling from the solicited questions a list of questions to be answered, making a reproducible sound recording of answers to said list of questions by said expert, marking the locations of said recorded answers on said answer sound recording to facilitate the location of any desired answer on the recording, and preparing a perceptible guide to the recordings including a list of the questions to which answers have been recorded and instruction for identifying the answers to each question from the markings on said answer sound recording.

3,971,142
SIMULATION APPARATUS
James Fisher Hollander, 40 Middlesex St., Matawan, N.J. 07747
Filed May 23, 1975, Ser. No. 580,308
Int. Cl.² G09B *19/00*
U.S. Cl. 35—22 R **34 Claims**



1. Simulation apparatus comprising
means for indicating and adjustably varying levels of a plurality of decisional influences;
means for indicating one of a plurality of alternative decisions;
and physical system means for causing said decision indicator to indicate a first decision when a combined total of said variable levels is above a threshold level and to indicate a different decision when said total is below said threshold level.

3,971,143
DEVICE FOR TESTING THE ABILITY OF A PERSON TO RECOGNIZE SYNCHRONOUS SPEEDS
Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204
Filed Mar. 19, 1975, Ser. No. 557,661
Int. Cl.² G09B *19/00*
U.S. Cl. 35—22 R **4 Claims**

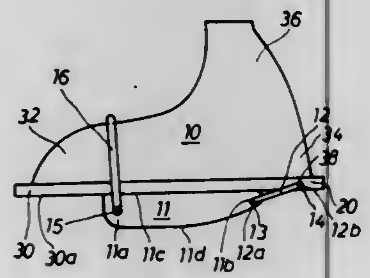


1. Apparatus for testing the capacity of perceiving motion which comprises a pair of rotatable discs with identical indicia applied thereto, said discs being located where they can be viewed simultaneously by a person being tested, separate electric motors each driving a separate said disc, electric circuit means supplying electric current to each said motor, one of said discs being driven by its corresponding electric motor at a predetermined constant rotational speed, auto-

matic control means continually changing the rotational speed of the other of said discs in a predetermined manner whereby the rotational speed of said other disc varies within a range from lower than that of the one said disc to higher than that of the one said disc, rotational speed indication means indicating the rotational speed of said other disc, and selector means for the person being tested to signal when in his judgment the rotational speeds of said pair of discs are the same.

3,971,144
COMBINATION SKI BOOT AND WALKING SOLE AND CONNECTION MEANS FOR SUCH COMBINATION

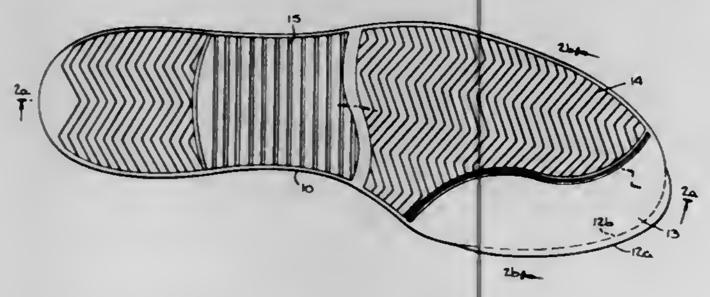
Ruth Brügger-Stuker, Spiez, Switzerland, assignor to Panta AG, Zurich, Switzerland
Filed Nov. 5, 1975, Ser. No. 628,913
Claims priority, application Switzerland, Nov. 8, 1974, 15010/74
Int. Cl.^{2} A43B *00/00*
U.S. Cl. 36—100 **5 Claims**



1. The combination with a ski boot having tread surface means and a walking sole of a connection element for securing the walking sole to the ski boot, said connection element including means for mounting the walking sole at the ski boot such that the walking sole can be pivoted about at least one axis of rotation at the ski boot away from the tread surface means of the ski boot into a position adjacent the upper of the ski boot, said position enabling the ski boot to be inserted into a ski binding without the walking sole, during skiing with the ski boot, having to be carried at any location other than at the ski boot itself.

3,971,145
TENNIS SHOE AND SOLE THEREFOR

Harry R. Stegerwald, Cheshire, Conn., assignor to Uniroyal Inc., New York, N.Y.
Filed May 22, 1975, Ser. No. 580,120
Int. Cl.^{2} A43B *13/04*
U.S. Cl. 36—32 R **7 Claims**

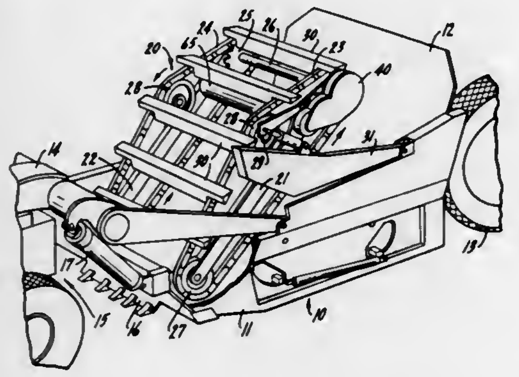


1. A sole for a tennis shoe comprising:

an elastomeric body having an elongated bottom portion and having an upwardly extending side portion having a given horizontal thickness at the junction thereof with said bottom portion along the side boundary of said body except in a toe region and an inside ball-of-the-foot region, said upwardly extending side portion in said toe region and inside ball-of-the-foot region being horizontally thicker at the junction thereof with said bottom portion than said given thickness.

3,971,146
REENTRANT DRIVING ARRANGEMENT FOR SCRAPER ELEVATOR

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.
Filed Mar. 14, 1975, Ser. No. 558,226
The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.
Int. Cl.^{2} B60P *1/36;* **B65G** *23/00*
U.S. Cl. 37—8 **13 Claims**

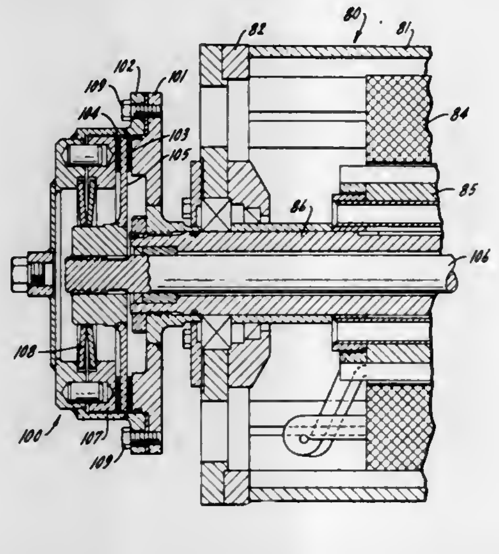


1. For use with a tractive vehicle, an earth moving machine including a receptacle in the form of a wheeled bowl having vertical side sheets, a floor and an open front with a scraper blade spanning the open front, a draft frame for securing the bowl to the vehicle, an elevator having a pair of interconnected frame members inclined upwardly and rearwardly from the region of the blade, a pair of endless conveyor chains having spaced upward and downward runs, the frame member having sprockets at the upper end and rollers at the lower end for supporting the chains, the sprockets being mounted on a drive shaft extending between the frame members and whch has a driving end, the chains having a series of transverse flights for conveying soil loosened by the blade upwardly and rearwardly into the bowl, a gear box of elongated flat configuration positioned closely against the frame member which is at the driving end of the shaft and extending downwardly from the latter, the gear box having input and output connections on the same side at its respective lower and upper ends interconnected by a set of reduction gears, the output connection being connected to the drive shaft, and a drive motor having its shaft connected to the input connection of the gear box, the drive motor extending reentrantly into the empty space between the runs of chain.

3,971,147
TORQUE-LIMITED DRIVING ARRANGEMENT FOR SCRAPER ELEVATOR

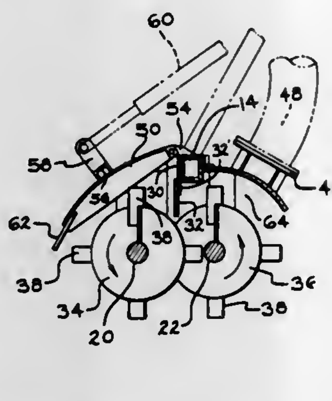
John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.
Filed Mar. 31, 1975, Ser. No. 563,486
Int. Cl.^{2} B60P *1/36*
U.S. Cl. 37—8 **15 Claims**

1. In an earth moving machine of the type having a wheeled bowl assembly with an open front end defining a soil receptacle as well as a scraper blade mounted on said assembly adjacent the open end of the receptacle, the combination comprising an elevator having a frame inclined upwardly and rearwadly from the region of the blade and having lateral surfaces, the elevator having a pair of conveyor chains and a drive shaft at the upper end thereof mounting sprockets for driving the chains and having supportive rollers at the lower end, the chains having a series of flights for conveying soil from the blade upwardly and rearwardly for deposition in the receptacle, a step-down gear box at the upper end of the frame including a set of reduction gears and having an input connection and an output connection, the gear box being of thin, flat construction in the axial direction and presenting an inside surface lying flatly in a laterally accessible position adjacent one of the lateral surfaces of the elevator frame, the input and output connections being located in laterally spaced positions projecting from the inside surface of the gear box, the output connection being alined with and connected to the drive shaft, a driving motor coupled to the input connection, the motor having a flywheel mass, and a friction slip clutch interposed between the flywheel mass and the input connection of the gear box, the slipping torque of the friction clutch being set to provide a drive connection which resists slippage during normal loading of the flights including peak loads while permitting slippage upon blockage of the drive shaft when a flight engages a more stubborn obstruction causing the set level of torque to be exceeded thereby to dissipate the kinetic energy stored in the flywheel mass and to prevent the development of torque in the gear box at a destructive level.



3,971,148
DREDGE CUTTER HEAD

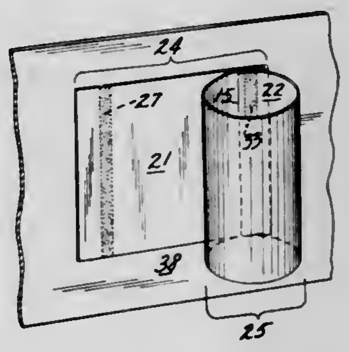
Troy M. Deal, 277 Trismen Terrace, Winter Park, Fla. 32789
Filed Feb. 10, 1975, Ser. No. 548,576
Int. Cl.^{2} E02F *3/88*
U.S. Cl. 37—66 **5 Claims**



1. A dredge cutter head comprising a horizontally disposed auger structure, comprising two augers supported for rotation about parallel axes, means for rotating said augers in timed relation in the same direction, a slotted cutting bar disposed above and between said axes, radial projections axially spaced along said augers and disposed in common planes normal to said axes, said projections in each common plane traversing a common slot of said bar from different directions, the projections on one auger having an upward arcuate movement through the common slot and the projections on the other auger having a downward arcuate movement through the same slot in timed relation, a hood comprising front and rear sections substantially coaxial with said auger structure and located on opposite sides of said bar to provide a passageway between said structure and the under surfaces of said hood sections, an opening defined in said rear hood section, and a suction inlet communicating with said passage through said opening whereby dispersion of dredged material into the surrounding water is mitigated.

3,971,149
DISPLAY DEVICE

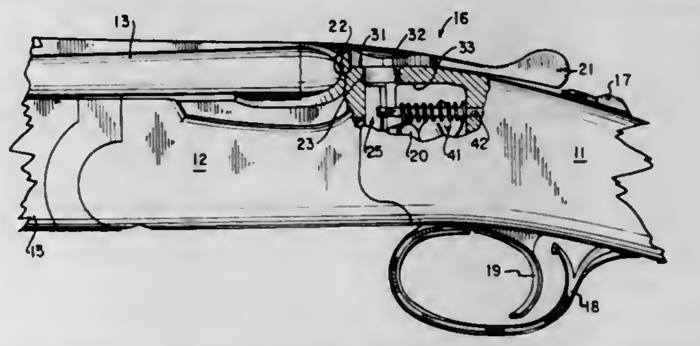
Oliver Morley Tanney, Englewood, N.J., assignor to Goodren Products Corporation, N.J.
Filed June 18, 1975, Ser. No. 587,896
Int. Cl.^{2} G09F *19/00*
U.S. Cl. 40—126 A **8 Claims**



1. A display device for arrangement into a three-dimensional configuration, comprising a thin, flexible sheet having a front information display surface, and a back surface, the sheet having a first section extending from a first edge to a dividing line, and a second section extending from the dividing line to a second edge, means, located on the first section of the sheet on said back surface thereof, for securing the device to a support surface, adhesive means located on said front surface proximate said line for securing together the front surface of said sections of the sheet on each side of said line and proximate thereto, and further means for attaching a portion of the second section proximate the second edge to said back surface near said dividing line, whereby upon arrangement of said device in its three-dimensional configuraion, said adhesive means adjacent said dividing line secures together the front surface of said sections adjacent a crease along said dividing line and said second section projects forward of the plane of the first section in a three-dimensional configuration, with said edge portion attached to said back surface near said line.

3,971,150
TOP LEVER RETAINING MEANS FOR BREAK-OPEN FIREARMS

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, both of Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.
Filed Apr. 22, 1975, Ser. No. 570,445
Int. Cl.^{2} F41C *11/08*
U.S. Cl. 42—44 **8 Claims**



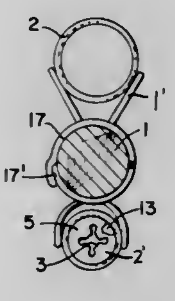
1. In a firearm having a frame, at least one barrel pivotally mounted on the frame; a barrel lock bolt movably mounted on the frame for releasably locking the barrel at its closed position; a top lever removably mounted on the frame, said top lever being rotatable to move the lock bolt from its barrel locking position to its barrel unlocking position and return; and top lever retaining means for retaining the top lever on the frame; the improvement in top lever retaining means which comprises;

- a top lever having a bearing surface adapted to rest on a corresponding support surface of the frame, and a radially offset vertically elongated lock bolt operating crank disposed a predetermined distance below the bearing surface of the top lever, said operating crank having a spring strut receiving notch and a lock bolt operating portion;

a frame having a top lever receiving opening in which the top lever is rotatably received, a lever retaining shelf located at the top lever receiving opening of the frame, and a spring strut retaining shelf located below the top lever receiving opening of the frame adjacent the upper end of the spring strut receiving notch of the operating crank, said lever retaining shelf having an operating crank passageway that permits the passage therethrough of the operating crank of the top lever when the top lever is at its barrel locking position, upward movement of the operating crank and the top lever being blocked by said lever retaining shelf when the top lever is at its barrel unlocking position; and

a top lever spring and spring strut mounted in the frame rearwardly of the top lever with the forward end of the spring strut received in the spring strut receiving notch of the operating crank of the top lever, upward movement of the forward end of the spring strut and the top lever being blocked by the strut retaining shelf when the top lever is at its barrel locking position.

3,971,151
FISHING HOOK HOLDING MEANS
Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758
Continuation-in-part of Ser. No. 440,991, Feb. 11, 1974, abandoned. This application Jan. 16, 1975, Ser. No. 541,656
Int. Cl.^{2} A01K *87/04*, *97/06*
U.S. Cl. 43—24 **6 Claims**



1. A combination fishing pole line guide and fishhook holder comprising an annular member having a central opening of a size to securely grip a fishing rod section, bracket means attached to the outer peripheral surface of said annular member and radiating outwardly therefrom, a circular line guide secured to said bracket means in spaced relation to said annular member, and a fishhook retaining member secured to said bracket means, said fishhook retaining member including a body portion formed from resilient material and having apertures formed therein of a size to resiliently receive and secure a portion of a fishhook.

3,971,152
FISHING LURE
Frank Husson, Jr., La Jolla, Calif., assignor to Applied Oceanographic Technology Corporation, Southampton, N.Y.
Filed May 14, 1975, Ser. No. 577,551
Int. Cl.^{2} A01K *85/00*
U.S. Cl. 43—42.06 **8 Claims**

1. A fishing lure comprising:

a flexible, elastomeric body comprising a hollow cylinder having axial forward and aft ends;

inwardly extending shoulders within said cylinder defining said aft end and including a narrow opening therebetween;

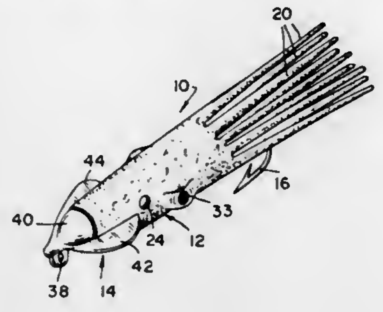
at least one opening in the wall of said cylinder;

an axial opening in the forward end of said cylinder;

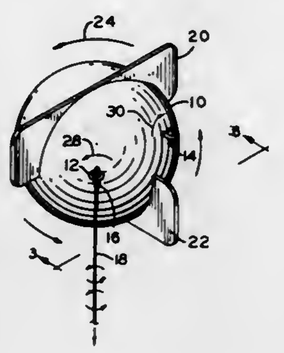
a solid head including an integral hook extending aft from the base of said head, said body being adapted to slide over said hook and against said base;

means locking said head against said body; and

eye means in said head for attaching said lure to a line.



3,971,153
DEVICE FOR USE WITH FISHING TACKLE
John F. Harms, 6418 Stony Brook Drive, Fort Wayne, Ind. 46815
Filed Apr. 30, 1975, Ser. No. 573,583
Int. Cl.^{2} A01K *91/00*
U.S. Cl. 43—43.13 **5 Claims**



1. A device for restoring the lay of a line, such as a fishing line, comprising:

a spherical body having an outer surface and a central plane and being adapted to be drawn through water;

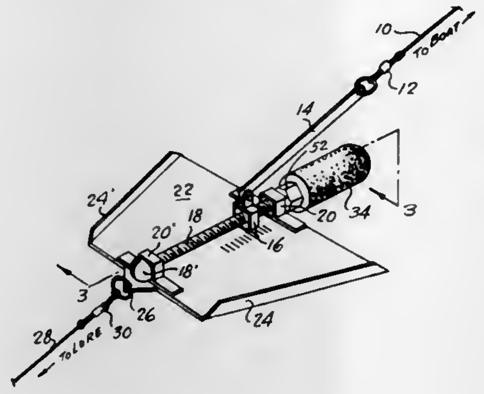
a pair of line attaching means non-rotatably fixed to said body and located in said central plane for non-rotatably attaching a line to said body so that said body can be drawn through the water;

first and second ribs located in first and second planes respectively and attached to said body to extend outwardly from said outer surface to contact the water and be acted upon by the water in a manner to cause rotation of said body as it is drawn through the water, said first and second planes being essentially perpendicular to each other and to said central plane;

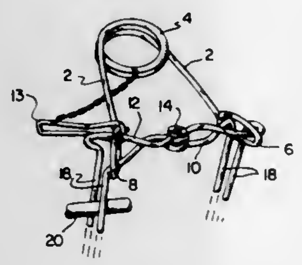
said attaching means being fixed to said body for rotation therewith so that rotation of said body causes rotation of the line in one direction when it is attached to a first one of said pair of attaching means, and rotation of the line in an opposite direction when it is attached to the other one of said pair of attaching means, said attaching means being essentially symmetrically located on said body with respect to said ribs, so that line rotation in both directions is essentially uniform.

3,971,154
TROLLING PLANER
Henry A. Craig, 4130 S. Elm, Rapid City, S. Dak. 57701
Filed Oct. 3, 1975, Ser. No. 619,490
Int. Cl.^{2} A01K *95/00*
U.S. Cl. 43—43.13 **5 Claims**

1. A trolling planer comprising a planer plate having a leading and trailing edge, a rotatable threaded element extending rearwardly from the leading edge of said planer along its center line, non rotatable nut means mounted on said rotatable threaded element to be moved therealong by rotation of said threaded element, a towing bar pivotally secured to said non rotatable nut means, means on said towing bar to receive a fishing line, and means at the trailing edge of said planer plate to receive a leader for a fishing lure.



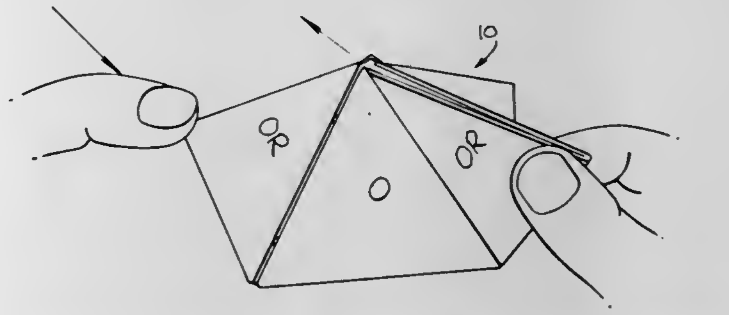
3,971,155
ACTUATOR FOR ANIMAL TRAP
Frank R. Conibear, 2170 Evergreen Place, Victoria, British Columbia, Canada
Filed Oct. 21, 1974, Ser. No. 516,580
Int. Cl.^{2} A01M *23/26*
U.S. Cl. 43—90 **7 Claims**



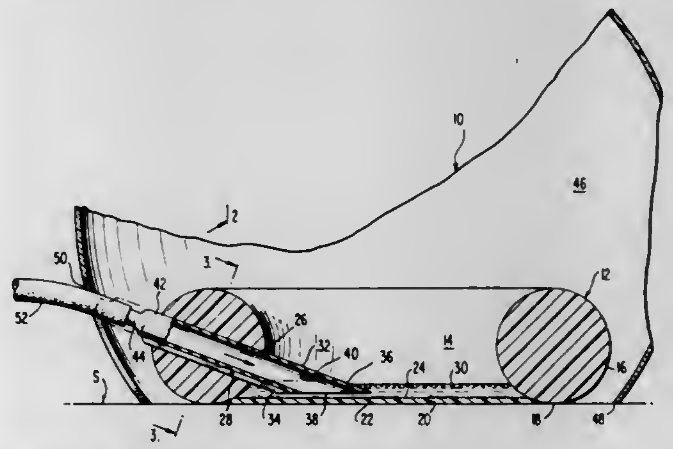
1. In an animal trap of the type having two similar first and second frames made of round wire stock, each having sides serving as jaws and ends extending therebetween, and which are pivotally connected through adjacent ends for relative rotation between set and closed positions about a common axis, trigger means for releasably maintaining the trap in set position and an actuator made of round wire stock, capable of rapidly and forcefully effecting such rotation upon release of the trigger, having two arms spring-biased at one end so that the other end, if unobstructed, would move to a distance substantially greater than the length of said frame ends, each arm terminating in a ring respectively adapted to encircle adjacent ends of both frames on opposite sides of said axis, an improved actuator wherein each actuator ring is of a regular oblong shape symmetrical about the major axis and the minor axis, the major axis being in the general direction of the respective actuator arm and having a length of a ratio of about 5:3 to the length of the minor axis.

3,971,156
INTERCHANGEABLE-FACE DEVICES AND METHOD OF MAKING SAME
Stewart Lamlee, 55 W. 86th St., New York, N.Y. 10024
Filed Oct. 8, 1975, Ser. No. 620,808
Int. Cl.^{2} A63H *33/14*
U.S. Cl. 46—1 L **8 Claims**

1. An improved interchangeable-face device comprising a first row of alternatively disposed equilateral triangles equally spaced apart, with link members bridging the interspaces, to form a single unit thereof, a second row of identical triangles similarly spaced and linked to form a single unit, and an intermediate flat pliant binder element of identical shape, means to bond one row of triangles to each surface of the binder element so as to bring the triangles and interspaces of each row in registry with the other, with the exposed portions of the binder element adapted to act as hinges between adjoining triangles, the triangles being schematically overlaid, with end triangles in registry, and means to bond the end triangles together to form of the device a polygon, the latter adapted to be progressively flexed at one side and extruded at the other to progressively expose different groups of triangle faces.



3,971,157
BUBBLE MACHINE WITH PROTECTIVE TRANSPARENT DOME
Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003
Filed Nov. 3, 1975, Ser. No. 628,282
Int. Cl.^{2} A63H *33/28*
U.S. Cl. 46—7 **5 Claims**



1. A bubble effect device comprising:

a weighted annular ring having a base wall fixed thereto said ring and base wall being adapted to rest on a supporting surface;

the ring having a slant bore formed therein;

a tube extending through the bore;

a quantity of bubble forming fluid solution on the base wall;

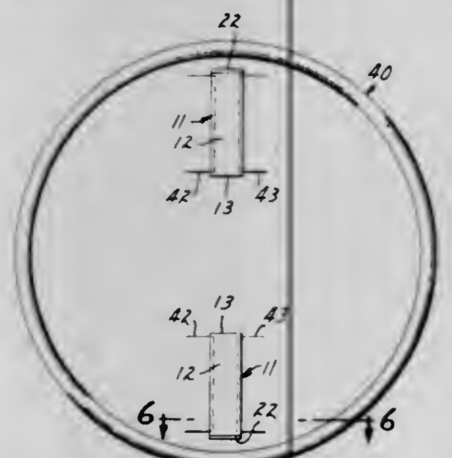
means for protecting the bubble effect to make it relatively long lasting, said means comprising a protective transparent dome adapted to rest on said surface about the ring; and

hose means connected to the tube and extending outwardly of the dome to introduce air therethrough into the solution.

3,971,158
ILLUMINATED TWIRLING TOY
Cameron G. Hanson, Osceola, Wis. 54020
Filed Sept. 4, 1974, Ser. No. 503,140
Int. Cl.^{2} A63H *1/24*
U.S. Cl. 46—228 **9 Claims**

9. A toy which in operation assumes a circular motion providing a variation in velocity at points on its body, said toy comprising

- a handle shaped to be held in one hand and having an opening therein defining a large entrance end and terminating with a wall having a small aperture,
- a cord extending through said aperture,
- a module secured to one end of the cord and comprising:
  - a housing of insulative material having a first end secured to said cord, a second translucent end and a central cavity extending between said ends,
  - a cylindrical battery disposed in said cylindrical cavity with the center pole piece thereof positioned toward said second end,



  - a helical compression spring of conductive material positioned around and out of contact with said pole piece and contacting the battery end wall, and
  - a small incandescent lamp having a base, a bulb and a terminal end, which base is positioned within and engages said compression spring with said terminal end positioned adjacent and aligned with said pole piece, said spring having a normal length sufficient to maintain said terminal end spaced from said pole piece and said spring having sufficient elasticity to permit said battery to move toward said bulb to contact the pole piece with the terminal end of said bulb and light the same when the battery is subject to centrifugal force, forcing it toward said second end.

3,971,159

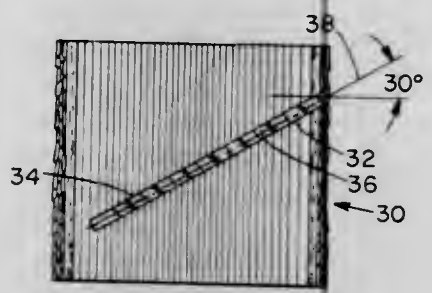
TREATMENT OF CONIFERS

Claud Lafayette Brown, Watkinsville, Ga., and Herman Isaac Enos, Jr., Pennsbury Township, Chester County, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 5, 1975, Ser. No. 547,310

Int. Cl.² A01G *23/10, 29/00*

U.S. Cl. 47—10 **18 Claims**



1. In the method of applying a treating chemical to a living conifer wherein the conifer is provided with a treatment site on the bole thereof, the improvement which comprises preparing a treatment site by cutting into sapwood of the conifer one elongated hole and inserting into the hole absorbent fibrous material to carry said treating chemical, the axis of said elongated hole having a vertical angle of from about 5° to 45° and a horizontal angle of from about 20° to about 30°, the hole being of a length sufficient to provide a sector angle of from about 110° to about 135°.

3,971,160

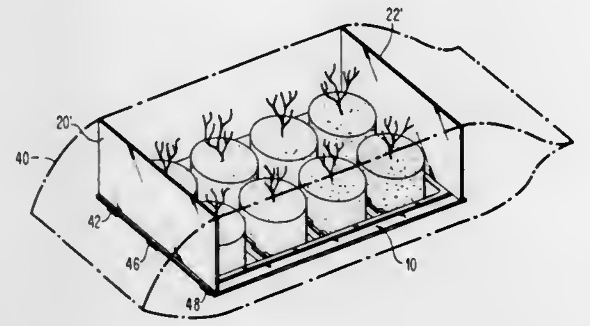
ENVIRONMENTAL PACKAGE

Leslie Vajtay, 215 Davidson Ave., Somerset, N.J. 08873

Filed Nov. 18, 1974, Ser. No. 524,563

Int. Cl.² A01G *9/10*

U.S. Cl. 47—34.11 **4 Claims**



1. An environmental package adapted for compact transportation of organic matter and for subsequent formation of an enlarged enclosed chamber with adequate room for plant growth, comprising:
  - a support base including a plurality of compartments adapted to retain liquid, each said compartment having upwardly extending sidewalls and a bottom surface;
  - a pair of end panels attached to said support base and in a first position folded flat over said support base in a plane substantially parallel with the bottom surface of each said compartment, and in a second position folded upright in a plane substantially perpendicular to the bottom surface of each said compartment;
- each said end panel having end sections foldable in a plane perpendicular to both the remaining portion of said end panels and the bottom surface of each said compartment, each said end section having a depending locking means for engaging said support base;
- each said end panel having, in said second position, a vertical dimension substantially greater than the vertical dimension of said organic matter, the vertical dimension of each said end panel being substantially equal to at least the greatest height of anticipated plant growth within a subsequently formed enlarged enclosed chamber, thereby forming an intermediate structure; and
- transparent bag means, said intermediate structure being inserted in said bag means which is supported by said pair of end panels, completing the enlarged enclosed chamber with adequate room for plant growth.

3,971,161

PRODUCTION OF HYBRID SWEET CORN

Peter A. Bonucci, Northfield, Minn., assignor to Northrup, King & Co., Minneapolis, Minn.

Filed May 27, 1975, Ser. No. 580,963

Int. Cl.² A01H *1/02*

U.S. Cl. 47—58 **4 Claims**

1. A method for producing hybrid sweet corn seeds in commercial quantities comprising the steps of:
  - a. planting a row of normal sweet corn, homozygous for su_1, wherein said sweet corn can be genotypically represented as follows: $su_1su_1Sh_2Sh_2$;
  - b. planting a row of sugary-shrunken corn in cross-breeding proximity to said row of normal sweet corn, wherein said sugary-shrunken corn can be genotypically represented as follows: $su_1su_1sh_2sh_2$;
  - c. detasseling one of the two rows of plants resulting from steps (a) and (b), whereby the detasseled row serves as a female parent and the row with tassels remaining intact serves as a male parent;
  - d. harvesting the F_1 ears of corn of the detasseled row to obtain commercial quantities of hybrid sweet corn from said ears of corn, said hybrid sweet corn seeds obtained from said F_1 ears of corn being heterozygous and genotypically represented as: $su_1su_1Sh_2Sh_2$.

3,971,162

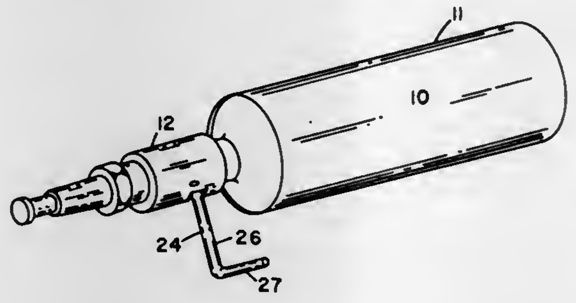
PORTABLE SPARK PLUG CLEANER

Joseph L. Bellsmith, 12612 Sungrove Circle, Garden Grove, Calif. 92640

Filed June 5, 1975, Ser. No. 584,207

Int. Cl.² B24C *3/34*

U.S. Cl. 51—8 SP **2 Claims**



1. A portable spark plug cleaning device comprising:
  - a. a gas pressurized, grit dispensing container having a normally closed, top discharging, reciprocating nozzle valve extending from a forward boss; and
  - b. a spark plug adaptor assembly engaged on said forward boss;
- wherein the spark plug adaptor assembly comprises:
  - a. a rod having an axial bore therethrough;
  - b. a radial annular recess in the forward end of said axial bore;
  - c. a resilient ring seal located in said radial annular recess;
  - d. a controlled inside diameter in the aft end of said axial bore whereby said inside diameter may be engaged on said forward boss;
  - e. a substantially "L" shaped valve actuator rod pivotally mounted to said spark plug adaptor.

3,971,163

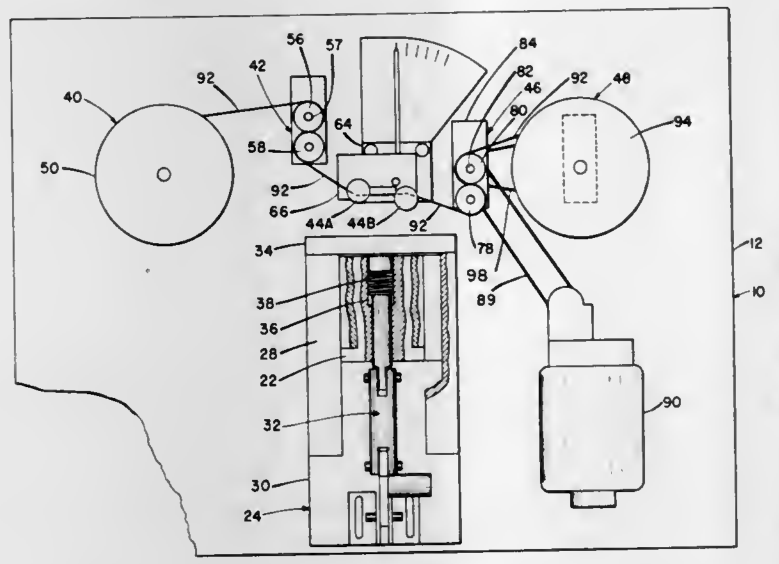
ABRASIVE TAPE APPARATUS FOR CONTOURING A FLEXIBLE LENS

Wayne E. Trombley, and Lawrence R. Jacobson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,870

Int. Cl.² B24B *13/00, 21/02*

U.S. Cl. 51—62 **1 Claim**



1. An apparatus for machining an article formed of a nonrigid material comprising an abrasive tape having an article engaging area, abrasive tape carrying and moving means including means for oscillating the article engaging area of the abrasive tape through an arc; and article holding means having means for moving the article into engagement with the abrasive tape, the tape being unsupported except at points spaced from the article engaging area during engagement of the article with the tape.

3,971,164

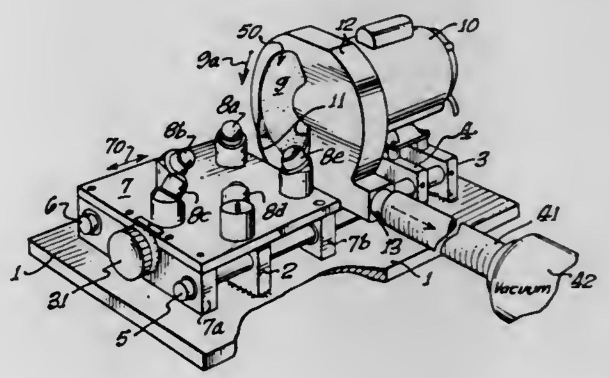
BOWLING BALL RESURFACING MACHINE

Merritt Timothy Albin, 6337 Bluebell Ave., North Hollywood, Calif. 91606, and James W. Benton, 3650 Mountain View Ave., Pasadena, Calif. 91109

Filed May 27, 1975, Ser. No. 580,576

Int. Cl.² B24B *11/06, 55/06*

U.S. Cl. 51—129 **4 Claims**



1. A resurfacing machine for a bowling ball, comprising:
- a frame;
- ways on said frame;
- a carriage slidable on said ways;
- an abrasive disc and a shaft and motor means to rotate said disc mounted on said frame, the plane of said disc being perpendicular to the plane of said ways, and
- the diameter of said disc being substantial compared to the diameter of said bowling ball;
- a plurality of ball-like rollable supports for said bowling ball mounted on said carriage and disposed around a circle in a plane parallel to said ways and permitting manual rotation of said ball about any axis but preventing its translation;
- the center of said circle being displaced from the axis of said shaft in a plane parallel to said ways, the friction force of said disc acting to urge said bowling ball against said supports;
- a shroud enclosing said disc;
- an opening in said shroud for intrusion of a portion of said bowling ball and having a shape and a protruding dust-catching lip fitting closely around said portion on the trailing side;
- a tangentially-disposed exit spout on said shroud; and
- external suction exhaust means connected to said spout to withdraw dust.

3,971,165

RING MANUFACTURE, PRODUCTIVE OF FACE CONTACT SEAL

Norman M. Packard, Des Plaines, and John W. Gaines, Wheaton, both of Ill., assignors to International Harvester Company, Chicago, Ill.

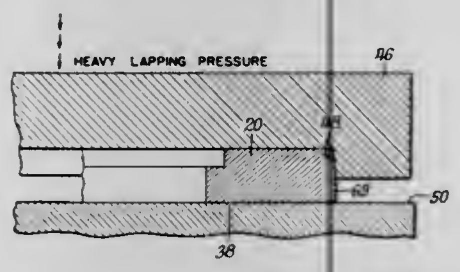
Continuation of Ser. No. 195,955, Nov. 5, 1971, abandoned, and a continuation of Ser. No. 482,309, June 24, 1974, Pat. No. 3,913,199. This application June 30, 1975, Ser. No. 591,787

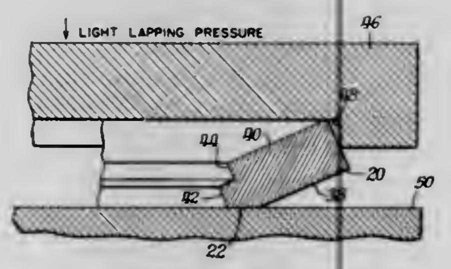
Int. Cl.² B24B *5/36, 37/04, 51/00*.

U.S. Cl. 51—131 **9 Claims**

1. Apparatus for lapping against lapping surface means the side of a split torsion piston ring which, when torsionally distorted by pressure bringing the torsion piston ring into collapsed state conforming to a bore size for which it is normally designed, becomes closed or substantially so, and which, when worked while so torsionally distorted, has at one stage the inner periphery only of said side of the ring projecting into local contact with the confronting lapping surface means, said apparatus comprising:
- a ring fixture having open mouth means for receiving the ring to establish the lapping contact aforesaid;

- a lap surface confronting said mouth means in spaced apart relation to the ring fixture;
- said mouth means having approximately bore size to insure retention of the ring substantially precisely in collapsed state at all times;
- a power cylinder having a compressive-force-transmitting connection to said fixture, effectively with the mouth means of the latter holding the ring relative to the lap surface so that at one stage said side of twisted and under light lap pressure forms a slight angle to said surface whereby the side is provided with a lapped narrow sealing band which is at the locally contacting inner periphery and which forms an angle of intersection with the major portion of the side, and so that at another stage said side if distorted under heavy lap pressure has the major portion thereof compressed untwisted into flattened state against said surface while so collapsed;
- means for causing relative movement between the fixture and lap surface in at least one direction of lap; and
- separate means of two-stage, fluid pressure connection to the power cylinder from respectively a source of light fluid pressure and a source of heavy fluid pressure, whereby at said one stage light fluid pressure in the cylinder causes the lapping force exerted by the ring fixture on the inner periphery of the ring to be limited to a light pressure force, and at said other stage heavy fluid pressure causes the ring fixture to exert a heavy pressure lapping force on said flattened major portion of the ring side.





3,971,166

BELT POSITION SENSOR FOR WIDE BELT SANDING MACHINE

Gerald E. Habeck, Princeton, and Fred W. Kiser, Hopkins, both of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

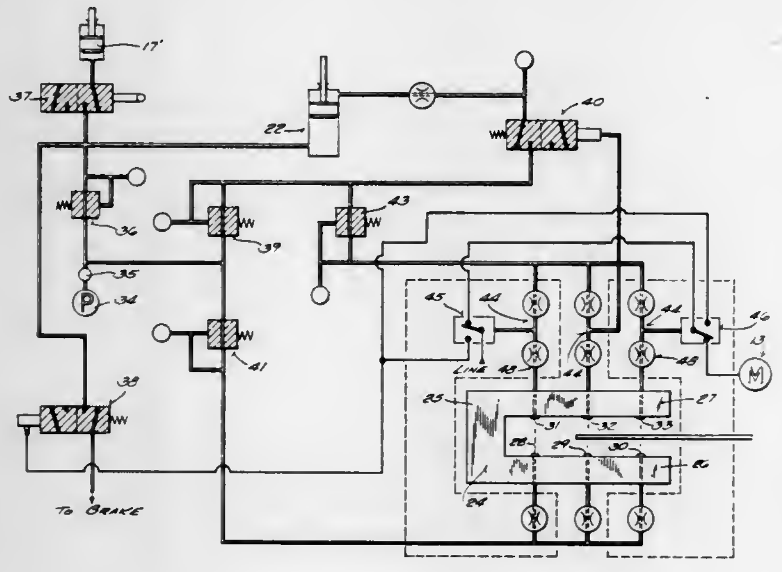
Filed June 9, 1975, Ser. No. 585,063
Int. Cl.^{2} B24B *21/18*
U.S. Cl. 51—135 BT **2 Claims**

1. In a belt-type abrading machine wherein power means drives an endless abrasive belt orbitally along a defined path which includes a substantially straight stretch, and an air motor effects back and forth edgewise excursions of the belt within the bounds of a predetermined tracking zone, wherein said air motor is controlled by signals resulting from the detection of the presence or absence of an edge portion of said stretch of the band by first sensor means in the form of paired opposing low pressure and high pressure air discharge nozzles so disposed with respect to one another and said edge portion of the belt that streams of air issuing from said nozzles unrestrictedly impinge upon one another when no part of said edge portion of the belt is interposed between the nozzles, and wherein the power means driving the belt is controlled by signals resulting from the detection of the presence or absence of an edge portion of said stretch of the belt by second sensor means in the form of two pairs of opposing low pressure and high pressure air discharge nozzles spaced apart transversely of said stretch of the belt and so disposed with respect to said edge portion of said stretch of the belt that streams of air issuing from the opposing low pressure and high pressure nozzles of each pair thereof unrestrictedly impinge upon one another when no part of said edge portion of the belt is interposed therebetween,

the improvement whereby the signals that control the power means driving the belt and the air motor that effects back and forth edgewise excursions of the belt are both derived solely and directly from the direct impingement upon one another of the air streams issuing from their respective opposing nozzles,

and which improvement comprises:

- A. means providing separate sources of low and high pressure air;
- B. low pressure duct means connecting the low pressure one of each pair of nozzles with the source low pressure air, each of said separate low pressure duct means including means defining pressure chamber means directly in series with the source of low pressure air and upstream of its respective low pressure nozzle;
- C. high pressure duct means entirely separate from said low pressure duct means connecting the high pressure one of each pair of nozzles with the source of high pressure air so that unless intercepted by an edge portion of the belt, the air streams leaving the high pressure nozzles unrestrictedly enter the opposing low pressure nozzles with the result that the pressure in said pressure chambers is of one magnitude when such interception exists and of a different magnitude when it does not;
- D. means directly responsive to changes in pressure in the pressure chamber means associated with the paired nozzles of the first sensor means operatively connected with said air motor operable to translate the detection of such changes into forces by which the functioning of said air motor is controlled; and
- E. means directly responsive to changes in pressure in the pressure chamber means associated with the paired nozzles of the second sensor means operatively connected with said power means and operable to translate the detection of such changes into forces by which the functioning of said power means is governed.

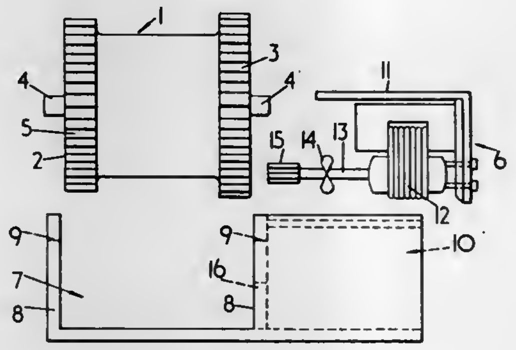


3,971,167

TUMBLING APPARATUS

Michael van Moppes, Lilac Cottage, Alresford, Hampshire, England

Continuation of Ser. No. 429,845, Jan. 2, 1974, abandoned.
This application June 11, 1975, Ser. No. 586,012
Claims priority, application United Kingdom, Feb. 28, 1973, 9852/73
Int. Cl.^{2} B24B *31/02*
U.S. Cl. 51—164 **8 Claims**



1. Tumbling apparatus comprising

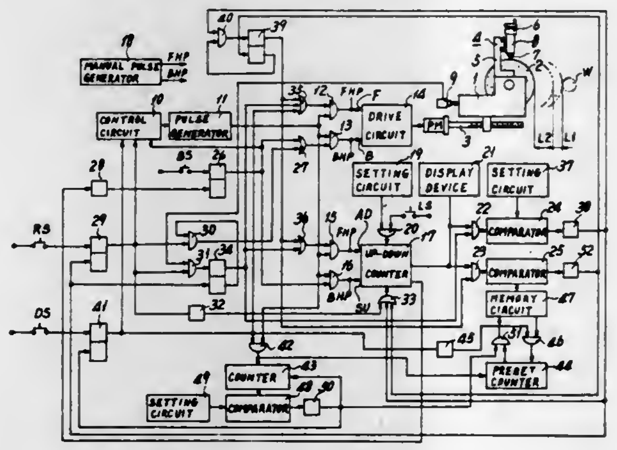
- a circular sectioned tumble-barrel,
- two mutually exclusive external peripheral drive surfaces of different diameters formed about said barrel and spaced equally from the longitudinal center of said barrel,
- a base member for said barrel,
- drive means supported on said base member for engaging one of said mutually exclusive drive surfaces to directly rotate said barrel, and
- mounting means secured to said base member for supporting said barrel for rotation about its longitudinal axis so that the axial orientation of the barrel may be reversed to provide for alternative engagement of a selected one of said drive surfaces with said drive means to rotate said barrel at two alternative speeds of rotation of said barrel for a given speed of rotation of the drive means.

3,971,168

CONTROL APPARATUS FOR A MACHINE TOOL

Hideo Nishimura, Kariya, and Ikuo Otsu, Toyota, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 20, 1975, Ser. No. 560,365
Claims priority, application Japan, May 17, 1974, 49-55198
Int. Cl.^{2} B24B *51/00*
U.S. Cl. 51—165.8 **10 Claims**



1. Control apparatus for a machine tool having a tool support supporting a tool for machining a workpiece and movable relative to said workpiece comprising:

- a pulse generating means for generating a train of pulse signals;
- a drive motor operatively connected to said tool support for moving said tool support relative to said workpiece in response to said pulse signals;
- first means including a manually operated switch for causing said drive motor to be actuated to move said tool support away from said workpiece toward an original position;
- detecting means actuated when said tool support is moved into the original position;
- second means responsive to the actuation of said detecting means for causing said drive motor to be actuated to move said tool support toward said workpiece;
- counter means responsive to said second means for counting the number of said pulse signals supplied to said drive motor;
- setting means for digitally setting a distance between said original position and a start position; and
- comparing means operatively connected to said counter means and said setting means for comparing the contents of said counter means and said setting means and for generating a coincidence signal when said contents coincide to stop the movement of said tool support to thereby position said tool support at the start position.

3,971,169

METHOD FOR REPAIRING SELENIUM PHOTORECEPTORS

John Frank Byrne, Worthington, Ohio, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1974, Ser. No. 512,803
Int. Cl.^{2} B24B *37/04*
U.S. Cl. 51—283 **5 Claims**

1. A method for repairing a damaged area on a selenium photoreceptor comprising:

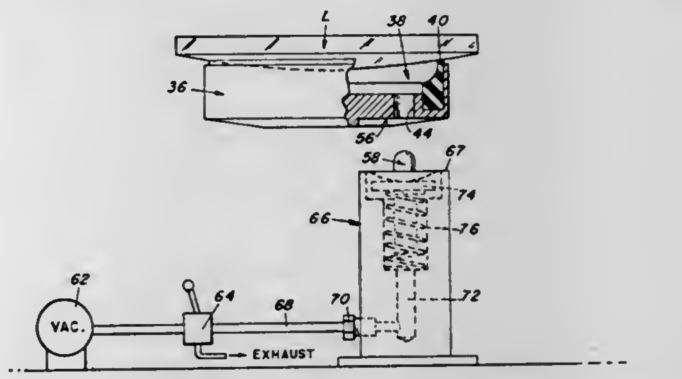
- a. providing a polish composition including (i) magnesium hydroxide, (ii) a secondary suspending agent selected from the group consisting of colloidal silica particles and silica aerogels, and an abrasive, all three materials being suspended in a liquid medium of water and isopropyl alcohol;
- b. applying the polish composition to a physically damaged area of a selenium photoreceptor; and
- c. rubbing the polish composition about the damaged area so as to effect a smoothing of the physically damaged area of the photoconductor.

3,971,170

VACCUM CHUCK WITH SEALABLE CAVITY

Orin W. Coburn, and Joe D. Stith, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Division of Ser. No. 322,232, Jan. 3, 1973, Pat. No. 3,874,127.
This application Jan. 17, 1975, Ser. No. 541,977
Int. Cl.^{2} B24B *1/00*
U.S. Cl. 51—284 **2 Claims**



1. The method of blocking a lens blank to a block member having a base with an aperture therethrough and a side wall mounted on said base and adaptable to receive a resilient

member for supporting a lens blank on the periphery thereof and including an elastomeric plug with a nipple means on one side thereof for insertion in said aperture by a plug inserting means having an interior cavity adapted to accept a vacuum and a spring-biased platform within said cavity comprising the steps of,

- placing said elastomeric plug, nipple side up, upon said platform,
- positioning a surface of said lens blank on said resilient means in sealable engagement therewith,
- setting the aperture of said block member over said nipple so that said lens block and said plug inserting means form a vacuum seal around said plug,
- evacuating the chamber defined by said base, said resilient member and said lens surface by drawing a vacuum through said aperture, around said elastomeric plug, and into the cavity of said plug inserting means, and
- sealing said aperture with said elastomeric plug by introducing atmospheric pressure into said cavity thereby forcing said elastomeric plug into said aperture and forming a vacuum seal therewith.

3,971,171

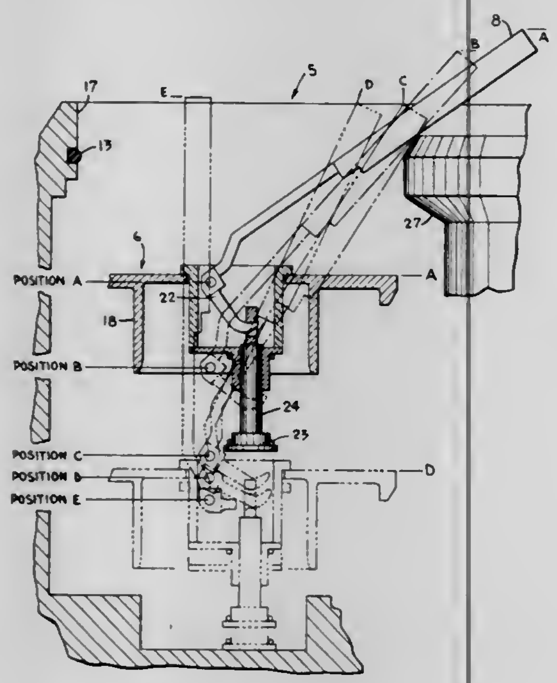
DEBRIS CAP MECHANISM FOR A SUBSEA WELLHEAD

Norman J. Wood, San Jose, Calif., assignor to Subsea Equipment Associates, Hamilton, Bermuda

Filed July 8, 1975, Ser. No. 594,012

Int. Cl.² E04D ***29/14***

U.S. Cl. 52—19 **7 Claims**



1. A debris cap mechanism, for use in connection with a housing to enclose and protect a re-entry hub of a subsea well, comprising, in combination:

- frame means adapted for engaging said housing;
- first sealing means adapted to be disposed between said frame means and said housing and operative to inhibit the passage of liquid therebetween;
- lid means movable between closed and opened positions, respectively, and connected to said frame means in such a manner that clear access to said re-entry hub is possible when said lid means is in its open position;
- second sealing means adapted to be disposed between said frame means and said re-entry hub and operative to inhibit the passage of liquid therebetween, said frame means being movable and operative for moving said lid means between its closed and open positions.

3,971,172

PREFABRICATED CONSTRUCTION

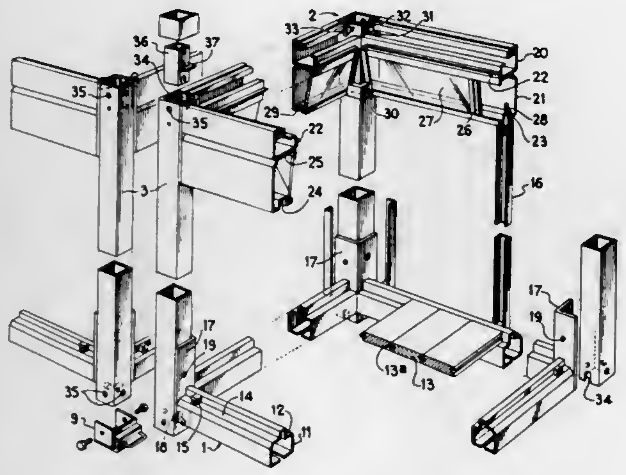
Robert Gentil, Paris, France, assignor to Industrielle de Constructions Mobiles, Paris, France

Filed May 6, 1975, Ser. No. 574,965

Claims priority, application France, May 8, 1974, 74.15948; May 8, 1974, 74.15949; May 8, 1974, 74.15950; May 8, 1974, 74.15951

Int. Cl.² E04G ***1/02***

U.S. Cl. 52—28 **26 Claims**



1. A metal framework for a prefabricated construction, comprising a lower structure and an upper structure and vertical uprights, the lower structure and upper structure each comprising a frame having a substantially rectangular shape, a vertical corner member provided at each corner of the frame, the vertical corner members of the upper structure being engaged with upper parts of the uprights and the vertical members of the lower structure being engaged with lower parts of the uprights, each of said vertical members and the corresponding upright comprising complementary detachable means for fixing and guiding the vertical member and uprights, wherein the fixing and guide means comprise screwthreaded rods carried by the corner members and notches provided respectively at lower and upper ends of the uprights, and nuts screwed tight on the screwthreaded rods so as to achieve the fixing.

3,971,173

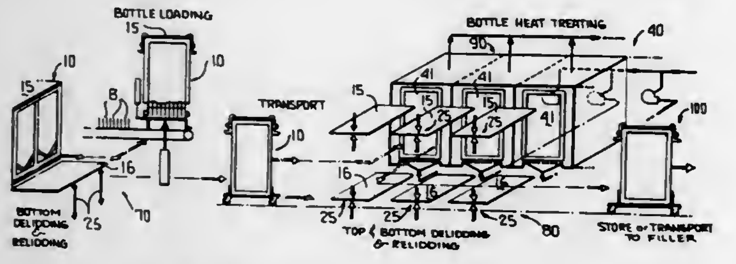
PROCESS FOR HEAT TREATING PLASTIC BOTTLES

Kenneth F. M. Friendship, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 246,716, April 24, 1972, Pat. No. 3,886,253. This application Feb. 18, 1975, Ser. No. 550,570

Int. Cl.² B29C ***17/07, 25/00;*** **B65B** ***43/00***

U.S. Cl. 53—29 **8 Claims**



1. A process of reducing the creep characteristics of plastic containers comprising the steps of providing a cartridge having upper and lower ends and a plurality of vertically extending transversely interconnected chambers also having upper and lower ends, blow molding a plurality of containers, stacking the blow molded containers vertically upwardly through the lower ends of the chambers toward the upper ends thereof atop and in contact with each other in an upright position in each chamber, transferring the cartridge into a heat treatment bay, circulating hot air in contact with the plastic containers in a direction upwardly from and through the lower ends through the upper ends in open condition and through and between the chambers for a predetermined period of time and at a predetermined temperature sufficient to reduce the creep characteristics of the plastic containers, and removing the cartridge from the heat treatment bay.

3,971,174

PREFABRICATED BUILDINGS

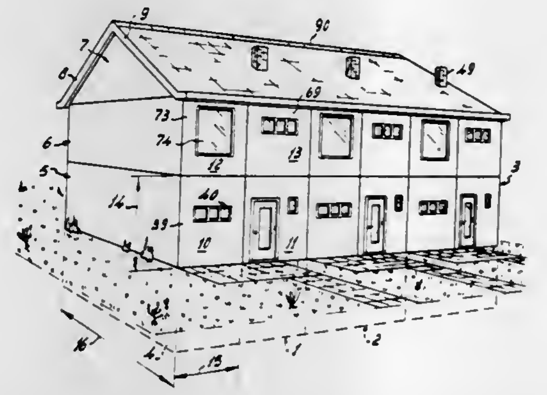
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jan. 16, 1973, Ser. No. 324,078

Claims priority, application Netherlands, Jan. 17, 1972, 7200627

Int. Cl.² E04H ***1/00***

U.S. Cl. 52—79 **22 Claims**



1. A row of houses wherein each house comprises a foundation defining a basement having a furnace, and a staircase, each house consisting of four parallelepiped elongated prefabricated units with two of said units of the first floor supported by said foundation over said basement in a connecting side-by-side arrangement and two further units of the second floor each supported by an underlying first mentioned unit, said second floor units also being connected in a side-by-side arrangement, said units together forming a box-shaped structure, the longitudinal axis of each unit being perpendicular to the front of the house, the front of the house having an entrance into the hall and kitchen beside the hall, a stairwell is provided for said staircase from the basement immediately behind said kitchen whereby said staircase communicates with said hall, the living room spanning the first floor units after said hall and said stairwell behind said kitchen and including a stairway, and landing receiving said stairway included in a unit of said second floor, said second floor units further defining three rooms having entrances from said landing and bathroom also having an entrance from said landing disposed at the head of said stairway is said unit including said landing.

3,971,175

FACTORY-MADE HABITATION CELL

Charles Boël, Bully-Les-Mines; Jean-Pierre Cottin, Lens, and Francois Guitard, Lille, all of France, assignors to Houilleres du Bassin du Nord et du Pas-de-Calais, France

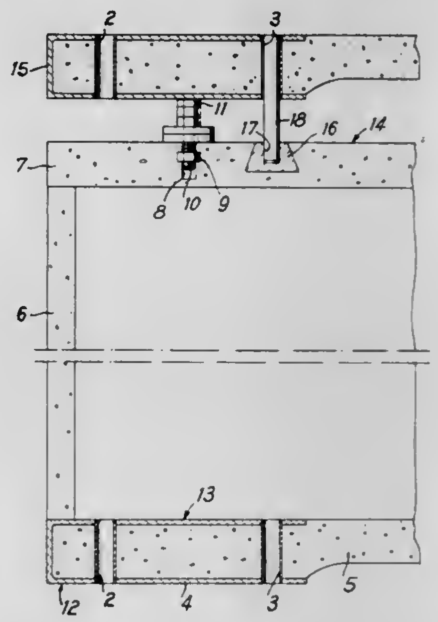
Continuation of Ser. No. 485,216, July 2, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,181

Claims priority, application France, July 3, 1973, 73.24465; June 13, 1974, 74.20608

Int. Cl.² E04B ***1/348***

U.S. Cl. 52—79 **6 Claims**

1. In a multi-story building structure having superposed modular cells, each cell having a floor slab, walls supported on said floor slab and a ceiling slab supported on said walls, the floor slab of one cell being spaced from and aligned with the ceiling slab of an underlying cell, the improvement which comprises in combination a floor slab of reinforced concrete and generally rectangular, a plurality of metal L-shaped corner pieces each bonded to said floor slab at a corresponding corner thereof, each corner piece having a pair of legs in the form of channels with generally U-shaped transverse cross sections, respective edge portions of the floor slab being received inside the channel openings of said legs, each leg having an upper outside surface and a lower outside surface, at least one tubular member connected to each corner piece and extending through the floor slab and a leg of the corner piece, a ceiling slab of reinforced concrete, spacer means received in said ceiling slab and disposed for engagement with a lower outside surface on a corner piece leg of the floor slab of an overlying cell to establish a given spacing between said ceiling slab and such floor slab, and alignment means received in said ceiling slab and received inside a tubular member associated with the floor slab of said overlying cell to establish a given alignment between such floor slab and said ceiling slab.



3,971,176

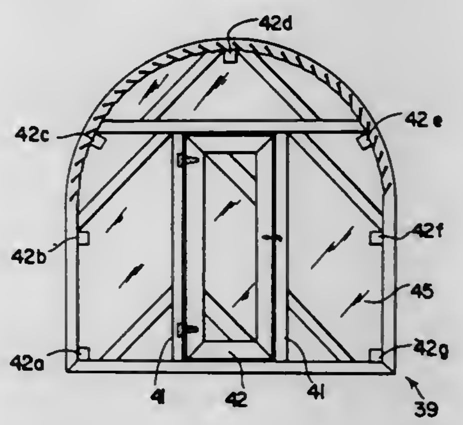
STUD-TRUSS AND METHOD OF MAKING SAME

Lynn Lee Rannels, R.D. 2, Reinholds, Pa. 17569

Filed Feb. 5, 1975, Ser. No. 547,332

Int. Cl.² E04B ***1/32***

U.S. Cl. 52—86 **3 Claims**



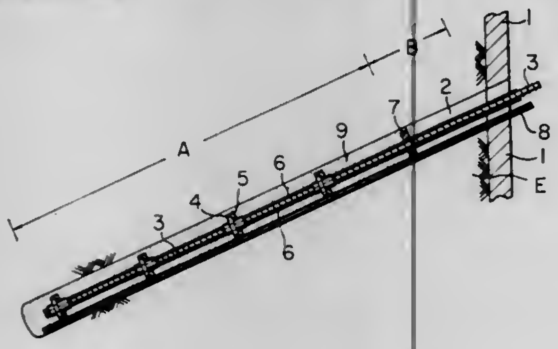
1. A permanently formed stud-truss comprising

a. a wood member having a curved length positioned between two substantially straight lengths, said curved length having a plurality of substantially parallel cuts on the concave side thereof at least a portion of the adjacent surfaces of which are in contact, each of said cuts having a depth greater than one-half the thickness of said wood member but at least about one-quarter inch less than the total thickness thereof, said cuts being all inclined in the same direction at about an included angle of 30° to 80° with the longitudinal axis of said wood member prior to the formation of said curved length, said angle being measured on the wood member surface containing partial cuts, and

b. a hardened adhesive material between each of said adjacent surfaces permanently maintaining at least the open ends of the adjacent surfaces of each of said cuts substantially in contact whereby said stud-truss permanently retains a desired form.

3,971,177
EARTH ANCHOR WORK METHOD AND ANCHOR DEVICE

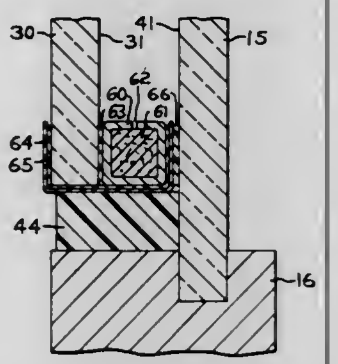
Yuzo Endo, Urawa, Japan, assignor to Shoichi Kimura and Mitsui Construction Co., Ltd., both of Tokyo, Japan
Filed June 20, 1975, Ser. No. 588,656
Claims priority, application Japan, Jan. 9, 1975, 50-4655
Int. Cl.² E02D *5/74*
U.S. Cl. 52—166 **10 Claims**



2. An earth anchor base for earth anchor insertable into a bore of suitable depth provided at the anchor position in the earth, the improvement residing in that a plurality of flanged load-resistant plate couplers are mounted at any desired intervals axially on a Tendon providing the core portion of the anchor, a spring mechanism is closely annexed to the load-resistant surface of each of said flanged load-resistant plate couplers, and sheath materials cover the portions of said Tendon which are exposed.

3,971,178 ·
ADD-ON MULTIPLE GLAZING WITH HYGROSCOPIC MATERIAL

Renato J. Mazzoni, Tarentum; George H. Bowser, New Kensington, and Richard R. Lewchuk, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Mar. 25, 1974, Ser. No. 454,338
Int. Cl.² E06B *7/12, 3/28*
U.S. Cl. 52—172 **32 Claims**



1. An architectural glazing unit for converting installed glazing to multiple glazing, comprising:

no more than one transparent pane;

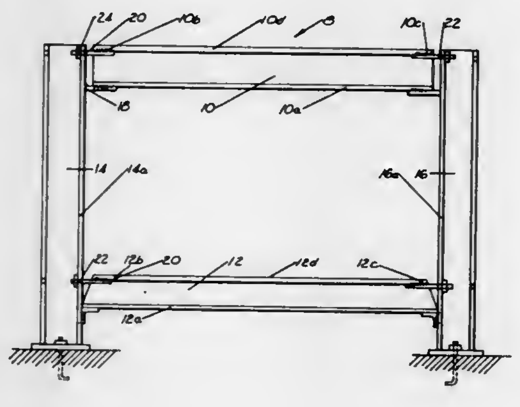
an elongated spacer element adjoining marginal portions of a first major surface of said pane around the perimeter of said pane, each longitudinal portion of said spacer element having a first surface and a second surface on opposite sides thereof, wherein said first surface faces said marginal portions of said pane in adjoining relationship thereto, and said second surface faces outwardly, away from said marginal portions of said pane;

a ribbon of essentially moisture vapor impervious material extending around the perimeter of the unit adhered to said second surface of said spacer element and overlying peripheral edge surface portions of said pane; and

moisture-resistant sealant interposed between said ribbon and edge surface portions of said pane so as to provide adhesion and a hermetic seal therebetween.

3,971,179
NON-BONDED FRAMING SYSTEM

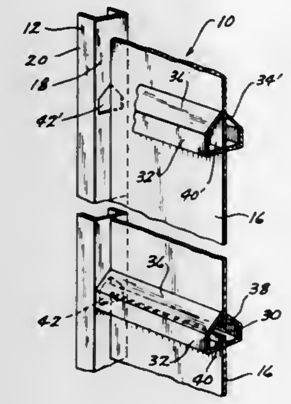
Andrew Bodocsi; John H. Hoge; John H. Hubbard; S. Jackson Hubbard, and Gerard Roberto, all of 4204 Airport Road, Cincinnati, Ohio 45226
Continuation-in-part of Ser. No. 849,787, Aug. 13, 1969, abandoned. This application Mar. 2, 1971, Ser. No. 120,123
Int. Cl.² E04C *3/10;* E04B *1/06*
U.S. Cl. 52—223 R **14 Claims**



1. A non-bonded, prestressed, rigid frame structure providing post-tension and resulting camber in all flexural members comprising beam members and at least three spaced column members with each said beam member being joined at each of its end faces to a side face of one of said column members by post-tensioned, moment-transferring connections, said beam members each having at least one adjustable tension connecting element and at leastt one compression connecting element on the end faces thereof, said column members each having corresponding tension and compression connecting elements on the side faces thereof for mating with said connecting elements on the end faces of said beam members, said mating connecting compression elements comprising the distending edge of a bias cut end face of said beam members engaging a compression bearing surface on a side face of said column members in unattached abutment to cause a spacing apart of said joined end and side faces at the locations of said mating tension connecting elements and serving as compression fulcrums for unrestricted relative rotation between saidd joined end and side faces, and said adjustable mating tension connecting elements comprise at least one threaded rod attached to the upper portion of the end faces of said beam members and extending therefrom through corresponding apertures in the spaced apart side faces of said column members, and secured thereto by nuts, and resistance to said relative rotation comprising only the deadweight of said members and their connections at the other ends of said beam and column members, whereby the tightening of said nuts produces and secures controlled relative rotation about said compression fulcrums between respective pairs of said joined members and tensions and cambers all of said joined beam and column members of said frame structure and renders said connections therebetween capable of immediate moment transfer and said frame structure capable of supporting vertical and horizontal service loads in rigid frame action.

3,971,180
WALL STRUCTURE

Charles V. Frederick, Rte. No. 5, Box 132, New Virginia, Iowa 50210
Filed Oct. 25, 1974, Ser. No. 517,881
Int. Cl.² E04B *1/16, 2/34*
U.S. Cl. 52—251 **4 Claims**



1. In a concrete, reinforceable metal building structure having metal building panels, comprising, a first panel of

U-shaped metal side members each having a web portion and outwardly disposed spaced-apart flange members, said side members being oppositely disposed in a spaced-apart relation with the flanges thereof extending outwardly in opposite directions,

a plurality of metal sheet members extending between said web portions and being secured thereto, and pairs of metal stiffener members extending between said side members on opposite sides of said sheet members and covering the adjacent edges of adjacent sheet members, said metal stiffener members having a beveled outer surface so that particulate material will not lodge thereon when said panel is in a vertical position; said stiffener members forming an enclosed compartment along the adjacent edges of adjacent sheet members,

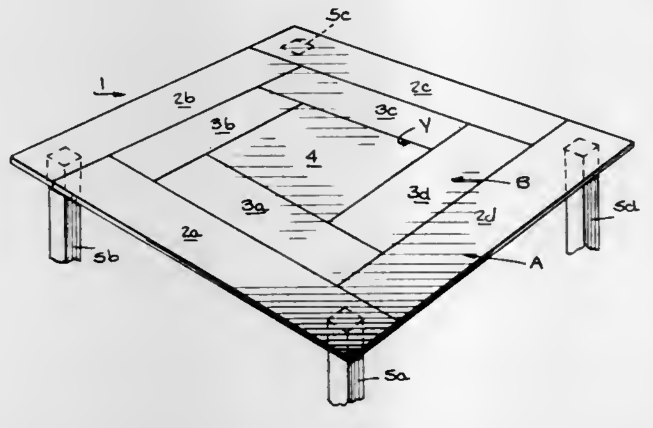
said webs having openings formed therein at the ends of said compartments,

a second building panel of like description is aligned with said first panel so that the outwardly extending flanges of said panels are aligned to form a column compartment,

and hardened concrete material positioned within said column compartments and the enclosed compartments formed by said stiffener members creating an interconnecting rigid structure member with said panels.

3,971,181
BEAMLESS FLOOR AND ROOF STRUCTURE

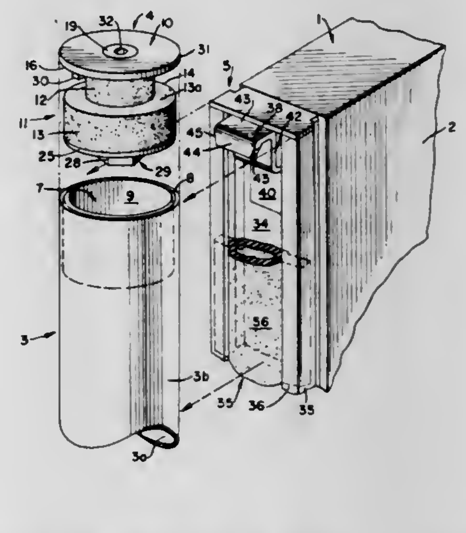
Lev Zetlin, 89 Hamilton Drive, Roslyn, N.Y. 11576
Filed Apr. 4, 1974, Ser. No. 457,982
Int. Cl.² E04B *5/08*
U.S. Cl. 52—263 **16 Claims**



1. A beamless floor structure comprising a plurality of elongated plate members cooperating to form a closed ring means, each of said plate members having an end portion supported by a longitudinal edge portion of the next succeeding one of said plate members and having a longitudinal edge portion supporting an end portion of the next preceding one of said plate members when viewed in one direction around said closed ring and not in the other, and a plurality of support means equal in number to said plate members and cooperating with said plate members for supporting said ring means at a given elevation, each of said plate members having a second end portion supported by a corresponding one of said support means and having an unsupported portion intermediate said end portions thereof.

3,971,182
PORTABLE WALL ASSEMBLY

Charles R. Donahue, and Philip J. Williams, both of Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio
Filed May 2, 1975, Ser. No. 574,023
Int. Cl.² A47G *5/00;* E04B *2/82;* E04F *13/08*
U.S. Cl. 52—282 **12 Claims**



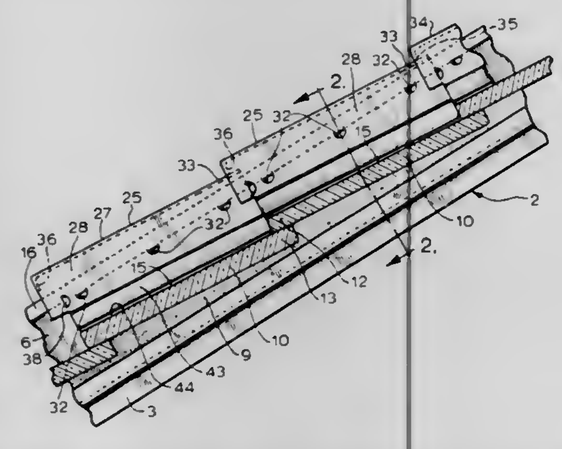
1. A portable wall assembly including, a panel element having a vertical side edge, an upright post disposed adjacent said panel edge for supporting same, vertically spaced apart mounting means carried by said panel and projecting from said side edge for support by said post, said mounting means including a top clip overlying the top of said post and having a depending tongue inserted into the upper portion of said post, a cap and plug assembly securing said top clip tongue against vertical and lateral displacement relative to said post, said cap and plug assembly including a top cap plate affixed to a connector plug, said plug of elastomeric material and disposed within said post and including an upper smaller diameter portion disposed above a lower larger diameter portion, said cap plate overlying said top clip tongue when inserted into said post with said tongue disposed above said lower larger diameter portion, and means operable from outside said cap and plug assembly to vertically compress and laterally expand said elastomeric connector plug to retain said cap plate in locking engagement atop said panel top clip as said lower larger diameter portion of said plug is expanded to engage the interior of said post.

3,971,183
INTERLOCKING CLIPS AND RAFTERS FOR ROOF PANELS

Henry Padleckas, 815 N. Oak Ave., Oak Park, Ill. 60302 and Ludwig Wenzlow, 507 Longfellow Dr., Deerfield, Ill. 60015
Filed July 2, 1973, Ser. No. 375,604
Int. Cl. E04b *1/40*
U.S. Cl. 52—478 **7 Claims**

1. A hold-down clip and rafter combination for securing roof panels;

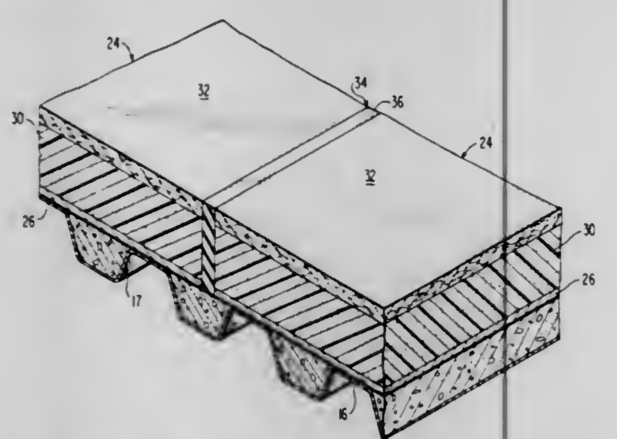
a rafter having catch means extending longitudinally thereof,
means for supporting said panels against said rafter beneath said catch means,
and clips having means for engagement with said catch means and slidable thereon lengthwise of said rafter into wedging securing engagement between said catch means and associated panels therebeneath;



and said rafter comprising a longitudinal vertical web and said catch means disposed along the upper edge of the web,
and each clip having resilient portions overlying respective panels and flexible transversely thereof;
and each clip having a body portion sleeved over the web and having on said body portion inwardly extending projections constituting latch means;
and said latch means located along a line converging with the planes of the catch means.

3,971,184
INSULATED, WATER IMPERMEABLE ROOFING SYSTEM

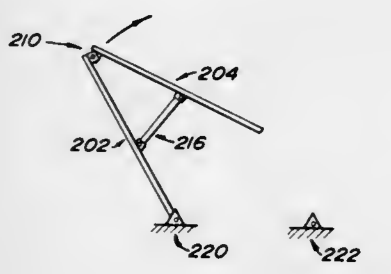
John D. Van Wagoner, McLean, Va., assignor to Robert M. Barlow, Fairfax, Va., a part interest
Filed Mar. 5, 1975, Ser. No. 555,596
Int. Cl.^{2} E04C ***2/00;*** **E04B** ***1/62***
U.S. Cl. 52—613 **2 Claims**



1. A factory assembled, insulated, water impermeable, roofing panel for use in a roofing system to insulate the interior of a building from ambient thermal cycling and for insuring water impermeable integrity of a roof or deck portion of the building; said roofing panel being laminated and comprising:
a water and vapor impermeable membrane, said membrane comprising a course of water and vapor impermeable material and having one surface thereof operably bondable to a roof deck for insuring water impermeable integrity of a roof or deck portion of the building;
an insulation course coextensively overlaying and evenly extending to and meeting the peripheral margins of said course of water and vapor impermeable material,
said insulation course serving to isolate said water and vapor impermeable membrane as well as the roof or deck surface to which the membrane is applied from ambient thermal cycling and from exposure to the surrounding environment which may tend to degrade the water and vapor impermeable character of the membrane material, and
said insulation course coextensively overlying and evenly extending to and meeting the peripheral margins of said course of water and vapor impermeable material having a vapor permeability greater than the vapor permeability of said course of water and vapor impermeable material such that water vapor trapped within the laminated roofing panel will pass outwardly through said insulation course away from the building and said water and vapor impermeable membrane; and
a protective course coextensively overlying and bonded directly to the outer surface of said insulation course and evenly extending to and meeting the peripheral margins of said insulation course,
said protective course being resistant to ultra-violet, ozone, temperature and wind degradation and further being substantially water impermeable;
said laminated roofing panels composed of a water and vapor impermeable membrane, an insulation course and an overlaying protective course each evenly extending to and meeting adjacent peripheral margins of a juxtaposed course such that said panels are operable to be positioned in a posture mutually juxtaposed but laterally spaced from one another upon a roof or deck portion of a building to form a peripheral zone around each panel and being operable to receive within the peripheral zone thus formed a water and vapor impermeable compound which operably bonds to the roof or deck portion of the building, the peripheral margin of a water and vapor impermeable membrane, the peripheral margin of the insulation course, and the peripheral margin of the protective course to form a water and vapor impermeable barrier across the entire roof deck and concomitantly to form an expansion zone or joint about the peripheral edges of each of the roofing panels.

3,971,185
METHOD OF ERECTING A FOLDABLE BUILDING MODULE

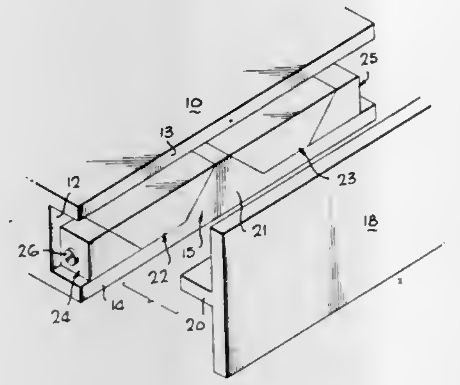
John H. Hendrich, 5 W. 10th St., Erie, Pa. 16501
Continuation-in-part of Ser. No. 332,677, Feb. 15, 1973, Pat. No. 3,863,419, which is a continuation-in-part of Ser. No. 178,942, Sept. 9, 1971, abandoned. This application Aug. 23, 1974, Ser. No. 500,085
Int. Cl.^{2} E04B ***1/344;*** **E04G** ***21/14***
U.S. Cl. 52—745 **7 Claims**



1. A method of constructing an A-frame type structure comprising:
a. providing first and second spaced apart base members;
b. providing a module including first and second wall-defining members each having first and second end portions with the first end portion of the first wall member pivotally connected to the first end portion of the second wall member to permit said wall members to be folded about a first axis to lie in side-by-side generally parallel relationship;
c. positioning said module in its folded condition to lie in a generally horizontal position with the second wall member subjacent the first wall member and connecting the second end portion of the second wall member to the first base for pivotal movement about a second axis parallel to said first axis with second end portion of the first wall member extending generally toward said second base;
d. lifting said first wall member to pivot it about said first axis and moving the second end portions of said wall members a distance apart substantially equal to the distance between said base members;
e. providing a floor member and with said first wall member in the lifted position interconnecting said first and second members with said floor member extending therebetween; and,
f. thereafter lifting said module to rotate it about said second axis to move the second end of said first wall member into engagement with said second base.

3,971,186
WEDGE LOCK UNIT

Steven E. Havelka, Playa del Rey; Paul L. Graham, Culver City, and Carl L. Matschke, Canoga Park, all of Calif., assignors to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.
Filed Aug. 13, 1975, Ser. No. 604,344
Int. Cl.^{2} F16B ***5/06***
U.S. Cl. 52—753 G **12 Claims**

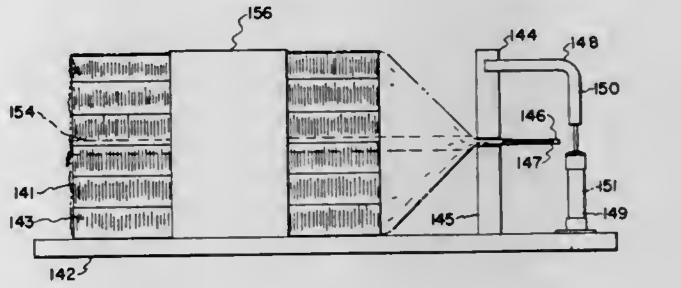


1. In a wedge lock of the type including at least first and second separate members with mating wedged sides and operable means for selectively applying a clamping force to said members to cause relative motion between said members, with said first member being in contact with a first flange of a first structure and said second member comes in contact and clamps a flange of a second structure against a second flange of said first structure, the improvement comprising:
means for producing a reaction force when said clamping force is applied to said members of said wedge lock, the direction of said reaction force being opposite to the clamping force direction, whereby when said clamping force is removed, said reaction force urges said second member to become separated from the flange of said second structure and moves toward the first member of said wedge lock.

3,971,187
METHOD OF MAKING VACUUM WRAPPED SHIRRED SAUSAGE CASINGS

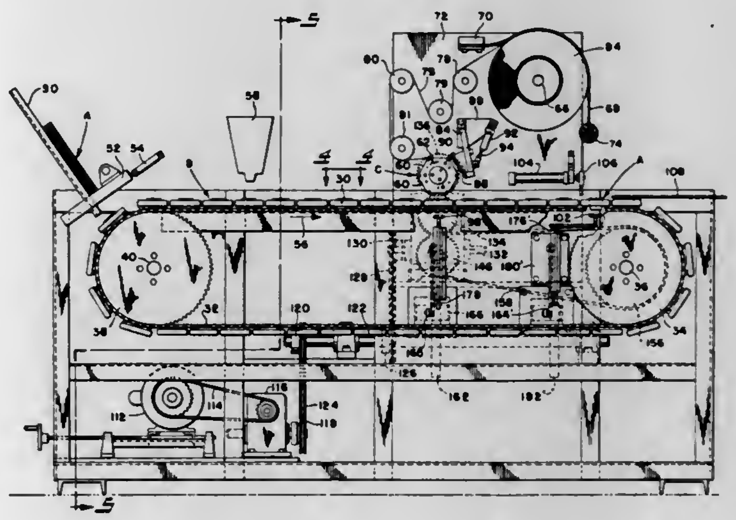
Frank M. McNeill, Lombard, and Harold H. Martinek, Danville, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Continuation of Ser. No. 438,305, Jan. 31, 1974, abandoned. This application June 4, 1975, Ser. No. 583,730
Int. Cl.^{2} B65B ***31/02***
U.S. Cl. 53—21 FC **9 Claims**

1. A method for packaging a shirred artificial sausage casing which comprises enveloping said casing within a flexible tubular film, said film having a transmission rate for air of less than about 1cc/100in^2/24 hr.-atm removing sufficient air from within the resulting envelope to produce therein an absolute pressure of substantially not less than about 0.4 atmospheres, and then sealing said envelope for maintaining said pressure.



3,971,188
APPARATUS AND METHOD FOR APPLYING LIDS TO CONTAINERS

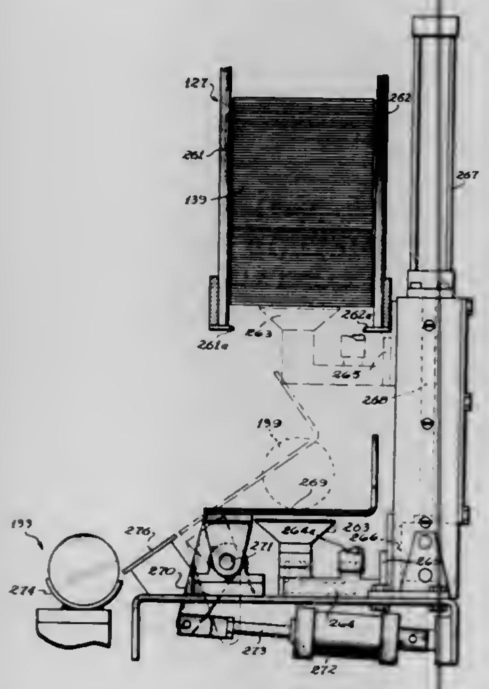
Richard S. Cawrse, 915 Beachside Lane, Huron, Ohio 44839
Division of Ser. No. 418,608, Nov. 23, 1973, Pat. No. 3,890,767. This application Apr. 7, 1975, Ser. No. 565,745
Int. Cl.^{2} B65B ***7/28***
U.S. Cl. 53—39 **2 Claims**



1. A method of applying lids having a layer of heat sealing material on one side thereof to containers having open upper ends comprising the steps of horizontally indexing successive containers to sequentially advance said containers to a lidding position whereat a rotatably indexable heated polygonal mandrel has, in each indexed position, a bottom planar face spaced above a container at said lidding position; applying by vacuum the leading end portion of lidding material from a roll thereof to an upper planar face of said mandrel with said heat sealing layer facing upwardly and softened by contact of the other side of said lidding material with said mandrel; indexing said mandrel and the vacuum-held lidding material thereon to cutting position; transversely cutting said lidding material at the vortex between successive faces of said mandrel at said cutting position to provide a separate lid held by vacuum against the mandrel; indexing said mandrel and the separate lid thereon to lidding position; lifting the container at lidding position to engage its open upper end with the heat softened layer of the lid then held by vacuum against the bottom face of the mandrel to heat seal said lid to the upper open end of said container; and applying air pressure on the lid contacted by the lifted container while commencing to lower the container to aid in sealing the lid against the open upper end of the container, to assist in separating the lid from the bottom face of the mandrel, and to provide a cooling effect on the layer of heat sealing material.

3,971,189
APPARATUS FOR COUNTING AND PACKAGING CAN ENDS

Wallace W. Mojden, Hinsdale; Jose E. Davila, Chicago; George W. Hooper, Western Springs; Gerald M. Kwiatkowski, Dolton, and Howard W. Pantel, Jr., Woodridge, all of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.
Division of Ser. No. 521,842, Nov. 7, 1974, which is a division of Ser. No. 351,639, April 16, 1973, Pat. No. 3,878,945. This application Dec. 3, 1975, Ser. No. 637,473
Int. Cl.^{2} B65B *57/06, 43/26*
U.S. Cl. 53—63 **9 Claims**

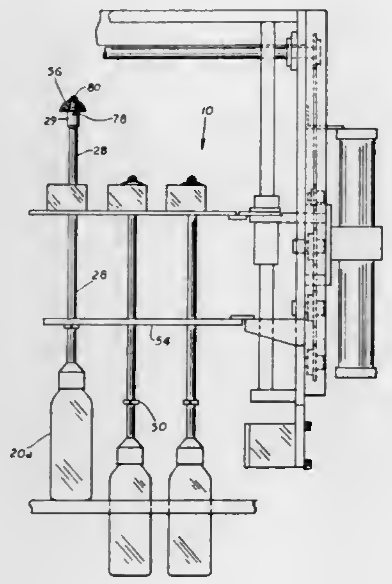


1. Bag handling apparatus for use with an article packaging device or the like, said apparatus including: a bag storage magazine for receiving a plurality of bag elements in clamped, stacked relation; means for removing a bag element from said magazine including a plurality of suction cup devices adapted for connection to a vacuum source, elevating means operatively associated with said suction cup devices for moving said devices between a first position and a second position wherein said suction cup devices engage the lowermost bag elements in said storage bag means, whereby upon return movement of said suction cup devices toward said first position a bag element will be maintained in engagement with said devices and will be removed from said storage magazine; means for opening the mouth of the bag element so removed preparatory to the disposition of articles therein, said means including a clamping arrangement positioned at the level above said first location and disposed in the path of movement of said bag element, said clamping arrangement being adapted to engage an upper portion of the bag mouth in clamped relation, such that upon movement of said bag element past said clamping arrangement, the mouth of said bag will be expended to an open condition.

3,971,190
ARTICLE TRANSFER APPARATUS HAVING RELEASABLE RODS

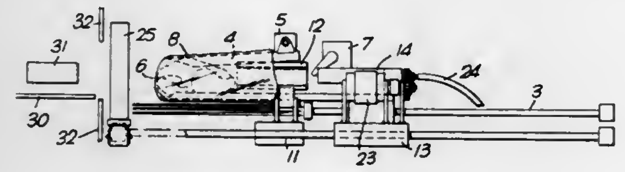
Robert W. McGill, Munroe Falls, Ohio, assignor to A-T-O Inc., Willoughby, Ohio
Filed Feb. 20, 1975, Ser. No. 551,266
Int. Cl.^{2} B65B *57/00, 35/38*
U.S. Cl. 53—77 **8 Claims**

1. In container depositing or case packer apparatus or the like having articles fed onto a releasable support at an article processing station in a plurality of rows of abutted articles, the combination comprising a frame means, a carrier means slidably engaging said frame means for vertical movement, said carrier means extending across said support at the processing station and being thereabove, drive means engaging said carrier means to control its position and move it vertically toward and away from said support, manifold means on said carrier means and having vertical bores therein and having a fluid pressure force supplied to said bores, a plurality of vertically positioned pusher rods individually slidably engaging said bores of said manifold means and protruding therefrom in both directions but being movable as a unit with said carrier means, and a suction cup member on the upper end of each of said pusher rods to engage said carrier means to releasably secure each operably positioned pusher rod thereto for individual movement of said pusher rods, said manifold means operatively transmitting a vacuum fluid pressure force to said suction cup members to aid in operatively positioning the same.



3,971,191
MACHINE FOR INSERTING OBJECTS INTO BAGS

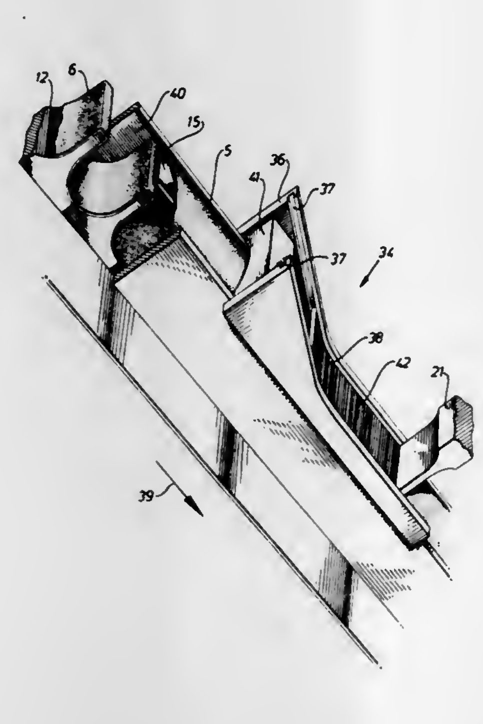
Trevor Barrie Hoyland, Norwich, England, assignor to Thurne Engineering Company Limited, Norwich, England
Filed July 11, 1975, Ser. No. 594,972
Int. Cl.^{2} B65B *7/12, 31/06, 43/36, 51/08*
U.S. Cl. 53—112 B **6 Claims**



1. A machine for inserting objects into bags comprising a holder for a stack of bags, an object support movable back and forth between a forward position in which, in use, it is inserted together with an object supported on it, into a bag, and a retracted position, carriage means, first and second pushers mounted on said carriage means, the first pusher being operable to engage said object on said object support and push said object forwards from said object support and at the same time cause said bag to move forwards from said holder, said carriage means also being arranged subsequently to withdraw said first pusher, means for advancing said second pusher into the mouth of the bag, means for pressing said bag inwards into contact with said second pusher behind said object, a suction connection associated with said second pusher for sucking air from said bag after said bag has been pressed into contact with said second pusher, and means for closing said bag after said bag has had said air sucked from it.

3,971,192
DEVICE FOR THE DISPLACEMENT OF FILLING MATERIAL AND THE SHAPING OF A MATERIAL WEB IN A PACKING MACHINE

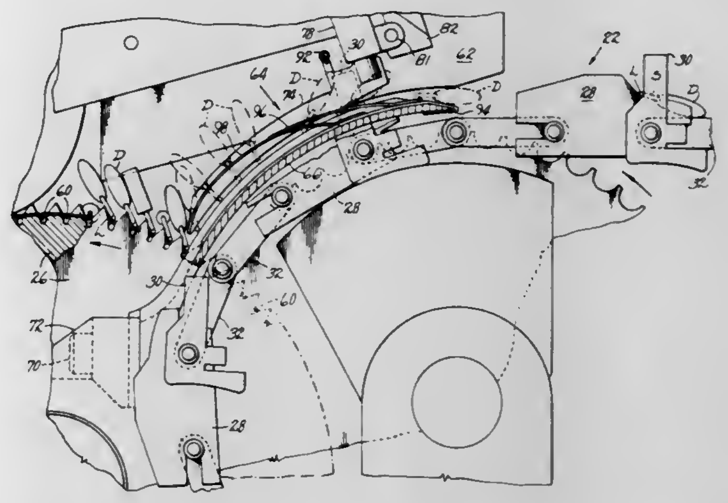
Franz Soukup, Malmo; Bengt A. Rosberg, Hoor; Tore I. Larsson, Loddekopinge, and John-Erik Brunlid, Lund, all of Sweden, assignors to Tetra Pak Development, Switzerland
Filed May 27, 1975, Ser. No. 580,724
Claims priority, application Sweden, June 28, 1974, 7408564
Int. Cl.^{2} B65B *1/24*
U.S. Cl. 53—184 R **6 Claims**



1. In a machine for forming, filling and sealing packages including movable mould means for forming a series of interconnected U-shaped sections transversely in a first longitudinal web of flexible packaging material, means for forming spaced cuts along the side edges of a second longitudinal web of packaging material to form successive edge flaps along the edges of the second web, means for successively sealing transverse pairs of said edge flaps to the side edges of each U-shaped section to form a series of interconnected cavities, a filling tube extending parallel to the tops of the U-shaped sections and beneath the center longitudinal section of the second web for filling said cavities with a filling material, said center longitudinal section of the second web being outwardly bulged to accommodate said filling tube, reciprocating means for sealing the second web transversely to the transverse outer edges of the filled U-shaped sections of the first web to form sealed packages and means for separating each of the interconnected packages, the improvement comprising pressing means disposed substantially between the end of of the tube and the second mentioned reciprocating sealing means and including a reciprocatable mat-like element movable in the direction of the moving webs, means for guiding said mat-like element angularly toward the upper outer surface of the second web and then parallel to the tops of the U-shaped sections to press the second web against the outer transverse edges of the successive U-shaped sections to flatten the bulging center longitudinal section of the second web and to displace the filling material from between the webs in the areas to be sealed and thus maintain said mat-like element against the second web until the areas are sealed by said second mentioned reciprocating sealing means.

3,971,193
MACHINES FOR SEQUENCING DIVERSE COMPONENTS

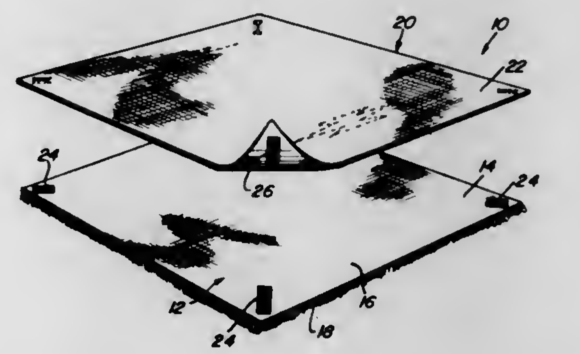
Armand L. Tardiff, Salem; Glover F. Broughton, Marblehead; David R. Delorey, Beverly, and Bangt R. Pearson, Magnolia, all of Mass., assignors to USM Corporation, Boston, Mass.
Filed Apr. 23, 1975, Ser. No. 570,842
Int. Cl.^{2} B65B *27/10*
U.S. Cl. 53—198 R **10 Claims**



1. A machine for sequencing and interconnecting differently-shaped as well as similarly-shaped electrical components respectively having stand-off lead portions and/or only coaxial lead portions, comprising a plurality of dispensers for supplying the components, a conveyor movable along a path adjacent to the delivery ends of said dispensers to receive and continuously advance selected components with the coaxial portions in uniform spacing in the direction of feed, means for interconnecting the leads as thus fed, means for centering bodies of the successive components transversely along the path, and means ahead of the lead interconnecting means and extending adjacent to and above the conveyor for engagement with the advancing component bodies having stand-off leads for uniformly orienting them with respect to the axes of their coaxial lead portions.

3,971,194
SEPARABLE DOUBLE PLY SADDLE PAD

Veldon Morgan, Box 65, Ellsworth, Nebr. 69340
Filed Apr. 15, 1975, Ser. No. 568,191
Int. Cl.^{2} B68C *1/12*
U.S. Cl. 54—66 **7 Claims**



1. A multi-ply saddle pad including a first flexible lower ply having a flexible backing layer with a dense fibrous pile layer carried by the undersurface of said backing layer, said flexible lower ply being capable of being draped over the compound curvature saddle supporting back surfaces of a domestic animal to be saddled with said lower ply conforming to the compound curvature of said back surfaces, a flexible second ply overlying said first ply in at least substantial registry therewith and capable of conforming to the compound curvature of the first lower ply resulting from its being draped over said back surfaces, said first and second plies including corresponding

peripheral portions spaced thereabout, coacting fastener means releasably stationarily securing corresponding peripheral portions of said plies together against shifting relative to each other, said plies being free of direct connection with each other independent of said fastening means, and said fastening means including means operative to allow stationary releasable securement of said corresponding peripheral portions together in at least slightly randomly relatively shifted positions.

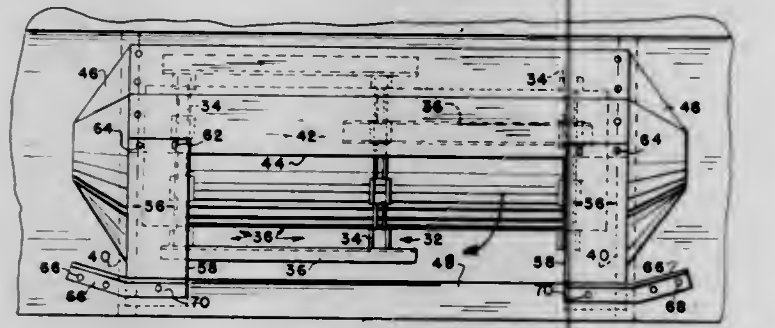
3,971,195
INFEED CONTROL FOR COMBINE ELEVATOR

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 14, 1975, Ser. No. 558,506

Int. Cl.² A01D *45/02*

U.S. Cl. 56—14.6 **2 Claims**



1. A combine of the axial flow type comprising crop material harvesting means mounted on the forward end of said combine and having discharge means operable to discharge cut crop material from the central part of said harvesting means, an elevator extending from said harvesting means upwardly and rearwardly therefrom, axially arranged threshing and separating mechanism adjacent the upper end of said elevator and having an inlet end and including rotatable auger means extending longitudinally forward from said inlet end and receiving crop material to be threshed, said auger means having a working area centrally thereof and of less width than the width of said auger means, said elevator comprising endless flight means movable within a housing having a substantially vertical wall member provided with an inlet opening extending across said wall member at the lower end of said elevator, said opening being substantially as wide as said flight therein and the upper end of said housing having a discharge opening adjacent the inlet end of said threshing and separating mechanism; in combination with inlet restricting plates detachably connected to said wall member of said elevator housing and overlie the opposite sides of said inlet opening therein to restrict said opening to a width less than that of said flight and thereby permit only a mass of crop material of less width than said elevator flight to be carried by said elevator to said working area of said threshing and separating mechanism, thereby eliminating a tendency for crop material otherwise to become lodged outside of said working area or escape from opposite edges of said flight means of said elevator and accumulate within spaces at opposite sides of said elevator housing, and means detachably connecting the upper and lower ends of said vertical plates to said wall member of said elevator housing.

3,971,196
POWER MOWER

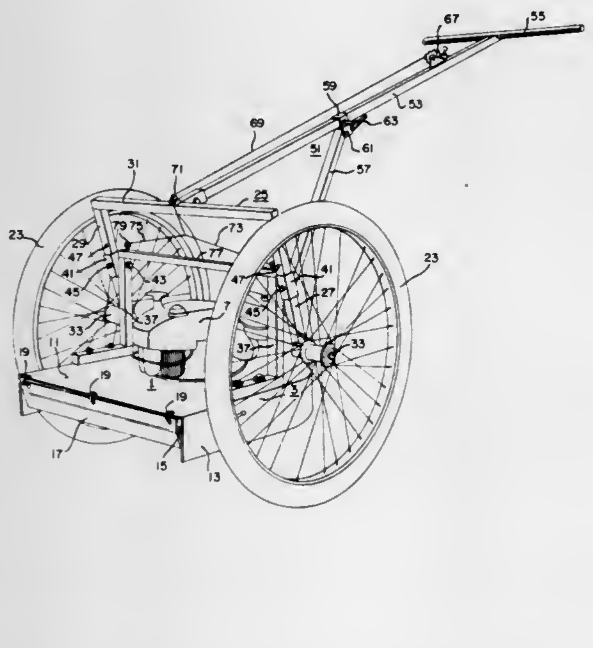
James S. Stevenson, 4230 St. Andrews Road, Oakland, Calif. 94605

Filed Dec. 16, 1974, Ser. No. 533,008

Int. Cl.² A01D *35/262*

U.S. Cl. 56—17.1 **9 Claims**

1. A power mower comprising a mower unit, a mobile support for said mower unit, said mobile support including a pair of wheels spaced apart a distance sufficient to receive said mower unit between them, and means for adjustably supporting said mower unit elevationally between said wheels in the vertical plane through the axes of said wheels whereby to maintain said power unit substantially balanced at its various elevational adjustments, said mobile support comprising a bridge coupling said wheels, said bridge including an upright member adjacent one wheel and an upright member adjacent the other wheel, and a cross member connecting said upright members at their upper ends, and said means for adjusting said mower unit as to elevation between said wheels, including means slidably adjustable along said upright members and means suspending said mower unit from said slidable adjustable means.



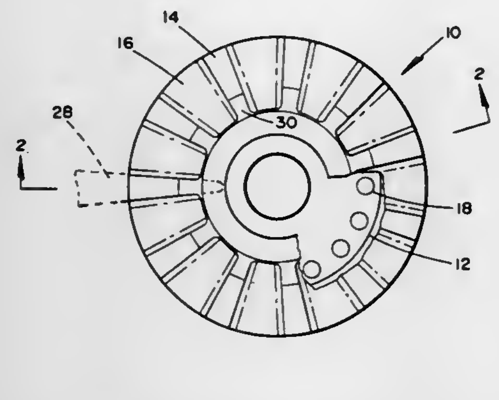
3,971,197
COTTON DOFFER

Richard R. Batzer, Galesburg, Ill., and John D. Redmond, Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 22, 1975, Ser. No. 543,081

Int. Cl.² A01D *46/16*

U.S. Cl. 56—41 **8 Claims**



1. In a cotton doffer of the type having circumferentially spaced, integrally molded, generally radially aligned annular teeth extending from at least one generally planar side thereof, the improvement comprising:

a perforated disk substantially concentric with and embedded in the doffer along at least one annular portion of the disk to a point generally radially inward of the mid diameter of the annular teeth whereby the rim of the doffer and at least half of each annular tooth are unsupported and deflectable at least generally normal to the planar side.

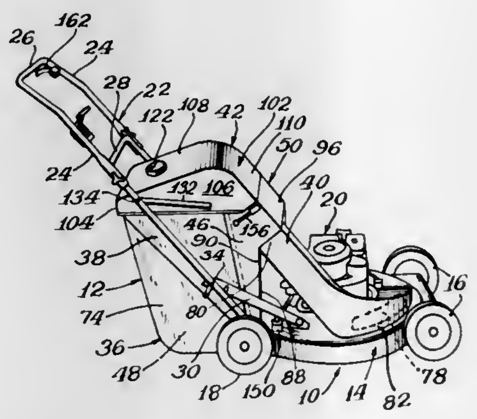
3,971,198
COLLECTOR FOR A POWER LAWNMOWER

Joseph J. Lane, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Dec. 23, 1974, Ser. No. 535,423

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **12 Claims**



1. An assembly for collecting grass clippings, in a container, from a lawnmower, said assembly comprising, in combination, a housing for said lawnmower, means for supporting said container in a substantially upright position, with an upper opening and rearwardly of said housing, a member carried on said supporting means for covering said upper opening of said container, said covering member and said container defining a substantially enclosed chamber having an interior, spaced inlet means and outlet means located in said covering member and being positioned entirely above said upper opening, passage means interconnecting said housing with said inlet means, exhaust passage means for communicating said outlet means with said interior, means for separating solid matter from exhaust air prior to passing to the exterior of said chamber from said interior, said housing, said passage means, said covering means, and said exhaust passage means defining a substantially continuous flow path for air passing from said housing to said exterior while said clippings drop by gravity into said flexible container through said upper opening after passing through said inlet means, and means for detachably mounting at least a portion of said supporting means to selectively remove said container from said housing.

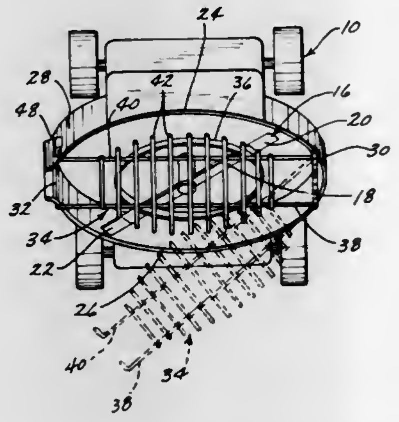
3,971,199
BLADE GUARD FOR ROTARY LAWN MOWERS

Wesley F. Buchele, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 11, 1974, Ser. No. 514,126

Int. Cl.² A01D *75/20*

U.S. Cl. 56—320.2 **3 Claims**



1. In a mower device,

a wheel-supported mower cowling having an open bottom,

a horizontal elongated cutting blade disposed within said cowling, said blade having sharpened cutting ends and an unsharpened center portion,

means operatively secured to said cowling for supporting and rotating said blade,

guard means secured to and covering the open bottom of said cowling, said guard means including a plurality of spaced apart elongated members extending longitudinally in the intended direction of travel of said mower device, the space between the forward ends of said elongated members and the forward end of said cowling being open and free from obstructions, the forward ends of said elongated members being disconnected with the spaces therebetween being free from obstructions, said elongated members having varying lengths to define an effective area substantially the same as the area defined by the unsharpened center portion of said blade when rotating so that the sharpened ends of said blade extend outwardly beyond the said effective area of said guard means.

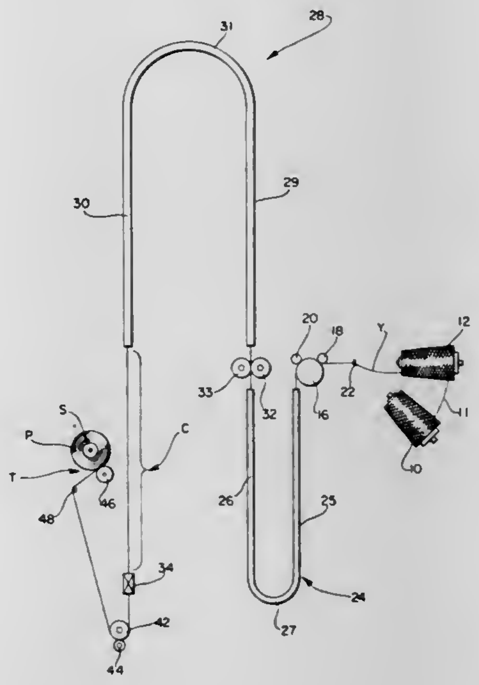
3,971,200
PROCESS AND APPARATUS FOR CONTINUOUS HEAT SETTING OF CARPET YARNS

Hans Heinrich Richter, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of Ser. No. 448,641, March 6, 1974, abandoned. This application Oct. 7, 1974, Ser. No. 512,181

Int. Cl.² D02G *1/04*; **D01H** *13/28*

U.S. Cl. 57—34 HS **15 Claims**



14. An apparatus for texturing yarn comprising first heating means for heating a moving strand of yarn to a temperature in the range of 160° to 200°C, second heating means downstream from said first heating means for heating said yarn during passage therethrough to a higher temperature than said first heating means, a cooling zone downstream from said second heating means, means for imparting a false twist to said moving yarn while said yarn is in said cooling zone and said second heating means, means for tensioning said moving yarn to a greater extent in said second heating means than in said first heating means, and means for collecting said moving yarn downstream from said false twisting means.

3,971,201
FALSE-TWIST CRIMPING MACHINE

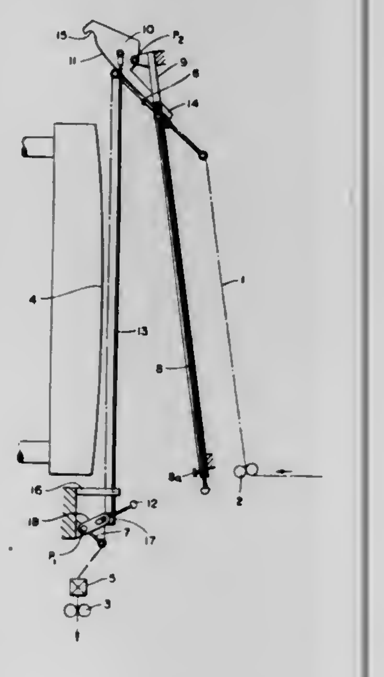
Wolfgang Hartig, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 7, 1975, Ser. No. 602,729

Claims priority, application Germany, Aug. 16, 1974, 2439183

Int. Cl.^{2} D02G *1/02*

U.S. Cl. 57—34 HS **6 Claims**



1. In a false twist crimping apparatus having means to continuously stretch a thermoplastic yarn between yarn supply means and yarn draw-off means together with an elongated contact heater and a false-twisting device to simultaneously torque-crimp and heat-set the stretched yarn, the improvement which comprises:
   - a lower yarn guide arranged pivotably on a horizontally fixed axis relative to an approximately vertically positioned contact heater;
   - an upper yarn guide slidable longitudinally of the contact heater on a carrier means and mounted pivotably on a second horizontal axis relative to said contact heater;
   - a rocker cam mounted pivotably on a fixed horizontal axis adjacent said upper yarn guide in its upper operating position, said rocker cam having a curved surface for positive contact with said upper yarn guide to transfer the pivot movement of the rocker cam to pivot the upper yarn guide in applying yarn onto said heater or removing said yarn therefrom; and
   - linking means connecting the rocker cam and lower yarn guide to synchronize their pivot movements.

3,971,202
COBULKED CONTINUOUS FILAMENT YARNS

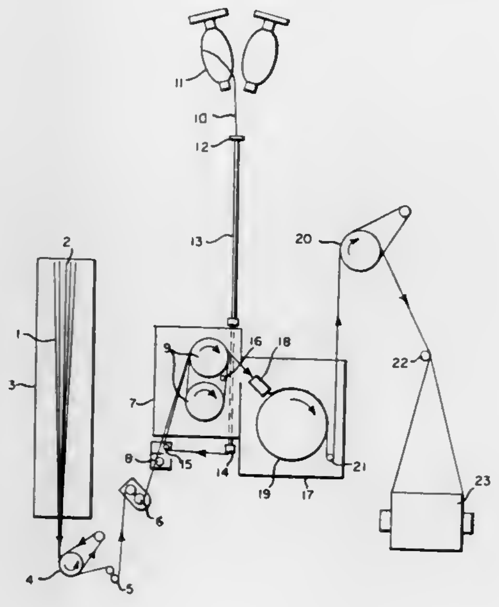
William Thomas Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 495,831, Aug. 8, 1974, abandoned. This application July 22, 1975, Ser. No. 597,980

Int. Cl.^{2} D02G *3/12*

U.S. Cl. 57—140 BY **19 Claims**

1. A cobulked continuous filament yarn which comprises a first continuous filament yarn cobulked with a second continuous filament yarn in which the filaments of said cobulked yarn have random, three-dimensional curvilinear crimp with alternating regions of S and Z filament twist, the filaments of said second yarn are 4 to 20 percent longer than the filaments of said first yarn, and the filaments of said second yarn are frequently located near the surface of the cobulked yarn.



3,971,203
HAYMAKING MACHINES

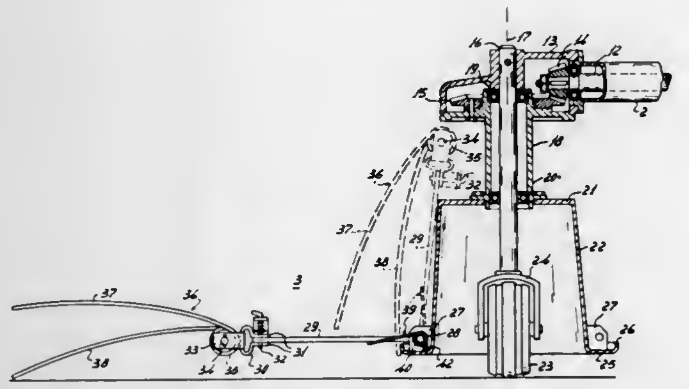
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed June 20, 1974, Ser. No. 481,311

Claims priority, application Switzerland, June 22, 1973, 8694/73

Int. Cl.^{2} A01D *79/06*

U.S. Cl. 56—370 **27 Claims**



1. A haymaking machine comprising a frame and at least one rake head rotatably mounted on said frame to turn about a substantially vertical axis, said rake head including at least one support arm pivoted on a pivotal axis to central housing means of said head, said pivotal axis being substantially inclined to said vertical axis of rotation, the outer end of said arm having a tine group that is freely pivotable about pivot means adjacaent said end, said arm being movable from a working position to a contracted transport position and a spring mechanism connected to bias said arm about said pivotal axis to the transport position during non-rotation of said head, driving means connected to said head to rotate same during operation.

3,971,204
CIRCUIT FOR DRIVING A DC MOTOR FOR A CLOCK

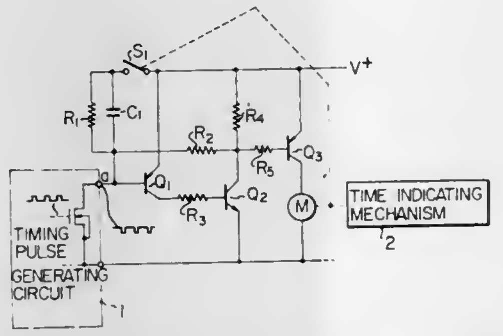
Norio Kawaguchi, No. 2-23-4-1202, Takashimadaira, Itabashi, Tokyo, and Toshio Yaehashi, No. 3-4-13, Minami, Ichikawa, Chiba, both of Japan

Filed Jan. 13, 1975, Ser. No. 540,650

Claims priority, application Japan, Jan. 17, 1974, 49-8487[U]

Int. Cl.^{2} G04C *3/00*; H02P *3/08*

U.S. Cl. 58—23 D **5 Claims**



1. A control circuit for a clock having a time indicating mechanism, which control circuit regulates the intermittent driving of a DC motor by a predetermined amount at predetermined time intervals so as to actuate said time indicating mechanism, said control circuit having a timing pulse generating circuit for generating timing pulses at said predetermined time intervals so as to actuate said control circuit and means for providing an energizing voltage for driving said motor, wherein the improvement comprises a holding circuit coupled at its input to said timing pulse generating circuit and at its output to said motor, said holding circuit being actuated to be self-held each time a timing pulse is applied thereto thereby enabling said motor to be driven by said energizing voltage, and switching means, coupled to said time indicating mechanism, so as to be actuated each time said motor is driven by said predetermined amount, said switching means being coupled to the input of said holding circuit so as to release the self-holding thereof when the switching means is actuated, whereby said motor is deenergized exactly at the completion of the driving thereof by said predetermined amount without being affected by the variation in the amplitude of said energizing voltage and the variation in the load on said motor.

3,971,205
ALL ELECTRONIC-TYPE TIMEPIECE

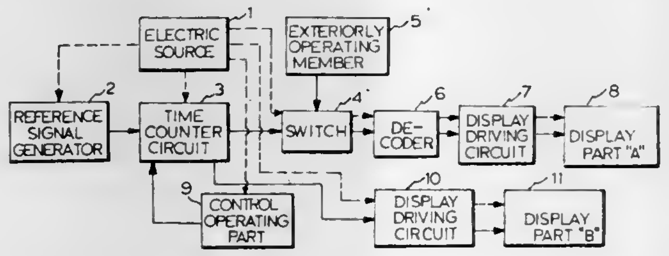
Yasushi Nomura, Tokorozawa, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,458

Claims priority, application Japan, Sept. 6, 1973, 48-100696; Nov. 20, 1973, 48-130516

Int. Cl.^{2} G04B *19/30*, *19/24*; G04C *3/00*

U.S. Cl. 58—50 R **5 Claims**



1. A time measuring device which is completely electronic comprising
   - a reference signal generating source for producing pulses,
   - a time counter cicuit for counting said pulses,
   - a decoder driving circuit for decoding the output of said time counter circuit,
   - a control operating member for initiating operation of said counter circuit,
   - a first electro-optical display part connected to said decoder for displaying measured time,
   - a switch controllable from said time counter circuit and independent of the operating condition of said first electro-optical display,
   - a second electro-optical display for displaying the operating condition of said time counter circuit, and
   - an additional electro-optical display circuit including a display driving circuit for driving said electro-optical display,

wherein when measuring time, operation of said switch causes at least a part of said first electro-optical display to extinguish and simultaneously causes said additional electro-optical display circuit to operate so that said second electro-optical display is driven and thereby indicates the operating condition of said time counter circuit.

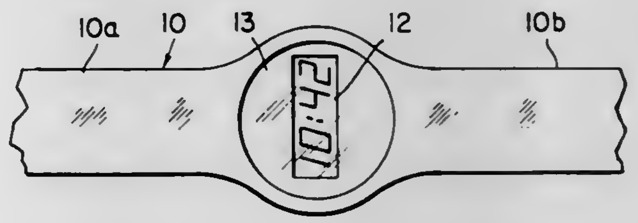
3,971,206
DISTRIBUTED WATCH

Raymond R. Martino, Sharon Hill, Pa., assignor to U.S. Electronic Services Corporation, Sharon Hill, Pa.

Filed Oct. 3, 1974, Ser. No. 511,593

Int. Cl.^{2} G04B *37/00*; G04C *3/00*

U.S. Cl. 58—88 R **9 Claims**



1. An electronic wristwatch-and-band arrangement comprising
   - a casing enclosing an electronic wrist watch movement and display, but not the electronic power source therefor,
   - a band formed of a longitudinally continuous, flexible member extending substantially from one end of the band to the other,
   - at least two recesses in said band, one recess being adapted to receive the casing and the other being adapted to receive a battery for powering the electronic watch,
   - the casing recess being so constructed and arranged that the casing inserted therein has its rim surrounded by the band, leaving only the watch face exposed from one side of the band, and
   - one of said recesses having an openable lid in the opposite side of the band through which the recess contents can be replaced.

3,971,207
PACKING MEANS FOR A WATCH

Tomomi Murakami, Higashi Yamato; Hiromichi Nagata, Higashi Murayama; Masakazu Funazawa, Tokorozawa, and Satoru Fukutome, Atsugi, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 19, 1975, Ser. No. 579,005

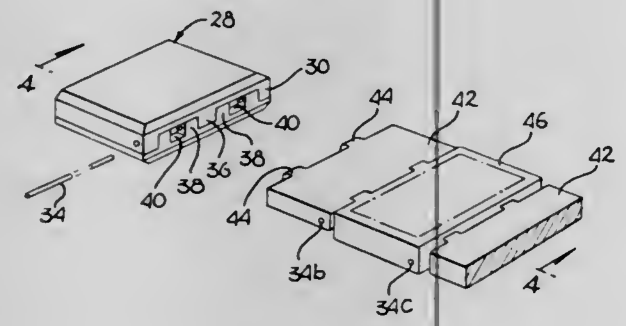
Claims priority, application Japan, May 21, 1974, 49-56860

Int. Cl.^{2} G04B *23/12*, *37/08;* G04C *23/04*

U.S. Cl. 58—152 B **19 Claims**

1. A packing means disposed in a watch for allowing an electrical connection to be made between said watch and an external device and for providing a substantially watertight seal in said watch, said packing means comprising:
   - a first ring member made of a resilient, non-conductive flexible material, said ring member disposed in said watch so as to provide a substantially watertight seal therein; and

at least one arm member made of a resilient, conductive flexible material having first and second ends, said first end coupled to said ring member within said watch, and said second end extending outwardly therefrom and coupled to electrically said device so as to electrically couple said watch with said external device, said arm member coupled to said ring member such that said substantially watertight seal in said watch case is not destroyed.



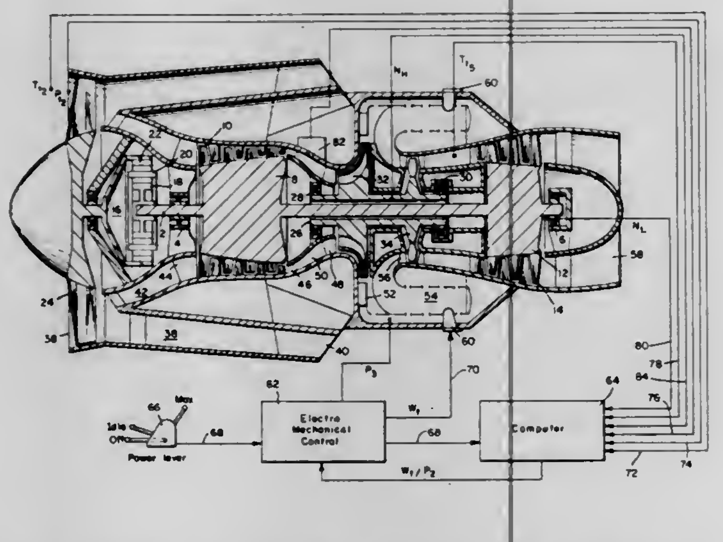
3,971,208
GAS TURBINE FUEL CONTROL

Glennon V. Schwent, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 1, 1974, Ser. No. 456,492

Int. Cl.² F02C *9/02*

U.S. Cl. 60—39.03 **12 Claims**



11. A method of controlling fuel flow to a gas turbine engine, said engine having at least one compressor-turbine spool and a compressor bleed surge valve, said method comprising:

generating a fuel flow power signal indicative of desired engine output;

generating a first plurality of fuel schedule signals including an engine surge schedule signal, said schedule signals being derived from engine operation limits;

selecting the lowest of said power signal or said first fuel schedule signals;

generating a second plurality of fuel schedule signals derived from engine operating limits;

selecting the highest schedule signal of said second schedule signals or first selector signal;

comparing said selected highest signal and said surge schedule signal;

opening said surge valve to increase compressor bleed if the surge schedule signal is limiting said selected highest signal wherein opening said surge valve raises the surge schedule limit; and

increasing said selected highest fuel signal to the level permitted by the increased surge schedule.

3,971,209
GAS GENERATORS

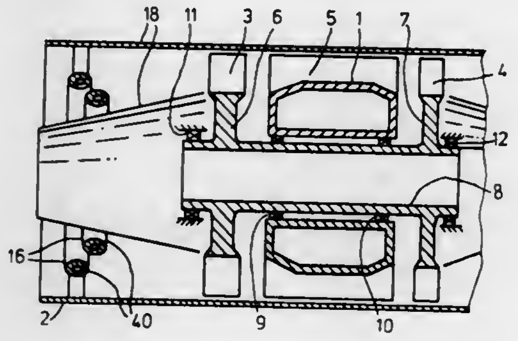
Rory Somerset de Chair, St. Osyth's Priory, St. Osyth, Essex, England

Continuation-in-part of Ser. No. 327,180, Jan. 21, 1973, abandoned. This application July 16, 1974, Ser. No. 489,063

Claims priority, application United Kingdom, Feb. 9, 1972, 6158/72

Int. Cl.² F02C *3/16, 3/14*

U.S. Cl. 60—39.14 **25 Claims**



1. In a gas generator including housing means having an air inlet and an exhaust gas outlet, bearing means mounted inwardly of said housing means, a rambine rotor; said rambine rotor being rotatably mounted on said bearing means and having a plurality of blades, each of said blades and a next adjacent one of said blades defining an inlet passage for compressing air induced from said air inlet, there being an axially extending region downstream of said inlet passages, and means for dispensing fuel into said axially extending region for combustion with air received from said inlet passages, said rambine rotor having means defining outlet passages for expanding the products of combustion; and wherein there is further provided:

a. a plurality of compressor rotors upstream of the inlet side of said rambine rotor, each compressor rotor having at least one set of radial blades, said blades being shaped so as to impart a component of velocity to an exit gas stream from the compressor rotor in the direction of rotation of said compressor rotors, that compressor rotor adjacent the rambine rotor being in direct communication therewith,

b. bearing means for rotatably supporting said compressor rotors, and

c. means for rotating successive compressor rotors at successively faster rotational speeds in a like direction and in the opposite direction to the direction of rotation of the rambine rotor.

3,971,210
START-UP COMPRESSED AIR SYSTEM FOR GAS TURBINE ENGINES

Willis Earl Rose, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 22, 1975, Ser. No. 543,092

Int. Cl.² F02C *7/26*

U.S. Cl. 60—39.14 **6 Claims**

1. A system for supplying compressed air providing atomized fuel to the fuel nozzles in gas turbine engines that include a compressor and a combustor, said system comprising:

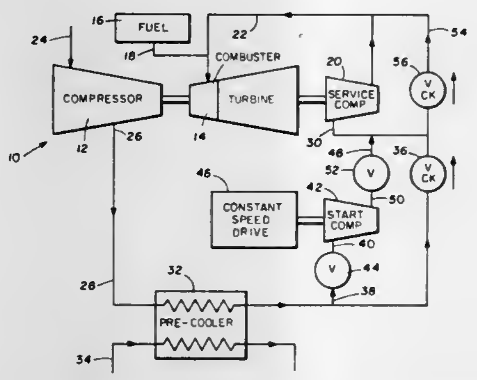
a starting compressor having an inlet and an outlet; constant speed drive means for driving said starting compressor;

a service compressor having an inlet and an outlet and arranged to be driven by said engine;

first conduit means connecting the outlet of said starting compressor in fluid communication with the inlet of said service compressor;

second conduit means connecting the inlet of said starting compressor in fluid communication with said first conduit means and with the gas turbine compressor;

one-way valve means located in said second conduit means permitting flow through said second conduit means from the inlet of said starting compressor and from the turbine compressor to said first conduit means and preventing flow in the opposite direction; and,



third conduit means for connecting the outlet of said service compressor to the fuel nozzles, whereby said starting compressor provides compressed air to the nozzles during start-up and augments said service compressor until said service compressor reaches operating speed.

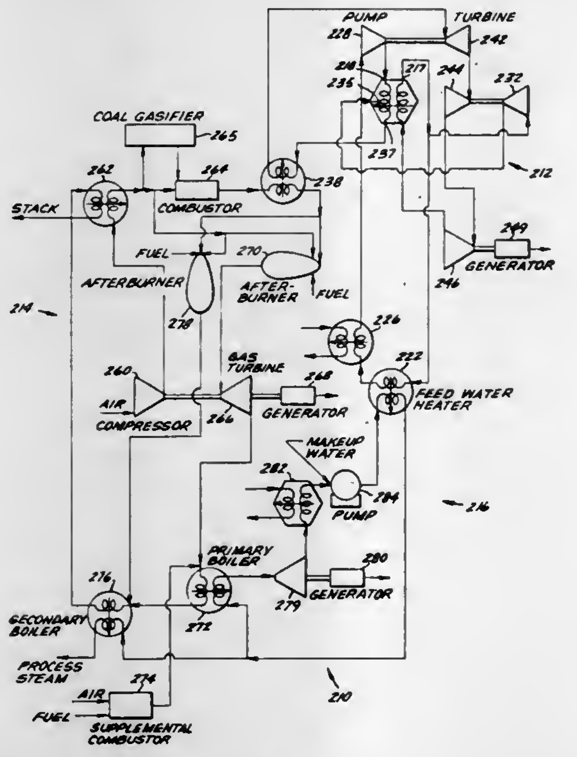
3,971,211
THERMODYNAMIC CYCLES WITH SUPERCRITICAL CO_2 CYCLE TOPPING

Jay D. Wethe, Whittier, and William M. Waters, Glendora, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 2, 1974, Ser. No. 457,286

Int. Cl.² F01K *23/04*

U.S. Cl. 60—39.18 R **3 Claims**



1. A heat engine comprising:

a circulating system containing CO_2 above its critical pressure, a CO_2 pump having an inlet and an outlet, said CO_2 pump raising the pressure of the CO_2 from a first supercritical pressure to a second supercritical pressure, a primary heat exchanger having a CO_2 inlet and outlet, said primary heat exchanger heating the CO_2 when it is at a pressure above said first supercritical pressure, a secondary heat exchanger having a CO_2 inlet and outlet, said secondary heat exchanger cooling the CO_2 when it is at said first supercritical pressure, a recuperator having high and low pressure sides, said recuperator being for transferring heat from the CO_2 at the first pressure to CO_2 at a higher supercritical pressure, and a turbine having an inlet and an outlet, said turbine expanding the CO_2 extracting work therefrom and exhausting at said first supercritical pressure; and

a gas turbine system having a compressor for increasing the pressure of air fed thereto, a combustor having an input to receive the compressed air from the compressor and an input to receive fuel, the compressed air and fuel being burned in said combustor to form hot combustion products, means for placing said hot combustion products in heat transfer relationship with the CO_2 in said primary heat exchanger to heat the CO_2, and a turbine connected to receive the combustion products from said primary heat exchanger, said turbine expanding and cooling said combustion products to extract work therefrom to drive said compressor, said CO_2 turbine being connected at its high pressure side to said primary heat exchanger and on its low pressure side to said recuperator, said recuperator being connected to pass a portion of the low pressure CO_2 to said secondary heat exchanger, said secondary heat exchanger cooling the CO_2 and conducting it to said CO_2 pump which pressurizes said CO_2 and conducts it to the high pressure side of said recuperator, said system including a CO_2 compressor connected to receive a portion of the low pressure CO_2 from said recuperator and to pressurize it; said recuperator high pressure side including a junction for receipt of the CO_2 pressurized by said CO_2 compressor, the heat engine further including:

a primary boiler connected to receive the combustion products from said turbine, said primary boiler transferring heat from the combustion products to pressurized water to generate steam therefrom;

a steam turbine connected to receive the steam from said primary boiler and to expand it to extract work therefrom;

a condenser connected to receive the steam once the work has been extracted therefrom, said condenser converting the work extracted steam to water;

a water pump connected to said condenser to pressurize the water therefrom;

feed water heater means connected to said water pump and being in heat transfer relationship to said secondary heat exchanger which extracts heat from the CO_2 by heating the pressurized water; and means for conducting the pressurized water from said feed water heater means to said primary boiler for heating into steam.

3,971,212
METHOD OF AND AN APPARATUS FOR PURIFYING EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Minoru Morita, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 20, 1974, Ser. No. 471,829

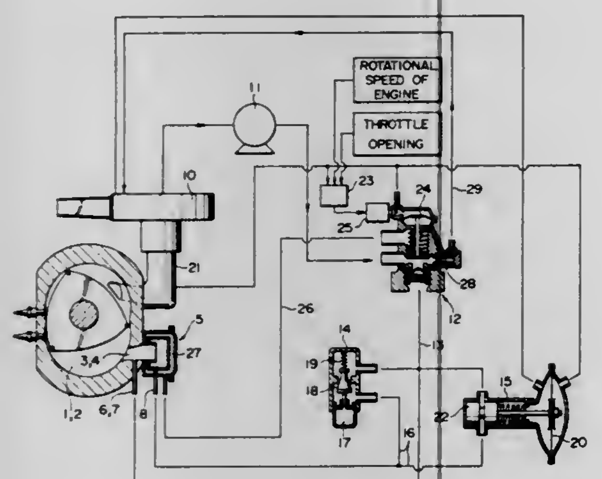
Claims priority, application Japan, Feb. 7, 1974, 49-15763

Int. Cl.² F02B *75/10;* **F01N** *3/10*

U.S. Cl. 60—290 **3 Claims**

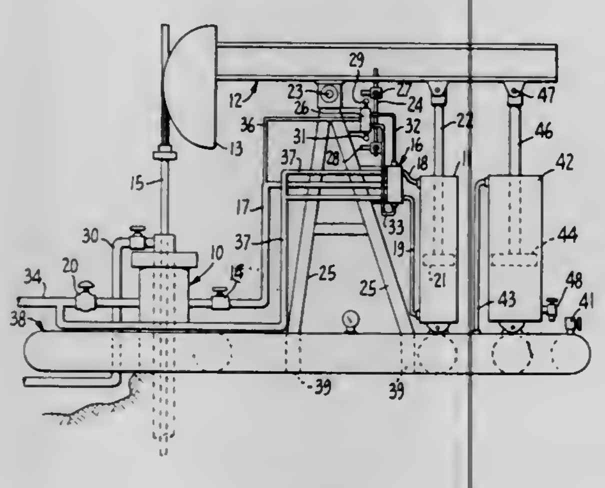
1. A system for purifying exhaust gases of an internal combustion engine by a manifold reactor with the injection of secondary air into the exhaust gases which comprises, providing a source of the secondary air, a first secondary air supply port which opens into the exhaust gas passage extending from an exhaust port of the engine to the manifold reactor, a second secondary air supply port which opens into the inside space of the manifold reactor, conduit means for transmitting secondary air from said source to said first and second secondary air supply ports, said conduit means including a main passage which leads to said first secondary air supply port and a branch passage which is branched from said main passage and leads to said second secondary air supply port, said branch passage including automatic control valve means for altering the ratio of the flow of air through said branch passage with respect to the total secondary air flow, according to at least one operating condition of the engine including the tempera-

ture thereof, said automatic control valve comprising a thermostat valve which is open when the temperature of the engine is low and is gradually closed as the temperature of the engine rises.



3,971,213
PNEUMATIC BEAM PUMPING UNIT

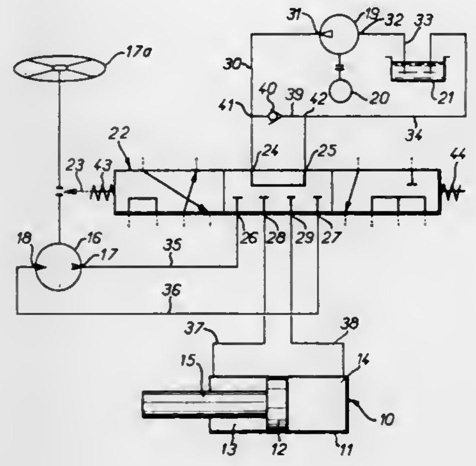
Robert K. Kelley, 3944 Floyd Drive, Fort Worth, Tex. 76116
Continuation-in-part of Ser. No. 355,577, April 30, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,430
Int. Cl.^{2} F15B *21/06*
U.S. Cl. 60—372 **25 Claims**



1. Apparatus for pumping liquids from gas producing wells, comprising
a well pumping unit having a reciprocably tilting walking beam,
a pneumatic cylinder having a piston connected to said walking beam,
valve means adapted for connection to the well casing head for receiving gas under pressure therefrom and for connection to a gas sales line,
and conduits connecting said valve means to the opposite ends of said cylinder,
said valve means being formed for selectively supplying gas under pressure to an end of said cylinder and for connecting the other end of said cylinder to the sales line whereby movement of said piston toward said other end of said cylinder forces gas therefrom and into said sales line,
said valve means being responsive to tilting movement of said walking beam to alternate the cylinder ends to which gas under pressure is supplied.

3,971,214
ASSISTED HYDRAULIC CONTROL

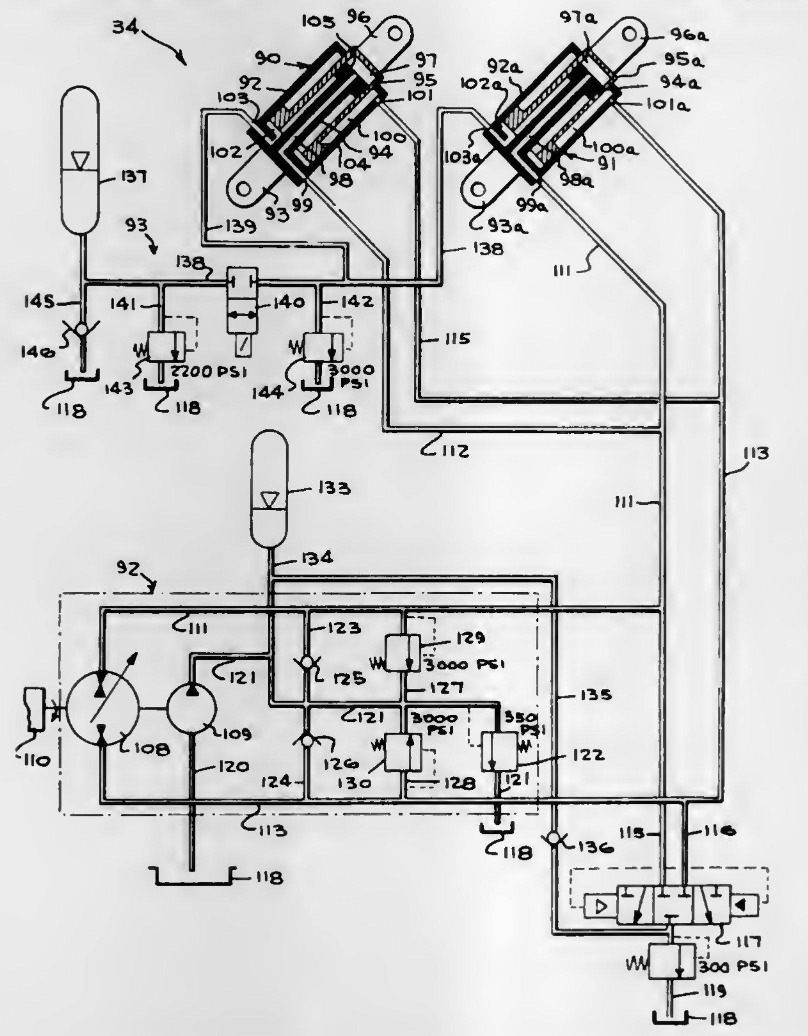
Bernard Mercier, 8 Chemin Jean Jullien, Ville d'Avray (Hauts de Seine), France
Filed Mar. 19, 1975, Ser. No. 559,836
Claims priority, application France, Mar. 29, 1974, 74.11178
Int. Cl.^{2} F15B *15/18*
U.S. Cl. 60—386 **7 Claims**



1. An assisted hydraulic control comprising a double acting receiver means having a cylinder in which a piston defines first and second opposite chambers, a bidirectional volumetric pilot pump having a first and a second orifice and working either in a first direction in which it sucks in fluid through the second orifice and delivers said fluid through the first orifice, or in a second direction in which it sucks in fluid through said first orifice and delivers it through the second orifice, a hydraulic station having a source of pressure and a tank, a distributor means, a pressure conduit interconnecting said source of pressure with said distributor means, a return conduit interconnecting the distributor means and said tank, a first and a second pilot conduit interconnecting said distributor means and respectively the first and second orifices of said pilot pump, a first and a second actuating conduit interconnecting the distributor means and the first and the second chambers respectively of said receiver means, said distributor means being switchable between three positions and being controlled in dependence on the direction of operation of said pilot pump, said distributor means having a first working position towards which it is urged when said pilot pump is operating in said first direction and in which it connects said pressure conduit with the second pilot conduit and connects the first pilot conduit to the first actuating conduit, said distributor means having a second working position towards which it is urged when the pilot pump is operating in said second direction and in which it connects the pressure conduit to said first pilot conduit and connects said second pilot conduit to the second actuating conduit, said distributor means having a neutral position towards which it is elastically returned when the pilot pump is not in operation, and in which it isolates said pressure conduit from said pilot conduits, said piston having a rod extending into said first chamber and giving said first chamber a section smaller than that of said second chamber, said distributor means connecting, in the first working position, said return conduit to the second actuating conduit; said hydraulic control having one single said distributor means further comprising a fixed body having six orifices, namely: a pressure orifice coupled to the pressure conduit of said hydraulic station, a return orifice coupled to said return conduit, a first pilot orifice coupled to said first pilot conduit, a second pilot orifice coupled to said second pilot conduit, a first actuating orifice coupled to said first actuating conduit and a second actuating orifice coupled to said second actuating conduit, said distributor means further comprising at least one moving portion arranged inside said fixed body in such manner that, in said second working position, the pressure orifice is coupled to said first pilot orifice, the return orifice is closed, and said second pilot orifice and the two actuating orifices are all three coupled together.

3,971,215
POWER SHOVEL AND CROWD SYSTEM THEREFOR

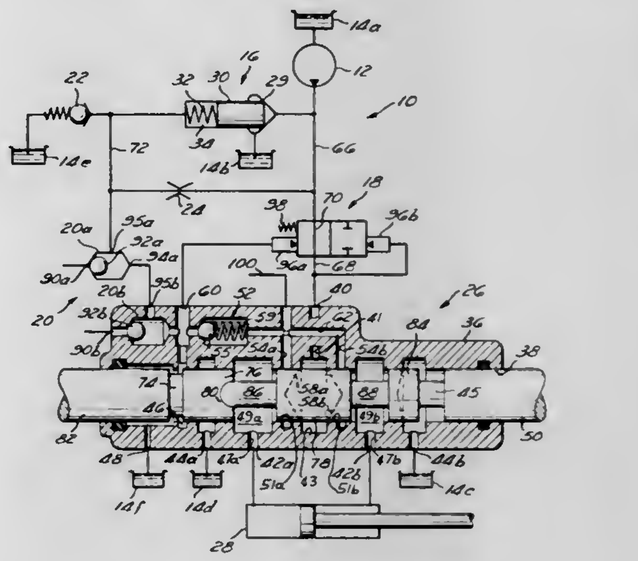
George B. Baron, and Paul W. Padrutt, both of Marion, Ohio, assignors to Marion Power Shovel Company, Inc., Marion, Ohio
Division of Ser. No. 477,022, June 6, 1974. This application Jan. 31, 1975, Ser. No. 545,885
Int. Cl.^{2} F15B *1/02*
U.S. Cl. 60—403 **6 Claims**



1. An actuating system comprising a fluid actuated, piston and cylinder assembly including a cylinder, a fixed piston mounted in said cylinder and a movable piston mounted on said fixed piston within said cylinder providing a first variable volume chamber defined by said fixed and movable pistons, a second variable volume chamber defined by said movable piston and said cylinder and a third variable volume chamber defined by said movable and fixed pistons and said cylinder; means for selectively supplying fluid under pressure to said first and second variable volume chambers, said selective means including a bi-directional, variable displacement pump and fluid supply lines operatively interconnecting said pump and said first and second chambers; a first accumulator constituting an energy storage means; a closed hydraulic circuit intercommunicating said third chamber and said accumulator, said closed hydraulic circuit including a cutoff valve disposed between said third chamber and said energy storing means; a first relief valve connected to said closed hydraulic circuit between said third chamber and said cutoff valve, adapted to open responsive to a predetermined pressure in said closed hydraulic circuit between said third chamber and said cutoff valve when said cutoff valve is closed; and a second relief valve connected to said closed hydraulic circuit between said energy storing means and said cutoff valve, adapted to open responsive to a predetermined pressure in said closed hydraulic circuit between said energy storing means and said cutoff valve when said cutoff valve is closed.

3,971,216
LOAD RESPONSIVE SYSTEM WITH SYNTHETIC SIGNAL

Wendell E. Miller, Warsaw, Ind., assignor to The Scott & Fetzer Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 480,756, June 19, 1974, abandoned. This application June 25, 1975, Ser. No. 590,103
Int. Cl.^{2} F16H *39/46*; F15B *11/16*
U.S. Cl. 60—445 **78 Claims**



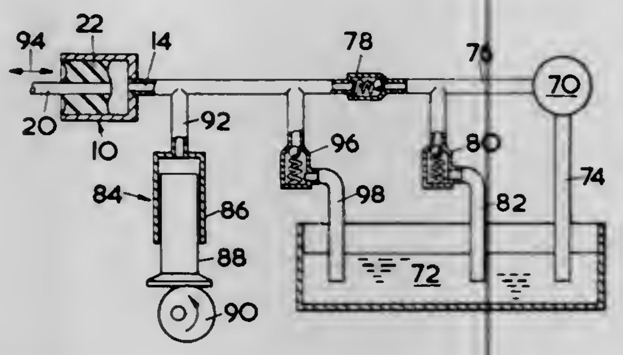
52. A directional control valve of the type which includes a body having an inlet port means (340*a*) and a work port (342*a*), return port means (344*a*) in said body, and a movable valving element selectively communicating said work port with said inlet port means and with said return port means, the improvement which comprises:
a. a signal control port (360) in said body communicating with said valving element;
b. means (186*a* + 190*a*) for establishing a first fluid flow path from said signal control port to said work port when said valving element communicates said inlet port means to said work port, and for selectively establishing a second fluid flow path from said signal control port to said return port means; and
c. means (valved signal supply restrictor 198*a*) for establishing a restricted flow path from said inlet port means to said signal control port when said valving element communicates said inlet port means to said work port.

3,971,217
RECIPROCATABLE DEVICES

Donald Firth, Glasgow, Scotland; Keith Foster, and Christopher John Hooke, both of Birmingham, England, assignors to The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Division of Ser. No. 299,178, Oct. 19, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,523
Claims priority, application United Kingdom, Aug. 4, 1972, 36447/72
Int. Cl.^{2} F15B *13/09, 15/04*
U.S. Cl. 60—486 **8 Claims**

1. A hydraulic system having a reciprocatable device comprising an outer member, an inner member which can be reciprocated relative to the outer member in a given axial direction, and a resilient member connecting said outer and inner members so as to form a seal therebetween, an end of the outer member forming an enclosure which can contain pressurized fluid through which force can be applied to the inner member to move said inner member in said axial direction relative to the outer member while flexing the resilient member, the average thickness of the resilient member in a direction normal to the axial direction being not greater than the average length of said resilient member in said axial direc-

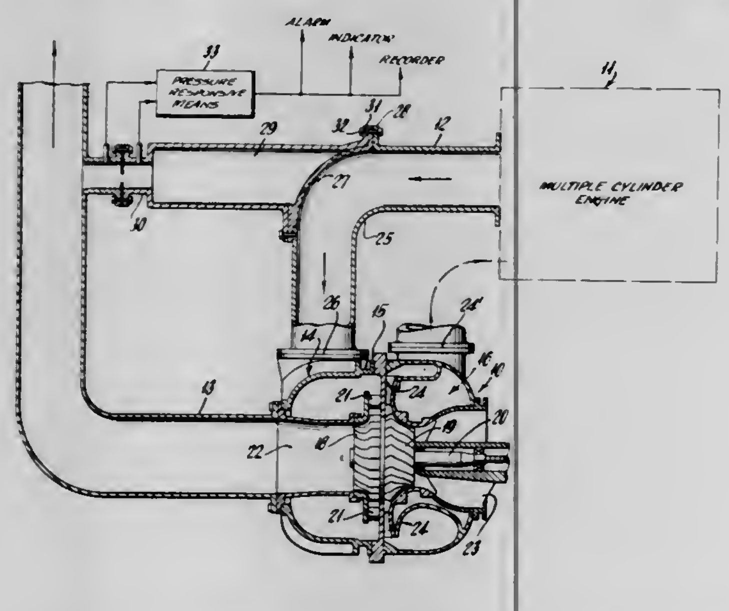
tion and a piston which is a close sliding fit in the end of the said outer member, said piston being arranged so that it can apply force from pressurized fluid when in the enclosure to the inner member of the device.



3,971,218
MEANS FOR PREVENTING AN ENGINE TURBOCHARGER FROM BEING DAMAGED BY FOREIGN OBJECTS

Michael Toth, Jr., Crosby, and Jean Andre Jackson, Jr., Houston, both of Tex., assignors to DeLaval Turbine Inc., Princeton, N.J.

Filed Dec. 26, 1974, Ser. No. 536,625
Int. Cl.² F02G ***3/00***
U.S. Cl. 60—597 13 Claims



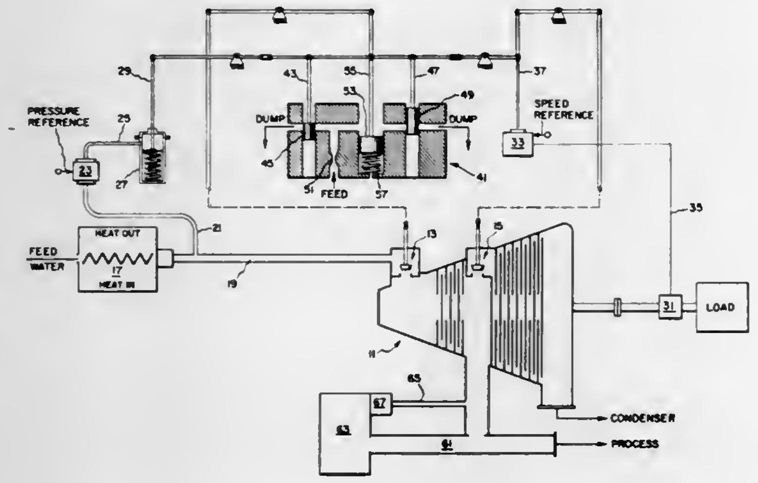
7. The combination of claim 1, and including an internal-combustion engine having an exhaust connection to said inlet duct for rotor operation by engine-exhaust gases, and air-compressor means driven by said rotor for compression of inlet air supplied to said engine.

3,971,219
TURBINE CONTROL SYSTEM

Franklyn H. Taylor, Leominster, and Edward J. Finck, Townsend, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,839
Int. Cl.² F01D ***17/02;*** **F01K** ***13/02***
U.S. Cl. 60—660 7 Claims

1. A control system for an extraction steam turbine of the type having a steam inlet valve and an extraction control valve, said steam turbine being driven by steam from a steam generator in fluid communication with said steam inlet valve through a steam inlet conduit, said control system comprising:
- means for sensing a steam inlet condition and for comparing said steam inlet condition with a reference steam condition to derive a steam condition control signal;
- means for sensing turbine speed and for comparing said turbine speed with a reference speed to derive a speed control signal;
- means for positioning said extraction control valve in response to said speed control signal; and,
- means for positioning said steam inlet valve, said inlet valve positioning means having a first input proportional to said steam condition control signal and a second input proportional to said speed control signal; and, said inlet valve positioning means having a single output for positioning said steam inlet valve, said output being in accordance with said steam condition control signal unless it is overridden by said speed control signal calling for a lower inlet steam valve position.



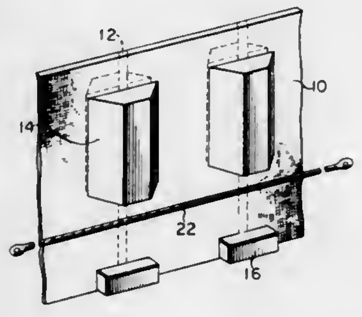
3,971,220
OIL FENCE

Takeo Kinase; Isamu Yano; Kanichi Okubo; Hidetoshi Kitakoga, and Hiromitsu Tayama, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 15, 1974, Ser. No. 443,131

Claims priority, application Japan, Feb. 23, 1973, 48-23420[U]; Aug. 30, 1973, 48-101721[U]; **Dec. 12, 1973, 48-144152[U]**

Int. Cl.² E02B ***15/04***
U.S. Cl. 61—1 F 3 Claims

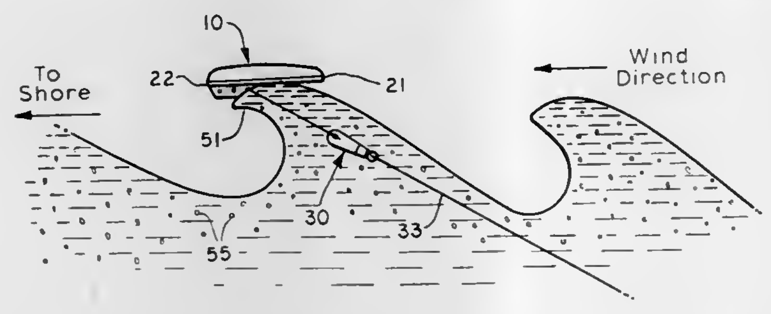


1. An oil fence comprising, in combination:
- an elongated water impervious sheet-like flexible shielding screen having a pair of opposed longitudinal edges and a pair of opposed major surfaces;
- a plurality of rigid reinforcing strips disposed at intervals along the longitudinal dimension of said shielding screen and extending in a transverse dimension of said shielding screen;
- means for fixing said rigid reinforcing strips to said shielding screen;
- a plurality of pairs of opposed rigid elongated floats, each pair of opposed floats comprising a first float adjacent one of said opposed major surfaces and a second float adjacent the other of said opposed major surfaces and opposite said first float, each of said pairs of opposed floats being disposed along the longitudinal dimension of said shielding screen and extending in the transverse dimension thereof and spaced from other pairs of said opposed floats to permit flexing of the shielding screen at the spaces between pairs of said opposed floats, said pairs of opposed floats being disposed in groups about respective ones of said reinforcing strips and wherein the respective groups of floats are spaced apart along the longitudinal dimension of said shielding screen;
- means for fixing said pairs of opposed floats to said shielding screen comprising a plurality of sheet-like members each overlying a respective one of said groups of floats and each adhered to said shielding screen at the border of the respective one of said groups and at the spaces defined between adjacent ones of the pairs of said opposed floats comprising the respective one of said groups to maintain said groups of floats adjacent to said shielding screen;
- means disposed along a longitudinal edge portion of said shielding screen for weighting said edge portion to eliminate the buoyancy thereof;
- a rope-like reinforcing member disposed on a surface of said shielding screen and extending along a longitudinal dimension of said shielding screen; and
- means for fixing said reinforcing member to said shielding screen.

3,971,221
BREAKWATER SYSTEM FOR CREATING ARTIFICIAL SANDBARS

Charles W. Greenleaf, P.O. Box 156, Lakeside, Mich. 49116

Filed Oct. 4, 1974, Ser. No. 511,990
Int. Cl.² E02B ***3/06***
U.S. Cl. 61—5 7 Claims

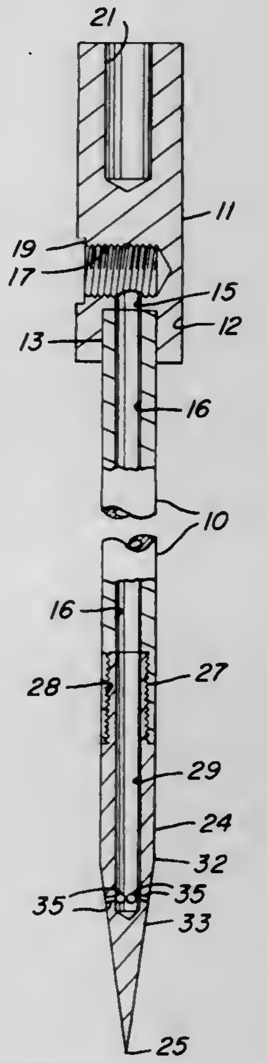


1. Means for forming at the bottom of a body of water, a barrier to substantially reduce the impact of waves developed in said body of water, comprising:
- flotation means, having a leeward end, a windward end and a tapered bottom surface whereby said leeward end is of greater length than said windward end so that a propagating wave passing under said bottom surface contacts an increasingly greater area thereof, thereby applying a proportionately greater upward force to said flotation means at said leeward end than at said windward end; said flotation means being adapted to have a first position wherein said leeward end intersects the plane of the surface of said body of water, and a second position wherein said flotation means floats upon the surface of said body of water;
- means, defining a pivotal axis for said flotation means extending substantially parallel to said leeward end and being closer thereto than said windward end, for permitting said flotation means to be alternatively moved into said first position and said second position; and
- structural means for applying a predetermined force to said flotation means causing said flotation means to pivot about said axis and urge said leeward end into said body of water so that said flotation means are normally in said first position; said leeward end, when urged into said body of water, causing particulate material suspended therein to gravitate to the bottom to form a barrier for said waves; said predetermined force applied by said structural means being adapted to be overcome when waves of a predetermined size are developed in said body of water and applied to said bottom surface of said flotation means, whereupon said flotation means are temporarily pivoted about said axis to said second position to prevent damage to said flotation means and said structural means when waves of said predetermined size are developed.

3,971,222
SOIL STABILIZATION

Robert E. Griffith, Jr., Houston, Tex., assignor to Robert Burke, Robstown, Tex., a part interest

Filed May 28, 1974, Ser. No. 473,892
Int. Cl.² E02D ***3/12***
U.S. Cl. 61—36 R 4 Claims



1. Apparatus for use in delivering fluid stabilizing material to subsurface soil under pressure with minimal return to surface of the fluid stabilizing material along the path of the apparatus, comprising elongate conduit means of uniform outer diameter throughout its length without any inward depressions or outward projections along its length whereby it may be driven longitudinally into the ground without disturbing the walls of its penetration path, head means at the upper end of said conduit means having a fluid flow inlet communicating with the interior of said conduit means, said inlet having connection means for connection of said inlet to a separate conduit, tip means at the lower end of said conduit means having a cylindrical upper portion of the same outer diameter as said conduit means and a downwardly diminishing conical portion therebelow terminating downwardly in a pointed tip, the exterior of said lower end of said conduit means at the junction therebetween and said tip means having smoothly reduced to said pointed tip, said tip means having passage means extending longitudinally therethrough downwardly from said junction terminating above said pointed tip and having at least one laterally disposed fluid outlet port extending from the lower end of said passage to exit at a reduced portion of said tip means, whereby when said tip means and conduit means are driven into the ground the soil through which the same are driven is compressed outwardly by downward movement of the reduced portions of said tip means to form an uninterrupted annular ring of compressed soil around said upper portion of tip means and around said conduit means above said outlet ports and thereby forming a seal around said apparatus to prevent flow of fluid stabilizing material injected from said outlet ports into the soil upwardly around said.

3,971,223
PROTECTION METHOD

Joseph Edward Barrett, Twickenham, England, assignor to The British Petroleum Company Limited, London, England

Filed Dec. 4, 1974, Ser. No. 529,270

Claims priority, application United Kingdom, Dec. 12, 1973, 57472/73; Mar. 19, 1974, 12049/74

Int. Cl.^{2} E02B *5/02;* **E02D** *3/12*

U.S. Cl. 61—36 R **11 Claims**

1. A method for forming a glass fiber reinforced unsaturated polyester resin (GRP) sheet on a ground surface which comprises covering the surface with a membrane which is sufficiently flexible to conform to the contours of the ground surface under the force of the sprayed glass fibers and resin, arranging a flexible sheet mesh structure on the membrane, said structure having a thickness less than the desired thickness of the GRP sheet but of sufficient thickness to prevent drainage of said polyester resin from a sloping ground surface, and applying glass fibers and unsaturated polyester resin onto the membrane/mesh structure to the desired thickness using the thickness, color and visual appearance of said mesh structure to gauge the thickness of said GRP sheet.

3,971,224
METHOD FOR ERECTING A PILE WALL ADAPTED TO TAKE COMPRESSIVE FORCES AND A PILE WALL PRODUCED BY THE METHOD

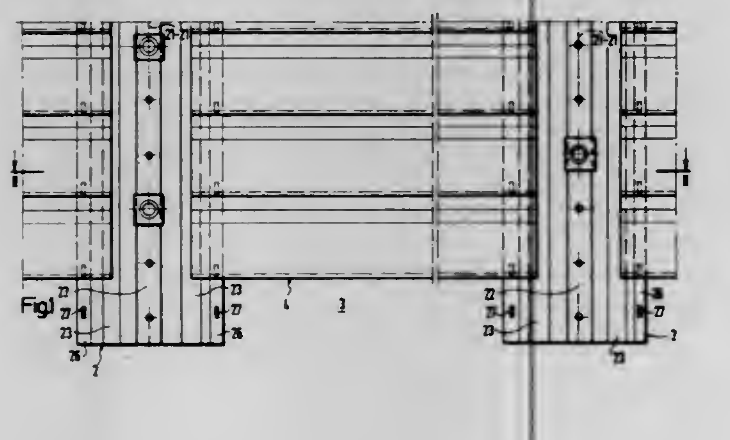
Erwin Elkuch, Tonlaulestr. 10, FL-9490 Vaduz, Liechtenstein (FL 9490)

Filed Nov. 20, 1974, Ser. No. 525,295

Claims priority, application Austria, Nov. 26, 1973, 9906/73; Oct. 15, 1974, 8282/74

Int. Cl.^{2} E21D *5/00*

U.S. Cl. 61—41 A **19 Claims**



1. A method of erecting a retaining wall which is adapted to resist pressure exerted by a medium behind said retaining wall, said method comprising the steps of:

positioning a plurality of piles vertically at intervals in a substrate, inserting a plurality of suspension means in the form of hooks in apertures along the vertical side edges of said verticle piles, and closing the free zones between said vertical piles from the insides of said vertical piles remote from the medium by hanging a plurality of interconnecting bridging piles from said suspension hooks, the upper and lower edges of each bridging pile being engageable with adjacent suspension hooks on adjacent vertical piles so that said plurality of bridging piles are disposed generally perpendicular to the vertical piles, and whereby said suspension hooks lock said bridging piles to said vertical piles.

3,971,225
MINE SUPPORT ASSEMBLIES

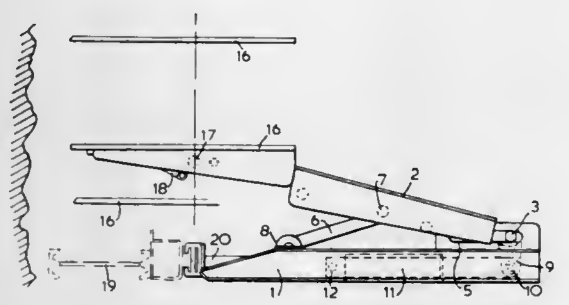
Wilhelm Wertelewski, and Jorg Schade, both of Datteln, Germany, assignors to Becorit Grubenausbau GmbH, Recklinghausen, Germany

Filed Feb. 28, 1975, Ser. No. 554,025

Claims priority, application Germany, Apr. 8, 1974, 2417048

Int. Cl.^{2} E21D *15/44*

U.S. Cl. 61—45 D **8 Claims**



1. A shield support assembly for underground mining operations, said assembly comprising:

a ground-engaging structure;

a roof-engaging structure;

a caving shield pivotally connected near its upper end to the roof-engaging structure and near its lower end to the ground-engaging structure by a pivot mounting displaceable longitudinally of the ground-engaging structure;

a support beam pivotally connected at its lower end to the ground-engaging structure and at its upper end to the caving shield to rotate the shield in the pivot mounting and relative to the ground-engaging structure when the pivot mounting is displaced longitudinally of the ground-engaging structure;

and pressure-fluid-operated ram means pivotally connected between the ground-engaging structure and the caving shield to displace the pivot mounting longitudinally of the ground-engaging structure so as to move the support beam to rotate the shield and raise and lower the roof-engaging structure.

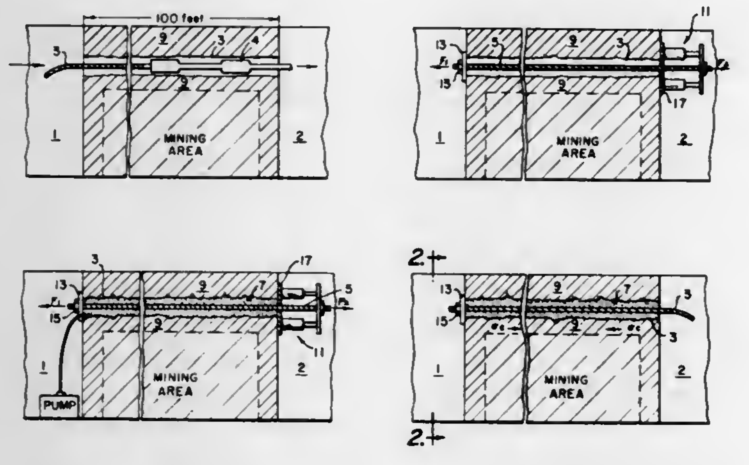
3,971,226
PRESTRESSED ROOF SUPPORT SYSTEM

Roger J. Morrell, Bloomington, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,650

Int. Cl.^{2} E21D *21/00*

U.S. Cl. 61—45 B **5 Claims**



1. A method for supporting a mine roof between two mine cavities comprising the steps of:

drilling a series of generally horizontal holes above the area to be worked, each of said drilled holes extending from one mine cavity to a distant mine cavity;

inserting an elongated support member into each of said holes such that it extends lengthwise from one of said cavities to the other cavity;

pretensioning of said support members while fully inserted in the holes and extending between said two cavities by first firmly anchoring one end of said member near one hole cavity;

forcing a liquid filler bonding agent between each of the walls of said holes and said support while inserted in its hole; and

releasing said pretension applied to said support member after said bonding agent sets to bond the support member to the wall of its hole.

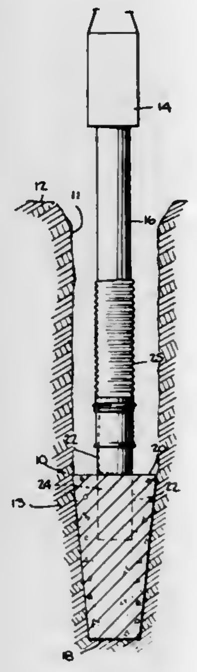
3,971,227
INSTALLATION OF EXPANDED BASE PILES

Augustus P. Godley, Sugar Land, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Feb. 19, 1974, Ser. No. 443,222

Int. Cl.^{2} E02D *5/30, 5/48*

U.S. Cl. 61—53 **22 Claims**



1. A foundation pile construction comprising a massive precast pile tip driven into the earth, a tubular sleeve extending part way into the material of said tip, said sleeve extending out from said tip, and an elongated tubular stem casing fixedly attached to said tubular sleeve by a ring having an internal shoulder for receiving hammer blows, said tubular stem casing extending therefrom, up to the surface of the earth and being of substantially thinner wall thickness than that of said sleeve.

3,971,228
PROCESS AND SYSTEM FOR LIFTING SUBMARINE PIPELINES

Antonio Silvestri, and Pasquale Brando, both of San Donato Milanese, Italy, assignors to Saipem S.p.A., San Donato Milanese, Italy

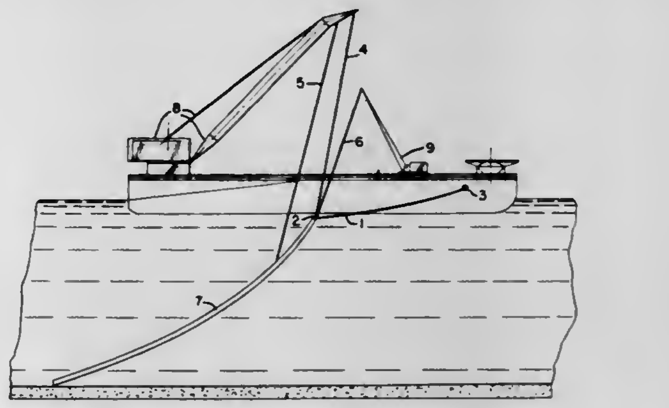
Filed Feb. 22, 1974, Ser. No. 444,772

Claims priority, application Italy, Feb. 23, 1973, 20745/73

Int. Cl.^{2} F16L *1/00*

U.S. Cl. 61—114 **1 Claim**

1. A method of lifting a closed end of a pipeline submerged in water from a deep depth to the surface of the water and recovering a length of said pipeline terminating in said end, which consists in first exerting a diagonal pull on said end by means of a capstan mounted on a floating pontoon and having an adjustable tension, and then simultaneously exerting a lift on said pipeline at said end and at least one point spaced from said end by means of a set of cranes mounted on said pontoon, at least one of said cranes being mounted for movement on said pontoon and adapted to exert a lift at said end of the pipeline, and at least one other crane being fixed to said pontoon and adapted to exert a lift at said end and at the point spaced from said end of the pipeline so that the length of the pipeline between said end and said point is raised above the surface of the water to a point at which said length may be removed from the balance of the pipeline.



3,971,229
APPARATUS FOR PRODUCING COLD PRINCIPALLY FOR THE APPLICATION OF COLD BY CONTACT ON THE BODY OF LIVING BEINGS

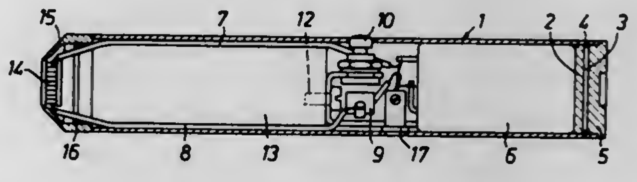
Yves Emile Privas, Killowen-Blarney, Ireland, assignor to Panoduz-Anstalt Co., Vadu, Liechtenstein

Filed Mar. 20, 1973, Ser. No. 342,962

Claims priority, application Switzerland, Mar. 29, 1972, 554,683, Nov. 22, 1972, 574,259

Int. Cl.^{2} F25B *21/02*

U.S. Cl. 62—3 **7 Claims**



1. An apparatus for generating cold, principally for the application of cold by contact on the body of living beings, constituted by a very small, light apparatus which is easy to take hold of and easy to handle in one hand, comprising a body carrying a very small generator rapidly generating cold within the temperature range of −10°C to −80°C, the surface of application of cold by contact being constituted by the actual surface of the generating element or by an auxiliary surface which is thermally connected to the latter, the cold generating element comprising at least one thermoelement having a Peltier effect and the apparatus also carries means for cooling the hot face of the thermoelement and means for supplying electric current to the generating element including means for connecting and disconnecting said supply of current said apparatus further including a device which acts as a support for the apparatus and which ensures the recharging of the battery through a circuit which is closed by the mere fact that the apparatus is mounted on the support.

3,971,230
STIRLING CYCLE ENGINE AND REFRIGERATION SYSTEMS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Walter H. Higa, Tujunga, Calif.

Filed May 5, 1975, Ser. No. 574,208

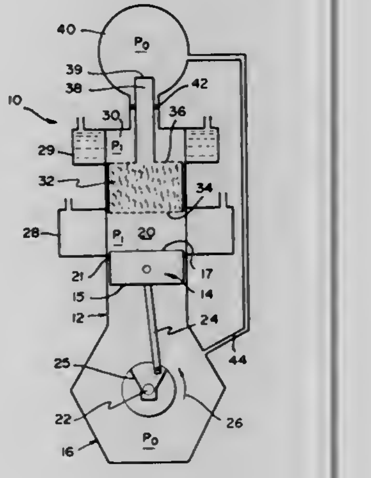
Int. Cl.^{2} F25B *9/00*

U.S. Cl. 62—6 **12 Claims**

1. In a Stirling cycle engine of the type including first and second variable volume chambers, a working fluid, heating

means for supplying heat at a temperature T_h to working fluid in said first chamber, cooling means for absorbing heat at a temperature T_c from working fluid in said second chamber, $T_h >> T_c$, the working fluid being at a variable pressure definable as P_1, a drive piston having a top surface exposed to said first chamber, a displacer mounted for reciprocal motion between said first and second chambers to alternately vary the volumes thereof, a regenerator in communication with said first and second chambers for providing a communication path for the working fluid between said chambers, and drive means coupled to said drive piston for moving said drive piston from a first position in which the total volume of said first and second chambers is a maximum and the working fluid pressure P_1 is at a minimum level, to a second position in which the total volumes of said first and second chambers is a minimum and the working fluid pressure P_1 is at maximum level, the improvement comprising:

a displacer piston coupled to said displacer and defining an end surface remote therefrom;



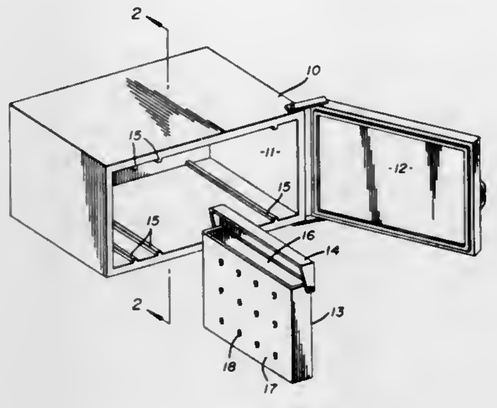
a third chamber, said displacer piston end surface being disposed therein, and the pressure in said third chamber being substantially constant and definable as P_O, P_O being between the maximum and minimum levels of P_1, whereby as said drive piston moves from said first position toward said second position, when P_1 is greater than P_O said displacer moves in a direction to minimize the volume of said second chamber and thereby force working fluid contained therein to pass through said regenerator to said first chamber, and drive piston being movable by said drive means and working fluid present in said first chamber and heated by said heating means, from said second position to said first position, whereby as said working fluid pressure P_1 drops below P_O, and displacer moves in a direction to decrease the volume of said first chamber and increase the volume of said second chamber.

3,971,231
REFRIGERATOR WITH DRY ICE COOLANT

Juanita Derry, 2009 W. Washington St., Ext., New Castle, Pa. 16101

Filed Mar. 27, 1974, Ser. No. 455,515
Int. Cl.² F25D *3/12*
U.S. Cl. 62—388 **5 Claims**

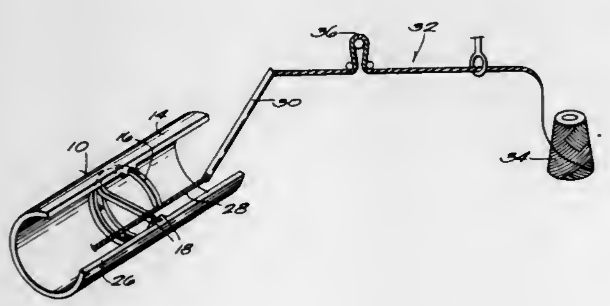
1. A refrigerator consisting of an insulated cabinet having an access opening and a hinged insulated closure therefor and at least one hollow partition forming a receptacle, dry ice positioned in said receptacle, said hollow partition being positioned in said insulated cabinet and being of a size dividing the interior of said insulated cabinet into two separate areas, said hollow partition having a perforated side and an unperforated side and located in said insulated cabinet so that the perforated side communicates with one of said separate areas to form a freezer and the unperforated side communicates with the other of said separate areas to form a refrigerator.



3,971,232
ROTARY KNITTING MACHINE

Phillip H. Darling, c/o Bentley Labs., Inc., 17502 Armstrong, Irvine, Calif. 92705

Continuation-in-part of Ser. No. 273,819, July 21, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 392,069
Int. Cl.² D04B *23/04;* **D05B** *57/04, 57/30*
U.S. Cl. 66—1 R **11 Claims**



1. A knitting device including

at least one rotary needle including an outermost peripheral edge and at least two circumferentially spaced openings extending radially inwardly from said outermost peripheral edge, said openings defining loop forming means for releasably capturing and pulling a segment of filament into a loop as said rotary needle is rotated about an axis extending through its center of rotation;

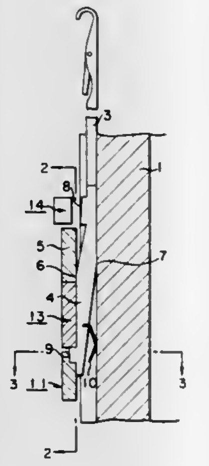
drive means for rotating said needle about said axis, said drive means operatively engaging only said outermost peripheral edge throughout the entire rotational cycle of said needle such that the internal portion of said needle on which said loop is carried remains completely unencumbered throughout the entire rotational cycle of said needle, said drive means supporting said needle so that said center of rotation is not at any time radially displaced from said axis during rotation of said needle; and

means for feeding filament to the vicinity of said rotary needle so that, during a rotational cycle, one of said loop forming means sequentially captures a first segment of filament and pulls it into a first loop, the circumferentially adjacent loop forming means captures another segment of filament and pulls it into a second loop through the first loop, and the loops are released by their respective loop forming means after at least one loop of filament has been pulled therethrough.

3,971,233
CIRCULAR KNITTING MACHINE WITH PATTERN PRODUCING DEVICES

Yukio Amaya, Ohbu, and Kazufusa Sakakura, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 14, 1974, Ser. No. 523,878
Claims priority, application Japan, Nov. 22, 1973, 48-134686
Int. Cl.² D04B *9/00*
U.S. Cl. 66—50 R **3 Claims**

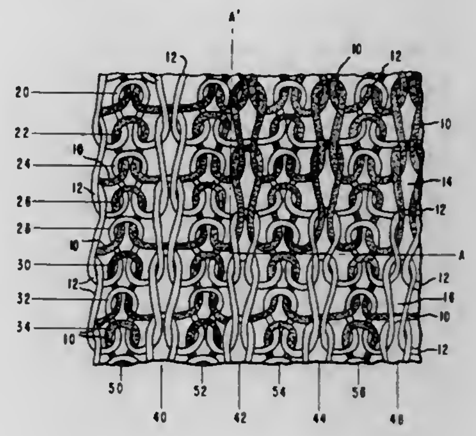


1. A circular knitting machine including a cylinder provided with needle slots; a series of independently operable knitting needles disposed in said needle slots; a series of needle operating jacks having fulcra at the mid-portions thereof and being disposed, one for each needle, in said needle slots in abutting end to end relation with lower ends of said needles and disposed in said slots for pivotal movement about said fulcra and for reciprocating movement along said needle slots, each of said jacks having a one-piece integral structure, and being provided at the opposite end portions with outwardly extending lower and upper butts; a camming mechanism disposed along a circumferential surface of said cylinder, said camming mechanism comprising needle raising cams engagable with one of the butts for causing one of the butts on each of said jacks to move upwardly along said needle slot when it engages said needle raising cams, and jack turning cams engagable with each of said one of the butts to turn said jack from a position in which it can be raised by said needle raising cams to a position in which it cannot be raised by said raising cams; a series of jack holding means disposed so as to correspond in position to the other of the butts of each of said jacks for magnetically holding particular jacks, which are not to bring about a knitting operation, among said jacks having been turned by said jack turning cams to said position in which said jacks cannot be raised by said needle raising cams, said jack holding means being circumferentially disposed outwardly of the series of needle operating jacks for acting on the other of said butts, each of jack holding means comprising two permanent magnets and one electrical magnet interposed between said permanent magnets, said three magnets being transversely aligned in contact with each other; and resilient spring means for normally urging said one of the butts on each of said jacks toward said needle raising cams and said jack turning cams, said resilient spring means being disposed inwardly of the series of needle operating jacks.

3,971,234
DOUBLE-KNIT ELASTIC FABRIC WITH RAISED PATTERNS

Harold J. Taylor, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 4, 1974, Ser. No. 503,180
Int. Cl.² D04B *9/06*
U.S. Cl. 66—200 **11 Claims**

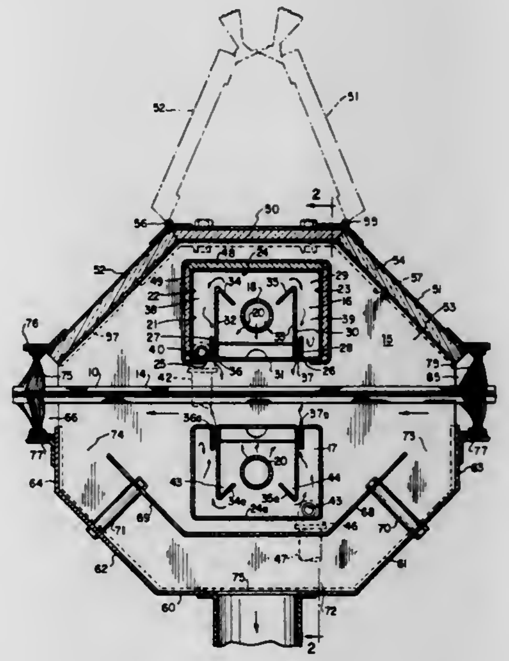


1. A fabric having courses knit with front and back wales, said courses comprising an elastic and an inelastic yarn knit together as a pair as one component and an inelastic yarn alone as the other component, said one component appearing in spaced groups of uninterrupted walewise series of stitches in adjacent front wales and in selected stitches in at least every fourth course in the back wales, all the remaining stitches in the fabric being the other component.

3,971,235
HIGH PRODUCTION STEAMER

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 348,068, April 5, 1973, Pat. No. 3,875,624, and a continuation-in-part of Ser. No. 355,401, April 30, 1973, Pat. No. 3,868,215. This application Jan. 28, 1975, Ser. No. 544,840
Int. Cl.² D06B *3/20, 23/18*
U.S. Cl. 68—5 E **12 Claims**



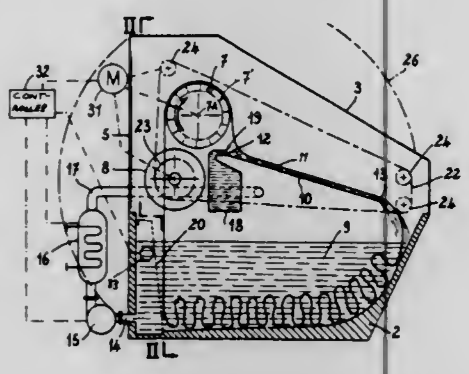
1. A high production processing steamer for imparting moisture to tubular knitted fabric or the like, comprising

a. means for conveying the fabric in relatively flat form along a predetermined, generally horizontal processing plane,

b. a pair of steam boxes mounted in opposed relation, one above and one below the processing plane,
c. said steam boxes having effectively continuous slot-like steam discharge openings extending across the width of the fabric and arranged to direct opposed, high velocity streams of steam toward the fabric generally perpendicular to the processing plane, from above and below said plane, and
d. confining means above and below the processing plane forming an enclosed processing chamber containing the said steam boxes and substantially enclosing a portion of the conveying means inclusive of that passing between the steam boxes,
e. said confining means substantially entirely enclosing said steam boxes and limited portions of the conveying means upstream and downstream thereof relative to the direction of fabric movement,
f. said confining means having transversely elongated slit-like openings in its upstream and downstream sides to accommodate the presence of the conveying means and providing for at least limited egress of steam from the chamber,
g. said confining means being so constructed and arranged as to temporarily confine steam ejected from the steam boxes to a limited region closely surrounding the fabric, and
h. forced draft steam exhaust means communicating with said confining means below said processing plane,
i. said confining means being substantially closed in the regions above said processing plane, whereby confined steam above said plane is withdrawn through said fabric and removed through said exhaust means.

3,971,236
APPARATUS FOR TREATING AN ELONGATED WEB WITH A LIQUID

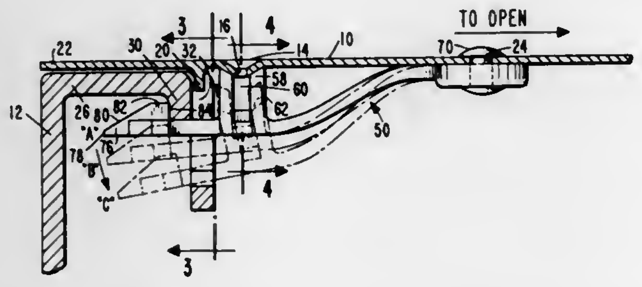
Armand Jean Bene, 17, route de Toussieu, Manissieux 69800 Saint-Priest, France
Filed July 29, 1974, Ser. No. 492,873
Claims priority, application France, July 30, 1973, 73.28408
Int. Cl.² D06B *3/28, 23/04*
U.S. Cl. 68—176 **1 Claim**



1. An apparatus for treating an elongated web with a liquid, said apparatus comprising:
a housing having a bottom and formed at its bottom with an upwardly open vessel containing a bath of a treating liquid, said vessel having a wall inclined downwardly and inwardly for guiding said web into said bath;
a plate disposed in said housing above said bath, said plate being inclined downwardly toward and spaced from said wall for feeding said web downwardly toward the latter, said plate extending substantially horizontally in said housing and having an upper and a lower edge;
a drum rotatably mounted in said housing and disposed above and along said upper edge of said plate for laying said web onto the latter;
nozzle means for feeding a treating liquid onto said plate below said web whereby said web contacts said liquid on said plate, the liquid on said plate cascading into said bath at the lower edge of said plate;
an auger rotatably mounted in said housing between said bath and said drum and having a helical rib, said web having turns separated by said rib as said web rises from said bath onto said drum; and
means for driving said auger and said drum.

3,971,237
DOOR LOCK

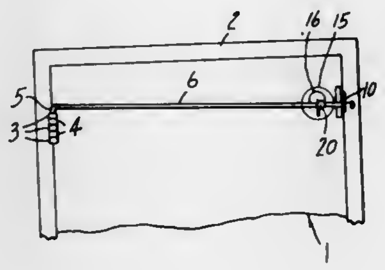
Holgar Rasmussen, Kilchberg, Switzerland, assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed July 9, 1975, Ser. No. 594,256
Int. Cl.² E05B *65/08;* **E05C** *19/06*
U.S. Cl. 70—99 **16 Claims**



1. A lock for securing a door member to a frame member, said lock comprising:
means defining a lock opening having first and second edge portions on one of said members,
a catch element mounted on the other of said members, said catch element having a free end portion extendable through said lock opening when said door member is closed, said free end portion having first and second locking shoulders extending outwardly in different directions, said free end portion being movable between a first position wherein said first shoulder is engageable with said first edge portion to prevent said door from being opened, a second position wherein said second shoulder is engageable with said second edge portion to prevent said door from being opened, and a third position intermediate said first and second positions wherein both of said shoulders can pass freely through said lock opening to allow said door to be opened, said free end portion being biased toward said first position, and
key means engageable with said catch element to move said free end portion between said first position and said third position.

3,971,238
KEY ACTUATED AUXILIARY DOOR HOLDING MEANS

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109
Filed Mar. 31, 1975, Ser. No. 563,570
Int. Cl.² E05B *65/06*
U.S. Cl. 70—135 **11 Claims**

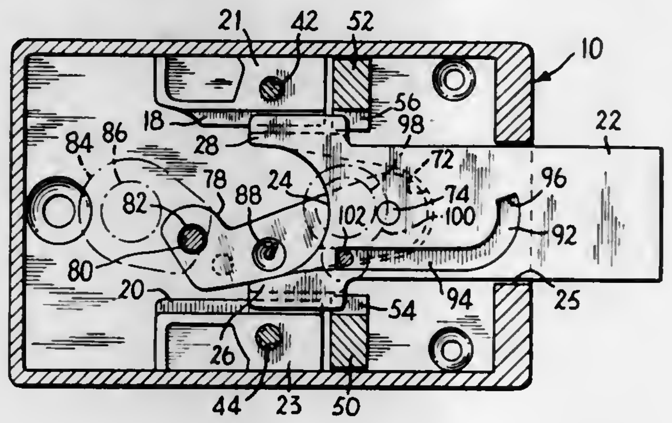


1. A door lock for use with a door structure that includes a door and a frame therefor, comprising:

a rod extending alongside the inner face of said door,
a keeper mounted on said frame,
said rod being movable vertically in a plane parallel to said inner face from a locked position in engagement with said keeper to an unlocked position out of engagement with said keeper,
a base rotatably mounted on said inner face of said door,
a rod holder on said base and slidably engaging said rod at a point intermediate the ends of the latter,
means extending through said door from the opposite face thereof for rotating said base to move said rod between locked and unlocked positions.

3,971,239
LOCK

Stanley Lavis, Little Ferry, N.J., assignor to Phelps Time Recording Lock Corporation, New York, N.Y.
Filed Feb. 7, 1975, Ser. No. 548,013
Int. Cl.² E05B *65/06, 9/00*
U.S. Cl. 70—134 **1 Claim**

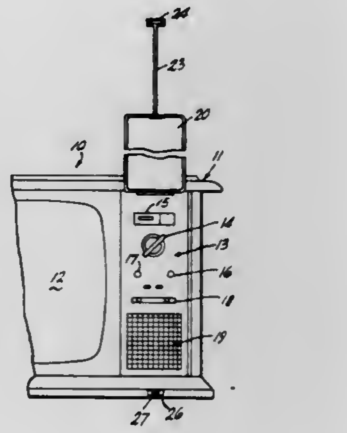


1. A lock having a casing and a cover, a bolt mounted for sliding movement in said casing, said bolt having a pair of flanges thereon, said casing having a bolt receiving opening in one end thereof, said opening being completely surrounded by the material of the casing, said bolt being slidable between an advanced and retracted position relative to said casing, said bolt extending through said opening in said advanced position; and means on said cover for engaging the bolt to prevent removal of said cover when said bolt is in said advanced position comprising a pair of projections mounted on said cover and extending into said casing, said projections each being L-shaped, each of said flanges resting in a different one of said L-shaped projections at least when said bolt is in the advanced position, said cover being locked to said casing by the projections and by the engagement of the bolt with the casing in the advanced position of said bolt said projection engaging the bolt in both the advanced and retracted positions of the bolt.

3,971,240
LOCKING COVER FOR TELEVISION CONTROLS

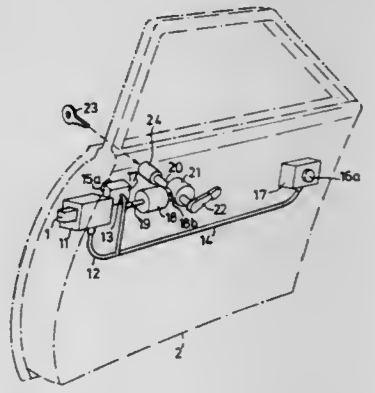
John A. Love, Sr., 30 Somerset St., Battle Creek, Mich. 49017
Filed June 22, 1971, Ser. No. 155,559
Int. Cl.² B65D *55/14*
U.S. Cl. 70—160 **1 Claim**

1. In combination with a television set having a cabinet containing an electrical chassis, a picture tube, primary television controls exteriorly accessible, a loudspeaker and a loudspeaker port:
a a primary control cover hingedly mounted at one edge of said cabinet and arranged alternatively to expose said primary controls including an on-off switch and a channel selector switch or to cover all the primary controls, and
b locking means for locking the cover in place over the controls thereby preventing manipulation of the controls while the cover is in a closed and locked position,
c said cover and said locking means being so arranged that sound emanating from the loudspeaker port is not adversely affected or attenuated,
d said locking means comprising a rod extending across said loudspeaker port and having one end affixed to said cover and having a slot provided at the other end thereof, hasp means mounted on said cabinet adapted to be engaged by said slot when said cover is in closed position and padlock means having a shackle adapted to extend through said hasp and to be locked in place.



3,971,241
OPERATING DEVICE FOR LOCKING MECHANISMS IN DOORS, HATCHES AND THE LIKE

Nils Owe Pärsson, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden
Filed Sept. 23, 1974, Ser. No. 508,716
Claims priority, application Sweden, Sept. 24, 1973, 7312946
Int. Cl.² E05B *51/02*
U.S. Cl. 70—275 **6 Claims**



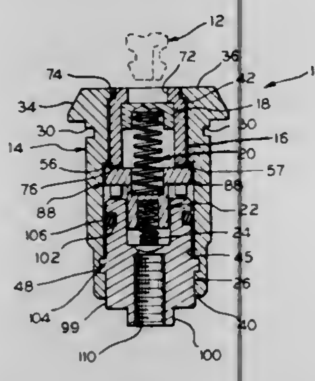
1. An operating device for a lock-bolt or the like for doors, hatches or the like comprising an actuating means for the lock-bolt, at least two manually operable releasing means and pipes which connect the actuating means with the releasing means to form a closed system filled with a liquid for transferring a volume change in one of the releasing means into a corresponding volume change in the actuating means for the lockbolt, said system including an expansion means coacting with a manually operable latching means which in at least one position limits expansion of the expansion means by contact therewith, each of the actuating, releasing and expansion means including a flexible bellows, one end of a bellows being closed and the other end of a bellows being in communication with the closed system.

3,971,242
KEY EJECTOR LOCK

Aloysius J. Mikos, Skokie, Ill., assignor to Chicago Lock Co., Chicago, Ill.
Filed July 25, 1975, Ser. No. 599,154
Int. Cl.² E05B *17/00, 27/08*
U.S. Cl. 70—388 **13 Claims**

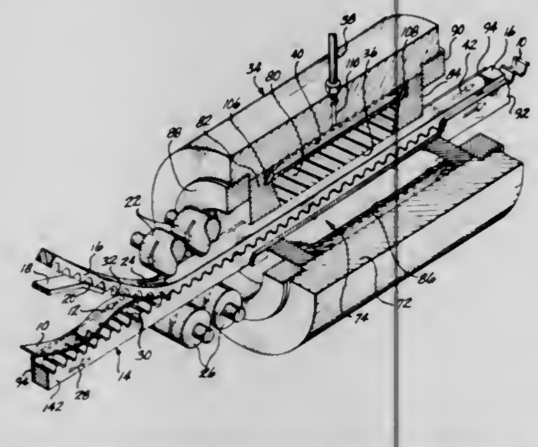
1. A key ejector lock which comprises:

- a tubular barrel,
- a front end plug rotatably mounted in said barrel and having a keyway extending therethrough for operation thereof by a key,
- a rear end plug rotatably mounted in said barrel and adapted for operative connection to a locking member,
- rotatable drive means interposed between said plugs and drivingly engaging said rear end plug,
- means providing a sliding drive connection between said front end plug and said drive means, one member of said front end plug and said drive means being mounted for axial reciprocal movement in said barrel,
- means resiliently urging said one member forwardly in said barrel,
- means on said barrel providing rearwardly opening circumferentially spaced internal notches,



- lug means projecting outwardly from said one member, said lug means being removably received in respective ones of said notches for securing said rear end plug in respective locked and unlocked rotational positions,
- a key ejector axially reciprocally movable in said barrel between said front end plug and said drive means and engaging a key inserted through said keyway,
- and means resiliently urging said key ejector forwardly in said barrel,
- whereby insertion of a key in said keyway serves to move said one member rearwardly to free the rotatable parts for rotation and enable the key to rotate said front end plug for rotating said rear end plug between said locked and unlocked positions thereof, and said key ejector acts to eject the key when released in any rotational position thereof.

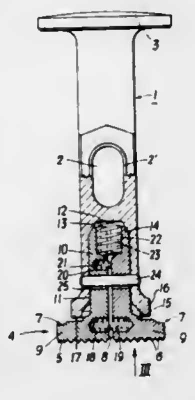
3,971,243
METHOD FOR DIE FORMING STRIP MATERIAL
Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 461,995, April 18, 1974, Pat. No. 3,888,618. This application Jan. 9, 1975, Ser. No. 539,745
Int. Cl.² B21D *13/02*
U.S. Cl. 72—385 **8 Claims**



1. A method for die-forming a strip of material capable of undergoing plastic deformation comprising:

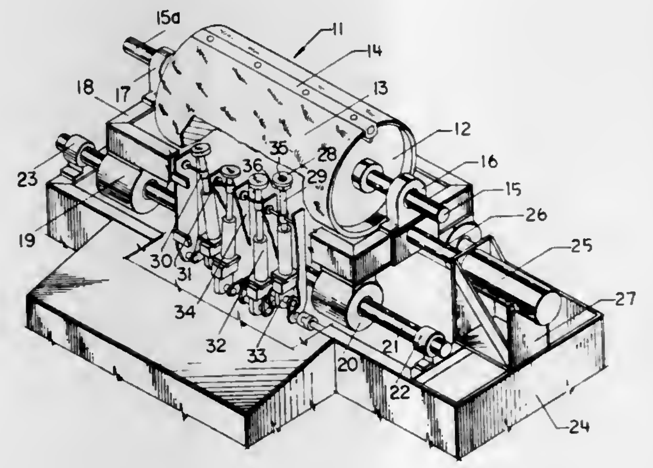
- feeding a first die half into superposed relationship with a second die half at a first location upstream from a forming zone, said first die half being an elongate, flexible die member having a corrugated forming surface running longitudinally thereof, said second die half having a corrugated forming surface complementary to the forming surface on said first die half, said second die half being fed to said first location along a predetermined path from a second location upstream from said first location, said first die half being fed to said first location along an arcuate path from a third location upstream from said first location, said third location being transversely spaced from and adjacent said second location relative to the feed direction of said second die half along said predetermined path,
- feeding said strip of material into sandwiched relationship between said first die half and a second die half at said first location upstream from said forming zone, said strip being fed between said first and second die halves at said first location in a manner to gather sufficient material from said strip between the forming surface of said first die half and the complementary forming surface of said second die half to prevent substantial stretching of said material, and
- applying a forming pressure to said die halves in said forming zone to simultaneously form a plurality of corrugations in said metal strip.

3,971,244
IMPACT TOOL
Hans Zengerer, Bundesstrasse 221, A-8410 Wildon, Austria
Filed Feb. 27, 1974, Ser. No. 446,536
Claims priority, application Austria, Mar. 5, 1973, 1923/73
Int. Cl.² B21D *1/12, 25/00;* B21J *7/18, 13/02*
U.S. Cl. 72—395 **9 Claims**



1. A portable impact tool for dressing metal sheets, comprising a tool carrier having a take-up bore formed therein provided with guide surfaces and a closed inner end, a tool head positioned exteriorly of said carrier, a stem joined to said tool head and mounted in said carrier, said stem being slidably guided along said guide surfaces of said take-up bore and being spaced from said inner end when the tool is in a rest position, wherein a gap is formed between the stem and the inner end of said bore, aligned transverse openings formed in said carrier, transverse openings formed in said stem in alignment with the openings in said carrier and having a diameter that is greater than that of said openings, a transversely extending stop member fixed in the openings in said carrier and being loosely received in the openings in said stem and being engageable by said stem wherein the stem is limited in the movement thereof, a spring located in said take-up bore and abutting against said closed end thereof and against said stem so that said spring bridges said gap for resiliently loading said tool head in a longitudinal direction with respect to said tool carrier, said tool head having an outer face provided with serrations and that is divided transversely into at least two tool head portions, said tool head portions being movable relative to each other and being slidably guided within the tool carrier along said guide surfaces, each of said tool head portions including a jaw that is engageable with said metal sheets, a rigid abutment for said jaws defined by a surface formed on said tool carrier adjacent to said jaws, said jaws being movable in longitudinal direction of said take-up bore, whereby said abutment and said stop member defines the limit of longitudinal movement of said jaws, the inner and outer ends of said take-up bore being formed with inclined surface portions that diverge in a direction toward said jaws, said tool head having first and second inclined surfaces portions that are axially and longitudinally spaced from one another in said take-up bore and that cooperate with said bore to move said jaws into engagement with each other when said jaws strike the metal sheets to be treated, and resilient means interposed between said jaws and abutting thereagainst for maintaining said jaws laterally spaced from one another, when said jaws are in a rest position.

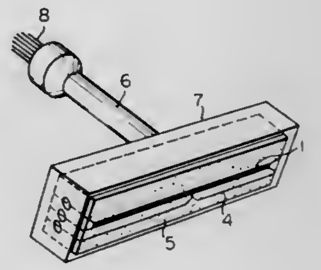
3,971,245
WEAR TESTING DEVICE
Joseph C. Crafford, Newport News; Vincent J. Dowling, Jr., Yorktown, and James A. Gusack, Williamsburg, all of Va., assignors to Dow Badische Company, Williamsburg, Va.
Filed June 18, 1975, Ser. No. 587,932
Int. Cl.² G01N *3/56*
U.S. Cl. 73—7 **6 Claims**



1. A device for the wear testing of fabric samples such as carpets, which device comprises:

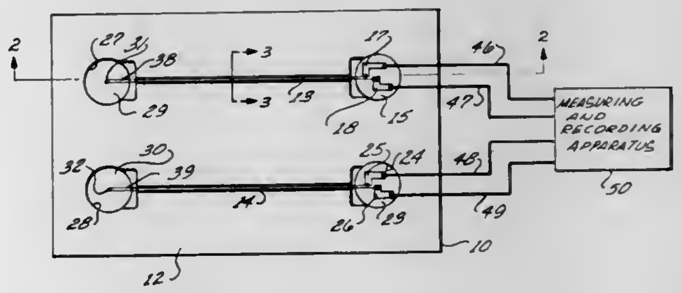
- a. a cylinder for supporting the sample to be wear tested, the cylinder having means for securing the inner surface of the sample in congruity with the exterior of the major surface of the cylinder;
- b. mounting means for permitting rotation of the cylinder about its longitudinal axis and simultaneous reciprocation of the cylinder along its longitudinal axis;
- c. a plate affixed on one major surface thereof to a rod, the free major surface of the plate positioned so that it may contact the outer surface of the sample;
- d. a crankshaft, to which the free end of the rod is attached, and by means of which a reciprocating motion is imparted to the rod, so that the plate is moved back and forth from a position away from the sample to a position in contact with the sample;
- e. means for allowing simultaneous reciprocation and oscillation of the rod so that as contact between the plate and the sample is effected, the cylinder is caused to rotate about its longitudinal axis;
- f. means for mounting and driving the crankshaft; and
- g. means affording reciprocation of the cylinder along its longitudinal axis.

3,971,246
METHOD AND APPARATUS FOR MEASURING THE COEFFICIENT OF THERMAL CONDUCTIVITY OF A SAMPLE
Sadao Sumikama; Nobuyoshi Tanaka; Yoshiaki Arakawa, and Katsushi Akama, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1973, Ser. No. 424,276
Claims priority, application Japan, Dec. 21, 1972, 47-127653; Sept. 26, 1973, 48-108178; Sept. 26, 1973, 48-107514
Int. Cl.² G01N *25/18*
U.S. Cl. 73—15 A **4 Claims**



1. Apparatus for measuring the thermal conductivity of a sample comprising a rectangular cover means having an open end, a stick, one end of which is connected to said cover means, a reference material inserted in said cover means so that the flat surface of said reference material is on said open end of said cover means, the thermal conductivity of said reference material being known, a long linear electric heater having a resistance $R=R_0(1+\beta T)$ mounted on the surface of said reference material, said electric heater being connected to a current source, a thermo-electric couple connected to the surface of the middle part of said heater, said thermo-electric couple being electrically connected to a meter to measure temperature, a plug attached to the end of said stick for electrically connecting said heater and said thermo-electric couple to the current source and to the meter, where R_0 and β are constants and T is an average temperature of the electric heater, said thermo-electric couple measuring the temperature of said heater at least at two predetermined different times before the reference-sample-heater system reaches thermal equilibrium.

3,971,247
FLUID MEASURING APPARATUS
Jerome A. Rodder, 775 Sunshine Drive, Los Altos, Calif. 94022
Filed Nov. 15, 1974, Ser. No. 523,995
Int. Cl.² G01F *1/68;* G01N *31/00*
U.S. Cl. 73—27 R **23 Claims**



1. Fluid measuring apparatus comprising:

- a housing having an elongated cavity enclosed on its sides and open at its ends;
- a thin elongated, i.e., uncoiled, hot wire bent in half to extend along the length of the cavity;
- first means at one end of the cavity for supporting the ends of the wire in fixed relationship longitudinally and later-

ally with respect to each other and electrically isolated from each other;

second means at the other end of the cavity for supporting the middle of the wire, the second wire supporting means comprising a deformed spring that exerts tension on the middle of the hot wire to keep the hot wire taut as its length changes, permits longitudinal movement of the middle of the wire, and prevents lateral movement of the middle of the wire, the first and second supporting means cooperating to maintain the halves of the wire in spaced approximately parallel relationship from each other and in spaced relationship from the sides of the cavity;

means for forming in the housing a fluid entrance to the cavity;

means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance; and

means for measuring the change in resistance of the hot wire.

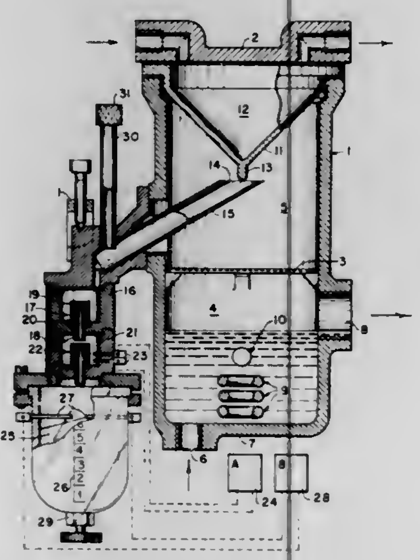
3,971,248
UNIT FOR ASCERTAINING THE PRESENCE OF WATER IN LUBRICATING OIL
Arne Orskov Christensen, 14, Glentevej, DK-9900 Frederikshavn, Denmark

Filed Feb. 1, 1974, Ser. No. 438,655

Claims priority, application Denmark, Dec. 14, 1973, 6809/73

Int. Cl.² G01N *25/14, 33/26*

U.S. Cl. 73—61.1 R **6 Claims**



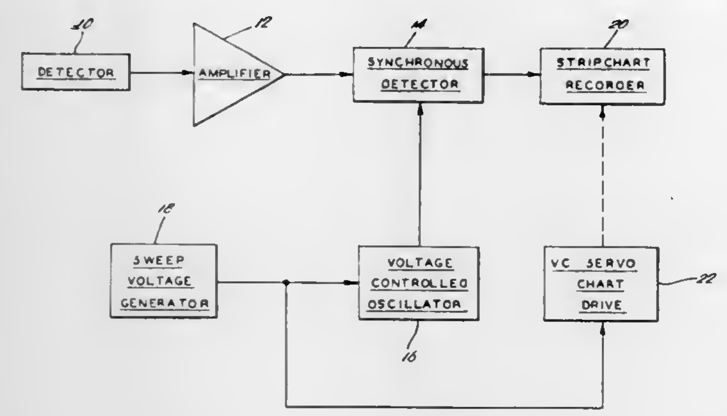
1. An apparatus for ascertaining the presence of water in an oil, comprising a condensing chamber, a heating chamber for heating said oil, said two chambers communicating with each other, the condensing chamber being provided with a condensing surface, the condensing surface having a discharge end adapted to collect the condensate at a predetermined location by means of gravity, a measuring chamber for ascertaining the presence of a predetermined quantity of condensate in the chamber, communicating means adapted to feed the condensate collected at the discharge end of the condensing surface to the measuring chamber, the measuring chamber being provided with warning means adapted to emit a warning signal when the water in the measuring chamber reaches a predetermined quantity and a fore-chamber provided between the communicating means and the measuring chamber, the communicating means discharging into the fore-chamber, the fore-chamber being adapted to collect a predetermined quantity of condensate and provided with outlet means for delivering the quantity thus collected as a whole into the measuring chamber.

3,971,249
MECHANICAL TESTING SYSTEM
Henry L. Bachofer, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 28, 1975, Ser. No. 563,019

Int. Cl.² G01H *1/08*

U.S. Cl. 73—67 **1 Claim**



1. A system for checking the condition of mechanical apparatus and comprising:

a. means for detecting vibrations in the mechanical apparatus within a given bandwidth;

b. means for systematically scanning through the frequencies of the detecting vibrations in said bandwidth and including a variable frequency, voltage controlled oscillator, the output frequency of which may be controlled by an input voltage signal to cause it to scan through said bandwidth, means for producing a sweep voltage for driving said voltage controlled oscillator through said bandwidth, and a synchronous detector means, coupled with said detecting means and said variable frequency, voltage controlled oscillator, for detecting when the frequency of said variable frequency oscillator matches the frequency of a vibration detected by said detecting means, whereby as said variable frequency oscillator is scanned through the bandwidth said synchronous detector means will produce an output whenever the frequency of said variable frequency oscillator matches the frequency of a vibration detected by said detecting means; and

c. means, coupled to said synchronous detector means and said means for producing a sweep voltage, for recording the amplitude of the output of said synchronous detector means as a function of the frequency of said voltage controlled oscillator, whereby the recording of amplitude versus frequency may be utilized to diagnose the condition of the mechanical apparatus.

3,971,250
ELECTRET SENSING MEDIUM HAVING PLURAL SENSING UNITS
Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1975, Ser. No. 550,536

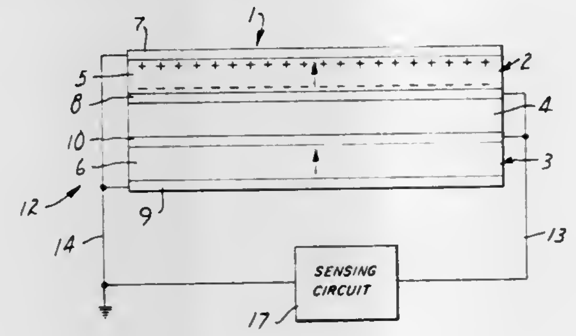
Int. Cl.² G01B *7/16;* G01K *7/00;* H01G *7/02*

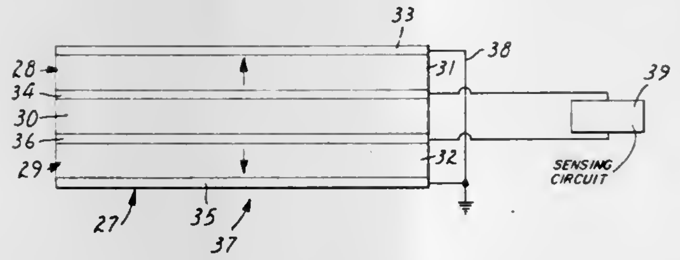
U.S. Cl. 73—88.5 R **7 Claims**

1. A temperature compensated sensor comprising the combination of:

a first sensing unit formed of:
- a first layer of poled pyroelectric material that produces electrostatic charges on its planar surfaces when its ambient temperature is varied, the charges on a first planar surface of said layer being opposite in polarity to the charges on a second planar surface of said layer;
  - a first pair of conductive plates in surface-to-surface contact with said pyroelectric layer, said pair of plates including a first plate disposed on said first surface of said layer, and a second plate disposed on said second surface of said layer;

a second sensing unit formed of:
- a second layer of poled pyroelectric material that produces electrostatic charges on its planar surfaces when its ambient temperature is varied, the charges on a first planar surface of said second layer being opposite in polarity to the charges on a second planar surface of said second layer and also opposite in polarity to the charges on the second surface of said first layer; and
- a second pair of conductive plates in surface-to-surface contact with said second pyroelectric layer, said pair of plates including a first plate disposed on said first surface of said layer, and a second plate disposed on said second surface of said layer; and





a layer of thermally and electrically insulative material interposed between said first and second sensing units and in surface-to-surface contact with one of the conductive plates of each of said sensing units to thermally isolate said sensing units from one another;

connecting means for electrically interconnecting various plates of said pairs to form two sets of interconnected plates, each set including at least one plate on one surface of said first pyroelectric layer and at least one plate on the surface of said second pyroelectric layer; and

a sensing means connected to said two sets of interconnected plates for detecting electrostatic charges on at least one of said two sets of plates only when said plates are not similarly varied in temperature.

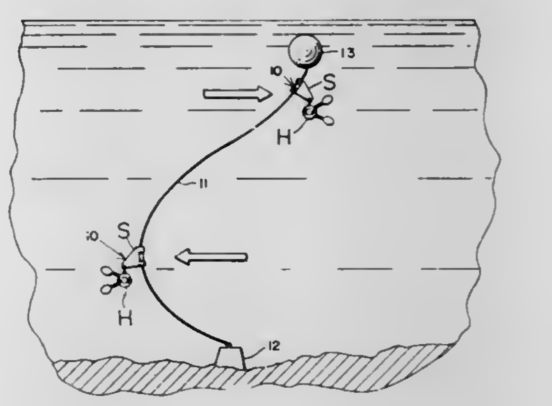
3,971,251
DYNAMICALLY BALANCED APPARATUS FOR WATER BORNE INSTRUMENTS
Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133

Filed Apr. 16, 1975, Ser. No. 568,556

Int. Cl.² G01D *21/00*

U.S. Cl. 73—170 A **9 Claims**

1. A dynamically balanced apparatus for water borne instruments comprising an elongated member having horizontal and vertical axes and arm portions extending along said horizontal axis, support means rotatably supporting said arm portions in a substantially balanced position whereby said horizontal axis lies in the horizontal plane, pivot means mounted on said support means permitting the pivotal movement of said arm portions in said horizontal plane, weighted means secured to said arm portions compelling said arm portions to rotate about said horizontal axis to assume a predetermined position, at least one vane mounted on said support means lying in a substantially vertical plane parallel to said vertical axis and at right angle to said horizontal axis and water flow actuating means mounted on each of said arm portions substantially equidistant from said support means and along said horizontal axis.

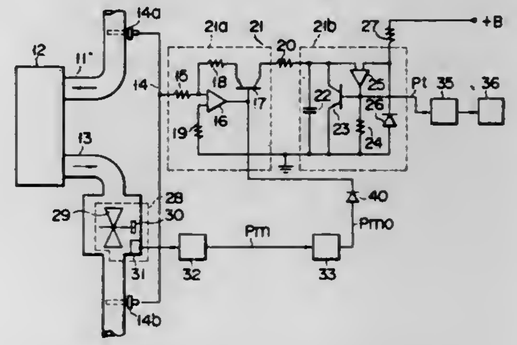


3,971,252
ELECTRONIC INTEGRATION CALORIMETER
Hajime Onoda, Tokyo, Japan, assignor to Kimmon Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1975, Ser. No. 567,178

Int. Cl.² G01K *17/16*

U.S. Cl. 73—193 R **5 Claims**



1. An electronic integration calorimeter comprising:

a temperature difference detecting device for generating a first electrical signal having an amplitude proportional to a difference between the temperature of a heat medium flowing into a heat load and the temperature of the heat medium flowing out of the heat load, the first electrical signal being one of a voltage and current signal;

a flow pulse generator mounted in a flow passage of the heat medium and generating a flow pulse signal wherein the number of pulses per unit time of the flow pulse signal is proportional to the rate of flow of the heat medium;

a voltage-current conversion circuit coupled to the temperature difference detecting device and to the flow pulse generator to convert the first electrical signal produced from the temperature difference detecting device into a second electrical signal in response to the flow pulse signal, the second signal having an amplitude which is function of the first electrical signal and a pulse rate which is a function the flow pulse signal, and the second electrical signal being one of a current and voltage signal when the first electrical signal is respectively one of a voltage and current signal;

an A-D converter coupled to the voltage-current conversion circuit to convert the second electrical signal into a second pulse signal wherein the number of pulses of the second pulse signal is proportional to the amplitude of the second electrical signal; and

a counter coupled to the A-D converter for counting the pulses of the second pulse signal from the A-D converter.

3,971,253

FLOW METER WITH A MAGNETIC FIELD-DEPENDENT RESISTOR ARRANGEMENT

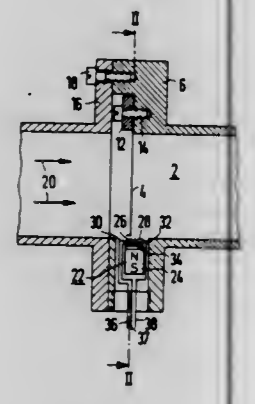
Paul Hinl, Erlangen-Kosbach, and Bernt Paul, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 19, 1975, Ser. No. 588,236

Claims priority, application Germany, July 19, 1974, 2434864

Int. Cl.² G01F *1/28*

U.S. Cl. 73—228 **4 Claims**



1. A flow meter for use with a flowing medium comprising:
- a housing having a channel therein through which said medium can flow;
- a field dependent resistor arrangement including:
  - a permanent magnet; and
  - first and second magnetoresistive field plates arranged to be in the magnetic flux of said magnet; and
- a ferromagnetic control member for varying the degree of said flux permeating each of said plates, said control member including:
- a throttle plate extending into said channel, said throttle plate having one end elastically clamped to said housing and a portion which is within the magnetic flux of said magnet.

3,971,254

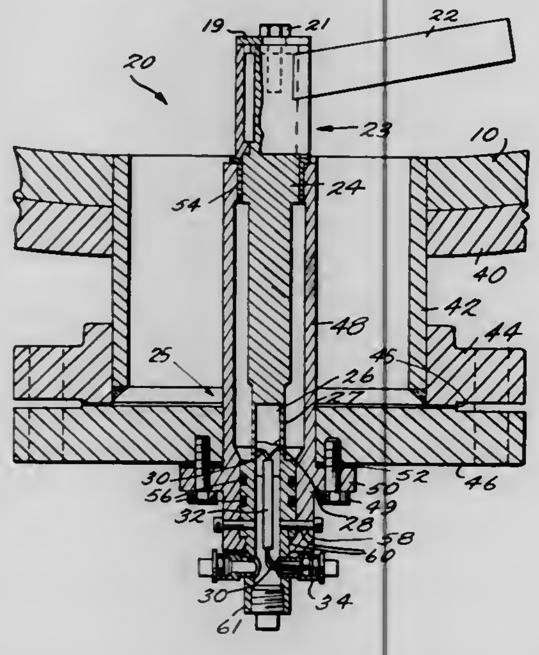
SOLIDS LEVEL INDICATOR

Micheal I. Sherman, Glen Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,384

Int. Cl.² G01F *23/00*

U.S. Cl. 73—290 R **20 Claims**



1. A detector for indicating the solids level in a vessel or the like adapted to have solid particles flowing downwardly therein, the vessel or the like having a generally vertical axis, said detector comprising
- a. a shaft having an axis passing through the center thereof,
- b. means for fixedly mounting said shaft at a first end thereof to the vessel or the like and for allowing a second end thereof to be freely mounted, said second end extending into the vessel or the like,
- c. a generally flat plate,
- d. means for rigidly mounting one end of said plate to said second end of said shaft, said plate being perpendicular to said shaft axis, and generally perpendicular to the axis of the vessel or the like,
- e. a thin-walled portion of said shaft located adjacent said first end thereof, said shaft being generally tubular at said thin-walled portion thereof, and
- f. means for indicating twisting motion of said shaft as a result of solid particles acting on said plate, said means including a strain gauge mounted on said thin-walled portion of said shaft interiorly thereof.

3,971,255

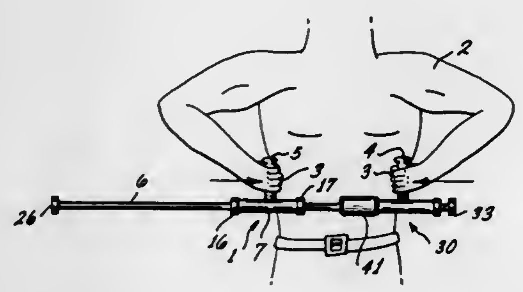
EXERCISE APPARATUS

Justin Arnold Varney, 7326 Oglesby Ave., Los Angeles, Calif. 90045, and Thomas Aquinas Feeney, 10108 Gaynor Ave., Sepulveda, Calif. 91343

Filed Aug. 4, 1975, Ser. No. 601,599

Int. Cl.² G01L *5/02*

U.S. Cl. 73—379 **14 Claims**



11. An exerciser device comprising
- a shaft;
- a housing slidably mounted on said shaft, said housing including means for selectively varying the degree of frictional engagement between said shaft and said housing; and
- applied force indicating means operatively associated with said shaft whereby the level of a force tending to cause axial movement of said shaft relative to said housing may be observed.

3,971,256

METEOROID CAPTURE CELL CONSTRUCTION

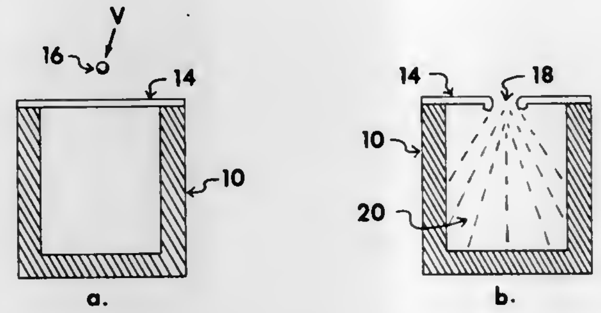
Herbert A. Zook, and Richard W. High, both of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 5, 1974, Ser. No. 448,320

Int. Cl.² G01N *1/00*

U.S. Cl. 73—425.2 **3 Claims**

1. A meteoroid capture cell comprising:
- a. A housing for receiving and restraining particles from shattered meteoroids of a pre-selected size class, said housing being constructed entirely of one chemical substance having a purity of at least 0.9999 and having one open side for receiving therethrough said particles and wherein the thickness of said housing substance is resistant to complete penetration by said particles; and,
- b. A membrane comprised of the same chemical substance as said housing affixed to and covering the open side of said housing wherein the thickness of said membrane is responsive to penetration by a meteoroid of said preselected size class striking said membrane while causing complete shattering of said meteoroid as said meteoroid penetrates said membrane.



3,971,257

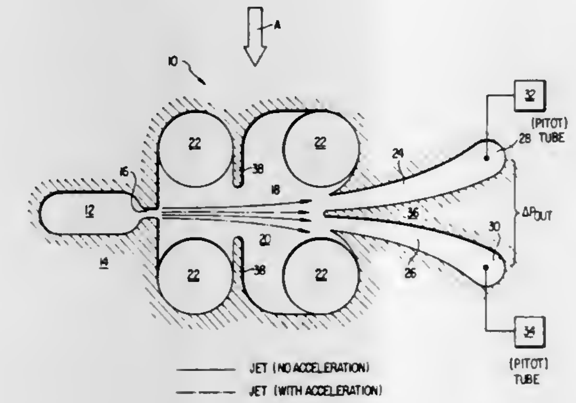
LAMINAR JET LINEAR ACCELEROMETER

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,736

Int. Cl.² G01P *15/02*

U.S. Cl. 73—515 **4 Claims**



1. An improved laminar jet linear accelerometer, comprising:
- a housing;
- a first chamber defined within said housing and into which a pressurized fluid is supplied;
- a second chamber fluidically connected to said first chamber, said second chamber vented to an ambient environment through a plurality of vents to prevent pressure build-up within said second chamber;
- means defining a nozzle operatively associated with said first chamber for issuing said fluid from said first chamber and into said second chamber in the form of a laminar jet and along a predetermined axis;
- sensing means, fluidically connected downstream from said second chamber and disposed symmetrically about said predetermined axis within fluid channels, for sensing and indicating a differential fluidic output characteristic of said fluid,
- whereby under non-acceleration conditions, said differential output will be zero as said fluid flows along said axis and uniformly impinges upon said sensing means, while under applied acceleration conditions, said differential output will not be zero as said fluid flow will be deflected away from said axis by said applied acceleration so as to non-uniformly impinge upon said sensing means;
- flow splitter means integrally formed with said housing for facilitating the flow of said fluid into said channels toward said sensing means, said flow splitter means disposed co-axially with said flow axis and includes a sharply tapered upstream portion extending into said second chamber; and
- swirl attenuation vanes, disposed within said second chamber, for preventing recirculation and backflow of said fluid toward said nozzle.

3,971,258

FEED MECHANISM FOR A MACHINE TOOL

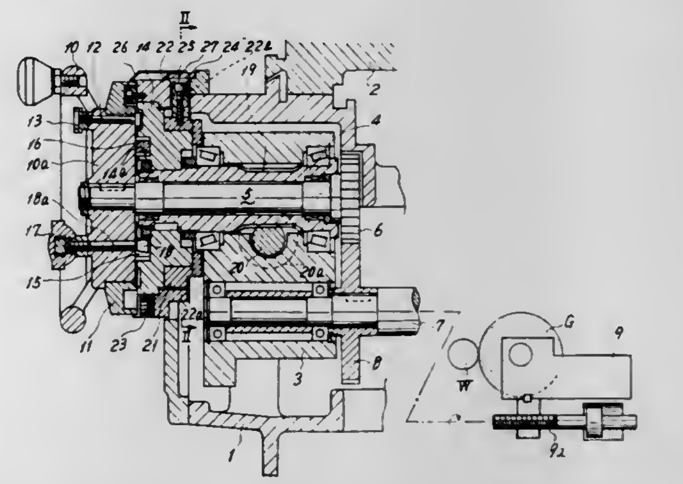
Akiyoshi Kobayashi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed Feb. 26, 1975, Ser. No. 553,272

Claims priority, application Japan, Mar. 4, 1974, 49-25553

Int. Cl.² G05G *5/04*

U.S. Cl. 74—10.2 **8 Claims**



1. A feed mechanism for a machine tool comprising:
- a shaft rotatable for supplying a feed movement to a movable unit of said machine tool in a machining operation;
- drive means capable of reversibly turning said shaft;
- a ring member rotatable together with said shaft and provided with a cut-out portion;
- a movable stop rotatable in axial alignment with said ring member and engaged within said cut-out portion for permitting a relative rotation therebetween through a predetermined rotational extent; and
- a stationary stop fixedly provided on the rotational path of said movable stop for restraining one end of said ring member by interference with said movable stop, said predetermined rotational extent being defined to be more than the sum of widths of said movable stop and said stationary stop so that said shaft may be turned within a range of less than two revolutions.

3,971,259

FLUID TRANSDUCER

Henry Schottler, SE. Lamon Lane, Fort Pierce, Fla. 33452

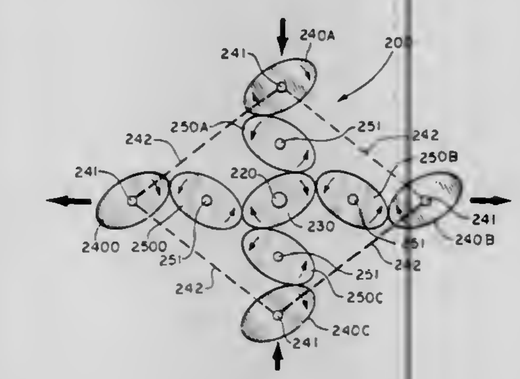
Filed Jan. 2, 1974, Ser. No. 430,332

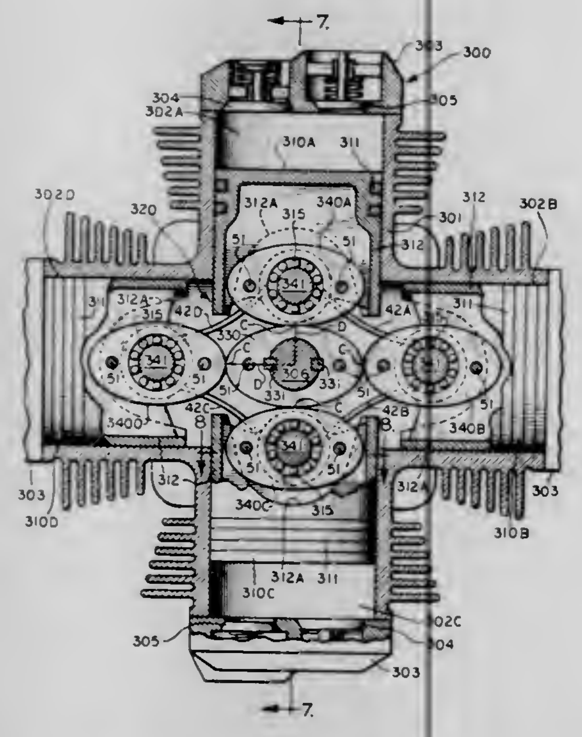
Int. Cl.² F16H *21/16*

U.S. Cl. 74—25 **9 Claims**

1. A fluid transducer for imparting energy to or receiving energy from a fluid comprising:
- central rotary shaft means;
- a plurality of reciprocatory piston members disposed around said central shaft means within piston cylinders;
- a first elliptical member having selected major and minor diameters and positioned within said transducer for rotation about its elliptical center as said shaft member rotates;
- a plurality of second elliptical members having substantially the same major and minor diameters as the first elliptical member, each of said second elliptical members being mounted in said transducer to rotate about its elliptical center and to reciprocate in response to the reciprocation of one of said piston members;
- said second elliptical members being arranged in engagement with said first elliptical member so that said first and second elliptical members rotate in unison with constant angular velocity as said piston members and said second

elliptical members reciprocate with respect to said rotary shaft means; and





means to retain said second elliptical members in said engagement with said first elliptical member whereby said drive mechanism transmits motion between said pistons and said rotary shaft means.

3,971,260
POWER TRANSMISSION APPARATUS

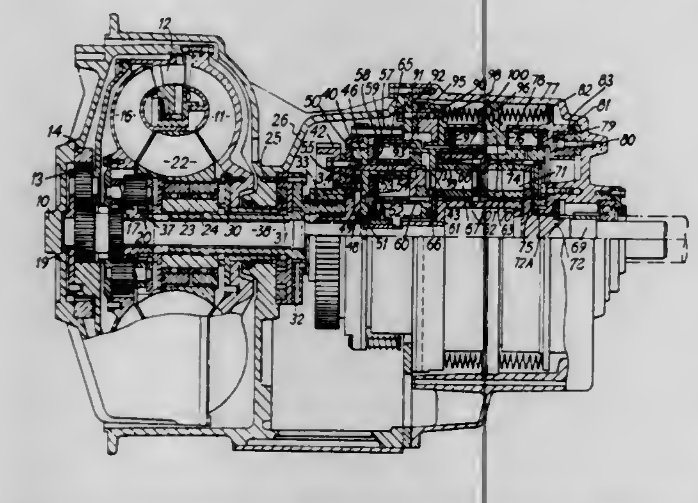
Howard Frederick Hobbs, Napton-on-the-Hill, England, assignor to Variable Kinetic Drives, Ltd., England

Filed Aug. 28, 1974, Ser. No. 501,414

Claims priority, application United Kingdom, Sept. 4, 1973, 41542/73

Int. Cl.^{2} F16D *23/00, 43/20;* **F16H** *5/06, 3/74*

U.S. Cl. 74—337.5 **7 Claims**



1. A power transmission apparatus comprising a fixed part (e.g. 79), a rotary input member (e.g. 40) a clutch having engageable input and output clutch members (e.g. 49, 60), means for engaging and releasing the clutch members, said input clutch member being driven by said rotary input member (40), a planetary gearing having an input gear member (61) connected with said clutch output member, a brake acting on part (74) of said planetary gearing, the releasing of said clutch and engaging of said brake serving to effect a down gear change, said brake comprising two sets of friction plates and a movable brake carrier (78) carrying one of said sets of friction plates, means to urge said carrier to press one of said sets against the other set in the direction for engaging the brake, said other set being connected with said gearing part (74), means for urging said one set in the opposite direction for disengaging the brake, two sets of torque transmitting cam teeth (83) on said brake carrier (78) and on said fixed part (79) respectively, said sets of cam teeth being permanently meshed with each other and being so shaped as to transmit reaction torque to said fixed part and applying brake engaging pressure to said carrier and said one set of brake friction plates only when the brake carrier is transmitting reaction torque through said cam teeth to the fixed part.

3,971,261
SLIDE DRIVING DEVICE FOR USE IN METAL WORKING PRESS

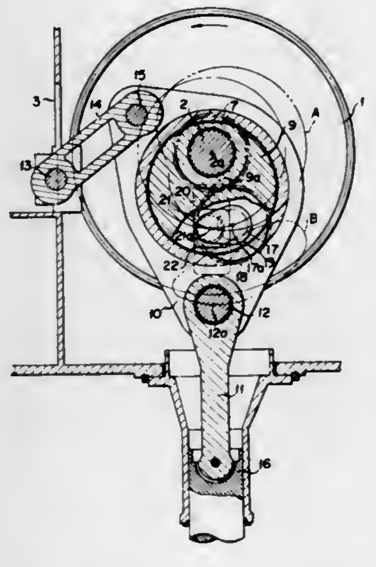
Keiji Matsushita, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,702

Claims priority, application Japan, Dec. 11, 1973, 48-137382

Int. Cl.^{2} F16H *37/12*

U.S. Cl. 74—52 **1 Claim**



1. In a slide driving device for use in a metal working press including a main shaft rotatably suspended on the device frame, a rotary member fixedly mounted on the main shaft and adapted to be rotated at a constant angular velocity by a driving power source, an eccentric sheave mounted on the main shaft and adapted to be eccentrically rotated about the main shaft, an oscillating link member oscillatingly mounted on the eccentric sheave to eccentrically rotate the eccentric sheave, the oscillating link member being adapted to oscillate in response to the eccentric rotation of the eccentric sheave, a connecting rod pivotally connected between the oscillating link member and the slide, and an eccentric arm shaft connected between the eccentric sheave and the rotary member at their respective offset positions so that rotation of the rotary member is transmitted to the eccentric sheave, the improvement comprising:

- a fixed gear serving as a bushing fixedly secured to the device frame at one end of said main shaft;
- a planetary or epicyclic gear fixedly secured to one end of said eccentric arm shaft and adapted to mesh with said fixed gear;

- a pin shaft eccentrically and rigidly secured through an arm member to the other end of said eccentric arm shaft wherein said eccentric arm shaft, arm member and pin shaft form an integral crank shaft;
- a slider rotatably mounted on said pin shaft; and
- a long slot formed at a disk part of said rotary member in the radial direction thereof within which said slider is slidably housed, wherein when said rotary member is rotated said eccentric arm shaft is rotated about said main shaft while rotating on its own axis by the co-operative action of said fixed and planetary gears, whereby said slider is slidingly moved within said long slot of said rotary member in the radial direction thereof, and said eccentric sheave is eccentrically rotated about said main shaft at different angular velocities.

3,971,262
FRICTION GEAR

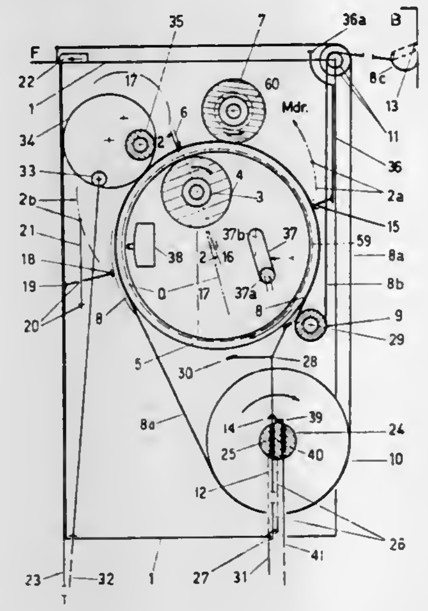
Wilhelm E. Altrogge, P.O. Box 8617, 8202 Schaffhausen, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,743

Claims priority, application Germany, Oct. 17, 1973, 2352014

Int. Cl.^{2} F16H *7/00*

U.S. Cl. 74—227 **9 Claims**



1. A friction gear comprising a driven ring having an inside and outside surface, a drive pulley disposed within said drive ring, an elongated flexible tractive member extending around the outside surface of said drive ring with each of the end portions of said member for attachment to a fixed point, a pair of counter pulleys fixedly mounted adjacent the outside surface of the ring and peripherally spaced from each other, said driven ring being pivotable about said drive pulley with the inside surface of said ring in pressure contact with said drive pulley forming a friction zone by an increase in tension on either end of said member with the outside of said ring in contact with a corresponding one of said counter pulleys forming lever for automatically generating sufficient pressure in said friction zone for either of the two directions of rotation of said gear.

3,971,263
VARIABLE DIAMETER PULLEY WITH MEANS FOR CHANGING WEAR PATTERN ON THE PUSHER RING

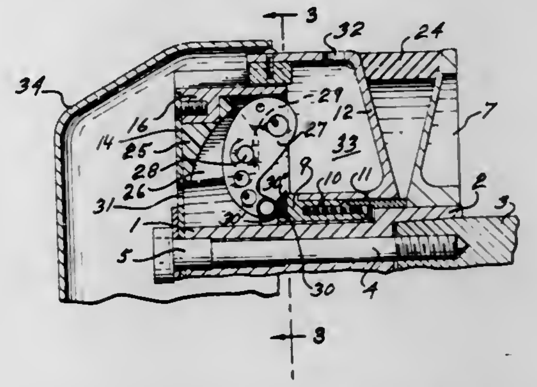
Guy Beaudoin, 1238 Chabanel Street, Drummondville South, Quebec, and Marcel Vincent, 320 Herbert Street, Wickham, Quebec, both of Canada

Filed Jan. 14, 1975, Ser. No. 541,070

Int. Cl.^{2} F16H *55/52*

U.S. Cl. 74—230.17 E **4 Claims**

1. A variable diameter pulley comprising shaft means defining the axis of rotation of the pulley, a first and a second pulley flanges coaxially mounted on said shaft means, said first pulley flange being axially displaceable along said shaft means and having axially opposite sides with one of the latter facing said second pulley flange, a pusher ring adjoining the other of said sides of said first pulley flange relative to said one side facing said second pulley flange, a drive member secured to said shaft means and bodily rotatable therewith, a centrifugal weight carrier body circumferentially surrounding said shaft means and rotatable relative to the latter and to said drive member about said axis of rotation in friction drive engagement with said drive member, and centrifugal weights movably supported by said carrier body in rotatively shiftable and axial engagement with the pusher ring, whereby acceleration of the drive member produces friction drive of the carrier body and inertial angular shifting of the latter and of the centrifugal weights about said axis relative to the pusher ring.



3,971,264
SCREW-AND-NUT MECHANISM WITH BALL OR ROLLER RECIRCULATION

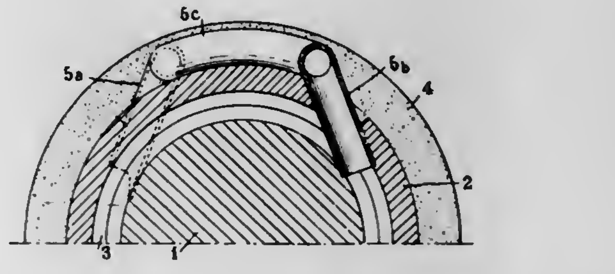
Jacques Detraz, Chambery, and Michel Gambut, La Motte Servolex, both of France, assignors to La Technique Integrale S.A., Chambery, France

Filed May 14, 1974, Ser. No. 469,800

Claims priority, application France, May 16, 1973, 73.17737

Int. Cl.^{2} F16H *1/18*

U.S. Cl. 74—459 **5 Claims**



1. In a recirculating ball, screw-and-nut mechanism operable with a plurality of balls situated in at least one helical passage formed by mating grooves of screw and nut members of the mechanism, said passage including axially spaced inlet and exit locations for said balls to enter and exit the passage, the improvement in combination therewith wherein said nut member has an outer surface and inlet and exit bores extending from said surface inward to and entering said helical passage at said inlet and exit locations, said improvement further comprising a molded casing surrounding said nut, and a recirculation channel comprising tubular inlet and exit parts respectively in said inlet and exit bores, each of said parts having one end communicating with said helical passage at said inlet and exit locations and a remote end outward of said outer surface, and a tubular connecting means encased in said casing and interconnecting said two remote ends, thus forming a continuous tube, whereby said balls can, via said recirculation channel, exit and re-enter said helical passage, said inlet and exit parts and connecting means of said recirculation channel being three separable elements.

3,971,265
MANUAL AUTOMOTIVE TRANSMISSION

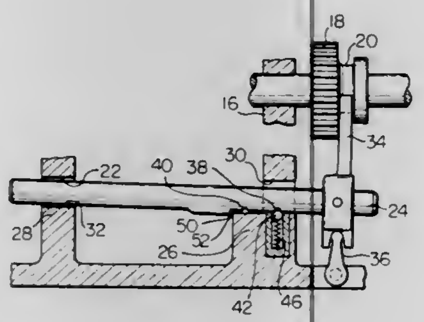
Katsuyasu Kurisu, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 29, 1974, Ser. No. 492,870

Claims priority, application Japan, July 31, 1973, 48-89883[U]

Int. Cl.² B60K *20/08*

U.S. Cl. 74—475 **1 Claim**



1. In a manual automotive transmission having a case, input and output means mounted in said case, gear means operable to connect said input means to said output means, manually operable means including a slidable shifting rod with a fork at one end and supported at opposite ends axially slidably in first and second supports formed on said case, said first support being adjacent said fork and between said second support and said fork, and said shifting rod having a first position wherein said shifting rod allows said gear means to connect said input means to said output means and a second position wherein said shifting rod allows said gear means to disconnect said input means from said output means, said shifting rod being pivotable with said second support as a fulcrum and formed with a step portion selectively engageable with an abutment formed on said first support; the improvement in that said first support has biasing means including a spring biased detent ball disposed in a pocket formed in said first support for biasing said shifting rod in a direction to disengage said step portion of said shifting rod from said abutment of said first support, whereby when said shifting rod takes said first position thereof, said shifting rod is pivoted against the biasing force of said biasing means in response to a force generated by said gear means in another direction to engage said step portion with said abutment, and the engagement of said step portion with said abutment is maintained until said shifting rod is manually operated to slide to said second position by a force produced by the manual operation of said gear means.

3,971,266
POWER TRANSMISSION DEVICE

Tuneho Inakura, Kariya, and Masayuki Doi, Tokyo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed July 16, 1974, Ser. No. 489,037

Claims priority, application Japan, July 17, 1973, 48-81985; July 20, 1973, 48-81479

Int. Cl.² F16H *37/06*

U.S. Cl. 74—675 **16 Claims**

1. A power transmission device used with an industrial manipulator comprising:

a main body;

a source of rotational force;

a first driving shaft rotatably mounted in said main body and coupled to said source of rotational force;

a second driving shaft rotatably mounted in said main body and coupled to said source of rotational force;

a supporting shaft mounted in said main body;

a first epicyclic differential gearing including,

a first sun gear fixed to said supporting shaft,

a first planet gear being in mesh with said first sun gear, and

a first orbit gear rotatably mounted on said supporting shaft and being in mesh with said first planet gear, said first orbit gear being connected and driven by said first driving shaft to rotate about said supporting shaft;

a second epicyclic differential gearing including,

a second sun gear rotatably mounted on said supporting shaft,

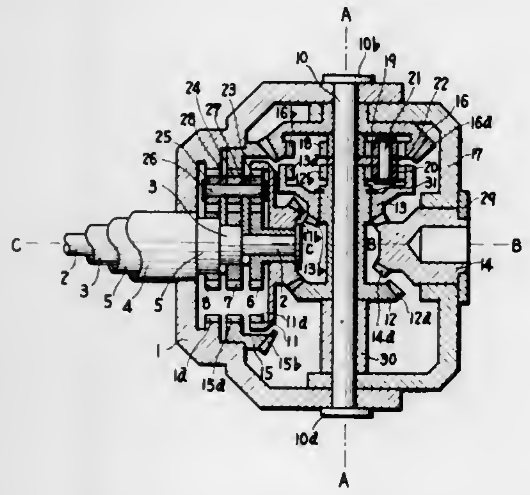
a second planet gear being in mesh with said second sun gear, and

a second orbit gear rotatably mounted on said supporting shaft and being in mesh with said second planet gear, said second sun gear being connected to and driven by said second driving shaft to rotate about said supporting shaft,

said first and second planet gears being connected by means of a pin and being independently rotatable about said pin;

a housing mounted on said supporting shaft for limited pivotal rotation and connected to and driven by said first orbit gear to rotate about said supporting shaft, the rotation of said housing being less than 360°; and

a driven shaft rotatably mounted in said housing and connected to and rotatively driven by said second orbit gear.



3,971,267
SPEED CHANGE GEAR SYSTEM

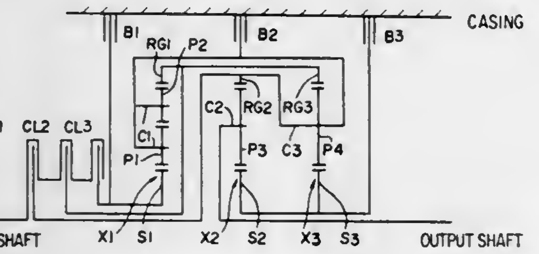
Noboru Murakami, Nagoya; Koichi Matsuo, Toyota; Koichiro Hirosawa, Kariya, and Kazuo Ohara, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,680

Claims priority, application Japan, Aug. 29, 1973, 48-97514

Int. Cl.² F16H *57/10*

U.S. Cl. 74—759 **15 Claims**



1. A speed change gear system comprising:

an input shaft;

a first sun gear;

a first brake capable of locking said first sun gear to a gear casing;

a first planetary gear engaged with said first sun gear;

a secondary planetary gear engaged with said first planetary gear;

a first ring gear engaged with said secondary planetary gear;

a first carrier rotatably supporting said first and second planetary gears;

a second ring gear drivingly engaged to said first carrier;

a third planetary gear engaged with said second ring gear;

a second sun gear engaged with said third planetary gear;

a second carrier rotatably supporting said third planetary gear;

a third sun gear drivingly engaged with said second sun gear;

a fourth planetary gear engaged with said third sun gear;

a third ring gear drivingly engaged with said first ring gear as well as with said fourth planetary gear;

a third carrier rotatably supporting said fourth planetary gear and engaged with said first carrier and said second ring gear;

a first clutch for coupling or uncoupling said input shaft and said first carrier, said third carrier and said second ring gear;

a second clutch for coupling or uncoupling said input shaft and said first ring gear;

a third clutch coupling or uncoupling said input shaft and said first sun gear;

a second brake capable of locking said first carrier, said third carrier and said second ring gear to said gear casing;

a third brake capable of locking said second and third sun gears to said gear casing; and

an output shaft drivingly engaged with said second carrier.

3,971,268
SPEED CHANGE GEAR SYSTEM

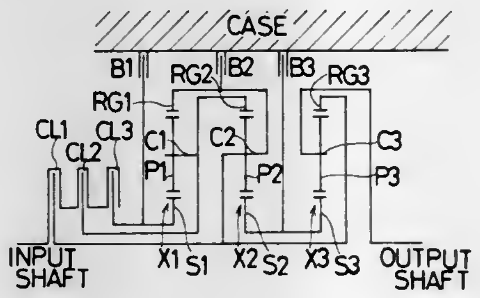
Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Koichi Matsuo, and Kazuo Ohara, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 11, 1974, Ser. No. 514,068

Claims priority, application Japan, Oct. 11, 1973, 48-114097

Int. Cl.² F16H *57/10*

U.S. Cl. 74—759 **15 Claims**



1. A speed change gear system comprising:

an input shaft;

an output shaft;

a first planetary gear set including a first sun gear, a first planetary gear meshed with said first sun gear, a first ring gear meshed with said first planetary gear, a first carrier rotatably supporting said first planetary gear;

a second planetary gear set including a second sun gear, a second planetary gear meshed with said second sun gear, a second ring gear meshed with said second planetary gear and drivingly connected to said first carrier, and a second carrier rotatably supporting said second planetary gear and drivingly connected to said first ring gear;

a third planetary gear set including a third sun gear drivingly connected to said second sun gear, a third planetary gear meshed with said third sun gear, a third ring gear meshed with said third planetary gear and drivingly connected to said carrier and said first ring gear, and a third carrier rotatably supporting said third planetary gear and drivingly connected to said output shaft;

a first clutch for engaging or disengaging said input shaft and said first ring gear and said second carrier and said third ring gear;

a second clutch for engaging or disengaging said input shaft and said first carrier and said second ring gear;

a third clutch for engaging or disengaging said input shaft and said first sun gear;

a first brake for fixedly mounting said first sun gear on a casing;

a second brake for fixedly mounting said first ring gear and said second carrier and said third ring gear to said casing; and

a third brake for fixedly mounting said second sun gear and said third sun gear to said casing.

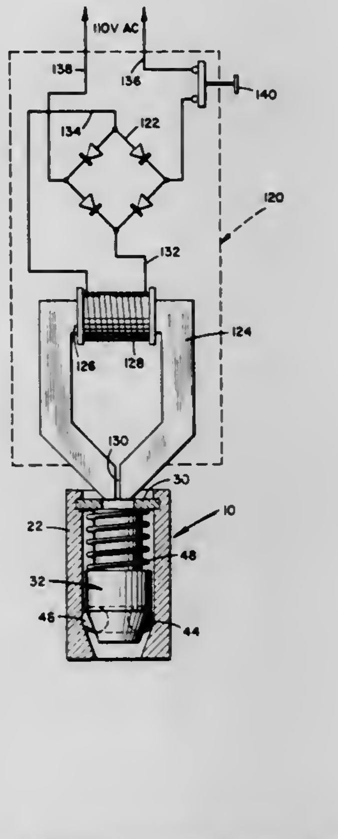
3,971,269
FASTENING CLIP AND TOOL FOR RELEASING SAME

Martin A. J. Martens, Peabody, Mass., assignor to I. D. Engineering, Inc., Peabody, Mass.

Division of Ser. No. 307,366, Nov. 17, 1972, Pat. No. 3,858,280. This application Mar. 19, 1974, Ser. No. 452,553

Int. Cl.² B25B *5/00, 27/00*

U.S. Cl. 81—3 R **1 Claim**



1. The combination of a fastening clip and a separate tool for releasing the same comprising:

a. a generally cylindrical housing having means forming a tapered conical surface at one end thereof,

b. a retainer of ferromagnetic material loosely received within said housing, said retainer being formed with a conical end adapted to mate with said tapered conical surface, an axial bore adapted to receive a pin or the like to be releasably retained by the clip, and at least one transverse opening formed in said conical end of relatively greater dimension than said axial opening,

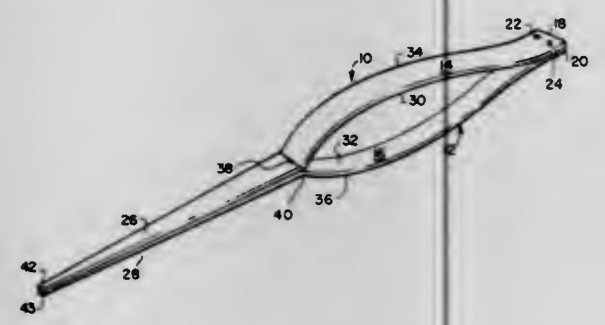
c. a plurality of retaining balls disposed within said transverse opening between said tapered conical surface and said axial bore,

d. means for resiliently biasing said retainer toward the end of said housing formed with said tapered conical surface thereby adapting said balls to tightly frictionally engage said pin and retain the same in said housing, and

e. a tool separate from and independent of said housing for releasing said retaining balls, said tool including an electromagnet having an air gap, and means for creating a magnetic field at said air gap for attracting said retainer when said tool is positioned adjacent said housing, with movement of said retainer freeing said balls and permitting withdrawal of said pin, said means for creating a magnetic field comprising a rectifier bridge and windings around one leg of said electromagnet and electrically connected to said rectifier bridge, and an alternating current source for supplying alternating current to said rectifier bridge.

3,971,270
TWEEZERS

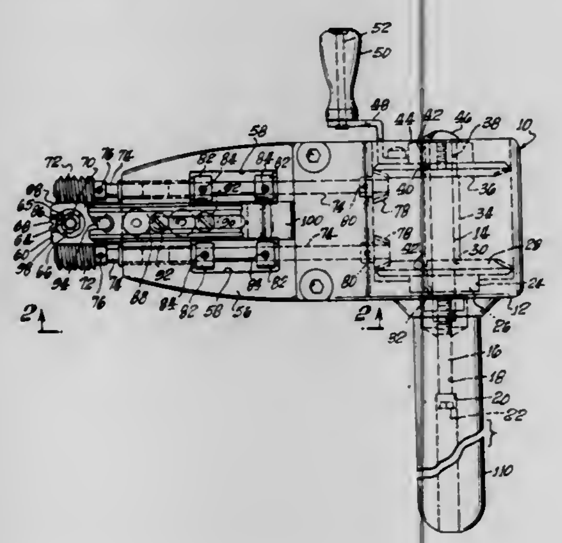
Joseph T. Wallace, 4401 Juniper, Tempe, Ariz. 85282
Filed June 2, 1975, Ser. No. 582,595
Int. Cl.² B25B *9/02*
U.S. Cl. 81—43 **10 Claims**



1. In a tweezer structure, the combination of: a pair of resilient tweezer members; each tweezer member having a handle portion provided with an integral finger portion; each handle portion having a butt end and said finger portion having a terminal end; said handle portion having a substantially concavo-convex portion integral therewith; said concavo-convex portion having a concave side and a convex side; said concavo-convex portion being integral with said finger portion; each finger portion having substantially straight configuration relative to said substantially concavo-convex portion; a transition portion disposed between said concavo-convex portion and said finger portion; said pair of tweezer members fixed together in resiliently loaded relation to each other at their butt ends; said concave sides facing each other; said transition portions being in close proximity to each other; said substantially straight finger portions being in resiliently loaded parallel contiguous relationship to each other; whereby opposed pressure on said convex sides of said concavo-convex portion causes said transition portions to engage each other and act as fulcrums and whereby said opposed pressure deflects said concave sides toward each other and pivots said finger portions apart at their terminal ends and beyond said transition portions.

3,971,271
WRENCH FOR SURGICAL USE

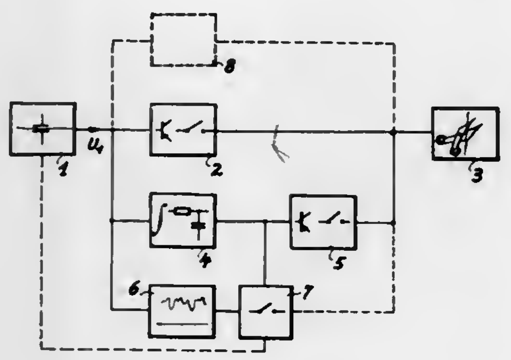
Frederick William Wagner, Jr., 1650 Amate Drive, Whittier, Calif. 90603, and Thomas A. Rickard, 46 Windjammer Court, Long Beach, Calif. 90803
Filed Aug. 25, 1975, Ser. No. 607,666
Int. Cl.² B25B *17/00*
U.S. Cl. 81—57.29 **7 Claims**



1. A wrench for surgical use, comprising:
a hollow housing;
an extension at one side of the housing;
said extension having a pair of shaft receiving parallel bores extending from the free end of the extension into the housing and spaced apart;
a pair of projections extending forwardly from the free end of the extension and spaced apart, there being aligned cross bores adjacent the ends of said projections and slots extending inwardly from the free ends of the parts into the respective cross bores, said slots being of less width than said cross bores, a socket rotatably disposed in said aligned bores, said socket having a nut receiving socket opening therein extending from one end of the socket to the other and having sides adapted to engage corresponding sides of nuts, said socket have a slot therein through which a nut is adapted to pass;
a worm wheel on the exterior of the socket and received in the space between the projections;
a pair of shafts rotatably disposed in the respective parallel bores in the extension;
a worm gear at the end of each of said shafts, said worm gears being at opposite sides of the worm wheel and operably engaging same;
gears within the housing secured to the respective shafts adjacent at inner ends, said gears being spaced apart;
a pair of interconnected gears within the housing engageable with the respective gears on the shafts;
means for operably rotating said interconnected gears;
a retaining member at each side of said extension and having a notch in the free end thereof, said retaining members being slidable between position whereat parts thereof at each side of the notch overlap the opening in the socket to prevent a nut in said socket from escaping laterally of the tool and a position whereat said retaining members are at an inoperative position.

3,971,272
REGULATION OF ELECTRONICALLY OPERATED QUALITY CONTROL EQUIPMENT

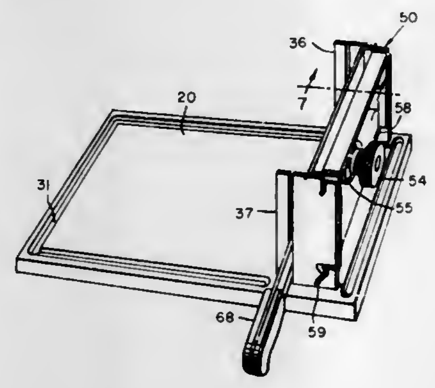
Ernst Felix, and Hans Locher, both of Uster, Switzerland, assignors to Zellweger, Ltd., Uster, Switzerland
Continuation of Ser. No. 118,100, Feb. 23, 1971, abandoned, which is a continuation of Ser. No. 400,340, Sept. 30, 1964, abandoned. This application July 8, 1974, Ser. No. 486,600
Claims priority, application Switzerland, Oct. 1, 1963, 12138/63
Int. Cl.² B26D *5/12, 5/38*
U.S. Cl. 83—13 **5 Claims**



1. A method for regulating the operation of yarn clearers having error correcting means such as yarn cutters, and sensing means providing an electrical signal representative of the controlled quality, said method comprising the steps of: feeding the signal from the sensing means to two independent electrical circuit channels each having separate threshold switch means, the threshold switch means of one circuit responsive to signals corresponding to yarn faults of given magnitude, the threshold switch means of the other circuit responding to signals corresponding to faults of given duration; and obtaining an independent control signal from each of said channels for initiating the operation of the cutters when a limiting value selected for each of said two channels is exceeded.

3,971,273
MEAT SLICING BOARD

Leo Peters, Grand Rapids, Mich.; Joseph M. Dymit, Addison, Ill.; James C. Lilley, Ada, Mich.; Donald R. Smith, and Henry Warners, both of Grand Rapids, Mich., assignors to Leo Peters, Grand Rapids, Mich.
Filed Feb. 26, 1975, Ser. No. 553,247
Int. Cl.² B26D *4/42, 4/46*
U.S. Cl. 83—42 **11 Claims**



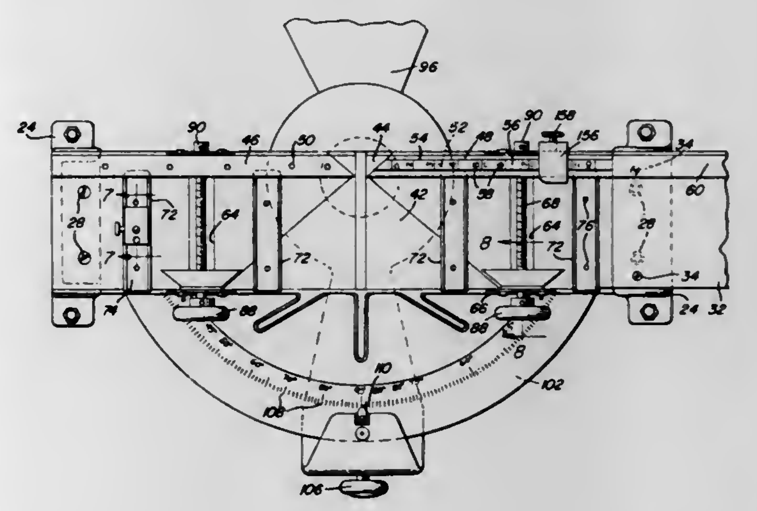
11. A method of hand slicing a boneless meat roast comprising the steps of:

a. placing the roast on a flat board,
b. positioning it between two upright posts extending from the board, the posts having aligned vertically extending knife guide-rail slots,
c. maintaining the posts rigidly in perfect alignment, thereby guaranteeing that slices cut from the meat are never cut on a bias to the length of the meat roast but always at a 90° angle to the length and thus, in turn, assuring that said slices are always of substantially equal thicknesses at their two opposite side edges,
d. pressing and holding one end of the meat against a vertically standing stationary back-up plate adapted for indexing movements to produce the various thicknesses of meat slices required for portion-weight control slicing of the meat,
e. spacing the plate at a distance from the slots equal to the desired thickness of a slice of meat,
f. slicing said slice-thickness-spaced meat-end by moving a knife downwardly within the slots and through the meat while the slots are guiding the knife's line of cut at right angles to the squared length and width of the meat roast, thereby producing a slice that is of uniform pre-determined, even thickness without dependence on human hands or eyes,
g. holding the completed slice flat and erect on a base-flange of the plate and between the uncut portion of the meat and the plate,
h. pivoting the plate and the flange-held slice downwardly to a generally horizontal plane, and then
i. transferring the slice with a sliding movement from the plate to a serving dish.

3,971,274
VARIABLE ANGLE CUT-OFF SAW

Glenn B. Barton, P.O. Box 127, Calhoun City, Miss. 38916
Filed Apr. 15, 1975, Ser. No. 568,186
Int. Cl.² B26B *11/10*
U.S. Cl. 83—100 **5 Claims**

1. In combination, an elongated horizontal workpiece support, an elongated lower support arm extending transversely beneath said workpiece support centrally intermediate its opposite ends and with the central portion of said support arm oscillatably supported from said workpiece support for swinging of said support arm about an upright axis relative to said workpiece support, one end of said support arm including an upright standard supported therefrom projecting upwardly above said workpiece support, an upper support arm secured at one end from the upper end portion of said standard and extending over said workpiece support and generally paralleling said lower support arm, a depending mount slidably mounted on said upper support arm for guided movement therealong and a powered rotary saw blade journaled from a lower portion of said mount and disposed in an upright plane containing said upper support arm, the longitudinal side of said elongated workpiece support adjacent said standard including upwardly projecting abutment means extending along said workpiece support and adapted to have the adjacent side of a workpiece supported on said workpiece support and extending therealong abutted thereagainst, said elongated workpiece support including a longitudinal central portion adapted to be traversed by said saw blade, the longitudinal side of said workpiece support remote from said standard including upwardly projecting abutment members spaced along said workpiece support on opposite sides of said central portion screw threadedly mounted from said workpiece support for independent adjustment transversely of the latter toward and away from said abutment means, longitudinally spaced portions of said elongated workpiece support including upright support means spaced along said workpiece support and supported therefrom on opposite sides of said central portion for independent adjustable transverse shifting relative to said workpiece support member, releasably securable in adjusted positions and having workpiece hold-down members mounted thereon for independent adjustable vertical shifting therealong, and means operative to releasably secure said hold-down members in adjusted vertically shifted positions.

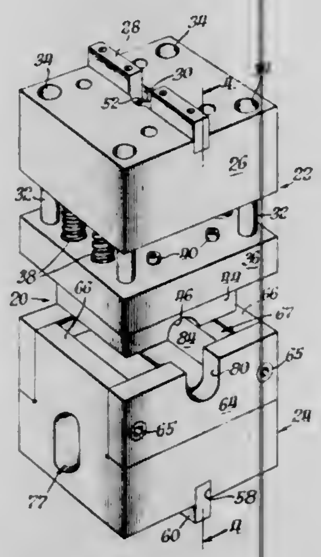


3,971,275
NESTABLE DIE ALIGNMENT MEANS FOR PUNCH PRESS MACHINES

John J. Mach, 2126 S. Kenilworth Ave., Berwyn, Ill. 60402
Filed Sept. 18, 1975, Ser. No. 614,705
Int. Cl.² B26F *1/14*
U.S. Cl. 83—140 **3 Claims**

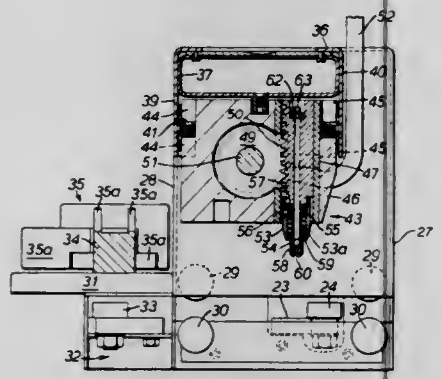
1. Alignment apparatus for punch press machines of the type having separable die set halves, a first die set half being affixed for reciprocal operative movement with the punch press ram and a second die set half being affixed to the press bed, each die set half comprising die carrier block means and demountable die insert means, the latter cooperatively operable to position a workpiece during punching thereof, punch means, and workpiece stripper means, the alignment apparatus comprising in combination:
projecting die insert means secured to one die set half and extending therefrom toward the other die set half, said projecting die insert means presenting alignment means formed on the outer periphery thereof; nesting means carried by the die carrier block means of the other die set

half and formed about the die insert means thereof, said nesting means extending toward said projecting die insert means of said one die set, thereby providing a nesting recess characterized by an inner periphery operable to nestably receive said alignment means when said die set halves are forcibly engaged, whereby the operational alignment of said die inserts of said die set halves is assured.



3,971,276
PICTURE COMPOSING TECHNIQUES AND APPARATUS THEREFOR

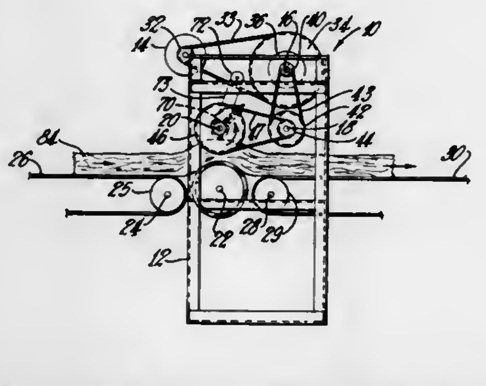
Leonard Kay Billows, 1 Longdean Park, Hemel Hempstead, Hertfordshire, England
Filed Aug. 6, 1973, Ser. No. 385,638
Claims priority, application United Kingdom, Aug. 9, 1972, 37178/72
Int. Cl.^{2} B26D *7/18*
U.S. Cl. 83—164 **5 Claims**



1. A montage or "light" table comprising a structure movable along the table, a punch mechanism including a hollow cutting punch mounted upon the structure for movement relatively thereto across the table, a core member within the hollow punch and movable relatively thereto to eject punched-out discs within the hollow punch, means for reciprocating the hollow cutting punch to effect a punching operation by cutting, a receptacle for discs and further means for moving the receptacle between a first position, beneath the hollow punch to receive discs ejected from the hollow punch by the core member, and a second position clear of the path of reciprocation of the hollow punch.

3,971,277
INTERMITTENTLY OPERABLE ROTARY CHOPPING APPARATUS FOR MATTED FIBROUS MATERIAL

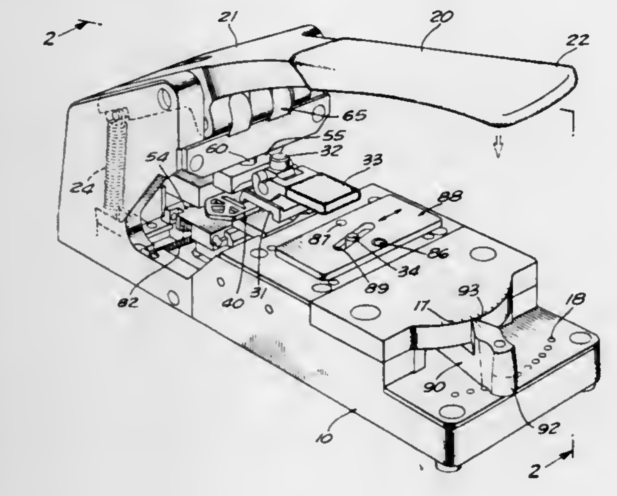
Carl D. Kowalski; Lawrence R. Finn, both of Toledo, and Richard C. Yawberg, Grand Rapids, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed June 19, 1975, Ser. No. 588,525
Int. Cl.^{2} B26D *7/14, 1/56*
U.S. Cl. 83—176 **7 Claims**



1. Rotary chopping apparatus for chopping resiliently compressible matted fibrous material fed continuously thereto into mats of a pre-selected length discharged therefrom, the apparatus comprising a back-up roll, a rotatably mounted chopping blade intermittently driven while the apparatus is in operation and cooperatively associated with the back-up roll, means for rotatably driving the chopping blade from a rest position through one revolution upon the passing of substantially a pre-selected length of the matted fibrous material across the back-up roll, means for stopping the chopping blade in its rest position after the one revolution until additional matted fibrous material of a length substantially equal to the pre-selected length has passed the back-up roll, and a cam associated with the chopping blade and mounted rotationally ahead thereof for progressively compressing the matted fibrous material against the back-up roll, by moving a top surface of the material progressively closer to the back-up roll before the chopping thereof by the cooperative action of the chopping blade and the back-up roll, to aid in effecting end surfaces on the chopped-off mats substantially planar and substantially perpendicular to top and bottom surfaces of the mats after end portions thereof resume their original thickness from a compressed state occurring during the chopping.

3,971,278
CARRIAGE POSITIONING MECHANISM

Horst W. Wich, 816 Brent St., South Pasadena, Calif. 91030
Division of Ser. No. 458,708, April 8, 1974. This application June 30, 1975, Ser. No. 591,639
Int. Cl.^{2} B26F *1/12*
U.S. Cl. 83—413 **11 Claims**

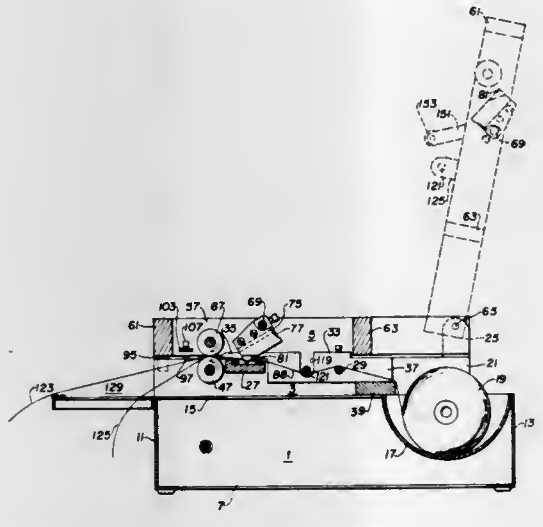


1. In a key cutting machine, punch and die mechanism comprising:

a die carriage having a die and a punch supported thereon, said punch being reciprocable within said die;
guideway means supporting said die carriage for movement in a direction perpendicular to the axis of reciprocation of said punch, said die carriage having a series of notches spaced along one surface thereof in a direction parallel to said guideway means;
ratchet means adapted to engage a selected one of said notches for supporting said carriage in a corresponding position of movement; and
drive spring means associated with said die carriage for advancing same through a series of positions corresponding to respective ones of said carriage notches.

3,971,279
COPY TRIMMER MACHINE

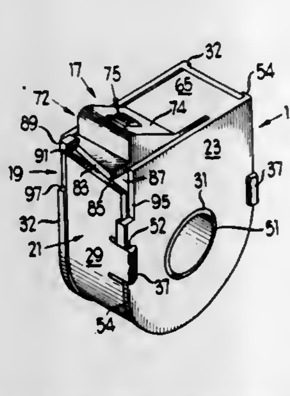
William T. Wright, 1800 Stokes St., San Jose, Calif. 95126
Filed Sept. 22, 1975. Ser. No. 615,477
Int. Cl.^{2} B26D *7/00, 1/02*
U.S. Cl. 83—425.4 **8 Claims**



1. A copy trimmer machine comprising a base frame having means for supporting a roll of paper to be trimmed, a guide assembly supported on said base frame and including means for guiding paper from such roll past a trimming location, a cutter assembly, means removably securing said cutter assembly to said guide assembly, said cutter assembly including meaps for trimming said paper as it passes said trimming location.

3,971,280
TAPE DISPENSER

Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.
Filed Nov. 6, 1975, Ser. No. 629,271
Int. Cl.^{2} B26D *1/38, 5/10*
U.S. Cl. 83—436 **10 Claims**

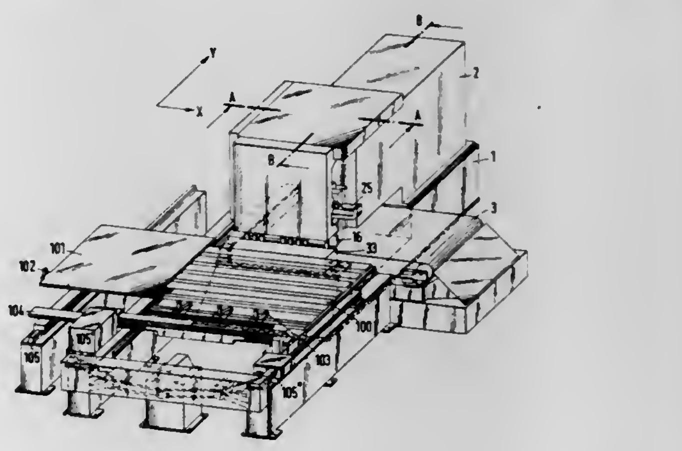


1. A dispenser for shearable material comprising:

a chamber defining housing for receiving a quantity of material in the form of a rolled strip, said housing including means defining an opening to allow egress of the material from the chamber;
advancement means operable to advance the strip of material out of said chamber through the opening; and
a shearing mechanism integrally formed on said housing said shearing mechanism including a pair of sharp shearing edge surfaces disposed to receive the strip material therebetween and being movable to produce point contact between said sharp shearing edge surfaces progressively thereacross to effect shearing of the interposed strip of material.

3,971,281
ANGLE SHEARS WITH DIVIDED SHEAR CUTTING MEMBERS

Walter Bredow, Ziegelmasch 16a; Walter Tamaschke, Pestalozzistr. 10, both of 322 Alfeld, Leine, and Günther Rott, Neue Strasse 35, 3221 Gerzen near Alfeld, all of Germany
Filed Feb. 11, 1975, Ser. No. 549,055
Claims priority, application Germany, Sept. 5, 1974, 2442547
Int. Cl.^{2} B23D *15/08*
U.S. Cl. 83—519 **15 Claims**



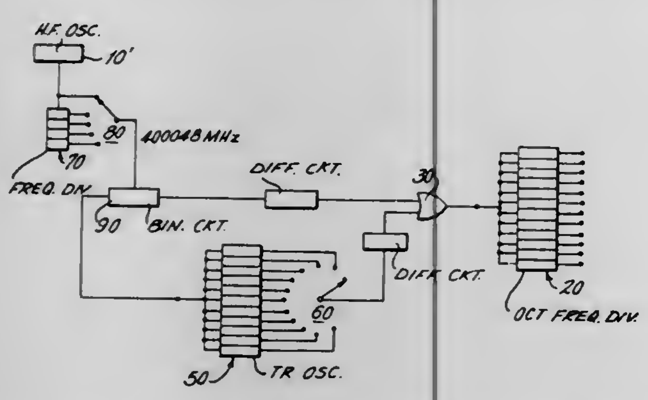
1. An angle shears for cutting sheet metal and the like including two shear cutting members for cuts in two directions, the shear cutting members having cutting edges, means arranging one shear cutting member in the X-direction and the other shear cutting member in the Y-direction to be capable of moving independently of each other, the cutting edges of the shear cutting members being inclined at small angles to the surface of the sheet metal to be cut, a divided drive for said shear cutting members including threaded spindles operably connected to the shear cutting members whereby rotation of the spindles in one direction moves the shear members in a first direction and rotation of the spindles in a second direction moves the shear members in the opposite direction, and a positional sensor for sensing the vertical position of the shear cutting members.

3,971,282
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF TRANSPOSITION

Nobuharu Obayashi, Shizuoka, and Tetsuzi Sakashita, Hamamatsu, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan
Continuation-in-part of Ser. No. 352,627, April 19, 1973, Pat. No. 3,877,337. This application Jan. 27, 1975, Ser. No. 544,664
Claims priority, application Japan, Apr. 20, 1972, 47-39103
Int. Cl.^{2} G10H *1/00, 5/02*
U.S. Cl. 84—1.01 **1 Claim**

1. An electronic musical instrument capable of transposition comprising a high frequency oscillator having an output, a first frequency divider connected to the output of said oscillator, selector switch means connected for selecting the output frequency of the high frequency oscillator or a divided frequency at different outputs of the divider, an octave frequency divider including twelve counter circuits to generate

twelve tone signals, a transposition oscillator including a plurality of counter circuits, means to control the addition of the frequency of the output of said high frequency oscillator or said first frequency divider to the frequency of the output of the transposition oscillator to generate an input frequency for the octave frequency divider, said means including a selector switch between the transposition oscillator and said octave



frequency divider, first and second differentiation circuits connected respectively to said switch means and to said selector switch, an OR circuit connected to the outputs of the first and second differentiation circuits and to the input of the octave frequency divider, and a binary counter between said switch means and said transposition oscillator and said first differentiation circuit.

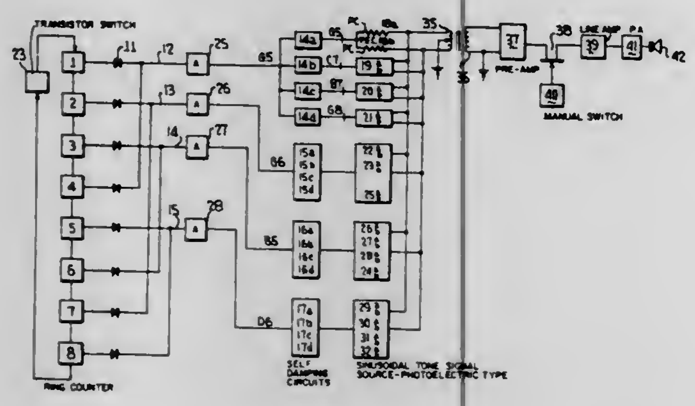
3,971,283
ELECTRONIC ZIMBELSTERN

William C. Wayne, Jr., Fort Mitchell, Ky., assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 29, 1974, Ser. No. 501,847

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.26 **8 Claims**



1. In combination, with a plurality of groups of tone signal sources, said tone signal sources being normally inoperative and operative in response to application of control voltages for rendering said tone signal sources operative at amplitudes which are functions of the levels of said control voltages, a source of repetitive relatively short pulses, a plurality of leads connected to said sources and each conveying one of said pulses, means for converting said relatively short pulses to plural relatively long control voltage pulses, each of said relatively long control voltage pulses having a predetermined relatively rapid exponential rate of rise followed by a relatively slow exponential rate of fall, each of said groups of tone sources including plural sinusoidal tone sources having frequencies appropriate in combination to form partials of a bell sound, when electroacoustically reproduced, and means applying said plural relatively long control voltage pulses as said control voltages individually to said tone signal sources, the said rates of rise and fall of each of said control voltages, respectively, being appropriate to shape the envelopes of said tone signal sources, respectively, of said groups appropriately to simulate the sounds of a different bell for each of said groups.

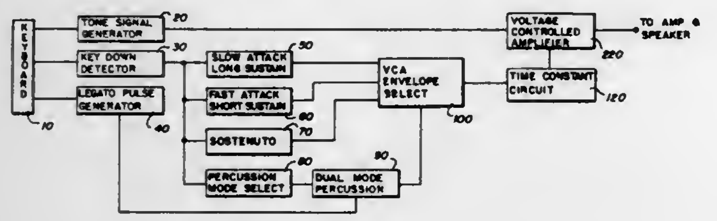
3,971,284
PLURAL MODE ENVELOPE GENERATOR FOR VOLTAGE CONTROLLED AMPLIFIER

Wilford R. Schreier, Bensenville, Ill., assignor to Hammond Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 447,905, March 4, 1974, Pat. No. 3,898,905. This application Mar. 3, 1975, Ser. No. 554,437

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.26 **6 Claims**



1. In combination in an electronic musical instrument:

a plurality of selectively actuable control elements for controlling the sounding of musical notes;

a keydown detector for detecting when any one of said control elements is actuated to produce a keydown signal;

a legato pulse generator for producing a legato pulse signal each time an additional one of said control elements is effectively actuated;

a tone signal generator coupled to said control elements for producing electrical tone signals in response to actuation thereof;

a voltage controlled amplifier for gating said electrical tone signals to an output circuit; and

voltage envelope control circuitry for said voltage controlled amplifier comprising:

a basic time constant circuit comprising an input lead, an output lead coupled to said voltage controlled amplifier, and a resistor and capacitor coupled in parallel between said input and output leads and ground;

a plurality of envelope signal generating means coupled individually to one or both of said keydown detector and said legato pulse generator, each adapted to be operatively coupled to said input lead of said basic time constant circuit to produce a different envelope signal on said output lead thereof; and

selector circuit means for selectively coupling individual ones of said envelope signal generating means to said input lead.

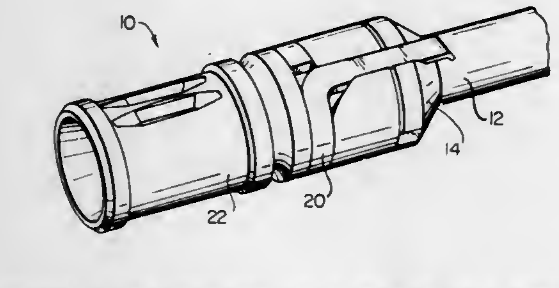
3,971,285
ADJUSTABLE MUZZLE COMPENSATOR

Paul H. Ellis, and Richard R. Kramer, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,543

Int. Cl.² F41C *21/18*

U.S. Cl. 89—14 C **7 Claims**



1. A device to be mounted on a muzzle of a weapon comprising:

a collar means adapted to be secured to said muzzle having two indexing slots for defining two radial positions on said muzzle, said collar means including a plurality of internal radial ridges for engaging said muzzle and preventing rotational movement of the collar relative to the muzzle;

gas diverter means adapted to be rotatably connected to the muzzle and to extend beyond the end of the muzzle for diverting gases exiting said muzzle to a preselected radial direction; and

locking means interconnecting said collar means and said gas diverter means for locking said gas diverter means in one of the two radial positions defined by said collar means.

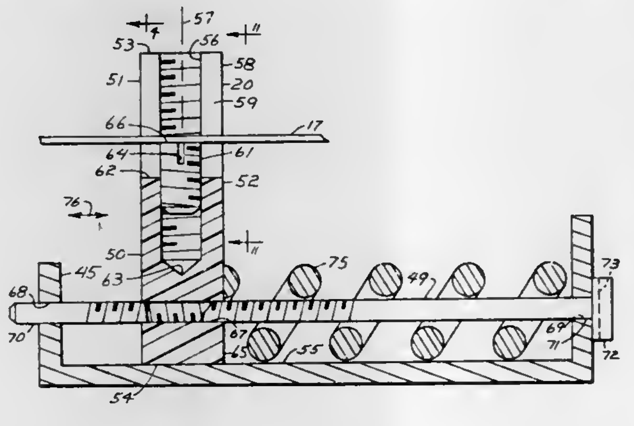
3,971,286
GUITAR STRING SUPPORTING DEVICE

James J. Borell, 1318 W. Oak St., Kissimmee, Fla. 32741

Filed Aug. 27, 1975, Ser. No. 608,063

Int. Cl.² G10D *3/04*

U.S. Cl. 84—298 **10 Claims**



1. A guitar comprising an elongated horizontally arranged keyboard, a guitar string suspended over the keyboard, and a device mounted at one end of the keyboard for thereat supporting said guitar string above the keyboard, said device comprising a body portion having vertically spaced apart upper and lower faces, horizontally spaced apart opposite side walls located between said faces, an axially vertically arranged threaded bore located between said side walls and opening upwardly through the upper face of the body portion, and a vertical slot which lies in a plane common to the axis of said bore and which opens laterally of the body portion through said side walls and upwardly through said upper face, and a threaded screw element which threadedly engages the body portion within said bore and has an upper surface that is located below said upper face; said guitar string being received in said slot and supported on said upper surface, and said screw element being axially adjustable in the bore by the rotatable manipulation thereof with respect to the body portion.

3,971,287
DAMPER FOR STRING INSTRUMENT

Tetsuo Ito, 5-5-22, Shimo-Hoya, Hoya, Tokyo, Japan

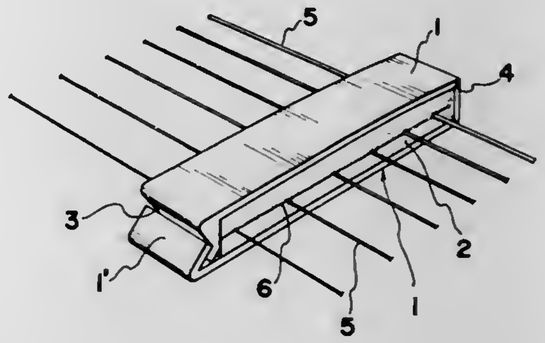
Filed Sept. 9, 1974, Ser. No. 504,238

Claims priority, application Japan, Nov. 26, 1973, 48-135760[U]

Int. Cl.² G10D *3/00*

U.S. Cl. 84—453 **11 Claims**

1. A damper for a stringed instrument comprising a clamp formed of an integral elongate strip of plastic material comprising two leg portions of approximately equal length, a short intermediate connecting portion and transversely notched portions joining opposite ends of said connecting portion with one end of each of said leg portions in hinge lines, the other ends of said leg portions being free, and catch means at said free ends of said leg portions for releasably securing said free ends together, said legs being movable by flexing of said strip at said hinge lines between a closed position in which said catch means is engaged and said legs are approximately parallel to one another and an open position in which said catch means is disengaged and said legs are disposed angularly to one another and a strip of plastic sponge material on the inner faces of said legs, said plastic sponge material being of a thickness equal to approximately half the distance between said legs when in closed position so as to engage the strings of a stringed instrument disposed between said legs and thereby damp said strings.



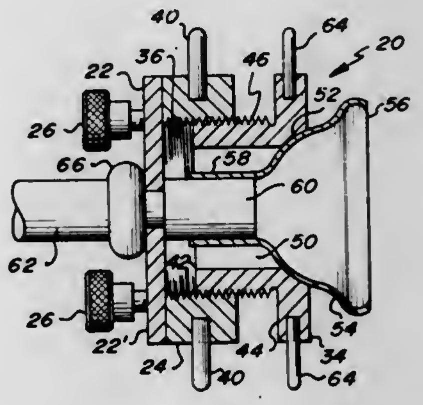
3,971,288
MOUTHPIECE EXTRACTOR

Robert C. Jones, R.D. 6, Box 275, and Robert W. Anderson, R.D. 6, Forest View Acres, both of Flemington, N.J. 08822

Filed Dec. 8, 1975, Ser. No. 638,319

Int. Cl.² G10D *9/02*

U.S. Cl. 84—453 **11 Claims**



1. Apparatus for removing the mouthpiece from a musical instrument comprising, in combination: clamping means having a central opening therethrough for engaging the tubular portion of said instrument adjacent an enlargement on the tubular portion; a support collar having an annular threaded interior portion and a radially extending opening communicating with said threaded interior surface of said collar to receive the tubular portion of said instrument therethrough; means for removably coupling said clamping means to said collar; and hollow ring means coaxially aligned with said support collar and having a first end, a second end, an annular threaded exterior portion adjacent said first end, said threaded exterior portion being rotatably engaged with said threaded interior portion of said collar, and a radially extending opening communicating with the interior of said ring means to receive the tubular portion of said instrument therethrough, said ring means second end being adapted to abut said mouthpiece to exert a longitudinal thrust thereon to separate said mouthpiece from the tubular portion of said instrument as said ring means and said support collar are rotated in opposite directions relative to one another so as to cause said ring means to move longitudinally away from said clamping means.

3,971,289

WHEEL NUTS

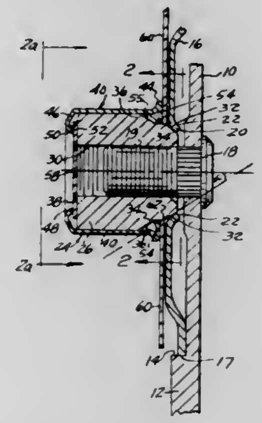
Joseph W. Chalvre, Royal Oak, Mich., assignor to Towne Robinson Fastener Company, Dearborn, Mich.

Continuation of Ser. No. 69,816, Sept. 4, 1970, abandoned, which is a division of Ser. No. 825,330, May 16, 1969, Pat. No. 3,561,820. This application July 24, 1972, Ser. No. 274,364

The portion of the term of this patent subsequent to June 22, 1988, has been disclaimed.

Int. Cl.^{2} F16B *37/14*

U.S. Cl. 85—35 **3 Claims**



1. A capped wheel nut assembly comprising: a wheel nut having a plurality of flat peripheral faces and an axially extending shank portion of reduced diameter, a decorative cap of relatively thin sheet material having a skirt portion overlying the faces of the nut and in facial engagement therewith, said skirt portion terminating adjacent said shank in a radially outwardly extending flared flange of greater diameter than said skirt portion which is in facial engagement with said nut, said flared flange being reversely bent substantially radially inwardly toward said shank portion to provide a flat, annular surface having a plane which is substantially perpendicular to the longitudinal axis of said nut.

3,971,290

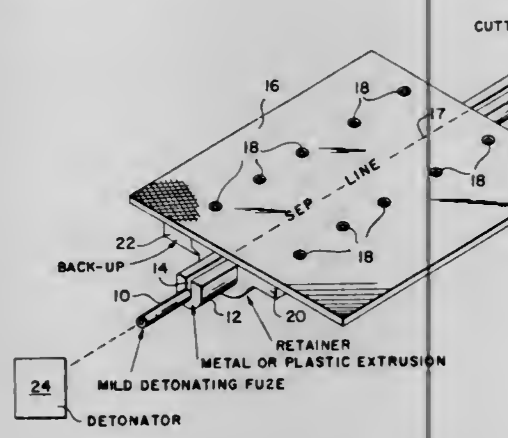
EXPLOSIVE LINEAR CUTTER

Jim W. Blain, Santa Cruz, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,696

Int. Cl.^{2} B26F *1/26*

U.S. Cl. 89—1 B **2 Claims**



1. Apparatus for making a clean cut in a composite laminate of graphite/fiberglass material comprising:
- cutter means for propelling a high velocity metal fragment into the material to be cut, said cutter means comprising:
  - an explosive longitudinal core sheathed in a metal covering, said core and said covering having a circular cross section, said covering being adapted to fragment upon firing of said core;
  - a support extending in a longitudinal direction and having an elongate bore of circular cross section in intimate contact with the core metal cover to encompass it over more than one hundred and eighty degrees of its external surface;
  - a narrow longitudinal slot with parallel walls having an internal width dimension that is no greater than the diameter of said bore, said slot extending from the bore and forming a spaced opening between a portion of the sheathed core and the material to be cut when the latter is placed upon the support over the slot for cutting by means of a highly directional jet formed from a portion of said sheath and by said slot geometry upon explosion of said core.

3,971,291

APPARATUS FOR COCKING A BREECHBLOCK

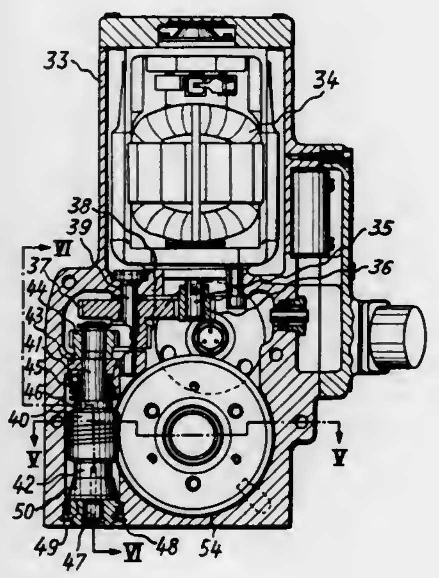
Heinz Schellenberg, Wetzikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,833

Claims priority, application Switzerland, Nov. 1, 1973, 15396/73

Int. Cl.^{2} F41D *11/00*

U.S. Cl. 89—1 K **2 Claims**



1. An apparatus for cocking a breechblock of an automatic firing weapon comprising, in combination:
- A. an electric motor;
- B. a displacement mechanism for the breechblock for moving the breechblock into its cocked position;
- C. an electromagnetic coupling for connecting said electric motor with said displacement mechanism;
- D. transmission means arranged between the electric motor and the electromagnetic coupling;
  - a. said transmission means forming an overload device including:
    - 1. a worm;
    - 2. a worm gear meshing with said worm;
    - 3. a spring cooperating with said worm;
- E. means for mounting said worm to be axially displaceable against the force of said spring;
- F. a conical portion provided for the worm;
- G. an electric switch for disconnecting the electromagnetic coupling when the breechblock reaches its cocked position;
- H. said conical portion actuating said electric switch during axial displacement of the worm for disconnecting the electromagnetic coupling upon encountering a displacement resistance of the breechblock which exceeds a predetermined value.

3,971,292

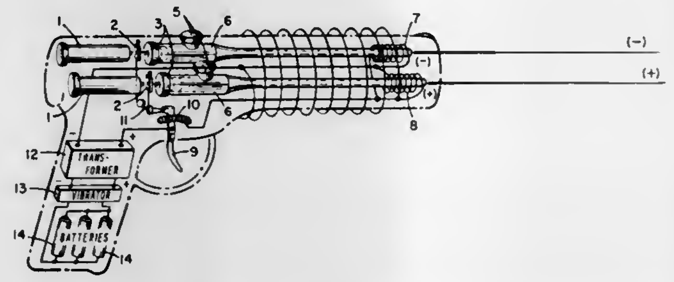
PROJECTOR OF FLUID WITH ELECTRIC CHARGE, OF PORTABLE TYPE

Juan Garcia Paniagua, C/Alejandrina, 1609, Guadalajara, Jal., Mexico

Filed Nov. 12, 1974, Ser. No. 522,775

Int. Cl.^{2} F41F *5/00*

U.S. Cl. 89—1 A **8 Claims**



1. A double-barrelled electrical weapon which projects two, continuous, parallel streams of conducting medium and which utilizes a target object to complete an electric circuit through which electrical energy flows, the weapon consisting of: a source of gas under pressure; an actuating mechanism for controlling the discharge of gas from said source; a source of conductive fluid associated with said gas in such a manner that discharge of said gas projects said conductive fluid; first and second non-conductive conduits through which said conductive fluid is projected by said gas; first and second conductive contactors associated with respective said non-conductive conduits, for making electrical contact with the fluid passing through said first and second conduits; an electrical power supply whose poles are connected to respective said first and second contactors so that the conductive fluid propelled from one of said conduits is electrically positive, and the conductive fluid propelled from the other of said conduits is electrically negative; and first and second solenoids, concentric with respective of said non-conductive conduits for reinforcing the polarity and intensity of the electrical energy in said conductive fluid.

3,971,293

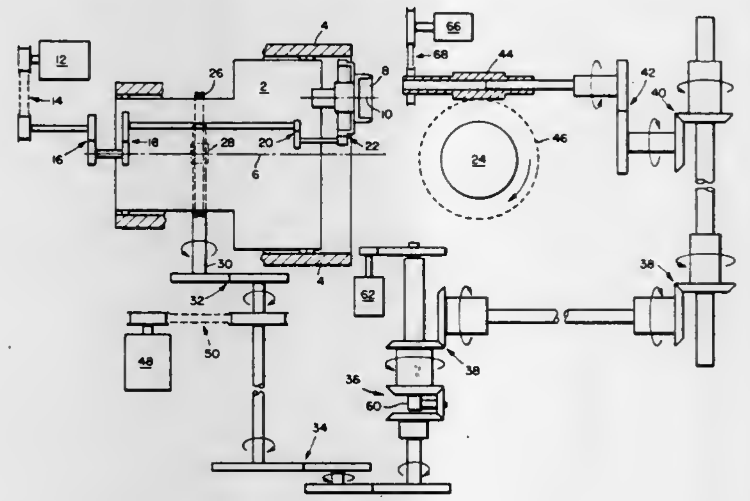
ANTI-BACKLASH MECHANISM FOR GENERATING TRAIN OF GEAR CUTTING MACHINE

Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Apr. 30, 1975, Ser. No. 572,998

Int. Cl.^{2} B23F *9/10*

U.S. Cl. 90—5 **5 Claims**



1. In a gear generator having
- a. a rotatable work-holding spindle,
- b. a cutter spindle mounted in a rotatable cradle,
- c. a generating train interconnecting the work spindle and cradle for rotating them simultaneously in timed relation, and
- d. first drive means,
  - i. connected to the generating train at a first junction intermediate said work spindle and cradle,
  - ii. for driving said train in at least one direction,

the improvement comprising:
- e. second drive means
  - i. for simultaneously driving the train in the same said direction,
  - ii. said second drive means being connected to the generating train at a second junction remote from said first junction and in proximity to the work spindle end of said train.

3,971,294

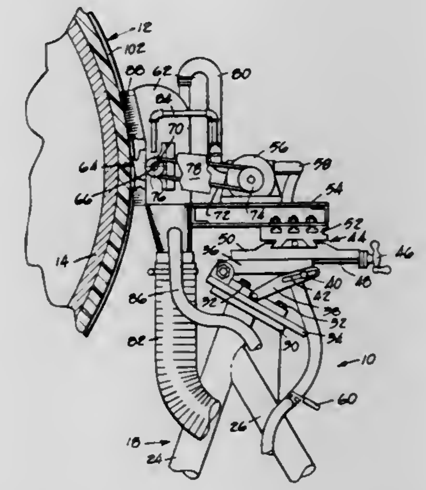
APPARATUS FOR CUTTING A MEMBER AND SEAL MEANS FOR ASSOCIATION WITH SUCH MEMBER

Charles E. Devrick, Lakeland; Nicholas J. Houmis, Tampa, and Russell A. Johnson, Brandon, all of Fla., assignors to Fibreboard Corporation, San Francisco, Calif.

Filed Feb. 11, 1974, Ser. No. 441,060

Int. Cl.^{2} B23C *1/14*

U.S. Cl. 90—20 **2 Claims**



1. Apparatus for forming an annular groove about the outer surface of a member rotatable about an axis, comprising:
- base means; means adjustably positioning said base means;
- cutter means comprising a rotatable cutter having a plurality of cutting edges, means rotatably mounting said cutter relative to the base means, and positionable upon positioning of the base means to engage the outer surface of the member so, that, upon rotation of said cutter, said cutting edges are in cutting engagement with the outer surface of said member; said adjustable means further including means for selectively varying the position of the cutter relative to the base means and the member toward and away from said axis about which the member is rotatable and means for selectively varying the position of the cutter relative to the base means and the member generally along said axis about which the member is rotatable,
- means for rotating the cutter to cut the outer surface of the member, so that upon rotation of the member about said axis, said annular groove is cut therein about the outer surface thereof,
- said means for rotating the cutter comprising an air motor means drivable upon a supply of flowing air thereto, and further comprising inlet conduit means for supplying a flow of air exhausted from said air motor means adjacent to the cutter, and outlet conduit means conducting the air with the member material residue resulting from said cutting of the member away from said cutter, and
- brush means mounted relative to the base means and disposed around the cutter and engageable with at least a portion of the outer surface of the member adjacent the cutter serving to contain the air entering and exiting adjacent the cutter means.

3,971,295
CONTROL MEANS

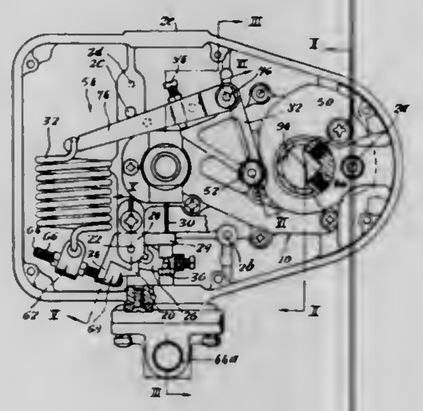
Alan Richard Brine Nash, 39 Abbott's Ride, Farnham, England

Filed Sept. 11, 1974, Ser. No. 505,132

Claims priority, application United Kingdom, Sept. 14, 1973, 43297/73

Int. Cl.² F15B *13/16*

U.S. Cl. 91—386 **9 Claims**



1. Positioning means for use with an actuator having a chamber, a displaceable member in said chamber and porting leading to the chamber at opposite sides of the member for admission of pressure fluid to displace the member in the chamber, an element connected to and displaceable with said member being engageable from the exterior of the actuator for transmission of the motion of the member, the positioning means comprising, in combination, a control valve, means connecting said valve to said actuator chamber, biasing means and interconnection between said biasing means and the control valve for transmitting a force from said biasing means urging the valve to a state in which the fluid is supplied to the actuator chamber to move the displaceable member to one end position, means for applying a controlling force to the control valve to move it against the action of the biasing means, feedback means comprising an element connected to said transmission element of the actuator for movement by said element and said feedback means further comprising a lever, pivot means supporting the lever intermediate its extent, opposite end portions of the lever projecting in different directions from said pivot means, one end portion of the lever engaging said element of the feedback means, the other end portion being connected to a first region of the biasing means for modifying the action of the biasing means on the control valve in dependence upon the movement of said transmission element, whereby the control valve is brought to a neutral position by the resultant action of said feedback and biasing means with said controlling force means, said neutral position being obtained at an actuator position dependent upon the magnitude of said controlling force, the control valve being disposed between the biasing means and said element of the feedback means, and the feedback means lever being adjacent one side of the control valve, said interconnection means being connected to a region of the biasing means remote from said first region and being adjacent to the opposite side of the control valve.

3,971,296
PNEUMATIC ACTUATORS

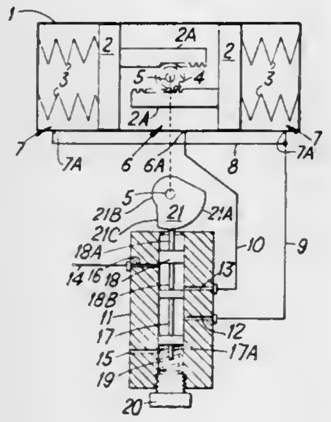
John Tugwell, Crawley, England, assignor to Kelor Limited, Burgess Hill, England

Filed Sept. 18, 1974, Ser. No. 507,105

Int. Cl.² F01B *7/06;* **F15B** *13/042*

U.S. Cl. 91—392 **3 Claims**

1. A pneumatic actuator comprising:
a housing;
a double acting piston movably disposed in said housing separating two pressure chambers;
spring means for urging said piston in one direction;
valve means for admitting compressed air to one of said chambers for loading said spring means, and for transferring some of the air from said one chamber into the other chamber to be trapped therein when the supply of compressed air is cut off, and for opening said one chamber to atmosphere, said spring means and the trapped compressed air providing combined forces acting on said piston in said other chamber completing a power stroke of the actuator; and
means for mechanically interconnecting said piston with said valve means for opening said one chamber to atmosphere at a selected phase position of said piston.



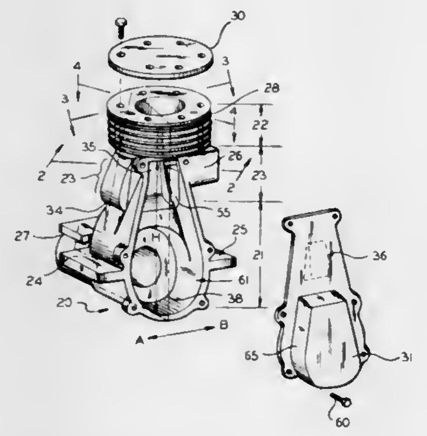
3,971,297
TWO CYCLE ENGINE WITH PERIPHERAL BYPASS FOR PISTON HEAD AND METHOD OF MANUFACTURE

Duke M. Fox, Fort Smith, Ark., assignor to Fox Manufacturing Company, Fort Smith, Ark.

Filed May 24, 1974, Ser. No. 473,074

Int. Cl.² F16J *11/02*

U.S. Cl. 92—169 **6 Claims**



1. A unitary housing for a two-cycle engine, said unitary housing comprising a single casting having a common internal cavity wall forming the entirety of a crank case region and a cylinder region, a number of bypass regions therebetween, there being within said housing three bypass regions extending away from the cylinder in mutually perpendicular directions to form bypasses between said cylinder and crank case when a piston is furtherest withdrawn at the bottom of its stroke, a shaft bearing support region in the crank case and at the front of the housing, an opening formed in the back of the cavity wall of said housing, said opening beginning below the shaft bearing support region and extending from the crank case region through said bypass region, and removable cover means having at least part of one of said bypass cavities formed therein for covering said opening.

3,971,298
PISTON ASSEMBLY WITH COMPRESSION AND GUIDING RINGS

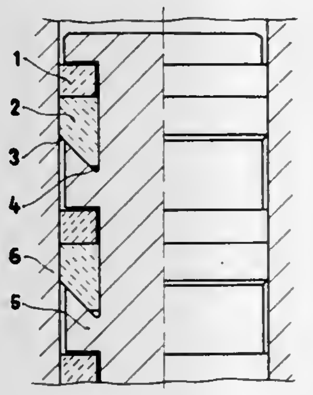
Stanislaw Kulig, Krakow, Poland, assignor to Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea, Krakow, Poland

Filed May 7, 1974, Ser. No. 467,838

Claims priority, application Poland, May 10, 1973, 162453

Int. Cl.² F16J *1/00, 9/20*

U.S. Cl. 92—248 **3 Claims**



1. A piston assembly adapted for use in non-lubricated high-pressure compressors, comprising a piston having a plurality of identical peripheral trapezoidally shaped cross-section grooves therein with each groove having a uniform annular base, a dual ring assembly in each groove protruding from said piston surface so as to contact the cylinder walls of said compressors, thus avoiding direct contact of the piston with said cylinder walls consisting of a seal ring of rectangular-shaped cross-section and a guide ring of largely trapezoidal cross-section with said guide ring seated behind the seal ring in a direction away from the compression end, said seal ring and guide ring in each groove having abutting planar surfaces, said guide ring having a surface opposite the one abutting with the seal ring which is at an acute angle relative to the base thereof to form the said trapezoidal cross-section and at least partially conical in shape, each peripheral groove in said piston having a corresponding wall defining an acute angle with the base of the groove to define an angularly shaped groove enabling said guide ring to hook into same and in abutment therewith, said guide ring being made from carbon-graphite material providing higher resistance to shape deformation than the seal ring said seal ring being made from polytetrafluoroethyle and both rings being more abradable than the material of the piston.

3,971,299
MANUFACTURE OF BAGS

Harry Reed Whittle, Wallingford; Michael John Lee, Didcot, and Roy Causer, Wantage, all of England, assignors to United Kingdom Atomic Energy Authority, England

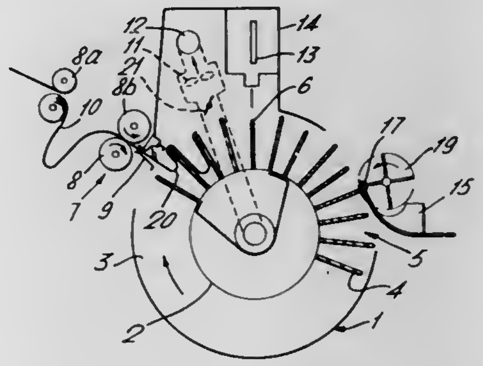
Filed Dec. 3, 1974, Ser. No. 529,056

Claims priority, application United Kingdom, Oct. 3, 1974, 43027/74

Int. Cl.² B31B *23/00*

U.S. Cl. 93—33 H **21 Claims**

1. A machine for manufacturing bags from a strip of two superimposed layers of plastics material, said machine comprising a carriage, a plurality of dividing members thereon which define a series of spatial intervals, means for moving the carriage so as to present each spatial interval first to a material feed station, then to a work station, and then to a take-off device, said feed station including means for continuously feeding a strip of material to the carriage, means for maintaining a predetermined relationship between the rate of feed of the material and the speed of the carriage, and a feed duct for feeding the strip of material into each spatial interval as that spatial interval is presented to the feed station, the work station including means for forming a welded seam and for cutting the strip material into sealed length at every alternate dividing member as it is presented to the work station, and said take-off device comprising at least one stationary spike pointing in a direction opposite of the direction of movement of the dividing members past the take-off device and disposed so as to pierce the sealed and cut lengths of material where said lengths are folded over the dividing members intermediate the dividing members at which the cutting and sealing operations are carried out, the said intermediate dividing members being relieved to allow the passage of the at least one spike therethrough.



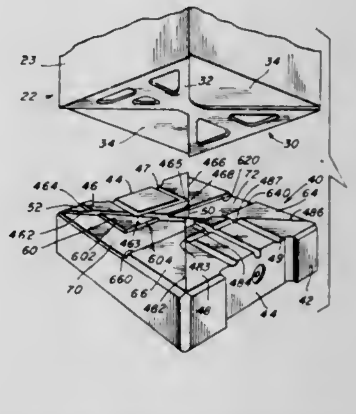
3,971,300
APPARATUS FOR ULTRASONIC SEALING OF NON-UNIFORM FOLDED CARTON BOTTOM CLOSURE

George L. Bachner, Barrington, Ill., assignor to Nimco Corporation, Crystal Lake, Ill.

Filed Apr. 25, 1975, Ser. No. 570,544

Int. Cl.² B31B *1/28*

U.S. Cl. 93—36.3 **31 Claims**



1. Apparatus for use with a bottom closure folding machine for sealing the bottoms of paperboard cartons composed of foldable thermoplastic double coated material, comprising:
a first means for sealing, said first sealing means having a body portion and a face with a raised portion and a recessed portion;
a second means for sealing, said second sealing means for forcibly engaging said first sealing means, said second sealing means having a multiplicity of surfaces separated from one another by walls, said multiplicity of surfaces lying in at least two distinct planes and shaped for receiving infolded panels of a folded carton bottom closure so that the force applied to the outer surface of the folded carton bottom closure during forcible engagement of said first sealing means and said second sealing means is substantially uniform over a selected area of the folded carton bottom closure;
an ultrasonic vibrator for creating ultrasonic vibration which is transmitted to said selected area of the folded carton bottom closure during a portion of the period of forcible engagement between said first sealing means and said second sealing means to create an ultrasonic seal over said selected area of the folded carton bottom closure; and

a drive means for urging said first sealing means and said second sealing means into forcible engagement during the sealing operation.

3,971,301

PROCESS FOR THE PRODUCTION OF THE CLOSURE OF A HOLLOW STICK OF SHIRRED SAUSAGE CASING

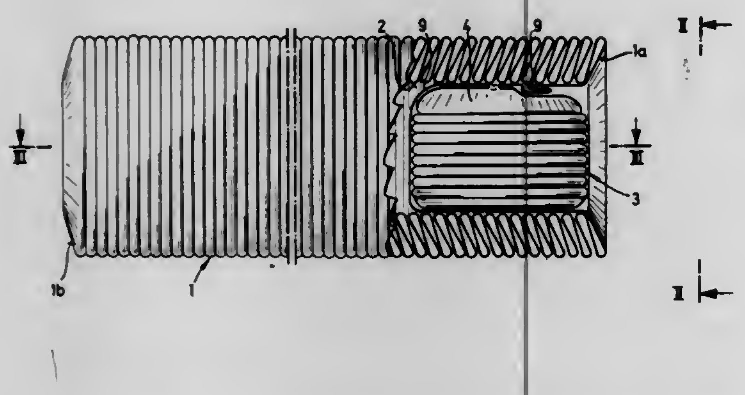
Reinhold Becker, Wiesbaden-Biebrich; Manfred Hennecken, Walluf, and Hans-Georg Zimmerman, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 528,838, Dec. 2, 1974. This application Aug. 29, 1975, Ser. No. 609,316

Claims priority, application Germany, Dec. 3, 1973, 2360480

Int. Cl.² A22C *13/00*

U.S. Cl. 93—84 TW **1 Claim**



1. A process for the production of a unilaterally closed hollow stick of shirred tubular casing with a closure arranged in the interior of the stick and formed from the tubular casing itself, which comprises unshirring a part of the stick to form an unshirred tube portion,

drawing a narrow stick ring from the stick so that an unshirred portion of tubular casing remains between the ring and the stick,

applying a radial force to the outer surface of the narrow stick ring along a line parallel to the longitudinal axis thereof and thereby compressing said ring to form a shaped body having two halves, which body serves as a closure

rotating the closure through 90° in a manner such that a dome-shaped end thereof points to the stick end from which the stick ring was drawn,

and pushing said closure into said stick end.

3,971,302

CHIMNEY FOR EXHAUST GAS HAVING AN ADJUSTABLE MEANS FOR THROTTLING A FLOW OF EXHAUST GAS

Hermann A. Durrer, Brutten, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

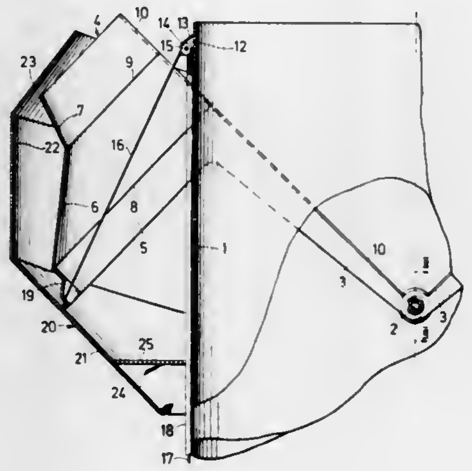
Filed Nov. 19, 1974, Ser. No. 525,178

Claims priority, application Switzerland, Nov. 23, 1973, 16508/73

Int. Cl.² B05B *15/04*

U.S. Cl. 98—60 **11 Claims**

1. An exhaust gas chimney having an outlet end and a throttling means at said end for throttling a flow of exhaust gas passing from said end, said throttling means including a pair of members movably mounted at said outlet end for movement between a closed position relative to each other to define an upwardly converging funnel-like nozzle above said outlet end for throttling a flow of gas passing from said outlet end and an open position relative to each other and out of the vertical plane of said outlet end.



3,971,303

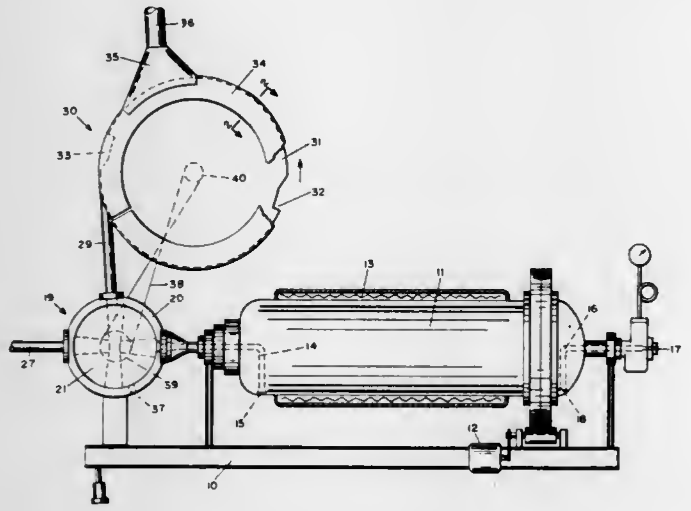
APPARATUS FOR CONTINUOUS PUFFING

Myrland J. Dahl, Northfield, Minn., assignor to Malt-o-Meal Company, Minneapolis, Minn.

Filed Feb. 24, 1975, Ser. No. 552,328

Int. Cl.² A23L *1/18*

U.S. Cl. 99—323.4 **8 Claims**



1. An apparatus for continuous puffing of food material capable of being puffed comprising a pressurized puffing chamber having at its ends, respectively, an inlet and an orifice which is open to a zone of lower pressure than that of the chamber, material supply means, valve means for directing into the inlet successive charges of material and a pressurized gaseous fluid comprising a valve member having at least one passageway extending therethrough, said valve member being movably mounted to repeatedly bring the passageway into and out of communication with said inlet and into and out of position to receive a charge of material from the supply means, feeding means for feeding a charge of material into the passageway each time it is in material receiving position, said feeding means including propelling means for receiving separate successive charges of material from the supply means and applying force thereto for forcibly propelling each charge into the passageway, and means for directing a stream of pressurize gaseous fluid into the passageway after it has received a charge of material and it is in communication with the inlet whereby the fluid and material are brought into mutual contact and then forced into the chamber and expelled through the orifice to cause puffing of the material.

3,971,304

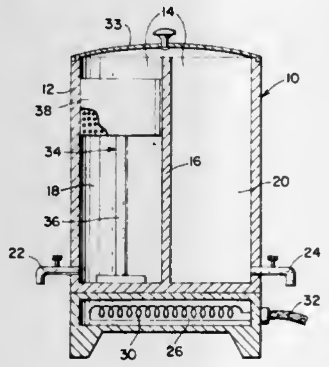
DUAL COMPARTMENT BEVERAGE URN

Mary Cvitkovich, Bellerose, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 28, 1975, Ser. No. 554,074

Int. Cl.² A47J *31/00*

U.S. Cl. 99—291 **5 Claims**



1. A dual compartment urn for providing heated beverages, comprising:

a. a generally cylindrical body defining an interior space;

b. a single continuous partition member disposed in said space and dividing said space into first and second compartments, said partition member and said generally cylindrical body comprising an integral structure whereby the respective contents of said compartments are confined thereto;

c. separate spout means on said generally cylindrical body and communicating with said first and second compartments, respectively;

d. heating means disposed at said cylindrical body so as to be in heat transfer relationship with said respective contents of said first and second compartments; and

e. percolating means for holding coffee grounds and the like.

3,971,305

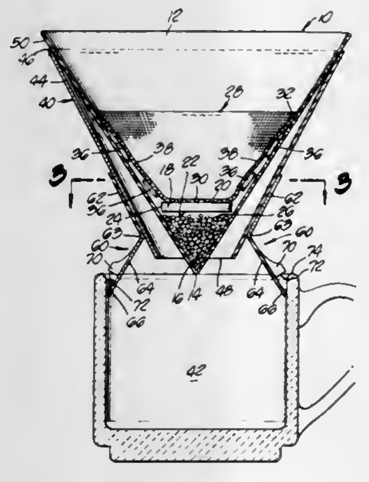
DISPOSABLE BEVERAGE BREWER

Alexander C. Daswick, 647 Orange Grove No. 209, South Pasadena, Calif. 91030

Filed Mar. 27, 1975, Ser. No. 562,707

Int. Cl.² A47J *31/06*, *31/02*

U.S. Cl. 99—295 **17 Claims**



1. A beverage brewer, which comprises:

a. a disposable brewing element having an open top and a closed bottom, and having contained in a lower region thereof a pre-selected quantity of coffee grounds or the like,

said brewing element being adapted to receive a supply of liquid and being liquid permeable,

b. a liquid diverting element disposed within said brewing element above said coffee grounds or the like,

said diverting element being buoyant and substantially nonporous, and substantially covering said coffee grounds or the like in its lowest position, whereby to divert liquid poured into said brewing element from being poured directly onto said coffee grounds, and

c. means disposed within said brewing element above said coffee grounds or the like for movably retaining said diverting element generally within said brewing element,

said retaining means allowing said diverting element to float at substantially any level of liquid within said brewing element, and retaining means also retaining said coffee grounds or the like within said brewing element and allowing a flow of liquid thereto.

3,971,306

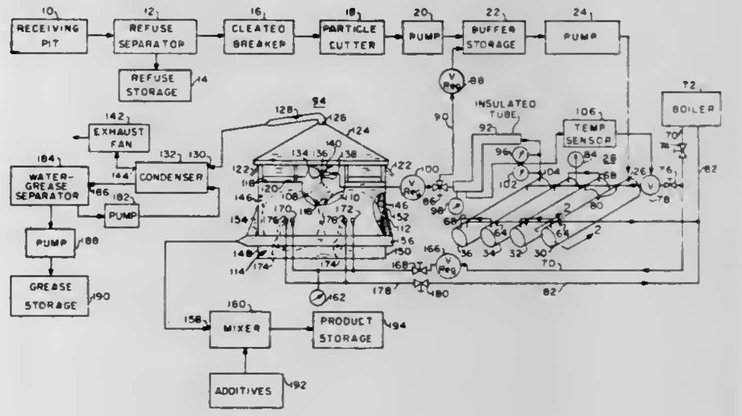
SYSTEM FOR MANUFACTURING ANIMAL FEED

Frank D. Wiese; Donald F. Link, both of Huntsville, and Charles W. Brown, Guntersville, all of Ala., assignors to Cord Systems, Inc., Huntsville, Ala.

Filed July 30, 1974, Ser. No. 493,173

Int. Cl.² A23K *1/10*, *1/14*

U.S. Cl. 99—348 **3 Claims**



1. A system for the manufacture of animal feed comprising:

pulverizing means, including means for receiving animal and vegetable material and liquid for providing as an output an emulsion wherein solid particle sizes are held to 0.02 inch in maximum dimension;

heating means having an inlet and outlet, and comprising means for receiving the output of said pulverizing means at said inlet and raising the temperature of said emulsion to 240° to 300°F. at a pressure of 40 to 90 PSI and discharging said emulsion at said outlet, and comprising:

- at least one heated elongated tube, having an inlet and outlet, and stirring means within said tube for stirring said emulsion and preventing said emulsion from adhering to the inner surface of said tube,
- buffer storage means having first and second inlets and an outlet, said first inlet being coupled to the output of said pulverizing means, and said outlet being coupled to an inlet of said elongated tube, and
- valve means having an inlet connected to the output of said elongated tube and having first and second selected outputs, said first output being connected to said second inlet of said buffer storage means, whereby, selectively, said emulsion may be initially recirculated through said buffer storage means and said heating means until the emulsion is heated to a temperture of 240° to 300°F. and thereafter supplied to said second output;

sterilization means comprising:

- an insulated chamber having an inlet coupled to said second output of said heating means,
- an intermediate region, and
- an outlet, whereby the heated emulsion is received at said inlet and passed through said insulated chamber to said

outlet at a temperature of 240° to 300°F. during transit of said emulsion through said chamber;

pumping means for pumping said emulsion from said pulverizing means through said heating means and said sterilization means with a transit time of 10 to 30 seconds through said sterilization means; and

drying means having an inlet coupled to said outlet of said sterilization means for receiving sterilized emulsion from said sterilization means and separating moisture and grease from said emulsion, whereby a solid material is provided as an output, and comprising:

an enclosure, including means for providing a reduced pressure within said enclosure compared to that in said heating means,

a pair of rotating heated drums, said drums being positioned within said enclosure side-by-side, and wherein adjoining rotating surfaces of said drums have a like direction of peripheral movement, and wherein at the closest region between drums there is a spacing of 0.002 to 0.030 inch,

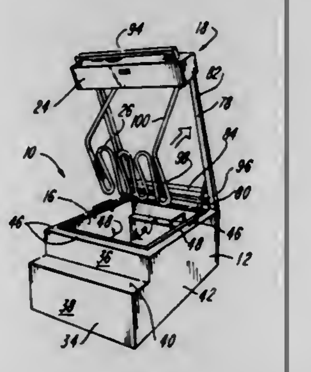
means for spraying said emulsion from said sterilization means into a region of said enclosure above said drums, whereby liquid portions of the emulsion are substantially vaporized by virtue of reduced pressure and solid matter is directed onto and between the adjacent rotating drums, and whereby a film of material forms, dries, and initially adheres to the sides of said drum, and

scraping means in engagement with each said drum for removing said solid matter and for providing it as said output of said drying means.

3,971,307
DEEP FAT FRYER

Glenn N. Graham, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.

Filed Aug. 14, 1975, Ser. No. 604,847
Int. Cl.² A47J *37/12*
U.S. Cl. 99—403 12 Claims

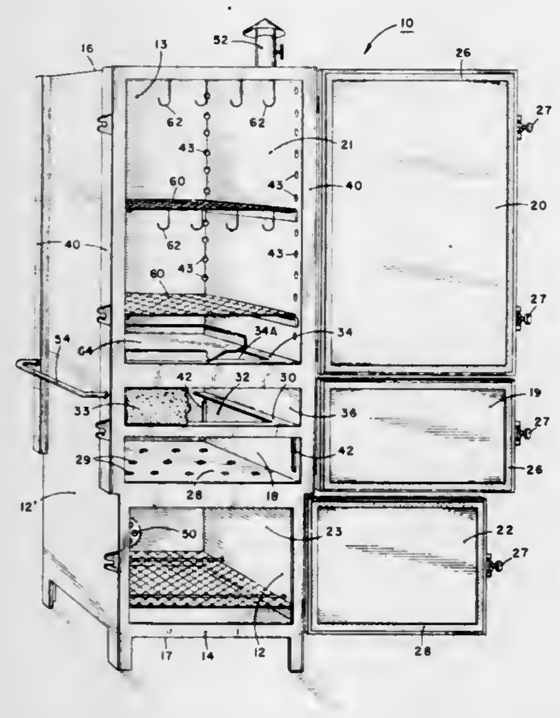


1. The deep fat fryer which comprises: a generally rectangular box having front and rear endwalls and sidewalls cooperating with one another to define an open-topped well; an open-topped reservoir for cooking oil removably mounted within the well in the box; an open-topped lid subassembly hingedly attached to the box for movement between a closed position atop thereof and an open position raised to a height that will permit removal of the reservoir from the well in the box, said lid subassembly including a pair of hollow arms pivotally attached at their rear ends to the upper outside corners of the rear endwall of the box and extending forwardly therefrom along the sidewalls of the latter to its front endwall, a housing connected to the front ends of the arms extending transversely therebetween along the front endwall of the box atop which it rests in the closed position of said lid subassembly, an electrically-powered heating element connected to the housing and projecting therefrom down along the front wall of the reservoir and along the bottom thereof, and control means mounted on the front of the housing and connected to the heating element operation to actuate the latter and regulate the temperature thereof; and, means comprising a power cord connectable to a source of electrical energy entering the rear endwall of the box and passing therefrom in heat-shielded rotation to the control means at the front of the lid subassembly through the hollow arms thereof.

3,971,308
PORTABLE SMOKEHOUSE

Darrell G. Parker, F.M. 159, P.O. Box 422, Millican, Tex. 77866

Filed July 21, 1975, Ser. No. 597,801
Int. Cl.² A23B *4/04*
U.S. Cl. 99—467 4 Claims



1. A portable smokehouse having a box-shaped housing, comprising:

a top wall, a bottom wall, a rear wall, a front wall, and side walls between said top and bottom walls;

means vertically spaced below said top wall forming a comestible chamber therebetween;

said means and said bottom wall forming a firebox therebetween;

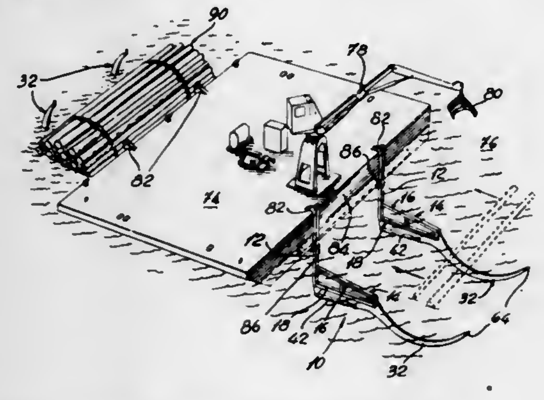
vertically positioned duct means in smoke communication between said firebox and said comestible chamber for carrying smoke into said comestible chamber and;

a heat insulating tray removably positioned above said firebox whereby when said tray is removed from said housing, heat and smoke will move directly from said fire box into said comestible chamber.

3,971,309
LOG BUNDLING APPARATUS AND METHOD OF BUNDLING LOGS

Wilfred Spry Brodie, P.O. Box 175, Gibsons, British Columbia V0N 1V0, Canada

Filed Apr. 10, 1975, Ser. No. 566,904
Int. Cl.² B63B *27/16*
U.S. Cl. 100—2 12 Claims



1. A log bundling apparatus comprising:

at least one L-shaped frame, each L-shaped frame including a leg portion and a base portion extending outwardly from and rigidly connected to the leg portion, each leg portion adapted to be secured to a support structure situated within a body of water, whereby each base portion and a lower section of each leg portion is adapted to be submerged beneath a surface of a body of water;

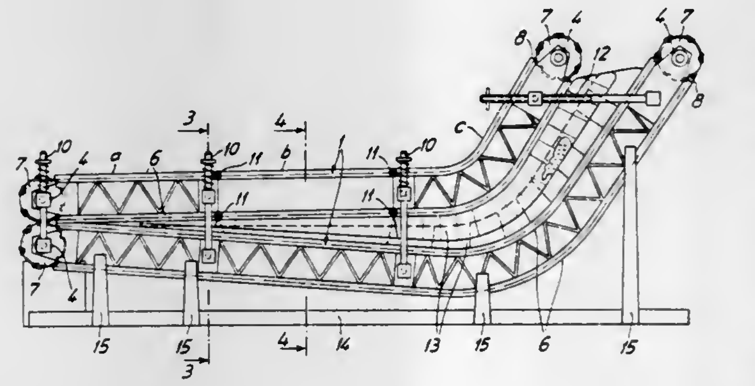
an arm structure pivotally secured to each base portion adjacent a free end thereof;

actuating means mounted between each L-shaped frame and each arm structure, the actuating means adapted to pivot its respective arm structure from an open position in which each arm structure is submerged beneath the surface of the water and a closed position wherein a free end of eacn arm structure extends above the surface of the water, whereby each arm structure is adapted to engage logs situated above each arm structure and its respective submerged base portion so as to urge the logs towards its respective leg portion as each arm structure is being advanced into the closed position by the actuating means, thereby forming a compact bundle of logs which can be secured together.

3,971,310
PRESS FOR SQUEEZING AGRICULTURAL PRODUCTS

George C. Kondos, Patission Street, 153, and Dimitrios I. Angelou, Sevastoupoleos Street, 47-49, both of Athens, Greece

Filed Feb. 18, 1975, Ser. No. 550,746
Claims priority, application Greece, Feb. 16, 1974, 49623
Int. Cl.² B30B *9/24*
U.S. Cl. 100—118 13 Claims



1. A press for squeezing agricultural products comprising

a pair of perforated endless belt means disposed in opposed relation to each other;

guide means mounting said pair of belt means therein to define a converging passageway between said pair of belt means from an entrance end to an exit end, said guide means including a series of guide rails guiding each endless belt means, said guide rails being separated into a plurality of articulated sections;

means for driving said pair of belt means in opposite directions;

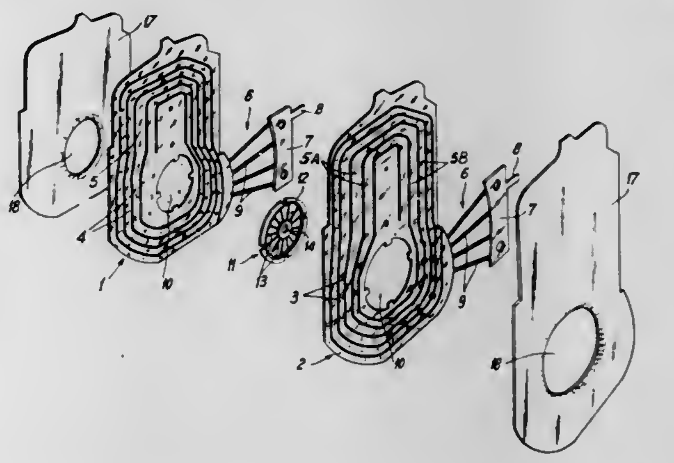
a pair of perforated vertical side walls between said pair of endless belt means, each said side wall being disposed on an opposite side of said passageway; and

spring means secured to said guide means for resiliently mounting said guide rail sections and belt means therein relative to each other to permit an outward vertical adjustment of said guide rail sections and said belt means therein to the other in response to excess pressure within said passageway.

3,971,311
STRIKING DEVICE FOR DOT PRINTER

Jacques Roland Deproux, Sevres, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 15, 1974, Ser. No. 442,834
Claims priority, application France, Feb. 19, 1973, 73.05754
Int. Cl.² B41J *1/28*
U.S. Cl. 101—93.04 17 Claims

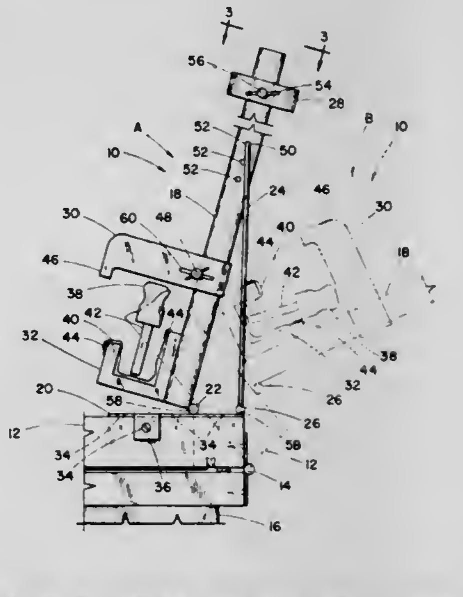


1. Striking device for a dot printer, said striking device comprising an electrodynamic coil operatively associated with a striking hammer and connected to a current generator, a deformable elastic suspension unit carried by said coil and having means for mounting on a fixed support, for substantially rotational movement about a first axis perpendicular to the plane of said coil, said coil being generally a spiral and being in the form of a thin foil sheet having at least one generally spiral cut therein dividing said sheet into two parallel rectilinear parts, first and second magnetic means providing first and second magnetic fields, the first rectilinear part being subjected to the action of the first magnetic field the direction of which is substantially perpendicular to the plane of the coil and to said first rectilinear part, the second rectilinear part being subjected to the action of the second magnetic field the direction of which is opposed to the direction of the first magnetic field.

3,971,312
ADJUSTABLE SQUEEGEE HOLDING DEVICE FOR SILKSCREEN PRINTING FRAME

Othmar Carll, 341 Baltimore St., Gettysburg, Pa. 17325

Filed May 19, 1975, Ser. No. 578,663
Int. Cl.² B41F *15/02, 15/36*
U.S. Cl. 101—114 7 Claims



1. An adjustable squeegee holding and counterbalance device for a silkscreen printing frame comprising in combination, a silkscreen printing frame, a printing bed, a mounting bracket member firmly affixed in flush complementary abut-

ment to an upper corner surface of said silkscreen printing frame, hinge means connecting one side of said printing frame to said printing bed and said mounting bracket member having affixed to a first leg thereof a first set of axially aligned longitudinally disposed gudgeon members, an upwardly extending tubular support rod member, a second set of axially aligned longitudinally disposed gudgeon members complementary with said first set and connecting one end of said tubular support rod member to said first leg of said mounting bracket member, a channel shaped member having the open face thereof normally disposed upwardly to receive and support the blade end of a silkscreen squeegee, said channel member being fixedly attached midway of the longitudinal dimension thereof to the lower end of said upwardly extending tubular support rod member and the longitudinal axis of said channel shaped member being substantially parallel to the longitudinal axis of said first and second sets of axially aligned longitudinally disposed gudgeon members, an adjustable bracket member slidably mounted upon said upwardly extending tubular support rod member intermediately of the ends thereof, an adjustable counterweight member mounted upon said upwardly extending tubular support rod member substantially above the mid-point thereof, and adjustable means to position and retain said upwardly extending tubular support rod member at an outwardly disposed angle relative to said silkscreen printing frame.

3,971,313

ATTACHING PRINTING STENCILS TO ROTARY SCREEN PRINTING PRESSES

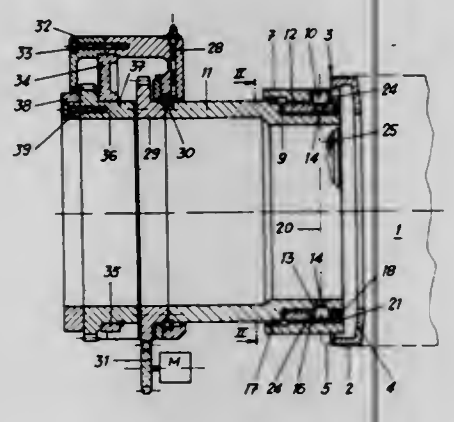
Heinrich Voegelin, Wiler near Utzenstorf, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Wiler near Utzenstorf, Switzerland

Filed Jan. 18, 1974, Ser. No. 434,418

Claims priority, application Switzerland, Jan. 29, 1973, 1238/73

Int. Cl.² B41F *15/38;* **B41N** *1/24*

U.S. Cl. 101—127.1 **5 Claims**



1. A rotary printing press, having at least one cylindrical stencil (1) and end rings (3) secured to the axial ends thereof,

a rotary drive connection and attachment means to secure the cylindrical stencil (1) by its end rings (3) to the drive connection comprising

a universal joint (7, 9, 10, 11, 12, 13, 14) interposed between the drive connection and at least one of the end rings (3) of the stencil (1) and having a plane of movement transverse to the axis of rotation of the rotary drive connection which is immediately adjacent to a plane defined by the respective ends of the stencil (1);

the universal joint comprising a connecting ring (7) to which the respective end ring (3) of the stencil is secured; and

a gimbal structure having a coupling ring (12) and radially extending connecting pairs of gimbal pins (10,13), the pairs of gimbal pins being offset by 90° with respect to each other, one of said gimbal pin pairs (13) movably connecting the respective end (9) of the drive connection with the gimbal ring (12) and the other of said gimbal pin pairs (10) movably connecting said gimbal ring (12) with the connecting ring (7).

3,971,314

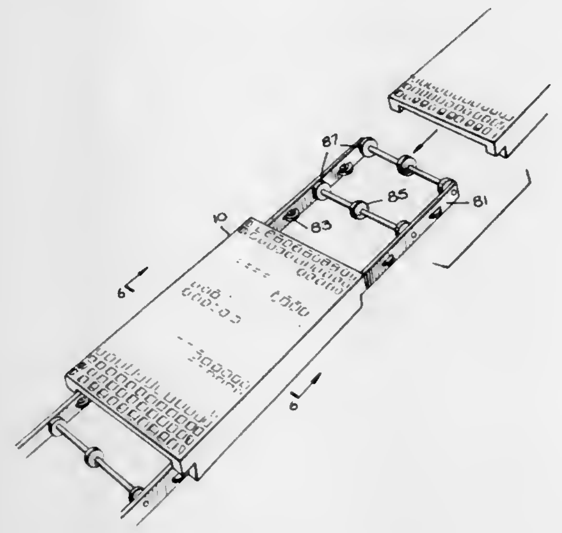
SKATEWHEEL CONVEYOR PALLET

Theodor Max Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed Apr. 2, 1975, Ser. No. 564,375

Int. Cl.² B65D *19/00*

U.S. Cl. 104—135 **3 Claims**



1. A skatewheel conveyor pallet comprising an open latticework grid defining an upper load bearing surface, an underside adapted for contact with the skatewheels of said conveyor, a pair of depending skirt members disposed along opposite side edges of said pallet and extending below the level of said upper surface, said skirt members adapted to extend beyond the sides of said conveyor and provide guide means for said pallet as it moves along said conveyor, a closed bearing surface extending adjacent each skirt member along the underside of said pallet and inboard of each said skirt member for engagement with skatewheels of said conveyor, braking means extending centrally along the underside of said pallet midway between said skirt members adapted to engage rubber wheels on said conveyor and thereby slow the speed of said pallet along said conveyor, openings in said grid extending through said pallet from said upper surface to said lower surface, drain means in said bearing surfaces, said braking means comprised of a gear-toothed rack.

3,971,315

MACROPOROUS MICROPOROUS MARKING STRUCTURE

Frederick C. Hansen, Union Grove, Wis., assignor to Porelon, Inc., Racine, Wis.

Filed Aug. 12, 1974, Ser. No. 496,677

Int. Cl.² B41K *1/42*

U.S. Cl. 101—333 **16 Claims**

1. A multi-layered marker comprising:

an outer layer having a microporous material formed of aggregated particles of plasticized thermoplastic resin, said aggregated particles forming a substantially uniform cohesive structure defining a network of pores, and a marking fluid contained within said network, said fluid being substantially incompatible with said resin; and

a reservoir layer underlying said outer layer and comprising an open-pored macroporous elastomeric structure, a microporous material impregnated within said macroporous structure, said microporous material being formed of aggregated particles of plasticized thermoplastic resin and defining within said macroporous structure a network of pores, and a marking fluid contained within said network, said fluid being substantially incompatible with the thermoplastic resin of said reservoir and outer layers, said aggregated particles of said reservior and outer layers being interconnected to join the layers, permitting the continuous passage of marking fluid from the network of pores of said reservoir layer to the network of pores of said outer layer.

3,971,316

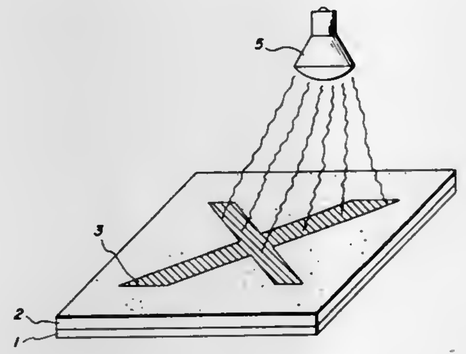
PROCESS FOR SMOOTHING WATERLESS LITHOGRAPHIC MASTERS

Richard L. Schank, and Wolfgang H. H. Gunther, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,601

Int. Cl.² B41N *3/00;* **B41C** *1/10*

U.S. Cl. 101—465 **11 Claims**



1. A method of removing irregularities on the surface of a waterless lithographic master comprising providing a waterless lithographic master comprising an adhesive silicone which is deformable at elevated temperature and having an image formed of depressions in the silicone, said master additionally having surface irregularities in the non-imaged areas which accept ink or surface irregularities in the imaged areas resulting in a lack of clarity; selectively heating said master at a temperature and for a time sufficient to smooth out said irregularities without collapsing the image.

3,971,317

DETONATION SYSTEM AND METHOD

Frank S. Gemmell, and Mark A. Fried, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

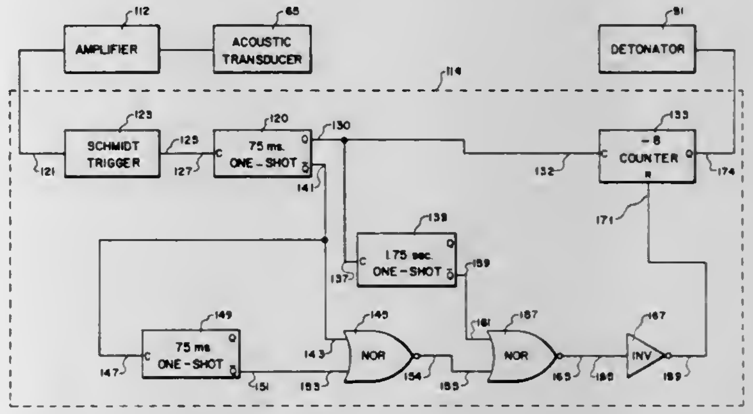
Filed Oct. 7, 1974, Ser. No. 512,651

Int. Cl.² E21B *43/26*

U.S. Cl. 102—21 **17 Claims**

1. A method for triggering a detonator situated at a remote position linked by a conduit means capable of providing acoustic propagation comprising the steps of:

acoustically coupling receiving means at the remote end of said conduit means, said receiving means including means for receiving an acoustic wave signal and for decoding a predetermined modulation of said acoustic wave signal comprising sequential digital pulse coding from said conduit and generating an output electrical signal for actuating the detonator in response to said reception of said sequential digital pulse coding modulation signal; and



acoustically coupling transmitting means a distance away from said receiving means, said transmitting means including means for generating said sequential digital pulse coding modulation signal and means for enabling said transmitter means to send said coded acoustic wave signal to said receiving means.

3,971,318

EXPLOSIVE ASSEMBLY COMPRISING A TUBULAR MEMBER FORMED OF WATER-SOLUBLE PLASTIC

William C. Burkle, and Clyde W. Ello, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 18, 1972, Ser. No. 316,333

Int. Cl.² F42B *3/00, 3/02*

U.S. Cl. 102—24 R **7 Claims**

1. An explosive assembly for use in a water-distended borehole, comprising as an intact unit in said borehole, a tubular member and an explosive contained therein; said tubular member formed in its entirety from a water-soluble plastic material, and having its wall thickness correlated with its water solubility so that its rate of solution in the water in contact therewith does not impair its integrity as an intact tubular unit during an initial period of at least about one hour in said water contact; and means for detonating said explosive.

3,971,319

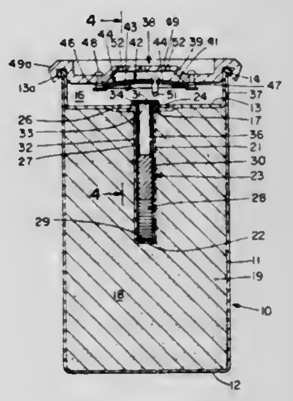
THERMALLY ACTUATED PERCUSSION INITIATABLE EXPLOSIVE CARTRIDGE ASSEMBLY

Richard Ralph Larson, Ulster Park, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 18, 1974, Ser. No. 516,232

Int. Cl.² F42B *3/10*

U.S. Cl. 102—24 R **11 Claims**



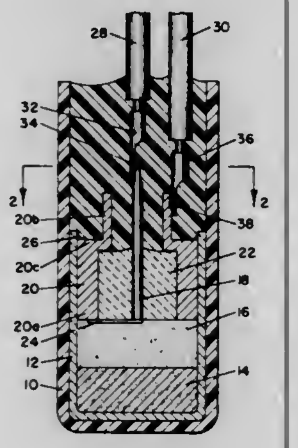
1. An explosive cartridge assembly which comprises

a shell, and at least a portion of same enclosed and containing a main explosive charge;
a percussion initiatable primer extending into said shell and into said main charge therein, said primer including a percussion sensitive ignition charge adjacent an external wall of said enclosed shell portion and a base explosive charge detonatable in operative response to ignition of said ignition charge and disposed in detonating relationship with said main charge;
thermostatic means outside said enclosed shell portion for percussion initiation of said primer including a laminate of a pair of metallic layers having different coefficients of thermal expansion, and said laminate being a curved strip having opposed convex and concave surfaces;
said strip spaced from said percussion sensitive ignition charge and supported at its opposite ends with said concave surface facing said percussion sensitive ignition charge, and a pin member secured to said strip and extending from said concave surface toward said ignition charge into spaced apart relationship with said ignition charge for subsequent percussion impact therewith;
said strip in response to a predetermined increase in temperature thereof adapted to expansively change the curvature of said convex and concave surfaces respectively toward concave and convex so as to move said pin into said percussion impact and cause percussion ignition of said ignition charge, thereby providing for subsequent detonation of said primer charge and in turn said main explosive charge; and
means for admitting flow of sufficiently hot fluid into contact with said laminate strip for transfer of heat from said fluid to said laminate strip to cause said strip to change its curvature to move said pin member into said percussion impact, to thereby initiate said primer for detonation of said main explosive charge.

3,971,320
ELECTRIC INITIATOR

John T. M. Lee, Phoenixville, Pa., assignor to ICI United States Inc., Wilmington, Del.

Filed Apr. 5, 1974, Ser. No. 458,360
Int. Cl.^{2} F42B *3/12*
U.S. Cl. 102—28 R **5 Claims**

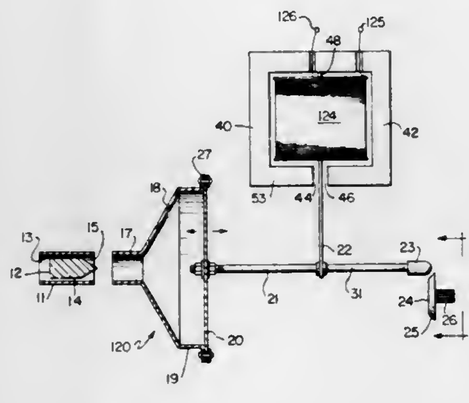


1. An electric initiator comprising:
a. a cup-shaped nonconductive cylindrical outer case open at one end and closed at the other end;
b. a cylindrical metallic inner cup open at one end and closed at the other end, said cup being of one piece construction comprising a cylindrical wall and an end wall at one end, the thickness of the end wall being at least as great as the thickness of the cylindrical wall, the open ends of said nonconductive case and said inner cup being oriented in the same direction, said outer case completely surrounding the side and closed end of said inner cup so as to prevent accidental grounding of said inner cup;
c. an explosive charge within said inner cup;
d. a coaxial plug assembly within said inner cup adjacent to said explosive charge, said assembly comprising
  1. an elongated, longitudinally extending conductive center pin;
  2. a conductive sleeve surrounding said pin and coaxial therewith but spaced therefrom, said conductive sleeve being in engagement with said inner cup,
  3. a refractory insulator separating said pin from said sleeve, said insulator forming refractory-to-metal seals with said pin and said conductive sleeve, and
  4. a bridge element connecting said pin with said sleeve, said bridge element being in proximity with said explosive charge;
e. means forming a moisture proof seal between said inner cup and said sleeve;
f. a pair of lead wires extending through the open end of said case;
g. means connecting one of said lead wires to said pin;
h. means connecting the other of said lead wires to said sleeve; and
i. potting material sealing the open end of said case.

3,971,321
FLUID DRIVEN ELECTRICAL-MECHANICAL SAFETY AND ARMING SYSTEM

Francis E. Blodgett, Silver Spring, and Carl J. Campagnuolo, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,999
Int. Cl.^{2} F42C *5/00;* H02K *7/06*
U.S. Cl. 102—81 **4 Claims**

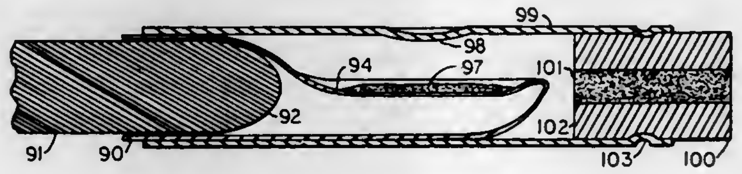


1. A fluidically actuated safety and arming mechanism comprising:
resonant means having a fluid input port and a diaphragm output for oscillating said diaphragm at a resonant frequency;
a linear rod mounted at one end to said diaphragm axially extending substantially perpendicular therefrom and having a mass mounted on its other end;
a smooth surface gear capable of rotation positioned adjacent the other end of said rod such that axial motion of said rod at said one end produced by oscillation of said diaphragm becomes elliptical motion of said mass in a plane perpendicular to said rod at said other end by engaging said gear, said elliptical motion at said other end causes said gear to rotate; and,
a reed mounted at one end to said rod to move there with and means associated with the other end of said reed for producing electrical energy from the movement of said reed.

3,971,322
PRESSURE ACTUATED TUBE PRIMER

Charles R. Olsen, 307 Conestoga Way, Suite 37, Eagleville, Pa. 19408

Filed Jan. 23, 1975, Ser. No. 543,553
Int. Cl.^{2} F42C *19/08*
U.S. Cl. 102—86.5 **6 Claims**

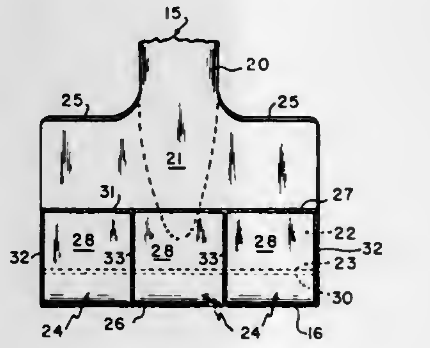


1. A tubular primer comprising:
a deformable metal tube having at least one indented portion defining a longitudinally extending, concavely-shaped cavity on the exterior thereof;
a case having a bore into which the tube is telescoped and defining a space within the bore between the indented portion of the tube and the case; and
a percussion-ignitable primer mixture situated within said space between the indented portion and the case whereby the indented portion may be deformed by internal force within the tube, crushing the primer mixture against the case wall thereby igniting and deflagrating the primer mixture.

3,971,323
TAMPING BLADE AND A HARD WEAR-RESISTANT INSERT THEREFOR

Richard W. Beiswenger, Penn Hills Township, Pa., assignor to Teledyne Mid-America Corporation, Los Angeles, Calif.

Filed Feb. 19, 1975, Ser. No. 551,042
Int. Cl.^{2} E01B *27/00*
U.S. Cl. 104—10 **7 Claims**

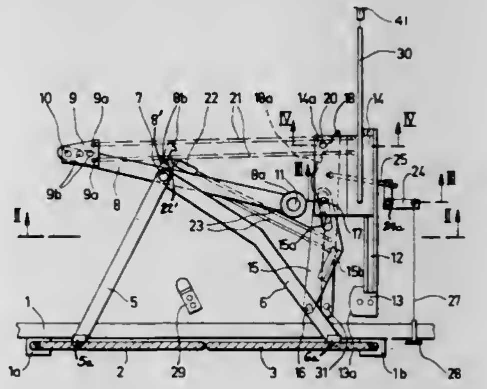


1. A tamping blade insert comprising:
A. a body of hard wear-resistant material having first and second opposed sides and first and second opposed major surfaces, said surfaces being angular to each other to provide a substantially uniform thickness for the body at each side;
B. said first side of the body having a thickness of at least about ⅜ inch and adapted to provide a leading edge for a tamping blade extending across the thickness of the leading edge of said tampiing blade, and said first major surface being adapted to provide a wear-resistant facing for said tampiing blade during lateral movement; and
C. said second side and said second major surface being adapted to support the body on said tamping blade for impact loading of said first side of the body.

3,971,324
AUTOMATICALLY ACTUATED SUSPENDED RAILWAY CABIN CLOSURES

Anton Frech, Schongrund 21, 4600 Olten, Switzerland

Filed Mar. 18, 1974, Ser. No. 452,435
Claims priority, application Switzerland, July 17, 1973, 10366/73
Int. Cl.^{2} B61B *1/02, 3/00, 7/06;* B61D *19/00*
U.S. Cl. 104—28 **7 Claims**

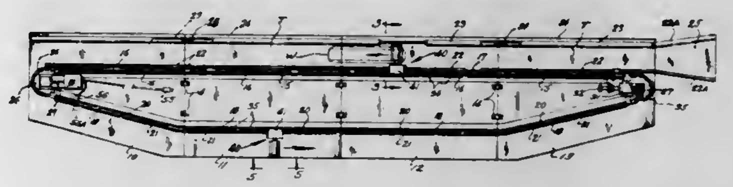


1. A cable transport system comprising two control rails secured at each station for a cabin, each cabin being provided with a cabin door, a locking mechanism for locking the cabin door when in its closed position, an actuation lever mounted for rotation about an axis of rotation and with which the door is operatively connected, a tension device having one end engaging with an end of the actuation lever, said tension device is an intermediate position of the door intersecting an extension of the axis of rotation of the actuation lever, a control element movable between two terminal positions, a feeler element connected with said control element, said feeler element during scanning of the control rails displacing the control element from one terminal position into the other terminal position, the cabin door being opened in one terminal position and closed in the other terminal position, said control element comprising a carriage, a guide rail fixedly connected with the cabin, said carriage being displaceable along said guide rail, an unlocking element cooperating with said locking mechanism, said carriage when assuming a position at a location between both of its terminal positions unlocking the locking mechanism of the cabin door via the unlocking element, said carriage being connected with the other end of the tension device.

3,971,325
VEHICLE CONVEYOR

Lyle B. Evans, 3520 SW. 108th Ave., Beaverton, Oreg. 97005

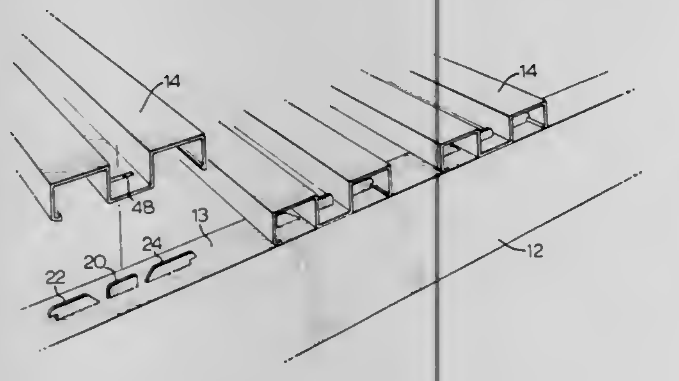
Filed Feb. 28, 1975, Ser. No. 554,204
Int. Cl.^{2} B61B *13/12*
U.S. Cl. 104—172 B **5 Claims**



1. A vehicle conveyor adapted for placement on a continuous floor surface for moving driverless vehicles along a desired path, said conveyor comprising,
a base comprised of interconnected plate members for placement on the floor surface,
an endless roller chain including upwardly disposed side components, said chain having runs lengthwise disposed on said base,
upwardly opening chain guideways in place on said interconnected plate members of the base with each of said guideways in communication with a remaining guideway

and confining said chain runs for advancement along a desired course, said guideways open at their upper extremeties, and
pusher assemblies disposed at points along said chain, each independently engagable with the wheel of a vehicle and including,
  a main body including an upright portion and an upper offset portion,
  cooperating pivot means carried by said upper offset portion of the main body and the upper surface of an upwardly disposed side component of the chain permitting displacement of the pusher assembly body about a horizontal axis of the cooperating pivot means disposed parallel to and above the chain, and
  multiple rollers carried by said main body transferring vehicle imparted loads to said base, said multiple rollers also displaceable with said main body about said horizontal axis.

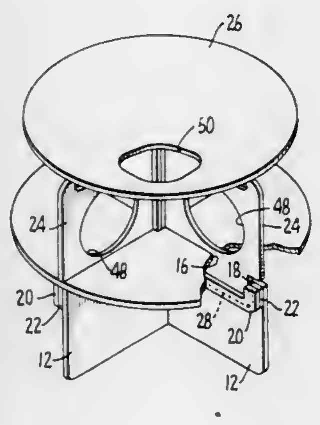
3,971,326
PALLET CONSTRUCTION
Ferdinand M. Svirklys, Toronto, Canada, assignor to Extrados Company Limited, Toronto, Canada
Filed May 21, 1975, Ser. No. 579,410
Int. Cl.² B65D *19/28*
U.S. Cl. 108—56.1 **26 Claims**



1. A pallet construction comprising:
at least two spaced-apart substantially-parallel longitudinally-extending aluminum members,
a first plurality of deck-forming aluminum members contacting and extending at least between the at least two longitudinally-extending members generally transverse thereto in spaced-apart relation,
each of said first plurality of deck-forming members having at least one planar portion cooperating with the at least one planar portion of the others of said first plurality of deck-forming members to provide a first planar pallet deck surface which extends substantially the length of said longitudinally-extendable members,
snap fit means releasably interconnecting said at least two longitudinally-extending members with each of said first plurality of deck-forming members at the intersections thereof,
at each said intersection, said snap fit means includes a first part integral with said longitudinally-extending member and a second cooperating part integral with said deck-forming member, and
stop means located at each said intersection and preventing movement of each of said first plurality of deck-forming members longitudinally thereof and transverse to said at least two longitudinally-extending members while normally permitting movement of said first plurality of deck-forming members out of contact with said longitudinally-extending members upon release of said snap fit means to allow disassembly of said pallet,
said stop means at each said intersection including cooperating elements integral with said longitudinally-extending member and integral with said deck-forming member.

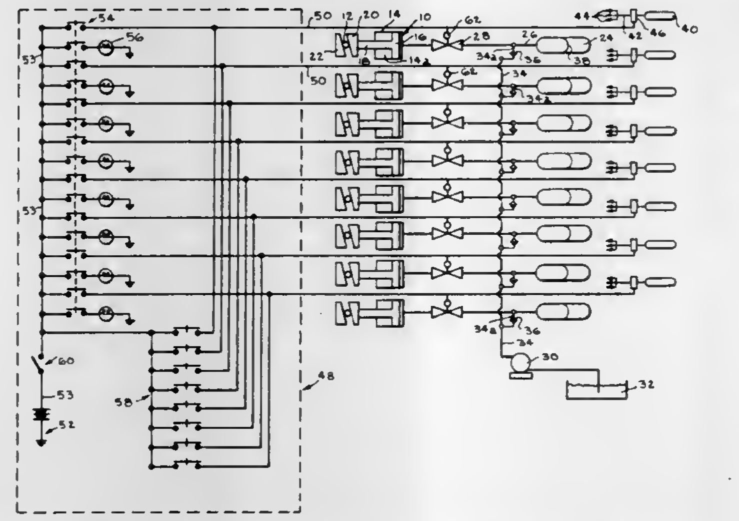
23. In combination,
a first substantially rigid elongate member having a flat surface,
a second elongate member having a flat central portion thereof in engagement with said flat surface,
first and second projections upstanding from said flat surface of said first member, each of said projections having a shoulder projecting therefrom in opposite directions to each other generally parallel to said flat surface and defining an undercut with said flat surface,
first and second shoulder engaging members integrally joined to said central flat portion of said second elongate member and projecting towards said central flat portion, said shoulder-engaging members being positioned one in each of said undercuts in engagement with the respective shoulder,
said second elongate member being capable of limited flexure about its centre line for release of at least one of said shoulder-engaging members from its respective undercut to allow separation of the second elongate member from the first elongate member,
a third projection upstanding from said flat surface of said first elongate member, and
an opening in said central portion of said second elongate member receiving said third projection therethrough preventing movement of said second elongate member transverse of said first elongate member and normally permitting said separation of the second elongate members from the first elongate member upon said limited flexure.

3,971,327
MULTIPURPOSE TABLE
Paul J. Critchett, 10 Elm Ave., San Anselmo, Calif. 94960
Filed Jan. 27, 1975, Ser. No. 544,354
Int. Cl.² A47B *37/00*
U.S. Cl. 108—60 **8 Claims**



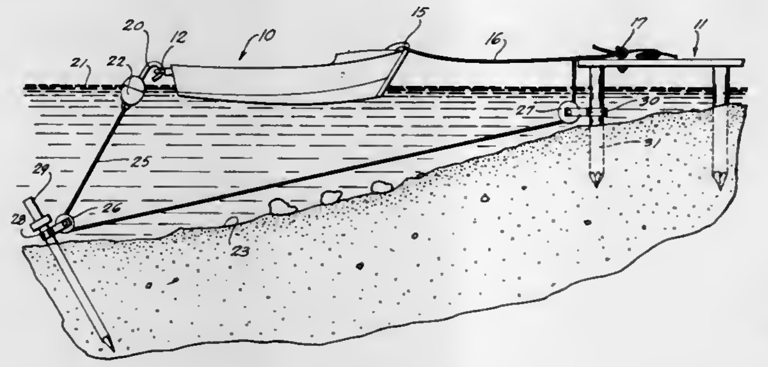
1. A multipurpose table comprising, in combination: a generally planar top supported on panel-like legs disposed in intersecting cruciform relationship relative to one another and fixedly connected to the under side of the top so as to extend generally normal thereto, said top having an upper surface and slots extending therethrough adjacent the connection of the legs to the undersurface; pockets supported on the panel-like legs in alignment with the slots extending through the top; partitions received within said slots and the pockets in alignment therewith, said partitions disposed in intersecting cruciform relationship to one another and extending upwardly from said top to divide the upper surface thereof into a plurality of work areas which are isolated from one another, said partitions being removable from said slots and pockets to convert the upper surface of the top into a condition wherein it is not interrupted by the partitions.

3,971,328
EMERGENCY MOORING RELEASE
Porter R. Edling, Houston; Kenneth L. Yoast, Texarkana, both of Tex., and Glenn D. Wickline, deceased, late of Houston, Tex. (by Mrs. Glenn D. Wickline, executrix), assignors to The Offshore Company, Houston, Tex.
Filed Sept. 21, 1973, Ser. No. 399,404
Int. Cl.² B63B *21/50*
U.S. Cl. 114—221 R **11 Claims**



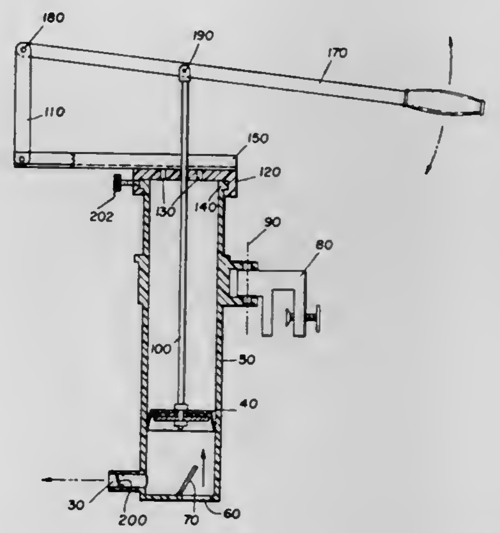
1. A system for emergency release of a ship from its mooring cables comprising:
  a plurality of fluid powered cable cutters, one cutter being prearranged in operable relationship to each cable for which emergency release may be desired and being adapted upon actuation to sever said cable;
  charged accumulator means for storing under pressure actuating fluid for actuating said cable cutters;
  fluid communication means interconnecting said cutters and said accumulator means;
  valves means in said fluid communication means for selectively blocking or permitting flow of actuating fluid from said accumulator means to said cutters; and
  remote control means for selectively operating said valve means.

3,971,329
MOORING DEVICE
Arthur J. Kosmatka, 7766 Honey Creek Parkway, Milwaukee, Wis. 53219
Filed July 19, 1974, Ser. No. 490,043
Int. Cl.² B63B *21/16*
U.S. Cl. 114—230 **2 Claims**



1. In a mooring device for mooring a boat in a body of water in the vicinity of a pier; a bar driven into the ground beneath the water at a distance from the pier; a first pulley rotatably supported by said bar with the pulley being fully submerged in the water and being disposed adjacent to the bed of the body of water; securing means on said pier for receiving lines that are secured to it; a first line having one end fastened to said securing means and passing about said pulley so that its opposite end is in the water at a distance from the pier; a float secured to said first line at said opposite end which is remote from the pier; a hook secured directly to said float at an end of said float opposite from said line so that said float will keep said hook at the surface of the water and will retain said line in engagement with said pulley; and a second line having one end tied to the boat and its opposite end tied to said securing means on the pier whereby said hook may be engaged with the boat to moor the boat at a distance from the pier but said first line may be released from said securing means so that the boat can be pulled toward the pier by drawing on said second line.

3,971,330
PROPULSION PUMP FOR WATER BORNE VESSELS
Neil S. French, Kodiak, Alaska, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed May 27, 1975, Ser. No. 580,800
Int. Cl.² B63H *1/32*
U.S. Cl. 115—32 **2 Claims**

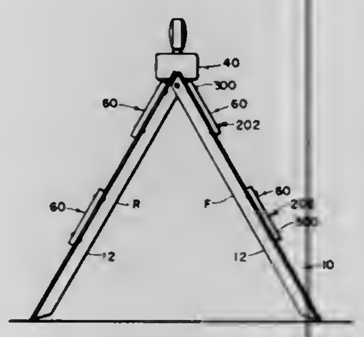


1. A manually operated pump device designed for attachment to and propulsion of water borne vessels, said device comprising:
  a vertically elongated pump with an intake port at the bottom and a rearwardly directed exhaust port near the bottom, said pump being operable by an up-and-down motion of a vertical rod, said pump being provided with a first pivoted butterfly valve;
  a piston operated by the rod, and cooperating with the first valve, the first valve opening and closing the intake port in cooperation with the up-and-down motion of the piston;
  a handle attached to the top of the pump and operating rod, said handle being connected to the rod in a manner that a lever of the second class is formed, said handle being rotatable through a 360° arc and lockable at any position selected; and
  a clamp detachably securing the front of the pump to the side of a water borne vessel in a manner that the pump is free to rotate 180° about a vertical axis located outside the body of the pump.

3,971,331
PLASTIC BARRICADE PANEL
Michael J. Sawyer, 5705 Tucker, Omaha, Nebr. 68152
Filed Mar. 1, 1974, Ser. No. 447,388
Int. Cl.² E01F *9/10;* **G09F** *7/12*
U.S. Cl. 116—63 P **10 Claims**

1. A warning barricade of the type having legs, said barricade being self-supporting when on a horizontal surface, said barricade having spaced horizontal rails connected to its legs, said legs comprising a pair of right legs and a pair of left legs, each of said pairs of legs comprising a forward leg and a rearward leg, said pairs of legs being horizontally spaced apart, the legs of each pair inclining divergently downward with respect to each other forwardly and rearwardly respectively, at least one of said rails connecting said forward legs

together and being formed of material separate from said legs, at least one of said rails connecting said rearward legs together and being formed of material separate from said rearward legs, said legs each being generally straight, said rails being formed by a panel of thermoplastic material, said panel pretreated with means for oxidizing other than atmospheric so as



to an oxidized forward surface, pressure-sensitive adhesive material attached to said forward surface, said material being of a color and shape for indicating to a viewer a meaningful message, the back surface of said panel being constructed to have substantially rigid and strong for giving structural strength to said barricade.

3,971,332

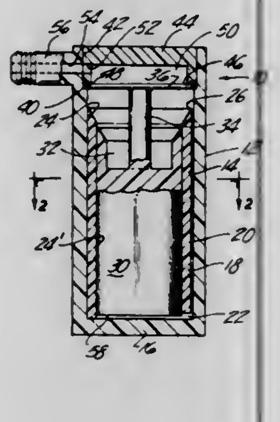
VEHICLE PARTS INDICATING INSTRUMENT

Gerald F. Lewis, 1850 Columbia, Berkley, Mich. 48072

Filed Dec. 5, 1974, Ser. No. 529,971

Int. Cl.² B60Q *11/00;* **G01L** *19/12;* **G01P** *15/00*

U.S. Cl. 116—114 AM **13 Claims**



1. An instrument for indicating the operating characteristics of a vehicle, the combination of; a housing forming a cavity therein, a diaphragm disposed in said housing and enclosing one end of said cavity, a piston disposed in said cavity and forming a first chamber in said cavity between said diaphragm and said piston and at one side of the latter, said piston forming a second chamber at the other side of said piston, passage means including an elongated conduit formed in said housing adjacent an outer wall of the latter and communicating said first and second chambers with each other, said conduit extending parallel to the axis of said piston and having a uniform cross-sectional area throughout its length, means connecting said diaphragm and said piston for movement of the latter in response to movement of said diaphragm, a quantity of liquid in said second chamber, means in said vehicle for moving said diaphragm to change the level of liquid in said passage means, said liquid being displaceable into said passage means upon movement of said piston in one direction and being movable out of said passage means into said second chamber upon movement of said piston in the opposite direction, said piston having a surface in said chamber with an area substantially larger than the cross-sectional area of said conduit.

3,971,333

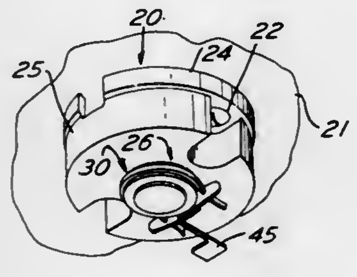
ACTIVATION INDICATOR FOR A FIRE DETECTOR

Albert Levy, 1605 Pennington Road, Philadelphia, Pa. 19151

Filed Mar. 28, 1975, Ser. No. 563,148

Int. Cl.² G01k *1/14;* **G01K** *11/06*

U.S. Cl. 116—114.5 **7 Claims**



1. An activation indicator for an overhead fire detector, said indicator comprising attachment members in end-to-end overlapping relation for positioning adjacent to one side of the detector, fusible securement means fixing said attachment members together, and an elongate resilient element deflected to embrace the other side of the detector with its end portions connected to distal regions of said attachment members urging the latter out of said relation, whereby elevated temperature melts said securement means to release said attachment members for separation thereof and gravitational falling to indicate said temperature elevation.

3,971,334

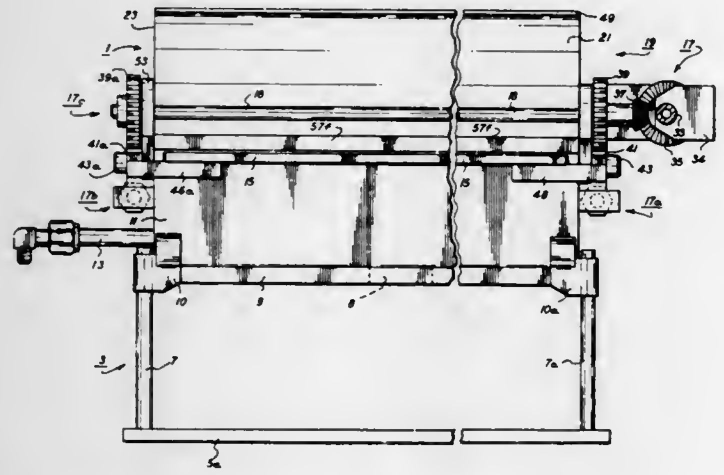
COATING DEVICE

Arnold L. Pundsack, Oakville, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1975, Ser. No. 555,339

Int. Cl.² C23C *13/12*

U.S. Cl. 118—5 **36 Claims**



1. A crucible comprising in combination:
a. a reservoir to hold an evaporant;
b. a variable aperture forming means over said reservoir forming an aperture for the control of the amount of vapor emitted from said reservoir;
c. adjustment means to vary said aperture;
d. a vapor exit chamber over said reservoir to receive vapors from said reservoir, said chamber formed by two end members extending above the ends of said reservoir joined by a concave side member extending from over one side of said reservoir and over said aperture and a vertical side member extending from over the opposite side of said reservoir, said members forming an exit aperture at the top for said vapors, and;
e. a deflection baffle positioned on said vertical side member below said exit aperture and extending from said side for a distance sufficient to intersect any plane defined by a straight line between a boundary of said variable aperture to any point on said vertical side member above said baffle to provide a passage way for said vapor between said baffle and the side concave side member.

3,971,335

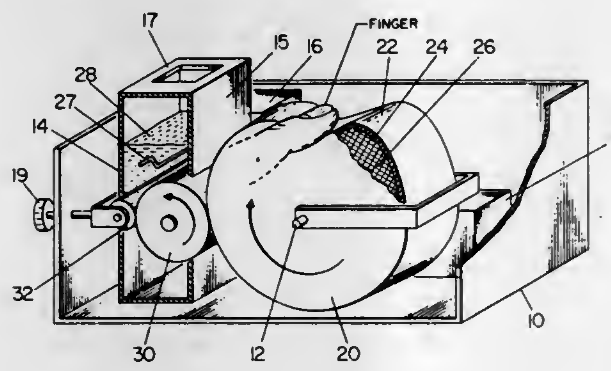
FINGERPRINT INKING DEVICE

Daniel L. Curtis, 1956 Ardmore Ave., Manhattan Beach, Calif. 90266, and Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356

Filed Nov. 26, 1975, Ser. No. 635,602

Int. Cl.² A61B *5/10*

U.S. Cl. 118—6 **4 Claims**



1. In fingerprinting apparatus, a finger inking device comprising:
- an ink reservoir;
- a roller applicator operatively associated therewith and means for rotating said applicator in a first direction;
- a doctor roll operatively associated with said applicator and means for rotating said doctor in an opposed direction and at a lesser surface speed whereby to effect slippage between said rolls to produce a uniformly thin film of ink on said applicator;
- a movable, flexible, elastic, endless member operatively associated with said applicator, having the characteristic of conforming to a finger pressed thereupon, and adapted to be inked by said applicator upon relative movement therebetween;
- means to move said endless member to effect said inking of a continuous finite length thereupon; and
- each said means to move and to rotate being operative by means actuated by release of pressure of a finger being removed from said endless member;
- whereby a subsequent portion of said endless member is inked preparatory to a finger inking operation.

3,971,336

CONTROL SYSTEM FOR CONTROLLING TRANSLATION SPEED OF CARRIAGE WITH RESPECT TO ROTATIONAL SPEED OF MANDREL

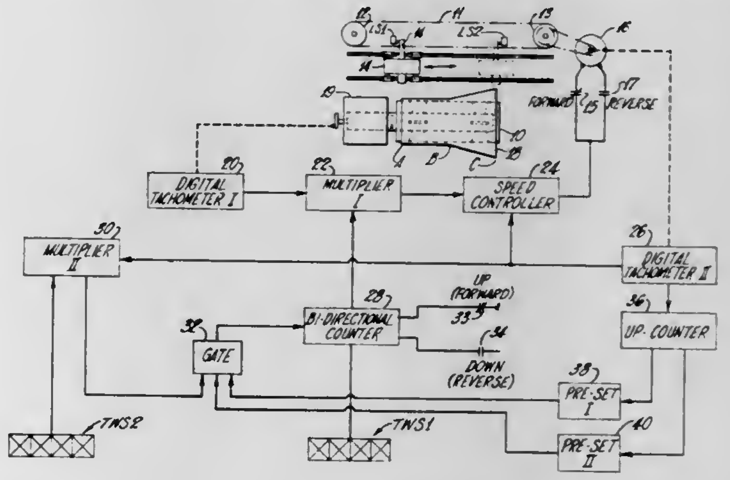
Richard W. Allen, Temperance, Mich.; Raymond E. Bond, Newbury, Ohio, and Richard T. Saba, South Bend, Ind., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 27, 1975, Ser. No. 591,240

Int. Cl.² B05C *11/10;* **B05B** *13/02*

U.S. Cl. 118—8 **10 Claims**

4. In a machine for producing tank walls of glass fiber reinforced plastic, the machine including a rotatable mandrel, a carriage reciprocable axially of the mandrel and carrying means for dispensing hardenable liquid resin and reinforcing glass fiber material on the mandrel, and a reversible variable-speed motor operatively connected to the carriage for reciprocally driving the carriage, a control system comprising:
a. first sensing means for sensing rotation of the mandrel,
b. adjustable means for controlling the speed of the motor and carriage in accordance with the rotational speed of the mandrel as sensed by the first sensing means to produce a layer of uniform thickness in the formation of a tank wall on the mandrel,
c. second sensing means for sensing rotation of the motor as an indication of translational movement of the carriage, and
d. adjusting means for continuously adjusting the adjustable means in accordance with the rotation of the motor sensed by the second sensing means to continuously adjust the speed of the motor and carriage with respect to the rotational speed of the mandrel to produce a layer of increasing thickness when the carriage is moving in one direction and a layer of decreasing thickness when the carriage is moving in the other direction in the formation of a tapered tank wall portion of varying thickness on the mandrel.



3,971,337

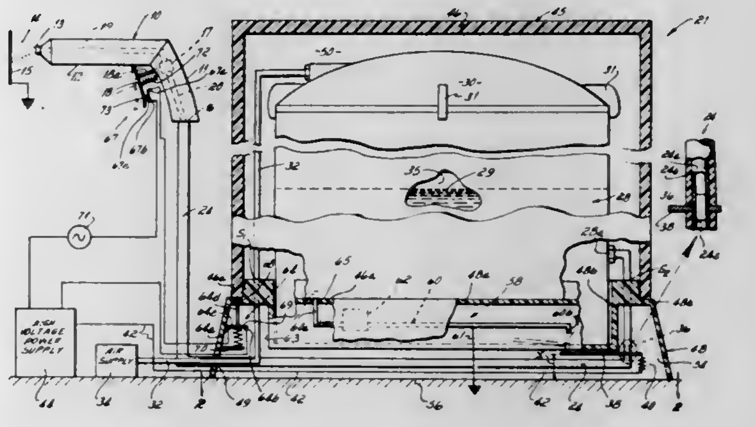
APPARATUS FOR ELECTROSTATICALLY SPRAYING HIGHLY ELECTRICALLY CONDUCTIVE WATER-BASED COATING MATERIAL

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 29, 1975, Ser. No. 545,153

Int. Cl.² B05B *5/02*

U.S. Cl. 118—629 **9 Claims**



1. A system for electrostatically spraying highly electrically conductive water-based coating material with improved safety, comprising:
- a spray device for directing electrostatically charged water-based coating material toward an object to be coated which is maintained at a potential different from that of the charged coating material,
- a container for highly electrically conductive water-based coating material,
- a fluid conduit interconnecting said container and said spray device for transporting water-based coating material from said container to said spray device, said fluid conduit having a bore through which coating material is transported from said container to said spray device, said conduit including:
  - a. an inner zone surrounding said bore, said inner zone including material which is substantially chemically

inert and impermeable to said water-based coating material,

b. an outer zone of dielectric material surrounding said inner zone, said outer zone having an exterior surface which is substantially free of electrically conductive material to minimize the capacitance of the conduit, and hence the electrical energy stored in the conduit in capacitive form, when the conduit is physically spaced from a grounded object,

said inner and outer zones having dielectric constants and radial thicknesses to avoid dielectric breakdown therein when subjected to a potential difference equal to the difference in potential between ground potential and the potential existing at the interface of the transported coating and the inner zone, and

a source of electrostatic charging potential for charging water-based coating material in said container, conduit and spray device,

said fluid conduit having a length and cross-section dimensioned to provide a very low electrical resistance between said spray device and container whereby said water-based coating material in said container, conduit and spray device is charged to an electrostatic potential substantially the same as output from said electrostatic charging source.

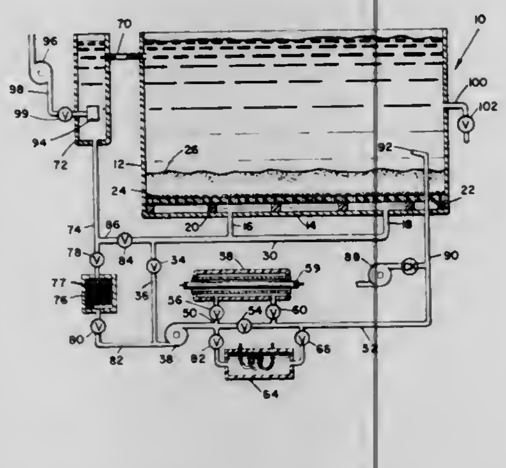
3,971,338
AQUARIUM APPARATUS

Peter Charles Alexson, Anaheim, Calif., assignor to Sea Life Exhibits, Inc., Anaheim, Calif.

Filed Jan. 30, 1975, Ser. No. 545,611

Int. Cl.^{2} A01K *63/00*

U.S. Cl. 119—5 4 Claims



1. In an aquarium system of the kind that includes a tank having a lower outlet and an inlet and a bed of particulate material disposed in said tank above said outlet and below said inlet, the improvement which comprises, in combination:

holding means for holding said bed of particulate material such that the flow of water above said bed to said outlet proceeds through said bed;

main flow path means comprising a flow path for receiving tank water from said outlet and returning it to said tank at said inlet;

pumping means in said flow path for pumping tank water from said outlet to said inlet;

an active chemical filter and an ultraviolet irradiation sterilizer in series with one another and with said pump in said flow path at a point below said tank; and

an air stripper filter and air stripper filter flow path means for directing water from said tank at a point above said bed through said air stripper filter and delivering it to said main flow path means at a point upstream from said pumping means.

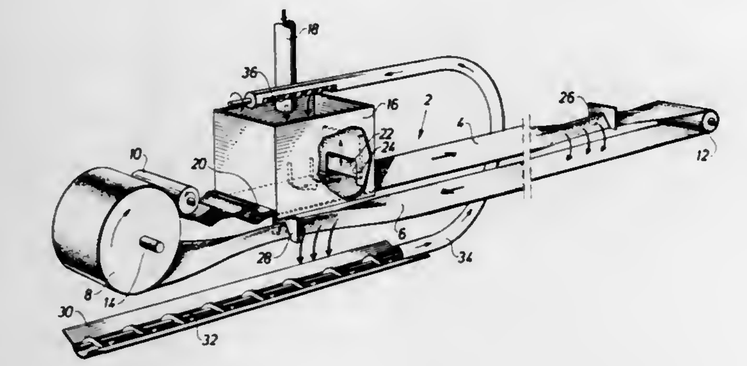
3,971,339
FEEDING SYSTEM

Erik Sterner, Tomtegatan 9, 331 00 Varnamo, and Elving Nilsson, Nygatan 7, 440 60 Skarhamn, both of Sweden

Filed Jan. 8, 1974, Ser. No. 431,754

Int. Cl.^{2} A01K *39/00*

U.S. Cl. 119—52 AF 9 Claims



7. A feeding system comprising a feed supply, means for discharging feed from said supply, conveyor means for supporting and conveying substantially the whole amount of feed so discharged along a path, the feed being accessible to the animals over at least a section of the path, said conveyor means including at least two belt portions conveying the feed and positioned in different horizontal planes, and transfer means including an element adapted to impart to the belt an inverted generally V- or U-shaped cross section for transferring the feed from the belt to a collecting means for collecting and returning substantially the whole amount of feed remaining on the belt after the passage of the path to the said feed supply.

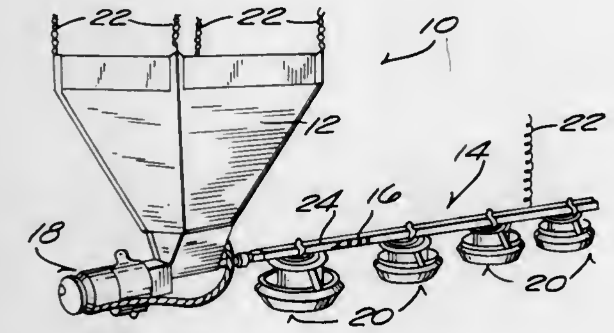
3,971,340
LIMIT AND CONTROL FEEDER FOR ANIMALS

Dee Dexter Allen, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,364

Int. Cl.^{2} A01K *5/00*

U.S. Cl. 119—52 AF 13 Claims



12. A feeder pan assembly comprising a cover member for suspension from a feed trough; a dish-shaped feed pan suspended from said cover member; a feed-accumulating container anchored to said cover member for communication with the trough and having a bottom opening; gate means disposed at the bottom of said container movable between an open and closed position, the bottom of said container being spaced above said pan such that when said gate means is closed, said feed-accumulating container is filled with feed and when said gate means is open, a preselected amount of feed is dispensed by gravity from said container into said pan, said gate means comprising a cone shape and having a base diameter greater than the diameter of said bottom opening; and actuator means for moving said gate means between said open and closed position.

3,971,341
AUTOMATIC PROPORTIONER FOR LOW-PRESSURE WATERING TROUGHS

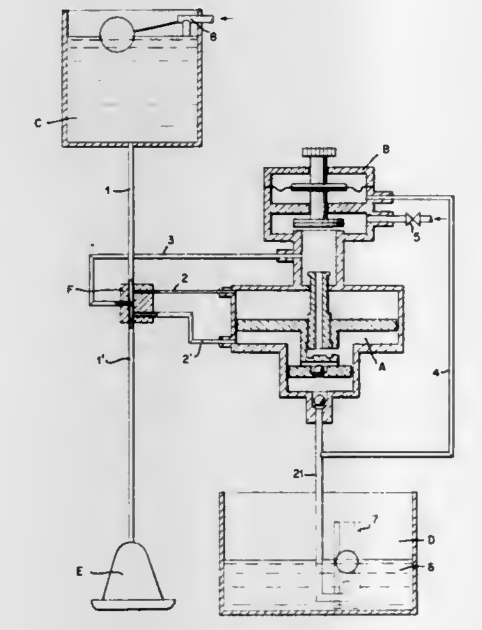
Dan Bron, Haifa, 36 Palmach St., Romema, Israel

Filed Dec. 13, 1974, Ser. No. 532,408

Claims priority, application Israel, Dec. 18, 1973, 43855

Int. Cl.^{2} G05D *11/03;* **A01K** *7/02*

U.S. Cl. 119—72 4 Claims



1. a proportioner designed to supply a medicated solution to automatic watering troughs comprising a piston pump and a hydraulic piston actuator of larger diameter, both linearly movable in a stepped cylinder casing, with their pistons rigidly held in spaced relationship by a tubular spacer which is provided, in proximity of the pump piston, with openings in its wall, and which contains slidingly arranged in its interior a tube valve reaching at its one end to the outside of the casing through a sealing element and closing with its other end, in its innermost position in the said spacer, a valve seat, the tube valve being further provided with outwardly extending projections adapted to engage with corresponding stops in the casing for opening or closing the valve seat, the pump being provided with a suction valve in the cylinder, with a delivery valve in its piston and with ports leading from the delivery valve to the mixing space formed by the inner faces of the two pistons and the spacer on the one hand and by the casing walls on the other hand; the suction stroke of the pump being induced by water under pressure entering the mixing space from the outside through the open tube valve and the openings in the spacer and driving the actuator piston in a direction away from the pump cylinder, while the return stroke is induced, after closing of the tube valve, by water from a raised tank acting on the outer face of the actuator piston and thereby driving the mixture of medicated solution entering the said space through the delivery valve and the water previously contained in this space to the watering troughs through a suitable connection.

3,971,342
LIVESTOCK DUSTING BAG

William C. Cortner, Jr., St. Joseph, Mo., assignor to Dale Alley Co., St. Joseph, Mo.

Division of Ser. No. 422,341, Dec. 6, 1973, Pat. No. 3,902,461. This application May 13, 1975, Ser. No. 577,013

Claims priority, application Canada, Nov. 27, 1973, 186782

Int. Cl.^{2} A01K *13/00, 29/00*

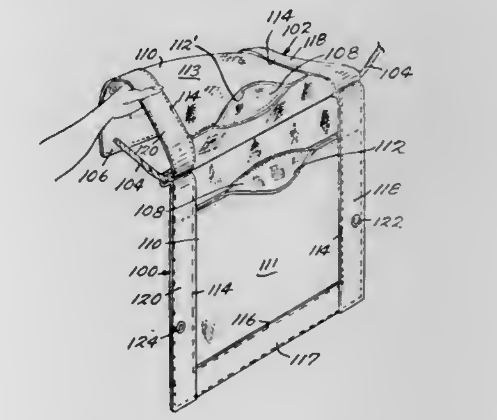
U.S. Cl. 119—159 22 Claims

1. A protected self-dusting livestock dust applicator comprising:

a cone-shaped flexible weatherproof outer cover having an apex at one end and an open end at the opposite end,

an inner porous storing and dusting bag having a closed bottom and an open top for filling purposes and being disposed inside said outer cover,

means for elevating the central area of said inner bag bottom substantially relative to the outer edge of said inner bag bottom to prevent central bag sag when dust is disposed in the bag and to cause the dust to spread to said outer edge around the bag bottom,



interior means connected between the upper end of said inner bag and apex of said outer cover for hanging the inner bag from a single point within the outer cover and to a height such that the said outer edge of the inner bag bottom is substantially above the said open end of the outer cover, and

exterior means connected at the apex of said outer cover for exteriorly hanging said applicator from a single point.

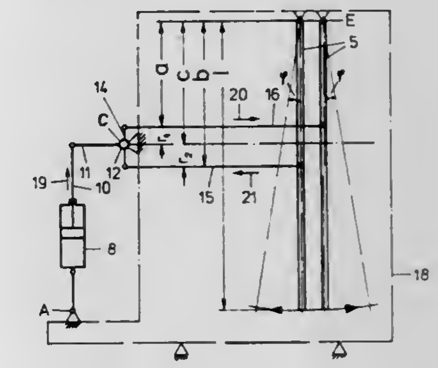
3,971,343
DEVICES FOR THE CLEANING OF HEATING SURFACES

Erich Ulrich, Mulheim (Ruhr), Germany, and Adrianus Reinier van Liempt, Budel, Netherlands, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen (Rhine), Germany

Filed Mar. 31, 1975, Ser. No. 563,613

Int. Cl.^{2} F28G *7/00*

U.S. Cl. 122—379 11 Claims



1. In a heat exchange apparatus having walls enclosing a heat exchange passage in which heated pipe coils adjacent to one another are suspended at their upper ends at a predetermined level in said apparatus and wherein a jarring means is attached to at least one of said walls and to said pipe coils to clean the coils by jarring vibration;

said jarring means having a lever mounted by a first pivot means to one of said walls and connected to said selected pipes in said pipe coils;

said lever having an upward extending arm and a lower extending arm;

a piston attached to the heat exchanger wall at one end and at its opposite end to said lever to impart vibration to said coils;

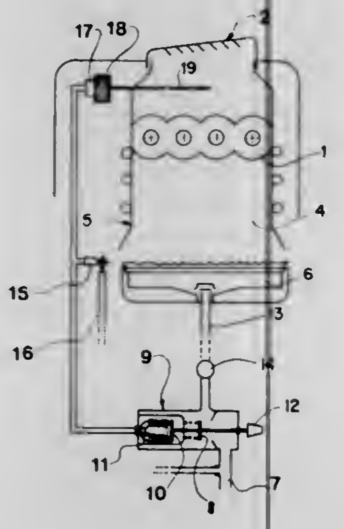
a first substantially horizontal connecting means connected to the upper end of said upward extending arm and to selected pipes in said pipe coils;

a second substantially horizontal connecting means connected to the lower end of said downward extending arm and to selected pipes in said pipe coils;
the improvement comprised said upper extending and lower extending lever arms being of unequal length;
said first horizontal connecting means connected to one of said selected pipes at a vertical distance *a* from the level from which said pipes are suspended;
a second pivot connecting said first connecting means to said upward extending arm;
said second horizontal connecting means connected to another of said selected pipes at a vertical distance *b* from the level from which said pipes are suspended;
a third pivot connecting said second connecting means to said downward extending arm;
said first pivot located at a vertical distance *c* from the level from which said pipes are suspended where:

$$c = \frac{2ab}{a+b}$$

3,971,344
SAFETY DEVICE FOR INSTANT WATER HEATER

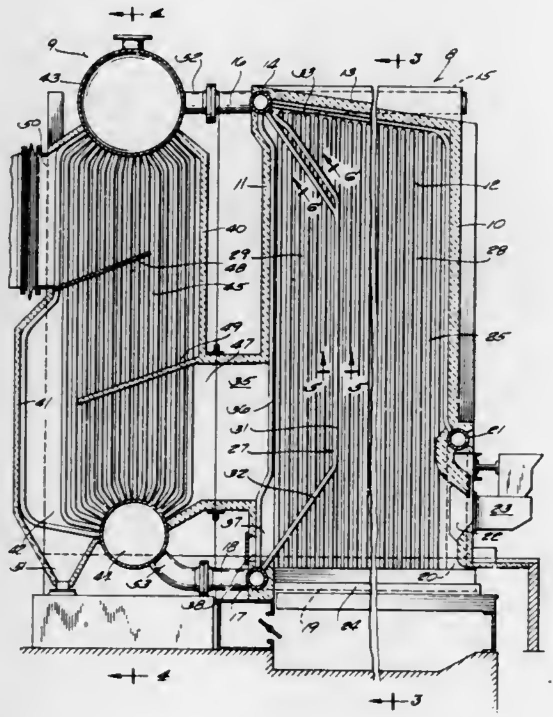
Jacques Gouyou-Beauchamps, Ville d'Avray, France, assignor to Saunier Duval, Rueil Malmaison, France
Filed Jan. 8, 1975, Ser. No. 539,333
Claims priority, application France, Jan. 10, 1974, 74.00763; Feb. 25, 1974, 74.06265
Int. Cl.² F22B ***37/42;*** **F23N** ***5/02***
U.S. Cl. 122—504 **10 Claims**



1. A safety device for a gas water heater of the type in which combustion products from a gas burner are vented into the room in which the heater is installed, said device comprising:
a thermal mass having a preselected thermal capacity, said mass being positioned away from the heating zone of said heater:
a probe of preselected thermal conductivity extending from said mass into the heating zone of said heater, thereby to cause the temperature of said mass to increase at an essentially predetermined rate during operation of said burner; the cooling of said mass occuring at an essentially predetermined rate between operations of said burner;
selectively operable throttling means for said burner; and
a temperature sensing means which is responsive to the temperature of said mass and which is interconnected with said throttling means for substantially throttling said burner when the temperature of said mass reaches a preselected threshold temperature.

3,971,345
COAL FIRED PACKAGE BOILER

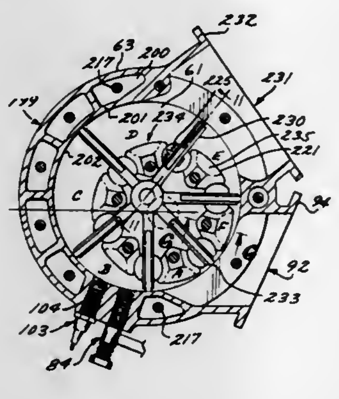
Denis G. Csathy, Minneapolis, Minn., assignor to Deltak Corporation, Minneapolis, Minn.
Filed July 7, 1975, Ser. No. 593,368
Int. Cl.² F22B ***37/24***
U.S. Cl. 122—510 **7 Claims**



1. A coal fired shop assembled water tube steam boiler comprising:
A. means defining a radiant heating section with upper and lower headers and tubes lining its walls and connecting the upper and lower headers;
B. a curtain wall formed of substantially vertically oriented tubes connecting the upper and lower headers and dividing the radiant heating section vertically into primary and secondary combustion zones;
C. a grate at the bottom of said primary combustion zone to support a bed of burning coal;
D. means defining a gas outlet from the lower portion of the secondary combustion zone through which combustion gases and products of combustion emanating from the bed of burning coal may leave the radiant heating section after rising in the primary combustion zone and descending in the secondary combustion zone;
E. means defining a convection heating section with vertically spaced steam and mud drums connected by external downcomer means and internal vertically oriented tubes;
F. means defining a gas inlet near the bottom of the convection heating section and a gas outlet near the top thereof;
G. pipe means for connecting the steam and mud drums of the convection heating section respectively with the upper and lower headers of the radiant heating section; and
H. duct means for connecting the gas outlet of the radiant heating section with the gas inlet of the convection heating section,
said pipe means and said duct means comprising separable sections respectively fixed with respect to said two heating sections so that the two heating sections can be independently fabricated and transported to an installation site and then mounted with the separable sections of the pipe means and the duct means in mating alignment for subsequent connection.

3,971,346
ROTARY INTERNAL COMBUSTION ENGINE

William W. McReynolds, 6148 Elsa St., Lakewood, Calif. 90713
Filed Sept. 30, 1974, Ser. No. 510,419
Int. Cl.² F02B ***53/08***
U.S. Cl. 123—8.41 **16 Claims**

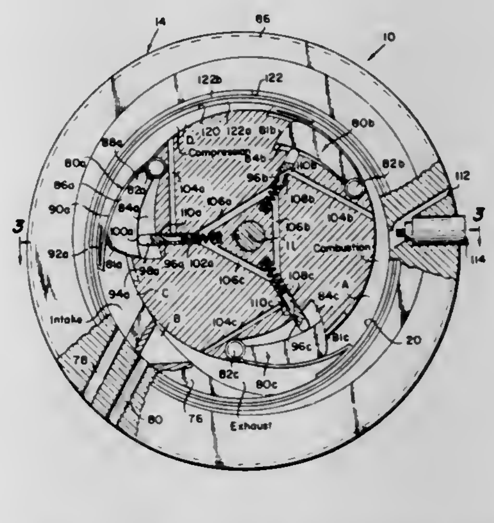


1. A rotary internal combustion engine comprising:
a. an air compressor section having a cylindrical compressor chamber, and a power section having a cylindrical power chamber, each of said compressor and power chambers having separately disposed therein:
  1. a rotor shell mounted eccentrically in said chamber,
  2. a floating vane assembly comprising a floating shaft and a plurality of vanes pivotally connected to said shaft and spaced circumferentially therearound, each vane extending through means defining a vane aperture in said rotor, the axis of each floating shaft being generally concentric with the axis of the respective chamber in which it is positioned but not securely mounted therein so as to permit limited movement of said shaft in directions parallel and radial to the axis of rotation of said rotor, constrained only by the engagement of the ends of said vanes with said chambers,
b. means for coupling said rotor shells for simultaneous rotation;
c. air inlet means communicating with said compressor chamber, and means for directing the compressed air from said compressor chamber to said power chamber;
d. means for delivering fuel to said power chamber for mixture with said compressed air, and
e. igniter means communicating with the interior of said power chamber for igniting said fuel-air mixture, whereby said rotor in said power chamber provides rotational drive force.

3,971,347
ROTARY INTERNAL COMBUSTION ENGINE

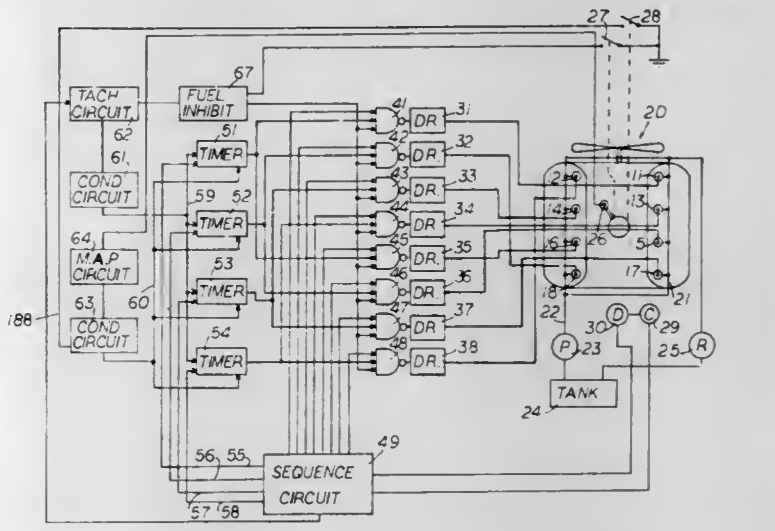
Michael Vasilantone, 147 E. First Ave., Roselle, N.J. 07203
Filed Oct. 10, 1973, Ser. No. 405,183
Int. Cl.² F02B ***53/00***
U.S. Cl. 123—8.45 **13 Claims**

1. In a rotary internal combustion engine, a cylindrical housing, said housing comprising an annular, ring-like intermediate member, a pair of end plates, one on each side of said annular member and defining an enclosed rotor chamber therewith, a shaft journaled in said end plates and extending through said chamber, a rotor in said rotor chamber and fixed to said shaft for rotation therewith, said rotor chamber being ecentric relative to said rotor to define a crescent-shaped chamber, pivoted vane elements on said rotor and biased into engagement with the annular wall of said rotor chamber as defined by the inner surface of said annular member, and sequentially forming intake, compression, combustion and exhaust chambers in said crescent shaped chamber, each comprising a body portion pivoted to said rotor and a resilient element for engaging said annular wall, said resilient element including a first elongated section attached to said body member and a second integral section bent back from said elongated section in the reverse direction, said second section engaging said annular wall, first passageway means in said housing to admit fuel to said combustion chamber and air to said intake chamber, and power means in said rotor for forcing said vanes into engagement with said annular wall comprising radially extending slots in said rotor and underlying said vanes, reciprocating pistons received in said slots and movable into engagement with the underside of said vanes, and second passageway means in said rotor communicating said slots with said combustion chamber, whereby the gases from said combustion chamber tend to push said pistons against said vanes to pivot said vanes outwardly.



3,971,348
COMPUTER MEANS FOR SEQUENTIAL FUEL INJECTION

Bruce A. Scofield, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.
Continuation of Ser. No. 467,970, May 8, 1974, abandoned, which is a continuation of Ser. No. 265,051, June 21, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 570,889
Int. Cl.² F02B ***3/00***
U.S. Cl. 123—32 EA **8 Claims**



1. A fuel injection control system for an engine including a plurality of cylinders and fuel injection valve means associated with said cylinders for injection of fuel for flow into said cylinders during the intake strokes thereof and electrically energizable actuator means for said fuel injector valve means, said control system comprising: tachometer means having an output terminal and having means for developing at said output terminal a speed signal in the form of an analog signal having an amplitude varying as a linear function of the speed of rotation of said engine, intake manifold pressure responsive means having an output terminal and having means for developing at said output terminal a pressure signal in the form of an analog signal having an amplitude varying as a linear function of the intake manifold pressure of said engine, control

means coupled to said actuator means and including timer means having first and second input terminals and including means for developing pulse signals with each pulse signal having a time duration controlled as a linear function of the amplitude of an analog signal applied to each of said first and second input terminals to be thereby linearly proportional to the product of the amplitude of said analog signals applied to said first and second input terminals, first signal conditioning means having an input terminal and an output terminal and including means for developing at said output terminal an analog output signal having an amplitude varying in relation to the amplitude of an analog signal applied to said input terminal thereof according to a first predetermined non-linear function, second signal conditioning means having an input terminal and an output terminal and including means for developing at said output terminal an analog output signal having an amplitude varying in relation to the amplitude of an analog signal applied to said input terminal thereof according to a second predetermined non-linear function, means connecting said output terminal of said second signal conditioning means to said second input terminal of said timer means, means connecting said input terminal of said first signal conditioning means to said output terminal of said intake manifold pressure responsive means, said timer means being operative to develop output pulse signals having durations proportional to the product of the amplitudes of the output signals of said first and second signal conditioning means which respectively correspond linearly to engine speed and engine intake manifold pressure except as modified in accordance with said first and second predetermined non-linear functions, and said control means further including means for applying said output pulse signals from said timer means to said actuator means in timed relation to engine rotation for opening said fuel injector valve means for time intervals having durations corresponding to the durations of said output pulse signals and to inject proportioned amounts of fuel for flow into said cylinders, whereby the rate of flow of fuel to the engine is controlled in linear proportion to manifold pressure and the square of the speed of rotation of the engine except as modified by non-linearities in said first and second predetermined non-linear functions.

3,971,349
FUEL FEED OF ROTARY CYLINDER COMBUSTION ENGINES

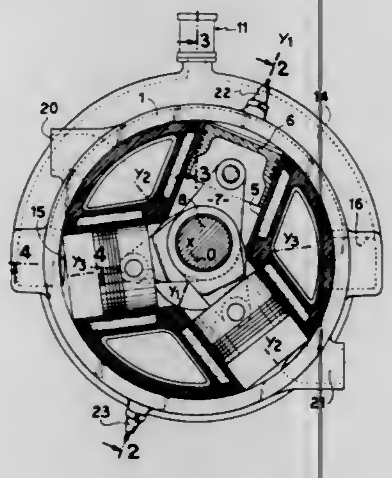
Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Nov. 29, 1974, Ser. No. 528,572

Claims priority, application France, Dec. 27, 1973, 73.46593

Int. Cl.² F02B *57/04*

U.S. Cl. 123—44 D **2 Claims**



1. In a combustion engine comprising a stator having an inner wall, a series of induction ports and exhaust ports in the stator inner wall, a fuel feed device communicating with the induction ports, a rotor received in the stator and defining cylinders with the stator inner wall, pistons movable in the cylinders, means for reciprocating the pistons in the cylinders upon rotation of the rotor relative to the stator, a combustion chamber being defined, in each cylinder, between the piston and the inner wall of the stator, means for ensuring that the rotation of the rotor and the reciprocating movements of the pistons are related in such manner that the induction and exhaust ports communicate with each cylinder respectively during the induction and exhaust stages of a four-stroke cycle; the improvement comprising an additional series of induction ports disposed in the stator inner wall in parallel with the first-mentioned series of induction ports so that each induction port of the first-mentioned series communicates with each cylinder in parallel with the corresponding induction port of the additional series, and an additional fuel feed device communicating with the induction ports of the additional series of induction ports, the respective induction ports of each one of the two series having different circumferential extents.

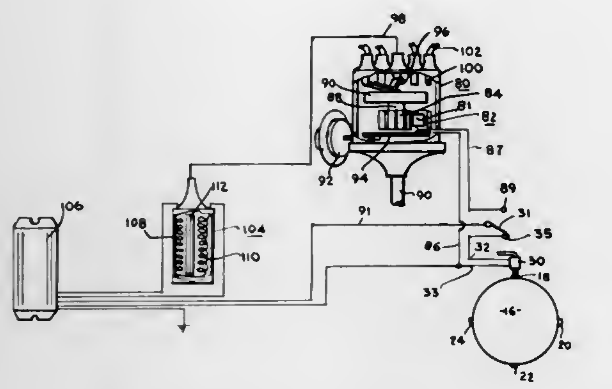
3,971,350
DISTRIBUTOR MEANS FOR HIGH SPEED ENGINES

Bill J. Hays, Midway City, Calif., assignor to Bill J. Hays International Inc., Midway City, Calif.

Filed Feb. 11, 1974, Ser. No. 441,650

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **11 Claims**



1. In an internal combustion engine having a crankshaft and a plurality of combustion chambers receiving an air-fuel mixture for combustion therein in a timed angular relationship to the rotation of said crankshaft and a high voltage pulse generating means including coil means with primary and secondary windings for generation of a train of high voltage pulses, a distributor having a distributor shaft rotatably mounted in a distributor housing and mechanically connected in a driven relationship to said output shaft, rotor means carried on said distributor shaft, conductor means extending from the secondary windings of said coil to said rotor and from terminal posts circumferentially disposed about said rotor to direct said train of high voltage pulses to spark means in each of said chambers in said timed relationship, a first voltage pulse generator mounted within said distributor housing and responsive to the rotation of said distributor shaft to generate a first train of voltage pulses in synchronism with the rotational speed of said distributor shaft, spark advance means on said distributor whereby the angular relationship between said first voltage pulse generator and said output shaft is variably adjustable from a minimum to maximum advance in response to varying conditions of one or both of engine speed and/or load to provide a first ignition timing, the improvement which comprises:

- a second voltage pulse generator including rotatable means fixedly carried on said crankshaft and cooperative pulse generating means fixedly mounted on said engine to generate a second train of voltage pulses in synchronism with the rotation of said crankshaft and at a predetermined and fixed angular relationship thereto to provide an ignition timing retarded from the maximum advance of said first ignition timing;
- first conductor means to apply said first train of voltage pulses to the primary windings of said coil;
- second conductor means to apply said second train of voltage pulses to the primary windings of said coil; and
- switch means in said first and second conductor means whereby either said first or second train of voltage pulses can be applied to the primary windings of said coil.

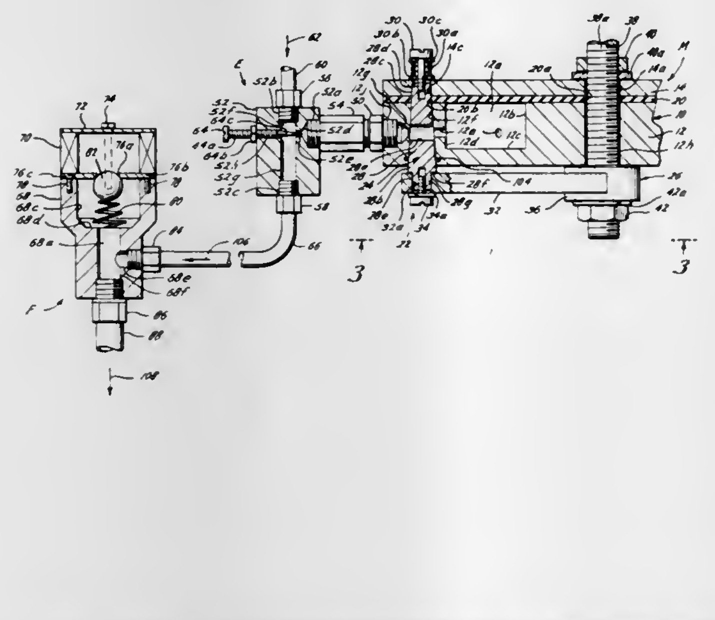
3,971,351
FUEL METERING SYSTEM

T. R. McKee, P.O. Box 127, Baytown, Tex. 77520

Filed Sept. 23, 1974, Ser. No. 508,448

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 R **7 Claims**



1. In an internal combustion engine having an exhaust manifold, a cylinder head with intake ports, a distributor, and a fuel pump, the improvement comprising a fuel metering system including:

- a metering apparatus mounted with the fuel pump including:
  - a housing having a cavity formed therein, said cavity receiving pressurized fuel from the fuel pump;
  - a plurality of cam-actuated valving means in fluid communication with said cavity for distributing charges of fuel from said cavity at predetermined intervals;
- exhaust gas mixing means mounted adjacent to said housing of said metering apparatus for mixing said charges of fuel with exhaust gas from the exhaust manifold to preheat and vaporize said charges of fuel, said exhaust gas mixing means having needle valve means for adjustably regulating the relative proportions of said charges of fuel with the exhaust gas from the exhaust manifold in proper ratios thereof;
- fresh air mixing means mounted with said metering apparatus for mixing fresh air with said charges of fuel, said fresh air mixing means having a mixing housing having a mixing chamber formed therein for mixing said vaporized charge of fuel-exhaust gas mixture with fresh air, to provide a combustable charge of fuel directed to the intake ports with the cylinder head; and,
- means for promoting ease of starting of the internal combustion engine and for providing the necessary boost for the internal combustion engine under high load conditions, said starting means mounted with said metering apparatus and the internal combustion engine.

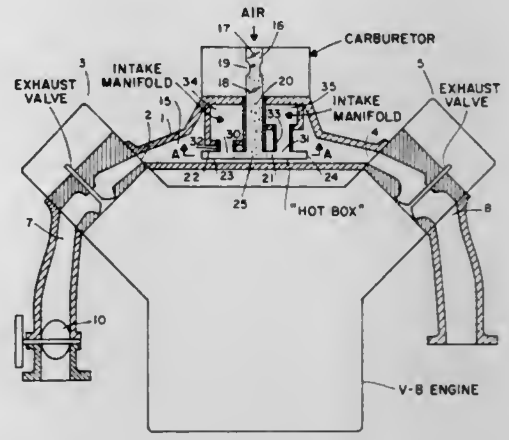
3,971,352
FUEL INDUCTION SYSTEM

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 439,912, Feb. 6, 1974, abandoned. This application Aug. 20, 1974, Ser. No. 498,960

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AC **13 Claims**



1. An internal combustion engine having improved cylinder-to-cylinder fuel distribution enabling operation of said engine at lean air/fuel ratios with resultant decreased emission of hydrocarbon and carbon monoxide in the exhaust gas, said engine comprising the combination of a multicylinder spark-ignited internal combustion engine, intake manifold means for delivering air/fuel mixture to each of said multicylinders, carburetor means having means for atomizing gasoline into a carburetor barrel, an exhaust gas passage through which hot exhaust gas flows, an enclosed container defined by a bottom wall, side wall, and top wall having an inlet in said top wall and an outlet, said container being separate from said intake manifold, said container being located within said exhaust gas passage, first passage means connecting said carburetor barrel directly to said inlet to conduct all of said air/fuel mixture into said container, second passage means connecting said outlet to said intake manifold means to deliver said air/fuel mixture from said container into said intake manifold means; said first passage means, said container and said second passage means forming the only flow path for substantially all of said air/fuel mixture from said carburetor barrel into said intake manifold means.

3,971,353
BENDIX-TYPE ENGINE STARTER WITH MECHANICAL LOOKOUT TO PREVENT UNDESIRED STARTING OF ENGINE

Joseph R. Harkness, Germantown, and Robert Couchman, Jr., Menomonee Falls, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 7, 1975, Ser. No. 548,162

Int. Cl.² F02H *3/00*

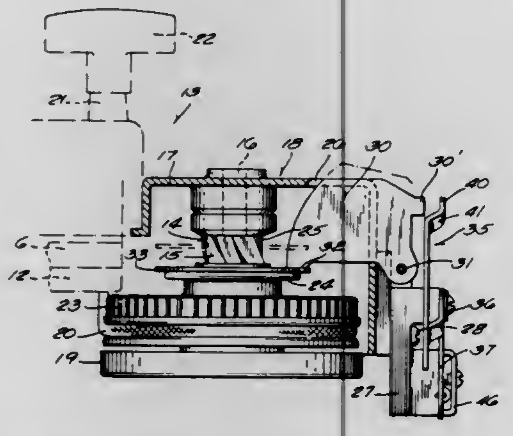
U.S. Cl. 123—179 K **11 Claims**

1. In combination with an engine starter of the Bendix-type wherein relative rotation in one direction between a driving pinion and a drive shaft with which it has a helically splined connection propels the driving pinion axially along the shaft into mesh with a ring gear on the flywheel of an engine with which the starter is associated and relative rotation in the opposite direction between the driving pinion and the shaft propels the driving pinion to a retracted position out of mesh with the ring gear, a mechanical lock-out adapted to be coupled to a remotely located control by which a function of the engine is activated, to prevent starting of the engine if said control has been actuated to activate said engine function, said lock-out comprising:

A. means providing a surface that is fixed with respect to the driving pinion, is substantially normal to its axis and faces in the direction the pinion moves as it leaves its retracted position;

B. a rigid movable restraining member;

C. pivot means mounting said restraining member and constraining the same to pivotal movement in an arcuate path about an axis that is fixed with respect to the retracted position of the driving pinion,
  a part of said rigid restraining member that is spaced from the axis of the pivot means being in contact with said surface so that axial movement of the driving pinion from its retracted position cannot take place if concomitant pivotal movement of the restraining member about the axis of said pivot means is prevented,
  the contact between said restraining member and said surface being at a point relatively close to the axis of the driving pinion and accommodating rotation of said surface;



D. a blocking member mounted to move along a path fixed with respect to the path of movement of said restraining member between an active position in which it blocks pivotal movement of the restraining member in the direction it must move for the driving pinion to leave its retracted position and an inactive position in which it does not interfere with such pivotal movement of the restraining member; and

E. motion transmitting means through which said blocking member is connectible with the remotely located control and by which the blocking member is moved to its active position concomitantly with actuation of the control to activate said engine function.

3,971,354

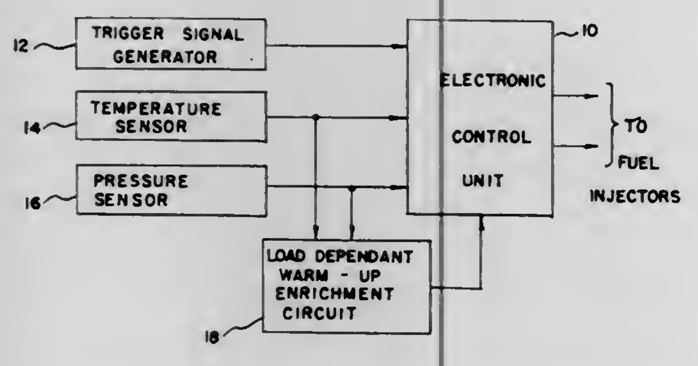
INCREASING WARM UP ENRICHMENT AS A FUNCTION OF MANIFOLD ABSOLUTE PRESSURE

David G. Luchaco, Rochester, and William A. Peterson, Jr., Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed June 23, 1975, Ser. No. 589,174

Int. Cl.² F02B *3/00*

U.S. Cl. 123—179 L **23 Claims**



1. In combination with an internal combustion engine fuel injection control system of the type having an electronic control unit to control the open time of at least one electrically actuated fuel injection valve in response to operating parameters of the engine, including the rotation of the engine's crank shaft, the engine's temperature and the engine's load, the improvement wherein said electronic control circuit comprises:

means for generating a first pulse train which produces a pulse for each revolution of said engine crankshaft, the magnitude of the pulses of said first pulse train varying in a predetermined manner;

means for generating a control signal having a predetermined fixed value for temperature above a predetermined temperature and a value variable as a function of engine temperature and engine load for engine temperatures below said predetermined temperature and engine load above a predetermined value;

means for generating a second pulse train which produces a pulse for each revolution of said engine crankshaft 180° out of phase with the pulses of said first pulse train, the magnitude of the pulses of said second pulse train varying as a function of said control signal;

means for combining the pulses of said first and second pulse trains so that the beginning of a pulse from said second pulse train terminates a pulse from said first pulse train and the end of a pulse from said second pulse train initiates a pulse from said first pulse train;

means for generating a third pulse train having pulses which begin with the beginning of each pulse of said second pulse train and ends when each pulse of said second pulse train reaches a value determined by the engine load; and

means for applying said third pulse train to said electrically actuated fuel injector valve to open said injector valve for the duration of each pulse of said third pulse train.

3,971,355

PISTON ROD-CONNECTING ROD INTERCONNECTIONS FOR INTERNAL COMBUSTION ENGINES

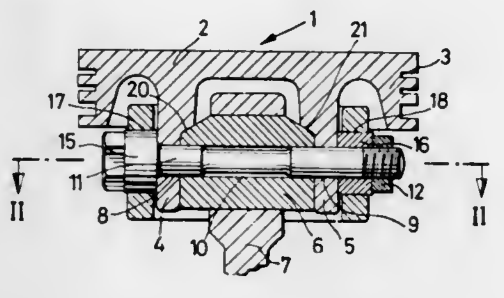
Helmut Kottmann, Urbach, Germany, assignor to Mahle GmbH, Stuttgart, Germany

Filed Sept. 4, 1974, Ser. No. 503,133

Claims priority, application Germany, Sept. 7, 1973, 2345223

Int. Cl.² F02B *75/32*

U.S. Cl. 123—197 A **4 Claims**



1. A piston and piston rod arrangement for a reciprocating piston engine, said arrangement comprising:

a. a piston having a piston head, a piston ring portion and a pair of support members integral with said piston head and extending away from said piston head in spaced relationship with respect to the piston ring portion;

b. a connecting rod positioned between and in contact with said support members, said connecting rod being so shaped as to define a bore therethrough;

c. a piston rod carried on said connecting rod;

d. a bolt passing through said support members and through said bore to exert a clamping force between said support members and said connecting rod, the bolt having an intermediate portion which passes through said bore and which has a diameter less than that of said bore; and

e. cooperating shoulders formed on said connecting rod and said support members to prevent movement of said connecting rod in a direction towards said piston head.

3,971,356

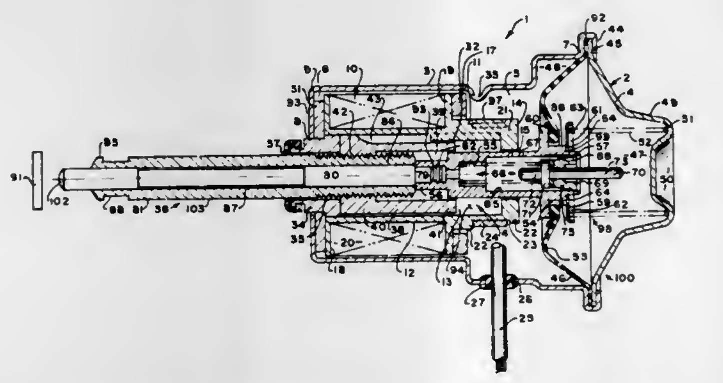
SOLENOID-DASHPOT

Robert E. Schlage, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,823

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 D **19 Claims**



1. An integral solenoid and dash pot device for regulating the carburetor of an internal combustion engine comprising:

a housing, said housing defining a solenoid container and a diaphragm chamber;

a solenoid mounted in said solenoid container, said solenoid including a core having an axial opening through it, and an armature mounted for movement in the axial opening of said core, said armature having a longitudinal opening through it;

a diaphragm assembly including a flexible diaphragm movable between at least a first position and a second position, said diaphragm having a central opening in it, said diaphragm adapted to divide said diaphragm chamber into a first chamber part and a second chamber part; a hub mounted to said diaphragm along said central opening, said hub having a first end and a second end; a valve assembly mounted in the first end of said hub, said valve assembly arranged to permit communication between said first chamber part and said second chamber part upon a predetermined distance of travel of said diaphragm in a first direction, and to close communication between said first and said second chamber parts after a predetermined distance of travel of said diaphragm in a second direction; and

a shaft assembly movably mounted in said housing, said shaft assembly including a first shaft and a second shaft coaxially arranged with respect to one another, said second shaft being attached to said hub and said first shaft being adjustably connected to the armature of said solenoid.

3,971,357

METHOD AND APPARATUS FOR THROWING FRANGIBLE TARGETS

Jean-Michel LaPorte, and Jean-Claude LaPorte, both of Pont de la Brague, 06600 Antibes, France

Filed Dec. 27, 1974, Ser. No. 536,989

Claims priority, application France, Jan. 2, 1974, 74.00018

Int. Cl.² F41B *3/04*

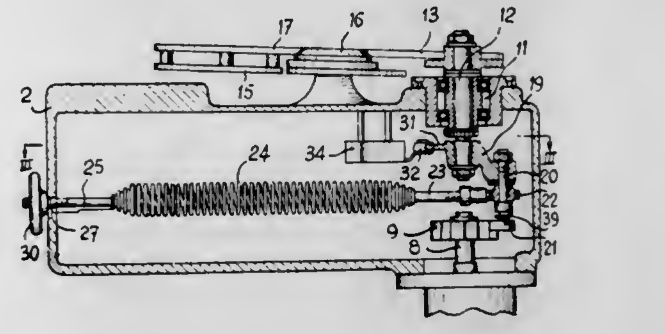
U.S. Cl. 124—8 **7 Claims**

1. In a throwing device, said device comprising a pivotal shaft, a body which supports said pivotal shaft, a throwing arm mounted to a first end of said shaft and a crank mechanism affixed to a second end thereof, and a traction spring, said crank mechanism being mechanically coupled to the extendable end of said traction spring, the improvement comprising:

drive motor means for developing a force for positioning the throwing arm against the tension of the traction spring, said motor means including an electric motor having an output shaft;

means drivingly coupling said motor means motor output shaft to the pivotal shaft which mounts the throwing arm, said coupling means including a unidirectional clamping means, said clamping means restraining the pivotal shaft to rotation in a first direction only and thereby maintaining the pivotal shaft and the throwing arm in a position commensurate with the traction spring being under tension, said clamping means converting the kinetic energy of the traction spring to potential energy at the end of a throwing operation; and

control circuit means for said drive motor means, said control circuit means automatically de-energizing said drive motor means motor after the throwing arm is spring driven to an overshoot position and locked, at which time said throwing arm is in a desired partially cocked spring tensioned position, and said control circuit means restarting said drive motor means motor whereby the pivotal shaft will be driven from the partially cocked spring tensioned position to an angular position wherein the throwing arm will be released to the influence of the traction spring acting on the crank mechanism for a throwing operation.



3,971,358

METHOD OF AND ARRANGEMENT FOR DRESSING OF GRINDING WHEELS

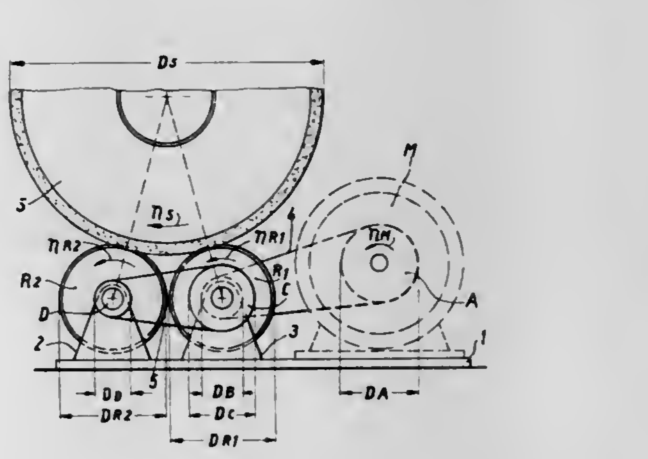
Wlodzimierz Sawluk, Hamburg, Germany, assignor to Ernst Winter & Sohn, Hamburg, Germany

Filed Apr. 29, 1974, Ser. No. 465,292

Claims priority, application Germany, Apr. 27, 1973, 2321477

Int. Cl.² B24B *53/14*

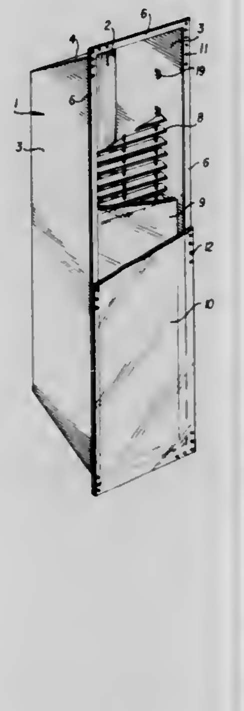
U.S. Cl. 125—11 CD **15 Claims**



3. An apparatus for dressing and sharpening of grinding wheels, comprising mounting means mounting a grinding wheel for rotation at a predetermined peripheral speed; a pair of adjacent dressing rollers in contact with said grinding wheel; and drive means driving each of said dressing rollers at a peripheral speed different from the other and each being different from the predetermined peripheral speed of said grinding wheel and so that the dressing directions of said dressing rollers are mutually opposite and the dressing speeds are identical.

3,971,359
LOUVERED SELECTIVE SOLAR ENERGY COLLECTOR

Richard Curtis Bourne, 1820 B St., Lincoln, Nebr. 68502
Filed Apr. 14, 1975, Ser. No. 567,844
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **5 Claims**

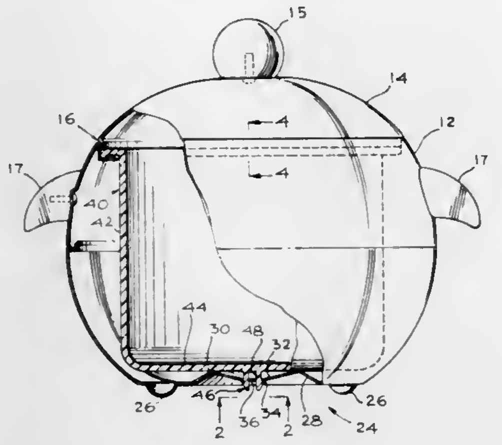


1. An apparatus for heating air by solar heat, comprising:
an enclosed air cavity having an inlet for admitting air thereto, and an outlet for conducting air therefrom;
an outer transparent sheet which comprises an exterior wall of said cavity, which exterior wall is for transmission of solar energy,
an inner transparent sheet for transmission of solar energy spaced adjacent said outer transparent sheet and being substantially coextensive with said outer transparent sheet, the edges of said outer and inner transparent sheets being sealed together to isolate a volume of air therebetween,
a plurality of louvers comprising thin, substantially parallel slats, arranged with their centerlines in a plane which is located within said enclosed air cavity and adjacent the inner transparent sheet, each of said slats having an upper surface which is highly reflective of solar energy, said slats being selectively angled for reflecting solar rays impinging thereon at high angles from the horizontal, and for permitting lower angle solar rays to pass therebetween;
the interior surface of said cavity being highly absorptive of solar energy.

3,971,360
INSULATED SERVER

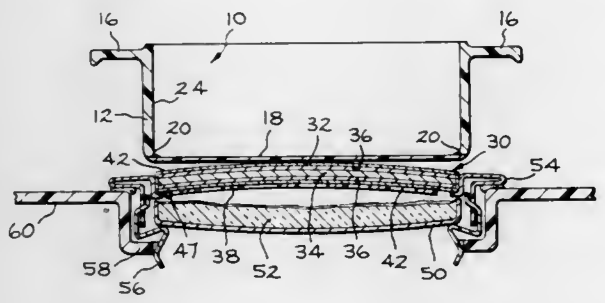
Carl R. Spoeth, Jr., Kewaskum, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 24, 1975, Ser. No. 571,150
Int. Cl.² B65D *25/14*
U.S. Cl. 126—373 **7 Claims**

1. An insulated server having an outer housing with a top opening defined by a peripheral rim flange and a base portion having an orifice therethrough and support means for said server including a removable inner liner having a bottom and upstanding integral sidewalls, said bottom having an integral downwardly extending engagement means for releasable attachment to the base portion of said server comprising at least one projection with an enlarged head for passing through said orifice, said head including a step portion for engaging the edges of said orifice.



3,971,361
LOW THERMAL MASS COOKING UTENSIL

Bohdan Hurko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed July 15, 1974, Ser. No. 488,526
Int. Cl.² A47J *27/00*
U.S. Cl. 126—390 **19 Claims**



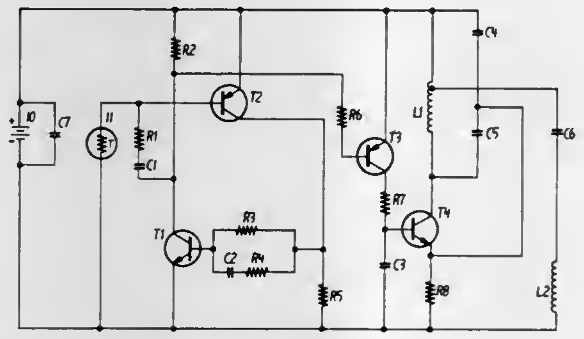
1. A low thermal mass cooking utensil for surface cooking comprising generally raised side walls and a high temperature resilient plastic sheet that is stretched taut and sealed across the bottom edge of the side walls to form a leak-proof bottom wall, so that the weight of the cooking load placed in the utensil will cause the bottom wall to stretch and conform to the top surface of a supporting surface heating means for good thermal coupling, and the principle manner of applying heat to the utensil is by thermal conduction through the resilient bottom wall.

3,971,362
MINIATURE INGESTIBLE TELEMETER DEVICES TO MEASURE DEEP-BODY TEMPERATURE

Jack M. Pope, and Thomas B. Fryer, both of Saratoga, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 27, 1972, Ser. No. 301,418
Int. Cl.² A61B *5/07*
U.S. Cl. 128—2 P **8 Claims**

1. A miniature, ingestible telemeter device for transmitting information relating to deep-body temperature of a subject comprising:
a free-running multivibrator having complementary transistors;
an r-f oscillator having a predetermined resonant frequency, said oscillator including an inductor for radiating r-f energy;
a buffer amplifier coupled between said multivibrator and said oscillator;

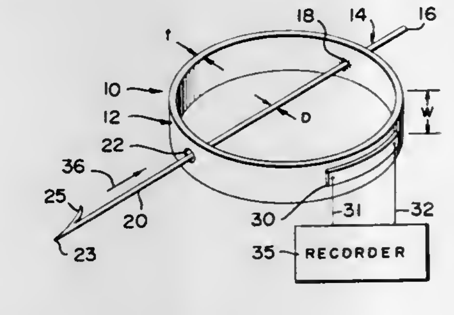
a battery connected to said multivibrator, said buffer amplifier, and said oscillator;
said free-running multivibrator having temperature-sensitive circuit means for turning on and off said multivibrator and controlling its output pulse frequency when in the on state, said temperature-sensitive circuit means comprising an R-C circuit, said R-C circuit being connected to said battery and to both of said complementary transistors, said R-C circuit including a thermistor;
means in said multivibrator for turning on said buffer amplifier when said complementary transistors are conducting;
means in said buffer amplifier for turning on said oscillator when said buffer amplifier is on;



said multivibrator, said buffer amplifier and said r-f oscillator being in an off state and drawing an insignificant current from said battery when said thermistor is subjected to or below a predetermined temperature which is below the deep-body temperature of the subject ingesting said telemeter device, said free-running multivibrator, said buffer amplifier, and said r-f oscillator being in an on state whenever said thermistor is exposed to a temperature above said predetermined temperature, the output frequency of said multivibrator being proportional to the temperature of said thermistor, said oscillator generating bursts of r-f energy at the output frequency of said multivibrator, the period between successive bursts being inversely proportional to the temperature of said thermistor.

3,971,363
MYOCARDIUM WALL THICKNESS TRANSDUCER AND MEASURING METHOD

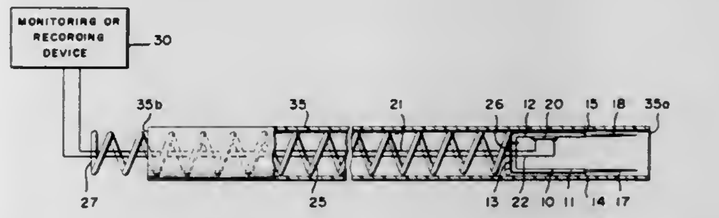
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyril Feldstein, Sierra Madre, Calif.; Gilbert W. Lewis, Arcadia, Calif.; Robert H. Silver, Van Nuys, Calif., and Virgil H. Culler, La Canada, Calif.
Filed May 5, 1975, Ser. No. 574,218
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **10 Claims**



1. A transducer for measuring changes in thickness of a material, comprising:
a closed loop shaped beam of high elastic compliance, said beam defining an opening therein;
an elongated rod-shaped spike of a diameter less than the diameter of said opening, said spike having a portion extending into said loop through said opening and being connected to said beam at a point substantially opposite said opening, said spike further including a working portion extending outwardly from said opening and terminating in a tapered end, the working portion of said spike being adapted to be inserted in a material, whose thickness change is to be measured, through an exposed surface of said material, to a depth so that said exposed surface is in intimate contact with the portion of the beam around said opening, with said material applying a minimal beam-deforming force to said beam; and
strain gauge means including a strain gauge bonded to said beam between said opening and the point at which said spike is connected to said beam for measuring changes in the beam strain as a function of the beam-deforming forces applied thereto.

3,971,364
CATHETER TIP FORCE TRANSDUCER FOR CARDIOVASCULAR RESEARCH

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyril Feldstein, Sierra Madre; Gilbert W. Lewis, Arcadia; Robert H. Silver, Van Nuys, and Virgil H. Culler, La Canada, all of Calif.
Filed May 16, 1975, Ser. No. 578,241
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **9 Claims**



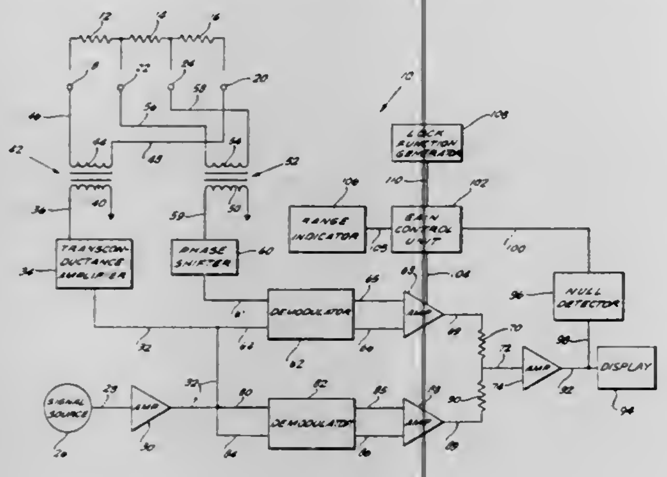
1. A transducer for measuring forces in an internal muscle of a living subject without surgical intervention comprising:
first means including a plurality of substantially parallel spaced apart tines with tapered outer ends for penetrating an internal muscle of a subject;
strain gauge means coupled to said first means to provide an output related to the low compliance deflection of one of said tines;
an elongated flexible member having a first end coupled to said first means remote from said tines and extending to a second end; and
an elongated flexible hollow tube, definig a catheter, having a first working end and an opposite second end, said catheter being adapted to be inserted into said subject so that its first end is substantially adjacent an internal muscle of said subject and the second end remaining external thereof, said catheter surrounding said first means with the tines adjacent and directed toward the catheter first end, and said elongated flexible member, except for a portion thereof, extending beyond said catheter second end, at least portions of said tines being extractable from said catheter first end for implantation in said muscle by pushing on the portion of the flexible member extending beyond said catheter second end toward said catheter, said tines being retractable from said muscle into said catheter through the first end thereof by pulling on the portion of the flexible member extending beyond said catheter second end.

3,971,365
BIOELECTRICAL IMPEDANCE MEASURING SYSTEM

Leland B. Smith, Arlington Heights, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Feb. 12, 1973, Ser. No. 331,770
Int. Cl.² A61B *5/05*
U.S. Cl. 128—2.1 Z **8 Claims**

1. A bioelectrical impedance measuring system comprising

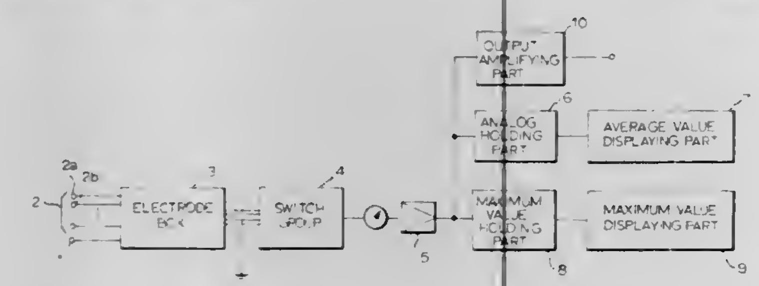
excitation electrode means adapted to be associated with a subject exhibiting impedance to be measured, for coupling a high frequency excitation signal to the subject;
receiver electrode means adapted to be associated with the subject for receiving a subject output signal developed in response to the excitation signal;
subject signal amplifier means connected to said receiver electrode means for developing a d.c. output signal proportional to the subject output signal;
reference amplifier means adapted to be connected to the source of the high frequency excitation signal for developing a d.c. reference signal from the excitation signal;



differencing means connected to said subject signal amplifier means and to said reference amplifier means for deriving a difference signal proportional to the amplitude difference between said d.c. subject signal and said d.c. reference signal;
detecting means connected to said differencing means for detecting a nulled condition of said difference signal;
gain control means for adjusting and stabilizing the gain of said subject signal amplifier means with said difference signal in a nulled condition; and
display means connected to said differencing means responsive to said difference signal.

3,971,366
APPARATUS AND METHOD FOR MEASURING THE CONDITION OF THE MERIDIANS AND THE CORRESPONDING INTERNAL ORGANS OF THE LIVING BODY

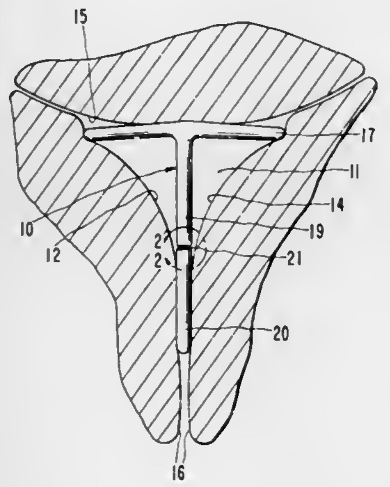
Hiroshi Motoyama, 4-11-7, Inokashira, Mitaka, Tokyo, Japan
Filed Nov. 25, 1974, Ser. No. 527,150
Int. Cl.^{2} A61B *5/04*
U.S. Cl. 128—2.1 Z **5 Claims**


10
OUTPUT AMPLIFYING PART
6
ANALOG HOLDING PART
7
AVERAGE VALUE DISPLAYING PART
2a
2b
3
4
2
ELECTRODE BOX
SWITCH GROUP
5
MAXIMUM VALUE HOLDING PART
MAXIMUM VALUE DISPLAYING PART
8
9

1. A visceral/automatic nervous function diagnosing apparatus comprising a reference electrode which is firmly attachable to a part of the living body, a plurality of differential electrodes firmly attachable to 14 pairs of specific minute points at the finger tips of the hands and feed of the living body, detecting circuit means to which said electrodes are connected for detecting electric resistance in the surface layer of the living body generated between said reference electrode and the respective differential electrodes and having a switching means for switching the connection between said reference electrode and respective differential electrodes, a maximum value measurement means connected to said detecting circuit means for obtaining a maximum value of the output of said detecting circuit means, an average value measurement means connected to said detection circuit means for obtaining an average value of the output of said detecting circuit means, and comparison and displaying means for comparing the maximum value and the average value and for displaying the results obtained from the comparison.

3,971,367
INTRAUTERINE DEVICE HAVING MEANS FOR CHANGING FROM UTERINE-RETENTIVE SHAPE TO NONUTERINE-RETENTIVE SHAPE

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 319,014, Dec. 27, 1972, Pat. No. 3,898,986. This application June 4, 1975, Ser. No. 583,829
Int. Cl.^{2} A61F *5/46*
U.S. Cl. 128—130 **23 Claims**



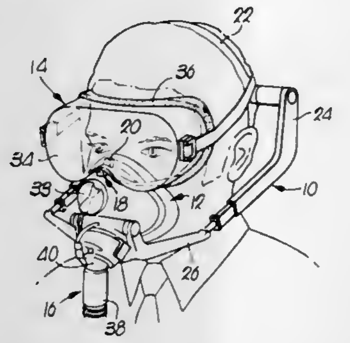
1. A drug dispensing intrauterine device, shaped and adapted for insertion and positioning in the uterine cavity, with the device comprising in combination:
a. a drug
b. a delivery means adapted for insertion into the uterine cavity and for dispensing a therapeutically effective amount of drug to the uterine cavity over a defined period of time, and
c. retention means for retaining the delivery means within the uterine cavity throughout the defined period of drug dispensing time, said retention means having an initial unit structural configuration sahped and adapted for insertion and positioning in the uterine cavity including means formed of a member selected from the group consisting of protein, collagen, elastin, keratin, resilin and fibrin that undergo biotransformation in the uterine cavity to a different and nonuterine-retentive configuration whereby at the completion of said defined period of drug dispensing time, said drug dispensing device is facilely removed or spontaneously eliminated from the uterine cavity.

3,971,368
COMBINED OXYGEN MASK AND SMOKE GOGGLE APPARATUS WITH AUTOMATIC FLUSH VALVE

Robert Stafford Forbes, Leawood; Gary Dean Herrick, Olathe, and Robert Julius Richter, Overland Park, all of Kans., assignors to Puritan Equipment, Inc., Lenexa, Kans.
Filed Aug. 13, 1975, Ser. No. 604,465
Int. Cl.^{2} A62B *7/00*
U.S. Cl. 128—142 R **6 Claims**

1. In protective breathing and vision maintenance apparatus;
breathing mask means having a face-piece adapted to fit over the nose and mouth area of the face of a user to present a first chamber between said mask means and the face of the user, said mask means including inlet means through which breathable gas under pressure may be supplied to said first chamber;

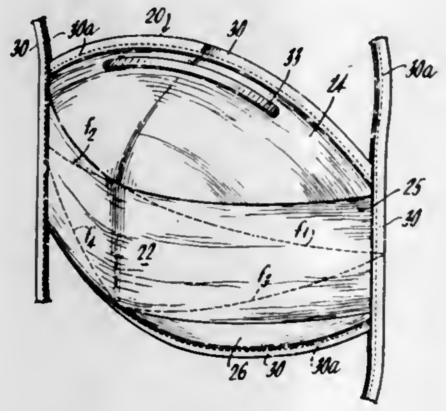
goggle means adapted to fit over the eyes area of the face of a user and to present a second chamber between said goggle means and the face of the user;
conduit means adapted for placing said chambers in fluid communication with each other for the passage of gas from said first chamber into said second chamber said goggle means including means for operably engaging said conduit means for displacing the latter from a first position, in which said first chamber is not in fluid communication with said second chamber, to a second position in response to the positioning of said goggle means, in which said first chamber is in fluid communication with said second chamber; and



valve means operably associated with said conduit means for opening and closing the latter for the passage of said gas from said first chamber into said second chamber, whereby said valve means is opened in response to the displacement of said conduit means into said second position and closed in response to the displacement of said conduit means into said first position, and
whereby gas under pressure will automatically be supplied from said first chamber to said second chamber to flush out said goggle means when the latter are in place on the face of the user, but said first chamber will be substantially sealed by the closing of said valve means to conserve said gas when said goggle means are not in place on the face of the user.

3,971,369
FOLDED CUP-LIKE SURGICAL FACE MASK AND METHOD OF FORMING THE SAME

Gary B. Aspelin, Bridgewater, and James T. Smith, Edison, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed June 23, 1975, Ser. No. 589,721
Int. Cl.^{2} A61M *16/00*
U.S. Cl. 128—146.2 **22 Claims**



12. A generally cup-like face mask comprising a body portion and means for holding the mask in place over the nose and mouth of a wearer, said body portion comprising a filtration medium for filtering bacteria and being folded from a blank of said filtration medium, said blank in its unfolded form having top and bottom edges and a pair of opposed side edges, said blank having established thereon;

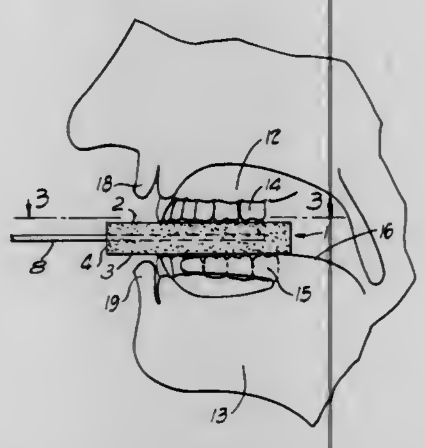
1. a longitudinal fold line running from top to bottom thereof;
2. a first transverse line of demarcation, said first line being substantially parallel to the top and bottom edges of said blank and extending from side to side thereof;
3. a second transverse line of demarcation extending from side to side of said blank, said second line being between, and generally parallel to, said first transverse line and one of said top and bottom edges of the blank;
4. a third transverse line of demarcation extending from side to side of said blank, said third line being between, and generally parallel to, said first transverse line and the other of said top and bottom edges of the blank;
5. first and second points on one of said side edges of said blank, said first point being between the point at which said second transverse line of demarcation meets said one of said side edges and said one of said top and bottom edges, said second point being between the point at which said third transverse line of demarcation meets said one of said side edges and said other of said top and bottom edges, the distance between said first point and said second transverse line of demarcation, and the distance between said second point and said third transverse line of demarcation being not greater than the distance between said second line of demarcation and said third line of demarcation;
6. third and fourth points on the other of said side edges of said blank, said third point being between the point at which said second transverse line of demarcation meets said other of said side edges and said one of said top and bottom edges, said fourth point being between the point at which said third transverse line of demarcation meets said other of said side edges and said other of said top and bottom edges, the distance between said third point and said second transverse line of demarcation, and the distance between said fourth point and said third transverse line of demarcation being not greater than the distance between said second line of demarcation and said third line of demarcation;
7. four angularly disposed fold lines, one of said four fold lines connecting said first point with a fifth point on said longitudinal fold line;

a second of said four fold lines connecting said second point with a sixth point on said longitudinal fold line;
a third of said four fold lines connecting said third point with said fifth point on said longitudinal fold line;
and the last of said four fold lines connecting said fourth point with said sixth point on said longitudinal fold line, provided, however, that none of said four fold lines meets said longitudinal fold line at that portion of said longitudinal fold line lying between said second transverse line of demarcation and said third transverse line of demarcation, and further provided that the distance between the intersection of said longitudinal fold line with said second transverse line of demarcation and said fifth point does not exceed about 75% of the distance between said first and second transverse lines of demarcation and the distance between the intersection of said longitudinal fold line with said thrid transverse line of demarcation and said sixth point does not exceed about 75% of the distance between said first and said third transverse lines of demarcation;
said blank being creased along said longitudinal fold line;
said first and second points being located, when said blank is in its folded configuration, on said one of said side edges at positions lying between said second said third transverse lines of demarcation;
and said third and fourth points being located, when said blank is in its folded configuration, at positions on said other of said side edges at positions lying between said second and said third transverse lines of demarcation, said folded blank being secured at the sides thereof

whereby its cup-shaped configuration is retained.

3,971,370
TONGUE AND JAW POSITIONING ARTICLE

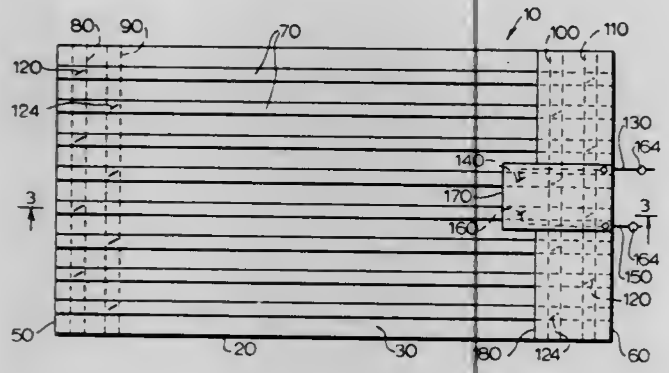
George C. Halford, and Robert E. Michael, both c/o Halbrand, P.O. Box 272, Willoughby, Ohio 44094
Filed Oct. 30, 1969, Ser. No. 872,499
Int. Cl.² A61F *5/56*
U.S. Cl. 128—136 **5 Claims**



1. In a tongue and jaw positioning article of the class described, in combination, a block of relatively dense, rigid plastic foam for inserting in the mouth of a subject, said block being approximately the width of the tongue of such subject and a length to substantially overlie such tongue, said block extending between and outwardly of the teeth of the upper and lower jaws of such subject when emplaced therebetween, the thickness and density of the block normally preventing the teeth of such subject from penetrating the block to any substantial depth, and the teeth of such upper and lower jaws from interengaging when the block is in the position described, and a strip of much harder relatively thin and nonyieldable material, fixed in said block extending over a substantial portion of the area of the block whilst being confined therein, one end of said strip extending outwardly from the block to form a handle.

3,971,371
URINE-SENSING PAD

Stanley Bloom, 1048 Kenyon Ave., Plainfield, N.J. 07060
Filed May 27, 1975, Ser. No. 580,776
Int. Cl.² A61B *19/00*
U.S. Cl. 128—138 A **5 Claims**



1. A pad for electrically detecting the presence of a conductive fluid comprising

a sheet of insulating material having top and bottom surfaces and first and second ends,

a plurality of parallel fluid-sensing strips of conductive material on the top surface of said sheet including first, second . . . *n* strips,

a first connecting strip connected to the odd-numbered fluid-sensing strips which are thus connected in a common first set,

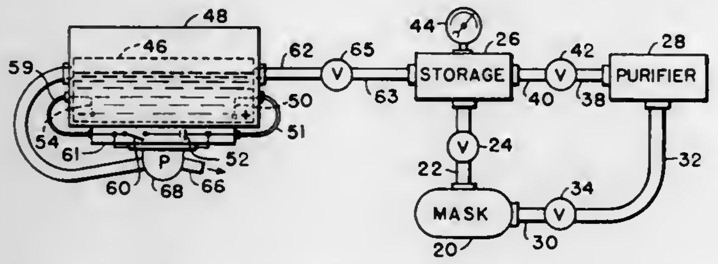
a second connecting strip connected to the even-numbered fluid-sensing strips which are thus connected in a common second set,

said first and second connecting strips being on the bottom surface of said sheet, and

metal staples making the connections between the fluid-sensing strips and their connecting strips through said sheet.

3,971,372
OXYGEN-GENERATING APPARATUS FOR SCUBA DIVING

Ronald J. Lenk, 8919 Eldora Drive, and David T. Fletcher, 3773 Belfast St., both of Cincinnati, Ohio 45236
Filed May 29, 1975, Ser. No. 581,716
Int. Cl.² A62B *7/00*
U.S. Cl. 128—142 R **11 Claims**



1. Underwater oxygen-generating apparatus for supplying oxygen for an underwater swimmer, said apparatus including an electrolytic oxygen generator adapted to be carried by the swimmer, said generator comprising:

a closed insulated container for containing an electrolytic solution;

mounting means for rotatably mounting said container for rotation on a normally horizontal axis, the center of gravity of said container being radially spaced from said axis, whereby said container rotates as said mounting means rotates on said horizontal axis;

a first anode electrode and a second cathode electrode mounted in said container and spaced from each other, said electrodes being oriented radially in the direction of said center of gravity, whereby said electrodes are normally maintained in a vertical orientation as said mounting means is rotated on said horizontal axis and wherein hydrogen gas forms at said cathode electrode and oxygen gas forms at said anode electrode;

means for connecting a two-terminal source across said electrodes; means for electrical insulating said connecting means from the surrounding environment; and

a collector means at each electrode for collecting the gases generated thereat and for exiting the gases from said generator.

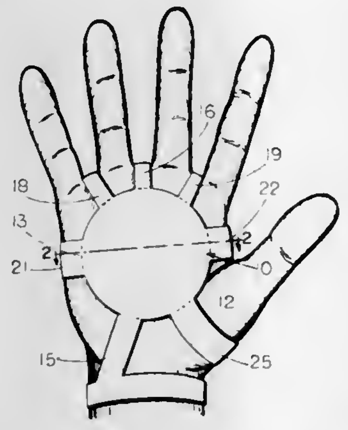
3,971,373
PARTICLE-LOADED MICROFIBER SHEET PRODUCT AND RESPIRATORS MADE THEREFROM

David L. Braun, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 435,198, Jan. 21, 1974, abandoned. This application Dec. 6, 1974, Ser. No. 530,070
Int. Cl.² A62B *23/02*
U.S. Cl. 128—146.2 **24 Claims**

21. A respirator comprising inlet structure defining a path of air intake from the ambient environment to the mouth and nose of a person wearing the respirator, support structure for mounting the respirator on a person wearing the respirator, and a porous sheet product disposed across the path of air intake so as to filter air drawn into the respirator, said sheet product comprising a web of entangled melt-blown organic polymeric microfibers and a three-dimensional array of solid particles dispersed and physically held in the web, the only contact between the microfibers and particles being the point contact of preformed solid bodies, whereby essentially the full surface of particles is exposed for interaction with a fluid passing through the sheet product.

3,971,374
SYMMETRIC PADDED BANDAGE FOR INJURED PALM OF EITHER HAND

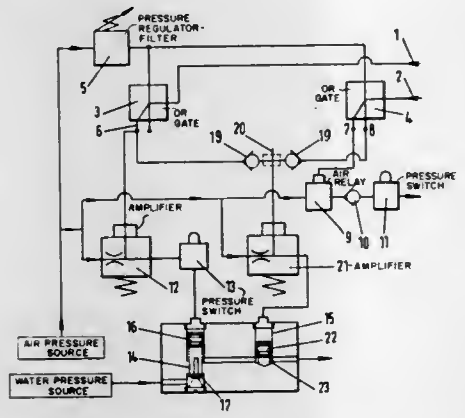
William H. Wagner, 5405 W. Eva St., Glendale, Ariz. 85301
Filed May 5, 1975, Ser. No. 574,683
Int. Cl.² A61F *13/00*
U.S. Cl. 128—155 **6 Claims**



1. A bandage suitable for protecting an injured palm of either a right or a left hand which comprises a sheet of wrapping material coated adhesively on its inner surface for adhesion to the skin and comprising a central area to cover the hollow part of the hand and plural pairs of tabs extending more or less radially from said central area, each pair of said tabs being arranged substantially symmetrically with respect to an axis aligned along the wrist and between the third and fourth fingers, one pair of said tabs being positioned to engage respectively the little finger and the index finger of a right hand or alternatively the index finger and little finger of a left hand, and a protective pad secured to the sheet in position to cover and protect said injured palm, the tabs being sufficient in number and so arranged as to hold said pad against said palm in either open or relatively closed conditions of the hand.

3,971,375
DENTAL SYRINGE

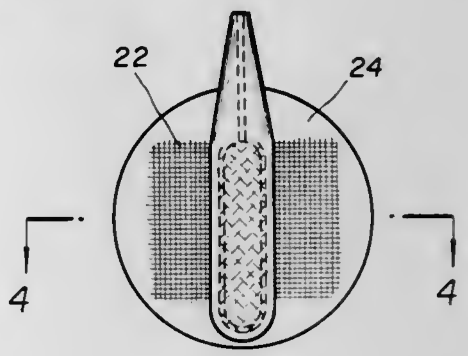
Horace Kirby Hill, London, England, assignor to The Amalgamated Dental Company Limited, London, England
Filed Apr. 17, 1975, Ser. No. 569,329
Claims priority, application United Kingdom, Apr. 19, 1974, 17333/74
Int. Cl.² A61M *11/00*
U.S. Cl. 128—173.1 **10 Claims**



1. A dental syringe comprising a hand held syringe unit coupled to a control unit, the hand held syringe unit being formed with an air control aperture and a water control aperture, the control unit comprising an air pressure regulator intended to be connected to an air pressure source and arranged to produce a regulated air pressure output, an air control fluid gate having a control input connected to the air control aperture in the syringe unit, a fluid input connected to the output of the air pressure regulator and a fluid output, the regulated air pressure being fed to the fluid output of the air control fluid gate only when the air control aperture is covered, an air control valve having a control input connected to the output of the air control fluid gate, an air input intended to be connected to the air pressure source, and an air output connected to an output nozzle in the syringe, the arrangement being that, when the regulated pressure appears at the output of the air control fluid gate, the air pressure source is connected to the said nozzle, a water control fluid gate having a control input connected to the water control aperture in the syringe unit, a fluid input connected to the output of the air pressure regulator, and a fluid output to which the regulated air pressure is fed only when the water control aperture is covered, and a water control valve having a water input intended to be connected to a water pressure source, a water output connected to the said nozzle and a control input connected to the fluid output of the water control fluid gate.

3,971,376
METHOD AND APPARATUS FOR INTRODUCING FLUIDS INTO THE BODY

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia
Continuation-in-part of Ser. No. 335,745, Feb. 26, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,428
Int. Cl.² A61M *7/00*
U.S. Cl. 128—260 **8 Claims**



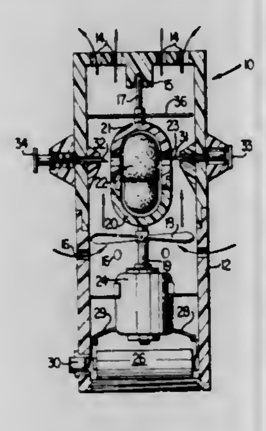
1. Apparatus for supplying fluids in an interior body organ comprising a capsule adapted to be implanted subcutaneously for extended periods of time said capsule having unitary walls formed of substantially non-collapsable self-sealing elastic material penetrable by injection and defining an enclosed bulbous interior cavity of given volume for receipt of fluid, said walls being formed of a hydrophillic elastic gel of sufficient strength to retain its shape and maintain a constant volume during periodic filling and emptying and reseal itself under penetration by injection feeding while implanted, said capsule having a channel exiting therefrom for connection to a conduit for the feeding and withdrawal of fluids to some body organ.

3,971,377
MEDICAMENT DISPENSING PROCESS FOR INHALATION THERAPY

Nalinkant C. Damani, Mountain View, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Continuation of Ser. No. 477,990, June 10, 1974, which is a division of Ser. No. 409,243, Oct. 24, 1973, Pat. No. 3,831,606, which is a continuation of Ser. No. 117,015, Feb. 19, 1971, abandoned. This application July 21, 1975, Ser. No. 597,568
The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl.² A61M *15/08, 13/00*
U.S. Cl. 128—266 **8 Claims**

1. A process of dispensing medicament for inhalation by a patient comprising:

- a. providing a hollow elongate housing having air inlet and air outlet passages;
- b. mounting a closed container of medicament within the housing on a fixed axis of rotation;
- c. opening said container;
- d. operating an internal rotation producing means to generate a positive pressure air stream between the air inlet and the air outlet to discharge the air stream from the outlet;



- e. rotating the container of medicament about said axis within the housing by said rotation producing means;
- f. dispensing a dosage of medicament from the container into the airstream while the container is rotating; and
- g. inserting the air outlet passage into the oral or nasal cavity of the patient.

3,971,378

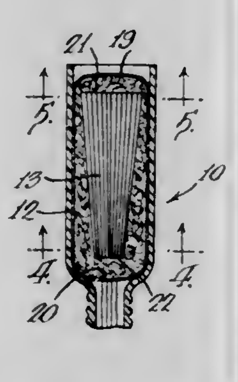
EXPANSIBLE TAMPON

Kermit E. Krantz, Shawnee Mission, Kans., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 20, 1974, Ser. No. 534,758

Int. Cl.^{2} A61F *13/20*

U.S. Cl. 128—285 **29 Claims**



1. A tampon comprising: an axially elongated, unitary absorbent member adapted to be inserted into the vagina with the leading end facing the cervix and disposed in close proximity thereto and the trailing end facing the exterior of the vagina, said trailing end being disposed in axial alignment with said leading end, axially elongated spreader means disposed within and surrounded by said unitary absorbent member for expanding said absorbent member from a compressed position for insertion of the tampon into the vagina to a relaxed position which is assumed after insertion of the tampon into the vagina, said spreader means having a leading end facing the leading end of the absorbent member and a trailing end facing the trailing end of the absorbent member, the trailing end of the spreader means being disposed in axial alignment with the leading end thereof, the lateral extent of the leading end of the absorbent member being approximately equal to the lateral extent of the trailing end of the absorbent member in the compressed position, and the lateral extent of the leading end of the absorbent member being larger than the lateral extent of the trailing end of the absorbent member in the relaxed position, said tampon adapted to expand and conform to the shape of the most distensible portion of the vagina upon insertion of said tampon therein, said tampon being sufficiently absorbent so as to be adapted for use in a post partum woman.

3,971,379

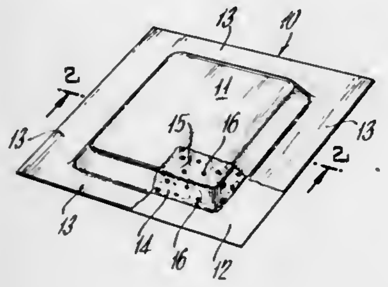
ABSORBENT HYDROPHILIC CELLULOSIC PRODUCT

Pronoy Kumar Chatterjee, Spotswood, N.J., assignor to Personal Products Company, Milltown, N.J.

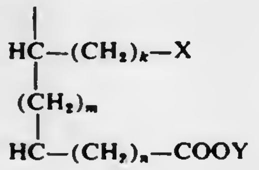
Filed Apr. 4, 1975, Ser. No. 565,294

Int. Cl.^{2} A61F *13/20*

U.S. Cl. 128—285 **15 Claims**



1. An absorbent body comprising hydrophilic crosslinked cellulose, said cellulose being crosslinked with an oxygen atom of a hydroxy group in an anhydroglucose unit of one cellulose molecule linked to an oxygen atom of a hydroxy group in an anhydroglucose unit of a second cellulose molecule through a crosslinking radical having the structure:



$$\begin{array}{l} | \\ \mathrm{HC{-}(CH_2)_k{-}X} \\ | \\ \mathrm{(CH_2)_m} \\ | \\ \mathrm{HC{-}(CH_2)_n{-}COOY} \end{array}$$

where X is chosen from the group consisting of H or COOY; Y is chosen from the group consisting of Na, K, Li, Ce, or H; and *k*, *m* and *n* are integers ranging from 0 to 4.

3,971,380

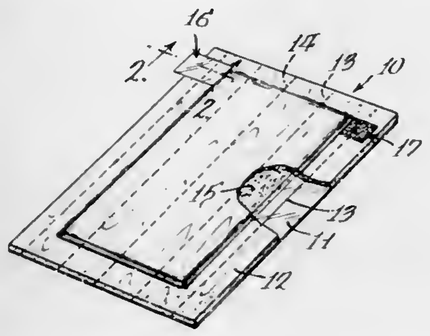
DISPOSABLE DIAPER HAVING AN ADHESIVE CLOSURE SYSTEM AND METHOD OF CONSTRUCTION THEREFOR

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 19, 1975, Ser. No. 578,556

Int. Cl.^{2} A61F *13/16*

U.S. Cl. 128—287 **3 Claims**



1. A disposable diaper having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant and including a flexible backing sheet of substantially moisture-impermeable material forming the diaper outside surface, a moisture-retaining layer having a pad of absorbent material superposed on said backing sheet and attached thereto and a porous facing sheet substantially coextensive with said backing sheet and forming the diaper inside surface, and a pressure sensitive adhesive closure within the peripheral limits of the diaper and comprising a layer of anchoring adhesive between said backing sheet and said facing sheet at a marginal location on said diaper and adhesively attached both to said backing sheet and to said facing sheet and a layer of pressure sensitive securing adhesive on said facing sheet, substantially coextensive with said layer of anchoring adhesive and adhesively attached to said anchoring adhesive through said facing sheet and presenting a tacky surface in the same direction as the diaper inside surface; said anchoring adhesive layer having greater adhesion to the backing sheet than said securing adhesive layer, and said securing adhesive layer having a greater quick stick property relative to the backing sheet than said anchoring adhesive layer.

3,971,381

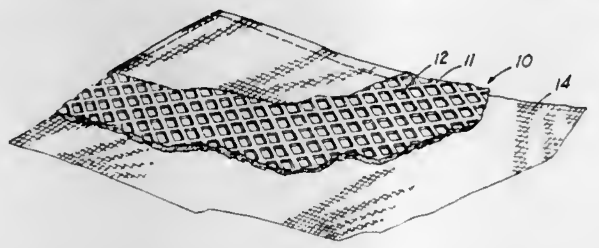
LAPAROTOMY SPONGE

Robert T. Gibson, Andrews, N.C., assignor to Professional Surgical Manufacturing Company, Marietta, Ga.

Filed Feb. 19, 1975, Ser. No. 551,134

Int. Cl.^{2} A61F *15/00, 13/00*

U.S. Cl. 128—296 **6 Claims**



1. A laparotomy sponge comprising a filler consisting essentially of rayon and polypropylene fibers mixed together in a weight ratio of approximately 80% rayon and 20% polypropylene and shaped into a configuration having a waffled surface; and a foraminous cover secured about said filler.

3,971,382

METHOD OF NON-SURGICAL TREATMENT OF CATARACTS

Mikhail Mikhailovich Krasnov, ulitsa Vesnina, 30, kv. 12, Moscow, U.S.S.R.

Continuation of Ser. No. 423,749, Dec. 11, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,311

Int. Cl.^{2} A61B *17/36*

U.S. Cl. 128—303.1 **5 Claims**

1. A method of non-surgical treatment of soft and membraneous cataracts, including congenital cataracts, said method comprising the step of cutting the anterior capsule of the lens and/or pupillary membrane without perforating injury to the eye wall with a laser beam caused to pass through the cornea, the anterior chamber of the eye and the pupil, and then be focused onto the anterior capsule of the lens and/or pupillary membrane to thus form at least one hole through which the cataract substance is thus let out of the lens capsule/soft cataract/into the anterior chamber of the eye where the substance is gradually dissolved.

3,971,383

CRYOGENIC SURGICAL INSTRUMENT

Johannes T. M. van Gerven, Tubingen, Germany, assignor to Erbe Elektromedizin KG, Tubingen, Germany

Filed Apr. 29, 1975, Ser. No. 572,872

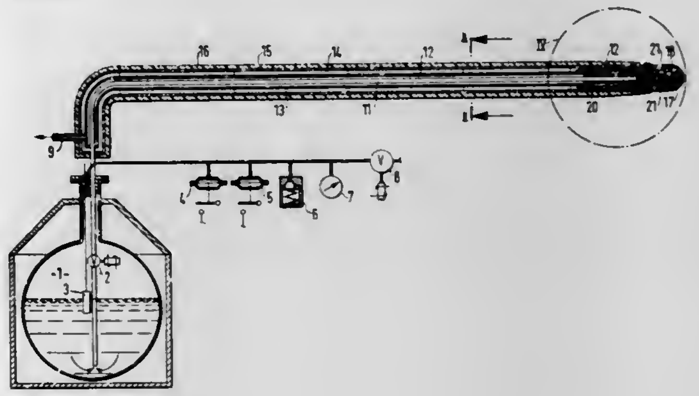
Claims priority, application Germany, May 7, 1974, 2422103

Int. Cl.^{2} A61B *17/36*

U.S. Cl. 128—303.1 **10 Claims**

1. Cryogenic surgical instrument to supercool limited areas of biological tissue having

- a hollow tip (21) of thermally conductive material, a supply vessel (1) of supercooled cryogenic liquid,
- a supply line (11) connected to said supply vessel (1) and to the hollow interior of the tip (21),
- a return line coaxial with said supply line and surrounding the same, said return line comprising two coaxial tubes (13, 15) spaced from each other and defining a heat-insulating space (14) therebetween, the inner one of the coaxial tubes (13) being spaced from the supply line (11) to define a return space (12) for evaporated cryogenic liquid,



and a filler material comprising n-butane in said insulating space (14).

3,971,384

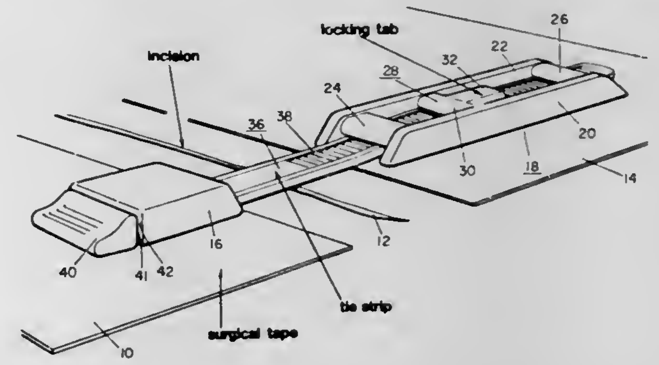
SURGICAL CLOSURE

Harrith M. Hasson, 6942 N. Waukesha Ave., Chicago, Ill. 60646

Continuation-in-part of Ser. No. 123,559, March 12, 1971, Pat. No. 3,698,395. This application Dec. 17, 1971, Ser. No. 209,165

Int. Cl.^{2} A61B *17/08*

U.S. Cl. 128—335 **7 Claims**



1. A surgical closure which comprises: a first surgical tape member for application to one side of an incision; a second surgical tape member for application to the other side of the incision; said first surgical tape member carrying a tie strip anchor and said second surgical tape member carrying a tie strip slide, said tie strip slide defining a slot to receive a tie strip and including a locking member; and a tie strip for sliding through said tie strip slide for coupling said first and second surgical tape members; at least a portion of said locking member being spaced, from the surface on which the tie strip lies, a distance that is smaller than the thickness of the tie strip, whereby said locking member can cooperate with said tie strip to maintain said tie strip within said tie strip slide; and further including a plurality of said surgical closures in a connected assembly, said connected assembly comprising tear strip means separating each surgical closure.

3,971,385

MEDICAL TUBE WITH CUFF

Joseph H. Corbett, Glen Falls, N.Y., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

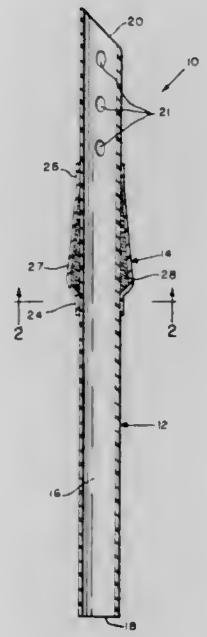
Filed Sept. 9, 1974, Ser. No. 504,204

Int. Cl.^{2} A61M *25/00*

U.S. Cl. 128—351 **13 Claims**

1. A medical tube insertable into a body cavity comprising an elongated tube for effecting fluid communication with the body cavity, a preformed cuff of smooth, pliable material connected to said tube in surrounding relation therewith and including proximal and distal portions sealingly connected to

said elongated tube and a balloon portion between said proximal and distal portions spaced radially from said elongated tube, said balloon portion being axially spaced from the distal and proximal ends of said elongated tube and tapering radially outwardly from the distal end thereof toward the proximal end thereof, and a substantially nonporous, homogenous gel filling said balloon portion and conforming to the shape of said cuff, said cuff being conformable to the walls of the cavity it engages to provide a seal between the cavity walls and said elongated tube when disposed in said cavity.



3,971,386
THORN TWEEZERS

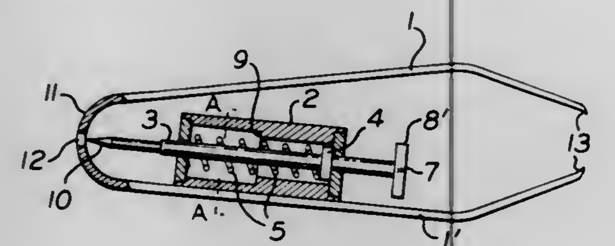
Masayoshi Yamada, 39, Sengencho 1-chome, Shizuokashi, Shizuoka, Japan

Filed Sept. 9, 1974, Ser. No. 504,403

Claims priority, application Japan, Sept. 11, 1973, 48-102461; Feb. 16, 1974, 49-18893

Int. Cl.² A61B *17/30*

U.S. Cl. 128—354 **1 Claim**



1. A thorn tweezer comprising an elongated resilient U-shaped member having a generally U-shaped end portion and a pair of opposed elongated shanks extending from said U-shaped end portion, said U-shaped end portion having an opening, said shanks having opposed terminating ends, said shanks being adapted to be manually compressed to move said opposed terminating ends towards one another to thereby grasp a thorn or splinter disposed therebetween, each of said shanks having an inner face which face opposite one another, a cylinder fixedly mounted on the inner face of one of said shanks such that said cylinder is disposed between said pair of elongated shanks, a needle having a point, means slidably mounting said needle in said cylinder for movement between an extended position in which the point of said needle extends beyond said U-shaped end portion of said resilient U-shaped member and a retracted position wherein the point of said needle is disposed within the longitudinal ends of said resilient U-shaped member, said needle passing through said opening in said U-shaped end portion when said needle is in said extended position, a laterally extending lever on said needle, a spring in said cylinder urging said needle into its retracted position, means on said cylinder adapted to be engaged by said lever to retain said needle in said extended position, said needle when in said extended position being operable to effect removal of a thorn or splinter from a person's body as the resilient U-shaped member functions as a handle to facilitate manipulation of said needle, said needle when in said retracted position being protected by said resilient U-shaped member to prevent injuries, said shanks of said resilient U-shaped member being adapted to be grasped by a user to move said terminating ends closer to one another independently of the movement of said needle between its retracted and extended positions, whereby the operation of said resilient U-shaped member and the operation of extending retracting said needle may be effected independently.

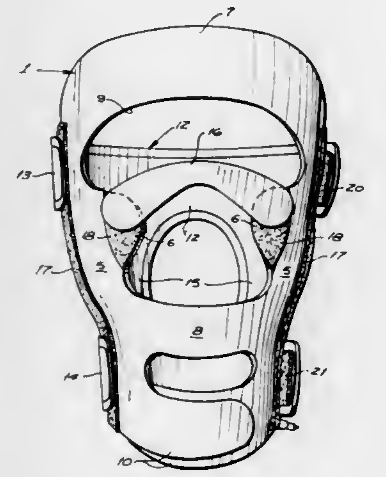
3,971,387
ELECTRO-THERAPEUTIC FACE MASK

Michael J. Mantell, 5334 Linley, Encino, Calif. 91316

Filed Mar. 21, 1975, Ser. No. 560,336

Int. Cl.² A61N *1/02*

U.S. Cl. 128—410 **5 Claims**



1. A therapeutic face mask for use with moisturized padding previously applied to the face of the user, comprising:

a. a normally flat flexible face mask member having an opening for exposing the eyes and nose of the user surrounded by cheek covering portions, a forehead covering portion, a jaw covering portion and a pair of side margins at the outer edges of the cheek covering portions;

b. a plurality of electrically conductive contact buttons carried by the mask on one side thereof for electrical contact with the moistened padding and conductor means for connecting all said buttons to a source of electrical energy;

c. a normally flat retainer member including a head strap and a neck strap;

d. and a plurality of separable fastener means for variably connecting said retainer member to said mask member, each including a fastener strip extending along a side margin, and mating fastener strips extending longitudinally of one of the end portions of each strap, the fastener strips being adapted for variable connection to secure the mask member in position to effect multiple electrical connections between the buttons and the padding.

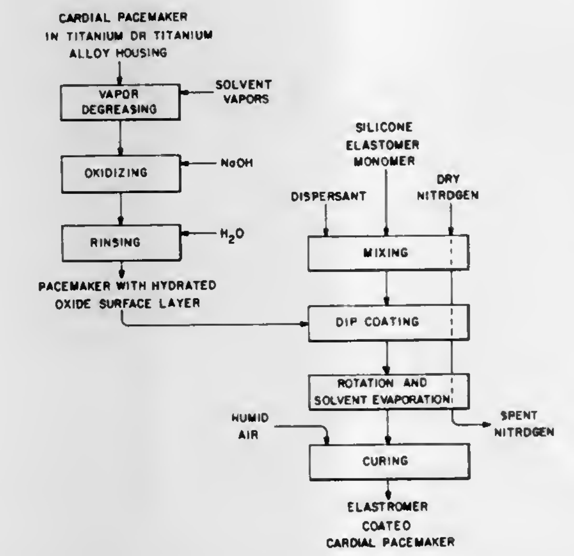
3,971,388
TITANIUM COVERED CARDIAC PACEMAKER WITH ELASTOMER COATING AND METHOD OF APPLYING SAME

David J. Cowdery, Elanora, Australia, assignor to Telectronics Pty. Limited, Australia

Filed Nov. 29, 1974, Ser. No. 528,091

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 P **8 Claims**


CARDIAL PACEMAKER IN TITANIUM OR TITANIUM ALLOY HOUSING
VAPOR DEGREASING
SOLVENT VAPORS
OXIDIZING
NaOH
RINSING
H2O
PACEMAKER WITH HYDRATED OXIDE SURFACE LAYER
SILICONE ELASTOMER MONOMER
DISPERSANT
DRY NITROGEN
MIXING
DIP COATING
ROTATION AND SOLVENT EVAPORATION
HUMID AIR
SPENT NITROGEN
CURING
ELASTOMER COATED CARDIAL PACEMAKER

1. A method of applying a flexible silicone elastomer to an implantable heart pacemaker enclosed within a housing formed of a material from the group including titanium and titanium alloys comprising dispersing a silicone elastomer in a solvent from the group including benezene, methyl benezene and dimethyl benezene, dipping the heart pacemaker in the dispersed elastomer, evaporating the solvent from the elastomer and curing the elastomer coating in a humid environment.

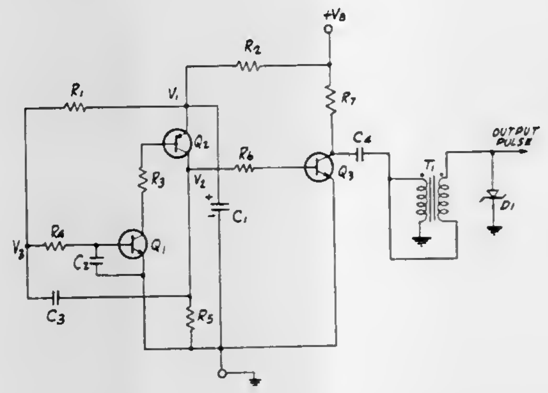
3,971,389
PACEMAKER LOW CURRENT PULSE GENERATOR

Robert R. Brownlee, State College; Frank O. Tyers, Hershey, and Carl Volz, Sr., State College, all of Pa., assignors to Research Company, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,409

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **8 Claims**



1. A pulse generating system for incorporation in a cardiac pacer or the like comprising:

a power cell having a first pole and a second pole with a difference of potential between them;

a first transistor;

a first resistor inserted between the collector of said first transistor and the second pole of said power cell;

a second transistor of a conductivity type opposite to that of said first transistor and having its emitter connected directly to said second pole;

a second resistor inserted between the base of said first transistor and the collector of said second transistor;

a third resistor inserted between the base of said second transistor and the emitter of said first transistor;

a first condenser inserted between the base of said second transistor and the collector of said first transistor;

a fourth resistor inserted between said first pole of said power cell and the emitter of said first transistor;

a second condenser having one side connected with said second pole and the opposite side directly connected to the junction between said fourth resistor and the emitter of said first transistor; and

means connected to the collector of said first transistor for conducting output pulses.

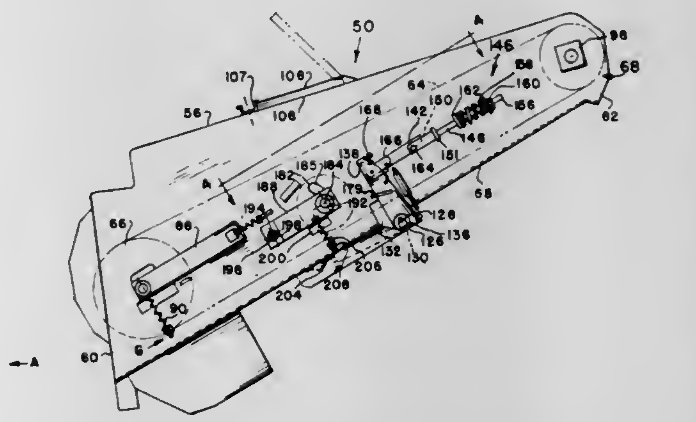
3,971,390
STONE TRAP FOR THRESHING AND SEPARATING MACHINE

James W. McDuffie; Claude K. Focht, both of New Holland, and Edward W. Rowland-Hill, Lancaster, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed June 3, 1974, Ser. No. 476,021

Int. Cl.² A01F *12/10*

U.S. Cl. 130—27 JT **13 Claims**



1. A threshing and separating machine comprising:

a. a frame adapted to travel across a field,

b. means mounted on the frame to thresh and separate grain from crop material,

c. means mounted on said frame for elevating crop material from the field to said threshing and separating means, the elevating means having a door pivotally mounted along the path of the crop material and adapted to move between a closed and an opened position,

d. means operably associated with said elevating means for controlling the movement of said door between its closed and opened positions, and

e. means operably associated with the controlling means and supported by said elevating means adjacent the path for exerting a force against solid objects in said path, said force affecting operation of said controlling means to open said door and eject solid objects under conditions where said objects travel along said path in the vicinity of said door.

3,971,391
PROCESS FOR IMPROVING THE QUALITY OF LIVING, HUMAN HAIR BY LANTHIONIZATION

Pierre Bore, Montfermeil; Jean-Claude Arnaud, and Grégoire Kalopissis, both of Paris, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 8, 1974, Ser. No. 449,437

Claims priority, application Luxemburg, Mar. 8, 1973, 67178

Int. Cl.² A45D *7/06*

U.S. Cl. 132—7 **16 Claims**

1. A process for improving and modifying the cosmetic properties of living human hair comprising thoroughly coating said hair, which is not subjected to any extension stress, with a composition consisting essentially of an aqueous medium of

an alkali or alkaline earth metal hydroxide present in an amount effective to impart to the composition a pH ranging from 12.5 to 13, and heating said hair at a temperature between 40 $\overset{\circ}{-}$50 C, while maintaining said hair in the wet state, for a period of time effective to convert about 25 to 70 percent of the cystine in said hair to lanthionine.

3,971,392
HAIRPIECE, PARTICULARLY A TOUPET, AND PROCESS FOR MAKING SAME

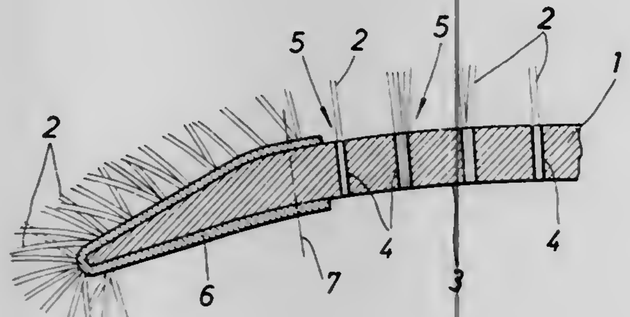
Kurt A. Brehmer, Bremen, Germany, assignor to Firma Carl Brehmer & Sohn, Bremen, Germany

Filed Apr. 12, 1974, Ser. No. 460,306

Claims priority, application Germany, Oct. 20, 1973, 2352818

Int. Cl.² A41G ***3/00***

U.S. Cl. 132—53 **5 Claims**



1. A hairpiece comprising
- a. a foundation formed as a plastic sheet which is curved to the shape of the head or a part thereof and having a plurality of holes therein perpendicular to the surface of said sheet and each of a diameter large enough to receive a plurality of hairs therein,
- b. a plurality of hairs perpendicular to the surface of said sheet, the ends of which are inserted in said holes in said plastic sheet from one side thereof, and terminating flush at the other side thereof, there being at least one hair in each of said holes, and
- c. a plug of adhesive in each such hole securing said hairs to said plastic sheet, each such plug terminating flush with the inner surface of said sheet.

3,971,393
APPARATUS FOR AUTOMATIC SUPPLEMENT OF CHANGE COINS IN A COIN OPERATED MACHINE

Kazuyuki Akai, Sakato, and Osamu Kobayashi, Saitama, both of Japan, assignors to Kabushiki Kaisha Nippon Koinko, Tokyo, Japan

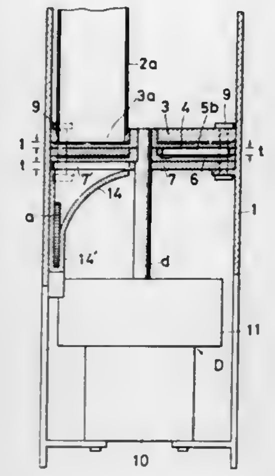
Filed Oct. 10, 1974, Ser. No. 513,946

Claims priority, application Japan, Oct. 12, 1973, 48-113850; Nov. 14, 1973, 48-130737; Apr. 23, 1974, 49-45100; Apr. 23, 1974, 49-45101; Apr. 23, 1974, 49-45102

Int. Cl.² G07D ***9/06***

U.S. Cl. 133—2 **10 Claims**

1. An apparatus for automatic supplement of change coins in a coin operated machine having a coin selection control device including a change coin cylinder and a switch means, said apparatus being detachably connected to said coin selection control device and comprising a change coin storing section including a change coin containing cylinder, discharging means operatively coupled with said coin storing section for discharging coins stored in the change coin storing section, guide means for receiving coins discharged from the discharging means and for guiding the coins to the change coin cylinder of the coin selection control device and means connected to said switch means so as to be operated thereby upon detection of a shortage of coins in the change coin cylinder by the switch means, for operating the discharging means to supply change coins to said change coin cylinder.



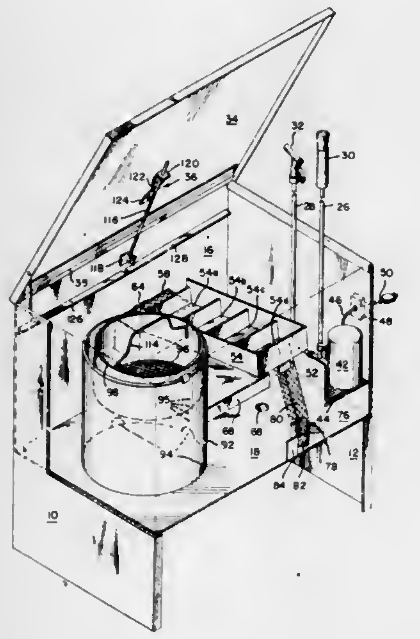
3,971,394
APPARATUS FOR CLEANING VEHICLE PARTS

Irving R. Osborne, 1602 Rockefeller, Everett, Wash. 98201

Filed Apr. 28, 1975, Ser. No. 572,156

Int. Cl.² B08B ***3/02, 3/10***

U.S. Cl. 134—104 **4 Claims**



1. A washer for vehicle parts, comprising:
- a tank containing a layer of water and a layer of lighter-than-water solvent;
- a fluid pump having an inlet port positioned in said solvent layer for receiving solvent therefrom and an outlet port conveying solvent through a solvent supply conduit to a utilization point;
- collection means beneath the utilization point for conveying solvent discharged from said solvent supply conduit after said solvent has washed the parts;
- a plurality of inclined, sequentially arranged settling tanks receiving the solvent from said collection means;
- a filter positioned adjacent the lower settling tank and receiving the solvent flowing therefrom, said filter tank containing a filter material, a discharge port beneath said filter material and a tube connected to said discharge port opening into said water layer; and
- a filter barrier dividing said tank into two compartments, a first compartment receiving the contents of said filter tank and a second compartment communicating with said fluid pump inlet port whereby recirculated solvent sequentially flows through said filter barrier, pump, collection means, settling tanks, filter tank and water layer.

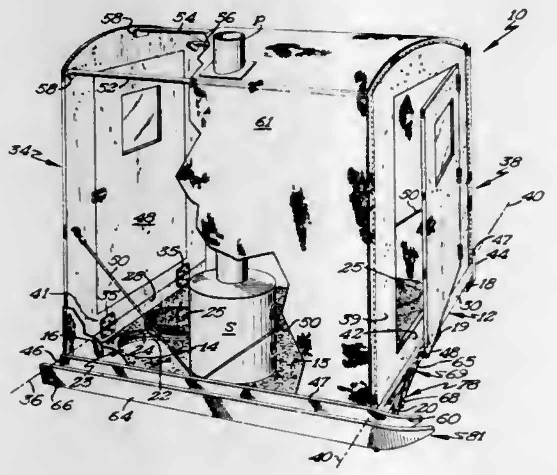
3,971,395
COLLAPSIBLE SELF-STORING SHELTER

Vincent B. Lipinski, P.O. Box 41, Chaska, Minn. 55318

Filed Dec. 16, 1974, Ser. No. 533,319

Int. Cl.² E04B ***1/347;*** **A45F** ***1/16***

U.S. Cl. 135—4 R **6 Claims**



1. A collapsible, self-storing shelter comprising:
- a rigid, substantially horizontal platform having a generally flat floor surface;
- a rear wall having a base swingably mounted to said platform to swing about a first generally horizontal axis between an upright erected position and a lowered storage position overlying and confronting said floor surface, said first axis being parallel to and at a first distance above said floor surface;
- a front wall spaced longitudinally along said platform from said rear wall and having a base swingably mounted to said platform to swing about a second generally horizontal axis between an upright erected position and a lowered storage position overlying and confronting said rear wall when said rear wall is in lowered position, said second axis being parallel to said first and at a second distance above said floor surface exceeding said first distance;
- a plurality of cables extending between said platform and each of said front and rear walls, permitting said walls to be swung from lowered storage positions to erected positions and preventing further swinging of said walls beyond erected positions;
- a plurality of longitudinal beams removably attached to each of said front and rear walls and extending therebetween, and preventing swinging of said front and rear walls toward one another when attached thereto, said beams cooperating with said cables to retain said walls in erected positions; and
- a foldable, flexible, weather-resistant tarpaulin extending between and fixed to said front and rear walls and fixed to said platform, said tarpaulin being supported upon said plurality of beams to form an integral roof and side walls when said front and rear walls are in erected positions and foldably stored and confined between said front and rear walls when said front and rear walls are in lowered positions; and
- one of said walls having a closable entryway therein to permit entry into the shelter.

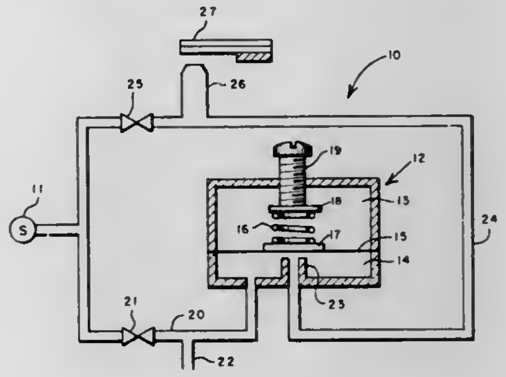
3,971,396
PNEUMATIC RELAY

Louis J. Bentsen, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 16, 1975, Ser. No. 596,688

Int. Cl.² G05D ***16/00***

U.S. Cl. 137—82 **14 Claims**



1. A pneumatic relay comprising:
- terminal means adapted to be connected to a source of pressure;
- first housing means divided by a diaphragm into a control chamber and a flow chamber and having a nozzle in said flow chamber;
- first means connecting said terminal means to said flow chamber for supplying pressure to said flow chamber;
- output means connected to said first means for providing an output pressure dependent upon said pressure within said flow chamber;
- biasing means within said first housing means acting against said diaphragm for establishing a minimum predetermined value for said pressure within said flow chamber; and,
- second means including condition responsive means connected to said nozzle, said condition responsive means applying a signal pressure to said flow chamber and having sufficient capacity to bleed off said pressure supplied by said first means above said predetermined value until said signal pressure achieves a value substantially equal to said predetermined value
- whereby said output pressure will be substantially equal to said predetermined value until said signal pressure attains said value substantially equal to said predetermined value at which time said output pressure will follow said signal pressure.

3,971,397
PUMP UNLOADING VALVE DEVICE

Diether Staisch, Walsrode, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed June 5, 1975, Ser. No. 584,189

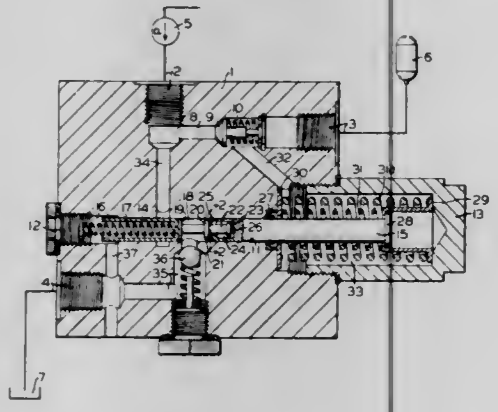
Int. Cl.² G05D ***16/10***

U.S. Cl. 137—116 **10 Claims**

1. For interposition in a conduit connecting the discharge of a fluid pressure pump to a fluid pressure storage reservoir, an unloading valve device operative to control flow of fluid under pressure from the pump to either the reservoir or a return tank, said unloading valve device comprising:
- a. a casing having formed therein a plurality of passageways and a bore extending through said casing and intersecting a first pair of said passageways, one of which is connected to the discharge of the pump and the other to the return tank,
- b. a one-way flow valve providing for the flow of fluid under pressure from said one passageway to the storage reservoir and preventing reverse flow from said reservoir, wherein the improvement comprises:
- c. a pair of cylindrical valve members of equal diameter slidably mounted in said bore and cooperating with said bore to form a chamber between their adjacent ends, the

other end of one of said cylindrical valve members being so subject to the pressure in the storage reservoir as to enable said pressure to shift said valve members in one direction in said bore until the adjacent end of the other valve member begins to open a communication between said one passageway of said pair of passageways and said chamber,

d. separate biasing means acting on each valve member in the direction opposite said one direction,



e. a lost-motion connection connecting said cylindrical valve members and disposed in said chamber therebetween, and

f. means restricting flow of fluid under pressure from said chamber to the return tank and thereby effective, upon said adjacent end of said other valve member beginning to open said communication, to cause the fluid under pressure admitted from the discharge of the pump to said chamber to establish a pressure therein to shift said other valve member, relative to said one valve member a distance corresponding to said lost-motion connection, to a fully open position.

3,971,398
APPARATUS FOR AUGMENTING VENOUS BLOOD FLOW

Duane F. Taylor, 680 Winter St., SE., Salem, Oreg. 97301; Richard C. Everett; Harry F. Everett, both of 6159 SW. Fernbrook Circle, Lake Oswego, Oreg. 97034, and Norman C. Williams, Rte. 1, Box 134, West Linn, Oreg. 97068

Division of Ser. No. 422,208, Dec. 6, 1973, Pat. No. 3,892,229. This application Nov. 25, 1974, Ser. No. 526,818

Int. Cl.² F16K *11/22*

U.S. Cl. 137—119 **2 Claims**

1. In a shuttle valve structure,

a valve body having a first pair of spaced diaphragm chambers and a supply passage extending therebetween with a supply port connected to the passage,

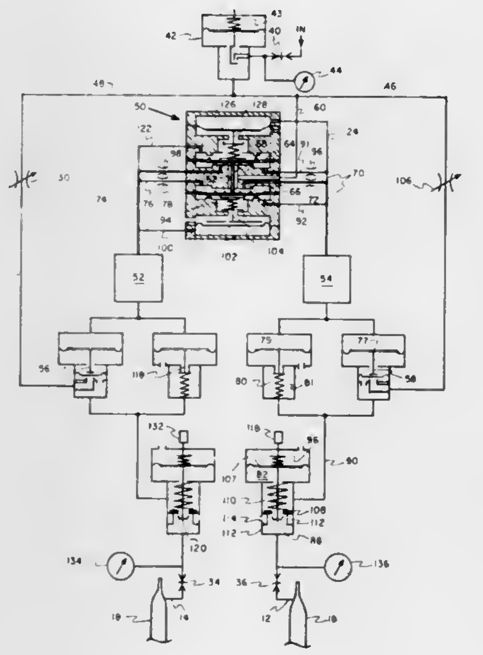
a pair of unstable diaphragms mounted in the diaphragm chambers,

means extending through the supply passage and connecting the diaphragms for movement together between first positions engaging one end of each of the chambers and second positions engaging the other end of each of the diaphragm chambers,

the inner ends of the chambers having central raised portions and depressed outer portions so that the diaphragms engage only the raised portions,

the body having a pair of actuating passages having chamber inlet ports opening into the depressed outer portions of the chambers and also having a pair of outlet passages leading from chamber outlet ports at the raised portions to the exterior of the valve body,

the outer ends of the chambers having raised portions spaced radially inwardly from the outer walls thereof and depressed outer portions so that the diaphragms engage only the last-mentioned raised portions,



the valve body having a pair of passages having chamber inlet ports at the last-mentioned depressed outer portions.

3,971,399
ARRANGEMENTS FOR PREVENTING OR MINIMIZING OVER-PRESSURES IN GAS PIPES

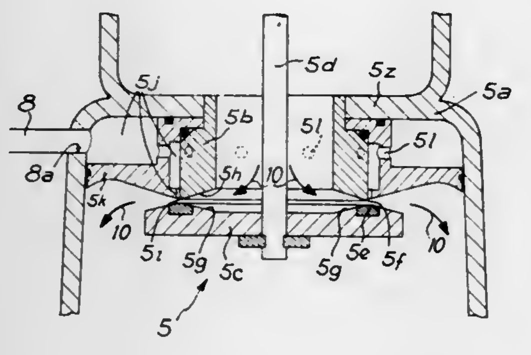
Jean-Philippe Cornil, Houilles, France, assignor to Gaz de France, France

Filed Oct. 10, 1974, Ser. No. 513,755

Claims priority, application France, Oct. 11, 1973, 73.36355

Int. Cl.² G05D *11/00*

U.S. Cl. 137—119 **6 Claims**



1. In an assembly for preventing or minimising over-pressures due to sudden interruptions in the flow of a compressible fluid caused by an obturator such as an electrical valve which is situated on a main gas pipe, said arrangement being of the type which comprises a pressure regulator and reducer, having a valve and a valve seating, said regulator and reducer being mounted on said main pipe upstream of said obturator and the response time of which is longer than that of said obturator, a venturi which communicates with that section of said main pipe which is situated between said obturator and said regulator and reducer, and a buffer reservoir which is in permanent communication with said section of said main pipe via said venturi, the invention which consists in that said regulator and reducer valve and valve seating also forms said venturi.

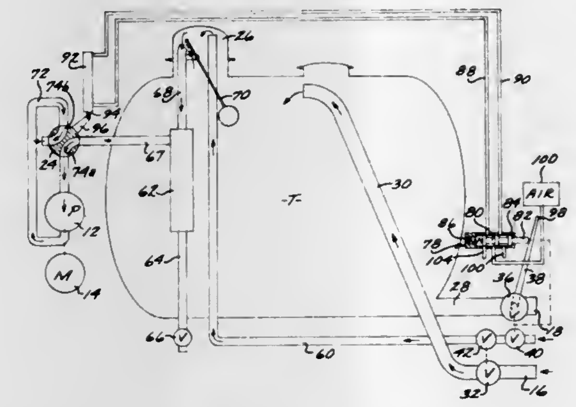
3,971,400
PORTABLE VACUUM AND PRESSURE LIQUID TANK APPARATUS

David L. Thompson, 7895 Berner St., Long Beach, Calif. 90808

Filed Jan. 24, 1975, Ser. No. 543,660

Int. Cl.² B67C *3/16*

U.S. Cl. 137—205 **10 Claims**



1. Portable vacuum and pressure liquid tank apparatus comprising:

a tank;

a power-driven pump adapted to supply either air pressure or a vacuum to the interior of said tank;

an inlet conduit through which liquid is admitted to said tank;

a discharge conduit through which liquid is discharged from said tank;

a bleeder line connecting the atmosphere with the upper interior of said tank;

an inlet valve in said inlet conduit having a valve element movable between an open and a closed position;

a drain valve in said discharge conduit having a valve element movable between an open and a closed position;

first and second bleed valves arranged in series in said bleeder line;

first and second levers that actuate said inlet and drain valves respectively;

first linkage means interconnecting said first lever and said first bleed valve so that movement of said inlet valve towards an open position will effect movement of said first bleed valve towards an open position;

second linkage means interconnecting said second lever and said second bleed valve so that movement of said drain valve towards an open position will effect movement of said second bleed valve towards a closed position; and

lost-motion connection means interposed in said first and second linkage means constructed and arranged so that said first and second bleed valves will not be moved towards an open position and closed position, respectively, until after said inlet and drain valves have been moved towards an open and a closed position, respectively, to thereby avoid damage to the valve elements of said inlet and discharge valves by foreign matter entrained in said liquid.

3,971,401
SILLCOCK

Bengt Arne Persson, Djursholm, Sweden, assignor to B A Installationsutveckling AB, Djursholm, Sweden

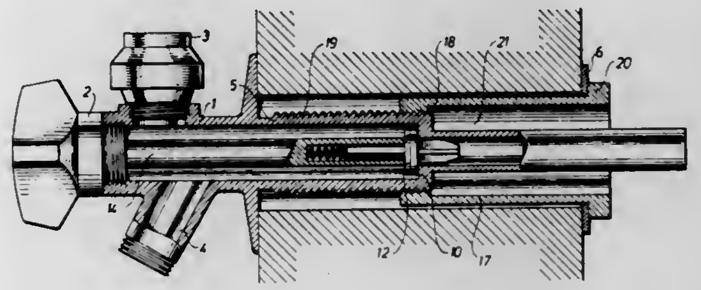
Filed Aug. 29, 1974, Ser. No. 501,823

Claims priority, application Sweden, Aug. 31, 1973, 7311923; Aug. 16, 1974, 7410483

Int. Cl.² F16K *51/00*

U.S. Cl. 137—360 **7 Claims**

1. A water faucet for mounting in a wall between a warm space on one side of the wall and a cold space on the other side of the wall, comprising a pipe extending continuously through the wall and having a first axial end at the warm side of the wall and a second axial end at the cold side of the wall so as to provide a water flow passage through the wall, a shut-off valve for the water flow through said pipe, said shut-off valve including a stationary valve seat fixed within said pipe to the inside of the wall of the pipe at a point along the pipe substantially equally spaced from said first and second ends of the pipe and a movable valve body cooperating with said valve seat, a valve control member at said second end of said pipe, and a valve control rod extending axially within said pipe between said valve control member and said valve body and operatively connecting said valve control member to said valve body.



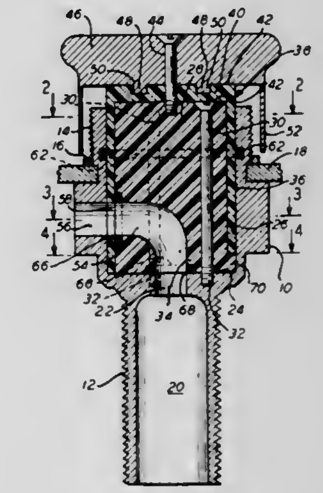
3,971,402
ROTARY VALVE ASSEMBLY

William C. Gallo, 4602-27th Ave. South, St. Petersburg, Fla. 33711

Filed Apr. 21, 1975, Ser. No. 570,197

Int. Cl.² F16K *5/04*

U.S. Cl. 137—382 **1 Claim**



1. A valve comprising a housing formed with a cylindrical bore opening at one end of said housing and terminating at its other end within said housing; a cylindrical core fixed coaxially within said bore in sealed relation to the bore's said other end, said core being of lesser diameter than said bore to provide an intervening cylindrical area between the bore and the core; a one piece, inverted-cup-shaped valve element having a depending cylindrical wall extending with a close sliding fit within said intervening cylindrical area substantially throughout the axial dimensions of said core, and a radially extending top, integral with said depending cylindrical wall; a manually operable one piece inverted-cup-shaped knob having a radially extending portion intimately overlying said top of the valve element, said knob and the top of the valve element being provided with coacting recesses and dogs constraining the knob and the valve element to turn in unison; a generally ell shaped fluid passage in said core communicating between a central area at the bottom of the core and a side area at one side of the core, separate fluid passages in said housing connecting said central and side areas of the core with distal fluid supply and fluid discharge areas; said depending cylindrical wall of the valve element having an opening of limited size, alignable with a side end of said ell shaped passage by turning

of said valve element to permit fluid flow from the latter passage to one of said separate fluid passages in the housing; and said fluid flow being discontinuable by turning of said valve element to bring said opening into non-alignment with said side end of the ell shaped passage.

3,971,403
SAFETY VALVE

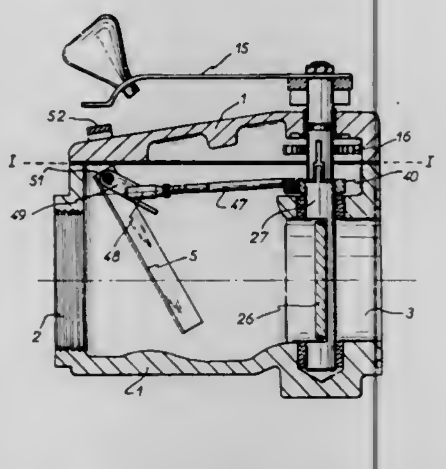
André Sergent, 21, rue Henri Barbusse, Paris 5eme, Seine, France

Filed Nov. 13, 1974, Ser. No. 523,551

Claims priority, application France, Nov. 14, 1973, 73.40530

Int. Cl.² F16K *17/04*

U.S. Cl. 137—459 **4 Claims**



1. In a safety valve-body for fluids, provided internally with an upstream seat and a downstream seat and comprising on the upstream side a first valve member openable to a degree dependent on the fluid flow rate, bearing internally upon said upstream seat and on the downstream side a second fully opening valve member including a shaft portion carrying thereon return means for sharply closing said second valve member, and mechanical linkage means coupling said second valve member to said first valve member, said first valve member being constituted by a swing-valve including means for urging it into closed position against the direction of the fluid flowing through the valve, said second valve member being constituted by a butterfly-valve having a shaft with one end projecting externally through said valve-body, said mechanical linkage means including a lever and a spring linking said lever to said first valve member, and a rod with a clevis fitted on one end thereof, said lever being in articulating relationship on said clevis, the second end of said rod comprising a ball engaged in a catch having an axle parallel to the shaft of said second valve member and provided with a matching portion in engagement with a cam fitted on said shaft, a latching means for opening of said second valve member comprising a lever fitted on the end of said shaft projecting externally, the free end of said lever being engageable in a latching notch on said body, whereby a predetermined position of said first valve member allows said mechanical linkage to cause disengagement of said catch from said cam and the sharp closure of aid second valve member.

3,971,404
HYDRAULIC RUNAWAY CONTROL VALVE

Vernon Kenneth Quarve, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed June 17, 1974, Ser. No. 480,124

Int. Cl.² F16K *17/20*

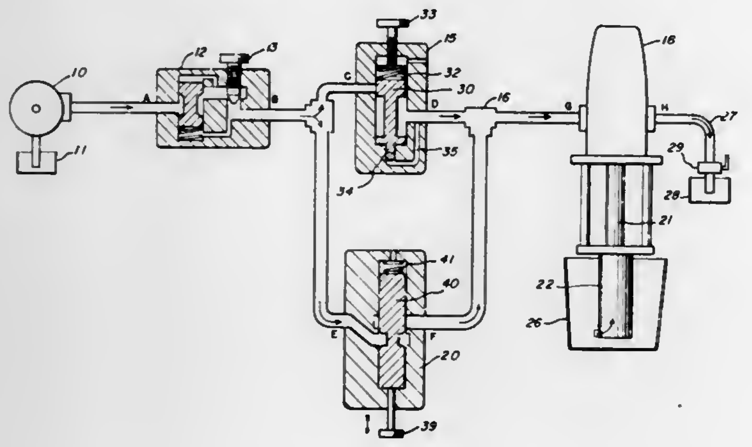
U.S. Cl. 137—462 **1 Claim**

1. Pressure sensing and responding apparatus for insertion in series relationship in a pressurized fluid line for stopping fluid flow on sensing a downstream pressure drop below a predetermined value, comprising:

a. a first fluid valve means for opening and closing said fluid line flow, said first fluid valve means having an adjustable spring-biased valving mechanism in a normally closed position and having an interior cylindrical chamber with end walls and with a slidable spool valving mechanism therein, one end of said spool valving mechanism having a compression spring biasing it away from an interior chamber end wall and the other end of said spool valving mechanism having a piston surface area;

b. a second fluid valve means for manually causing fluid flow in said fluid line, in parallel fluid flow connection relative to said first fluid valve means, said second fluid valve means having an interior cylindrical chamber with end walls, and said chamber having a slidable spool valve mechanism with a compression spring between an end wall of said chamber and an end of said slidable spool, said spring urging said spool in valve-closing position, and further comprising means for manually moving said spool into valve-opening position;

c. a pressure coupling passage having one opening in fluid contact with said first fluid valve means piston surface area, and a second opening in fluid contact with the downstream side of said first fluid valve means.



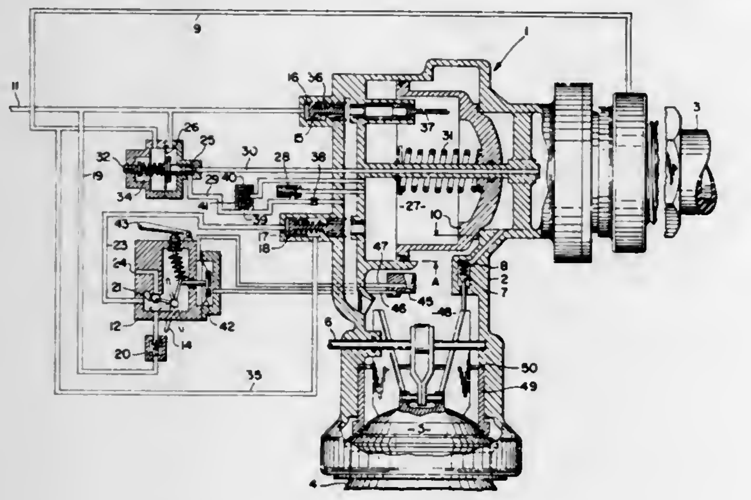
3,971,405
PRESSURE CONTROLLED HYDRANT VALVE COUPLER

James S. Millar, Fountain Valley, and Douglas R. Garrett, Los Angeles, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed July 15, 1974, Ser. No. 488,392

Int. Cl.² F16K *31/12, 11/10*

U.S. Cl. 137—489 **7 Claims**



1. In a pressure controlled valve assembly of the type wherein a valve housing has therein a pilot operated main pressure control valve which defines a pressure seating chamber with said housing having restricted communication with fluid pressure upstream of a seat in a valve housing passage and wherein said main valve is moved toward and away from said seat to control flow of fluid through said passage responsive to actuation of a pilot valve to bleed said chamber to the downstream side of said seat by pressure differential of a reference fluid pressure source and fluid pressure downstream of said seat acting on said pilot valve, the improvement which comprises a fast closing valve in said housing which is actuated by such reference fluid pressure independently of the magnitude of the downstream fluid pressure to close communication of said chamber with fluid pressure upstream of said seat and which, upon release of such reference fluid pressure acting thereon, opens communication of said chamber with fluid pressure upstream of said seat for rapid movement of said main pressure control valve toward said seat.

3,971,406
VAPOR FUEL CONTROL APPARATUS

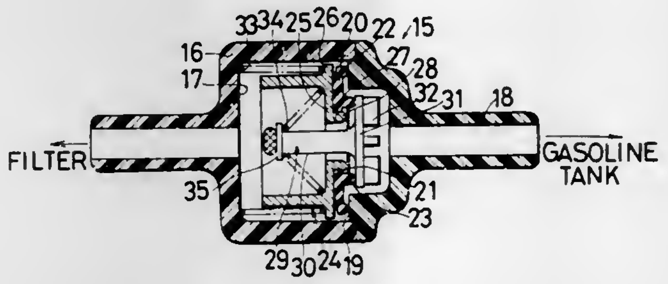
Masami Inada, Toyoake, and Shuji Okumura, Obu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 24, 1974, Ser. No. 517,611

Claims priority, application Japan, Oct. 24, 1973, 48-119759

Int. Cl.² F16K *17/26*

U.S. Cl. 137—493.4 **2 Claims**



1. A fuel vapor control apparatus for use in a fuel system between a gasoline tank and a filter-supporting canister for maintaining the gasoline tank side at a preselected pressure, comprising in combination:

a main body of plastic material having an opening therethrough;

first valve means movably disposed within said opening of said main body and including

a. a valve stem having a tubular portion, a radially inwardly extending end wall portion integrally formed at one end of said tubular portion, a radially outwardly extending end wall portion integrally formed on the periphery of said tubular portion at said one end thereof, and a valve member squeezing portion integrally formed on the inner end of said radially inwardly extending end wall portion defining a central aperture through said valve stem,

b. an annular elastic valve member having an inner end portion securely fitted to said end wall portion of said valve stem around said central aperture thereof through said valve member squeezing portion with one end face of said annular valve member being disposed against the outside surface of said end wall portion of said valve stem, an outer tongue portion formed on the peripheral surface of the end wall of said annular valve member facing away from the end wall of said valve stem, and a projecting foot portion also formed on said surface of said annular valve member adjacent to said inner end portion thereof and facing away from the end wall of said valve stem;

c. a first spring interposed between said main body and said valve stem for urging said annular elastic valve member carried by said valve stem to move in one direction wherein said outer valve tongue is caused to seat on an inner wall of said main body; and

second valve means movably disposed within said first valve means and including

d. a plunger extending through said central aperture of said first valve means,

e. a circular disc integrally formed on one end of said plunger, having a projecting portion on the face thereof remote from said plunger for maintaining suitable air flow thereby, and

f. a second spring interposed between the other end of said plunger and said valve stem of said first valve means for urging said circular disc to move in a direction opposite to said one direction of movement of said annular elastic valve member of said first valve means, wherein said circular disc is maintained seated against said projecting foot portion of said annular elastic valve member;

whereby when said gasoline tank is fully filled, said outer tongue portion of said first valve means is released from seating against said inner wall of said main body by the vapor of gasoline, and when said gasoline tank approaches vacuum, said circular disc of said second valve means is released from seating against said projecting foot portion of said first valve means by the atmospheric pressure in said canister.

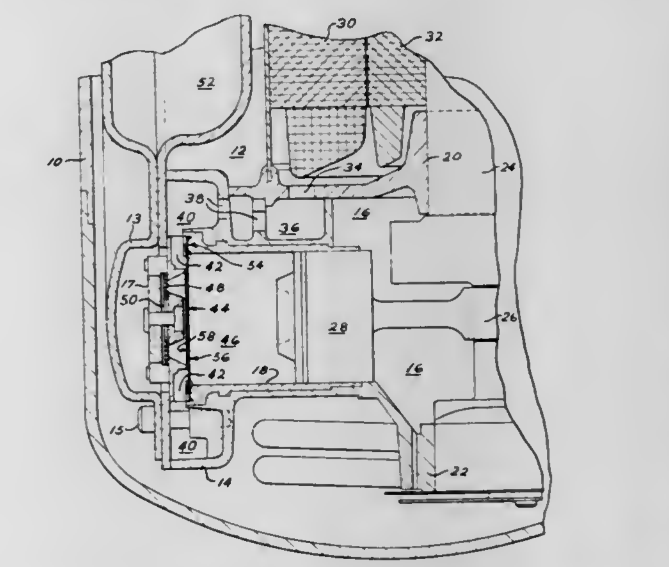
3,971,407
MEANS FOR LOCATING SUCTION VALVE

Eugene Hudson, and Henry R. Geary, both of Tyler, Tex., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 22, 1975, Ser. No. 606,864

Int. Cl.² F16K *15/08*

U.S. Cl. 137—516.15 **2 Claims**



1. In a reciprocating compressor having a cylinder block assembly including seat means and head assembly,

a. a valve member between said seat means and said head assembly having a flat face and including intake means providing an annular intake zone in said flat face for passage of gas through said valve member;

b. a valve movable between an open and closed position for controlling the passage of gas through said intake means including a thin flat ring of flexible metal having a continuous portion near its inner periphery mounted concentrically with said intake zone covering said intake zone in its closed position and support portions projecting from its outer periphery supporting said valve on said seat means adjacent said flat face of said member;

c. guide means including a flat ring circumscribing said valve having a thickness greater than said valve and a continuous portion near its outer periphery arranged between said flat face and said seat means for allowing movement of said valve, and recess portions extending inwardly from its inner periphery for receiving said support portions of said valve;

d. said seat means providing a backing surface for limiting the movement of said valve in said open position;

wherein the improvement comprises:

retaining means on the inner periphery of said guide means being formed adjacent the open end of said recess portions projecting axially toward said backing surface for preventing movement of said valve relative to said guide means and from moving between said guide means and said backing surface.

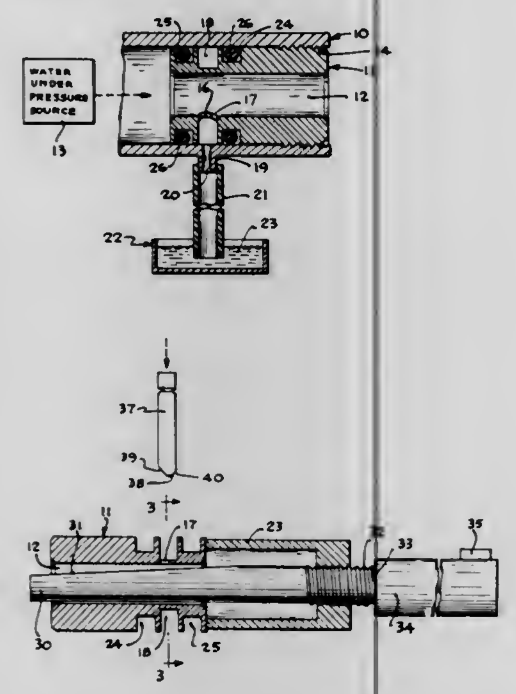
3,971,408
SPRAYER NOZZLE CONSTRUCTION

Frank A. Simmons, Grayslake, Ill., assignor to Burgess Vibrocrafters, Inc., Grayslake, Ill.

Division of Ser. No. 348,034, April 5, 1973, Pat. No. 3,861,194, which is a division of Ser. No. 125,129, March 17, 1971, Pat. No. 3,760,479. This application Sept. 16, 1974, Ser. No. 506,248

Int. Cl.² B23P *17/00;* **B23Q** *7/00*

U.S. Cl. 137—604 2 Claims



1. A workpiece for use in making a body part which has a Venturi therein, said workpiece having two ends and an opening extending therethrough from one end to the other, a circumferential slot about the periphery of the body part and defining walls at each side of the slot and a base wall between the slot and the opening, said base wall having a radial thickness substantially less than half the radial thickness of the thickest part of the body part, said body defining an orifice through said base wall adjacent one of said side walls and spaced from the other of said side walls.

3,971,409
PRESSURE REGULATOR FOR PNEUMATIC SYSTEMS

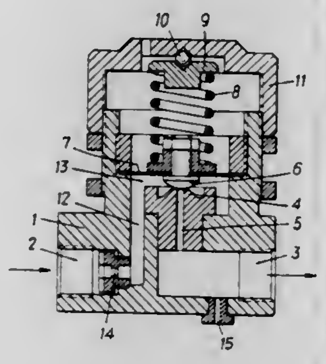
Friedrich Bauer, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Oct. 24, 1974, Ser. No. 517,831

Claims priority, application Austria, Oct. 25, 1973, 9073/73

Int. Cl.² F16K *21/00*

U.S. Cl. 137—613 2 Claims



1. A pneumatic pressure amplifier for proportionally converting variations in an input pressure into amplified variations of an output pressure, comprising:

- a housing including an inlet connected to receive a variable input pressure and an outlet having a fixed opening;
- a regulator valve mounted within said housing between said inlet and said outlet and including a valve seat with a passage and a closure element for controlling fluid flow through said passage;
- a diaphragm mounted within said housing for supporting said closure element and biased against said valve seat to subdivide said housing;
- means for adjustably biasing said diaphragm in a direction opposite to the pressure from said inlet for controlling the operation of said valve;
- a flow restrictor for reducing the pressure from said inlet and mounted upstream of said diaphragm in a feed passage from said inlet and having a cross-sectional area smaller than the cross-sectional area of the regulator valve when fully open; and
- a pressure chamber interconnecting said restrictor with said closure element;
- a restrictive discharge orifice having a fixed opening less than the opening of said outlet mounted downstream of said regulator valve leading to said outlet for restricting the rise of pressure within said outlet.

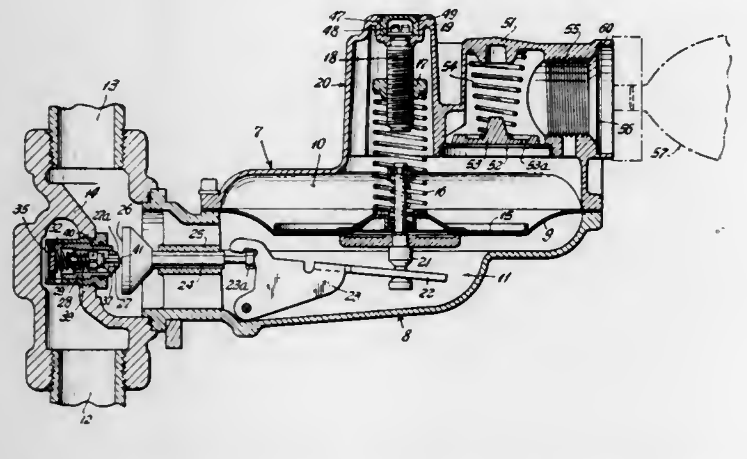
3,971,410
GAS PRESSURE REGULATOR HAVING LOW PRESSURE SHUT-OFF MEANS

Theodore A. St. Clair, Fairfield, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 5, 1975, Ser. No. 555,547

Int. Cl.² F16K *15/02*

U.S. Cl. 137—613 9 Claims



1. A gas pressure regulator comprising a housing having an inlet means, outlet means and a wall separating said inlet means and said outlet means; a diaphragm in the housing forming a gas chamber communicating with said outlet means and a chamber open to the atmosphere; an orifice sleeve extending between and communicating with said inlet means and said outlet means; means for mounting said orifice sleeve in said wall for axial sliding movement relative to said wall, said orifice sleeve having an orifice, an upstream valve seat and a downstream valve seat; a main valve; means operated by said diaphragm for moving said main valve toward and from said downstream valve seat of the orifice sleeve to regulate the flow of gas to said gas chamber and outlet means; and means including a safety valve slidably mounted in said orifice sleeve to engage said upstream valve seat to shut off the flow of gas through said orifice sleeve to said gas chamber and outlet means when the pressure of the gas in said gas chamber falls below a predetermined acceptable pressure.

3,971,411
VARIABLE RESISTANCE TYPE THROTTLING TRIM

Hans D. Baumann, Manville, R.I., assignor to Masoneilan International, Inc., Norwood, Mass.

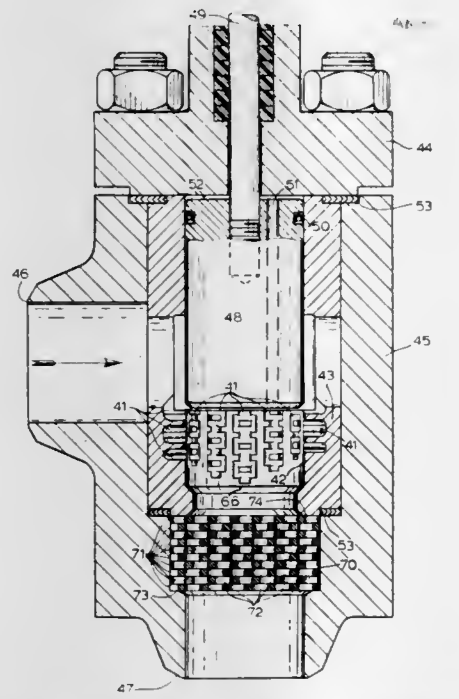
Division of Ser. No. 444,020, March 7, 1974. This application Apr. 4, 1975, Ser. No. 565,158

Int. Cl.² F16K *47/04*

U.S. Cl. 137—625.3 3 Claims

1. Variable resistance type valve throttling element comprising:

- a. a seatring having therewithin a continuous cylindrical bore, said seatring further having annular, non-cylindrical, inner wall surfaces at the opposite ends; of and terminating said continuous cylindrical bore;
- b. a cylindrical valve plug reciprocatingly and slidingly engaged within said cylindrical bore of the seatring, and having an outer cylindrical wall surface;
- c. a number of throttling flow channels penetrating radially outward from said continuous cylindrical bore of the seatring, at least one said penetrating channel commencing near one said continuous bore terminating surface of said seatring, and all said channels terminating within said other continuous bore terminating surface of said seatring, the non-cylindrical extent of said other continuous bore terminating surface being radially outward from said continuous cylindrical seatring bore whereby said other terminating surface is not covered by the engaging of said cylindrical valve plug within said cylindrical seatring bore, said channels-terminating thereby establishing a number of openings within said other continuous bore terminating surface of said seatring to provide access for fluid in direction of the longitudinal plug axis, said channels adapted to be covered along their longitudinal axis by the outer cylindrical wall surface of the reciprocating plug, while said plug is slidingly engaged within the seatring bore, and said channels comprising one or more penetrating grooves extending circularly at least part way around the interface between the reciprocating plug and said seatring bore; each groove provided with one or more communicating vertical passageways to the next groove, and said vertical passageways alternatively off-set to each other in the direction along the circumference of the seatring bore.



3,971,412
QUICK ACTING VALVES

Alexander Wierzbicki, Southport, England, assignor to Dewrance & Company, Limited, Skelmersdale, England

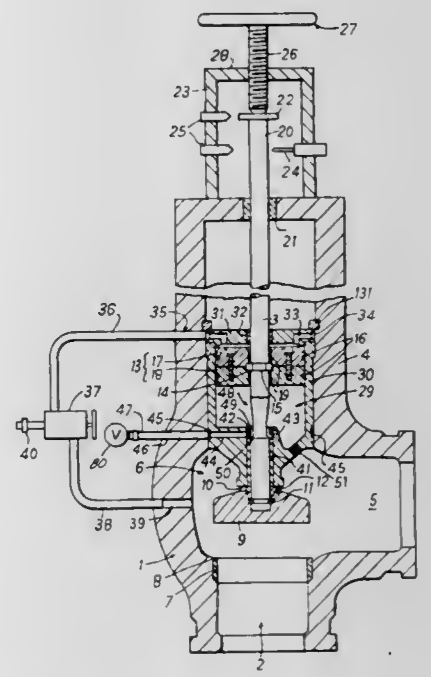
Filed Mar. 18, 1974, Ser. No. 451,902

Claims priority, application United Kingdom, Mar. 19, 1973, 13156/73

Int. Cl.² F16K *31/38, 11/04*

U.S. Cl. 137—625.5 14 Claims

1. A quick acting isolating valve comprising in combination a valve body having a fixed seat defining an opening through which connected system fluid may flow in a path between an inlet and an outlet, a moveable head adapted to cooperate with said seat to open and close said opening to fluid flow, said head being carried on a stem which is provided with a piston reciprocable in a piston chamber formed in the valve body substantially isolated from the fluid flow path, means operatively effective for applying system pressure to both sides of said piston, auxiliary valve means selectively operable between a first position for retaining system fluid pressure at the underside of said piston and a second position relieving system fluid pressure from the underside of said piston to enable movement of said head toward said seat, a fluid outlet from the chamber communicating the underside of said piston with said auxiliary valve means and effective when said auxiliary valve means is in said second position to permit discharge of system fluid from the chamber upon movement of the piston within the chamber as the moveable head moves toward said seat and means for effecting progressive restriction of fluid flow through the outlet to cushion movement of said head as the moveable head approaches the position of abutment with said seat.



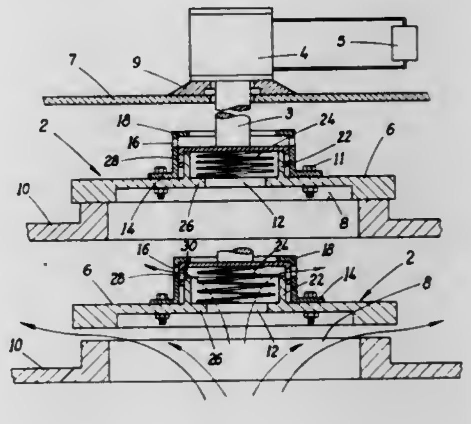
3,971,413
DAMPER ARRANGEMENT

Albert H. Berst, Louisville, Ky.; Robert Wright, Houston, Tex., and Wilson E. Kelley, Jr., Pleasure Ridge Park, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 4, 1975, Ser. No. 555,153

Int. Cl.² F16K *1/54*

U.S. Cl. 137—630.14 6 Claims

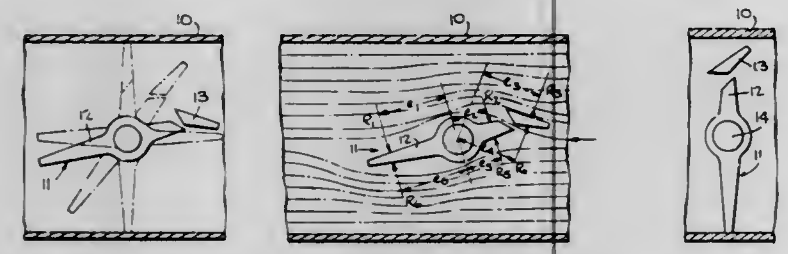


1. A damper arrangement comprising:

- a. a plate having an orifice located therein;
- b. an orifice closing blade movably positioned between an open position and a closed position in relation to said orifice, said blade having an opening therein of relatively small diameter in relation to said plate orifice, said opening being in flowthrough communication with said plate orifice; and,

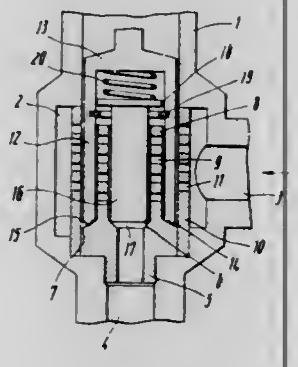
c. actuating means for moving said blade relative to said plate, said actuating means being in cooperation with a vent means, said vent means being in flow through communication with said opening upon actuation of said actuating means, said actuating means including a movably mounted piston with flow through apertures therein, said piston covering said opening in a fluid tight communication in one position and in fluid communication with said vent means in a second position, said vent means including a housing attached to said blade and surrounding said opening therein, said housing receiving said piston therein, said housing having flow through apertures therein in fluid communication with said flow through apertures in said piston when said piston is in said second position, said flow through communication being established prior to actuating means moving said blade from its closed position.

3,971,414
SERVO BUTTERFLY VALVE AND VANE
Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.
Filed Apr. 2, 1974, Ser. No. 457,266
Int. Cl.² F16K *1/22*
U.S. Cl. 137—630.15 **16 Claims**



6. In a butterfly vane including a main vane portion for pivoting about a longitudinal axis and a servo tab movably mounted on said main vane portion in one quadrant of said vane to define a single auxiliary flow path passing through said vane between said main vane portion and said servo tab, said servo tab extending to a peripheral edge of said vane.

3,971,415
THROTTLE VALVE
Werner Föller, Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen, Bremen, Germany
Filed July 14, 1975, Ser. No. 595,825
Claims priority, application Germany, Sept. 18, 1974, 2444607
Int. Cl.² F16K *1/44*
U.S. Cl. 137—630.19 **8 Claims**



1. A throttle valve having a valve housing with inlet and outlet openings, and responsive to an actuating member comprising:

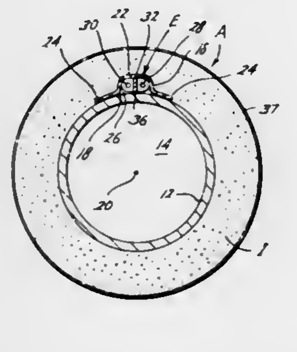
a valve seat element having a first valve seat for closing the outlet opening, and a second valve seat communicative to the inlet opening, said valve seat element having a coaxially extending jacket formed with a plurality of flow-through channels positioned at different planes;

a first piston-type locking member displaceably and adjustably disposed within said jacket and having a first sealing surface which cooperates with said first valve seat;

a second locking member displaceably disposed and surrounding said jacket, and having a second sealing surface opposite to said valve seat element which cooperates with said second valve seat on said valve seat element, said first and second locking members being displaceably connected with each other; and

means for biasing said first locking member with respect to said second locking member.

3,971,416
PREINSULATED PIPE ASSEMBLY AND PIPELINE
Ben C. Johnson, San Marcos, Tex., assignor to Thermon Manufacturing Company, San Marcos, Tex.
Filed Aug. 16, 1974, Ser. No. 497,958
Int. Cl.² H05B *3/58*
U.S. Cl. 138—33 **12 Claims**



1. A preinsulated pipe assembly for handling fluid, comprising:

a pipe having a fluid flow passage therethrough;

a heater housing mounted with said pipe and forming a cavity along the exterior of said pipe;

said heater housing including a channel member mounted on the exterior of said pipe such that said channel member and the exterior of said pipe form said heater housing cavity;

heating means disposable in said heater housing cavity for heating fluid in said flow passage of said pipe; and

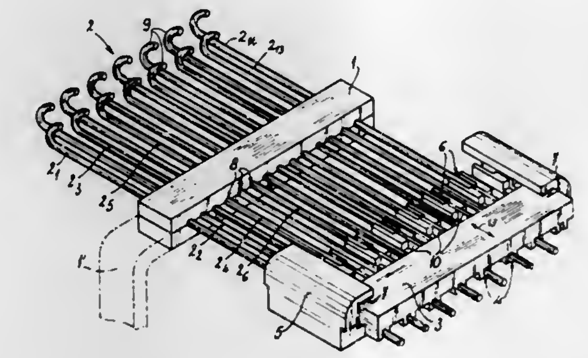
pulling means mountable with said heating means for controllably pulling said heating means from said heater housing cavity without removal of said heater housing from said pipe.

3,971,417
HAND LOOM
Henri Gentil, 5, avenue Pierre Semard, Bourg, Ain, France
Filed Apr. 11, 1975, Ser. No. 567,100
Claims priority, application France, Apr. 12, 1974, 74.13621
Int. Cl.² D03D *29/00*
U.S. Cl. 139—34 **6 Claims**

4. In a hand-weaving loom of the type wherein a multiplicity of needles are disposed in a parallel array in two groups, the needles of the groups interdigitating with one another, whereby in a first phase a weft web is formed from a yarn and in a second phase the same needles are drawn through the web to insert a warp therein, the needles having a weft-forming hook end and a warp-drawing eye end, the improvement which comprises:

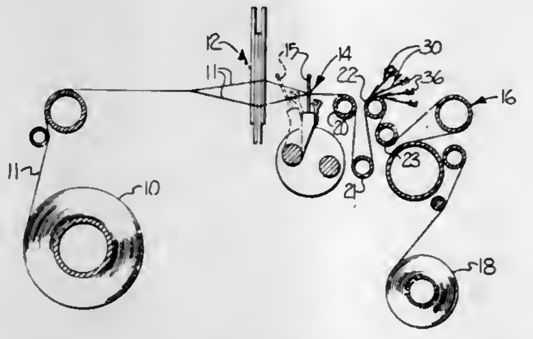
a common fixed support for all of said needles, said needles each being rectilinearly, longitudinally displaceable relative to said support and slidable therein; and

a respective movable bar rigid with the needles of each of said group and displaceable relative to said support in the direction of movement of said needles; and wherein



the groups of needles are shiftable alternately rectilinearly substantially in a common horizontal plane.

3,971,418
WEAVING MACHINE, APPARATUS AND METHOD
Stephen G. Fowler, 301 N. Cannon Blvd., Kannapolis, N.C. 28081
Filed Feb. 9, 1976, Ser. No. 656,649
Int. Cl.² D03D *39/24*
U.S. Cl. 139—116.6 **22 Claims**



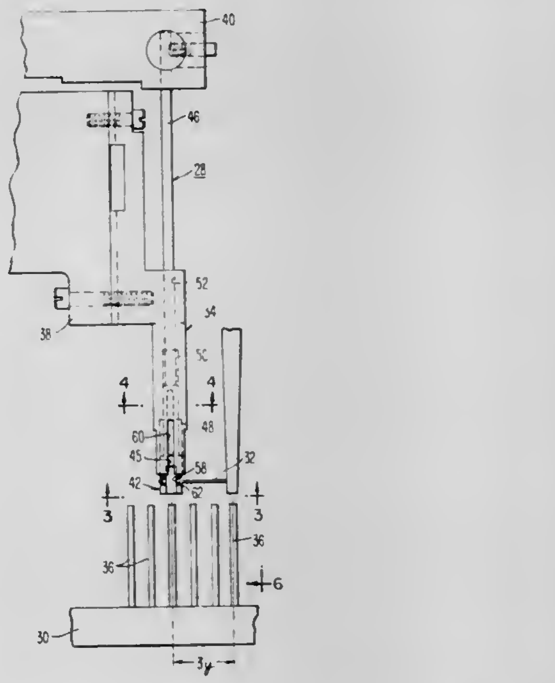
1. A corduroy producing weaving machine comprising weaving instrumentalities for forming at a fell fabric having warpwise races of weftwise floats, take-off means for moving fabric along a predetermined path of travel from the fell, roll means mounted adjacent the predetermined path of fabric travel for guiding the fabric through a predetermined arc of travel, and severing means mounted adjacent said roll means and extending warpwise of the fabric along at least a portion of the predetermined arc of travel for entering into the races of weftwise floats and for severing the floats to form wales as the fabric is moved from the fell.

3,971,419
DRESSING FINGER FOR AUTOMATIC WIRING MACHINES
George J. Sprenkle, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed July 31, 1975, Ser. No. 600,586
Int. Cl.² B21F *3/04, 15/04, 45/00*
U.S. Cl. 140—93 R **10 Claims**

1. A dressing finger assembly for use on automatic wiring machines to provide a predetermined pattern in a wire being connected to a terminal by an associated wrap tool, comprising:

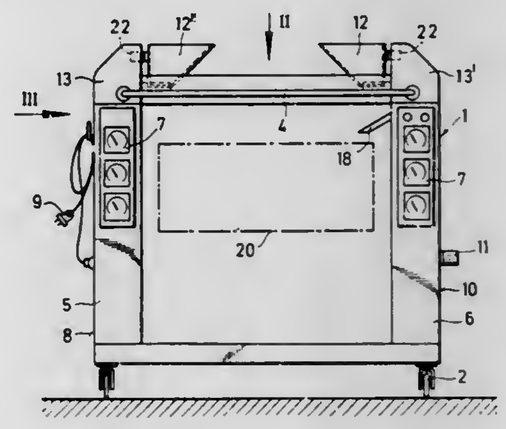
a dressing finger having a plurality of contiguous, coaxial, cylindrical sections arranged in order of decreasing outside diameters,

a first and a second of said sections having respectively the largest and next largest diameters of said plurality of sections and being tubular, said first and second sections having coaxial apertures which are elongated in cross section and have their center lines displaced from the central longitudinal axis of said sections, the aperture in at least a first part of said first section having larger dimensions than the aperture in said second section, the size and displacement of each of said apertures being



such that a longitudinal slot is formed in the wall of each of said sections, the axial center lines of the slots in said first and second sections being in substantial alignment.

3,971,420
DOSING DEVICE FOR INDUSTRIAL COOKING APPARATUS
Alfred Löhr, Bochum; Wolfgang Schwan; Wolfgang Tschek, both of Gelsenkirchen, and Günter Schreiber, Lunen, all of Germany, assignors to F. Kuppersbusch & Sohne Aktiengesellschaft, Gelsenkirchen, Germany
Filed Dec. 10, 1974, Ser. No. 531,373
Claims priority, application Germany, Dec. 11, 1973, 2361520
Int. Cl.² B65B *1/04*
U.S. Cl. 141—231 **10 Claims**



1. A dosing device for the automatic introduction of ingredients into a vessel of an industrial cooking apparatus, comprising in combination:

a. a mobile stand including means defining a bay-like, generally U-shaped space for receiving a stationary vessel of a cooking apparatus when said stand is moved next to the vessel into an operative position;

b. at least one cantilever member secured to said stand above said space;

c. a plurality of ingredient containers;

d. means pivotally attaching said containers to said cantilever member for providing for each container a first position in which the contents of the container are maintained therein and a second, or inwardly tilted, position in which the contents are discharged from the container by gravity directly into the vessel;

e. a spray tube mounted on at least one of said containers; and

f. means for supplying said spray tube with water for rinsing said at least one of said containers.

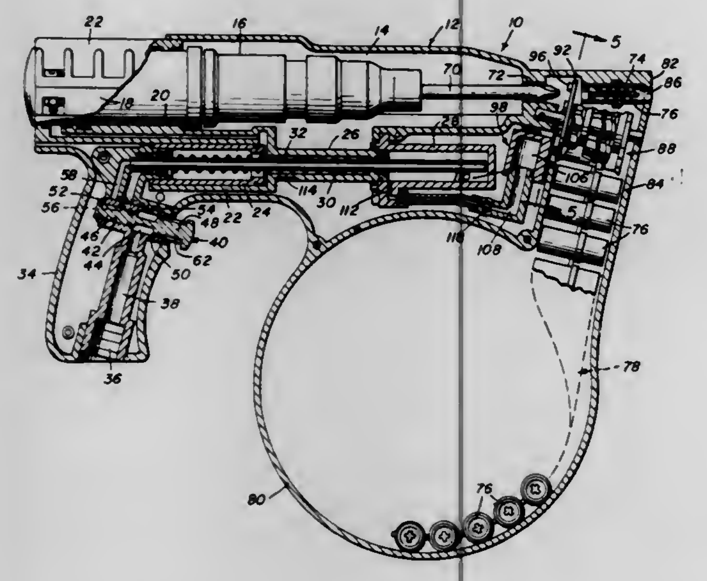
3,971,421
AIR-POWERED, SELF-FEEDING SCREW DRIVING TOOL

Harold E. Damratowski, Alda, Nebr., assignor to Triad Fastener Corporation, Alda, Nebr.

Continuation-in-part of Ser. No. 446,023, Feb. 26, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,819

Int. Cl.² B26B *23/00*

U.S. Cl. 144—32 **18 Claims**



1. An automatic screwdriving tool comprising a casing, an air-powered screwdriver, a carriage mounting said screwdriver in said casing, air pressure drive means for reciprocating said carriage between a forward screw engaging and driving position and a rear retracted position, said casing including a canister for retaining a supply of screws, air pressure control feeding means for sequentially feeding screws from said canister to a point forward of the carriage mounted screwdriver for a selective engagement of the screwdriver therewith upon a forward movement of the carriage, a single control means for said air pressure carriage drive means and said air pressure feeding means said feeding means for sequentially feeding screws including a star wheel unit mounted within said casing forward of said carriage for individually drawing the screws from the canister and sequentially positioning the screws in driving relation to the carriage mounted screwdriver, said screws being fixed within individual pods interconnected into an elongated canister received belt, said wheel incorporating peripherally spaced pod receiving seats thereabout.

3,971,422
METHOD OF TREE FELLING

George E. Silvey, 2252 N. 5th St., Springfield, Oreg. 97477

Filed Oct. 2, 1975, Ser. No. 618,825

Int. Cl.² A01G *23/08*

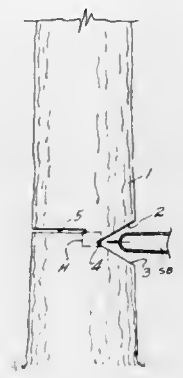
U.S. Cl. 144—34 B **4 Claims**

1. The method of felling a tree including the steps of,

cutting an undercut in the tree trunk, said undercut defined by planar sawn surfaces,

cutting a back cut terminating in an offset manner from the inner extremity of said undercut,

cutting multiple kerfs extending inwardly from said undercut into the tree holding wood located intermediate the inner extremities of the undercut and back cut so as to cause separation of the tree and stump to occur within the holding wood during felling of the tree and thereby avoid extraction of wood splinters from the butt of the tree being felled with a consequent loss of board feet of lumber, and



advancing the back cut into the holding wood until the tree commences falling.

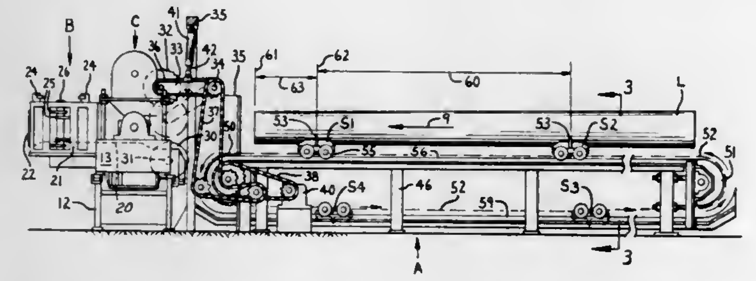
3,971,423
LOG FEEDER FOR CANTING MACHINE

Frederick L. B. Miller, Lake Oswego, Oreg., assignor to Mainland Industries, Inc., Lake Oswego, Oreg.

Filed Feb. 18, 1975, Ser. No. 550,468

Int. Cl.² B27C *1/12*; B27B *31/02*; B65G *15/42*

U.S. Cl. 144—176 **10 Claims**



1. In a canting machine having an infeed section arranged to feed a log lengthwise past at least one chipper head to slab a flat side on a lateral side of the log and an outfeed section for feeding the slabbed log away from said chipper head; means to provide two points of support spaced different distances apart in said infeed section for logs of different lengths, said means comprising a saddle carriage to support the leading end of the log and a saddle carriage to support the trailing end of the log with the log unsupported between said two carriages, said carriages allowing the log to rotate to stable position; a track for said carriages; endless chain means for moving said carriages toward said chipper head without rotational restraint on the log; and means adjacent the infeed side of said chipper head to restrain rotation of the log, said restraining means comprising a vertical knife edge guide wheel arranged to engage the underside of the log and lift the log off an approaching carriage, and a knife edge press wheel arranged to engage the upper side of the log above said guide wheel.

3,971,424
TIRE TREAD

Jacques Boileau, Clermont Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed July 11, 1975, Ser. No. 594,970

Claims priority, application France, July 25, 1974, 74.25987

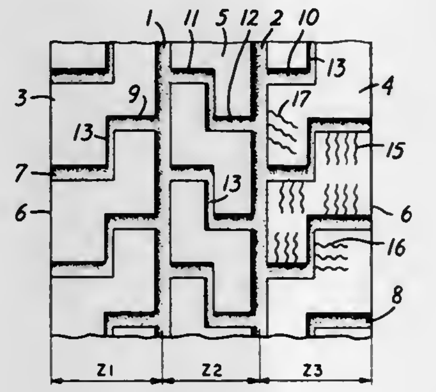
Int. Cl.² B60C *11/06*

U.S. Cl. 152—209 R **9 Claims**

1. A pneumatic tire having a tread comprising two wide grooves of circumferential orientation and rows of wide grooves of transverse orientation defining circumferential rows of elements in relief, characterized in that:

a. a middle row and two side rows of elements in relief are formed, separated in each row by grooves of transverse

orientation discharging alternately, in the case of the middle row, into the wide grooves of circumferential orientation and, in the case of the side rows, into the adjacent wide groove of circumferential orientation and into the adjacent edge of the tread;



b. the grooves of transverse orientation of each row of elements in relief are connected in pairs by grooves of reduced width and at most the same depth as the depth of said longitudinal and transverse grooves; and

c. the sum of the lengths, projected on a meridian section, of the transversely oriented grooves connected in pairs is between 0.75 and 1.5 times the width of the tread.

3,971,425
PROCESS AND DEVICE FOR AUTOMATIC REGULATION OF THE INTERNAL PRESSURE IN A PNEUMATIC TIRE

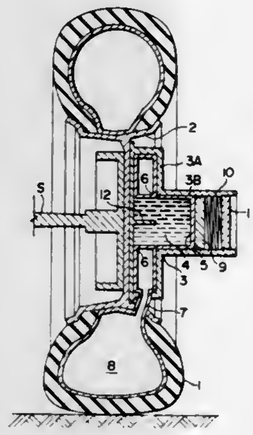
Yasuo Tsuruta, 22-2, 4-chome, Sanno, Ota, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,657

Claims priority, application Japan, Sept. 6, 1974, 49-101974; Feb. 12, 1975, 50-16937; Feb. 26, 1975, 50-22748

Int. Cl.² B60C *23/12*

U.S. Cl. 152—418 **13 Claims**



1. Method of automatically regulating the pressure within a pneumatic tire which comprises the steps of

providing centrifugal means positioned radially inward of said tire which is mounted to rotate when said tire is rotated, and to exert a radially outward pressure during such rotation, and

placing said centrifugal means in pressure-exchange relationship with the interior of said tire, whereby rotation of said tire and centrifugal means results in adding the radially outward pressure exerted by said centrifugal means to the original pressure with said tire when, but only when, said tire and centrifugal means are rotating.

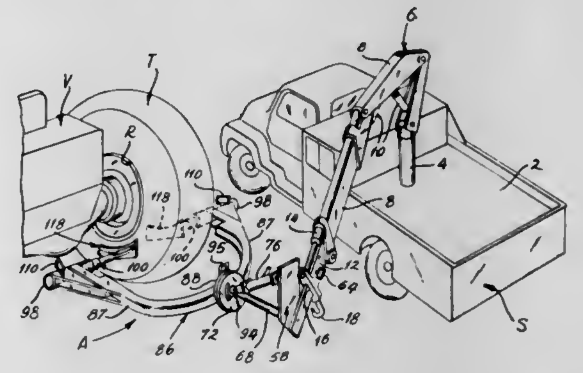
3,971,426
APPARATUS FOR CHANGING GIANT TIRES IN THE FIELD

Vallie D. West, 724 N. Washington St., and Jesse Kennedy, 201 S. Illinois Ave., both of DuQuoin, Ill. 62832

Filed July 1, 1975, Ser. No. 592,105

Int. Cl.² B60C *25/06*

U.S. Cl. 157—1.28 **17 Claims**



1. An apparatus for breaking the beads on the sidewalls of a tire away from bead seats on a rim on which the tire is mounted, said apparatus comprising: a rigid frame having spaced apart legs, the spacing between which is greater than the distance between the sidewalls on the tire; a tube on the end of each leg; a pressing shoe carried by each leg with the shoes of the two legs being located directly opposite each other, the shoes being configured and positioned to bear facewise against the sidewalls of the tires; and force exerting means for reducing the spacing between the shoes so as to force the sidewalls of the tire together and thereby break the beads away from the bead seats, said force exerting means including a fluid operated cylinder housed in the tube on each leg, the cylinders being axially aligned, and means for altering the axial positions of the cylinders in the tubes.

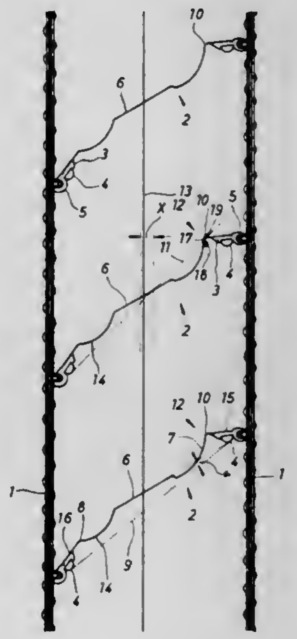
3,971,427
VENETIAN BLIND PROFILED SLATS

Heiko Coldewey, Jeddeloh; Mario Ammazzalorso, and Karl-Heinz Kaps, both of Oldenburg, all of Germany, assignors to Firma Justin Huppe, Oldenburg, Germany

Continuation of Ser. No. 465,430, April 29, 1974, abandoned. This application Sept. 11, 1975, Ser. No. 612,552

Int. Cl.² E06B *9/26*

U.S. Cl. 160—166 R **6 Claims**



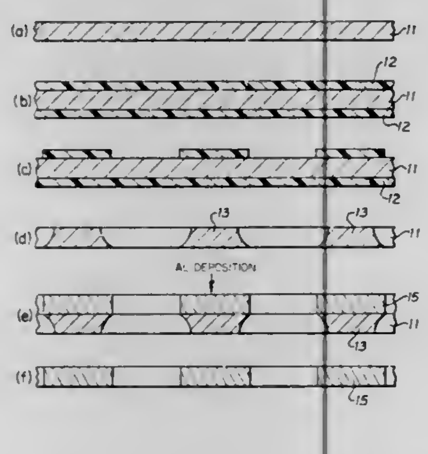
1. A venetian blind having a plurality of slats carried by supporting devices each of which is profiled transversely to its length, each slat having a substantially planar central section and first and second edge sections respectively connected to

and integral with opposite sides of said central section and respectively having free outer edges, the main plane of the central section being inclined at an acute angle with the connecting plane which passes through the outer edges of the edge sections, said central section having openings therein, raising devices extending through said openings, each slat having an asymmetrical cross-sectional profile such that said first edge section adjacent the central section includes a protuberance, a straight line between the top of said protuberance and the outer edge of said second edge section passing through said main plane, and pivot link means at said outer margins of said slats for connection with said supporting devices, said supporting devices being formed by a pair of vertical strips on either side of said slats.

3,971,428
METHOD FOR MAKING BEAM LEADS

Ronald D. Hall, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,526
Int. Cl.² B22D *23/00;* **H05K** *3/14*
U.S. Cl. 164—46 **4 Claims**



1. A process for making beam leads for use in the interconnecting of electronic packages to substrates comprising the steps of,

coating metallic foil with a resist pattern,

then etching said metallic foil with said resist pattern thereon to form a metallic foil pattern having a plurality of beam leads,

then depositing a second metal different than said metal of said metallic foil which said second metal has poor adhesion with said metallic foil, and

then separating said deposited second metal from said metallic foil to provide a plurality of second metal beam leads and whereby said metallic foil pattern is reuseable as a depository for another deposition of said second metal.

3,971,429
PROCESS OF EXTRACTING A HOT SLAB FROM A CONTINUOUS CASTING MOULD AND AN APPARATUS THEREFOR

Mathias Horeth, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed July 31, 1975, Ser. No. 600,812
Claims priority, application Austria, Aug. 27, 1974, 6913/74
Int. Cl.² B22D *11/08*
U.S. Cl. 164—82 **6 Claims**

1. A process of extracting a hot slab from a continuous casting mould with a lower opening by means of a tong-shaped starter bar head connected to a starter bar, comprising the steps of:

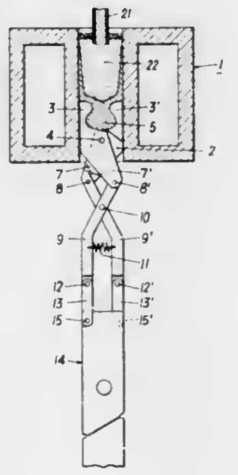
inserting the tong-shaped starter bar head having nippers forming a bit into the lower opening of said mould and thereby closing it,

filling the bit formed between said nippers in closed position with molten metal and allowing the molten metal to solidify, thus forming a cast connection piece,

subsequently extracting said starter bar head, and

opening the nippers of the tong-shaped starter bar head in a controlled manner so as to detach said nippers from said cast connection piece.

4. An apparatus for extracting a hot strand from a continuous casting mould comprising:



a starter bar,

a tong-shaped starter bar head dimensioned to fill the mould cross-section when inserted therein, said tong-shaped starter bar head being composed of tong-nippers defining an upwardly open cavity in their closed position and of tong-legs,

a shear-like linkage connected to the tong-legs,

two connecting brackets pivotable to and from the axis of the strand and connecting the shear-like linkage with the starter bar, and

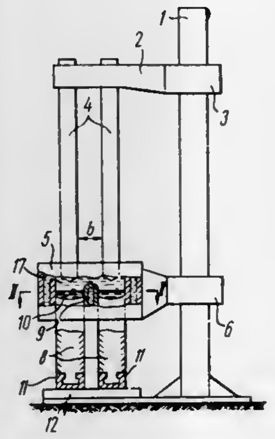
arcuately extending rails forming forced guide means connected with the connecting brackets for producing straddling and closing movements of the connecting brackets and for an analogous movement of the tong-nippers.

3,971,430
FURNACE FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton, ulitsa Kotsjubinskoga, 9, kv. 21; Boris Izrailevich Medovar, bulvar Lesi Ukrainki 2, kv. 8; Jury Pavlovich Shtanko, ulitsa E.Potie, 9, kv. 92, all of Kiev; Georgy Emmanuilovich Tsukanov, ulitsa Ryleeve 24/7, kv. 26, Moscow; Alexei Georgievich Bogachenko, ulitsa Muljutenko 15/2, kv. 141, Kiev; Oleg Petrovich Bondarenko, ulitsa Kreschatik 15, kv. 34, Kiev; Viktor Mikhailovich Martyn, ulitsa Vernadskogo 67, kv. 81, Kiev; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3, Kiev; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt, 39, kv. 9, Kiev; Viktor Leonidovich Artamonov, ulitsa Sovskaya 9, kv. 4, Kiev, and Georgy Anatolievich Pavliichuk, ulitsa Erevanskaya 8, kv. 8, Kiev, all of U.S.S.R.

Continuation of Ser. No. 233,627, March 10, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 551,682
Int. Cl.² B22D *27/02*
U.S. Cl. 164—252 **2 Claims**

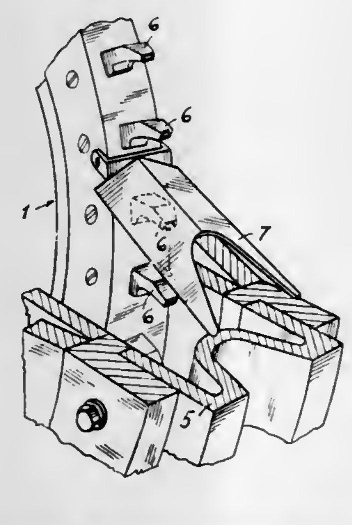
1. A furnace for the electroslag remelting of consumable electrodes for simultaneously forming at least two ingots, comprising: electrode supporting means including an electrode holder secured thereon and carrying at least two consumable electrodes connected to a power supply source; a mould having a common internal spatial cavity adapted to contain slag and having at least two separate ingot-shaping zones divided by at least one cooled vertical dividing wall; the dividing wall adapted to separate the molten metal in each ingot-shaping zone into separate pools and permit a common slag bath for the zones; the dividing wall is of a split construction made up of dismountable elements at least one of which is provided with a connecting piece for individual connection to a coolant source for cooling the dividing wall; each electrode being positioned over each ingot-shaping zone; a baseplate adapted to close the ingot-shaping zones from below during a first stage of the melting process; means for creating a relative motion between the electrode holder and the mould and the baseplate in a vertical direction; the height of the dividing wall is from 0.5–2.5 times the dimension of a minimum cross-sectional side of the part of the ingot-shaping zone; the width of the dividing wall does not exceed the spacing between the internal surfaces of the two adjacent consumable electrodes; the number of consumable electrodes equals the number of ingot-shaping zones; and the upper edge of the dividing wall is chamfered, forming angles of about 15°–85° to the horizon.



3,971,431
COOLING DEVICE FOR THE WHEEL OF A CONTINUOUS CASTING MACHINE

Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy (20122)

Filed Nov. 4, 1974, Ser. No. 520,700
Claims priority, application Italy, Nov. 12, 1973, 31214/73
Int. Cl.² B22D *11/06*
U.S. Cl. 164—278 **4 Claims**

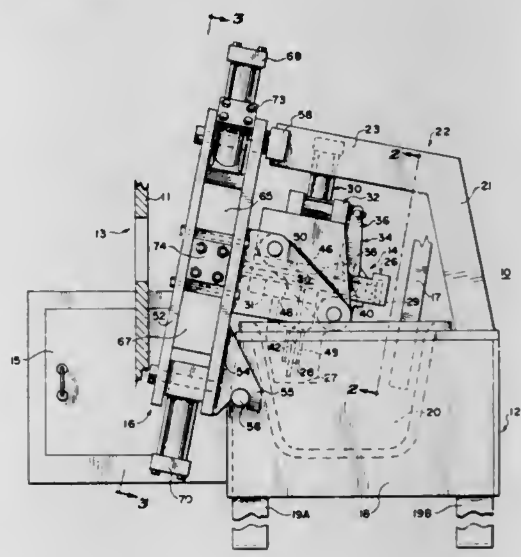


1. A cooling device for a continuous casting machine of the wheel and belt type having a casting wheel comprising a casting ring thereon defining with said belt a mold for the metal to be cast, the device comprising an annular header arranged internally to said casting ring, a plurality of spray nozzles arranged on said header for spraying cooling fluid onto the internal peripheral surface of said casting ring, cooling fluid guiding and separating elements arranged in spaced relationship in the space between said internal peripheral surface of said casting ring and said header and defining with said peripheral surface and said header a plurality of independent cooling sections each including at least one of said spray nozzles, said elements each comprising a metal sheet member connected at one end to said header and shaped at the other end so as to perfectly match with said internal peripheral surface of said casting ring, said sheet member having one face arranged to feed the sprayed cooling fluid substantially circumferentially onto said internal peripheral surface and an opposite face having portions arranged to diverge the oncoming stream of heated cooling fluid fed by upstream arranged spray nozzles into directions having opposite components transverse to the circumferential direction of flow of the cooling fluid on said internal peripheral surface of said casting ring.

3,971,432
DIE CASTING MACHINE

Donald Paul Hardey, 207 Sixth Ave., Sterling, Ill. 61081

Division of Ser. No. 368,505, June 11, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,793
Int. Cl.² B22D *17/04*
U.S. Cl. 164—318 **15 Claims**



1. Die casting apparatus for applying a molding material to a die comprising:

a first conduit having an inlet and an outlet;

means for moving said first conduit to bring said outlet in communication with a die;

a second conduit having first and second ports with said first port being adapted to receive said molding material from a source of molding material;

said second port communicating with said inlet; and

means for maintaining said second port in communication with said inlet to apply said molding material to said first conduit while said first conduit is moving and said second port is stationary.

3,971,433
APPARATUS FOR MOLDING CAST IRON PARTS CONTAINING SPHEROIDAL GRAPHITE

Henri Duchenne, Vanves, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

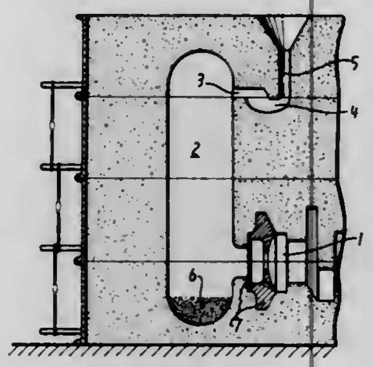
Filed Mar. 14, 1974, Ser. No. 451,196
Claims priority, application France, Apr. 20, 1973, 73.14539
Int. Cl.² B22D *27/20;* **B22C** *9/08;* **B22D** *1/00*
U.S. Cl. 164—362 **3 Claims**

1. Apparatus for casting iron parts requiring spheroidal graphite texture comprising:

a mold having a pouring channel and containing an impression of the part to be cast;

a treatment chamber disposed within the pouring channel of said mold and containing an inoculant required for the casting of said part, the volume of the portion of said treatment chamber leading to said impression of said part being equal to the sum of the volumes of said part being cast and the deadhead of said part;

said chamber being closed upon the side thereof facing said casting by means of a plug capable of being destroyed by means of the combined action of the temperature and pressure of the molten metal, said plug having a thickness and composition selected to provide a length of time said plug will resist the temperature and pressure of the molten metal charge so as to enable said volume of the portion of said treatment chamber leading to said impression of said part to be filled with said charge before said plug is destroyed; and



a separator disc, of neutral refractory material and including a cavity containing an active substance, disposed downstream of said plug;

whereby said inoculation occurs within said chamber during the time necessary for the destruction of said plug.

3,971,434

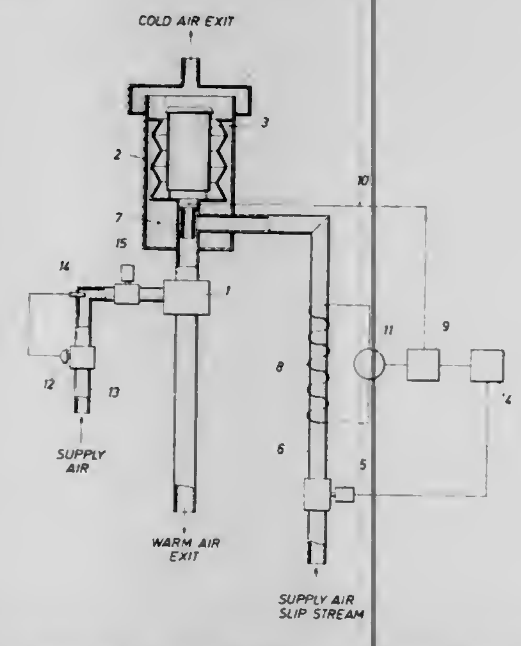
APPARATUS AND METHOD FOR OIL-IN-WAX DETERMINATION

James M. Martin, Jr.; Roy C. Heaton, both of Pasadena, and Richard H. Coe, Seabrook, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 3, 1973, Ser. No. 421,197

Int. Cl.² F28D *21/00*

U.S. Cl. 165—12 **5 Claims**



1. An apparatus for rapidly conditioning wax samples before determining the oil content of said samples by nuclear magnetic resonance measurement, said apparatus comprising:

a temperature equilibration chamber adapted to receive a wax sample holder designed to contain molten wax, said chamber having an inlet opening and an outlet opening for establishing a flow of gas therethrough;

a conduit communicating with the inlet opening of said equilibration chamber for supplying pressurized gas to a vortex tube;

a vortex tube attached to the base of said equilibrium chamber and having a hot air exit, and having a cold air exit in communication with said equilibration chamber for providing cold gas to said equilibration chamber to rapidly cool molten wax in said sample holder;

a conduit having heating means associated therewith and connected to the inlet opening of said equilibration chamber for conveying a heated gas to provide temperature control by mixing said heated gas with the cold gas exiting said vortex tube;

temperature measuring means operatively connected with said equilibration chamber for measuring the gas temperature in said equilibration chamber;

temperature controlling means, for operatively controlling said heating means and capable of maintaining a preselected gas temperature, and associated with said gas temperature measuring means; and

a timing relay associated with said temperature controlling means and having a solenoid activated valve located in said conduit for conveying heated gas, said relay designed to activate said heating means and to open said solenoid valve at a preset time.

3,971,435

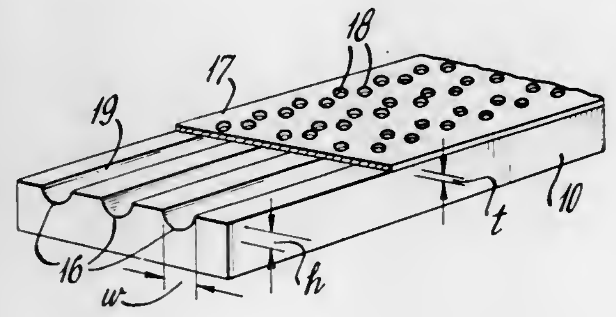
HEAT TRANSFER DEVICE

Wayne P. Peck, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 162,084, July 13, 1971, Pat. No. 3,803,688. This application Oct. 18, 1973, Ser. No. 407,478

Int. Cl. F28d *15/00*

U.S. Cl. 165—78 **21 Claims**



1. A heat-transfer device comprising a sealed container defining an enclosed space having an evaporator region and a condenser region, an internal surface of said container having a plurality of spaced elongated grooves therein and extending continuously and without obstruction through and between said regions, said grooves being of such restricted sectional dimension as to assure capillary liquid flow therethrough for a given condensable fluid selected for use therewith, and a smooth metal plate covering and continuously and integrally united to and in heat-transfer contact with said surface on both sides of and extending over each of said grooves, said plate having a plurality of openings registering with each of said grooves for communication between said grooves and the interior of said container, said openings for each groove being of lesser sectional dimension than the plate-spanned width of the groove, and said container including a condensable fluid medium in an amount sufficient to enter said grooves when condensed to a liquid and to be transported by capillary action in said grooves from the condenser region to the evaporator region of said container.

19. A heat-transfer device, comprising an elongate metal body having flat opposed sides, said body having an elongate groove open to one of said sides, and a separate elongate metal closure panel having sealed engagement to the opposed walls of the grooves, the inner surface of said panel facing and being spaced from the groove bottom, and the longitudinal ends of said engaged panel and body being sealed to close the longitudinal ends of the groove, the inner surface of said panel having longitudinal screen-wick formations, and said body having a closable port for admission of condensable liquid; said panel having a body with plural elongate grooves in the inner surface thereof, and said screen-wick formations comprising a single thin foraminated plate integrally united to the grooved inner surface and smoothly and uniformly bridging the grooves.

3,971,436

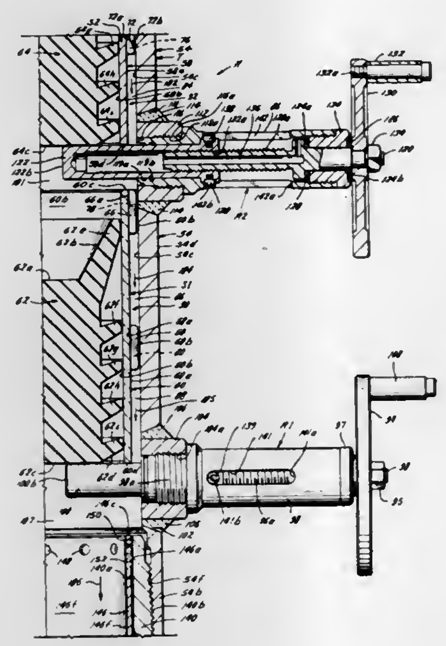
CEMENTING HEAD

William T. Lee, Harvey, La., assignor to Fishing Tools, Inc.

Filed Feb. 25, 1975, Ser. No. 552,799

Int. Cl.² E21B *33/05*

U.S. Cl. 166—70 **19 Claims**



13. A fluid head for selective channeling of differing fluids therein directed into a tubular member, comprising:

a tubular housing having a longitudinal inner bore therethrough and adapted to be mounted longitudinally having an upper end adapted to be connected for selectively receiving differing fluids and having a lower end adapted to be connected with the upper portion of the tubular member;

primary flow control means having a longitudinal inner bore and mounted with said tubular housing for controlling fluid flow within the inner longitudinal bore of said tubular housing; and,

said flow control means being releasably supported in a first position by a releasable support means mounted with said housing providing a fluid by-pass internally of said tubular housing, and upon release thereof, said releasable support means moving out of contact with said flow control means for longitudinal movement of said flow control means to a second position in engagement with an annular seating surface in said housing for closing said fluid by-pass and thereafter directing the fluid flow therethrough said longitudinal inner bore of said flow control means.

3,971,437

APPARATUS FOR DEWATERING BOREHOLES

Robert B. Clay, 728 W. 3800 South, Bountiful, Utah 84010, and Lex L. Udy, 4597 Ledgement Drive, Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 531,987, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 506,175, Sept. 16, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,011

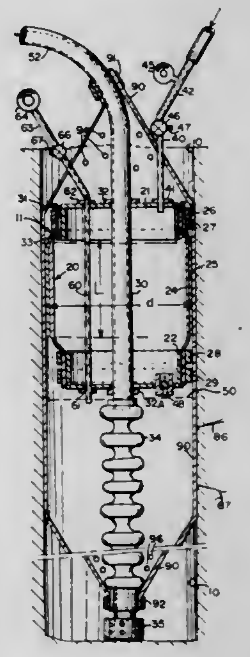
Int. Cl.² E21B *33/12;* **F04F** *1/06, 3/00*

U.S. Cl. 166—187 **6 Claims**

1. Apparatus for ejecting water from flooding blasting boreholes and the like, which includes an inflatable bore-hole plugging packer body having an upper head, a lower head, and an elastic expansible peripheral wall secured in gas tight relationship to both heads, and having through said upper head an inflating and water-ejecting gas supply line of predetermined gas flow-rate capacity and a rigid water discharge pipe passing through both heads, said apparatus comprising in combination the following improvements:

a. means fixed securing both heads to said rigid discharge pipe so as to prevent relative movement between said heads when said packer body is inflated,

b. a predetermined and selectively sized open orifice for restricting gas flow in said lower head, designed to permit continuous gas flow at a rate so controlled that a build-up of pressure will occur in said body as inflating and water-ejecting gas is supplied thereto through said gas supply line sufficient to insure holding of the body by frictional contact with a borehole wall against developing pressure below while permitting a gradual build-up of said developing pressure below to force the water in the borehole into said discharge pipe, said orifice also permitting said gas to flow through said lower head after the borehole water has been forced into the discharge pipe so as to blow water in said pipe completely out of said pipe, and



c. a substantially water-impervious borehole liner or membrane secured to said discharge pipe and lining the borehole walls below the packer body so as to substantially inhibit water in the borehole from flowing back into the formation of said borehole walls because of water-ejecting pressure in the borehole.

3,971,438

WIRELINE SAFETY VALVE WITH SPLIT BALL

Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

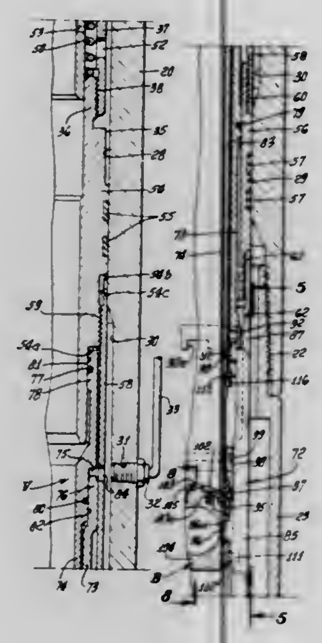
Filed Mar. 3, 1975, Ser. No. 554,623

Int. Cl.² F16K *11/16;* **E21B** *43/12*

U.S. Cl. 166—224 A **28 Claims**

1. In a subsurface shutoff valve for wells adapted to be supported in a well fluid production pipe: a body having a flow passage therethrough; shutoff valve means including a ball valve shiftable between a first position closing said passage and a second position at which said passage is open; actuator means for shifting said ball valve between said positions, including means defining a control fluid pressure chamber for moving said ball valve to said second position, and means responsive to the pressure of well fluid in the production pipe for biasing said ball valve to said first position upon reduction in the pressure of control fluid in said chamber; said shutoff ball valve including by-pass valve means, and a passage for

equalizing the well fluid across said shutoff valve means before said member is moved from said first position to said second position, and screen means for limiting entry of solids into said equalizing passage.



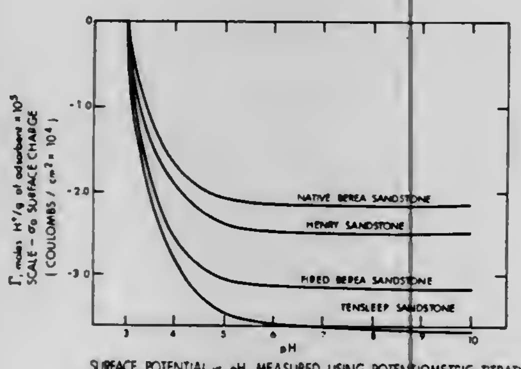
3,971,439
DESIGNING MICELLAR DISPLACEMENT SYSTEMS TO MINIMIZE ADSORPTION

Larry J. Douglas, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 31, 1975, Ser. No. 563,437

Int. Cl.² E21B *43/22, 47/00, 49/00*

U.S. Cl. 166—252 **11 Claims**



SURFACE POTENTIAL vs pH, MEASURED USING POTENTIOMETRIC TITRATION, FOR FOUR SANDSTONE MATERIALS.

1. In a process for reducing surfactant adsorption onto rock during oil recovery operations, the steps comprising contacting the rock with a micellar dispersion which interacts on contact with the rock to render the surface potential on the rock more negative.

3,971,440
METHOD FOR TREATING SUBTERRANEAN FORMATIONS WITH CELLULOSE ETHER-POLYACRYLAMIDE AQUEOUS GELS

James E. Hessert, and Richard L. Clampitt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 10, 1975, Ser. No. 611,751

Int. Cl.² E21B *33/138, 43/22, 43/26;* **C09K** *7/00*

U.S. Cl. 166—270 **11 Claims**

1. In a method wherein a fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, the improvement wherein at least a portion of said fluid medium comprises an aqueous gel, and wherein said gel comprises water to which there has been added:

a water-thickening polymeric mixture of (a) at least one cellulose ether and (b) at least one acrylamide polymer wherein the amount of (a) present in the mixture ranges from about 25 to about 95 weight percent of the total amount of (a) plus (b);

a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

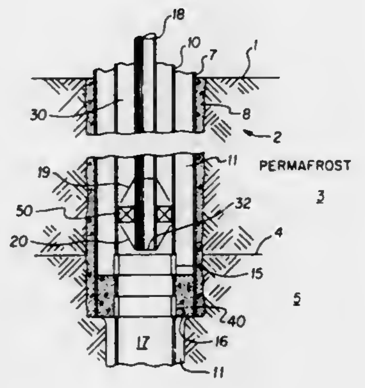
3,971,441
WELL COMPLETION IN PERMAFROST

Charles R. Knowles, Anchorage, Alaska; Leon H. Miles, Plano, Tex., and Larry N. Bell, Anchorage, Alaska, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 24, 1975, Ser. No. 616,502

Int. Cl.² E21B *33/13*

U.S. Cl. 166—285 **8 Claims**



1. A method for completing a well whose wellbore passes through a permafrost zone, said wellbore containing a freezable liquid, said method providing in the permafrost zone of said wellbore a longitudinally extending first annulus having inner and outer walls, said inner wall defining a longitudinally extending interior zone, providing near the lower end of said permafrost zone spaced apart upper and lower openable and closable aperture means in said inner wall, the apertures in both said aperture means being initially closed, providing a longitudinally movable conduit means for conducting fluid from the earth's surface to the vicinity of said apertures, running said conduit means into said interior zone thereby providing a second annulus between said conduit means and said inner wall, packing off said second annulus above said upper aperture means, opening said lower aperture means, pumping a hardenable fluid through said conduit means and through said lower aperture means into said first annulus, continuing said pumping until said hardenable fluid reaches said upper aperture means, closing said lower aperture means, opening said upper aperture means, washing hardenable fluid if any out of said upper aperture means thereby leaving a hardenable annular collar in said first annulus between said upper and lower aperture means, allowing said collar to harden, and injecting into said first annulus above said collar by way of said conduit means and upper aperture means essentially nonfreezable liquid under the conditions present in said permafrost zone of said wellbore thereby substituting said essentially nonfreezable liquid for said freezable liquid in the permafrost area of said annulus.

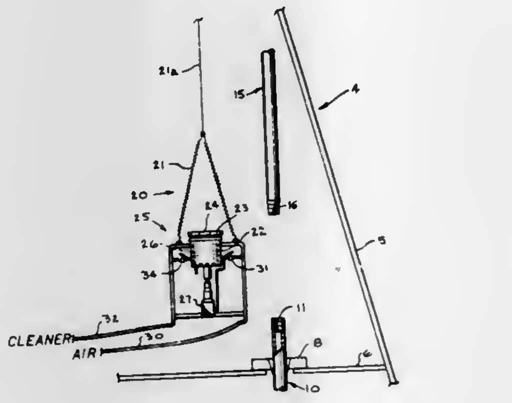
3,971,442
METHOD OF CLEANING TUBULAR MEMBERS ON A RIG FLOOR

Thomas W. Scott, P.O. Box 51407, O.C.S., Lafayette, La. 70501

Filed Jan. 6, 1975, Ser. No. 538,748

Int. Cl.² E21B *23/00*

U.S. Cl. 166—315 **2 Claims**



1. A method of cleaning the threaded pin end of a tubular member to be threadedly connected into the upwardly facing threaded box end of the uppermost tubular member of a well string suspended from a drilling apparatus, comprising the steps of:

maintaining a thread cleaner apparatus suitable for encircling and cleaning the threaded pin end of the tubular member in a standby position adjacent the rig floor, said thread cleaner apparatus being physically mounted upon said drilling apparatus for vertical and lateral movement relative thereto;

hoisting the tubular member to be cleaned into a selected position above the upwardly-facing threaded box end of the uppermost tubular member of the well string whereby the pin end of the tubular member to be cleaned faces downwardly;

moving the thread cleaner apparatus from its standby position into a selected position for cleaning the threaded pin end of the tubular member whereby the threaded pin end of the tubular member is encircled by the thread cleaner apparatus;

actuating the thread cleaner apparatus to clean the threaded pin end of the tubular member in the vicinity of the rig floor; and

removing the thread cleaner apparatus from its cleaning position encircling the threaded pin end of the tubular member whereby the threaded pin end of the tubular member is exposed for immediate connection with the upwardly facing threaded box of the uppermost tubular member.

3,971,443
DISCHARGE HEAD HAVING DUAL FUNCTION PLUG RETAINING MEMBER

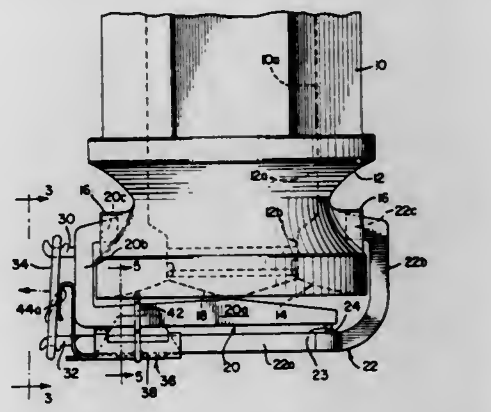
Karol R. Zenker, Needham, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Continuation of Ser. No. 499,639, Aug. 22, 1974, abandoned, which is a continuation of Ser. No. 346,454, March 30, 1973, abandoned. This application June 11, 1975, Ser. No. 585,742

Int. Cl.² A62C *37/12*

U.S. Cl. 169—39 **8 Claims**

1. A discharge head comprising a body member having an inlet adapted for connection to a source of fluid and an outlet for discharging said fluid, plug means; and support means for supporting said plug means relative to said body member in a position preventing the discharge of fluid from said outlet, said support means comprising a first lever disposed externally of said body member and in engagement with said plug means, a second lever connected to said body member and engaging said first lever, a fusible link connecting said levers and responsive to a predetermined temperature in the vicinity of said body member for releasing said connection, a spring loaded clip connecting said levers and responsive to a component of force of a predetermined value caused by a predetermined fluid pressure in said body member acting through said plug means and said levers, for releasing said latter connection, the releasing of said connections permitting said plug means to be forced from said discharge preventing position by said fluid, and said fluid to discharge from said outlet, and resilient means engaging said fusible link and adapted to urge same outwardly from said levers upon the fusing of said fusible link to facilitate said release.



3,971,444
REACTION VESSELS CHARGED WITH SPHERICAL ELEMENTS

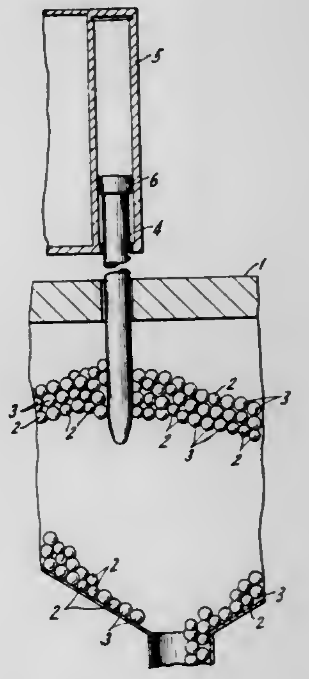
Fritz Schweiger, Hagen, and Jürgen Wohler, Uentrop, both of Germany, assignors to Hochtemperatur-Kernkraftwerk Gesellschaft mit beschrankter Haftung (HKG), Gemeinsames Europaisches, Uentrop, Germany

Continuation-in-part of Ser. No. 273,168, July 19, 1972. This application July 22, 1974, Ser. No. 490,692

Claims priority, application Germany, July 21, 1971, 2136403

Int. Cl.² G21C *19/00*

U.S. Cl. 176—32 **4 Claims**

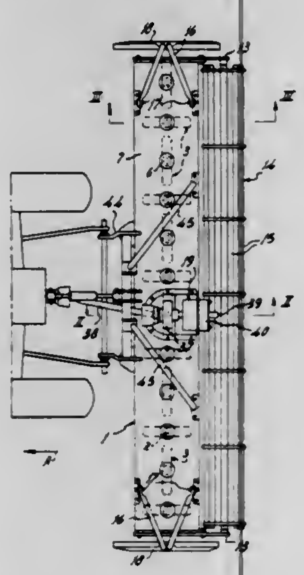


1. In a nuclear reactor, a reaction vessel, a charge of spherical reaction elements positioned in said vessel, means for providing a continuous circulation of said reaction elements through said vessel during operation thereof, a plurality of control rods and means for advancing said control rods into said charge during operation in direct contact with said elements and for retracting said control rods from said charge,

wherein the improvement comprises that said charge consists of two groups of said spherical elements, all of the elements in each of said groups being of the same diameter and the elements in each one of said groups being a different diameter from the elements in the other one of said groups, all of said elements being uniformly mixed together in said vessel and the different diameters of said groups being selected so that the diameter of one said group differs from the diameter of the other said group within a range of from 5 to 35% of the diameter of the other said group and the arrangement of the spherical elements is such that during the circulation of said spherical elements through said vessel during vessel operation the substantial segregation of said elements into said groups does not take place and the selected range in diameters prevents the charge of spherical elements from packing tightly together so that the advancement of said control rods into the charge in direct contact with the spherical elements is facilitated without causing damaging stresses to said spherical elements or to said control rods.

3,971,445
CULTIVATORS

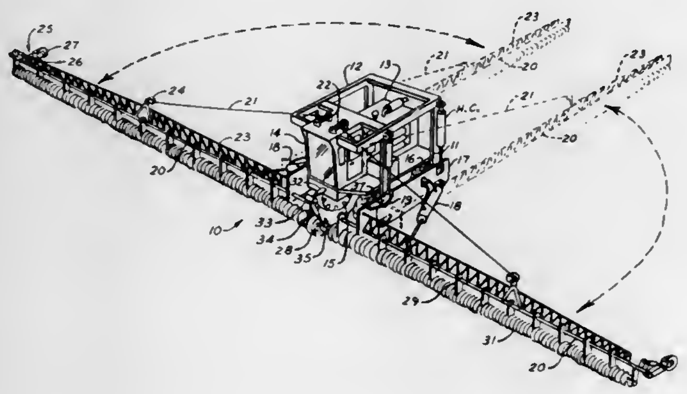
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Continuation of Ser. No. 233,133, March 9, 1972, abandoned.
This application Mar. 13, 1974, Ser. No. 450,738
Claims priority, application Netherlands, Mar. 12, 1971, 7103297
Int. Cl.² A01B *33/00*
U.S. Cl. 172—59 **12 Claims**



1. A cultivator attachment comprising a main frame beam and coupling means at the forward side of said beam, for direct and close connection to the rear of a prime mover, a plurality of rotatable soil-working members journalled on said frame beam, said soil-working members each being mounted on a rotary shaft and being in driving connection with driving means including a gear box positioned on said beam, the rotary shafts of said soil-working members extending in a row transverse to the direction of travel and said driving means including a driving shaft which in its entirety is located to the rear of a vertical plane that passes through said rotary shafts, said main beam being an elongated hollow member extending transverse to the direction of travel and housing meshed pinion gears of said driving means, each of said rotary shafts being secured to one of said pinion gears and one of said rotary shafts having its upper end in driving connection with said driving shaft, said driving shaft being connectable to a power take off of the prime mover, whereby said cultivator can be attached a minimum distance to the rear of the prime mover to improve maneuvering during operation and reduce stress during inoperative transport, said driving shaft being operatively connected to a branch shaft and the latter extending rearwardly and substantially horizontal for connection to another implement at the rear of said gear box placing same in driving connection with the same power take off that drives said soil-working members, said branch shaft projecting through an aperture in said gear box, the front of said beam being solely supported from the ground by said coupling means attached to the prime mover.

3,971,446
AGRICULTURAL DO-ALL MACHINE

Raymond Frank Nienberg, Box 44, Glandorf, Ohio 45848
Continuation-in-part of Ser. No. 309,156, Nov. 24, 1972, abandoned. This application July 5, 1974, Ser. No. 486,060
Int. Cl.² A01B *49/00, 63/00*
U.S. Cl. 172—311 **9 Claims**

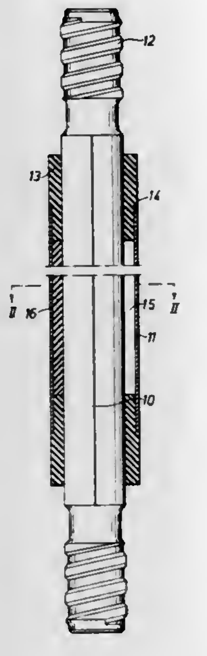


1. An all purpose farming vehicle comprising: a power unit frame, ground engaging traction units supporting said power unit frame, an engine mounted on said power unit frame, a superstructure positioned over said power unit frame and supported by said power unit frame, a carrier arm frame having opposite hand portions on opposite sides of said power unit frame, guide means operatively positioned between said power unit frame and said carrier arm frame to restrain lateral movement of said carrier arm frame while allowing said carrier arm frame to be positioned vertically with respect to said power unit frame, means attached to said superstructure for raising and lowering said carrier arm frame relative to said power unit frame, an implement carrier arm mounted on and extending laterally from one side of said carrier arm frame, and a tension member extending between said implement carrier arm and said superstructure.

3,971,447
DRILL ROD FOR PERCUSSION DRILLING

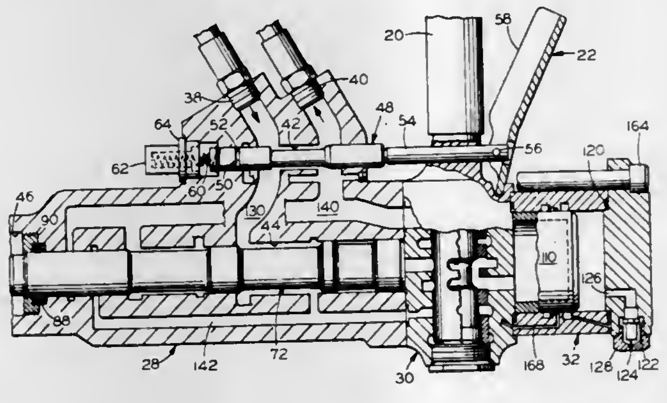
Erik Ahlberg, Nacka; Ingvar Carlvik, Lidingo; Bernt Soren Liljekvist, and Anders Carl Gustaf Hagglund, both of Sandviken, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken and Atlas Copco Aktiebolag, Nacka, both of, Sweden
Filed Dec. 3, 1974, Ser. No. 529,053
Claims priority, application Sweden, Dec. 3, 1973, 73162760
Int. Cl.² E21C *15/00;* **F16F** *7/00*
U.S. Cl. 173—128 **12 Claims**

1. An improved silenced drill rod for percussive drilling of the type wherein a noise-suppressing sleeve is disposed around said drill rod and extends along a major portion thereof, wherein the improvement comprises first elastomeric means (13) mounted on said drill rod (10) for substantially isolating said sleeve from said drill rod and for radially spacing said sleeve from said drill rod whereby to provide an annular space (15) therebetween, and second elastomeric means (17) in said space axially spaced from said first elastomeric means and radially substantially filling said space for damping out vibration of said drill rod, said second elastomeric means only partially filling said space whereby to permit lateral bending of said drill rod within said sleeve during transmission of impact energy through said drill rod.



3,971,448
BREAKER CONSTRUCTION AND VALVE THEREFOR

Stephen Earl Crover, Boring, and Gordon Eugene Brown, Milwaukee, both of Oreg., assignors to The Stanley Works, **New Britain, Conn.**
Continuation of Ser. No. 394,518, Sept. 4, 1973, abandoned.
This application Feb. 18, 1975, Ser. No. 550,661
Int. Cl.² B25D *9/20, 9/04*
U.S. Cl. 173—134 **10 Claims**



1. In a fluid operated tool operable for reciprocating linear movement of a tool member, the combination comprising:

a. a body member having a first bore extending longitudinally thereof and a second bore spaced therefrom, inlet means and outlet means formed therein, and means for detachably mounting a tool member at one end of said body member;

b. trigger means mounted on said body member for movement between an actuating position and a rest position;

c. a piston supported in said first bore of said body member for reciprocating movement in said bore between a first position adjacent said one end of said body member wherein said piston may drive the associated tool member in the direction of said one end of said body member and a second position spaced from said one end of said body member;

d. reversing valve means supported in said body member including an integral reversing valve spool supported in said second bore for movement between a first position and a second position, solely by hydraulic fluid action said spool having end faces, a passage extending therethrough between said end faces and a circumferential collar adjacent one end face providing a cross sectional area for said one face larger than that of the other end face, a radially extending circumferential collar shoulder intermediate said end facing oppositely of said one end face and providing a step up force area, said second bore being cooperatively dimensioned and configured for sliding movement of said spool therein, said second bore having an enlarged portion adjacent one end to snugly seat the portion providing said collar and collar shoulder during sliding movement of said valve spool and another portion of lesser cross sectional area to snugly seat the other end portion of said valve spool during movement thereof, said one end face providing a first force effective area and said other end face providing a second force effective area; and

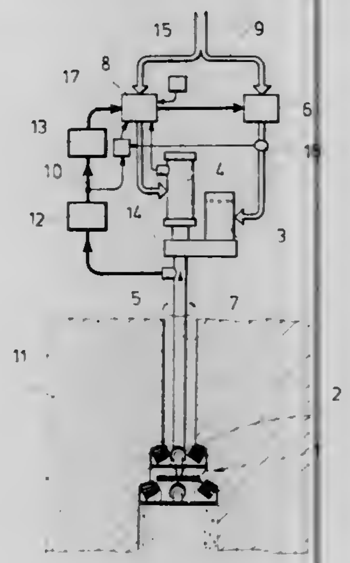
e. hydraulic circuit means including conduits in said body member between said first and second bores and connecting said inlet and outlet means with said bores, said hydraulic circuit means being operable to provide alternate hydraulic circuits within said body member, said hydraulic circuit means being operable when said trigger means is in said actuating position to provide a first hydraulic circuit from said inlet means through said body member to said reversing valve spool to establish therethrough a flow path to cause hydraulic fluid to be applied to said first force effective area to produce a force thereon and hydraulic fluid to flow through said passage in said reversing valve spool and to be applied to said second force effective area to produce a force thereon wherein the resultant force produced by the hydraulic fluid acting on said first and second force effective areas causes said reversing valve spool to move to said second position thereof, said hydraulic circuit means being operable when said reversing valve spool reaches said second position thereof to establish a second hydraulic circuit from said inlet means through said body member to said position to provide a flow path therethrough to cause hydraulic fluid to be applied to said piston to produce a force thereon to move said piston to said second position thereof, said hydraulic circuit means being operable when said piston reaches said second position thereof to establish a third hydraulic circuit from said inlet means through said body member to said reversing valve spool to provide a flow path therethrough to cause hydraulic fluid to be applied to said step up force area to produce a force thereon to cause said reversing valve spool to move to said first position thereof, and said hydraulic circuit means being operable when said reversing valve spool reaches said first position thereof to establish a fourth hydraulic circuit from said inlet means through said body member to said piston to provide a flow path therethrough to cause hydraulic fluid to be applied to said piston to move said piston to said first position thereof wherein said piston is driven towards said one end of said body member and may thereby drive an associated tool member.

3,971,449
PROCEDURE FOR CONTROLLING A ROCK DRILL AND ROCK DRILL FOR CARRYING OUT THE PROCEDURE

Roger Nylund, and Aulis Holmala, both of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland
Filed Oct. 9, 1974, Ser. No. 513,291
Claims priority, application Finland, Oct. 9, 1973, 3133/73; Oct. 1, 1974, 2869/74
Int. Cl.² E21B *19/08*
U.S. Cl. 175—27 **18 Claims**

1. A method for controlling the drilling functions of a full profile rock drill apparatus, comprising the steps of controlling the speed of rotation of the cutting head and controlling the feed force of the cutting head so that the rate of penetration of the drill bit reaches its optimum rate as a function of

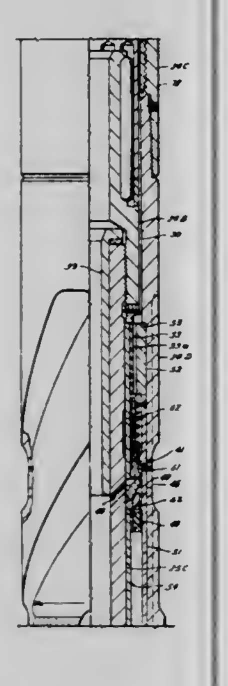
the feed force, said full profile drilling apparatus having a part of the cutting head cutting the rock comprising freely rotable cutters, measuring during the drilling operation the change of the rate of penetration of the cutting head into the rock, and controlling on the basis of said measured change the drilling functions so that the cutting head feed force is either increased or decreased, said feed force of the cutting head being controlled so that if the nearest preceding control action for increasing or decreasing the feed force has increased the rate of penetration of the cutting head then the feed force of the cutting head will be adjusted in the same direction as the nearest preceding adjustment, if the rate of penetration, on the other hand decreased or remained at the same level then the feed force of the cutting head is adjusted in the opposite direction.



3,971,450
WELL DRILLING TOOL

Fred K. Fox, Houston, Tex., assignor to Engineering Enterprises, Inc., Houston, Tex.

Filed Jan. 31, 1975, Ser. No. 546,006
Int. Cl.² E21B *3/12*
U.S. Cl. 175—107 38 Claims

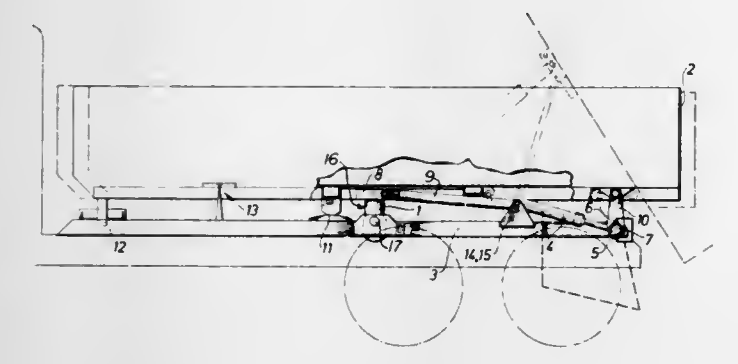


1. A well drilling tool adapted to be connected to the lower end of a drill string above the drill bit, whereby drilling fluid may be circulated downwardly through the inside of the tool and upwardly within the annulus between the outside of the tool and the bore of the well being drilled, comprising inner and outer members defining an annular space therebetween, means on the members within said space supporting them for rotation with respect to one another, first means sealing between said members for separating the fluid on one side of said tool from that within a portion of said space, means providing a variable volume lubricant chamber including second and third sealing means between said members within the space portion, and means fluidly connecting the other side of the tool with said space portion above and below said second and third sealing means, respectively, whereby said first seal means is adapted to contain the pressure differential between the inner and outer sides of the tool, and said second and third sealing means separate the part of the chamber between them from the fluid on said other side of the tool, the volume of said chamber being variable in response to changes in the pressure of fluid on said other side of the tool near said chamber, so as to maintain the pressure of lubricant within the chamber substantially equal to that on said other side of the tool, and thereby protect parts contained within said chamber for said drilling fluid.

3,971,451
METHOD AND APPARATUS FOR INDICATING A LOAD PLACED ON A LOAD-CARRYING VEHICLE PLATFORM

Carl Eric Bertil Norberg, Satunavagen 24 D, 195 00 Marsta, Sweden

Filed July 14, 1975, Ser. No. 595,576
Claims priority, application Sweden, Oct. 1, 1974, 7404903
Int. Cl.² B60P *5/00;* G01G *19/08*
U.S. Cl. 177—1 13 Claims



1. A method for indicating a load based on a vehicle platform which is supported on a vehicle, comprising:

providing a balancing member (16) on the vehicle and disposed at the theoretical center of gravity of the vehicle load;

relieving at least a portion of the vehicle platforms normal supporting points during load indication by means of said balancing member (16);

providing a first sensing and transmitting means (5, 6) spaced from said balancing member (16);

relieving the vehicle platforms other normal supporting points during load indication by means of said first sensing and transmitting means (5, 6);

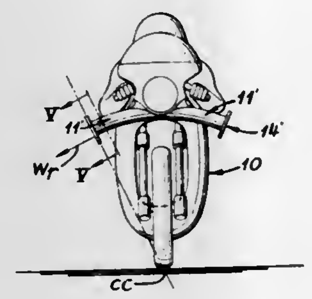
sensing, by means of said first sensing and transmitting means (5, 6), a torque about said balancing member (16) caused by application of a load on the vehicle platform (2) and delivering a signal which is a function of said sensed torque; and

displacing said platform (2) and therefore the center of gravity of the load placed thereon, as a function of said signal, towards and so as to substantially coincide with the theoretical center of gravity of the vehicle load on the vehicle platform (2).

3,971,452
AERODYNAMIC DEVICE FOR IMPROVING THE HIGH SPEED RUNNING CONDITIONS OF MOTORCYCLES

Alberto Morelli, Strada val Salice, 72, Turin, Italy

Filed Apr. 29, 1975, Ser. No. 572,847
Claims priority, application Italy, May 2, 1974, 68361/74
Int. Cl.² B62D *37/02*
U.S. Cl. 180—1 FV 16 Claims

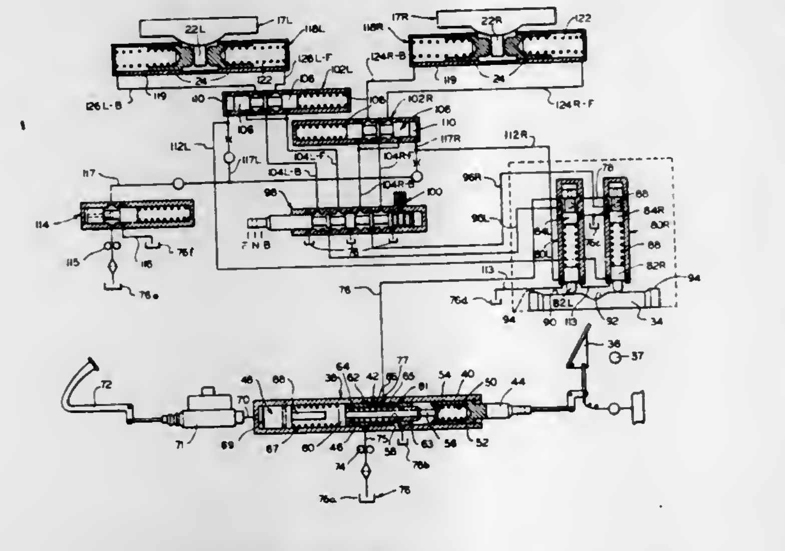


1. An aerodynamic device for improving the high speed running conditions of motorcycles, comprising a negative lift airfoil constrained on the motorcycle body, independently of any steering member, said airfoil including means to produce a negative lifting action approximately in the vertical plane passing through the pivot axle of the front wheel; said negative lift airfoil being fitted in a leading zone of the motorcycle body ahead of the barycentrical straight line such that said airfoil originates a diving barycentrical moment in relation to the motorcycle's barycenter in every point of said leading zone.

3,971,453
HYDROSTATIC CONTROL - PIVOT STEERING

Jon Richard Patton, and Ronald Loren Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 326,440, Jan. 24, 1973, Pat. No. 3,888,323. This application Oct. 29, 1974, Ser. No. 518,405
Int. Cl.² B62D *9/00*
U.S. Cl. 180—6.48 10 Claims



1. In a pivot steering vehicle,

a pair of hydrostatically operated driving wheels,

means for driving the driving wheels including a pump and a motor for each wheel, the pump providing driving power and the motor including a control element for controlling the speed and direction of the wheel as driven by the pump, and the control elements being independently actuatable for correspondingly independently controlling the wheels as to speed and direction,

steerable wheels and a steering wheel for actuating them and steering the vehicle,

a fluid line leading to each control element,

means for producing pressure in the fluid in the fluid lines and transmitting the pressure to the central elements,

first control means independent of the steering wheel and including an accelerator valve, the accelerator valve including a cylinder and spool means therein, and

the spool means including a main spool operative for closing and opening the fluid lines, the main spool being provided with a hollow interior and a port therefrom providing access of the fluid in the fluid lines to enter into the interior of the main spool,

the main spool including a main portion and a second portion movable relative to the first, the second portion being positioned for reaction thereagainst by the pressure of the fluid in the interior of the main spool,

manually actuatable means for actuating the spool means, and thereby actuating the accelerator valve,

the accelerator valve being operable, in response to actuation of the spool means, for controlling the transmission of pressure in the fluid lines, throughout a predetermined range of variation of pressure to the motors in proportion to the degree of actuation of the manually actuatable means and correspondingly driving the driving means at corresponding speeds,

the motors being effective for establishing corresponding reaction pressure through the fluid to the spool means and thereby the manually actuatable means, whereby to enable the operator to sense the pressure being applied to the central elements,

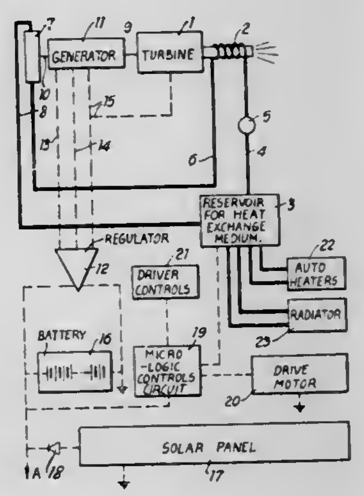
the spool means and manually actuatable means being so relatively positioned and constructed that the manually actuatable means acts against the second portion of the main spool means and hence the pressure of the fluid reacts against the second portion of the main spool means and thereby against the actuatable means,

said control means due to its independence of the steering wheel being operative for controlling the motors throughout the full range regardless of the condition of steering or any position of the vehicle due to steering.

3,971,454
SYSTEM FOR GENERATING ELECTRICAL ENERGY TO SUPPLY POWER TO PROPEL VEHICLES

Nelson J. Waterbury, 400 Coconut Row, Palm Beach, Fla. 33480

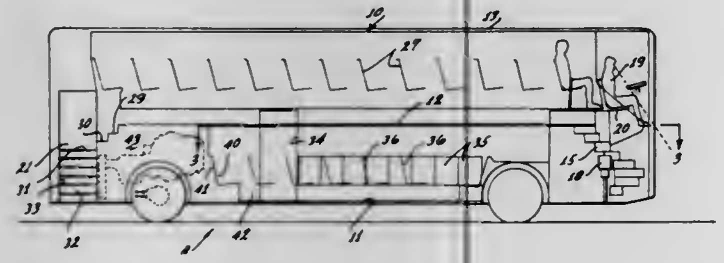
Continuation-in-part of Ser. No. 135,551, April 20, 1971, abandoned. This application Apr. 13, 1973, Ser. No. 350,944
Int. Cl.² B60L *11/12*
U.S. Cl. 180—65 R 12 Claims



1. An electric-powered vehicle having wheels driven by at least one electric drive motor; a battery consisting of a multiplicity of cells electrically connected to the or each motor for supplying power thereto; control means for regulating the supply of power from the battery to the or each drive motor; at least one bank of solar cells mounted on the vehicle in such a position as to be exposed to solar radiation during sunlight

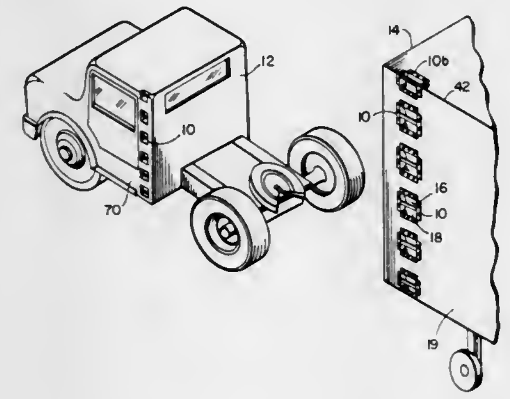
hours; means electrically connecting the or each bank of solar cells to the battery, said means including isolating means for protecting the solar cells against reverse current from the battery; an electrical generator adapted to supply charge to the battery; an intermittently operating gas turbine drivingly connected to the generator for operating the same; a heat exchanger adapted to receive hot waste gases from said turbine and transfer heat to a heat exchange medium circulating therein; a free-wheeling turbine drivingly connected to the generator; conduit means for supplying heated heat exchange medium in gaseous form to the free-wheeling turbine and for returning heat exchange medium therefrom to the heat exchanger; and a voltage regulator interpositioned between the generator and the battery for controlling the flow of charge to the battery, said voltage regulator having freedback means for controlling the operation of the first-mentioned turbine and of the generator in accordance with the charge existing on the battery.

3,971,455
DOUBLE DECK BUS
William R. Molzon, Rancho Palos Verdes, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.
Filed Sept. 17, 1975, Ser. No. 614,341
Int. Cl.² B60J *9/02;* **B62D** *31/04*
U.S. Cl. 180—89 R **9 Claims**



1. A double deck bus having a body with a front entrance and two rear exits, said bus comprising:
- a lower deck terminating short of the rear end of the body,
- an upper deck extending substantially the full length of the body and spaced vertically from the lower deck by selected standing head room height, the upper deck being spaced vertically from the roof of the body by selected sitting head room height,
- an engine compartment rearwardly of the lower deck,
- a sealed wall separating the engine compartment from the interior of the body between the decks,
- an upwardly opening channel passageway formed in, and extending lengthwise of, the upper deck, the bottom of the channel passageway being spaced from the roof by selected standing headroom height,
- a curved stairway ascending from an area adjacent the front entrance with its upper end opening into a forward portion of the channel passageway,
- a fare box mounted within the curve of the front stairway for access by persons entering the front entrance and going to both the upper and lower decks,
- a driver's seat elevated above the lower deck at a height, and so located, as to provide for monitoring of the fare box by a driver seated in the driver's seat,
- a second stairway descending from the rear end of the channel passageway to one of the rear exits, and
- a passageway along the lower deck, said lower deck passageway being offset laterally from the upper deck channel passageway, and extending from an area adjacent the fare box to the other rear exit.

3,971,456
HANDLE-RUNG MODULE
Everett R. Yonce, 464 42nd St., Oakland, Calif. 94609
Filed Apr. 10, 1975, Ser. No. 566,952
Int. Cl.² B60R *3/00*
U.S. Cl. 182—90 **7 Claims**

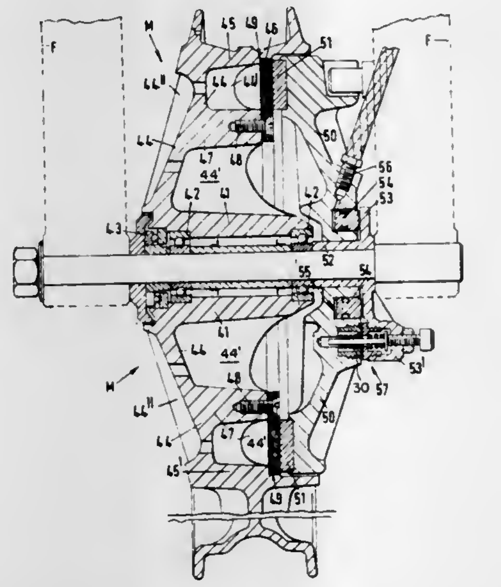


1. A handle rung module adapted for attachment in an aperture in a pre-existing structure comprising:
- a. a longitudinal segment of arcuate contour having arcuate end edges and parallel straight side edges;
- b. two substantial parallel end walls each having an arcuate edge portion joined to the arcuate edges of the longitudinal segment at opposite ends of said longitudinal segment;
- c. a longitudinally extending cross member centrally spanning the length of the longitudinal segment, said cross member having ends connected to said end walls proximate to a midpoint on said peripheral edge portion of said end walls; said cross member further having a flat surface and an arcuate surface concentric with said arcuate contour of said longitudinal segment and forming a straight edge longitudinally of said cross member; said flat surface facing outwardly from said arcuate longitudinal segment and;
- d. means at the straight edges of said longitudinal segment and said peripheral edge portions of said end walls attachable to the surface of a pre-existing structure for mounting the module within an aperture in the surface of a pre-existing structure with said longitudinal segment recessed in said surface.

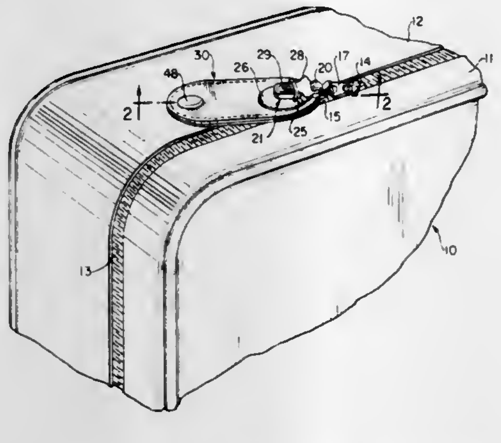
3,971,457
WHEEL HUB DISC BRAKE
Tullio Campagnolo, Corso Padova, 168, 36100 Vicenza, Italy
Filed Feb. 5, 1975, Ser. No. 547,249
Claims priority, application Italy, Feb. 5, 1974, 20178/74
Int. Cl.² B60T *1/06*
U.S. Cl. 188—18 A **2 Claims**

1. Disk brake for wheels of vehicles, of the type in which a ring-shaped brake disk is disposed between a hub rotating about a wheel axle and a spokes-carrying flange, comprising:
- a generally frusto-conical ribbed disk extending transversely to said wheel axle and connecting said hub with said spokes-carrying flange;
- a ring-shaped brake disk, supported by said ribbed disk and perpendicular to said wheel axle;
- a brake plate, mounted on said wheel axle, beside said ribbed disk, and parallel to said ring-shaped brake disk, said brake plate being axially movable but locked against rotation;
- an annular friction pad assembly on the periphery of said brake plate and adapted to engage said ring-shaped brake disk when the brake plate is driven toward said ribbed disk;
- fluid pressure control means, acting on said brake plate, for driving the same toward said ribbed disk, and comprising a circular recess forming a cylinder on the outer central part of the brake plate, and means for feeding said cylinder with brake fluid; an annular piston in said recess; and a radial flange opposing said piston and forming part of a bush, fitted onto the wheel axis and on which is axially slidably mounted said brake plate;

and return means to move said brake plate away from said ribbed disk, comprising a plurality of adjustable devices, automatically taking up slack and uniformly distributed about the periphery of said radial flange, each said device comprising a spring tied to said plate and a pin projecting parallel to the wheel axle from said flange and extending into the plate containing the spring so as to be held by the latter in frictional engagement.

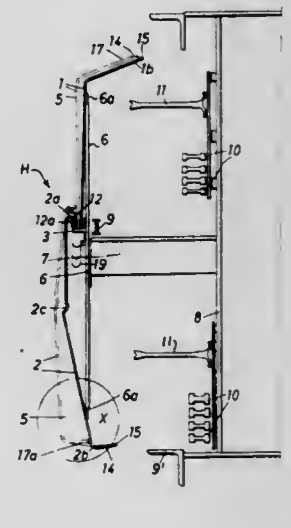


3,971,458
COMBINATION IDENTIFICATION CARD HOLDER AND LUGGAGE LOCK
Stanley Koenig, Englishtown, N.J., assignor to Atlantic Products Corporation, Trenton, N.J.
Filed Jan. 6, 1975, Ser. No. 538,745
Int. Cl.² A45C *3/00;* **A44G** *19/36*
U.S. Cl. 190—41 Z **7 Claims**



1. A combination luggage closure and identification tag assembly, which comprises
- a. a luggage article or the like having slide fastener type closure means,
- b. said slide fastener including a pair of opposed slide elements,
- c. an identification tag member swingably connected to one of said slide elements and serving as a pull tag therefor,
- d. a latch member swingably carried by the other of said slide elements and serving as a pull tag therefor,
- e. latch receiving means on said identification tag member for receiving and engaging with said latch member for lockingly securing said slide elements in adjacent relationship to retain said slide fastener in its closed position, and
- f. cooperating snap fastener means on said identification tag member and on said luggage article,
- g. said snap fastener means being engageable, when said latch member and latch receiving means are engaged, to releasably retain said identification tag member in a predetermined position on said luggage article.

3,971,459
HOUSING, INCLUDING READILY REMOVABLE PROTECTIVE PLATES, FOR MONORAIL ELECTRICAL COMPONENTS
Klaus Becker, and Hartwig Sprung, both of Wetter, Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany
Filed Jan. 13, 1975, Ser. No. 540,693
Claims priority, application Germany, Jan. 15, 1974, 2401642
Int. Cl.² B60M *1/04*
U.S. Cl. 191—30 **16 Claims**



1. A housing for a monorail girder mounting electrical rails, said housing including
- a. cantilever bracket means supporting a plurality of vertical support plates from said girder;
- b. an elongated longitudinally extending profile rail mounted to said support plates proximately of said electric rails;
- c. one horizontal longitudinal edge of each of said plates being tightly connected to said profile rail; and
- d. the other horizontal longitudinal edge of each of said plates being loosely connected with said support

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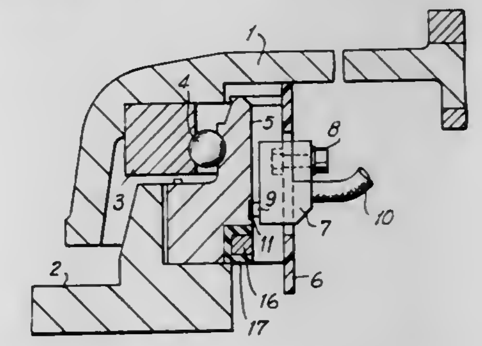
3,971,460
APPARATUS FOR ELECTRICALLY CONNECTING TWO CONDUCTORS BETWEEN TWO ROTATABLE ELEMENTS
Guillaume Antonin Gay-Chatain, and Paul Rene Marius Montjallard, both of Saint-Etienne, France, assignors to Etat Francais, Paris, France
Filed Feb. 27, 1975, Ser. No. 553,547
Claims priority, application France, Mar. 5, 1974, 74.07348
Int. Cl.² H01R *39/64*
U.S. Cl. 191—45 R **10 Claims**



1. Electrical connection apparatus for two conductors respectively connected to an electrical supply source and to a utilization device, the conductors being respectively secured

to first and second elements which are relatively rotatable with respect to one another through the intermediary of a roller bearing having a cage constituted by first and second parts respectively secured to said first and second elements and balls inserted in said cage, said apparatus comprising first and second conductive contacts fixedly secured to said first element, an annular grounding track on which said first contact is in sliding contact, an annular conductive track on which said second contact is in sliding contact, said conductive track and said grounding track being secured to said second part of the cage.

3,971,461

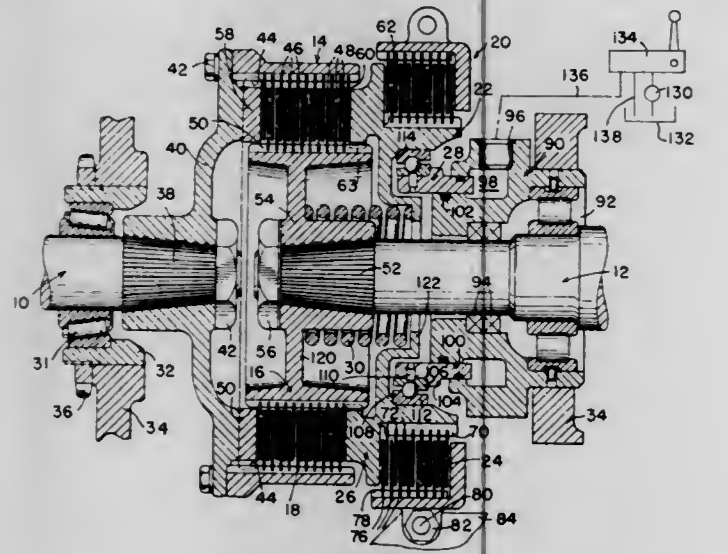
AXIALLY COMPACT CLUTCH AND BRAKE MECHANISM

William E. Conroy, Aurora; Charles C. Ehlke, Decatur, and Peter Sidles, Jr., Oswego, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 28, 1974, Ser. No. 501,240

Int. Cl.^{2} F16D ***67/02;*** **B60K** ***41/24***

U.S. Cl. 192—18 A **6 Claims**



1. An axially compact clutch and brake mechanism comprising:

a rotatable input shaft adapted to be driven;

a rotatable output shaft coaxial with said input shaft and adapted to be selectively driven or braked;

a first clutch element carried by said first input shaft;

a second clutch element aligned with said first clutch element and carried by said output shaft;

said first and second disc-like clutch elements being mounted for relative axial movement towards and away from each other to effect a selective driving connection between said shafts;

a first brake element carried by said output shaft;

a second brake element aligned with said first brake element and adapted to be affixed against rotation;

said first and second disc-like brake elements being mounted for relative movement towards and away from each other whereby said output shaft may be selectively braked;

said first and second brake elements further being axially spaced from said first and second clutch elements;

an actuator for said clutch elements and said brake elements mounted for axial movement relative to said shafts and operable in one direction of movement thereof to engage one of said clutch elements and move the same toward the other of said clutch elements to effect the driving connection while at the same time allowing one of said brake elements to move away from the other of said brake elements to preclude braking of said output shaft, and in another direction of movement to cause the reverse to occur;

a piston for axially shifting said actuator, said piston being concentric to one of said shafts and located radially inwardly with respect to said shafts of one of said first and second clutch elements and said first and second brake elements, said piston further being non-axially spaced from said one of said first and second clutch elements and said first and second brake elements;

whereby said clutch and brake mechanism is axially compact from its input shaft to its output shaft;

and a thrust bearing interconnecting said piston and said actuator whereby said actuator may rotate relative to said piston without causing said piston to rotate.

3,971,462

CENTRIFUGAL CLUTCH WITH ENGAGING AND RELEASING WEIGHTS

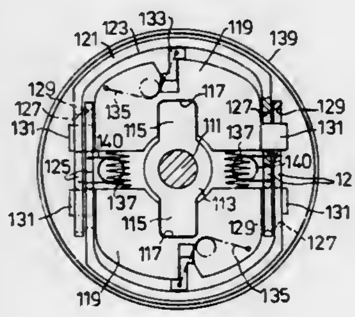
Rolf Anders Gunnar Johansson, Vare, S-310 83 Unnaryd, Sweden

Filed Jan. 3, 1974, Ser. No. 430,592

Claims priority, application Sweden, Jan. 12, 1973, 7300425

Int. Cl.^{2} F16D ***43/14***

U.S. Cl. 192—105 BA **21 Claims**



1. An arrangement for a centrifugal clutch comprising a clutch shoe center attached to a driving shaft, a clutch drum attached to a driven shaft, a clutch shoe assembly which under the effect of centrifugal force engages said clutch drum to provide a driving connection between said driving and driven shafts, said clutch shoe assembly comprising a radial inner primary shoe which is driven by said clutch shoe center and a radial outer secondary shoe which is radially movable in relation to said primary shoe, a spring for biasing said primary shoe inward so that outward movement of said primary shoe under the influence of centrifugal force is against the force of said spring, a stopping means connected to said clutch center, said primary shoe being movable from a radial inner release position to an outer position which is determined by said stopping means, a releasable locking means arranged between said primary shoe and said secondary shoe which, in a first position, permits operative contact of said secondary shoe with said primary shoe in a radial outer working position and in which said secondary shoe, under the influence of centrifugal force acting on said primary shoe presses against said clutch drum to transmit torque from said driving shaft to said driven shaft, means for actuating said locking means to a second position which releases said secondary shoe, in which position said secondary shoe are allowed to move mutually radially, the radial dimension of said secondary shoe being less than the distance between said primary shoe in its outer position and said clutch drum, said distance being measured at said secondary shoe, whereby, when said locking means and said secondary shoe are released, the centrifugal force acting on said primary shoe is taken up by said clutch center while said secondary shoe lies free from said clutch drum or is pressed against said drum by, at most, only the centrifugal force acting in said secondary shoe.

3,971,463

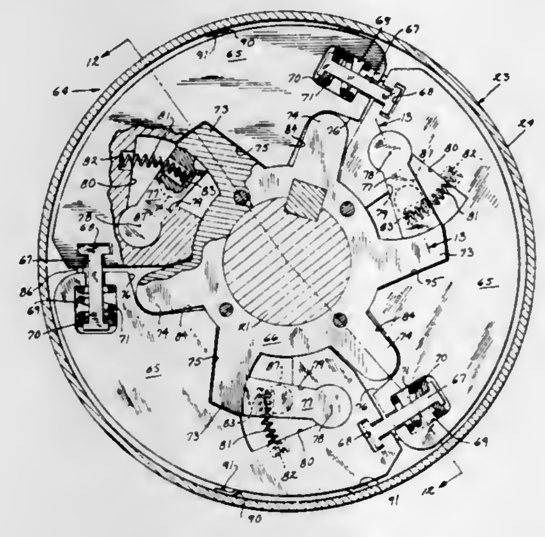
PROGRESSIVELY ENGAGED CENTRIFUGAL CLUTCH

Hugh A. Zindler, 11407 Cedar Creek Road, Cedarburg, Wis. 53012

Filed May 14, 1975, Ser. No. 577,336

Int. Cl.^{2} F16D ***43/14***

U.S. Cl. 192—105 BA **19 Claims**



1. In a centrifugal clutch for transmitting torque between an inner driving member and an outer driven member, a plurality of circumferentially spaced shoes interposed between the driving and driven members, spring means connecting the ends of adjacent shoes and biasing the shoes inwardly onto the driving member and out of engagement with the driven member, said shoes being movable against the bias of said spring means in response to centrifugal force to effect a driving engagement with the driven member, a plurality of circumferentially spaced projections extending outwardly from the driving member for engagement with each shoe, and means between the driving member and each shoe and providing for successive engagement between each said shoe and the corresponding projections with increasing increments of speed, the successive engagement between said shoes and the corresponding projections providing for progressively increasing torque transmitting capability up to the maximum torque load of the clutch.

3,971,464

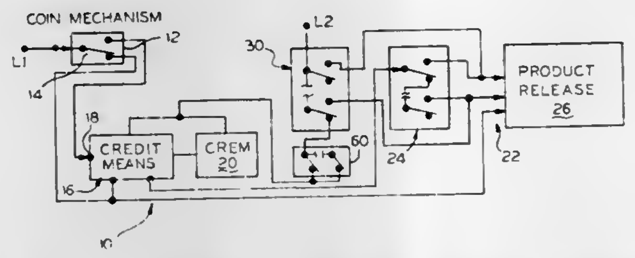
CONTROL MEANS FOR A VENDING MACHINE

Gordon F. Seversen, 245 Park Lane, Palatine, Ill. 60067

Filed Oct. 31, 1974, Ser. No. 519,574

Int. Cl.^{2} G07F ***11/00***

U.S. Cl. 194—10 **29 Claims**



1. A control system for a vending machine comprising:

means for producing a credit signal after a predetermined legal tender is accepted by the machine;

a credit means having an off-condition and a credit-condition, said credit means being switched to the credit-condition after said credit signal is generated, said credit means preventing acceptance of said legal tender when in the credit-condition;

product select switch means having an off-position and a select-position;

product release means having an activated state and a de-activated state, the switching of the product select switch from the off to the select-position when the credit means is in the credit-condition causing said product release to switch to said activated state from the de-activated state for releasing the product during a vend cycle; and

a vend switch having a credit-position and a vend-position, said vend switch in the credit-position providing an electrical path for electrical power to the credit means when the credit means is in the credit-condition, said vend switch severing said electrical path to the credit means when switched to the vend-position, said vend switch in the vend-position providing an electrical path for electrical power to the product release means.

3,971,465

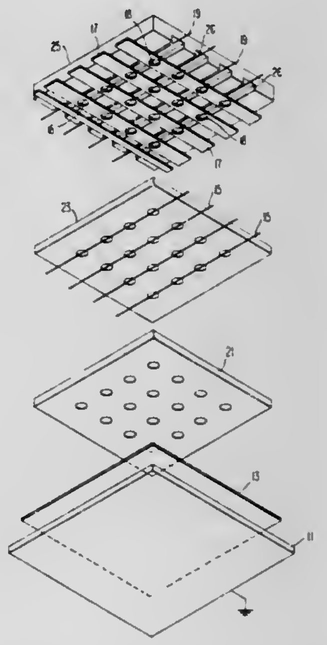
SELF-SCANNING ELECTROSTATIC PRINT HEAD FOR A DOT MATRIX PRINTER

Robert E. Benn, Broomall, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,909

Int. Cl.^{2} B41J ***3/18***

U.S. Cl. 197—1 R **9 Claims**



1. In an electrostatic printer, a dot matrix electrostatic print head system for cyclically generating a continuous self-scanning ionization pattern, generating therefrom a selective ionization pattern in synchronization with the self-scanning pattern, and depositing the selective ionization pattern onto electrostatic paper, the print head system comprising:

a planar electrode for supporting the back of electrostatic paper;

a set of parallel printing anodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper a set of apertured parallel cathodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper, the cathode plane being further removed from the paper than the printing anode plane, said set of cathodes being orthogonal to said set of printing anodes, and the cathode apertures being aligned with the apparent intersections of said set of cathodes and said set of printing anodes;

a set of parallel scanning anodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper, the scanning anode plane being further removed from the paper than the cathode plane, said set of scanning anodes being parallel to said set of printing anodes and aligned with the apertures in said set of apertured cathodes;

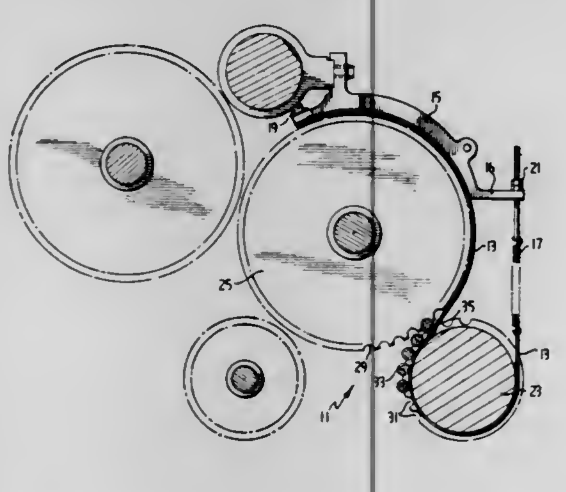
scanning means for cyclically transferring aperture-by-aperture ionization between said set of scanning anodes and set of apertured cathodes;

selective pattern generating means synchronized with said scanning means for selectively transferring a pattern of ionization through the apertures in said set of cathodes to said set of printing anodes; and

potential referencing means cooperating with said planar electrode for attracting the selective ionization pattern from said printing anodes through the electrostatic paper to said planar electrode thereby causing the selective pattern to be deposited on the electrostatic paper.

3,971,466
BELT TRANSFER MEANS FOR CIGARETTES OR THE LIKE

James S. Hurt, Rte. No. 2, P.O. Box 208, Ashland, Va. 23005
Filed Apr. 10, 1974, Ser. No. 459,626
Int. Cl.² B65G *47/00*
U.S. Cl. 198—20 C **18 Claims**



1. A transfer means for transferring tubular articles from one moving conveyor unit to a second moving conveyor unit, comprising:

a non-driven belt member extending at least partially around a transporting surface of a transferee moving conveyor unit, also extending in reverse wind at least partially across the surface of a transferor moving conveyor unit for contacting tubular articles on the transferor moving conveyor and urging them toward the transferee moving conveyor;

a guide bracket which serves to maintain the belt member in operable position, so that articles are transferred by the belt member from a transporting surface of said transferor moving conveyor unit to said transporting surface of said transferee moving conveyor unit; and

a biasing member for lengthwise tensioning said non-driven belt member and thereby urging said non-driven belt member toward said transporting surface of said transferee moving conveyor unit.

3,971,467
CONVEYOR ASSEMBLY FOR MOVING ARTICLES

Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Company, Clifton, N.J.
Filed Feb. 4, 1975, Ser. No. 547,065
Int. Cl.² B65G *15/06, 15/20*
U.S. Cl. 198—164 **10 Claims**

1. In a packaging machine, the combination comprising:

a. means for moving at least one article along a path to an article receiving station, and

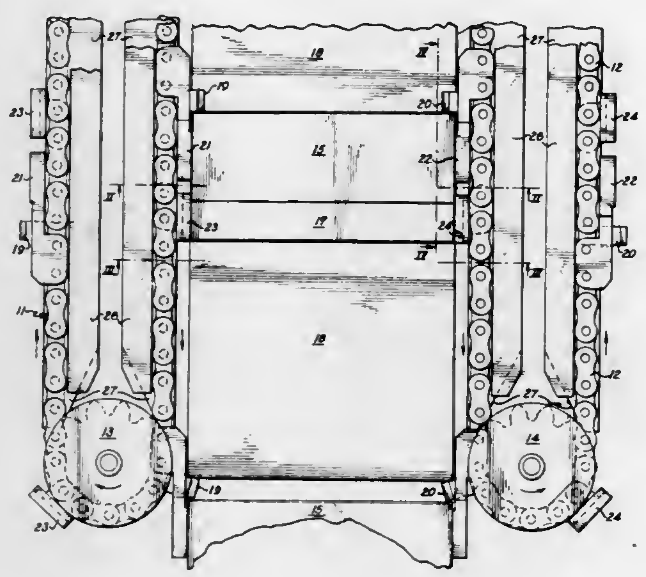
b. means for receiving said article at said receiving station,

c. said moving means including a conveyor means, stabilizing means and pushing means,

d. said stabilizing means and said pushing means being disposed on the conveyor means to travel in a forward direction for effecting controlled movement of the article along said path,

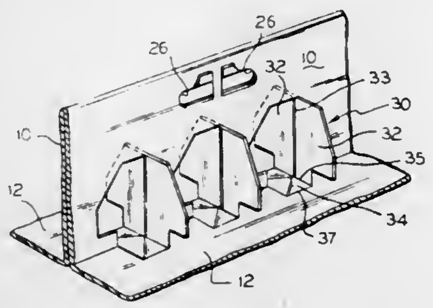
e. said pushing means being effective to engage the following side of the article for moving the article into the receiving station,

f. said stabilizing means at corresponding locations along each side of said path and being effective to engage opposing sides of the article for maintaining a predetermined alignment of the article while the article is moved away from the article moving means into the receiving station.



3,971,468
CARTON PARTITION ARRANGEMENT

Charles R. Heims, Barto, and William D. Patrick, Audubon, both of Pa., assignors to Container Corporation of America, Chicago, Ill.
Filed July 11, 1975, Ser. No. 595,058
Int. Cl.² B65D *75/08, 85/62*
U.S. Cl. 206—193 **6 Claims**



1. In a basket-style carrier carton, formed of foldable paperboard, for holding a plurality of packaged articles arranged in two side-by-side rows, the combination of:

a. opposed pairs of side and end walls and a bottom wall hingedly interconnected to form a box-like structure open at the top;

b. a longitudinally extending center partition member, for separating said rows of articles from each other, hingedly attached to said end walls and said bottom wall;

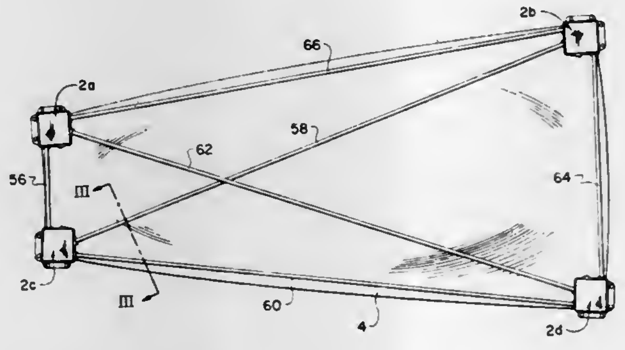
c. a plurality of transversely extending partition members, for separating the articles of each row from each other, each comprising:

   i. a vertical divider element having one side edge hingedly attached to said center partition member and extending in a direction normal to said center partition member;

   ii. a horizontal gusset element having one edge hingedly attached to said bottom wall and having another edge hingedly attached to a lower edge of said vertical divider element and being operable to maintain said vertical divider element in position when the carton is in erected condition.

3,971,469
PACKAGING APPARATUS

John L. Harris, Bettendorf, Iowa, and Bror H. Nelson, Moline, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed July 31, 1974, Ser. No. 493,383
Int. Cl.² B65D *85/48*
U.S. Cl. 206—452 **13 Claims**



1. A packaging apparatus, comprising

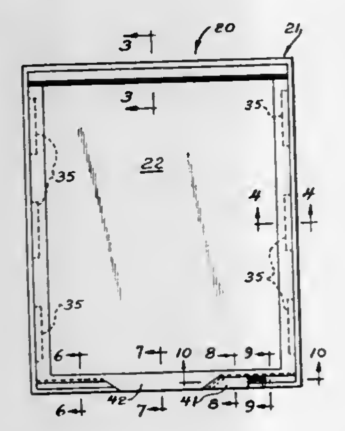
1. a plurality of separate pairs of top and bottom bearing half means positioned at strategic points on a material to be packaged, the top bearing half means being for bearing against a top portion of the material to be packaged, the bottom bearing half means being for bearing against a bottom portion of the material to be packaged,

2. tightenable connecting means, extending between each pair of the top and bottom bearing half means at each of said points, for holding the top and bottom bearing half means at each point in bearing relationship against respectively a top portion and a bottom portion of the material to be packaged, and

3. line means extending between each of said points and tied to the bearing half means for securing them in position on the material to be packaged.

3,971,470
X-RAY CASSETTE FILM HOLDER

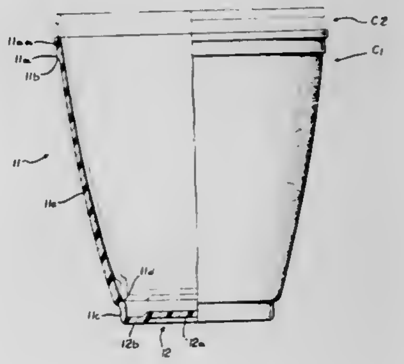
Velton C. White, V. C. Labs, Inc., 17 N. Broadway, Des Plaines, Ill. 60016
Continuation of Ser. No. 351,327, April 16, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,553
Int. Cl.² B65D *85/48*
U.S. Cl. 206—455 **18 Claims**



1. A cassette for holding film and the like having a separable hinge, comprising tray means having at one end an inflexible overhanging lip member and a recess of substantially uniform cross-sectional shape extending across the end of said tray means to provide a continuous, uniform closing pressure and lid means having at one end an inflexible ridge member of substantially uniform arcuate cross-sectional shape extending across the end of said lid means and projecting above the top surface of the lid means and formed to fit within said tray means recess for engagement with the overhanging lip member of the tray to cam the adjacent lid end at least partially into the tray means when the lid means and tray means are closed.

3,971,471
CLOSE-NESTING, LIGHT-WEIGHT, ONE-PIECE DRINKING CUP AND APPARATUS FOR THE MANUFACTURE THEREOF

Rodney E. Ludder, Glen Head, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Apr. 16, 1973, Ser. No. 351,561
Int. Cl.² B65D *21/02, 1/16*
U.S. Cl. 206—519 **5 Claims**



1. A one-piece, seamless drinking cup of nestable configuration, and of a size adapted to contain a single serving of a hot beverage, said cup comprising a sidewall tapering inwardly and downwardly over a major portion of its extent from the upper open mouth thereof, and a bottom wall formed integrally with the sidewall and extending thereacross at the lower end thereof, the sidewall and the bottom wall being formed from fused beads of an expanded thermoplastic material, which consists essentially of general purpose polystyrene whose density is not materially greater than 5 pounds per cubic foot, the sidewall gradually increasing in thickness over said major portion, as it extends downwardly thereof, said major portion extending from a first elevation near the upper open mouth of the cup to a second elevation near the lower end thereof and gradually increasing in its angle, relative to the vertical central axis of the cup, from a small acute angle at the first elevation to a larger acute angle at the second elevation to maintain adequate, but not excessive, clearances between all portions of the overlapped major portions of the sidewalls of a pair of such cups closely nested together, said cup being circular in horizontal cross-section at all elevations along said major portion, the ratio of the overall height to the outside diameter of the upper open mouth of said cup being of the order of 1.05, the thickness of said major portion of the sidewall at the second elevation being of the order of 2.0 times the thickness at the first elevation, and the inside surface of the major portion, along a vertical plane on which the vertical central axis of the cup lies, corresponding to the shape of an arc of a circle whose radius is of the order of 4.7 times greater than the outside diameter of said upper open mouth of the cup, the distance from the upper open mouth of the cup to the first elevation and the distance from the second elevation to the lower end of the cup each being equal to the desired stacking height between like cups closely nested together, the sidewall of said cup being provided with a thickened portion which extends for the length of such distance from the upper open mouth of the cup to the first elevation and which defines a horizontally outwardly projecting shoulder which is adapted to rest on the upper open mouth of a like cup when such cup is inserted in said like cup in closely nested relationship, the sidewall of the cup also being provided with a radially inwardly offset vertical section which extends for the length of the distance from the second elevation to the lower end of the cup and which defines a horizontally inwardly projecting shoulder on which the lower end of a like cup is adapted to rest when said like cup is inserted in said cup in closely nested

relationship, the thickness of the sidewall at the first elevation being not materially greater than 0.045 in., the distance from the upper open mouth of the cup to the first elevation being no greater than ⅜ inch.

3,971,472

CARTON WITH CLAMPING STRIP

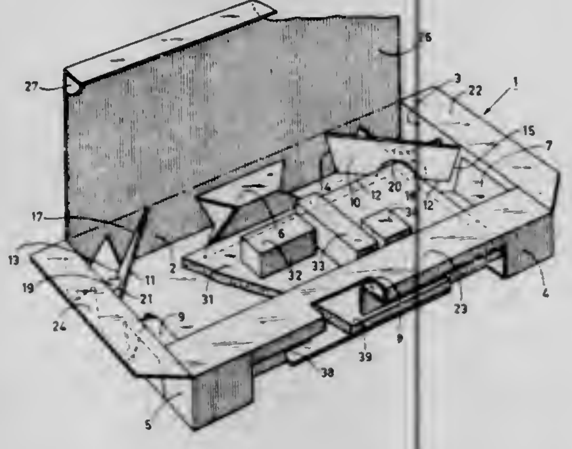
Jan Aalbert Veenman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,534

Claims priority, application Netherlands, Mar. 4, 1974, 7402869

Int. Cl.² B65D *81/00, 85/30*

U.S. Cl. 206—521 **3 Claims**



1. A carton comprising a planar bottom plate and side walls formed from a sheet of material folded at edges of said bottom plate, wherein said carton further comprises an oblique corner strip formed by a portion of said sheet of material, said corner strip comprising a base and edges, said strip being cut from said sheet along said edges and folded along said base out of the plane of the bottom plate, said base extending between two adjacent side walls and two edges, each of said two edges bearing against a respective one of said two adjacent side walls, said strip extending inwardly and upwardly from the base so as to enclose an angle greater than 45° and less than 90° with respect to the plane of the bottom plate.

3,971,473

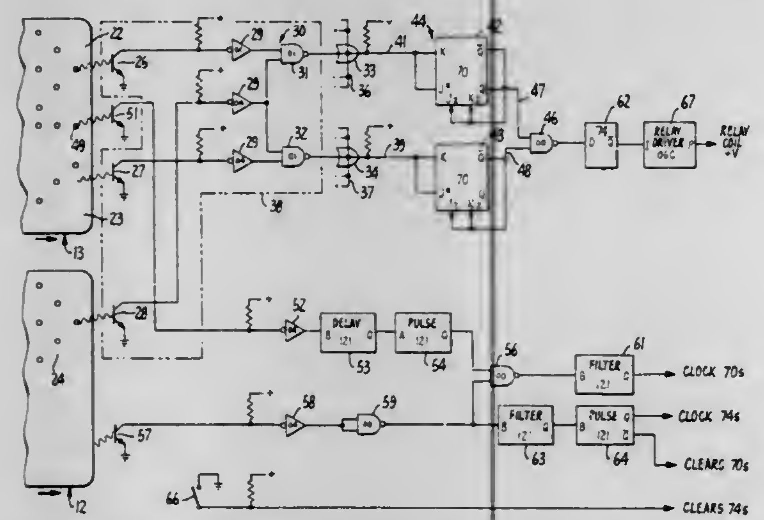
TRI-LEVEL SELECTOR

Franklin Henry Ernst, Jr., 631 Tennessee St., Vallejo, Calif. 94590, and Martin N. Nelson, 20326 Cohasset St., Canoga Park, Calif. 91304

Filed June 17, 1974, Ser. No. 480,228

Int. Cl.² B07C *3/10;* **G06K** *9/00*

U.S. Cl. 209—73 **24 Claims**



1. A device for selection among a plurality of individual information-bearing media, comprising

transport means for moving individual information-bearing media through a scanning station,

a master indicia-bearing medium for specifying the characteristics of the individual information-bearing media to be selected,

scanning means adjacent said scanning station and comprising a plurality of sensors, said scanning means being responsive to the characteristics of individual information-bearing media as compared with said master medium to detect those individual information-bearing media appropriate for selection and issue a select signal upon such detection,

said transport means being operative to move one of said individual information-bearing media and said master medium substantially continuously in joint synchronism with each other with respect to said scanning means for simultaneous comparison thereby,

said individual and master media each bearing a pattern of perforate and imperforate areas thereon,

said scanning means comprising a light source, a plurality of photosensitive devices positioned to sense light from said light source passing through said perforate areas, said imperforate areas blocking light from said photosensitive devices, and a three-state logical comparator circuit receiving signals from said photosensitive devices and comparing said signals to select among three identifications of the individual information-bearing medium being scanned, the three identifications being those media to be positively selected, those media to be positively rejected, and those media to be rejected by default.

3,971,474

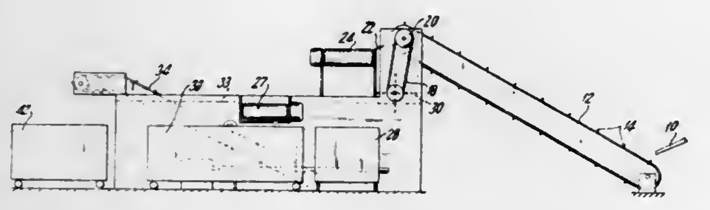
METHOD AND APPARATUS FOR SORTING AND CLASSIFYING METALLIC CANS

John B. Clement, Marblehead, Mass., assignor to Recor, Inc., Cambridge, Mass.

Filed Mar. 5, 1975, Ser. No. 555,705

Int. Cl.² B07C *1/00*

U.S. Cl. 209—73 **4 Claims**



1. A process for sorting used bimetal, aluminum and ferrous cans comprising:

providing a supply of unsorted used metallic cans;

magnetically separating the ferrous and bimetallic cans from the aluminum cans in said supply;

carrying said separated aluminum cans to a first collecting means;

carrying said ferrous and bimetallic cans to a liquid bath;

immersing said separated ferrous and bimetallic cans in said bath;

collecting said ferrous cans which sink from the bottom of said bath and carrying them into a second collecting means; and

collecting said bimetallic cans and ferrous cans which float at or near the top of said bath from said bath and carrying said bimetallic and ferrous cans which floated to the third collecting means.

3,971,475

TRAY FOR A DOCUMENT HANDLING SYSTEM

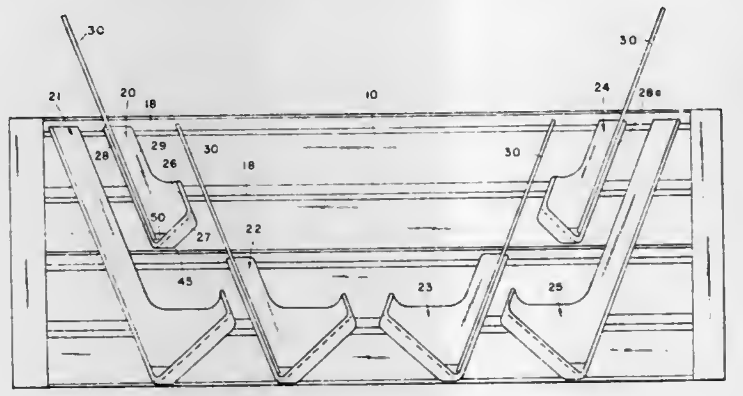
Ronald R. Hodges, Grandville, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Apr. 16, 1975, Ser. No. 568,673

Int. Cl.² B65D *21/04;* **A47F** *5/08*

U.S. Cl. 211—88 **12 Claims**

1. In combination with a tray for a manual paper handling system having an upright support panel means with means for removably hanging said tray thereon, the improvement comprising said tray having a bottom wall, a side wall and a back wall and hanging means for removably mounting said tray on said panel means with said back wall located immediately adjacent said panel means, said side wall extending substantially perpendicularly away from said panel means and inclined from the vertical, and said bottom wall extending away



from said panel; said bottom and side walls providing a support for papers with the bottom edge of the papers resting on the bottom wall and the side wall providing a support for laying papers thereagainst; a rigid insert sheet member having an outline of greater dimension than said side wall; and means for removably securing said insert sheet member in place against said side wall for increasing the surface area against which papers lay when inserted into said tray.

3,971,476

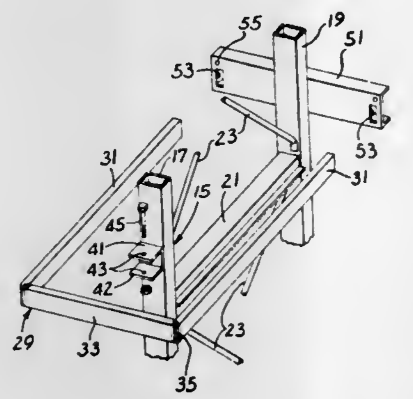
RAIL-CARRYING STORAGE RACKS

Anthony N. Konstant, Mount Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed Nov. 20, 1974, Ser. No. 525,392

Int. Cl.² A47F *5/00*

U.S. Cl. 211—134 **9 Claims**



1. A storage rack for holding superposed loads of palletized goods which comprises

a plurality of upright trusses each of which contains parallel vertical columns which are interconnected by spacers rigidly affixed thereto,

said trusses being arranged in parallel fore-and-aft extending planes and being laterally spaced apart from one another to define a plurality of storage bays therebetween,

plurality of U-shaped load support members carried by each of said trusses at vertical intervals thereupon,

each of said load supports constituting a pair of substantially parallel rails interconnected by an integral leg,

each said U-shaped load support being a tube of rectangular cross section which is formed with a substantially right-angle crush-bend at each corner between said leg and each rail,

first means connecting the central portion of each said leg to one of said columns and

second means connecting the ends of said rails opposite from said leg to another said column in said fore-and-aft extending plane whereby rails on trusses in adjacent fore-and-aft extending planes extend into the storage bay defined thereby and provide support for palletized loads in superposed relation to one another.

3,971,477

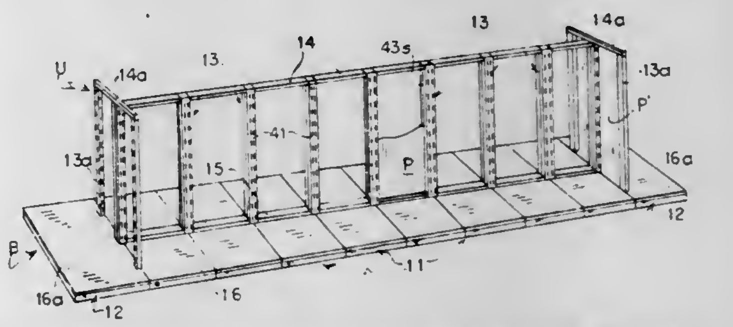
FRAMING AND MODULAR BASE UNIT STRUCTURE FOR DISPLAY FIXTURES

Roland L. Bruderly, Alliance, and Edward A. Tomayko, Uniontown, both of Ohio, assignors to Roland L. Bruderly, Alliance, Ohio

Filed Mar. 10, 1975, Ser. No. 556,660

Int. Cl.² A47F *5/16*

U.S. Cl. 211—189 **13 Claims**



1. For a floor-supported fixture, such as a gondola fixture or a free-standing wall fixture, including as a skeleton structure a plurality of rectangular base units successively abutted in a linear array on a floor to form an extended base structure, and a plurality of horizontally spaced upright posts received by respective sockets in the base structure and secured in a coplanar array as upright framing in superstructure of the fixture, the improved skeleton structure comprising:

a base unit module structure provided by an open frame of sheet metal generally rectangular in plan outline, and having

at least one pair of opposed sides, each with a straight vertical side panel, affording respective end faces of the module, whereby like modules may be abutted end-to-end with face-to-face contact,

on an inward face of each said side panel a respective upwardly open half-socket formation vertically extended over the height of the respective side, whereby a pair of like modules, placed in aligned abutting relation, form a composite socket symmetrical about the abutment plane,

a plurality of modules disposed in said relation; and, received in each composite socket, an upright post having a bottom end vertically slotted and in exterior cross section generally complementary to the interior shape of a said composite socket

with the end slot of the post accepting abutting side panel portions occurring within the sid composite socket thereby to secure abutting modules together in a base structure.

3,971,478

OVERHEAD CRANE WITH LIFTING BEAM PROVIDED WITH C-SHAPED CLAWS

Vasile Matasa, Bucharest, Romania, assignor to Institutul de Proiectare Tehnologica Pentru Laminoare —IPROLAM—, Bucharest, Romania

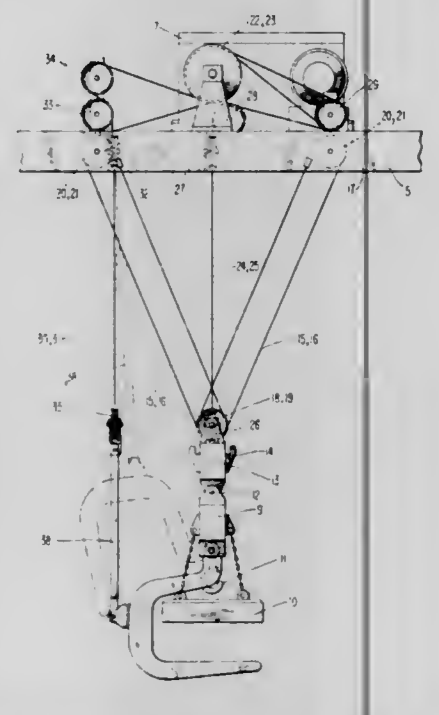
Filed Oct. 10, 1974, Ser. No. 513,491

Int. Cl.² B66C *17/06, 19/00*

U.S. Cl. 212—11 **5 Claims**

1. In an overhead crane with a lifting beam provided with C-shaped claws, said crane having a load trolley on top of which there is a small load crab provided with a load hoisting unit and being rotatable about a vertical axis, the load hoisting unit having a tilting unit, the improvement which comprises:

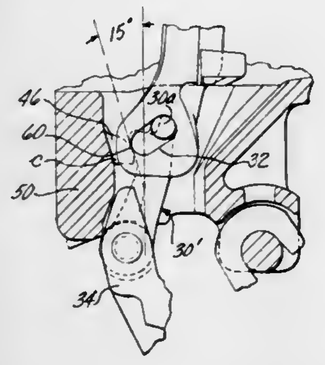
means for lifting and loading the lifting beam, such means comprising a plurality of pairs of wire ropes having runs inclined with respect to each other, the starting ends of such ropes being secured to the load crab, and a balance system comprising first pulleys mounted on the lifting beam and additional second guiding pulleys being mounted on said load crab, and winding drums mounted on said load crab, the wire ropes being driven by said winding drums, the ropes after being entrained over said first pulleys of the balance system and being guided about said second guiding pulleys being wound upon the driven drums, and means selectively to correlate the tilting and rising movements of the lifting beam, said last-named means comprising a further pair of wire ropes having runs inclined with respect to each other, such further pair of wire ropes having their starting ends attached to the winding drums and guided by being entrained over pairs of third guiding pulleys mounted on said load crab, the opposite ends of the further wire ropes being entrained over fourth pulleys, the center of rotation of said fourth pulleys being located on one side of and at a distance from the longitudinal center line of the lifting beam, the fourth pulleys being located as near as possible to the horizontal plane passing through the centers of rotation of the first pulleys of the balance system on the lifting beam, a tilting mechanism having a driven rope winding drum, the further ropes after leaving the fourth pulleys being wound round the driven ropes winding drum of the tilting mechanism said fourth pulleys being used for both lifting and tilting and being pivotally connected by an attachment member to the C-shaped claws, the point of attachment of said attachment member of the C-shaped claws being located spaced from the longitudinal center line of the lifting beam on one side thereof.



3,971,479
RAILWAY CAR COUPLER

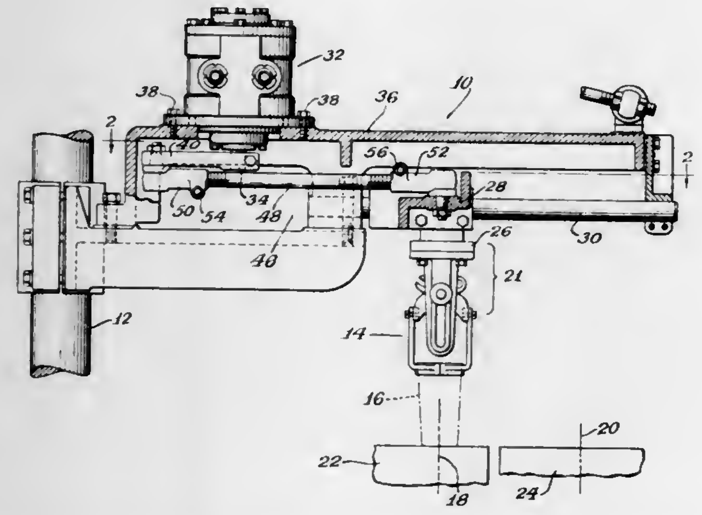
Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Jan. 27, 1975, Ser. No. 544,224
Int. Cl.^{2} B61G *3/06*
U.S. Cl. 213—127 **3 Claims**

1. A car coupler having a head, a knuckle pivoted to said head and swingable from closed to open position, said head having a lock receiving chamber provided with a front wall, a lock in said chamber, said lock having a lower position in which the lock is in locking relation with the knuckle when the latter is closed, said lock being movable to an upper position in which the lock is out of locking relation with said knuckle, said lock having a depending leg, a lock lifter toggle operatively connected to said leg, a rotor lever pivoted to said head and pivotally connected to said toggle, said lever being operative to effect lifting of said lock out of locking position with said knuckle to permit opening of the knuckle, anti-creep means on said toggle and wall to prevent undesired upward movement of said lock from its locking position, said means comprising a rearwardly extending lug on said wall and a forwardly extending shoulder on the upper end of said toggle adapted to underlie said lug, said shoulder having a flat inclined surface on its underside adapted to engage said lug as said lock drops by gravity from said upper position toward locking position as said knuckle is closed, said inclined surface upon engagement with said lug being adapted to cam said leg rearwardly so as to provide a clearance between said wall and the forward side of said leg during dropping of said lock, said inclined surface commencing adjacent the forward edge of said shoulder and extending downwardly and inwardly to about the midpoint of the length of the link, said surface being disposed at an angle of about 15° to the vertical when said surface engages said lug so as to effect positive downward sliding of said inclined surface against said lug so that said shoulder becomes completely disengaged from said lug to allow free dropping of said lock to its knuckle locking position.



3,971,480
ROTARY ACTUATOR

Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.
Filed June 7, 1974, Ser. No. 477,498
Int. Cl.^{2} B65G *47/00*
U.S. Cl. 214—1 BB **5 Claims**

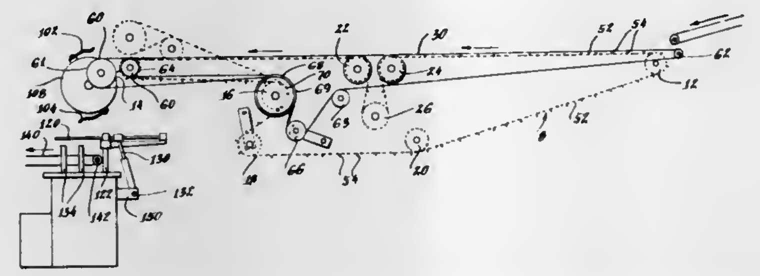


1. In an article transfer mechanism slidably mounted for rapid intermittent, reciprocating movement between an article pickup position and an article drop-off position, an improved means for moving said article transfer mechanism, comprising, in combination:
- a rotatable, reciprocal drive member including a drive shaft, air driven rotary actuator means for rotating said rotatable, reciprocal drive member,

- a drive line pivotally connected to said article transfer mechanism and pivotally connected to said drive member at a point radially outward from the axis of rotation of the drive shaft whereby rotational motion of said drive shaft causes said article transfer mechanism to be linearly reciprocated between said positions for article pickup and drop-off, and
- means for controlling the speed, acceleration and deceleration of movement of said rotatable, reciprocal drive member and of said article transfer mechanism between said article pickup and drop-off positions whereby the speed and smoothness of operation of said mechanism are optimized.

3,971,481
MATERIALS HANDLING APPARATUS

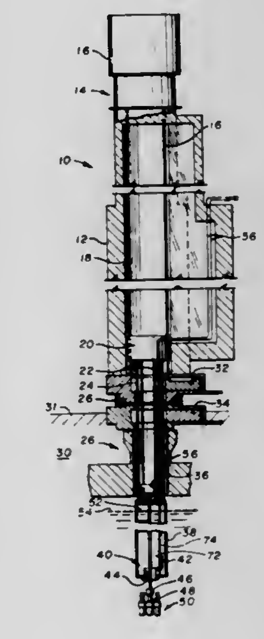
John G. Longenecker, Ozone Park, N.Y., and Manuel Jesus Rubio, Bridgeport, Conn., assignors to Roberto Gonzalez Barrera, Monterrey N.L., Mexico
Filed Apr. 21, 1975, Ser. No. 569,800
Int. Cl.^{2} B65G *57/03, 47/26*
U.S. Cl. 214—6 H **37 Claims**



1. Apparatus for positionally collating flat objects comprising
- a multiplicity of spacer means which are spaced apart from each other, and are affixed to and project upward from spacer member means adapted for causing said spacer means to move in a desired direction,
- path means for moveably supporting said spacer member means and for cooperatively acting with said spacer member means to cause said spacer member means to move through at least two substantially flat, adjacent path portions which are oriented in tandem with respect to each other in said desired direction, each tandem pair of which portions are spaced apart by a separation,
- outside conveyor means comprising endless continuums which are moveable in said direction and are substantially co-extensive with and positioned beside each side of said spacer member means and across each of said separations, and which, throughout said portions and across each of said separations, have top surfaces which are substantially co-planar with each other, and, throughout said portions, are in a plane which is substantially parallel to said path of movement of said spacer member means but is below the tops of said spacer means,
- and means for causing said spacer member means and said outside conveyor means to move in said direction, with said outside conveyor means moving faster than said spacer member means,
- said spacer member means and said path means being so cooperatively arranged as to cause spacer members traveling in said direction that have traversed one of said portions and have come to the end thereof closest to a separation to diverge downward from the associated plane described by the tops of said outside conveyor means to such an extent that a point of divergence is reached where the tops of the spacer means move below said plane,
- said spacer member means and said path means being so cooperatively arranged as to cause said spacer means to converge upward at the end of said adjacent portion closest to a separation to such an extent that a point of convergence is reached where the tops of said converging spacer means move above the associated plane described by said outside conveyor means,
- said path means being adapted to achieve synchronization of the passing of spacers through said point of convergence with respect to the movement of said outside conveyor means, and thereby to effect desired separation between spacer means passing through said point of convergence and each place on the top surface of said outside conveyor means determined by a location thereon which is adjacent to spacer means passing said point of divergence, as said place is the next among such places to approach said point of convergences as said outside conveyor means moves in said direction.

3,971,482
ANTI-LEAK CLOSURE VALVE

Christo Andrea, Windsor Locks, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Jan. 2, 1974, Ser. No. 429,605
Int. Cl. C21c *19/10*
U.S. Cl. 214—27 **7 Claims**



1. In combination with a liquid metal cooled reactor fuel assembly handling machine of the type wherein a handling tube is provided for handling said reactor fuel assemblies, the improvement which comprises:
- a. an open ended handling tube;
- b. an inwardly facing raised collar at the open end of said handling tube;
- c. a valve cap adapted to seal with said collar; and
- d. means within said handling tube and connected to said valve cap for closing said valve cap and for raising and swinging said valve cap away from said opening thereby allowing said fuel assembly to be inserted into and removed from said handling tube.

3,971,483
MOTOR TRUCK

Walter Weber, Sanatoriumstrasse 25, Vienna 14, Austria
Filed June 11, 1973, Ser. No. 368,706
Claims priority, application Austria, June 23, 1972, 5447/72
Int. Cl.^{2} B60P *1/00*
U.S. Cl. 214—75 G **1 Claim**

1. A motor truck comprising:
- a self-propelled motor-truck chassis having a cab at one end thereof;
- means on said chassis defining a cargo space of rectangular plan configuration rearwardly of said cab and accessible

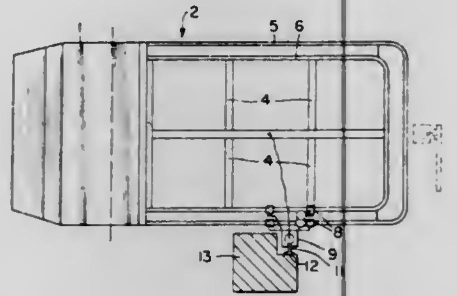
on three sides including the lateral sides and the rear of said cargo space;

guide means including upper and lower rails each extending continuously around and adjacent the respective upper and lower edges of said three sides of said cargo space;

a vertically extending support mounted on said guide means and having upper and lower rollers shiftable along said guide means on said three sides of said cargo space;

a load-carrying platform mounted on said support;

means for vertically displacing said platform relative to said support;



a motor on said support and a drive wheel driven by said motor and engaging said guide means for displacing said support along said guide means,

said support being provided with a vertically extending slot, said means for vertically displacing said platform including lifting means within said support, a substantially horizontally extending arm connected at one end to said lifting means and extending through said slot, and hinge means swingably mounting said platform to the other end of said arm for movement about a substantially horizontal axis to a substantially vertical storage position.

3,971,484

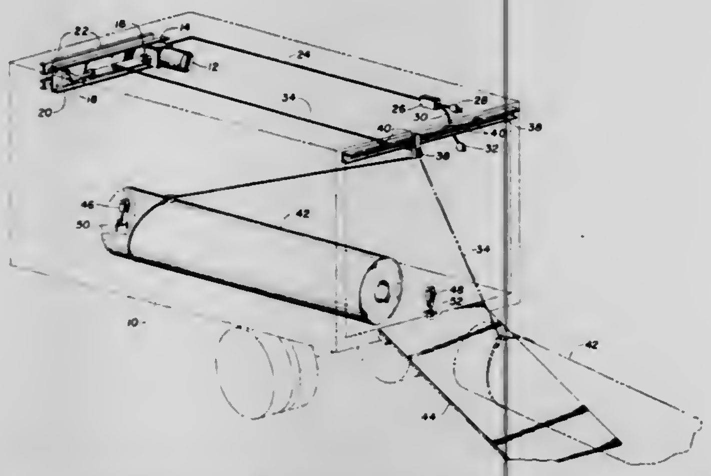
TRUCK MOUNTED CARPET HANDLING EQUIPMENT

Lloyd E. Anderson, and Gilbert L. Allnder, both of Minneapolis, Minn., assignors to National Carpet Jobbers, Minneapolis, Minn.

Filed Apr. 14, 1975, Ser. No. 567,712

Int. Cl.² B60P *1/00*

U.S. Cl. 214—85.5 **5 Claims**



1. In combination with a truck having a compartment suitable for transporting carpet rolls, a carpet roll loading and unloading device, comprising:

a shaft rotatably mounted on the upper portion of the front wall of the carpet carrying compartment of said truck, reversible motor means for rotating said shaft to wind said cable about said shaft when said motor means is driven;

motor control means for selectively driving said motor means;

pulley means attached above the rear opening to said carpet carrying compartment;

cable means passing over said pulley means, one end of said cable means connected to said shaft, the other end of said cable means terminated in a slip noose to provide means for encircling and engaging said carpet roll, the intermediate portion of said cable means in a first operation condition passing through said first pulley means to provide a substantially vertical lifting force when said motor means rotates said shaft to wind said cable on said shaft thereby to lift the end of a carpet roll engaged by said slip noose to a height above the floor of said carpet carrying compartment sufficient to permit insertion of the end of said carpet roll into said carpet carrying compartment, the central portion of said cable means in a second operating condition passing directly from said shaft without passing through said pulley means to provide a force on the carpet roll engaged by said slip noose which tends to slide said carpet roll toward the front of said carpeting carrying compartment.

3,971,485

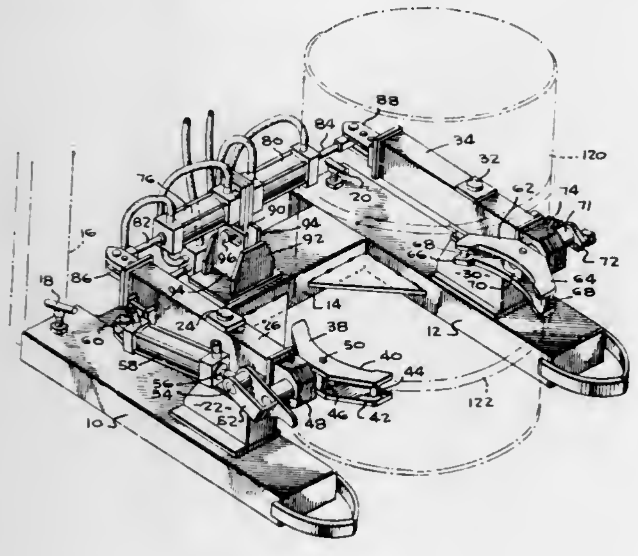
FORKLIFT ATTACHMENT

Thomas Hoppey, 142 Carlton Ave., Hazelton, Pa. 18201

Filed Nov. 26, 1974, Ser. No. 527,496

Int. Cl.² B65G *65/34;* B66F *9/18*

U.S. Cl. 214—313 **2 Claims**



1. Attachment means for mounting on a conventional forklift for enabling the lifting and tilting of elongated containers such as barrels, drums or the like, said attachment means comprising base frame means including connection means enabling supported attachment of said base frame means on the forks of a forklift, wherein said base frame means includes first and second fork sleeve members dimensioned and spaced to fit over first and second fork members of a forklift, wherein said connection means includes first and second threaded rods respectively mounted in said first and second fork sleeves and operable for effecting a clamping of said fork sleeves to a fork on which said fork sleeves are respectively mounted, a transverse base frame connection member connected to and extending between the first and second fork sleeve members at a position adjacent the inner end of the fork sleeve members so that said transverse base frame connection member and said fork sleeve members comprise a unitary generally U-shaped frame, first and second spaced container clamp jaw members, first and second container clamp jaw support means mounted on said base frame means for supporting said first and second container clamp jaw members for movement in a horizontal plane toward or away from each other for enabling a clamping of a container between said container clamp jaw members or for releasing said clamp jaw members from a clamped container, said clamp jaw support means include first and second coaxial pivot members on which said first and second container clamp jaw means are respectively mounted for pivotal movement about a horizontal axis coextensive with the axis of said pivot members, a first clamp arm means, means mounting said first clamp arm on said first fork sleeve for pivotal movement about a vertical axis medially of the first clamp arm and which vertical axis is oriented generally perpendicular to said first fork sleeve, said first pivot member being mounted for pivotal movement adjacent the outer end of said first clamp arm, a second clamp arm, second clamp arm support means supporting said second clamp arm for pivotal movement about a vertical axis medially of said second clamp arm, said second pivot member being mounted adjacent the outer end of said second clamp arm, clamping function power actuator means mounted on said base frame means for actuating said container clamp jaw support means to selectively move said container clamp jaw members toward or away from each other, said clamp function power actuation means comprising a pivot plate mounted for pivotal movement on said base frame and connection member, first and second hydraulic cylinder means coaxially mounted on opposite sides of said pivot plate and respectively having first and second piston rod means connected to the inner ends of said first and second clamp arms for effecting pivotal movement of said first and second clamp arms in opposite directions to provide a clamping or unclamping function with respect to a container or other object positioned between said first and second container clamp jaw members, tilting function power actuator means for pivoting said tilting function power actuator means for pivoting said clamp jaw members about the axis of said pivot members to effect a tilting of container means clamped between said container clamp jaw members, wherein said first pivot member comprises a first pivot shaft extending through bearing means adjacent the outer end of said first clamp arm, said tilting function power actuator means includes a third hydraulic cylinder, said third hydraulic cylinder being mounted on said first clamp arm, an eccentric means mounted on said first pivot shaft, and means providing a connection between said eccentric means and the outer end of the rod of said third hydraulic cylinder whereby actuation of said third hydraulic cylinder pivots said pivot shaft and said first container clamp jaw member and wherein said second pivot member comprises a second pivot shaft mounted in bearing means on the outer end of said second clamp arm and further including biassing means normally maintaining said second pivot shaft in a position in which said second container clamp jaw members is oriented horizontally for permitting rotation of said second clamp jaw upon actuation of said third hydraulic cylinder when a container is clamped between said container clamp jaw members.

3,971,486

APPARATUS FOR HANDLING AND TRANSPORTING CONTAINERS, LOAD SUPPORTING BODIES, PALLETS AND THE LIKE

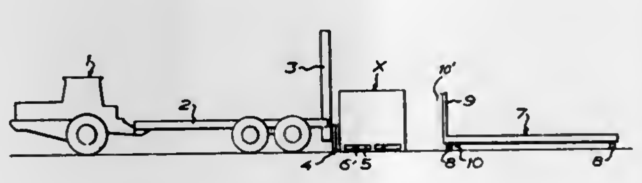
Ingemar Carlsson, Lindesberg, Sweden, assignor to Lihnell Vagn AB, Braas, Sweden

Filed Mar. 13, 1974, Ser. No. 450,918

Claims priority, application Sweden, Mar. 16, 1973, 7303700

Int. Cl.² B60P *1/28*

U.S. Cl. 214—505 **5 Claims**



1. An apparatus for handling, loading, unloading and transferring heavy articles comprising a transport vehicle, an elongated frame pivotally mounted on the rear end of said vehicle for movement about a first horizontal axis extending transversely of said vehicle, means moving said frame about a first horizontal axis between a substantially horizontal position and a generally vertical position, a fork lift device, mounting means supporting said fork lift device on said frame for movement theralong, pivot means mounting said fork lift device to said mounting means for pivotal movement about a second horizontal axis extending generally parallel to said first horizontal axis, means pivotally moving said fork lift device about said second axis, whereby said frame and said fork lift may be pivoted about their respective axes simultaneously, a load supporting body, and cooperating coupling means on said fork lift device and said supporting body whereby, upon engagement of said cooperating coupling means, said body may be loaded onto said vehicle by simultaneous movement of said frame about said first axis and of said fork lift device along said frame and about said second axis, said apparatus also being operable as a conventional fork lift.

3,971,487

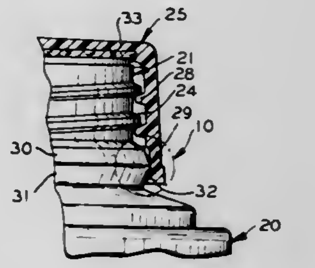
THREADED CAP AND NECK FOR A LIQUID CONTAINER

Gary Van Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed July 18, 1975, Ser. No. 596,979

Int. Cl.² B65D *55/02, 85/56;* A61J *1/00*

U.S. Cl. 215—216 **10 Claims**



1. In combination, a screw-type cap having a top and a threaded container neck, container neck sealing means on the underside of said cap top, said cap and said neck having mating threads and cooperating opposed surfaces on said cap and said container that are adapted to be engaged when said cap is turned onto said neck into sealing position by the continued engagement of the downwardly effective surfaces of said threads and to continue to exert downward thrust on said cap for retaining said cap in sealing position even when said cap is rotated in a retrograde direction toward open position a sufficient degree to disengage the downwardly effective surfaces of said mating threads and an insufficient degree to disengage said opposed surfaces.

3,971,488

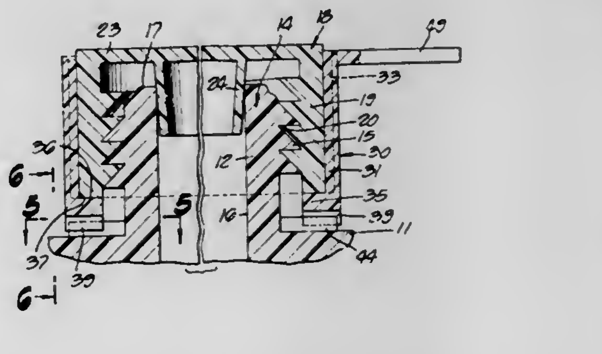
TAMPERPROOF SCREW CAP

John W. McRoskey, Los Angeles; Delbert D. Swartz, Torrance, and Michel A. LeBrun, Jr., Sebastapol, all of Calif., assignors to Republic Tool & Manufacturing Corporation, Los Angeles, Calif.

Filed Aug. 12, 1975, Ser. No. 603,800

Int. Cl.² B65D *41/32*

U.S. Cl. 215—254 **5 Claims**



1. A combination spout, cap and locking means for a container comprising:

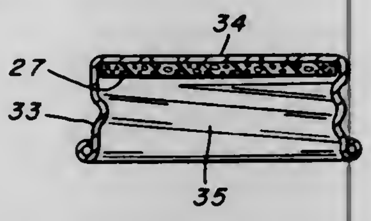
a. an externally threaded spout;
b. an internally threaded cap screwed onto the spout, said spout having a lower annular surface;
c. a removable lock band surrounding the cap, including a shoulder on said lock band extending inwardly below the lower surface of said cap, said shoulder being engageable by said lower surface and lock means for preventing said cap from being removed from said spout as long as said lock band is in place, said lock means including a plurality of teeth projecting downwardly from said shoulder;
d. stationary teeth positioned on said container adjacent said spout engageable with said teeth on said shoulder permitting said lock-band and cap to rotate in a direction to screw said cap onto said spout, but preventing said lock-band and said cap from moving in an opposite direction, thus preventing the unscrewing of said cap;
e. means cooperating between said cap and said lock-band for preventing relative rotation between the two; and
f. means to remove said lock-band from its position on said cap and thereby allowing said cap to be unscrewed from said spout.

3,971,489
CONTAINER CLOSURE

Bing Welch, Richmond, Ind., and William R. Wheeler, Dunlap, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 316,418, Dec. 18, 1972, Pat. No. 3,907,953. This application Mar. 28, 1975, Ser. No. 562,883
Int. Cl.² B65D *51/16*

U.S. Cl. 215—261 **2 Claims**



1. A container closure comprising a gas-impermeable shell and a polyvinyl chloride foam liner having a density in a range of 0.67 to 0.72 grams per cubic centimeter in the shell, said liner having an open pore structure, said shell having an end wall and a skirt means depending from the end wall for maintaining said liner in fixed relation to said end wall, said end wall having at least one hole.

3,971,490
COLOR CATHODE RAY TUBE WITH IMPROVED FACEPLATE-FUNNEL REFERENCING STRUCTURES

Robert R. Conger, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

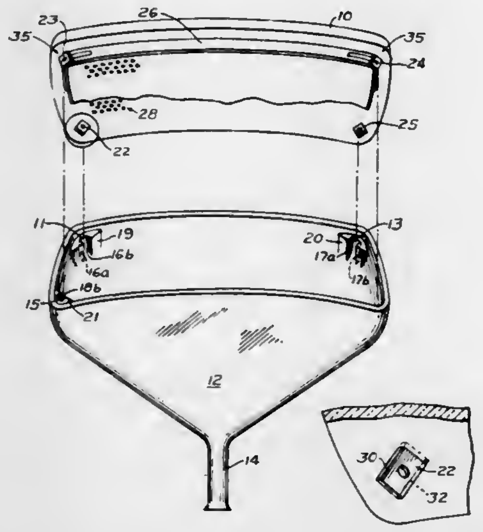
Filed Apr. 22, 1974, Ser. No. 462,915
Int. Cl.² H01J *5/02, 29/07*

U.S. Cl. 220—2.1 A **6 Claims**

1. In a rectangular-type color cathod ray tube of a type having a color selection electrode, the combination comprising:

an approximately rectangular, flangeless faceplate having a concave inner surface for receiving a phosphor screen and having referencing means in at least three corners thereof extending from said inner surface of said faceplate to define in each of said three corners two tangentially spaced faceplate reference surface areas; and

a funnel having an approximately rectangular mouth adapted to be sealed to said faceplate and provided in each of at least three corners corresponding to said three corners of said faceplate a notch molded integrally into said funnel and having an open side addressing the funnel axis, said notch having sides adjoining said open side which define a pair of tangentially spaced inside funnel reference surfaces oriented to capture therebetween the associated faceplate reference surface areas when the faceplate and funnel are assembled, said funnel reference surfaces collectively making interlocking referencing engagement with said associated faceplate reference surface areas to uniquely determine the location of said faceplate relative to said funnel and prevent beyond-tolerance rotational and translational relative movement therebetween.

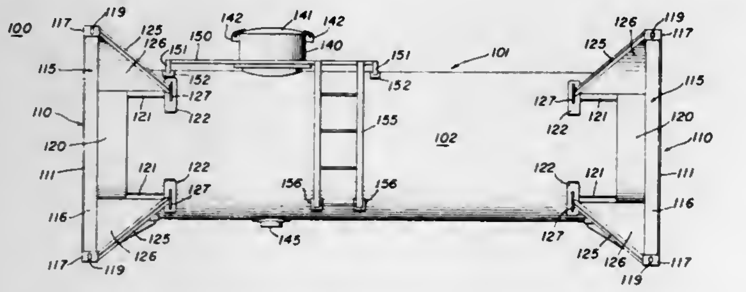


3,971,491
INTERMODAL TANK CONTAINER

Erling Mowatt-Larssen, Warren, Ohio, and Thomas S. Lapikas, Sharon, Pa., assignors to General American Transportation Corporation, Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 622,253
Int. Cl.² B65D *7/42, 87/00*

U.S. Cl. 220—71 **15 Claims**



1. An intermodal tank container for use interchangeably in railroad, highway, marine and terminal modes, said container comprising a tank for containing ladings and having means for loading lading thereinto and means for unloading lading therefrom, two spaced-apart end frames mounted respectively on the opposite ends of said tank, each end frame including a rigid framework surrounding an area greater than that of the adjacent end of said tank, and a tank support ring surrounding the adjacent end of said tank and secured thereto around the periphery thereof and rigidly secured to said framework for transmitting forces therebetween, said tank comprising the only connection between said end frames and having all parts thereof contained within an envelope defined by the peripheries of said end frames, whereby said tank is supported by said end frames and protected thereby during all modes of use of said intermodal tank container.

3,971,492
HOT MELT APPLICATOR GUN

Glynn H. Lockwood, Carmel Valley, Calif., assignor to Lockwood Technical, Inc., Sand City, Calif.

Filed Sept. 30, 1974, Ser. No. 510,165
Int. Cl.² B67D *5/32, 5/62*

U.S. Cl. 222—146 HE **4 Claims**

1. In combination with a hand gun for applying to a work piece molten adhesive and the like supplied under pressure from an adhesive source via a heated flexible hose, said hand gun including a nozzle for directing adhesive forwardly from the gun, normally closed valve means for controlling flow through the nozzle, a handle, and trigger means accessible to a hand grasping the handle for selectively opening the valve means; housing structure for said hand gun comprising

left and right housing members which are substantially mirror images of each other and are releasably joined in mating relation at a common plane of symmetry, said housing members integrally forming a rigid housing including three legs arranged in generally triangular configuration,

said nozzle projecting in alignment from the forward end of one housing leg,

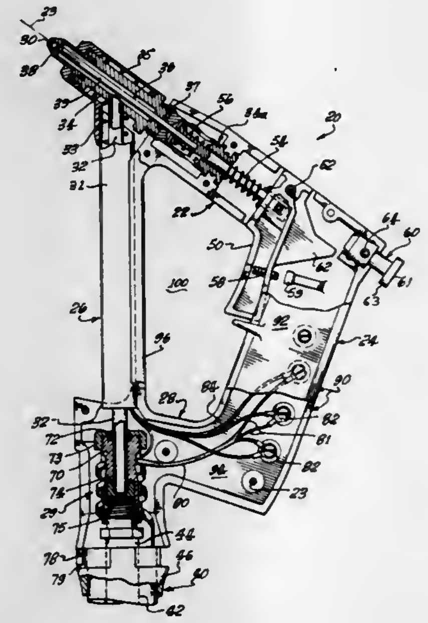
a second housing leg extending downward approximately perpendicularly from the other end of said first housing leg and forming said handle,

the third housing leg integrally interconnecting the forward end of said first leg and the lower end of said second leg, the three legs defining a generally triangular aperture for freely receiving the fingers of a hand grasping the handle,

said housing members further integrally forming a hollow cylindrical cuff section of said housing adjacent the junction of said second and third legs, the cuff section having a cylindrical axis aligned with said third leg,

said hand gun including a heated access tube shielded from said aperture by said third housing leg, the upper tube end communicating with said valve means and nozzle and the lower tube end projecting coaxially into the cuff section,

and swivel means comprising a cylindrical fitting rigidly mounted on the end of said flexible hose and coaxially mounted on the access tube within said cuff section for coaxial rotation in hermetically sealed relation.



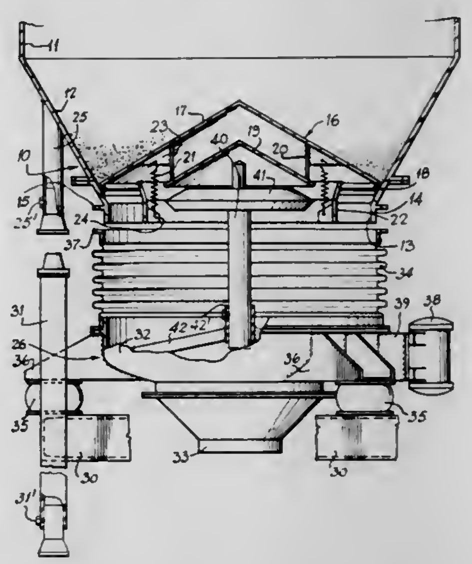
3,971,493
COMBINATION TRANSPORTABLE CONTAINER AND DISPENSING RECEIVER

David Michael Williams, 11 Ricardo Road, Minchinhampton, Stroud, Gloucestershire, England

Filed Aug. 26, 1974, Ser. No. 500,505
Int. Cl.² B65G *3/12;* **B67D** *5/06*

U.S. Cl. 222—185 **11 Claims**

1. In combination, a transportable container for particulate materials, comprising a tapering wall portion of hopper form, means defining a discharge opening at its base, a movable valve member adjacent said discharge opening, resilient means urging said valve member downwardly such that the periphery of said valve member is normally held in sealing contact with the inner surface of said tapering wall portion to close said discharge opening, said resilient means comprising a plurality of tension spring means arranged in spaced relationship with each spring means having one end connected to said valve member and the other end anchored on said container, said resilient means and said valve member being wholly disposed within said container above said discharge opening, and said valve member being movable upwardly against the action of said resilient means to define an annular opening between its periphery and the internal surface of said container wall for discharging material from the container; and receiving equipment permanently located at a position where the materials are to be dispensed from the container and which is formed to removably mount said container, said receiving equipment including means operative as the container is lowered onto said equipment to engage the underside of said valve member to effect said upwards opening movement thereof, and said receiving equipment comprising a material receiving member of generally dish-like form and frame means for supporting said receiving member in an elevated position with respect to the ground and said transportable container in position above the receiving member, resilient isolator means disposed between said material receiving member and the frame, and means for vibrating said material receiving member with respect to said frame.



11. A transportable container for particulate materials, comprising a tapering wall portion of hopper form, means defining a discharge opening at its base, a movable valve member adjacent said discharge opening, and resilient means urging said valve member downwardly such that the periphery of said valve member is normally held in sealing contact with the inner surface of said tapering wall portion to close said discharge opening, said resilient means comprising a plurality of tension spring means arranged in spaced relationship with each spring means having one end connected to said valve member and the other end anchored on said container, said resilient means and said valve member being wholly disposed within said container above said discharge opening, and said valve member being movable upwardly against the action of said resilient means to define an annular opening between its periphery and the internal surface of said container wall for discharging material from the container, said container being provided with an internal annular collar spaced inwardly of said discharge opening, and said spring means being distributed around and within said collar and having their other ends anchored upon said collar.

3,971,494
VALVE SYSTEM FOR FILLING MACHINES

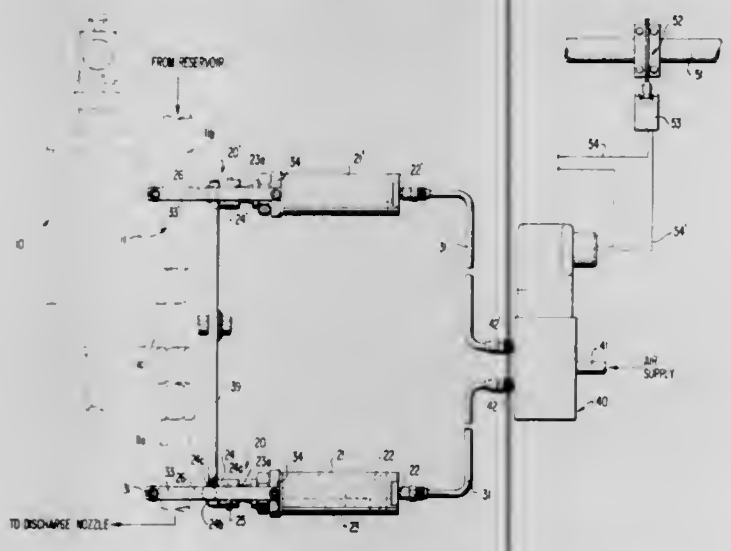
Sidney Rosen, 4119-27 Fordleigh Road, Baltimore, Md. 21215

Filed Sept. 2, 1975, Ser. No. 609,541
Int. Cl.² B67D *5/18*

U.S. Cl. 222—450 **27 Claims**

1. A valve system for a high-speed filling machine having a pump means which includes a shaft and a filling unit in opera-

tive connection with the shaft and in communication with hose means adapted to connect a reservoir containing the product to be filled with a discharge nozzle structure, said filling unit being operable to suck-in the product during the suction stroke of its pump means by way of a first hose section of said hose means and to discharge the product under pressure during the discharge stroke through the nozzle structure by way of a second hose section, characterized by a valve means operable as at least one of intake and discharge valve and operatively associated with the corresponding hose section to interrupt the flow of the product therethrough, a pneumatically operated piston-cylinder actuating unit for said valve means including a cylinder and a piston slidably received in said cylinder and having a piston rod operatively connected with the valve means for selectively opening and closing the valve means as a function of the reciprocating movements of the piston and piston rod, a solenoid valve means adapted to be connected with its input to a source of a pneumatic medium under pressure and operatively connected with at least one output thereof to the cylinder so as to displace the piston thereof by the selective feed of the pneumatic medium under pressure to the cylinder, an energizing circuit for said solenoid valve means including switch means, and means for closing said switch means in dependence on the angular position of said shaft.

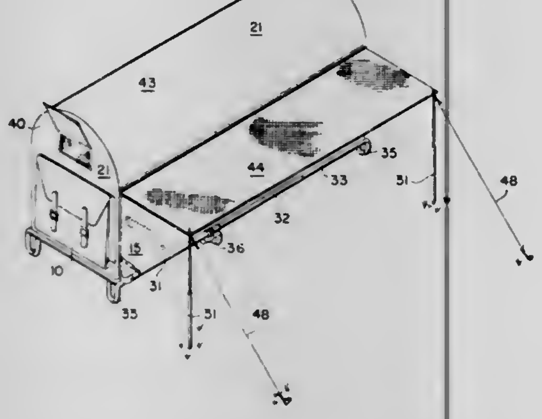


3,971,495
COMBINATION PACK FRAME AND BED

Pedro A. Velazquez, 231-48 Mentone Ave., Laurelton, N.Y. 11413

Filed July 1, 1974, Ser. No. 484,979
Int. Cl.^{2} A45F *4/00*

U.S. Cl. 224—10 **4 Claims**



1. A combination sleeper's cot and tent that may be folded up into a pack frame comprising

a tubular frame section formed of telescopic members that may be extended to form the frame of a cot, and fabric fastened to the frame section which in the extended position of the frame serves as a cot,

with the fabric forming the sides of a back pack when the telescopic members are nested together, in which the tubular frame section is formed of

a first end member in the form of a U-shaped section, formed of two parallel leg sections joined to a common mid-section, two tubular rods, each of which is telescopically engaged inside a leg section of the said first end member, and

a second end section similar in shape to the said first U-shaped section, with each leg section of said second section telescopically engaged inside one of said tubular rods, with

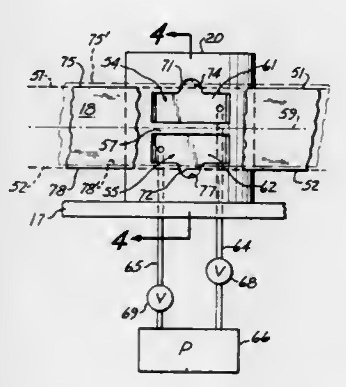
each end section shaped, adjacent the juncture of the mid-section to the leg section, to form a U-shaped support section, the plane of which extends generally perpendicular to the plane of the end section, said support sections serving as legs of the cot formed by telescopically extending the end sections apart from each other.

3,971,496
TAPE CENTERING METHODS AND APPARATUS

Irving Karsh, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 14, 1975, Ser. No. 541,036
Int. Cl.^{2} B65H *25/26*

U.S. Cl. 226—3 **8 Claims**



1. A method of centering a tape having two edge regions onto a desired tape advance path, comprising in combination the steps of:

providing a pair of separate cavities at said tape advance path;

providing each of said cavities with a lateral fluid flow orifice extending beyond the desired tape advance path;

providing each of said cavities with a fluid bearing chamber having a larger effective cross-section than said lateral fluid flow orifice;

covering both of said fluid bearing chambers with said tape;

establishing independent fluid pressures in said cavities;

moving said tape along said desired tape advance path;

maintaining both of said fluid bearing chambers covered by said tape during movement of said tape;

subjecting said tape to a first fluid pressure with one of said fluid flow orifices at one of said edge regions;

subjecting said tape to a second fluid pressure with the other of said fluid flow orifices at the other of said edge regions;

increasing said first fluid pressure in response to movement of said one edge region away from said desired tape advance path in one direction by varying the effective cross-section of said one orifice with said one edge region;

returning said tape onto said desired tape advance path with said increased first fluid pressure;

increasing said second fluid pressure in response to movement of said other edge region away from said desired tape advance path in a direction opposite to said one direction by varying the effective cross-section of said orifice with said other edge region; and

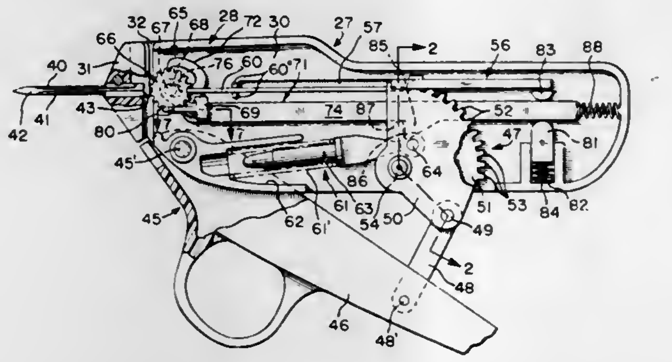
returning said tape onto said desired tape advance path with said increased second fluid pressure.

3,971,497
TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 24, 1975, Ser. No. 571,342
Int. Cl.^{2} B25C *1/00*

U.S. Cl. 227—67 **12 Claims**



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the fastener extending through the slot, means engageable with the coupling members to feed the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including a spring for urging the pawl to the first position, a manually engageable actuator, a gear segment, a gear section driven by the gear segment for driving the push rod, an abutment carried by the pawl, a projection carried by the gear segment for driving the pawl from the first position to the second position to cause the feed wheel to feed the fastener assembly, and return spring means for returning the actuator, the push rod, the pawl, the gear segment and the gear section to their initial positions.

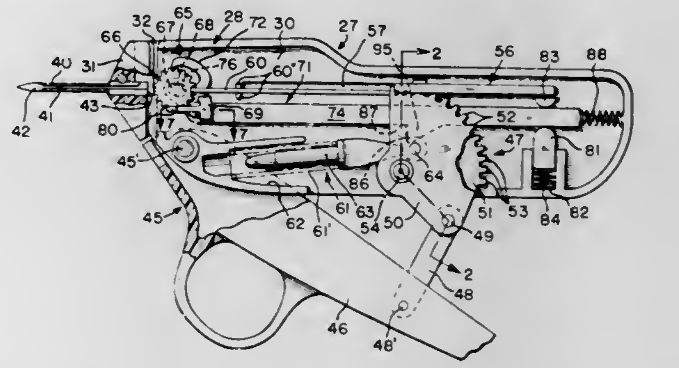
3,971,498
TAG ATTACHING APPARATUS

Charles B. Bussard, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 24, 1975, Ser. No. 571,345
Int. Cl.^{2} B25C *1/00*

U.S. Cl. 227—67 **31 Claims**

1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the fastener extending through the slot, means engageable with the coupling members for feeding the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including manually engagable actuator, a gear segment driven by the actuator, a gear section driven by the gear segment for driving the push rod, an abutment carried by the pawl and a pair of radially spaced apart projections carried by the gear segment for driving the pawl from the first position to the second position and thereafter from the second position to the first position to cause the feed wheel to feed the fastener assembly, and return spring means for driving the actuator, the push rod, the gear segment and the gear section to their initial positions.

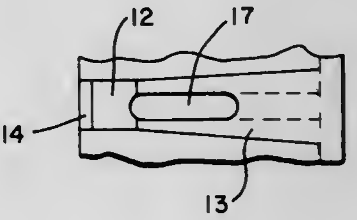


3,971,499
BONDING TOOL

George E. Goodrich, Jr., San Carlos; Earl S. Cain, Portola Valley; George E. Goodrich, Sr., San Carlos; Denis Keith Gilding, Mountain View, and Jerome A. Carlson, Woodside, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Sept. 3, 1974, Ser. No. 502,560
Int. Cl.^{2} B23K *31/02*

U.S. Cl. 228—54 **13 Claims**



1. In a bonding tool having a shank and a tapered work end including a narrow bonding tip for holding a wire against a surface to which it is to be bonded, the improvement comprising: a rectangular wire guide opening, which in transverse section is of relatively narrow width and large height, extending through the work end from the rear of the tool to a position adjacent to the bonding tip, whereby bonding wire can be fed and guided from the rear of the tool to the bonding tip over a variety of different angles.

3,971,500
METHOD OF METALLURGICALLY JOINING TUBING TO A WALL SEGMENT

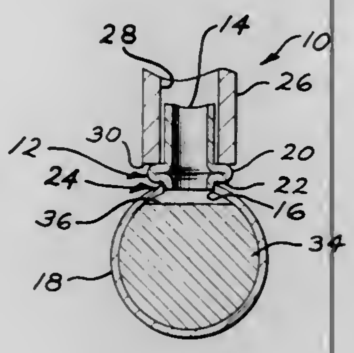
Gerald J. Kushner, and John H. Nininger, III, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed July 16, 1975, Ser. No. 596,317
Int. Cl.^{2} B23K *1/04, 1/12*

U.S. Cl. 228—154 **9 Claims**

1. The method of joining the end portion of a tube to a wall segment having an aperture for receiving said end portion comprising:

forming a circumferentially disposed radially projecting lip means on said end portion including a joining surface;
coating said joining surface and said wall segment adjacent the aperture;
placing said end portion so that said tube is in communication with said aperture and the joining surface is in contact with said wall segment adjacent said aperture;
placing a forming means on said tube into engagement with said lip means and said wall segment, said forming means being heated to a temperature sufficient to reflow said solder on said joining surface and said wall segment; and simultaneously



applying pressure with said heated forming means to said lip means and said wall segment while the solder is in liquid form, with the thickness of solder between said joining surface and wall segment being reduced to a minimum thickness, and continuing to apply sufficient pressure to deform said lip means and said wall segment and cause relative movement between them and said solder to induce an oxide layer on said solder to disperse in a desultory manner so that the minimum liquid solder film combines to form a joint between said joining surface and said wall segment.

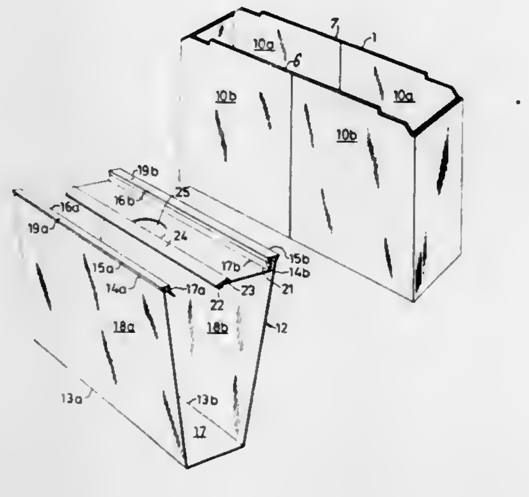
3,971,501
METHOD OF BRAZING ALUMINUM

William Ernest Cooke, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada
Filed Apr. 9, 1975, Ser. No. 566,299
Int. Cl.^{2} B23K *35/12*
U.S. Cl. 228—248 **9 Claims**

1. A method of joining aluminum surfaces with an aluminum brazing alloy having a melting point lower than that of metal of the surfaces to be joined, comprising
a. applying in an aqueous vehicle, to at least one of the surfaces, a mixture of said aluminum brazing alloy in powdered form and a powdered flux consisting essentially of a mixture of potassium fluoaluminate complexes essentially free of unreacted potassium fluoride, said mixture being carried as a solid suspension in said aqueous vehicle, to constitute said mixture as a coating on said one surface;
b. drying said coating to evaporate water therefrom;
c. heating said surfaces and said coating, in juxtaposed relation, to a temperature above the brazing alloy melting point for joining the surfaces to produce a brazed assembly; and
d. cooling the brazed assembly to form a solidified joint between the surfaces.

3,971,502
BOX-SHAPED PRODUCT

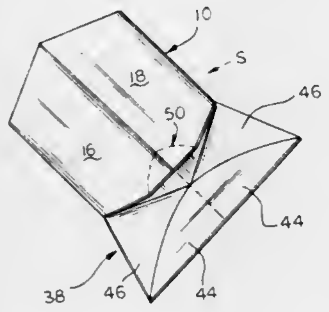
Carl-Erik Grundell, 8 Osmogatan, 122 48 Enskede, Sweden
Filed Sept. 25, 1974, Ser. No. 509,038
Claims priority, application Sweden, Sept. 27, 1973, 7313202; Mar. 20, 1974, 7403746
Int. Cl.^{2} B65D *5/62*
U.S. Cl. 229—14 R **7 Claims**



1. A box, comprising an inner box-shaped member made from a relatively rigid but foldable material and having a bottom, two opposite sides and at least one open side, and a cover member made from a relatively thin but foldable material which extends over at least said bottom and said two opposite sides of said box-shaped member, characterized in that said cover has portions, each folded over one of said opposite sides of said box shaped member, and slotted members each surrounding one of said folded portions and securing said folded portions to said box-shaped member sides at least against displacement in a direction perpendicular to said box-shaped member sides.

3,971,503
SANITARY PAPERBOARD SCOOP AND CONTAINER

Roger J. Allan, Conshohocken, and Joseph J. Hart, Philadelphia, both of Pa., assignors to Container Corporation of America, Chicago, Ill.
Filed Jan. 27, 1975, Ser. No. 544,325
Int. Cl.^{2} B65D *5/08*
U.S. Cl. 229—38 **1 Claim**

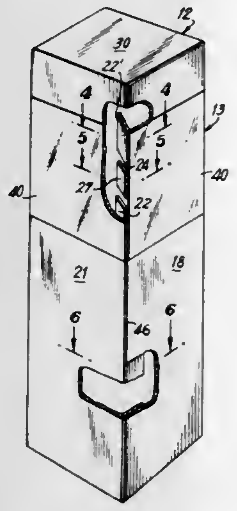


1. A collapsible combination sanitary scoop and container device formed from a unitary blank of foldable paperboard, comprising, in combination:
a. a plurality of side walls hingedly interconnected to form a generally tubular body member open at one end;
b. an integral cover member hingedly connected to an upper edge of said body member and being operable to serve both as a scoop for introducing material into said body member and as a cover for closing the open end of said body member;
c. said cover member comprising:

i. a cover element including a pair of cover panels spaced from each other;
ii. a gusset element interposed between said cover panels and including a pair of foldably interconnected gusset panels;
iii. said cover and gusset elements being foldably joined to each other and to said body member to provide in cooperation with each other a scoop having rear and side portions of a combined width in excess of the width of any one of said body side walls;
d. said body member including means engageable with a portion of said cover member for locking said cover member in a closed position.

3,971,504
BANDED CARTON AND BLANK ASSEMBLY

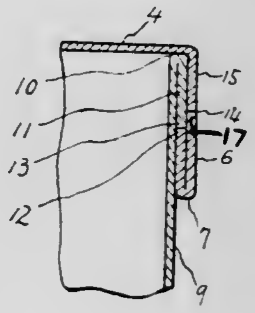
Adrian Alan Whyte, Bardonia, N.Y., assignor to Schenley Industries, Inc., New York, N.Y.
Division of Ser. No. 447,434, March 1, 1974, Pat. No. 3,911,798. This application June 6, 1975, Ser. No. 584,311
Int. Cl.^{2} B65D *5/10*
U.S. Cl. 229—38 **1 Claim**



1. A carton erected from a carton blank comprising a generally rectangular sheet having score and cut lines therein defining a plurality of adjacent body panels having end forming flaps at opposite ends thereof, a glue flap along one of said body panels, a tab defined in said glue flap, a pair of tabs along another of said body panels, a slot in said another body panel determined by said pair of tabs, said slot being axially aligned with said tab provided in said glue flap along one of said body panels, and an identification band extending transversely across said body panels in overlying relation to said outer surface, said identification band having opposed ends and in margins located a predetermined distance from said respective opposed ends, respective series of longitudinal perforations, one of said opposed ends of said identification band being adhesively secured to said pair of tabs provided along said another body panel along said margin of said identification band, said other opposed end of said identification band being adhesively secured to said tab provided in said glue flap along one of said body panels along said margin of said identification band, said identification band being otherwise free from said body panels of said carton blank, said carton being erected from said carton blank and having a body seam at one corner thereof, said body seam including said tab provided in said glue flap along one of said body panels and said perforated margin of said identification band secured thereto, and an adhesive securing an outer face of said perforated band margin to said perforated outer face of said band margin secured to said pair of tabs along said another body panel, said tab provided in said glue flap said adhesively bonded tabs and band margins being disposed within said carton.

3,971,505
CONTAINER

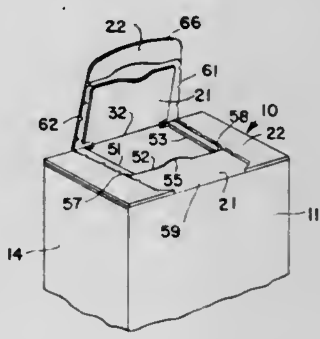
Hachiro Ohkubo, 3-23, Higashi, Nozato-cho, Nishiyodogawa, Osaka, Japan
Continuation-in-part of Ser. No. 328,228, Jan. 31, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,207
Int. Cl.^{2} B65D *5/66, 45/00, 5/22*
U.S. Cl. 229—45 R **1 Claim**



1. A hexahedral container comprising a bottom wall and four tightly closed-up side walls, constituting a body of the container, one of said walls being a front wall; a lid capable of being freely opened and closed said lid, said lid being integrally but pivotally connected at its rear to the top of said body; a hanging wall at the front of said lid; a stopping member attached to the hanging wall indicated on the inner surface of said hanging wall; a stopping device at the top of said front wall, said stopping device being elastic in the outward direction; said stopping member and said stopping device having free end abutment portions engaging each other to prevent further movement when said lid is closed; and a finger pressing piece on said hanging wall, said pressing piece is defined by at least one cut line in said hanging wall and a frangible linking portion thereat linking said pressing piece to said hanging wall, between said cut line, said hanging wall and said pressing piece, respectively, covering said abutment portions of said stopping member and said stopping device when said lid is closed, said frangible linking portion comprising means for sealing said container and for preventing opening thereof unless said frangible linking portion is broken as well as for providing indicia that the container has never been opened.

3,971,506
TEAR OPEN AND RELOCKABLE CONTAINER

Robert Fred Roenna, Medinah, Ill., assignor to St. Regis Paper Company, New York, N.Y.
Filed Nov. 27, 1974, Ser. No. 527,531
Int. Cl.^{2} B65D *5/54, 45/00*
U.S. Cl. 229—51 TC **8 Claims**



1. A tear open and relockable container, comprising in combination:
side means, bottom means, and top means in the container with said means having a first and a second member including a first and second edge, respectively,
said first member having a container aperture perforation defining a container aperture and with said container aperture perforation including a locking projection extending toward said first edge,

said first member having locking slot means extending in line with a side of said container aperture,

said second member having a first and a second perforation with a lift tab fold line extending between said first and second perforations defining a lift tab therebetween,

a lift tab perforation located between said first and second perforations and intersecting said lift tab fold line forming a reopen tab;

adhesive means for securing said second member to said first member with said second member overlapping said first member with said lift tab being in an initial position relative to the remainder of said second member for providing a tear open cover along said first and second perforations when said lift tab is raised thereby removing the portion of said first member defined by the container aperture in accordance with the movement of said second member to open the container;

and relocking means including said lift tab being inserted in said locking slot means with said locking projection extending through said lift tab perforation resulting in a first engagement between said lift tab and the bottom surface of said first member and resulting in a second engagement between said reopen tab and the top surface of said first member whereby said lift tab is biased to return to said initial position relative to the remainder of said second member by action of the content of the container on said lift tab when the container is overturned to increase the force of said first and second engagements.

3,971,507

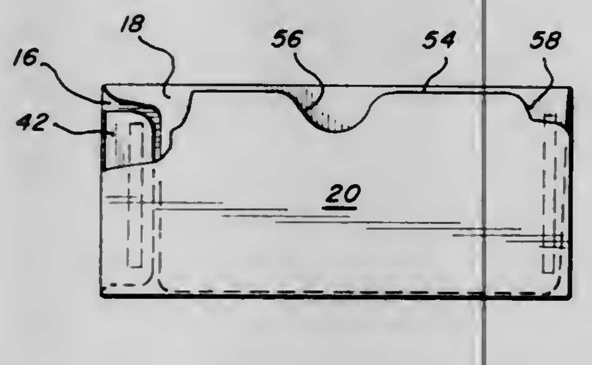
FOLDED MONEY PACK ENVELOPE

Mayne B. Stevenson, Park Ridge, Ill., assignor to Arvey Corporation, Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 623,901

Int. Cl.^{2} B65D *27/08*

U.S. Cl. 229—72 **8 Claims**



1. A sheet adapted to be folded to produce an envelope, said sheet being generally rectangular in plan view and having four lateral edges, said sheet having first and second spaced parallel fold lines dividing said sheet into a central panel portion and first and second panel portions on opposite sides of said central panel portion, said central panel portion having opposite ends defining first and second flat planar edges extending parallel to each other, said first panel portion having one flat edge defining an extension of said first flat planar edge and being inwardly angularly related thereto, between said flat planar edges, said one flat edge defining an included angle of a least 1° with respect to a plane extending along said first flat planar edge, said first panel portion having a second flat edge offset inwardly from said second flat planar edge of said central panel portion and extending generally parallel thereto, said second panel portion having a further fold line defining a continuation of said second flat planar edge to produce a tab, said tab having an outer lateral flat edge spaced from said further fold line by a dimension that is less than the spacing between the second flat edge of said first panel portion and the second flat edge of said central panel portion so that said tab can be folded along said further fold line, said sheet can be folded along said first fold line to place said first panel portion in overlapping relation with said central panel portion and subsequently along said second fold line to have said second panel portion in overlapping relation with said first panel portion while said tab is in overlapping relation with said central panel portion.

3,971,508

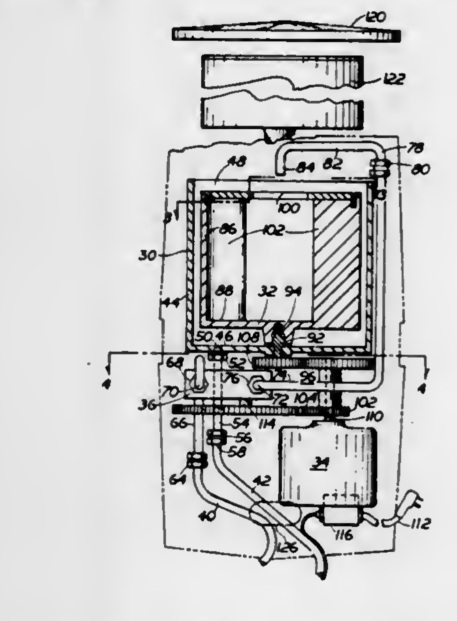
OIL CLARIFICATION SYSTEM

Clayton Gianglulio, 5 Skyline Drive, Malvern, Pa. 19355

Filed Feb. 3, 1975, Ser. No. 546,592

Int. Cl.^{2} B04B *11/04*

U.S. Cl. 233—4 **8 Claims**



1. An automatic system for clarifying cooking oil held in a deep fat fryer apparatus while said oil is hot by extracting higher density food particles from the lower density oil, comprising clarifying means comprising an inlet tube for carrying hot cooking oil having food particles disposed therein from said fryer to said clarifying means, a stationary hollow collector having an outlet tube for carrying clarified oil back to said fryer, a hollow rotatable drum disposed within said collector and having a central axis about which the drum rotates, said drum including an imperforate circular side wall disposed about said axis, a bottom wall and a top wall including an opening disposed about said axis and within said collector, pump means for carrying hot oil having food particles disposed therein from said fryer, through said inlet tube, and into said drum, motor means for rotating said drum at a high speed, and temperature responsive means adapted for immersion within the oil in said fryer and connected to said pump means and said motor means for automatically turning said pump means and said motor means on when the temperature of the oil in said fryer reaches a predetermined level and for automatically turning said pump means and said motor means off when the temperature of said oil drops below said level, whereupon the centrifugal force produced by said rotation effects the separation of said food particles by causing said particles to be thrown radially outward from said central axis against said imperforate side wall to be held thereon while said lower density oil flows over said trapped particles, out through the central opening in the top wall of the drum and into said collector for return to said fryer.

3,971,509

CENTRIFUGE COMPRISING AN OUTER DRUM AND AN INNER ROTOR PROVIDED WITH A CONVEYOR SCREW

Frank Birger Johnsen, Virum, Denmark, assignor to Titan Separator A/S, Soborg, Denmark

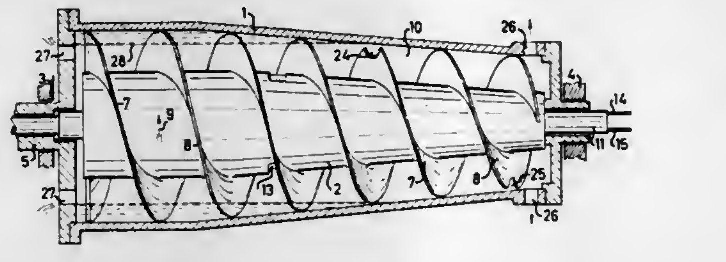
Filed Sept. 24, 1974, Ser. No. 508,942

Claims priority, application Germany, Oct. 1, 1973, 2349298

Int. Cl.^{2} B04B *1/20, 15/12*

U.S. Cl. 233—7 **5 Claims**

1. In a centrifuge for separating a solid phase from a liquid phase, said centrifuge including a drum, means journalling said drum for rotation about an axis, a hollow rotor mounted coaxially within said drum and defining therewith a separating space, a conveyor screw secured externally to said rotor and comprising at least two continuous helices defining between them helical ducts, means for supplying a raw material including said liquid and solid phases to each of said helical ducts, outlet means at opposite ends of said separating space for discharging said liquid and solid phases separately therefrom, the improvement comprising at least one aperture in each of said screw helices intermediate the ends thereof, said apertures extending inwardly from the outer periphery of the respective said screw helices and being located in a common helicoid surface, an opening in said rotor adjacent each of said apertures, and means for supplying a washing liquid through each opening into said separating space.



3,971,510

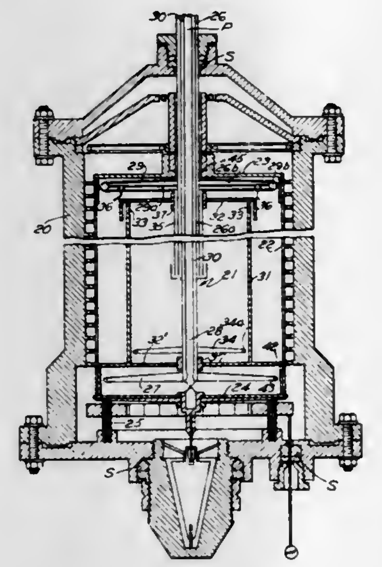
CENTRIFUGAL SEPARATOR

Theodore Frederick Morse, 25 Taber Ave., Providence, R.I. 02906

Continuation-in-part of Ser. No. 126,104, March 19, 1971. This application June 9, 1972, Ser. No. 261,449

Int. Cl.^{2} B04B *1/00*

U.S. Cl. 233—27 **3 Claims**



1. An ultracentrifuge having a gas tight cylindrical housing an axis having a hollow axially mounted central shaft with a surrounding stationary annulus and surrounding duct means, a first cylindrical shell having top and bottom walls and mounted about said shaft for rotation about the axis of the housing, means for rotating said shell, a second cylinder mounted within said first shell for rotation therewith, means at the lower end of said first shell for exhausting gas, a stagnation arm mounted adjacent the top wall of the first shell, means for introducing gas into said second cylinder through said annulus, said stagnation arm having a duct therein with a port adjacent the wall of the first shell to carry off waste products, said duct terminating adjacent said annulus in the second cylinder, a second stagnation arm with a duct therein mounted adjacent the bottom wall of the second cylinder to stimulate secondary flow, said duct communicating with the surrounding duct means, a choked duct between said second cylinder and said first cylindrical shell to deliver products of gas from the inner second cyliner cylinder the first cylindrical shell whereby a large pressure differential may be maintained across the second cylinder wall and means at the lower end of said second cylinder for exhausting waste gas.

3,971,511

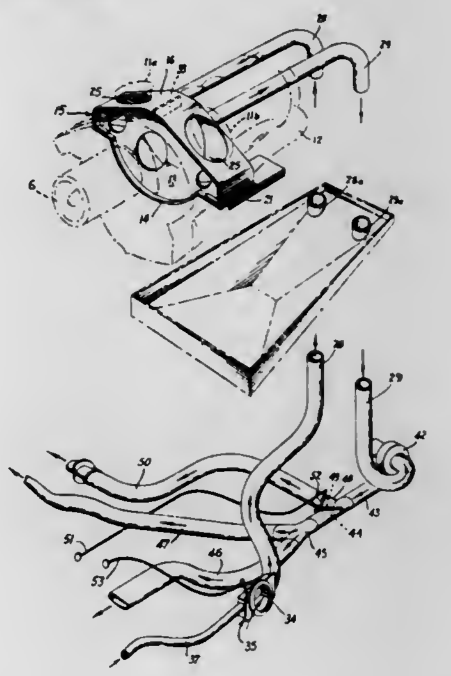
CABIN HEATER FOR HELICOPTERS AND FIXED WING AIRCRAFT

Anthony Joseph Casey, 5029 Perron St., Pierrefonds, Quebec, Canada (H8Z 2J2)

Filed Apr. 16, 1975, Ser. No. 568,420

Int. Cl.^{2} B60H *1/06*

U.S. Cl. 237—12.3 A **7 Claims**



1. A cabin air heating system for rotary and fixed wing aircraft in which the aircraft is driven by a gas turbine engine, in combination, a gas turbine engine having an exhaust discharge section, and air heating chamber about the exhaust discharge section of the engine, duct means to circulate fresh air from without the aircraft and recycled cabin air through the air heating chamber and to the cabin of the aircraft, a first valve means located within a valve box having a fresh air inlet, an air inlet from the cabin of the aircraft and an air outlet to said heating chamber to permit fresh air and recycled cabin air to pass through the air heating chamber when the aircraft is in flight or on the ground with the engine running, the first valve means in one position closing off the cabin air inlet to the valve box and permitting a full flow of fresh air to the air heating chamber, and in another position permitting a restricted inflow of fresh air and a full flow of air from the cabin through the valve box to the air heating chamber, and a second valve means to effect discharge of heated air to the atmosphere when the aircraft is in flight or on the ground with the engine running.

3,971,512

SPRAYING APPARATUS

David Robertson Duncan, Roundhill Farm, Charlton Musgrove, Wincanton, Somerset, England

Filed Apr. 21, 1975, Ser. No. 569,958

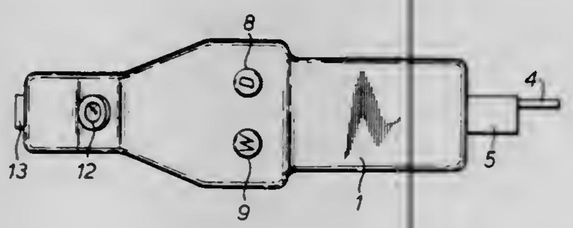
Claims priority, application United Kingdom, Apr. 26, 1974, 19237/73

Int. Cl.^{2} B05B *1/14*

U.S. Cl. 239—1 **10 Claims**

1. Spraying apparatus comprising two liquid input lines for independent supply of two liquids, one input line being so disposed that it surrounds the other input line, a valve unit defining two passageways, a first inlet connection interconnecting the one input line with one of the passageways and a second inlet connection interconnecting the other input line with the other passageway, the outer extremities of the first inlet connection being disposed to the outside of the outer extremities of the second inlet connection in the directions

normal to the liquid flow axes of the two inlet connections, separate outlet nozzles from each passageway, one of the nozzles being constructed to create a jet for liquid ejected therefrom and the other nozzle being constructed to create a spray for liquid ejected therefrom, and valves independently disposed within each passageway, which are biassed to close the respective passageways and are manually operable selectively to interconnect an input line with a respective outlet nozzle to allow a jet or a spray of liquid, from the respective independent liquid supplies, to be selectively dispensed from the spraying apparatus.



3,971,513

DREDGE PUMP

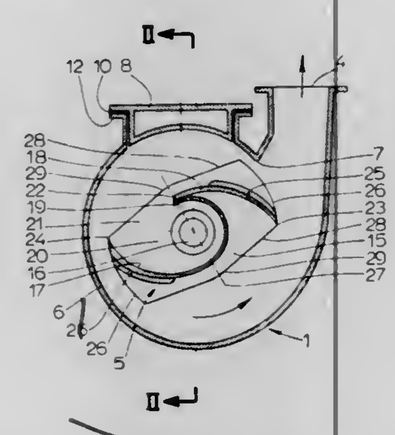
Johan Klip, Berkenwoude, Netherlands, assignor to Konijn Machinebouw B.V., Hoorn and Bagger-en Constructie Bedrijf Johan Klip B.V., Berkenwoude, both of, Netherlands

Filed May 13, 1975, Ser. No. 577,008

Claims priority, application Netherlands, May 22, 1974, 7406866

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46 R **9 Claims**



1. Dredge pump, consisting of a volute pump casing, with a lateral, round suction opening and with an outlet, in which pump casing an impeller is mounted which consists of a front plate with an opening adjoining the suction opening of the pump casing, of a back plate which is connected to a drive shaft supported in the pump casing and coupled to a motor, and of two blades extending between the front plate and the back plate and connecting these to each other, one of which blades, which has at least substantially the form of a circular arc at its end nearest the axis of rotation and subsequently increases in radius, forms a passage which is connected through the opening in the front plate to the suction opening of the pump casing and which is passed in the direction of its lateral outlet by all dredged material which is to be pumped, one end of the second blade adjoining the aforementioned end of the first blade radially on the outside and the other end of this second blade lying at least substantially diametrically opposite the other end of the first blade, the two blades, viewed from the axis of rotation, having a concave curvature, the passages formed by the first blade increasing gradually in width from the central inlet towards the lateral outlet, said central inlet being bounded by the part of the blade having at least substantially the form of a circular arc, the front plate and the back plate having a cutting edge along at least the greater part of their periphery, said cutting edge being located in their outer surface, said front plate and said back plate of the impeller having two curved end edges which are symmetrical with respect to the axial plane passing through the adjoining ends of the two blades, each edge ending on one side at the location of the outer end of one of the blades.

3,971,514

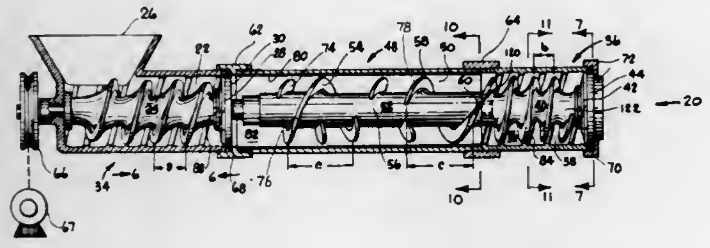
MEAT GRINDER ATTACHMENT

Luigi E. Martinelli, 5164 Rafton Drive, San Jose, Calif. 95124, and George S. Cerelli, 4161 Keith Drive, Campbell, Calif. 95008

Filed June 16, 1975, Ser. No. 587,125

Int. Cl.² B02C *18/30*

U.S. Cl. 241—82.4 **10 Claims**



1. In a grinder comprising a feed hopper for delivering material to be ground to a first cylindrical chamber; a first screw having a first pitch within said first chamber for coarsely grinding and transporting said material from said hopper passed a first rotary knife mounted to said first screw and through a first plurality of generally equal sized holes in a first plate; a second screw having a second pitch drivingly attached coaxially to said first screw within a second cylindrical chamber for finely grinding and transporting said material from said first plate passed a second rotary knife mounted to said second screw and through a second plurality of generally equal sized holes in a second plate; the holes of said first plurality of holes being larger than the holes of said second plurality of holes; and means for driving said first screw and thereby also said second screw; an improvement which comprises:

- a shaft coaxial with and connecting together said first and second screws;
- a third cylindrical chamber surrounding said shaft and connecting said first and second chambers;
- a first partial screw thread having a third pitch greater than said first pitch and greater than said second pitch, said first partial screw thread extending radially from said shaft within said third chamber commencing adjacent said first plate and terminating adjacent a central portion of said shaft; and
- a second partial screw thread non-contiguous with said first partial screw thread having a fourth pitch greater than said first pitch and greater than said second pitch, said second partial screw thread extending radially from said shaft within said third chamber commencing adjacent the central portion of said shaft and terminating adjacent said second screw.

3,971,515

BALL MILL WITH ENERGIZING BODY ON THE WEARING PLATE

Helmut Haas, Proz-Wahn, and Manfred Wolf, Lohmar, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 12, 1973, Ser. No. 426,635

Claims priority, application Germany, Dec. 13, 1972, 2260830

Int. Cl.² B02C *17/14, 17/22*

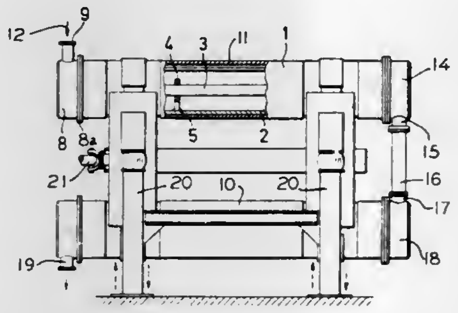
U.S. Cl. 241—175 **4 Claims**

1. A vibratory mill having a chamber for containing movable grinding bodies therein comprising:

- a wall forming a grinding chamber;
- means for driving the chamber in a vibratory grinding motion;

- a fixed body within the chamber spaced from the wall;
- a wearing plate within the wall on the inner surface of the chamber shaped to conform to the inner surface of the grinding chamber and being resilient and biased outwardly against the inner surface of the wall for holding its position therein;

and means supporting said body on said wearing plate.



3,971,516

DEVICE FOR WINDING TOROIDAL DEFLECTION COILS

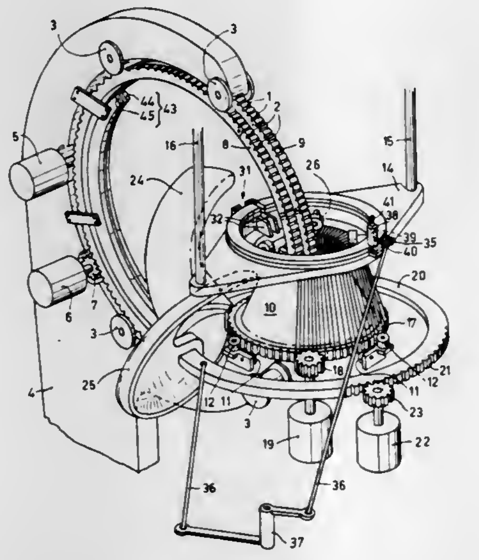
Edgard Emile Charles Rossaert, Dilbeek, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,539

Claims priority, application Netherlands, June 22, 1973, 7308700

Int. Cl.² H01F *41/08*

U.S. Cl. 242—4 B **6 Claims**



1. In an apparatus for winding toroidal coils comprising a rotatable winding wheel lying in a plane, a part of said wheel being detachable for insertion of a core on which a winding is to be wound, the core having first and second end faces, means for rotating said core about a first axis, and a first wire guide adjacent said first end face, an improved wire guide arrangement allowing the slanted winding of coils, comprising an annular member, means for pivoting said annular member about said first axis, and a second wire guide connected to said annular member for pivotal motion therewith, said second wire guide comprising two wire interceptors mounted on said annular member to fan out laterally from an edge of said second end face a distance such that in each position of the annular member one of the wire interceptors intercepts the plane of the winding wheel.

3,971,517

APPARATUS FOR WINDING A YARN ROUND A BOBBIN

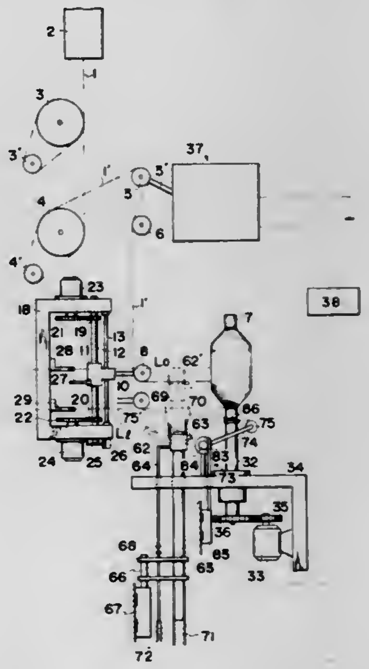
Yosio Matuura; Shoichi Murakami; Norihisa Yamaguchi; Takashi Kishida; Sadao Kadokura, and Kiyoshi Imai, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 344,512, March 26, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,514

Claims priority, application Japan, May 15, 1972, 47-47157; May 15, 1972, 47-47160; May 27, 1972, 47-52150; June 8, 1972, 47-56429; June 8, 1972, 47-66016[U]

Int. Cl.² B65H *54/02, 54/32*

U.S. Cl. 242—18 R **6 Claims**



1. An apparatus for winding a yarn round a bobbin without twisting, which comprises:

- an uprightly supported bobbin;
- means for driving said bobbin to wind the yarn extruded from a spinning apparatus at a speed higher than 2000 m/min.;
- a guide roller rotatably mounted to a supporting arm;
- means for introducing the yarn to said guide roller substantially in parallel to the axis of said bobbin;
- means for slowly traversing said guide roller supporting arm substantially in parallel to the axis of said bobbin; and
- means for traversing said guide roller supporting arm with traverse strokes which gradually become shorter as the diameter of the wound yarn becomes larger;
- said supporting arm comprising a bearing frame to which said guide roller is rotatably supported;
- a frame member to which said bearing frame is swingably pivoted; and
- a tension spring disposed between said frame member and bearing frame.

3,971,518

TRANSFER TAIL APPARATUS FOR USE WITH TEXTILE YARN WINDERS

Larry B. Newman, and John W. Demuth, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,902

Int. Cl.² B65H *54/02*

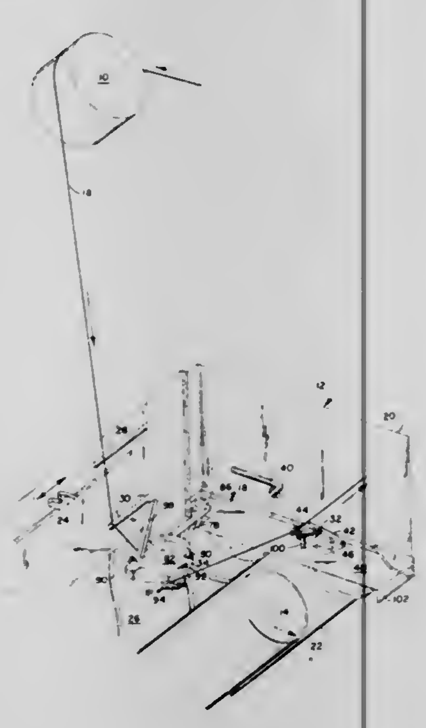
U.S. Cl. 242—18 PW **7 Claims**

1. A transfer tail apparatus adapted to form a transfer tail on the outer end portion of a rotating yarn package tube, which is mounted on a yarn winder having a yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the yarn package tube having at its outer axial end yarn snagging means for snagging and retaining yarn on the yarn package tube, the transfer tail apparatus comprising:

a first yarn guide means mounted spaced outwardly from the outer axial end of the yarn package tube and a second yarn guide means mounted spaced outwardly parallel to the axis of the yarn package tube and adjacent to the outer end portion of the yarn package tube, each yarn guide means adapted to receive, retain and engagingly guide a continuously moving yarn from a source of supply to a waste receiver and adapted as mounted so as to be moved in a predetermined path from a first position to a latched second position, and upon release, to be moved in return along a predetermined path to the first position;

each yarn guide means including a latch means for latching the yarn guide means in the latched second position, a release means for releasing the yarn guide means from the latched second position, and means for moving the yarn guide means in return to the first position;

the first yarn guide means adapted upon release from the latched position and movement in return along the predetermined path toward the first position to translate the thus engaged continuously moving yarn into engagement with the outer axial end of the yarn package tube whereupon the yarn snagging means rotates into snagging position, snags and retains the yarn, thereafter causing the yarn to become severed from the yarn going to the waste receiver and to be released from the first yarn guide means;



the second yarn guide means adapted as mounted in the latched second position to guide the thus engaged continuously moving yarn into a waste bunch of predetermined number of wraps on the outer end portion of the rotating yarn package tube, and upon release from the latched second position and movement in return along the predetermined path toward the first position to guide the yarn into a predetermined number of spaced helical wraps along the yarn package tube between the waste bunch and the package portion of the yarn package tube as the second yarn guide means moves and is also adapted at a predetermined point along its path of movement to move out of engagement with and thus release the yarn from the second yarn guide means for subsequent pickup by the yarn traverse guide for winding of the yarn package on the package portion of the yarn package tube; and

the release means for the second yarn guide means being actuated for release of the second yarn guide means from the latched second position in response to continued movement of the first yarn guide means toward the first position following the snagging and severing of the yarn, wherein the latch means for the first yarn guide means includes means for actuating the release means for the second yarn guide means.

3,971,519

MECHANISM FOR PREVENTING THE ADVERSE EFFECTS OF CENTRIFUGAL FORCE IN A STRAND WINDING MACHINE

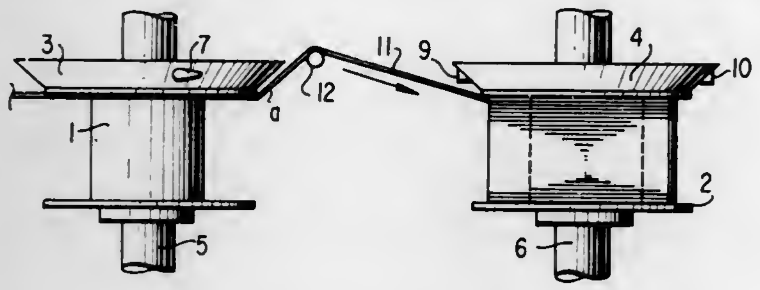
Yoshio Ikegami; Hirohumi Kimura; Tadashi Kohge, all of Kobe; Katsuji Sakamoto, and Takenbu Higashimoto, both of Yokohama, all of Japan, assignors to Kobe Steel Ltd., Kobe and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Oct. 15, 1974, Ser. No. 514,848

Claims priority, application Japan, Oct. 13, 1973, 48-118923

Int. Cl.^{2} B65H *67/04*

U.S. Cl. 242—25 A **3 Claims**



1. In a strand winding machine having two wheels and two reels respectively supported thereon, snaggers provided at the outer peripheral portion of each wheel rotatable with said reels and a mechanism for shifting the strand from a full reel to an empty reel, the improvement comprising:

each of said wheels having the outer peripheral portion thereof shaped so as to form a part of a cone;

shafts extending through the outer peripheral portion of each of said wheels so as to be parallel to the central axis of revolution of each of said wheels;

a respective one of said snaggers provided at one end of each of said shafts so as to be pivotable on the outer peripheral portion of its associated wheel, each of said snaggers being so constructed as to include a pointed end for performance of a snagging operation and wherein the centroid of each snagger is positioned at a point displaced from the pivot of the respective snagger toward the side opposite the pointed end of said snagger;

a plurality of pins, each of which is provided at at radial position corresponding to a radial portion of each of said reels mounted upon each of said wheels; and

pivotable members having a portion thereof pivotable along the axial direction of said wheels, each of said members being joined at one end thereof to a respective shaft and extending in a radial direction, beyond said position of each of said pins, so as to be pivoted in accordance with the movement of said corresponding pin, said other end of said member being secured to said wheel.

3,971,520

APPARATUS FOR DOFFING AND INSERTING EMPTY CORES ON AN AUTOMATIC WINDER

Junichiro Shimai, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

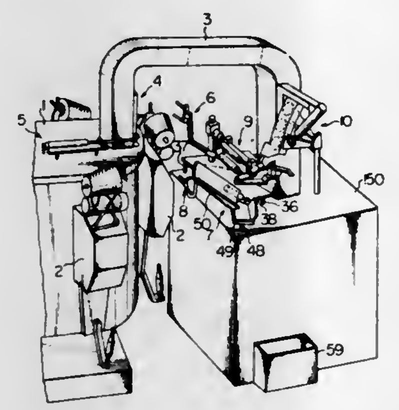
Filed Aug. 8, 1974, Ser. No. 496,088

Claims priority, application Japan, Aug. 14, 1973, 48-91394

Int. Cl.^{2} B65H *54/20, 54/24, 67/04*

U.S. Cl. 242—35.5 A **9 Claims**

1. An apparatus for doffing and inserting empty cores on automatic winder having core holders each adapted to clamp and free a core by assuming first and second prescribed positions respectively, and each mounted to urge a core mounted thereon toward a winding drum for forming full packages of yarn on the core from yarn on a bobbin, during a winding operation, said apparatus comprising, in combination, a position holding mechanism for lifting a full package from a winding drum, a forwarding mechanism for turning a core holder from a first position to a second position comprising means positionable to engage and push a side of a full package lifted by said position holding mechanism, a package take-off mechanism for taking off said full package comprising means positionable to engage and push one end of a full package on a core holder turned to its second position by said forwarding mechanism, a receiver mechanism positioned to receive a full package taken off a core holder by said take-off mechanism, a yarn severing and holding mechanism positionable to sever a yarn portion extending from a full package in said receiver



mechanism to a bobbin and to hold the end of the severed yarn extending to said bobbin, and a core inserting mechanism comprising means positionable to insert an empty core over a core holder from which a full package has been taken off by said take-off mechanism and means positionable to engage and push a side of said empty core on said core holder for returning said core holder to its first position.

3,971,521

APPARATUS FOR COLLECTING A CORELESS COILED THREAD PACKAGE

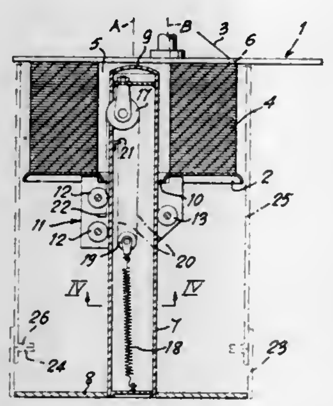
Renato Crotti, 71, Carso Canalgrande, Modena, Italy (4100)

Filed Mar. 11, 1974, Ser. No. 450,160

Claims priority, application Italy, Mar. 15, 1973, 12515/73

Int. Cl.^{2} B65H *54/80*

U.S. Cl. 242—47 **3 Claims**



1. An apparatus for collecting a coreless coiled thread package having a central hollow bore, said apparatus comprising:

a thread collecting or receiving disc, having means for defining a central through bore;

a vertical guide column passing through said bore of the said receiving disc, so as to permit vertical displacement of the said receiving disc upwardly and downwardly along said guide column, said guide column being constructed as a tubular hollow column structure,

supporting means for supporting said receiving disc during its vertical displacement along the guide column, said supporting means comprising a carriage mounted on the column to move therealong in the vertical direction, said receiving disc being fitted in a removable but nonrotatable manner onto the said carriage,

and further means being arranged inside of the hollow column structure for elastically urging said supporting means upwardly, towards the top of the column,

and said guide column having a section which is non-circular, presenting at least two substantially straight sides, and the carriage being mounted on rollers, at least two of said rollers being arranged so as to roll along the flat surfaces of the column corresponding to said straight sides.

3,971,522

APPARATUS FOR STORAGE OF FILAMENTARY MATERIAL

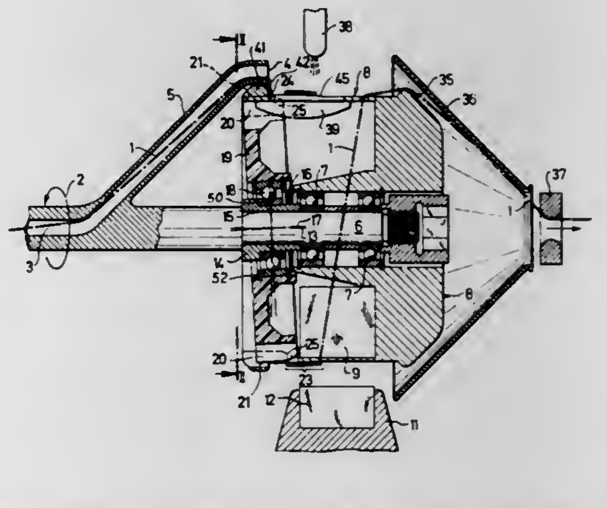
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sept. 20, 1974, Ser. No. 507,948

Claims priority, application Switzerland, Sept. 25, 1973, 13702/73

Int. Cl.^{2} B65H *51/20*

U.S. Cl. 242—47.01 **7 Claims**



1. Apparatus for the storage of filamentary material comprising a hollow shaft having a free end, a drum having an exterior surface conforming substantially to a surface of revolution, a wheel, means mounting the wheel and drum on the free end of the shaft for rotation with respect to the shaft about separate axes which are skew to each other, a flyer arm affixed to the shaft and extending radially and axially thereof into exterior overlapping relation with said surface of the drum adjacent the end thereof nearest the other end of the shaft, said exterior surface including, adjacent said end of the drum, a plurality of axially extending slots disposed about the periphery thereof, whereby upon rotation of the drum with respect to the shaft a filament passed through the shaft and out onto the arm will be laid in a helical coil on said surface adjacent said end of the drum and may be pulled off of the other end of the drum, and teeth on the wheel engaging the slots, the teeth having each a thread lifting top land surface extending substantially parallel to the axis of the wheel over a minor fraction of the length of the drum including however the portion of the drum length beneath the flyer arm, the teeth further having each a thread-thrusting surface extending in a direction includng a component radial of the wheel, whereby the top lands and thrusting surfaces engage only the portion of the coil nearest said end of the drum.

3,971,523

ENDLESS TAPE CARTRIDGE

Masaaki Ishii, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 242,879, April 7, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,211

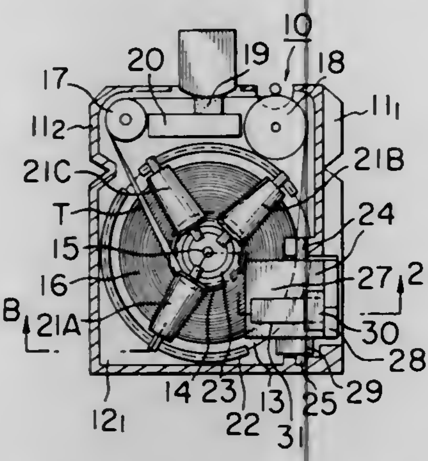
Claims priority, application Japan, Apr. 14, 1971, 46-28622[U]; Apr. 14, 1971, 46-28623[U]; Apr. 14, 1971, 46-28624[U]; Apr. 14, 1971, 46-28625[U]; Apr. 14, 1971, 46-28628[U]

Int. Cl.^{2} G11B *23/10*

U.S. Cl. 242—55.19 A **7 Claims**

1. An endless tape cartridge comprising:

- a housing;
- a tape coil in endless form;
- a reel member including a reel hub and a reel flange for rotatably supporting said endless tape coil a a normal operative position, and
- a brake member for preventing movement of said tape coil when said cartridge is not in use, said brake member including a wing-like member pivotally journalled in said housing and engageable with one end face of said tape coil, a resilient member for pressing said wing-like member against one end face of said tape coil and at least two releasing members for disengaging said wing-like member from said end face of said tape coil against the pressing force of said resilient member, each of said releasing members including a cam portion for receiving force in a direction approximately normal to the direction of a force externally applied, said applied force being applied, in the case of a first releasing member, in the side-to-side direction of said cartridge and in the case of the second releasing member in direction parallel to the axis of the reel, to effect releasing and to maintain the released condition.



3,971,524

DEVICE FOR CONNECTING AN EXPIRING FIRST WEB OF A WEB-SHAPED MATERIAL WITH THE BEGINNING OF A SECOND WEB OF A WEB SHAPED MATERIAL

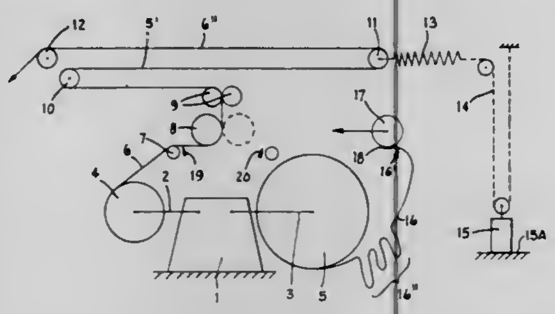
Günter Nudinger, Kempten; Heinrich Collin, Munich, and Hans Moosburger, Weiberhammer, all of Germany, assignors to Bayerische Berg-, Hutten- und Salzwerke AG, Munich, Germany

Division of Ser. No. 263,567, June 16, 1972, Pat. No. 3,837,954. This application Oct. 5, 1973, Ser. No. 404,029

Claims priority, application Germany, June 16, 1971, 2129903

Int. Cl.² B65H *19/10*

U.S. Cl. 242—58.4 **20 Claims**



1. In a device for connecting a first web of a web-shaped material unwinding from a first roll to the beginning of a second web of a web-shaped material unwinding from a second roll and having at least one transfer element and releasable engaging means for releasably coupling said second web to said transfer element, said transfer element effecting a pressing of said beginning of said second web to said first web, an adhesive for connecting said first web to said beginning of said second web, and a cutting device for cutting the first web downstream of a point where said second web is attached to said first web, the improvement comprising a guide roller for guiding said first web thereover, first support means for supporting said guide roller for movement along a path generally parallel with an exiting strand of said first web therefrom, resilient means, one end of which is connected to said guide roller, for biasing said guide roller to a first position, weight means, second support means for supporting said weight means, cable means extending between said weight means and the other end of said resilient means, third support means for supporting said cable means to effect a vertical movement of said weight means from off said second support means when the tension force applied by said first web to said guide roller exceeds the return force of said resilient means and the weight of said weight means, the return force of said resilient means increasing as said guide roller is moved along said path away from said first position in response to an increased tension force being applied to said first web, the magnitude of said weiight means and said return force of said resilient means being greater than a normal tension force of said first web on said guide roller during normal operation thereof to thereby effect a holding of said guide roller at said first position.

3,971,525

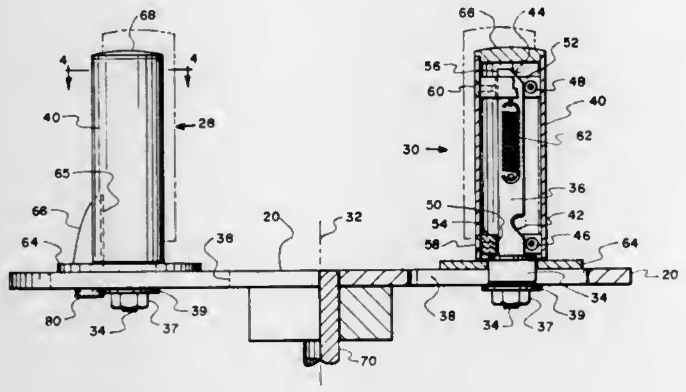
SEMI-AUTOMATIC HANKING APPARATUS

Arthur Winslow, Fairfield, Conn., assignor to Stanley L. Mead, Portland, Oreg.

Filed Jan. 8, 1975, Ser. No. 539,394

Int. Cl.² B65H *75/24*

U.S. Cl. 242—110 **3 Claims**



1. An apparatus for forming a length of elongate flexible material into a hank containing a predetermined number of loops comprising:

- a. a rotatable base member;
- b. hanking means attached to said base member for loopingly engaging a length of elongate flexible material as said base member is rotated;
- c. means for rotating said base member including an electric motor drive and selectively engagable clutch means for operatively connecting said motor drive to said base member;
- d. detector means for producing an electric signal pulse upon each revolution of said base member, and a control circuit, responsive to said signal pulses and including counter means, for maintaining said clutch means engaged with said motor drive until the sum of said signal pulses equals a value preset in said counter means; and
- e. means for consistently stopping said base member in a predetermined angular position after it has traversed a number of revolutions corresponding to said preset value in said counter means.

3,971,526

TEXTILE SPOOL

Robert H. Underwood, 19 Stacy St., Saco, Maine 04072

Filed June 2, 1975, Ser. No. 582,716

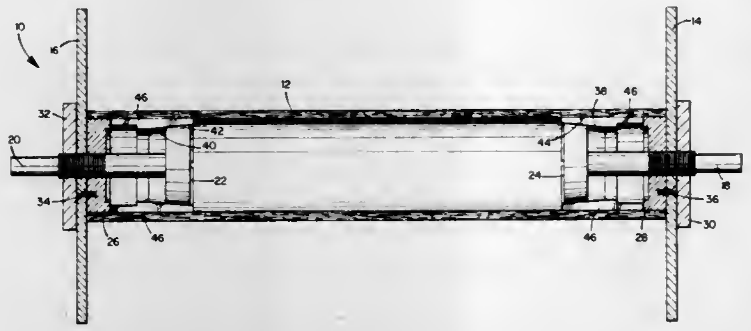
Int. Cl.² B65H *75/10*

U.S. Cl. 242—118.6 **19 Claims**

1. An improved textile spool adapted to carry a filament material thereon, which spool comprises:

- a. a hollow tube adapted to carry a filament material;

- b. a first flange at the one end and a second flange at the other end of the hollow tube;
- c. a first cylinder at the one end and a second cylinder at the other end of the hollow tube, the cylinders adapted to fit in a slidable, snug relationship within the internal diameter of the hollow tube, at least one of the cylinders characterized by a plurality of slots in the cylinder wall extending generally axially inwardly from one end of the cylinder;
- d. a first shaft at the one end and a second shaft at the other end of the hollow tube, the first and second shafts extending axially beyond the first and second flanges, respectively, whereby the extending ends may be placed in a relationship to rotate the hollow tube for a filament winding or unwinding operation;



- e. fastening means to secure in an assembled and disassembled position the first and second flange elements with the first and second ends of the hollow tube on the first and second shaft elements; and
- f. means within the interior of the slotted cylinder to provide for the outward expansion of the slotted end of the cylinder wall against the internal diameter of the hollow tube to secure the cylinder to the hollow tube, when the spool is in an assembled position, and to release the cylinder wall so that the hollow tube may be slidably removable therefrom and placed in a dissambled position through the axial movement of the respective shaft element.

3,971,527

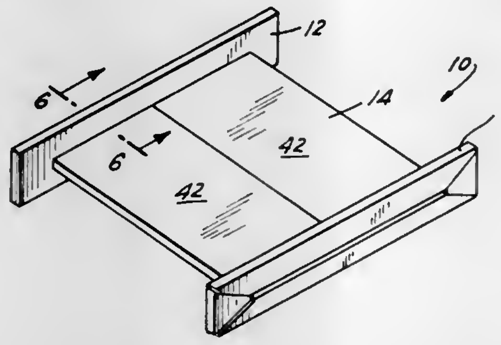
YARN REEL

Robert Maye, 7 Wildwood Gardens, Port Washington, N.Y. 10033

Filed Mar. 14, 1975, Ser. No. 558,352

Int. Cl.² B65H *54/68, 75/06, 75/14*

U.S. Cl. 242—118.7 **25 Claims**



1. A reel for yarn, ribbon and the like which consists of a pair of end pieces and a central member operatively connected therebetween, said end pieces each comprising a single blank of foldable material having a central section, a pair of intermediate sections respectively joined to opposite sides of said central section along at least one fold line and a pair of end sections respectively joined to its adjacent intermediate section along a fold line extending generally parallel to the fold line between its adjacent intermediate section and said central section; said central section having a slot formed therein for receiving said end flanges; said intermediate sections being folded through approximately 180° over said central section about the fold lines therebetween and said end sections being folded through approximately 90° about the fold lines joining them to their associated intermediate sections and extending through the slot in said central section; said central member being connected to the end sections of the respective end pieces to form said reel.

3,971,528

AUTOMATIC STOP DEVICE FOR TAPE RECORDERS

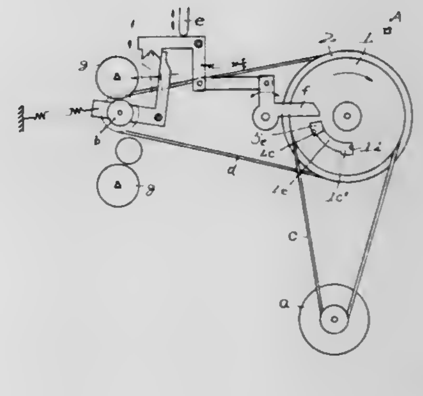
Fumito Komatsu, Suwa, and Sinkichi Yazima, Chino, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 24, 1975, Ser. No. 552,719

Claims priority, application Japan, Feb. 22, 1974, 49-21594

Int. Cl.² B65H *59/38;* G03B *1/02;* G11B *15/13*

U.S. Cl. 242—191 **10 Claims**



1. An automatic stop device for use with a tape recorder comprising: a fly-wheel which is directly coupled to a drive power source for rotation in conjunction therewith; a detector wheel supported in concentric relationship with said fly-wheel, said detector wheel being coupled with a tape feeding member: clutch means coupling said fly-wheel with the detector wheel so as to allow relative rotational slip between said two wheels responsive to a load greater than a predetermined magnitude being applied to said detector wheel; a striking member protruding in a axial direction responsive to said relative rotational slip so as to cause said wheels to come into collision with a member which is operatingly connected with a playback button of the tape recorder, and being displaced by said member so that the rotational force of said striking member is directly coupled to the fly-wheel at said displaced position; means retracting said striking member after said striking member has struck out said member to thereby release said playback button; and a clutch element of said clutch means being directly positioned on said striking member.

3,971,529

FISHING REEL

Klaus Dörbandt, Berlin, Germany, assignor to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G., Berlin, Germany

Filed May 15, 1975, Ser. No. 577,893

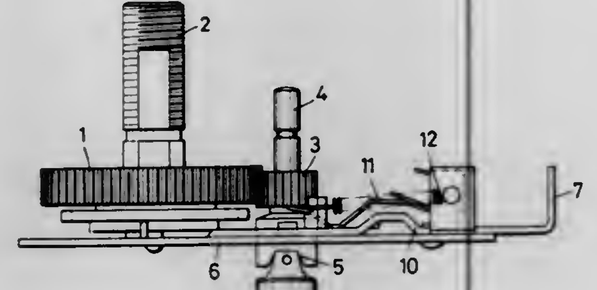
Claims priority, application Germany, June 4, 1974, 2427157

Int. Cl.² A01K *89/00*

U.S. Cl. 242—211 **5 Claims**

1. In a fishing reel, in combination, a slide, a return spring connected with said slide, a shaft, a gear wheel movably mounted upon said shaft, said slide being adapted to engage and move said gear wheel and having a locked position, an input gear wheel, a separate member, means swingably connecting said member in a circumferential direction for a lim-

ited movement with said input gear wheel, and a stop carried by said member and adapted to engage said slide when said member is swung along with said inlet gear wheel to release the locked position of the slide.



3,971,530

FISHING REEL

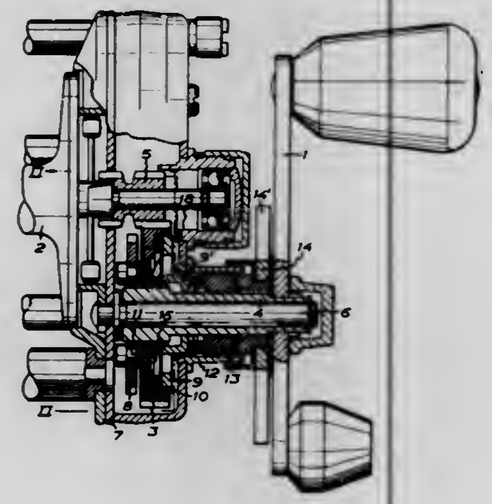
Ake Eugen Murvall, Svangsta, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed May 6, 1974, Ser. No. 467,588

Claims priority, application Sweden, May 11, 1973, 7306661

Int. Cl.² A01K *89/02*

U.S. Cl. 242—217 **5 Claims**



1. A fishing reel comprising
a handcrank;
a rotatably driven part;
a transmission connected between said handcrank and said rotatably driven part and including
a shaft,
an adjustable friction clutch mechanism mounted on said shaft including
  a gear wheel slidably connected by said adjustable friction clutch mechanism to said shaft,
  an element connected for rotary motion with said shaft and supported coaxially with said gear wheel,
  a friction ring located between and adjacent to said gear wheel and said element;
friction clutch adjusting means exerting a controllable force to relatively axially move said element and said gear wheel toward each other for mutual frictional engagement through contact with said friction ring;
a slide signal producing means arranged with said friction clutch adjusting means as an axially compact unit and supported by said element and said gear wheel, respectively, at sides thereof facing each other and in positions encompassed by said friction ring and radially inwardly of said friction ring for signal producing mutual engagement during relative rotational movement between said element and said gear wheel.

3,971,531

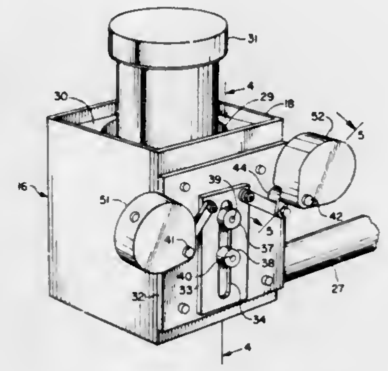
PNEUMATIC COURIER DISPATCH UNIT

Orin H. Davis, 6620 N. 16th Drive, Phoenix, Ariz. 85015

Filed Feb. 20, 1975, Ser. No. 551,307

Int. Cl.² B65G *51/28*

U.S. Cl. 243—25 **6 Claims**



1. In a pneumatic courier system including (i) a plurality of stations connected by pneumatic ducts, (ii) a source of pressurized air for propelling couriers through the system, and (iii) at least one dispatch unit for receiving couriers into the system, said dispatch unit comprising in combination:

a. a housing for receiving the couriers, said housing including an inlet and an outlet;
b. a pair of doors for normally sealing the inlet of said housing, said pair of doors being openable in response to the insertion of a courier into the inlet of said housing, said pair of doors being biased to a normally closed position, each door in said pair of doors including a shaft, each end of which is pivotally mounted to said housing and at least one end of which extends through the external surface of said housing;
c. means for linking the doors of said pair of doors to ensure commensurate movement of each door during insertion of a courier, said linking means comprising in combination:
  1. a first arm rigidly affixed to the externally extending end of one of said shafts;
  2. a second arm rigidly affixed to the externally extending end of another of said shafts;
  3. a slidable guide for interconnecting said first and second arms; and
  4. link means disposed intermediate said guide and each of said first and second arms for translating pivotal movement of said first and second arms into sliding movement of said guide; whereby, said guide inhibits independent pivotal movement of one door in said pair of doors by inhibiting independent pivotal movement of said first or second arm;
d. a passageway extending from the outlet of said housing to the duct for directing a courier from said housing into the duct; and
e. a pipe for establishing fluid communication between the source of pressurized air and said housing, whereby, the air pressure produced within said housing by the air inflowing through said pipe forces the courier through said passageway into the duct upon initial insertion of the courier into said passageway.

3,971,532

RUDDER RESTRAINT FOR GROUNDED AIRCRAFT

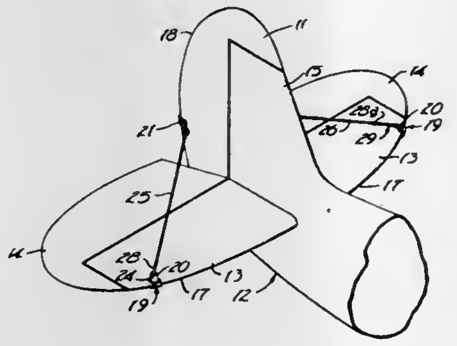
Craig Fountain, P.O. Box 9067, Moscow, Idaho 83843

Filed Aug. 4, 1975, Ser. No. 601,276

Int. Cl.² B64F *1/00*

U.S. Cl. 244—1 R **5 Claims**

1. A rudder restraint for grounded or stored airplanes, comprising:
a first clamp member for engaging the leading edge of a first horizontal stabilizer of an airplane empennage;
a first nonextendible flexible cord connected at one end to the first clamp member;
a rudder trailing edge engaging bracket connected to the remaining end of the first flexible cord;
a second nonextendible flexible cord connected at one end to the rudder engaging bracket;



a second clamp member connected to the remaining end of the second cord for engaging the leading edge of a second horizontal stabilizer of the airplane; and
cord tensioning means for holding the cords taut when the first and second clamp members are in position on the leading edges of the horizontal stabilizers and the rudder engaging bracket is engaged with the trailing edge of the rudder.

3,971,533

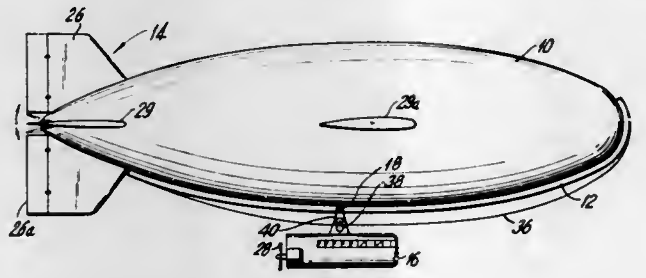
CONVERTIBLE AIRSHIP

Saul I. Slater, 1427 W. 22 St., Sunset Island 4, Miami Beach, Fla. 33140

Filed Feb. 25, 1975, Ser. No. 552,793

Int. Cl.² B64B *1/38*

U.S. Cl. 244—30 **21 Claims**



1. A lighter-than-air airship which comprises:
an elongated gas-containing envelope filled with lighter-than-air gas;
stabilizer means mounted to said envelope for stabilizing the orientation of said airship;
a gondola;
remote control means in said gondola for operating said stabilizer means;
propulsion means mounted to said gondola for providing propulsion capability to said airship to propel said airship during flight and stabilize said airship during maneuvering; and
means for slidably and pivotally mounting said gondola to said envelope and for variably positioning said gondola with respect to said envelope to cause rotation of the longitudinal axis of said envelope from a generally horizontal orientation when said gondola is positioned generally at the midsection of said envelope to a generally vertical orientation when said gondola is positioned generally at the nose of said envelope, while said gondola retains a generally horizontal orientation, such that said airship assumes convenient landing characteristics when said longitudinal axis is generally vertical and said airship is capable of substantial flight when said longitudinal axis is generally horizontal.

3,971,534

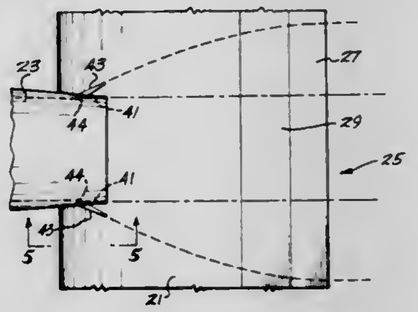
METHOD OF AND APPARATUS FOR CONTROLLING FLOW ATTACHMENT TO THE WING AND FLAP SURFACES OF AN UPPER SURFACE BLOWING TYPE AIRCRAFT

Charles A. Grotz, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1973, Ser. No. 429,658

Int. Cl.² B64C *21/00*

U.S. Cl. 244—42 CD **11 Claims**



1. In an upper surface blowing aircraft wherein a jet exhaust generated by a jet engine is emitted above the upper surface of a wing and flap and flows chordwise thereover so as to attach to said upper surface under a predetermined set of conditions, a method of controlling said jet exhaust flow attachment to said upper surface of said wing and flap comprising the step of varying only the horizontal divergence of said jet exhaust as it is emitted by said jet engine above said upper surface of said wing and flap so as to control the vertical thickness of said jet exhaust and its attachment to said upper surface.

4. In an upper surface blowing aircraft including at least one jet engine and a wing and flap surface, said jet engine being mounted in a position such that the jet exhaust created by said jet engine is emitted from the nozzle of said jet engine above the upper surface of said wing and flap so as to flow over the upper surface of said wing and flap and attach thereto under a predetermined set of conditions, the improvement comprising means for varying only the horizontal divergence of the jet exhaust as it passes over the upper surface of said wing and flap to control the vertical thickness of the jet exhaust and its attachment to said upper surface of said wing and flap.

3,971,535

OBLIQUE-WING SUPERSONIC AIRCRAFT

Robert T. Jones, Los Altos Hills, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 321,180, Jan. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 206,279, Dec. 9, 1971, Pat. No. 3,737,121. This application Aug. 12, 1974, Ser. No. 496,779

Int. Cl.² B64C *3/40*

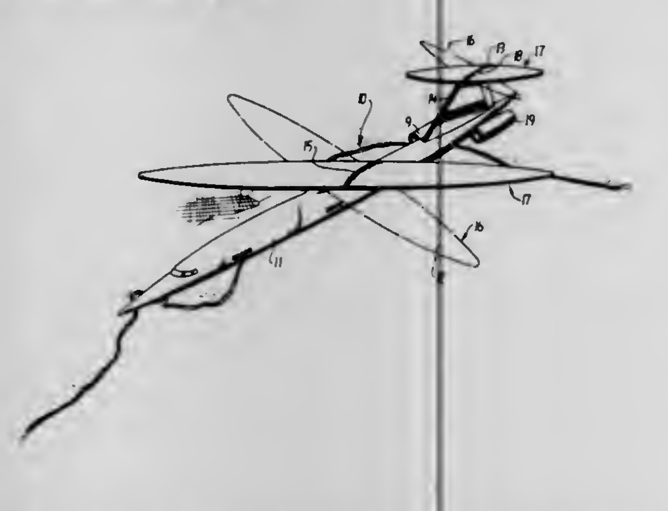
U.S. Cl. 244—46 **20 Claims**

1. An aircraft having variable airframe geometry for accommodating efficient flight at subsonic, transonic, and supersonic speeds, comprising:
  a wing having an approximately elliptic planform, and a curvilinear dihedral formed by the lateral extremities of said wing being curved upwardly from the midspan so as to obtain a substantially elliptical lift coefficient distribution along its length;
  a single elongated fuselage pivotally connected to said wing;
  means for rotating said wing relative to said fuselage such that in the transonic and supersonic speed regimes said wing is oblique with respect to said fuselage and at take-off and landing said wing is perpendicular to said fuselage.

6. In an aircraft having a fuselage and a pivotal wing, a method to optimize said aircraft's capabilities at subsonic,

transonic, and supersonic speeds, comprising the following steps:

selecting said wing to have an elliptic planform with a curvilinear dihedral formed by curving the lateral extremities of said wing upwardly from midspan; placing said wing perpendicular to the longitudinal axis of said fuselage at take-off and landing; and



rotating said wing at transonic and supersonic speeds to an angle of yaw relative to said longitudinal axis of said fuselage such that the Mach number of the free airstream normal to the longitudinal axis of said wing is less than the critical Mach number corresponding to the configuration of said wing.

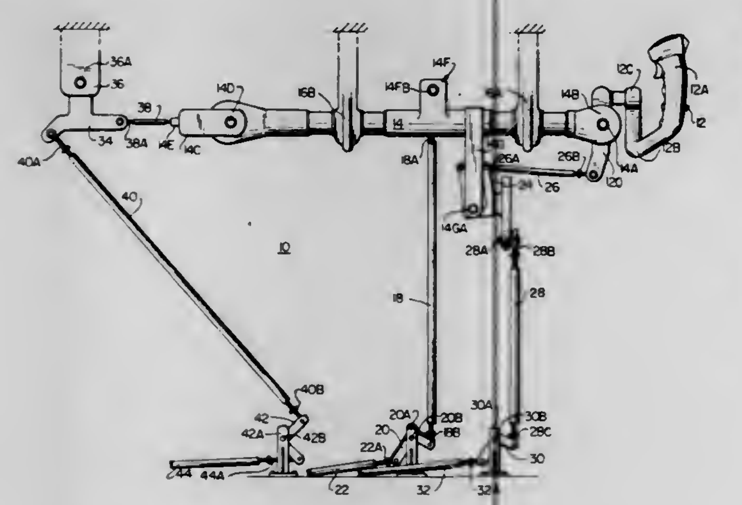
3,971,536
COMBINED HELICOPTER FLIGHT CONTROLLER

John H. Rollins, Jr., Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,627

Int. Cl.² B64C *27/56*

U.S. Cl. 244—83 F **9 Claims**



1. A flight control means for helicopters comprising:

integrated control means for generating cyclic and collective control function commands for rotor control heads of the swash plate type;

mounting means comprising a main control shaft for mounting said integrated control means for rotation in a first plane to provide a first cyclic control input, for rotation in a second plane on an axis orthogonal to that of said main control shaft to provide a second cyclic control input, and for translation in a third plane parallel to said second plane to provide a collective control input;

first displaceable output means responsive to rotation of said integrated control means in said first plane to provide a first cyclic control command;

second displaceable output means responsive to rotation of said integrated control means in said second plane to provide a second cyclic control command; and

third displaceable output means responsive to translation of said integrated control means in said third plane to provide a collective control command.

3,971,537
ADJUSTABLE TRACK MOUNTING DEVICE IN RAIL SYSTEM FOR MAGNETIC-SUSPENSION VEHICLES

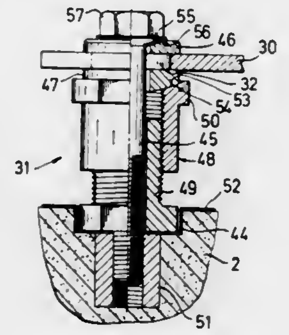
Günther Winkle, Munich; Peter Schwärzler, Fürstenfeldbruck; Peter H. Otto, Munich; Peter Mölzer, Hebertshausen, and Christian Walkner, Dachau, all of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Division of Ser. No. 378,966, July 13, 1973, Pat. No. 3,882,790. This application Mar. 27, 1974, Ser. No. 455,323

Claims priority, application Germany, July 17, 1972, 2335036; Jan. 25, 1973, 2303552

Int. Cl.² F16M *5/00, 3/00*

U.S. Cl. 248—23 **1 Claim**



1. A device for adjustably mounting a rail-carrying element having a lug member upon a support, especially in the track of a suspension vehicle, said device comprising a nut member anchored in said support, a pair of threadedly interconnected spacer sleeves interposed between said support and said lug member, and a bolt traversing said lug member and said pair of spacer sleeves engaging said nut member, while having a head member adapted to clamp said lug member against said pair of spacer sleeves and said sleeves against said support, one of said sleeves being formed with a generally spheroidal surface and a disk with a complementary spheroidal surface is interposed between said one of said sleeves and an adjoining member for enabling angular positioning of said lug member with two degrees of freedom relative to said support.

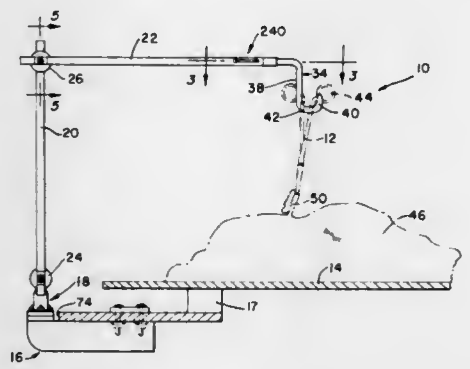
3,971,538
SURGICAL INSTRUMENT SUPPORT

Jack M. Marvich, 3516 Inwood Ave., New Orleans, La. 70114

Filed Sept. 16, 1975, Ser. No. 613,889

Int. Cl.² A47G *29/00;* **A47F** *5/04*

U.S. Cl. 248—278 **5 Claims**



1. A device for holding surgical instruments, comprising:

clamping means attached to a table;

mounting means rotatably attached to said clamping means so that said mounting means can be rotated with respect to said table;

a first movable arm having two ends and pivotally connected at one end to said mounting means;

a first brake means connecting said first movable arm at said one end to said mounting means to provide selectively adjustable pivotal engagement between said first movable arm and said mounting means, said first brake means including a pair of facially engaged discs located between said mounting means and said first movable arm one end, each disc having a groove defined in a rear surface thereof in which an outer surface of said first movable arm and said mounting means are respectively engaged;

a second movable arm having two ends and pivotally connected at one end to the other end of said first movable arm, said second movable arm having a longitudinal bore in the other end thereof;

a second brake means connecting said second movable arm one end to the other end of said first movable arm to provide selectively adjustable pivotal engagement between said first and second movable arms, said second brake means including a pair of facially engaged discs located between said second movable arm one end and said first movable arm other end, each disc having a groove defined in a rear surface thereof in which an outer surface of said first and second movable arms are respectively engaged;

an instrument supporting hook detachably mounted on said other end of said second movable arm for supporting surgical instruments, said instrument supporting hook being formed of an autoclavable material; and

locking means on said second movable arm including a lever pivotally mounted on said second arm and having a finger on one end thereof adapted to fit into an access hole in said second arm, and biasing means mounted on said second arm and attached to said lever to bias said finger into said access hole for releasably engaging said supporting hook, to detachably lock said hook to said second movable arm.

3,971,539
METHOD FOR PREVENTING THE ADHESIVE DEPOSITION OF SLUDGE ON THE SURFACE OF PARTS OF A PLANT FOR TREATING METAL SURFACES

Issei Goto, Funabashi, and Suzo Hara, Sakura, both of Japan, assignors to Parker Sangyo Co., Ltd., Tokyo, Japan

Filed Sept. 27, 1973, Ser. No. 401,146

Claims priority, application Japan, Nov. 29, 1972, 47-118870

Int. Cl.² B01K *1/00;* **B05B** *5/02*

U.S. Cl. 250—529 **5 Claims**

1. In a process for depositing a phosphate film onto the surfaces of metallic articles by spraying a phosphate containing coating solution through applicators onto said articles in which the residual phosphate solution resulting from said spraying is gathered in a recirculating tank equipped with heating coils and then returned through a non-magnetic conduit to said applicator means, wherein a means is provided for preventing deposition of an insoluble phosphate sludge in said applicators, on the inner surfaces of said conduit and on the outer surfaces of said heating coils, the improvement which comprises:

preventing deposition of said phosphate sludge by passing said phosphate coating solution containing phosphate sludge in amounts of 1 to 10 grams/liter through said conduit having a diameter of 2 to 12 inches; and simultaneously

subjecting said solution to a magnetic field from magnets each possessing a magnetic flux of 3000 to 5000 Gauss.

3. The method of claim 1, wherein said solution is continuously recirculated through said conduit and past said magnetic field.

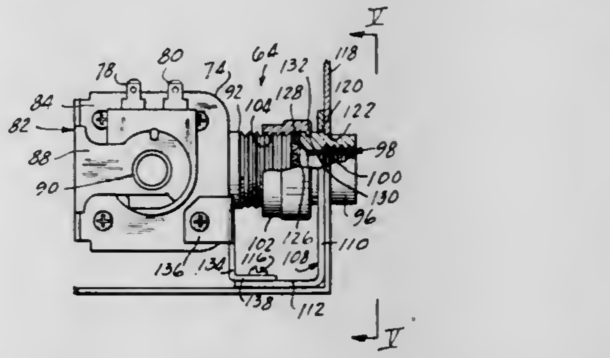
3,971,540
CONTROL VALVE AND MOUNTING ASSEMBLY FOR AN APPLIANCE

Philip Paul Johnson; William F. Gourdeau, and Ronald E. Hahn, all of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 4, 1974, Ser. No. 511,989

Int. Cl.² F16L *15/00;* **F16K** *51/00*

U.S. Cl. 251—143 **6 Claims**



1. A control valve assembly for controlling the flow of liquid supplied under pressure from external plumbing through a conduit to a washing area within the cabinet of an appliance, said control valve assembly comprising:

an electrically operated control valve for selectively providing fluid communication between the external plumbing and the conduit;

a swivel connector including

  a mounting bracket for attaching said connector to the cabinet, said mounting bracket including first and second portions,

  a fixed portion having a fluid passageway therein for connection to the external plumbing, said fixed portion connected to said first portion of said mounting bracket, and

  a movable portion releasably connecting said fixed portion in communication with said control valve; and

grounding means connecting said control valve to the cabinet,

  said grounding means including an adjustable registration device orienting said control valve with respect to the cabinet and placing said control valve and the cabinet at the same electrical potential, said grounding means electrically connected to said control valve and including a portion commonly connected to the cabinet with said second portion of said mounting bracket.

3,971,541
MANUALLY OPERABLE SELF-CLOSING VALVE

Raymond E. Griffin, 9442 W. Pine, Mokena, Ill. 60448

Filed Jan. 3, 1975, Ser. No. 538,363

Int. Cl.² F16K *31/44*

U.S. Cl. 251—347 **9 Claims**

1. A manually operable self-closing valve comprising:

first and second body members having end surfaces in face to face relationship;

the first body member having a port formed therein;

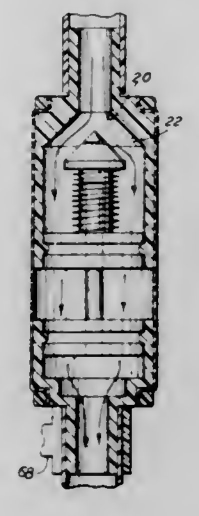
a plug rigidly mounted on the second body member and adapted to seal said port;

an elastic tube fitted longitudinally over said body members and forming a liquid-tight connection therebetween so that the space between said end surfaces is in liquid communication with said tube;

said elastic tube normally urging said plug and port into valve sealing engagement and being longitudinally responsive to linear forces applied to the opposite ends and parallel to the longitudinal axis thereof; and

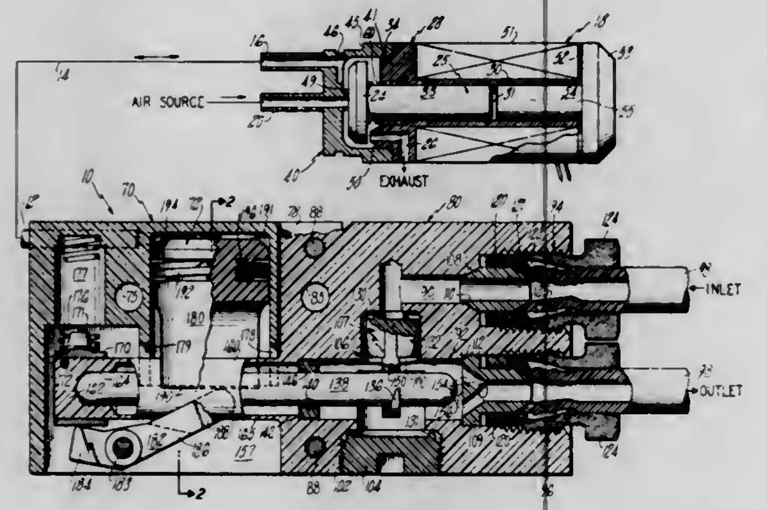
means on said body members for releasably connecting one or the other thereof into the discharge line of a liquid system.

said valve being operable, after connection of one of said body members into a discharge line, by applying a linear force to the free body member and pulling the same away from the connected body member to open the valve and



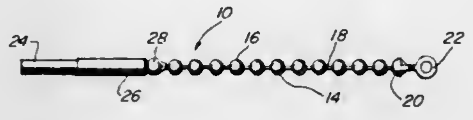
further separate said end surfaces and releasing the same whereupon said elastic tube automatically urges the valve closed.

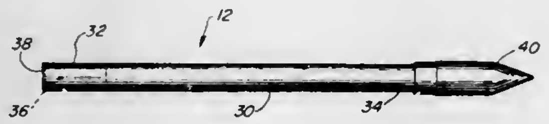
3,971,542
FLUID VALVE AND VALVE SYSTEM
Leighton Lee, II, Guilford, Conn., assignor to The Lee Company, Westbrook, Conn.
Filed July 5, 1974, Ser. No. 485,789
Int. Cl.² F16K *31/12*
U.S. Cl. 251—58 **14 Claims**



1. In a valve comprising a valve body with passageway means therein including fluid passageway means with a valve operating chamber, a valve member shiftable within the valve operating chamber for controlling the flow through the fluid passageway means, and valve operating means for shifting the valve member for controlling the fluid flow through the fluid passageway means, the improvement wherein the valve operating means comprises a valve member operating lever pivotally mounted within said valve body passageway means and having a lever arm at one end of the operating lever for pivoting the operating lever for shifting the valve member, wherein the valve body is a one-piece plastic valve body with an integrally formed imperforate enclosed tubular projection receiving the lever arm and forming therewith a lever combination, the tubular projection completely enclosing the lever arm within said plastic valve body passageway means and being flexible to permit pivoting the lever combination and thereby pivot the lever arm enclosed therein for shifting said valve member, and wherein the valve operating means further comprises means for pivoting the lever combination for shifting the valve member.

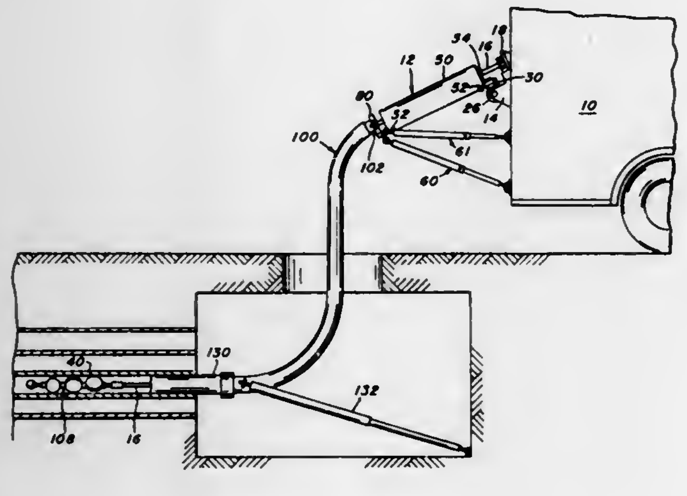
3,971,543
TOOL AND KIT FOR ELECTRICAL FISHING
William F. Shanahan, 2306 S. 3rd St., Philadelphia, Pa. 19148
Filed Apr. 17, 1975, Ser. No. 569,146
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **4 Claims**





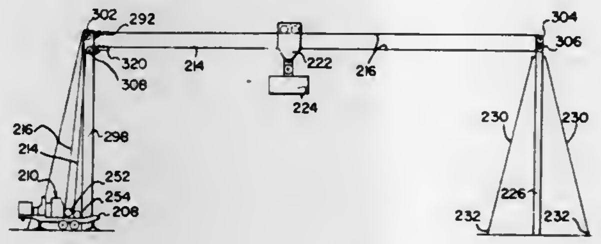
1. A tool for fishing for electrical wires and the like comprising a magnet means and a multi-part sensor assembly; said sensor assembly comprising a chain and a rod-shaped contactor connected to one end of said chain, said chain and said rod-shaped contactor being comprised of magnetically attractable materials and being connected by a connecting sleeve which encompasses part of said contactor and part of said one end of said chain; at least some of the parts of said sensor assembly having differing magnetic properties whereby varying forces are encountered when said sensor assembly is drawn across said magnet means.

3,971,544
APPARATUS FOR GUIDING A ROD INTO A CONDUIT
Raymond W. Smith, Jr., Texarkana, Ark., assignor to Rockwell International Corporation, Pittsburgh
Filed Nov. 5, 1975, Ser. No. 628,868
Int. Cl.² H02G *1/00*
U.S. Cl. 254—134.3 FT **16 Claims**



1. Apparatus for inserting rod into a conduit comprising, a length of rod wound on a reel spaced from said conduit, an elongated support one end of which is positioned adajcent the end of said rod when wound on said reel, a guide conduit extending between the other end of said support and the conduit into which said rod is to be inserted, removable cover means on said support extending substantially the length of said support whereby said support and said cover provide conduit means to guide the end of said rod into said guide conduit when said rod is unwound from said reel.

3,971,545
FLUID ACTUATED DYNAMIC BRAKE
Charles P. Warman, P.O. Box 1550, Wichita Falls, Tex. 76307
Continuation-in-part of Ser. No. 245,754, April 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 883,517, Dec. 9, 1969, abandoned, which is a division of Ser. No. 706,575, Feb. 19, 1968, Pat. No. 3,500,764. This application Dec. 21, 1972, Ser. No. 317,407
Int. Cl. B66d *1/48*
U.S. Cl. 254—173 R **11 Claims**

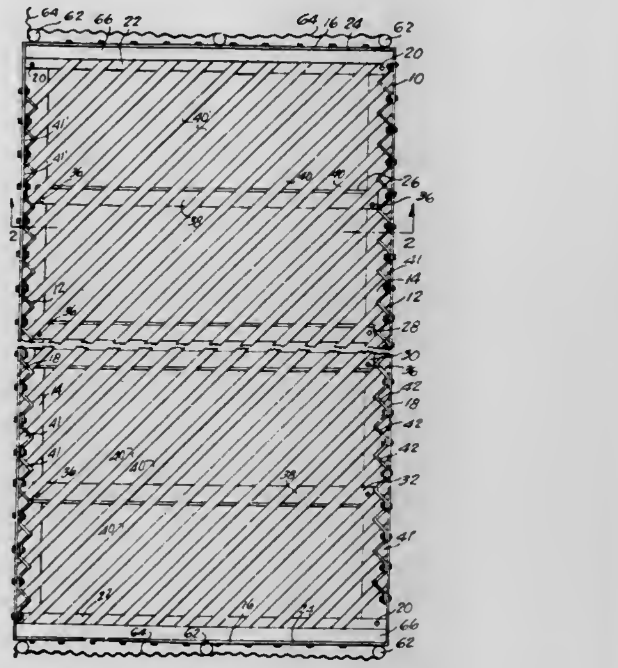


1. A dynamic braking friction-coupled device to constantly rotate a friction element with respect to a driven friction element, including a first fluid pressure actuated device comprising:

a. a first power drive unit,
  1. a first shaft,
  2. a load controlling device,
  3. a load moving device mounted on said first shaft,
b. a second shaft,
  1. friction clutch means mounted on said second sahft and connected in power driven relation with said first power drive unit, and with said load moving device on said first shaft,
  2. fluid pressure actuated means in fluid communication with said clutch to selectively engage said friction elements within said clutch,
  3. liquid cooling conduits leading to and through said friction clutch means to circulate a coolant to dissipate heat thereof,
c. a second power drive unit,
  1. gearing means connected to said second power drive unit,
  2. a dynamic braking mechanism mounted on said first shaft and connected with said gearing means to control the torque on said first shaft,
  3. sensing means to selectively sense the change in load on the load moving device to control the air input to the air actuated device and said dynamic brake to control the degree of engagement of said friction elements.

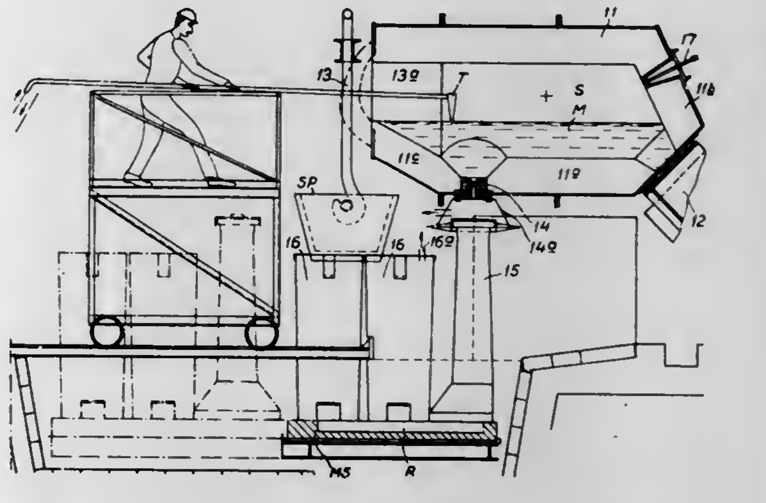
3,971,546
ANIMAL CROSSING GUARD
A. J. Bruner, 2166 Katherine St., Fort Myers, Fla. 33901
Filed Apr. 21, 1975, Ser. No. 569,702
Int. Cl.² A01K *3/00*
U.S. Cl. 256—14 **5 Claims**

1. An animal crossing guard allowing the passage of vehicular traffic while preventing the passage of hooved animals thereover comprising, in combination, a rectangular frame having longitudinal and end members with vertical flanges each having a series of bolt holes therealong, brackets each having two faces normal to each other, one of said faces containing an aperture, said brackets each having flanges with each flange extending on an obtuse angle from one of said faces, said flanges each having a bolt hole therethrough, bolts extending through said bolt holes of said flanges and said bolt holes of said vertical flanges of said frame with said brackets being disposed adjacent to each other along said vertical flanges within said frame with said faces of said brackets being in vertical planes, and bars extending between said vertical flanges into the apertures of said bracket faces, said brackets supporting said bars spaced distances apart from and parallel



to each other and extending across said frame at an angle to said vertical flanges forming a grid therein.

3,971,547
APPARATUS AND METHOD FOR REFINING METAL
Bengt Fredrikson, Vasteras, and Karl-Erik Öberg, Hagfors, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Aug. 22, 1974, Ser. No. 499,759
Claims priority, application Sweden, Aug. 23, 1973, 73114647
Int. Cl.² C21C *5/46*
U.S. Cl. 266—244 **1 Claim**



1. A metal-refining converter comprising an elongated vessel for containing a melt to be refined and which tilts so that it can be positioned upright or horizontal, said vessel having an upper end having a charging opening provided with a removable gas-tight cover and a lower end provided with a channel-type inductor and the vessel having a closable tap hole in its side which is downward when the vessel is horizontal, said vessel having an internal contour permitting it when horizontal to hold said melt with a space above the melt, and said inductor having a channel positioned to receive and heat the melt when the vessel is horizontal, said vessel having means for injecting pressurized-gas into said space when the vessel is horizontal, said inductor's channel extending downwardly from said lower side and forming a sump for retaining a portion of said melt after the latter is tapped from said vessel when the vessel is horizontal, and said inductor's channel extending diagonally with respect to said vessel's longitudinal axis so that the inductor can produce heat via said melt por-

tion retained in said sump, when the vessel is tilted upright, said vessel having at least one pipe connection for injecting melt-refining material into the lower portion of a melt charged in said vessel with the latter upright, said cover having an exhaust opening, said inductor by Pinch effect producing stirring currents in said melt which come to a focus in the melt, and said pipe connection pointing towards said focus and injecting said material at least approximately into said focus.

3,971,548

METALLURGICAL FURNACE HAVING A BLAST INJECTION NOZZLE

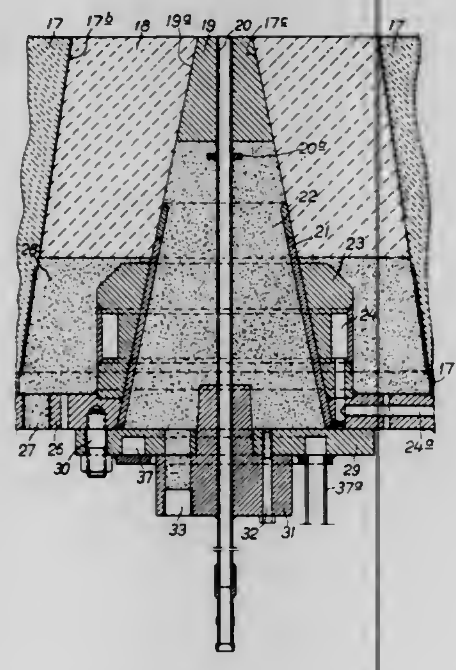
Kåre Folgerö, Vasteras; Lars-Gunnar Norberg, Hagfors, and Karl-Erik Öberg, Borlange, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 20, 1975, Ser. No. 560,204

Claims priority, application Sweden, Mar. 20, 1974, 7403730

Int. Cl.² C21C *5/48*

U.S. Cl. 266—218 5 Claims



1. A metallurgical furnace having a wall with an inside contacted by molten metal, the wall having a nozzle opening, and a nozzle in said opening and forming a passage for injecting a blast into said metal, said nozzle having means for liquid-cooling the outer end of said passage to freeze said metal when flowing backwardly through the passage in the event of a blast failure, said nozzle opening and nozzle being conical and the nozzle being removable from the opening, the nozzle comprising a metal conical shell having an outer flange for connection with the outside of the vessel's said wall, said flange having an opening into said shell and through which a fluent refractory material can be injection molded into the shell, a pipe extending longitudinally through the shell and flange forming a blast passage.

3,971,549

PROCESS AND APPARATUS FOR TREATING AND TRANSFERRING METAL IN THE LIQUID STATE

Alan L. Habig, 4048 Lehigh Blvd., Decatur, Ga. 30034

Filed Mar. 5, 1975, Ser. No. 555,438

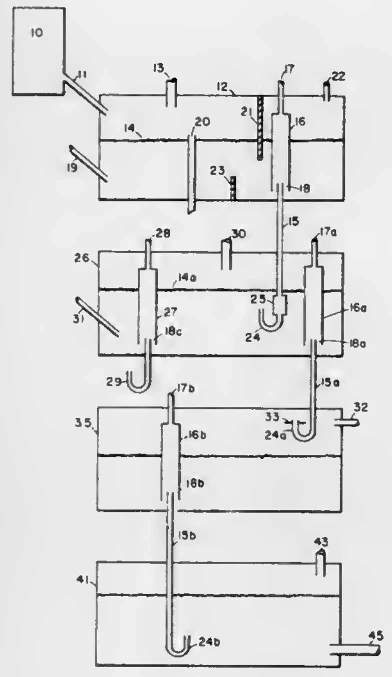
Int. Cl.² C21B *13/14*

U.S. Cl. 266—215 7 Claims

1. Apparatus for transferring metal in the molten state from a first zone to a second zone at a lower level by gravity flow which comprises

a. a transfer pipe communicating between said zones with its open upper end terminating below the normal level of liquid within said first zone and with its lower end terminating in a dip leg trap within said second zone;

b. a gas pressure pipe having a larger inside diameter than the outer diameter of the transfer pipe said gas pressure pipe being positioned within said first zone so as to surround and extend below the upper inlet end of said transfer pipe; and



c. means for introducing a gas under pressure into said gas pressure pipe,

whereby exertion of gas pressure within the gas pressure pipe will cause the level of liquid in the annulus between the two pipes to be forced below the inlet of the transfer pipe.

3,971,550

EYE-BUSH

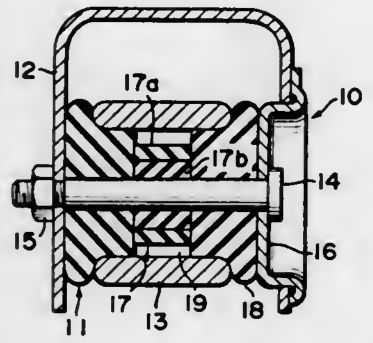
Chikara Matsuoka, and Yuichi Amano, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 21, 1975, Ser. No. 542,752

Claims priority, application Japan, Jan. 25, 1974, 49-10665

Int. Cl.² F16F *7/12*

U.S. Cl. 267—57.1 R 4 Claims



1. An eye-bush for use with a load carrying member for absorption of radial loads applied thereon, comprising a cylindrical elastic bushing which is adapted to fit elastically within a hollow cylindrical eye portion formed on the load carrying member while being laterally firmly clamped in and by portions of a holding bracket disposed adjacent the opposite ends of said eye portion, said cylindrical bushing having a pair of axial outer cylindrical portions which engage said holding bracket portions respectively and which are spaced from one another by a coaxial intermediate cylindrical bushing portion having a diameter less than that of said outer portions, said intermediate portion of said elastic bushing comprising a plurality of stratified annular layers of different elastic materials disposed in superposed coaxial relation to one another about the axis of said bushing and comprising an inner annular layer and an outer annular layer, said inner annular layer being fabricated of a material having a greater hardness than the material of said outer annular layer, the outer annular layer of said intermediate portion having an outer diameter which is smaller than the inner diameter of the eye portion of the load carrying member to define a gap between the inner surface of said eye portion of said load carrying member and the outer surface of said outer annular layer.

3,971,551

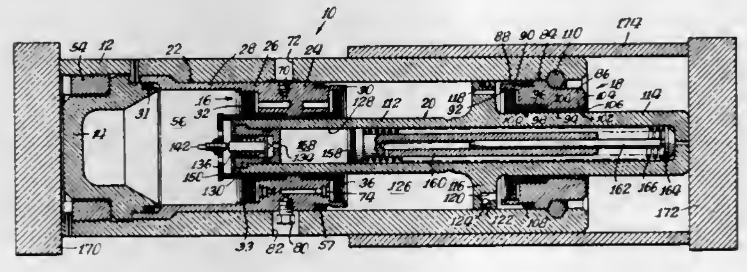
SHOCK ABSORBER

Giles A. Kendall, Burbank, Calif., and William D. Wallace, Northfield, Ill., assignors to Menasco Manufacturing Company, Burbank, Calif. and Miner Enterprises, Inc., Chicago, Ill.

Filed July 21, 1975, Ser. No. 597,575

Int. Cl.² F16F *5/00*

U.S. Cl. 267—65 R 9 Claims



1. A shock absorber comprising an elongated casing with a primary chamber therein, a piston rod having a variable volume auxiliary chamber therein and extending at its rear end into said primary chamber, said piston rod having aperture means adjacent said rear end thereof for placing said primary and auxiliary chambers in communication, valve means adjacent said aperture means and normally disengaged therefrom, a compressible medium filling said primary and auxiliary chambers, said variable volume auxiliary chamber accommodating changes in volume of said compressible medium resulting from changes in temperature of said medium, said valve means being engaged with said aperture means for closing the latter and interrupting communication between said primary and auxiliary chambers as said rear end of said piston rod initially moves into said primary chamber, and said compressible medium in said primary chamber providing a damping and spring force on said piston rod as said rear end of said piston rod thereafter moves into said primary chamber and reduces the volume of said compressible medium therein.

3,971,552

QUICK RELEASE PIPE VISE

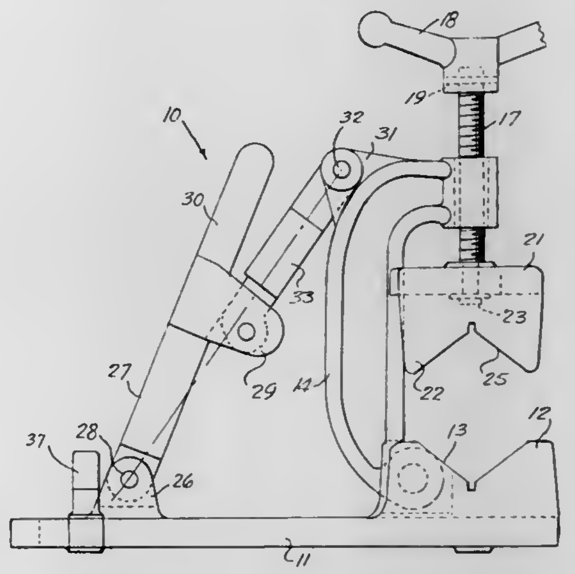
Johnny W. Mayfield, 4505 Greenstone Road, Placerville, Calif. 95667

Filed Nov. 12, 1975, Ser. No. 631,308

Int. Cl.² B25B *1/14*

U.S. Cl. 269—228 3 Claims

1. A pipe vise including a base plate, a plurality of spaced parallel V-shaped pipe jaws rigidly secured to said base plate, a generally C-shaped upper jaw frame member having its lower end pivotally secured to a pair of said jaws on said base plate with a generally horizontal pivot, an upper jaw member, hand controlled means extending through the upper end of said frame member for moving said upper jaw member along said frame member toward said lower jaws, and an over center linkage extending between the upper end of said frame member and said base plate at an angle to releasably rigidly support said frame member in upright position.



3,971,553

AUTOMATIC SHEET CHANGING SYSTEM FOR REPROGRAPHIC MACHINES

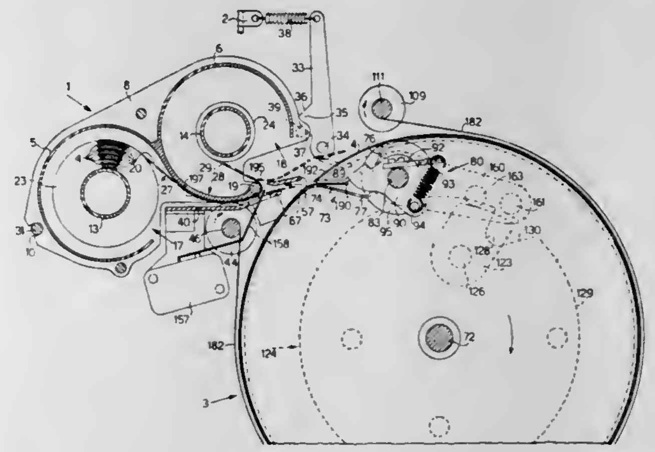
Nicola Cosmo, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 26, 1975, Ser. No. 607,868

Claims priority, application Italy, Sept. 2, 1974, 69662/74

Int. Cl.² B65H *5/12*

U.S. Cl. 271—3 10 Claims



1. An automatic sheet changing system for a reprographic machine comprising:

- a sheet receiving member;
- retaining means actuatable for retaining a sheet onto said sheet receiving member;
- a feed reel;
- a take-up reel;
- a flexible support wound from said feed reel to said take-up reel;
- a plurality of sheets positioned regularly spaced on said support and interwound with the support on said feed reel;
- means mounting said feed reel and said take-up reel on the machine with the portion of said flexible support extending from the feed reel to the take-up reel passing adjacent the gripping elements of said receiving member;
- means operative in a sheet changing cycle for removing a used sheet from the sheet receiving member;
- means operative during said cycle for advancing a predetermined length of flexible support along said path by unwinding it from the feed reel and rewinding it to the take-up reel;

means for separating a fresh sheet advancing with the support along said path during said cycle and for guiding the fresh sheet to the retaining elements; and

means for actuating the retaining elements to retain the fresh sheet.

3,971,554

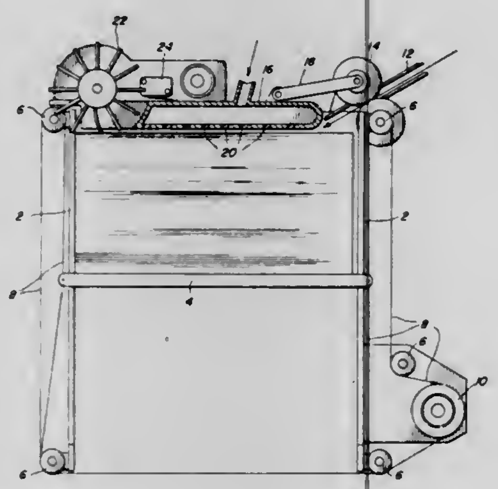
SHEET STACKER

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 9, 1975, Ser. No. 539,763

Int. Cl.² B65H *29/24, 31/10*

U.S. Cl. 271—195 1 Claim



1. A sheet stacking apparatus for receiving and stacking sheets including:

a sheet tray having a planar base plate for stacking sheets thereon and a side wall for abutting sheets thereagainst;

guide means disposed adjacent said tray to direct sheets therein at an angle relative to the plane of said base plate, said base plate being movable in a vertical direction to maintain the top of the stacked sheets adjacent said guide means as the stack height increases with the addition of sheets thereto;

feed means associated with said guide means to feed sheets through said guide means into said tray;

air plenum means having a plurality of air discharge ports therein canted at an angle relative to said base plate for discharge of air against incoming sheets in the direction of movement of the sheets to forward the sheets toward said wall, said air plenum means being disposed above the sheets in the stack for discharge of air in a downward, angled direction;

said air plenum means being mounted for limited movement in a vertical direction, discharge of air therefrom causing said plenum means to float above the sheet stack;

indexing means adapted for vertically indexing said base plate; and,

switch means adapted for contact by said plenum means when the height of the sheets in the stack causes said plenum means to float above a predetermined level, said switch means being adapted to energize said indexing means to lower said base plate and the sheets stacked theron to provide space above the stack for receipt of subsequent sheets presented thereto.

3,971,555

MULTIPURPOSE BODY EXERCISING MACHINE

Parker E. Mahnke, Glendale, Calif., assignor to Marcy Gymnasium Equipment Co., Glendale, Calif.

Continuation of Ser. No. 356,518, May 2, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,435

Int. Cl.² A63B *21/06*

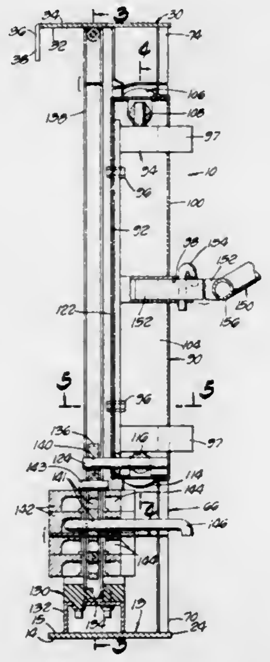
U.S. Cl. 272—118 6 Claims

1. A body-exercising machine comprising:

a. an upright supporting structure having vertical tracks generally "C" shaped in cross-section and having a pair of generally arcuate wheel engaging portions and a pair of flanges extending generally at right angles to each other and interconnecting said wheel engaging portions;

b. a vertically reciprocative carriage mounted in and guided by said tracks, said carriage being provided with wheels which have generally arcuate shaped peripheries adapted to engage said wheel engaging portions of said tracks and said wheels further including generally conically shaped hub means adapted to engage said flanges of said tracks upon lateral movement of said wheels relative to said tracks;

c. adjustable resistance means for varying the load against a user, said resistance means comprising a plurality of vertically movable apertured weights, a bar supporting said weights, said bar being supported in said upright structure and positioned below said carriage and connected directly to and biasing said carriage downwardly;



d. body-engaging means on said carriage for engagement and movement by a user only in vertical straight line direction and being adjustable, whereby the body-engaging means may be adjusted to different starting positions on the carriage; and

e. vertical guide means disposed within said upright structure between said vertical track means for vertically guiding said weights upon vertical movement of said vertically reciprocative carriage, said guide means comprising a pair of guide rods extending through said weights, said guide bars being located on opposite sides of said weight supporting bar.

3,971,556

COMBINATION BOOK END AND DUMBELL APPARATUS AND METHOD OF UTILIZING SAME

Robert D. Petrie, 28890 W. Chicago, Livonia, Mich. 48150; Thomas E. Wensley, 22034 Gregory, Dearborn, Mich. 48124; Charles Watkins, 19401 Newburg Road, Livonia, Mich. 48151, and Juan Gaminde, 29610 Grandon, Livonia, Mich. 48150

Filed Oct. 10, 1974, Ser. No. 513,886

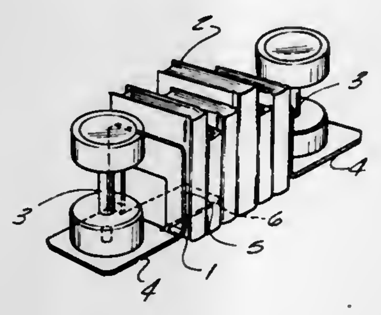
Int. Cl.² A63B *11/00*

U.S. Cl. 272—122 5 Claims

1. A device for physical exercise removeably mounted on a supportive apparatus for books and other office material;

said supportive apparatus comprises at least one horizontal member with a stud affixed to a first section of said horizontal member, a tongue comprising a second section of said horizontal member, a vertical member affixed to said horizontal member at the end of said tongue toward said stud;

said device for physical exercise comprises a dumbbell having a short bar between two enlarged end portions, with one end portion of said device being flat on the bottom side with at least one cavity, shaped and oriented to mate with said stud, so that said device may be readily removed from said apparatus, the said end portion being of any suitable geometric shape, the short bar between the said end portions being long enough to accept a clenched fist.



3,971,557

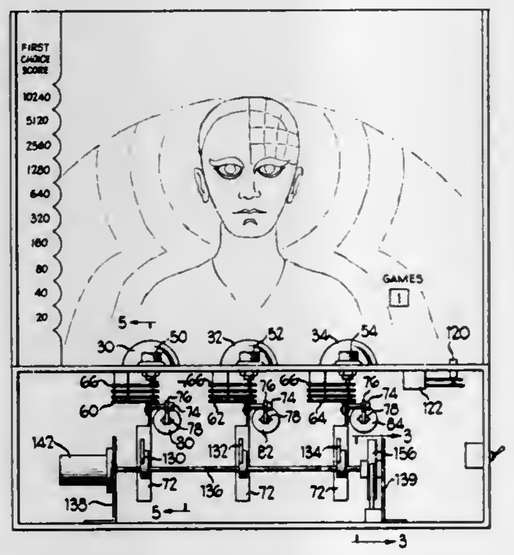
CHANCE AMUSEMENT DEVICE

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 13, 1975, Ser. No. 558,064

Int. Cl.² A63F *9/00*

U.S. Cl. 273—1 E 19 Claims



1. A game apparatus, comprising:

a base having a plurality of stations thereon;

a plurality of independently actuatable signal devices having a normal deactivated state and a second activated state mounted on said base, at least one at each station;

means to randomly activate the signal devices at only one station at a time;

a plurality of independently movable opaque covers, one at each station, for covering the signal device thereat and mounted for movement between a normal first position covering the associated signal device and a second position uncovering the associated signal device for observance by players of the game; and

a plurality of selectively and independently actuatable cover moving means operable by a player of the game, one for each station and operatively associated with the cover thereat, for moving the cover from its first position to its second position to expose the signal devices thereunder.

3,971,558

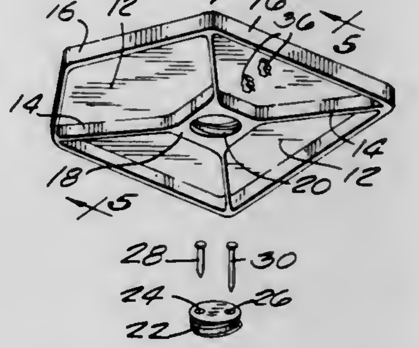
BASE MARKER FOR BASEBALL

Alfred D. Gardetto, 16880 West Sundown Court, New Berlin, Wis. 53151

Filed July 9, 1973, Ser. No. 377,493

Int. Cl.² A63B *71/00*

U.S. Cl. 273—25 2 Claims



1. A baseball base marker comprising a flat polygonal shaped plate having at least one opening in the central portion thereof, a plug dimensioned to removably fit within said opening, means for removably securing said plug to said plate within said opening, and at least two spikes of unequal length attached to said plug and projecting downwardly therefrom for securing said plate to the ground, said plate having recessed portions in its lower surface, said spikes being removably attached to said plug, and a clip attached within one of said recessed portions of said plate adapted to grip and hold said spikes within said recessed portion to store said spikes therein.

3,971,559

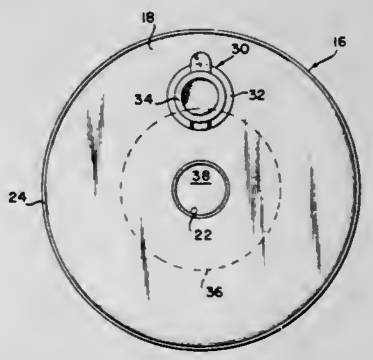
WEIGHTING DEVICE FOR ATTACHMENT TO BASEBALL BATS

Mariano P. Diforte, Jr., Baltimore, Md., assignor to Bat Weight, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 397,713, Sept. 17, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 499,905

Int. Cl.² A63B *69/40*

U.S. Cl. 273—26 R 11 Claims



1. A weighting device for attachment to a conventional baseball bats including:

a. a collapsible member of substantially doughnut shape having a bore, the size of which permits the handle portion of the bat to be passed through the bore while effecting frictional engagement of the portion of the member defining the bore with the barrel portion of the bat, for preventing relative longitudinal movement of said member with respect to the bat, when the latter is swung,

b. said collapsible member comprising a pair of like, opposed, annular walls of flexible sheet material,

c. means for sealing together the inner edges and outer edges respectively of said walls to provide an annular chamber therebetween,

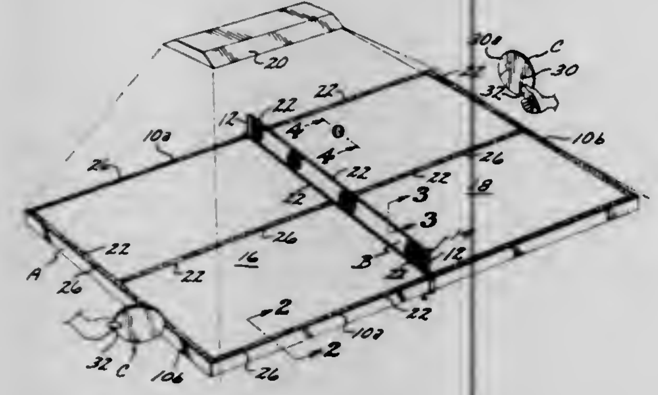
d. a substantially rigid stiffener of annular shape fixed to said collapsible member proximate the bore thereof for controlling the stretching of said walls when engaged with a baseball bat,

e. weighting substance, and

f. valve means in one of said walls for admitting said weighting substance to the annular chamber for use of the device, and to permit removal of said weighting substance therefrom, for collapsing the member.

3,971,560
FLUORESCENT TABLE TENNIS ASSEMBLY

James L. Panosh, Fullerton, Calif., assignor to Alpha Nova Development Corporation, Santa Ana, Calif.
Filed Mar. 21, 1975, Ser. No. 560,691
Int. Cl.^{2} A63B *69/36*
U.S. Cl. 273—30 **2 Claims**



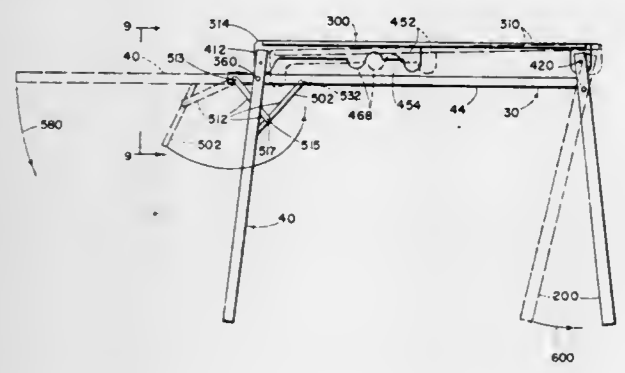
1. In combination with a source of ultra violet light, a tennis table assembly that may be used in the dark that includes a flat, horizontal, rectangular surface, a transverse vertically extending net that divides said surface into first and second portions, a resilient hollow ball, and a pair of paddles that define striking surfaces thereon, said table tennis assembly being characterized by:

a. first means that outline the outer boundary of said surface, said first means fluorescing and being visible when exposed to said ultra violet light;
b. second means that outline the edges of said net, said second means fluorescing and being visible when exposed to said ultra violet light;
c. third means carried on said ball, said third means fluorescing and being visible when exposed to said ultra violet light; and
d. fourth means that cover said striking surface, said fourth means fluorescing and being visible when exposed to said ultra violet light, and said table tennis assembly capable of being used in the dark when exposed to said ultra violet light due to the boundary of said playing surface, the edges of said net, said ball, and said striking surfaces being visible to the players using said assembly.

3,971,561
STORABLE MULTI-USE CHILDREN'S EXERCISING ASSEMBLY

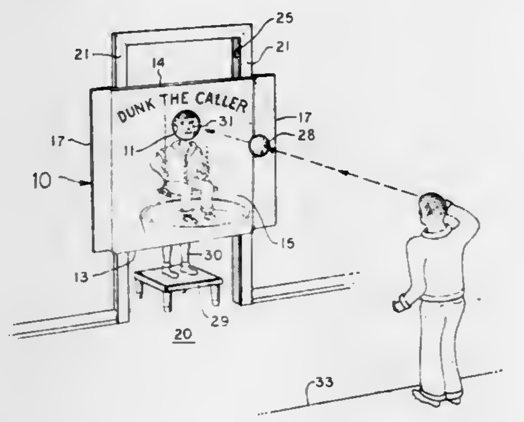
Le Roy S. Wenzel, 630 S. 124th Ave., Omaha, Nebr. 68154
Filed July 20, 1973, Ser. No. 381,358
Int. Cl.^{2} A63G *21/00;* **A63B** *17/04*
U.S. Cl. 272—56.5 R **5 Claims**

1. A collapsible children's exercising assembly comprising: three elongated sections comprising a central section and first and second support sections, section-connecting means connecting said sections together and permitting movement of said sections into storage positions alongside each other and also permitting movement of said sections into slide positions in which said central section inclines downwardly in general parallelism with and also end-to-end relationship with said first support section, when said sections are in said slide position said second support section being disposed upwardly extending and transverse to said central section and at least mostly beneath said central section, and also said section-connecting means permitting movement of said sections into a Jungle Gym position in which said support sections both extend transversely downwardly from and are approximately normal to said central section, said section-connecting means causing the ends of said central section to be firmly supported by said first and second support sections respectively when said sections are in said slide and Jungle Gym positions and while lower ends of said support sections are rested on a horizontal floor surface, said central section having two longitudinal side members interconnected by transverse rungs, said second support section having step means thereon to facilitate climbing thereon, slide panel means on said central and first support sections, and attachment means attaching said slide panel means on said central and first support sections when said sections are in said slide positions, whereby said slide panel means provides a substantially continuous slide surface along the majority of the length of said central and first support sections and whereby said slide panel means will stay in place on said central and first support sections during sliding useage by children and whereby that part of said slide panel means which is disposed on said central section is removable from said central section to permit free use of said rungs when said assembly is in said Jungle Gym position.



3,971,562
ROLLABLE SHEET HAVING TARGET APERTURE AND MISSILE USED THEREWITH

C. Robert Peterson, 2 E. Oak St., Chicago, Ill. 60611
Filed Aug. 5, 1974, Ser. No. 494,415
Int. Cl.^{2} A63B *71/02*
U.S. Cl. 273—95 R **3 Claims**



1. A target game comprising:

a flexible sheet member having a front surface, a rear surface, a lower edge and at least one other edge adapted to be removably secured to stationary support means; said sheet member having such surface integrity as to be adapted to be rolled to form a self-supporting cylinder upon removal from said support means for insertion into a container for storage;

adhesive means, disposed on said rear surface near said other edge, for removably securing said sheet member to said support means; said adhesive means being permanently maintained on said rear surface for reuse after said sheet member is removed from, and subsequently re-secured to, said support means;

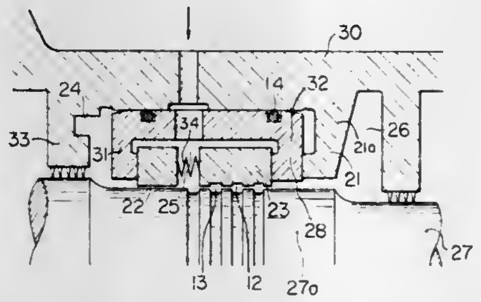
indicia means, disposed on said front surface, for representing a corporeal presence;

means defining target aperture means, communicating between said front surface and said rear surface of said sheet member; said target aperture means being associated with said indicia means for accommodating a target to be displayed within the context of said indicia means; and

access means, defined by said lower edge of said sheet member, for permitting participants of the game to pass under said sheet member from a position facing said front surface to a position facing said rear surface, whereby each of said participants can individually put their face into said target aperture means to lend a personal quality to said corporeal presence.

3,971,563
SHAFT SEALING APPARATUS USING A FLUID SEALING SYSTEM

Shojiro Sugimura, Okayama, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 397,654, Sept. 17, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,852
Int. Cl.^{2} F16J *15/16, 15/40*
U.S. Cl. 277—27 **6 Claims**



1. A shaft sealing apparatus using a sealing fluid comprising:

a housing having first inner and first outer walls, said first inner and outer walls having a substantially axial symmetry and being internal to said housing;

a rotary shaft extending through said inner and outer walls of said housing, said rotary shaft being disposed along the axis of symmetry of said inner and outer walls;

a sealing portion formed on said rotary shaft;

a seal ring supporting member having a high and a low pressure side, and having second inner and outer walls disposed around said sealing portion on said rotary shaft, said seal ring supporting member disposed within said first inner and outer walls of said housing and being slideable in an axial direction along said rotary shaft, said seal ring supporting member having a sealing fluid supply chamber being supplied with a sealing fluid;

a first seal ring disposed in slideable contact with an outer peripheral surface of said sealing portion of said rotary shaft adjacent to said low pressure side of said seal ring supporting member;

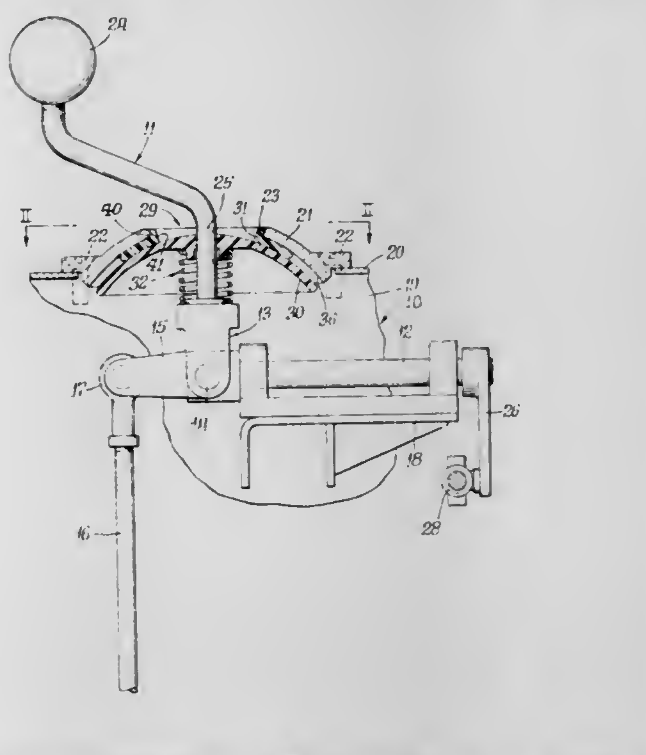
a second seal ring disposed in slidable contact with the outer peripheral surface of said sealing portion of said rotary shaft adjacent to said low pressure side of said seal ring supporting member, said second seal ring and sealing portion of said rotary shaft forming a labyrinthine chamber;

a spring means arranged between said first and second seal rings for urging said seal rings into contact with said second inner walls of said seal ring supporting member; and

a means for displacing said seal ring supporting member in an axial direction to vary the amount of said slidable contact of said seal rings with said sealing portion of said rotary shaft.

3,971,564
ENVIRONMENTAL SEALS FOR MULTIDIRECTIONAL CONTROL LEVERS

Robert B. Bowen, Edwards; Roger F. Maier, Peoria, and John R. Rediger, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed May 24, 1974, Ser. No. 473,139
Int. Cl.^{2} F16J *15/16*
U.S. Cl. 277—30 **16 Claims**



1. In an apparatus having wall means having an opening defined by an edge wall portion, and a movable member extending through and being transversely movable across said opening, and sealing structure for sealingly closing said opening about said movable member including a first closure element extending laterally outwardly from said movable member for movement directly therewith, a second closure element disposed between said first closure element and said wall means and having a first surface portion sealingly slidably engaging said first closure element and a second surface portion sealingly slidably engaging said wall means outwardly about said opening, said second closure element having an opening through which said movable member extends and which is substantially larger in cross section than the portion of the movable member extending therethrough, and means biasing said closure elements into slidable sealing engagement with each other and said second closure element into slidable sealing engagement with said wall means, the improvement comprising a stop flange on said second closure element arranged to engage said edge wall portion of the wall means in a limit position of the second closure element for limiting the movement of said second closure element transversely across said wall means opening, the transverse extent of said elements being preselected to be, in all transverse directions across said wall means opening, cumulatively greater than the transverse extent of said wall means opening whereby said two closure elements maintain said wall means opening effectively sealingly closed in all positions of said transversely movable member.

3,971,565
SEAL ASSEMBLY FOR PILLOW BLOCK HOUSING

Joseph H. Schickling, Collegeville; John L. Blake, Jr., Willow Grove, and Walter Hyduk, Southampton, all of Pa., assignors to SKF Industries, Inc., King of Prussia, Pa.
Filed May 27, 1975, Ser. No. 581,384
Int. Cl.^{2} F16J *15/32*
U.S. Cl. 277—59 **11 Claims**

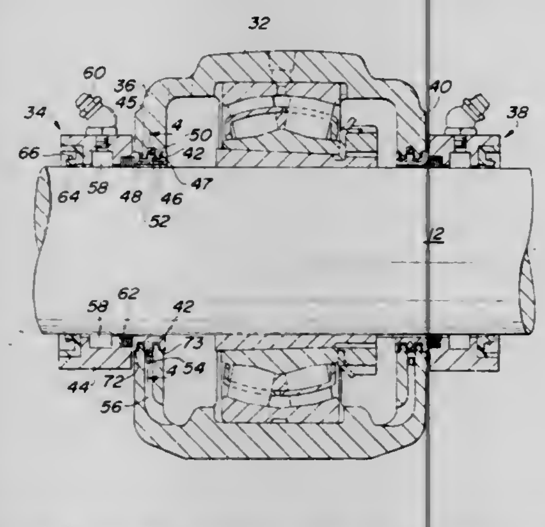
1. A nonrotatable seal assembly for use in a pillow block comprising

a. a cylindrical body having a length in an axial direction which is substantially longer than the thickness thereof in a radial direction, said body having a first end portion longitudinally spaced from a second end portion,

b. said first end portion having two spaced grooves on its outer periphery, each groove being adapted to receive an annular rib on a pillow block housing,

c. a deformable sealing ring on the outer periphery of said body at said first end portion between said grooves,

d. a pin means extending through said deformable sealing ring into said body, said pin means including a portion projecting from said sealing ring outer periphery for entry into a passage or opening in a pillow block,



e. said cylindrical body being hollow, the inner peripheral surface of said body at said second end portion having a lubrication recess positioned between first and second annular seals, a lubrication fitting on said body communicating with said recess, and

f. the inner peripheral surfaces of said first end portion being a smooth uninterrupted surface having a diameter slightly greater than the inner diameter of said first and second seals.

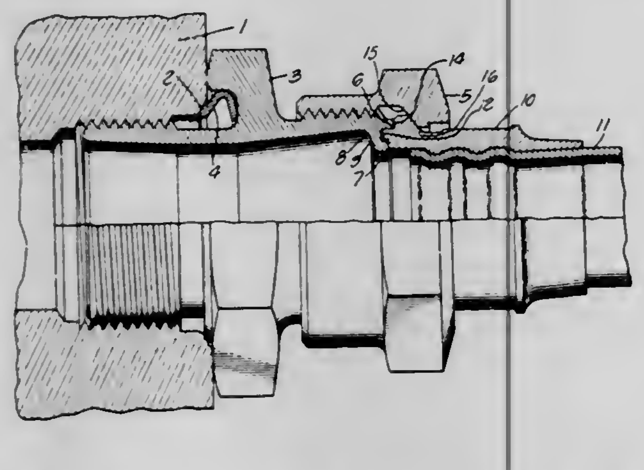
3,971,566
HYDRAULIC SEALING MEMBER AND PROCESS

Richard Levinsohn, deceased, late of Menlo Park, Calif.; Joseph Levinson, administrator-with-will-annexed, Los Angeles, and James E. Jervis, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 239,395, March 29, 1972, abandoned, which is a division of Ser. No. 70,321, Sept. 8, 1970, Pat. No. 3,759,552. This application Jan. 6, 1975, Ser. No. 538,740

Int. Cl.^{2} F16J *15/08*

U.S. Cl. 277—206 R **11 Claims**



1. A metallic V-ring sealing member capable of sealing hydraulic fluid against egress from a hydraulic system having an operating temperature range within the range of from about −54°C to about 232°C, said sealing member being formed from a metal alloy which (a) undergoes transition from an austenitic state to a martensitic state when cooled below a transition temperature, said temperature being below about −60°C (b) undergoes a further transition from the martensitic to the austenitic state upon warming from below said temperature to a temperature less than the operating temperature of said system, (c) remains in the austenitic state within the operating temperature range, and (d) is weaker in its martensitic state than in its austenitic state whereby a seal may be formed between a sealing surface of the sealing member and a sealing surface of the hydraulic system with substantially no galling or scratching of either sealing surface.

3,971,567
SAFETY SKI BINDING

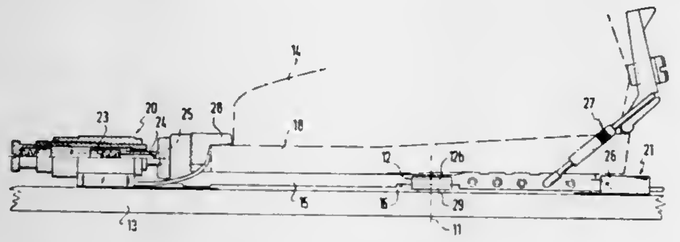
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed June 11, 1974, Ser. No. 478,358

Claims priority, application Germany, June 12, 1973, 2329832; Feb. 20, 1974, 2408162

Int. Cl.^{2} A63C *9/08*

U.S. Cl. 280—618 **40 Claims**



1. A safety ski binding with at least one of forward and rear retaining mechanisms operable to releasably hold a ski boot that is adapted to be rotatably supported on the ski, against a lifting off from the ski and against lateral deflections, wherein a retaining means is provided for the rotatable bearing support of the ski boot about an axis substantially perpendicular to the ski surface, said retaining means which is rotatably supported on the ski about said axis and includes lateral extensions, being operable to hold the ski boot by means of said lateral extensions against a lateral displacement in the transverse direction of the ski, the lateral extensions being operable to couple with each other the retaining means and the ski boot in the direction of rotation, yet permit a lifting off of the ski boot in a direction substantially perpendicular to the ski,

wherein the ski boot is retained on the ski by the retaining mechanisms by way of a sole plate means adapted to be clamped to the boot, wherein the lateral extensions surround the sole plate means on both sides, and

wherein the lateral extensions engage into lateral notches of the sole plate means.

3,971,568
SELF-SUPPORTING NESTING CART

Leonard E. Wright, Paradise Valley, Ariz., assignor to Tradewind Industries, Inc., Liberal, Kans.

Filed Jan. 31, 1975, Ser. No. 546,104

Int. Cl.^{2} B62B *11/00*

U.S. Cl. 280—33.99 H **15 Claims**

1. A self-supporting combination folding and nesting cart, comprising:

a first end frame having a side portion;

a back frame assembly comprising:

a corner post having a nesting cavity;

a lower cross member having one end connected to and extending normal to the side portion of the first end frame, the other end of the lower cross member connected to the corner post; and

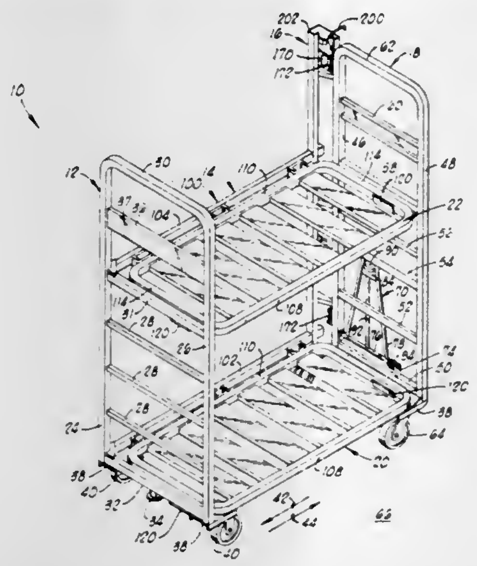
a mid-horizontal cross member having one end connected to and extending normal to the side portion of the first end frame, the other end of the mid-horizontal cross member connected to the corner post;

a second end frame pivotally connected to the corner post and selectively positionable in a folded position wherein the second end frame is adjacent to the back frame assembly, and in an extended position wherein the second end frame is normal to the back frame assembly and parallel to the first end frame;

wheel means for movably supporting the first end frame, the second end frame and the back frame assembly;

a first shelf pivotally connected to the lower cross member and selectively positionable in a folded-in position wherein the first shelf is parallel to and against the back frame assembly, and in a folded-out position wherein the first shelf is normal to the first end frame, the second end frame and the back frame assembly;

a second shelf spatially removed from the first shelf and pivotally connected to the mid-horizontal cross member, the second shelf being selectively positionable in a folded-in position wherein the second shelf is parallel to and against the back frame, and in a folded-out position wherein the second shelf is normal to the first end frame, the second end frame and the back frame assembly, the cart being in an L-shaped profile when the first shelf and the second shelf are in the folded-in position and the second end frame is in the folded position;



a hook member pivotally supported by the top of the corner post member and projecting therefrom a distance determined to be hookingly engageable with the nesting cavity of another cart of like construction placed in nesting relation to the cart when both carts are in the L-shaped profile, nesting relation being defined as having the first end frames and the back frame assemblies of both carts being respectively in adjacent and parallel relationship; and

spring means connected to the hook member for biasing the hook member in hooking engagement with the nesting cavity of the other cart.

3,971,569
SAFETY SEAT BELT DEVICE WITH AN INFLATABLE CUSHIONING MEANS

Fumiyuki Abe, Yokohama, and Syuichi Otani, Tokyo, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 19, 1974, Ser. No. 443,618

Claims priority, application Japan, Feb. 21, 1973, 48-20188

Int. Cl.^{2} B60R *21/08*

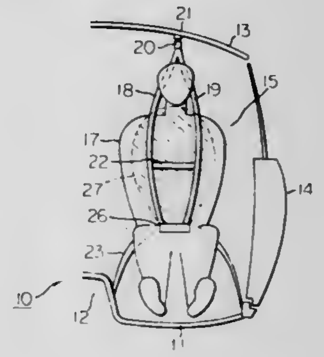
U.S. Cl. 280—733 **4 Claims**

1. A safety seat belt device for use in a motor vehicle having a floor and a roof cooperably defining an occupant compartment in which an occupant seat is mounted on said floor, said safety seat belt device comprising:

a lap belt having one end secured inward of said seat to said floor and the other end adapted to be held outward of said seat;

a yoke type shoulder belt including first and second belts, said first and second belts respectively having upper ends thereof adapted to be held at said roof, lower ends thereof secured to said lap belt at transversely spaced positions;

air bag means fixedly mounted on said lap belt between the lower ends of said first and second belts so that upon collision of said motor vehicle, an air bag of said air bag means is expanded toward said upper ends of said first and second belts; and



a transverse connecting strap transversely arranged between respective lower portions of said first and second belts so that upon expansion of said air bag of the air bag means, said transverse connecting strap holding, in combination with said first and second belts, the expanded air bag between said transverse connecting strap and a torso portion of a seated occupant.

3,971,570
BELT LOCKING ARRANGEMENT FOR A PASSIVE BELT SYSTEM FOR AUTOMOBILES

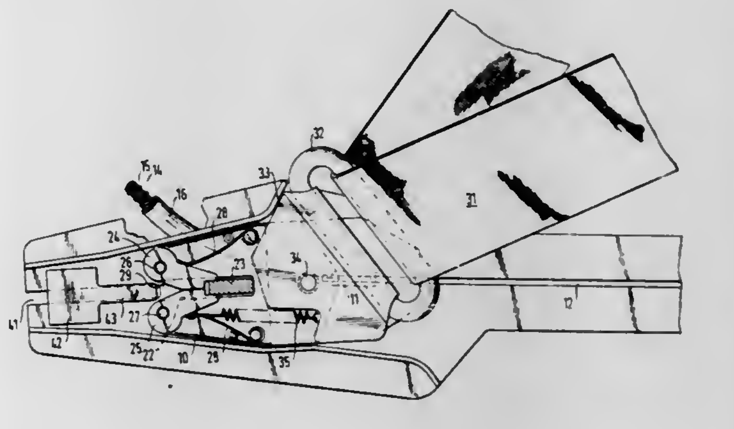
Karl Erik Nilsson, Rontgenstrasse 30, 8012 Ottobrunn, and Reiner van Riesen, Besenhelde 36, 2200 Elmshorn, both of Germany

Filed Mar. 3, 1975, Ser. No. 554,702

Claims priority, application Germany, Mar. 1, 1974, 2409835

Int. Cl.^{2} B60R *21/10*

U.S. Cl. 280—746 **5 Claims**



1. A belt locking arrangement for a passive safety-belt system for automotive vehicles having a forwardly hinged vehicle door, wherein a belt lock is movable in a guide on the inner surface of the door into and out of locking engagement with a lock tongue secured to the body of the vehicle, by an auxiliary power drive, said arrangement comprising, in combination, a guide sleeve built into the door and formed with a slot opening toward the interior of the vehicle; a flexible push-pull member running in said guide sleeve and connected to said auxiliary drive for operation thereby; and a transporter slide extending through said slot and connected to said push-pull member and to said belt lock; said lock comprising two substantially U-shaped cover plates spaced from and extending parallel to one another to define therebetween an open forward-facing gap for said lock tongue; a pair of symmetrically formed claws pivotally mounted between the front ends of said cover plates; said claws having oblique faces directed

toward the front and opposing each other in the zone of said forward-facing gap; and respective return springs biasing said claws to engage their oblique faces with each other.

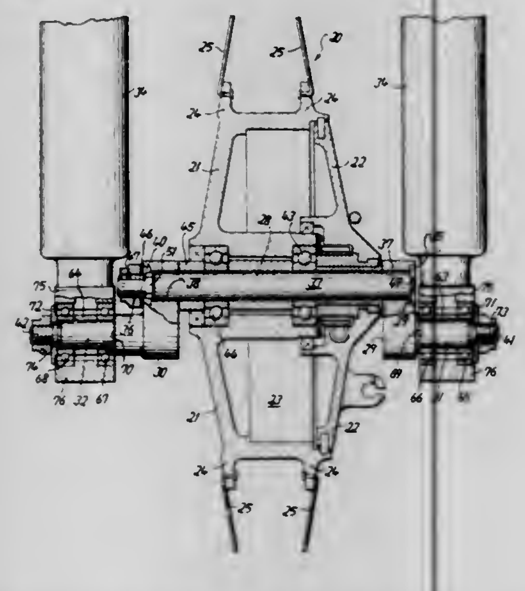
3,971,571
FRONT WHEEL SUSPENSION UNIT FOR MOTORCYCLES

Koji Yoshioka, Higashi-Osaka, Japan, assignor to Kayabakogyokabushikikaisha and Koji Yoshioka, both of Tokyo, Japan

Continuation-in-part of Ser. No. 499,886, March 11, 1974, abandoned, which is a continuation of Ser. No. 113,558, Feb. 8, 1971, abandoned. This application Apr. 30, 1975, Ser. No. 573,241

Int. Cl.^{2} B62K *25/06*

U.S. Cl. 280—276 **5 Claims**



1. A motorcycle front wheel suspension unit, comprising
- a telescopic front fork having a lower end portion;
- a front wheel provided with a center hub having opposite axial ends;
- an axle freely rotatably journalled in said hub and having end portions which extend outwardly past said axle ends;
- a pair of elongated link members extending transversely of said axle and each having a first section mounted on one of said end portions and a longitudinally spaced second section; and
- a pair of mounting shafts extending parallel to said axle and each having one part mounted in one of said second sections and another part freely turnably journalled in said lower end portion of said front fork, said other parts being axially aligned with one another and defining a pivot axis, said wheel being free to normally rotate relative to said front fork about said axle, but when subjected to a substantially horizontally acting force being free to yield to the same by pivoting with said axle relative to said front fork about said pivot axis.

3,971,572
MAGAZINE COVER

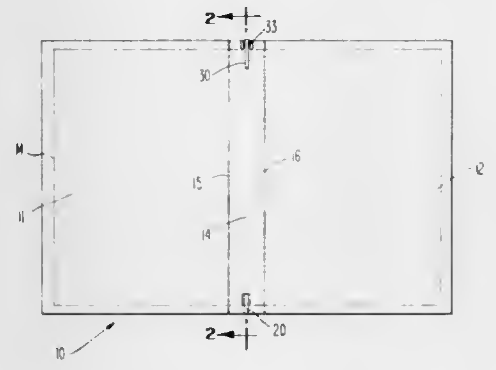
Stanley O. Fenkel, Elkins Park, Pa., assignor to David Anthony Desimone, N.J., a part interest

Filed May 20, 1975, Ser. No. 579,093

Int. Cl.^{2} B42D *3/00, 17/00*

U.S. Cl. 281—46 **2 Claims**

1. A binder for magazines, said binder comprising:
- a. a front cover portion;
- b. a back cover portion;
- c. a hinge portion hingedly connected at its opposite edges to said front and back cover portions;
- d. a first single fixed L-shaped finger having base and leg portions, said base portion being fixed to said hinge portion at one end of the hinge portion and said leg portion projecting inwardly above the hinge portion at a spaced distance therefrom, said spacing forming a first slot at one end of said hinge portion for receiving an edge portion of the center-fold portion of a magazine;
- e. a second single L-shaped finger having base and leg portions;
- f. a flexible strap pivotably connecting said base portion of said second finger to the opposite end of said hinge portion;
- g. locking means at said opposite end of said hinge portion;
- h. said locking means comprising a pair of spaced upstanding ears, each ear having a boss projecting inwardly toward the other ear;



- i. said base portion of said second finger being provided with bosses extending laterally outwardly therefrom and adapted to be cammed past the inwardly extending bosses of said ears to lock said finger between said ears;
- j. said second finger being pivotable inwardly on said flexible strap from an outwardly extending position to an inwardly extending position with its base portion disposed between said ears and its leg portion spaced above the hinge portion, said space forming a second slot for receiving and retaining said magazine at said opposite edge of its center-fold portion with said losses on the base portion of said second finger cooperating with the inwardly extending bosses of said ears to lock said second finger between said ears.

3,971,573
TRAIL LINE MOVES

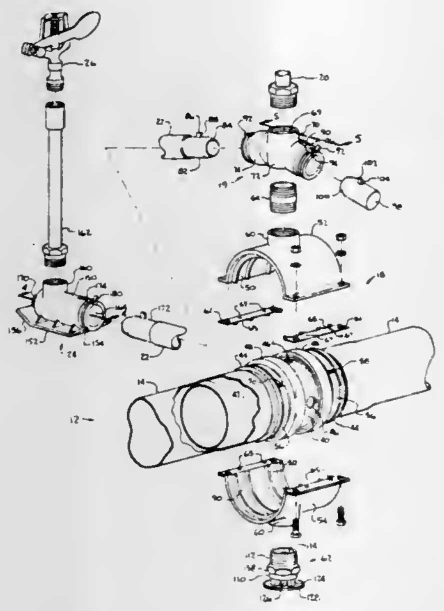
Lloyd W. Clements, Woodland, Calif., assignor to Ireco Industries, Inc., Eugene, Oreg.

Division of Ser. No. 415,825, Nov. 14, 1973, abandoned, which is a division of Ser. No. 252,587, May 12, 1972, Pat. No. 3,807,638. This application Apr. 7, 1975, Ser. No. 565,797

Int. Cl.^{2} F16L *55/00*

U.S. Cl. 285—5 **3 Claims**

1. For use in an irrigation line move including a rotatable horizontal line pipe having lateral ports and a swivel housing rotatable on the pipe around the ports, an irrigation trail line structure including
- a cross connector having a vertical tubular portion having a bottom, pipe connecting portion connected to a port in the housing and also having an upper, sprinkler connecting portion,
- the cross connector also having a tubular cross-arm, extending outwardly and downwardly from the vertical tubular portion and having a connector outer end portion adapted to connect to a trail line, the downward slope of the cross-arm being such as to so compensate for drag from the trail line that the tubular portion remains substantially vertical when the line pipe is moved laterally.



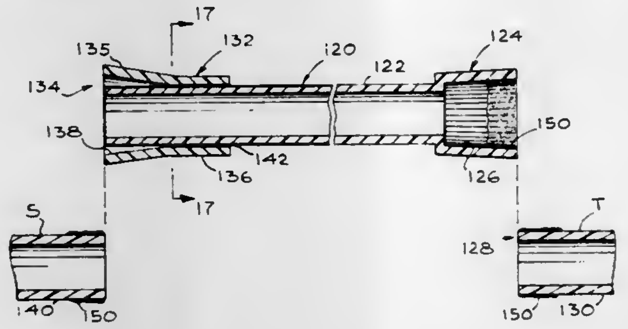
3,971,574
PIPE COUPLING

Hoyt S. Curtin, 10477 Laramie Ave., Chatsworth, Calif. 91311

Continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application Dec. 30, 1974, Ser. No. 537,093

Int. Cl.^{2} F16L *13/10*

U.S. Cl. 285—31 **2 Claims**



1. A coupling for joining first and second pipes having open ends spaced from one another by a predetermined distance, said coupling comprising:
- a pipe section including an elongated portion having an outer diameter smaller than the outer diameter of said first and second pipes;
- said pipe section having a total length substantially equal to said predetermined distance and further including an enlarged tubular portion formed on a first end thereof, said tubular portion defining an inner surface having a diameter slightly larger than the outer diameter of said first pipe for adhesive mounting on said first pipe; and
- a sleeve slidable along said pipe section elongated portion having a substantially smooth internal surface including a first portion having a diameter slightly larger than the outer diameter of said pipe section elongated portion for axial sliding movement of said sleeve therealong and for adhesive mounting thereto and a second portion having a diameter slightly larger than the outer diameter of said second pipe for adhesive mounting thereto, said sleeve having a substantially smooth external surface free of securing means;
- said sleeve second portion internal surface being tapered such that its diameter decreases from its free end toward said sleeve first portion from a diameter slightly greater than the outer diameter of said second pipe to a diameter slightly smaller than the outer diameter of said second pipe.

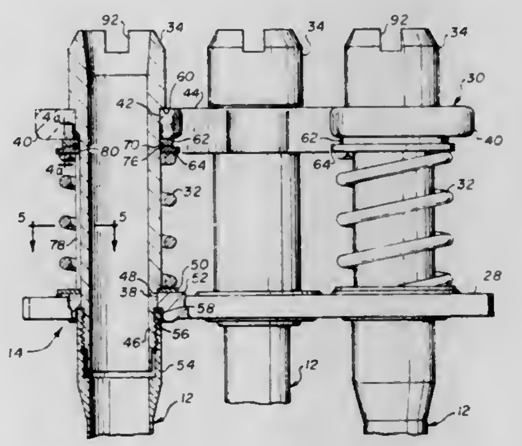
3,971,575
RELEASABLE LOCKING DEVICE

Adam Lesham, Bloomfield, and Glen Elwin Schukei, South Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 29, 1974, Ser. No. 528,121

Int. Cl.^{2} F16L *15/00*

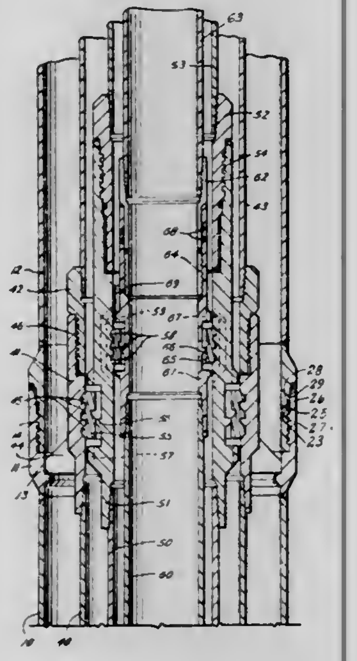
U.S. Cl. 285—85 **11 Claims**



1. A releasable locking device for urging limited relative rotation about a longitudinal axis between a first and a second object threadedly coupled together so as to maintain a tight connection of the coupled objects, the locking device comprising:
- a brake plate having a plurality of ratchet teeth having inclined surfaces extending therefrom in the longitudinal direction, said brake plate being positioned laterally adjacent to a longitudinal portion of the first object;
- first means associated with said brake plate and said second object for preventing relative rotational movement therebetween;
- a locking plate having a plurality of ratchet teeth having inclined surfaces extending therefrom in the longitudinal direction and being complimentary with said ratchet teeth of said brake plate, said locking plate being positioned laterally adjacent to said first object so as to permit said inclined surfaces of said ratchet teeth of said locking plate and said brake plate to mate with each other;
- second means associated with said locking plate and said first object for preventing relative rotational movement therebetween;
- at least one of said brake plate and said locking plates being longitudinally movable relative to said first object to move said ratchet teeth into and out of mating engagement; and
- means for normally biasing said locking plate and said brake plate toward one another to mate said inclined surfaces thereof, the biasing force applied by said biasing means being transmitted through said inclined surfaces to urge relative rotation of said locking plate and said brake plate to apply a tightening force between said first and second objects, said biasing means being releasable to permit one of said objects to be freely rotated relative to the other of said objects and positioned to bear against said second object and said at least one longitudinally movable plate.

3,971,576
UNDERWATER WELL COMPLETION METHOD AND APPARATUS

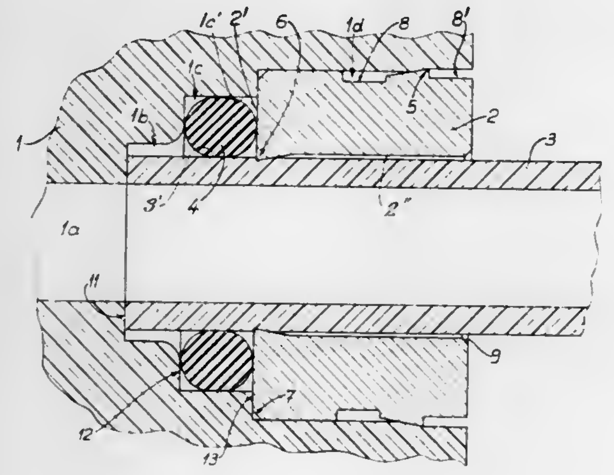
David P. Herd, Houston, Tex., and John H. Fowler, Pittsburgh, Pa., assignors to McEvoy Oilfield Equipment Co., Houston, Tex.
Division of Ser. No. 103,839, Jan. 4, 1971, Pat. No. 3,800,869, which is a continuation of Ser. No. 792,912, Jan. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 728,081, May 9, 1968, Pat. No. 3,442,536, which is a continuation of Ser. No. 572,511, Aug. 15, 1966, abandoned. This application Aug. 13, 1973, Ser. No. 387,667
Int. Cl.² F16L *37/24*
U.S. Cl. 285—87 **9 Claims**



1. A pipe joint for connecting first and second pipes of a pipe string passing through a body of water and driven into the sea floor comprising:
- a first tubular member affixed to the first pipe;
- a second tubular member affixed to the second pipe, said first tubular member having a portion thereof insertable within said second tubular member;
- a plurality of circumferentially spaced groupings of teeth disposed on both of said members;
- the pipes being connectable upon a rotation of one of the pipes in a common plane, said common plane being perpendicular to the axis of rotation;
- stop means on one of said members engageable with means on the other member to limit said rotation to less than one revolution;
- said teeth disposed on one of said members having surfaces engageable, when an axial tension load is placed on the pipe joint, with cooperable surfaces on teeth disposed on the other of said members; said cooperable surfaces being in planes perpendicular to said axis of rotation, thereby avoiding any substantial radial load on the pipe joint upon the application of axial tension loads; and
- abutting support means on said tubular members to transmit axial compression loads applied to the pipe joint whereby the pipe joint is capable of sustaining axial tension loads, axial compression loads, and bending moments caused by the driving of the pipe string into the sea floor and by the water currents.

3,971,577
UNION DEVICE FOR FLEXIBLE TUBING

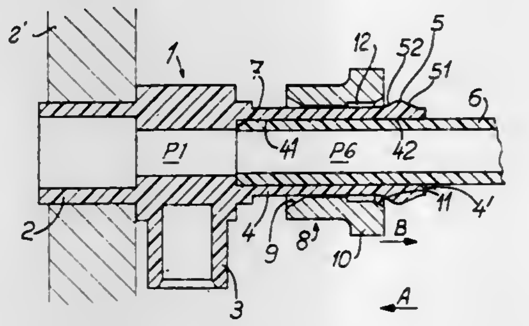
Gerard Schemith, Pontarlier, France, assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Aug. 16, 1974, Ser. No. 498,129
Int. Cl.² F16L *17/02*
U.S. Cl. 285—238 **9 Claims**



1. A connector for rapid, fluidtight connecting to a flexible tubular member, comprising:
- a connecting body having therein an inner bore and having, coaxially with the bore at an end thereof, a first recess wider than and communicating with the bore and extending away from it, a first annular shoulder extending outwardly from the first recess remotely from the bore, a second recess wider than and communicating with the first recess and having a side wall extending from a periphery of the first shoulder away from that shoulder, a second annular shoulder extending outwardly from an end of the side wall remotely from the first shoulder, and a third recess wider than and communicating with the second recess and extending away therefrom to a surface of the connector body;
- a sealing ring inserted in the second recess, engaging the first shoulder and the side wall and having sealing ring surface portions exposed opposite the side wall and the first shoulder;
- a locking ring slidingly receivable in use, in a direction axial of the inner bore, in the third recess to abut an end of the locking ring against the second shoulder, the locking ring having a generally smooth inner surface receptive in use, in a direction axial of the inner bore, of an end portion of a flexible tubular member for engagement of an outer surface portion of the tubular member's end portion with one of the exposed surface portions of the sealing ring, the locking ring having an end surface at said end thereof engageable with the other exposed surface of the sealing ring to compress the sealing ring against the first shoulder and thereby against the side wall of the second recess and the outer surface portion of the tubular member's end portion; and
- inner and outer barbs on the locking ring, the outer barb being disposed on an outer surface of the locking ring and being inclined relative thereto to oppose withdrawal of the locking ring, once received in the third recess, from the connecting body, and the inner barb being disposed on the generally smooth inner surface of the locking ring and being inclined relative thereto, oppositely to the inclination of the outer barb, to oppose withdrawal of the flexible tubular member from the locking ring once the tubular member is received therein;
- thereby enabling rapid locking of the tubular member to the connecting body through the locking ring, while also enabling simultaneous fluidtight connecting of the tubular member with the connecting body through the sealing ring compressed by the locking ring.

3,971,578
UNION DEVICE FOR FLEXIBLE TUBING

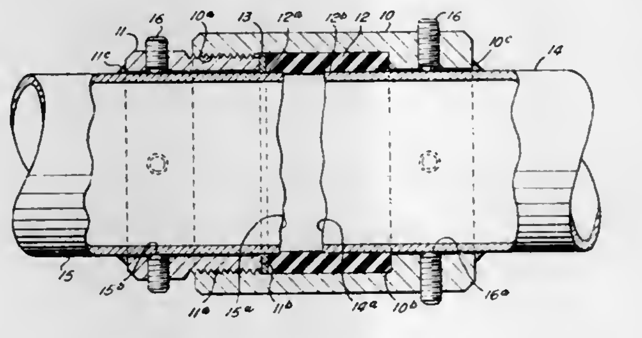
Gerard Schemith, Pontarlier, France, assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Aug. 16, 1974, Ser. No. 498,128
Int. Cl.² F16L *31/00, 33/22*
U.S. Cl. 285—260 **2 Claims**



1. A union device comprising; a hollow body providing an internal passage; a sleeve integral with the body and extending therefrom to an end of the sleeve remote from the body and enabling introduction of an end part of a flexible tube resistant to radial deformation; an outer annular embossment surrounding a portion of the sleeve adjacent the end thereof; and means for radially, releasably compressing the embossment to strengthen the tight holding of the end part of the tube in the bore of the sleeve; the sleeve being resiliently deformable radially and having a bore with an inner diameter which, prior to the introduction of the end part of the tube, is slightly less than the outer diameter of the tube, the sleeve and bore having a length at least approximately equal to twice said inner diameter, to enable the end part of the tube, upon the introduction thereof into the end of the sleeve, to be removably push-fitted into and tightly held in the bore of the sleeve, to place an inner passageway, provided by the tube, in communication with the internal passage provided by the hollow body with substantially no constriction of the inner passageway of the tube.

3,971,579
WELD CLAMP SEAL

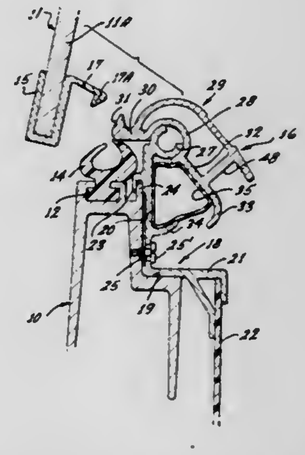
William A. Brown, 2418 W. 12th St., Odessa, Tex. 79760
Filed May 5, 1969, Ser. No. 821,731
Int. Cl.² F16L *19/07*
U.S. Cl. 285—353 **5 Claims**



1. A weld clamp for sealing off any leakage of fluid contained in a metal pipeline when same is severed with ragged end faces comprising:
- a. a stationary sleeve adapted to be telescoped over a first end portion of said pipeline and extend over a second end portion of said pipeline where same was severed,
- b. a plurality of set screws extending through said stationary sleeve for securely connecting it to the first end portion,
- c. a radial right angled shoulder in the stationary sleeve,
- d. internal threads in the stationary sleeve,
- e. a compression sleeve having a radial right angled end face adapted to be telescoped over the second end portion of said pipeline,
- f. a plurality of setscrews extending through said compression sleeve for securing it to the second end portion,
- g. external threads on the compression sleeve screwed into the internal threads of the stationary sleeve, and
- h. a compressible ring in the stationary sleeve extending from the radial right angled shoulder in the stationary sleeve to the radial right angled end face of the compression sleeve and adapted to compress upon both the first end portion and the second end portion of said severed pipeline to form a fluid seal with each.

3,971,580
DUAL RELEASABLE WINDOW LATCH MECHANISM FOR TRANSIT VEHICLE

Keith W. Tantlinger, Coronado, and Theodor C. Schubach, Bonita, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.
Filed May 21, 1975, Ser. No. 579,440
Int. Cl.² E05C *15/02*
U.S. Cl. 292—201 **11 Claims**



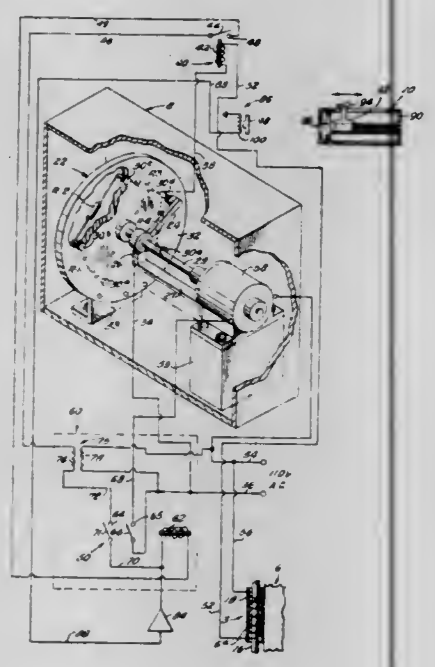
1. In a transit vehicle having a row of hingedly suspended windows along each side thereof, a dual releasable latch mechanism including a latch for each of said windows, each latch comprising:
- a latch base member mounted adjacent the lower edge of each of said windows,
- a latch member mounted for rocking movement on each latch base member, and manually rockable thereon by a passenger within the vehicle between latching engagement with, and release of, its respective window,
- an inflatable element concealed in each of said latches between an element of its latch base member and an element of its latch member, each of said inflatable elements being positioned, upon inflation, to rockingly urge its respective latch member toward window releasing condition,
- duct means interconnecting the inflatable elements of a selected plurality of said latches, and
- operator controlled valve means for communicating said duct means with a supply of pressurized fluid for simultaneously inflating all of such plurality of inflatable elements and thereby rocking their respective latch members toward unlatched, window releasing condition.

3,971,581
VARIABLE MAGNETIC LOCK

Tom C. Montgomery, Box 421, Big Springs, Tex. 79720
Filed June 17, 1974, Ser. No. 479,694
Int. Cl.² E05C *19/16*
U.S. Cl. 292—251.5 **10 Claims**

1. In combination with an enclosure having a door hingedly secured thereto: an electric current responsive lock means positioned to hold said door closed, said electric current responsive lock means comprising: an electromagnet having a coil secured about a ferrous core, a magnetic attracting element attached to the enclosure, and means securing said core

to said door; an electric current supply; means for connecting the lock means to the electric current supply to activate the lock means; and control means adapted to vary the electric current supplied to the lock means to thereby adjust the force required to disengage the lock means, said control means comprising: a circuit board, electrically conductive contacts spaced about the circuit board, a shaft rotatably secured to the circuit board, a wiper attached in series with the current supply source secured to said shaft, said wiper being positionable to selectively complete a circuit with one of said contacts, resistors connected in series between the contacts and the current supply, and means to rotate the shaft.



3,971,582

DOOR LATCH

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109
Filed Nov. 13, 1974, Ser. No. 523,199
Int. Cl.² E05C *17/06*
U.S. Cl. 292—268 **4 Claims**

1. In a door structure that includes a frame, and a door having a hinge edge and an opposite latch edge, a safety latch for holding said door against opening, comprising:

a bar swingably supported at one of its ends on said door structure,

a keeper mounted on said frame adjacent said latch edge of the door,

said keeper being formed with a horizontally outwardly opening slot for receiving the opposite end of said bar therealong,

said slot having a vertically offset portion for receiving said opposite end therein to prevent opening of the door,

a second keeper swingably connected to said first mentioned keeper,

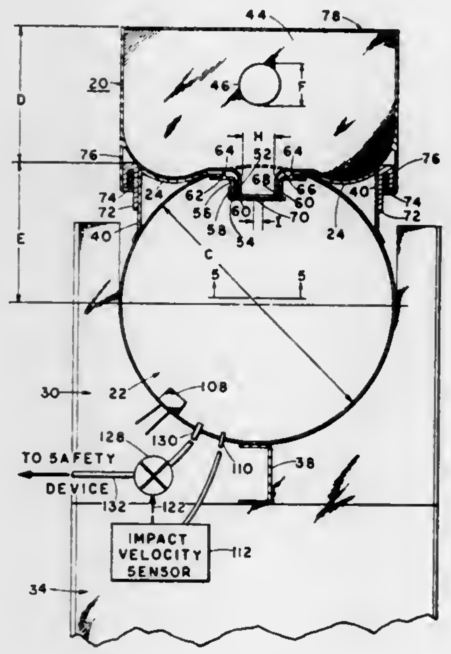
said second keeper being formed with an elongated slot having an open end adjacent said first mentioned keeper and in alignment with the slot in said first mentioned keeper when said keepers are in substantially coplanar relation,

whereby said opposite end of said bar may be moved along said elongated slot to the inner end thereof to permit said door to be partially opened to a position against said bar.

3,971,583

ENERGY ABSORBING BUMPER SYSTEM

Murray Kornhauser, Wynnewood, Pa., assignor to Safety Consultants, Berwyn, Pa.
Continuation-in-part of Ser. No. 126,155, March 19, 1971, Pat. No. 3,810,668. This application Jan. 4, 1974, Ser. No. 430,667
Int. Cl.² B60R *19/10*
U.S. Cl. 293—71 P **50 Claims**



1. A bumper apparatus for a vehicle comprising:

an elongated container having a volume containing a compressible gas,

an elongated impact receiving portion of the container wall being flexible under impact and shaped to define a substantial section of said container volume in the unflexed condition and to reduce the container volume in the flexed condition,

and another portion of said container wall being rigid and shaped to define a substantial concave section of said container volume of more than 25% of said flexible wall volume, said concave section having generally the same length and width as said flexible wall section,

said rigid wall portion being substantially rigid under impact and flection of said flexible wall portion so as not to change substantially the rigid wall section of said container volume,

means for interconnecting said flexible and rigid sections to transmit fore and aft tension forces from said flexible wall portion in line to said rigid wall concave section and to permit substantially free passage of the compressible gas from the flexible section to the rigid section upon impact so that the gas is at substantially the same pressure in the rigid section as in the flexible section at all times during impacts on said impact wall at speeds within the design impact velocity range of the apparatus,

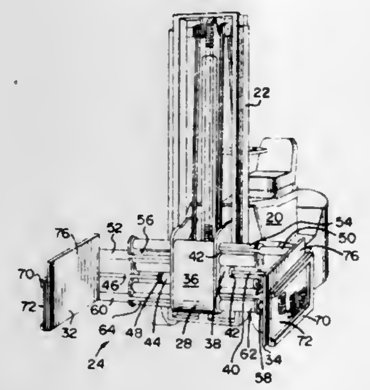
and means for attaching said rigid wall section to the exterior of a vehicle with the flexible section projecting therefrom as a bumper therefor,

whereby upon impact the rise in the gas pressure in said container is limited as impact energy is absorbed by gas compression.

3,971,584

AUTOMATIC LOAD COMPENSATING CLAMP TRUCK JAWS

Alexander William Duncan, Clayton, N.C., assignor to GTE Sylvania Incorporated, Stamford, Conn.
Filed Mar. 17, 1975, Ser. No. 558,635
Int. Cl.² B66C *1/44;* **B66F** *9/18*
U.S. Cl. 294—88 **5 Claims**



1. Load engaging and gripping apparatus for attachment to the lifting mechanism of a lift truck for handling loads, said apparatus comprising:

a lift assembly adapted for mounting on the lift mechanism of a lift truck;

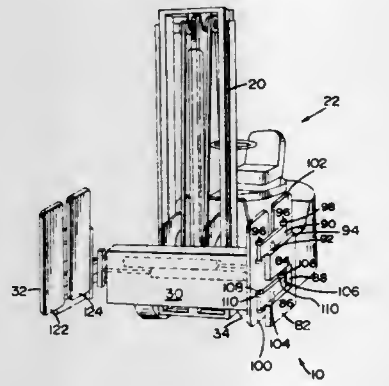
opposed load engaging and gripping means including opposed load engaging and gripping platens; and

means for connecting said opposed load engaging and gripping means to said lift assembly, said means including a carrier plate connected to opposite ends of said lift assembly and a slide bearing means cooperatively mounted on said carrier plate and each one of said opposing load engaging and gripping platens, said slide bearing means including a plurality of bearing assemblies each with an angularly disposed bearing rod and a bearing slidably carried thereon whereby said opposed load engaging and gripping means are in light frictional contact with a load under at rest conditions and move inwardly toward one another to firmly grip the load therebetween when the lift assembly is moved vertically upward.

3,971,585

LOAD ENGAGING AND GRIPPING APPARATUS

Richard G. LaBudde, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.
Filed Mar. 17, 1975, Ser. No. 558,779
Int. Cl.² B66C *1/44;* **B66F** *9/18*
U.S. Cl. 294—88 **6 Claims**



1. Load engaging and gripping apparatus for attachment to the lifting mechanism of a lift truck for handling loads, said apparatus comprising:

a lift assembly including reciprocable support means adapted for mounting on the lifting mechanism of a lift truck;

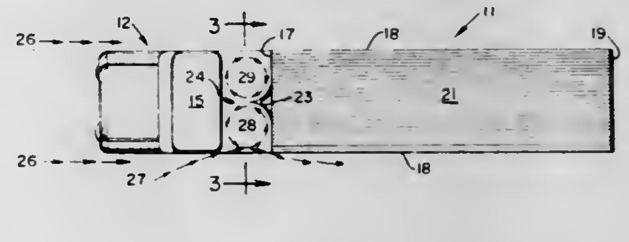
opposed load engaging and gripping means including engaging and gripping platens movably affixed to said reciprocable support means of said lift assembly, said movable affixation of said platens providing inward and outward travel thereof in response to vertical movement of said lift assembly; and

power means in the form of a pair of double acting hydraulic piston and cylinder assemblies mounted on said lift assembly with one of said pair of assemblies connected to each of said opposed platens to provide inward and outward movement therebetween whereby frictional contact of a load by said platens is effected by said power means and added inward and outward movement of said platens is effected by said movable attachment to said lift assembly upon vertical movement of said lift assembly.

3,971,586

DRAG REDUCER FOR LAND VEHICLES

Walter Selden Saunders, 307 Thornhill Road, Baltimore, Md. 21212
Division of Ser. No. 283,774, Aug. 25, 1972, Pat. No. 3,854,769. This application Oct. 17, 1974, Ser. No. 515,490
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **21 Claims**



1. In a vehicle having a gap formed by a first set of facing sides oriented perpendicular to the line of motion of the vehicle defined by a leading panel of a trailing element of said vehicle and a trailing panel of a leading element of said vehicle wherein the leading panel of the trailing element has a vertical height from the ground at least substantially equal to the vertical ground height of said trailing panel, and a second set of facing sides defined by slip streams along the line of motion of the vehicle; at least one drag reducing member mounted on one of said first sets of facing sides and comprising at least one surface which extends into said gap both horizontally and vertically sufficiently to define with said first set of facing sides at least one elongated cell for stabilizing at least one vortex therein, the periphery of said cell and said vortex being defined and confined by said surface, a portion of said first set of facing sides, and said slip stream along at least one of said second set of facing sides when the vehicle is moving through a fluid.

3,971,587

U-SHAPED FURNITURE FRAME

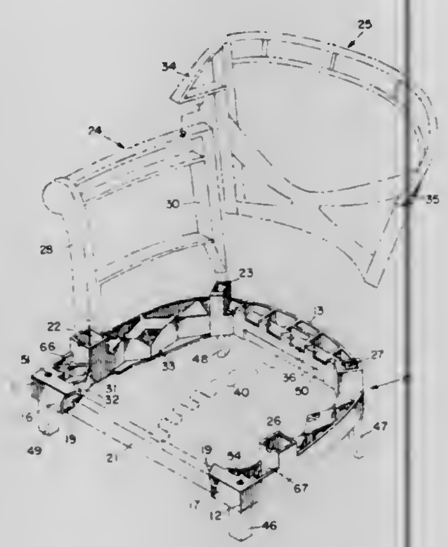
William R. Curtis, New Castle, and David C. Trimble, Yorklyn, both of Del., assignors to Hercules Incorporated, Wilmington, Del.
Filed Sept. 30, 1975, Ser. No. 618,199
Int. Cl.² A47C *7/02*
U.S. Cl. 297—452 **7 Claims**

1. A furniture frame for a barrel shaped chair comprising:

an integral U-shaped member made of plastic material, each end thereof having an inwardly projecting box portion for receiving a horizontal support member;

said ends being movable toward and away from each other due to the flexure of the U-shaped member to accommodate various lengths of support members to form a chair of varying widths;

said U-shaped member having means intermediate the ends thereof formed therein in the top thereof for receiving vertical arm supports; and



said U-shaped member having means formed therein in the bottom thereof for receiving legs.

3,971,588

FRAME FOR THE BODY OF A VEHICLE

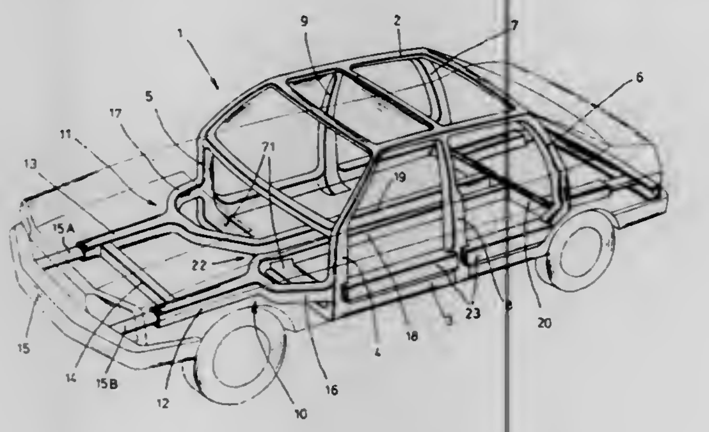
Andreas Bauer, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 20, 1974, Ser. No. 481,069

Claims priority, application Germany, July 17, 1973, 2336213

Int. Cl.² B62D *21/00*

U.S. Cl. 296—28 R **8 Claims**



1. Frame for the body of a vehicle comprising:
a roof frame;
a base frame;
at least two vertical corner columns joining the roof and base frames into a box-like structure surrounding a passenger space;
a vehicle bumper with bumper shanks attached; and
an underframe connected to the box-like structure comprising two substantially straight fork-shaped girders arranged symmetrically with respect to the longitudinal axis of the vehicle, said fork-shaped girders being arranged with an inclination towards the central longitudinal axis of the vehicle so that the outer prongs of the fork-shaped girders that face the outside of the vehicle are each connected to a separate vertical corner column on a level with the bumper and the inner prongs of the fork-shaped girders that face the center of the vehicle are connected to the base frame below the point where the outer prongs are connected to the vertical columns, the struts of the fork-shaped girders being connected to the bumper shanks and a traverse means of said base frame connecting the outer and inner prongs of each fork-shaped girder.

3,971,589

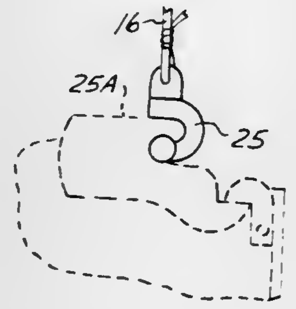
RETRACTABLE AUTOMOBILE TRUNK LID TIE DOWN

Donald L. Elrod, 1801 Butler Road, Willis, Mich. 48191

Filed Feb. 19, 1974, Ser. No. 443,254

Int. Cl.² B62D *25/10*

U.S. Cl. 296—76 **6 Claims**



1. The combination with a vehicle, having a trunk, a hinged lid, and an electric release trunk locking mechanism, of a tie down cable retractably secured to a spring biased, rachet controlled, rotatable member, with a support element for said rotatable member secured to the underside of said lid, said cable having at it's free end an anchor element suitable for attachment to an element of said trunk locking mechanism, the anchor element comprises an anchor hook having an enlarged terminal end to be recieved in a recess formed in the latch element of said electric release trunk lock mechanism.

3,971,590

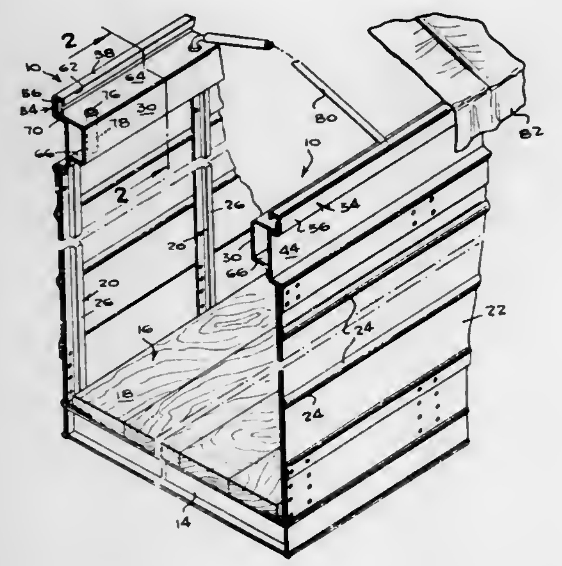
TRAILER TOP RAIL SYSTEM

James Raymon Yglesias, Savannah, Ga., assignor to Great Dane Trailers, Inc., Savannah, Ga.

Filed Oct. 11, 1974, Ser. No. 514,751

Int. Cl.² B62D *25/06*

U.S. Cl. 296—104 **21 Claims**



1. A two piece top rail assembly for interchangeable use in constructing both open top trailers with exterior posts and exterior skin having corrugations comprising:
an elongated outside element having in cross section a depending first leg for securing to said trailer,
a second leg secured at an angle to said first leg,
a third leg secured to said second leg and having at least a portion extending substantially in the opposite direction to said first leg,
a fourth leg secured to said third leg and extending at an angle substantially in the direction toward said first leg, said fourth leg having a transverse length greater than the transverse length of said second leg by the extent of the protrusion of the corrugation on said skin,

a fifth leg secured to said fourth leg and extending substantially in the opposite direction to said first leg,
an inside element secured to said outside element for extending toward the inside of said trailer and having first and second transverse legs,
a connector leg extending between and connecting said first and second transverse legs, means within said first and second transverse legs for receiving a roof bow,
whereby said inside and outside elements form a two piece rail assembly to form an open top trailer having either an exterior post or exterior skin.

3,971,591

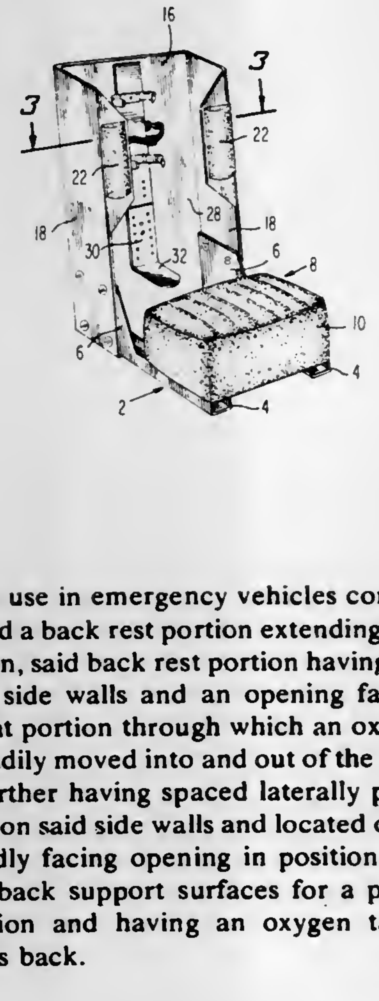
QUIC-SEAT

John Ziaylek, Yardley, Pa., assignor to Ziamatic Corporation, Yardley, Pa.

Filed May 1, 1975, Ser. No. 573,694

Int. Cl.² A47C *7/62*

U.S. Cl. 297—191 **5 Claims**



1. A seat for use in emergency vehicles comprising a lower seat portion and a back rest portion extending upwardly above said seat portion, said back rest portion having a cavity therein provided with side walls and an opening facing toward the front of the seat portion through which an oxygen tank or the like may be readily moved into and out of the cavity, said back rest portion further having spaced laterally projecting extensions mounted on said side walls and located on opposite sides of said forwardly facing opening in position to serve as forwardly facing back support surfaces for a person seated on said seat portion and having an oxygen tank or the like mounted on his back.

3,971,592

CHAIR FOR AIDING CONJUGAL RELATIONS FOR THE INFIRM

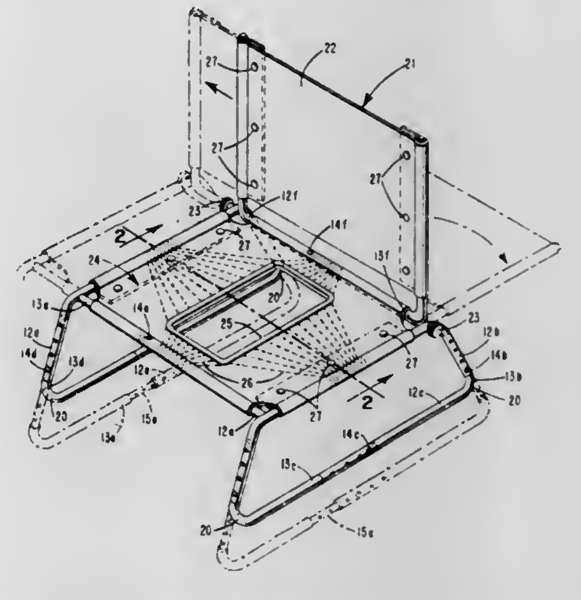
Brent Farley, 4215 Connecticut Ave., Baltimore, Md. 21229

Filed Sept. 26, 1974, Ser. No. 509,643

Int. Cl.² A47C *7/62*

U.S. Cl. 297—217 **10 Claims**

1. A chair for aiding conjugal relations for the infirm comprising:
a frame having a front member, a back member and two side members, said front and back members being adjustable to expand the width of the chair,
legs attached to the frame at the corners and to each other to form a contact surface greater than the depth of the seat, and
a covering spread between the front, sides and back members and surrounding portions of said members and having an orifice in the region of the center of the covering.



3,971,593

METHOD OF EXTRACTION OF NODULAR SEDIMENTS OR THE LIKE FROM THE SEA FLOOR AND AN INSTALLATION FOR CARRYING

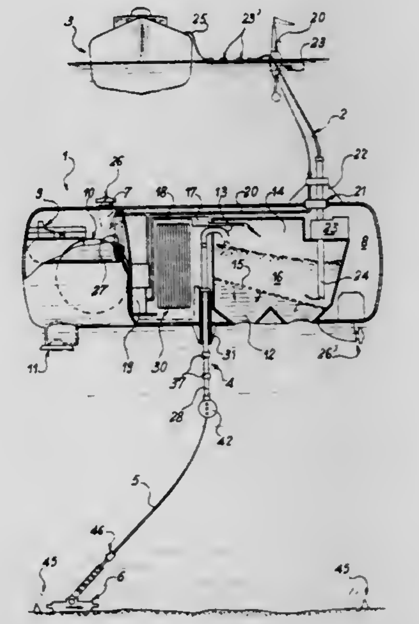
Robert Porte, Le Mesnil-St. Denis, and Michel Rommens, Chevreuse, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 9, 1974, Ser. No. 486,877

Claims priority, application France, July 18, 1973, 73.26289

Int. Cl.² E02F *3/88, 7/00*

U.S. Cl. 299—8 **11 Claims**

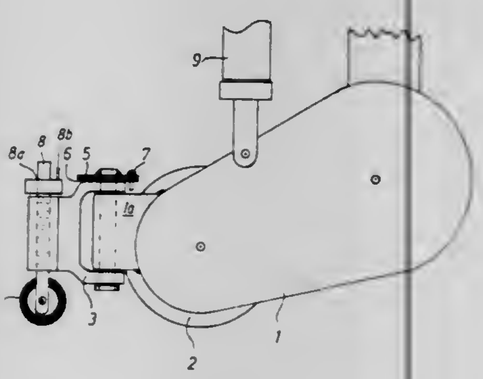


1. An underwater station for collecting ore particles of a predetermined minimum size from sea beds, comprising a compartment adapted to be submerged and having a portion open to the sea for maintaining the compartment at the same pressure as the surrounding water, separating means for retaining in the compartment particles above the predetermined minimum size and returning to the sea particles below the predetermined minimum size, pipe means for supplying ore particles to the separating means, the pipe means including suction means for creating a lifting force so that a combination of ore particles and sea water are lifted from the sea bed into the compartment, the suction means including a plurality of openings in the pipe means through which gas under pressure

can be injected for providing the lifting force, the suction means further including a compressor for supplying gas under pressure to the plurality of openings, and underwater recirculation means for recirculating to the compressor a substantial quantity of gas which has already been circulated through the pipe means and into the compartment and which is subjected to the pressure of the surrounding water between the time it leaves the pipe means and until it enters the compressor.

3,971,594
APPARATUS FOR MILLING ROAD SURFACES

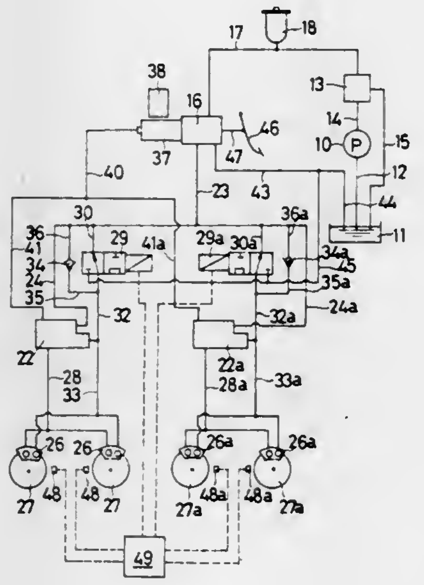
Reinhard Wirtgen, Hohnerstrasse, 5461 Windhagen uber Linz (Rhine), Germany
Filed July 9, 1974, Ser. No. 486,860
Claims priority, application Germany, July 10, 1973, 2335002; Sept. 6, 1973, 2344877
Int. Cl.² E01C *23/09*
U.S. Cl. 299—39 **4 Claims**



1. In an apparatus for milling road surfaces, an elongated milling roller provided with hard metal cutters and having a central horizontal axis around which said roller is adapted to be driven, said roller having opposed ends extending across said axis, a pair of end support means respectively situated next to said opposed ends of said roller for supporting the latter for rotation about said horizontal axis, said pair of end support means respectively having projections both of which extend forwardly beyond said roller, a pair of swivel arms respectively connected pivotally to said projections for swivelling movement with respect thereto about parallel vertical axes, respectively, a pair of road-engaging wheels, and adjusting means connecting said wheels respectively to said swivel arms at portions thereof distant from said projections for adjustment in elevation with respect to said swivel arms and for orientation in a direction where the axis of each wheel is parallel to the axis of said roller irrespective of the angular position of each swivel arm with respect to the projection to which it is pivotally connected, said swivel arms cooperating with said projections for situating said wheels in a selected one of three positions, namely positions respectively situated in front of said projections, positions respectively situated between said projections and in front of said roller, and positions respectively situated laterally beyond said projections outside of the space therebetween, and a pair of lock means, one of said lock means cooperating with swivel arms for locking the latter in a selected one of said positions and the other of said lock means cooperating with said adjusting means for locking said wheels in a position oriented with their axes parallel to the axis of said milling roller.

3,971,595
ANTI-SKID BRAKE CONTROL SYSTEM

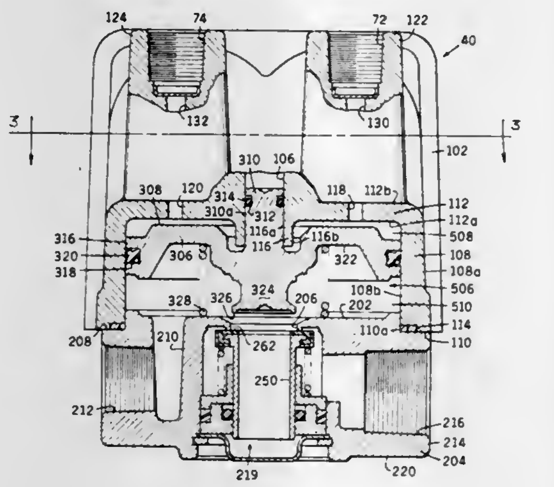
Toshiyuki Kondo, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Aug. 26, 1975, Ser. No. 607,786
Claims priority, application Japan, Aug. 26, 1974, 49-97060
Int. Cl.² B60T *8/06*
U.S. Cl. 303—21 F **3 Claims**



1. An anti-skid brake control system comprising:
a source of fluid pressure;
front and rear wheel brake means;
brake booster means fluidically connected to said source of fluid pressure for generating power pressure;
master cylinder means operatively connected to said brake booster means for supplying fluid pressure to said front and rear wheel brake means in accordance with the actuation of said brake booster means;
control valve means interposed between one of said front wheel brake means and said brake booster means and between one of said rear wheel brake means and said brake booster means for supplying said power pressure of said brake booster means to said front and rear wheel brake means and for decreasing said power pressure supplied to said front and rear wheel brake means according to a skid condition of said front and rear wheel brake means; and
actuator means interposed between the other one of said front wheel brake means and said master cylinder means and between the other one of said rear wheel brake means and said master cylinder means for supplying fluid pressure to said other ones of said front and rear wheel brake means in accordance with the actuation of said master cylinder,
whereby said anti-skid control system supplies said power pressure of said brake booster means to said actuator means for actuating said actuator means in order to supply said fluid pressure from said master cylinder means to said front and rear wheel brake means under normal braking operations and for blocking said fluid pressure from said master cylinder means to said front and rear wheel brake means under skid conditions.

3,971,596
ELECTRO-PNEUMATIC AIR BRAKE VALVE AND SYSTEM COMPATIBLE WITH A SKID CONTROL SYSTEM

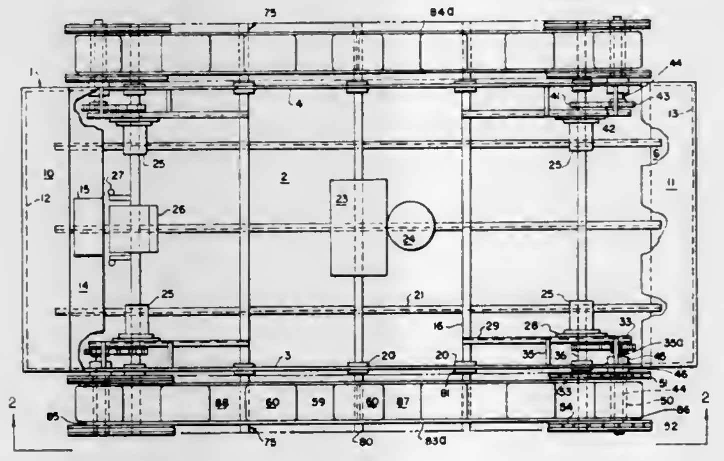
Arthur R. Grix, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.
Division of Ser. No. 536,596, Dec. 26, 1974. This application June 27, 1975, Ser. No. 591,148
Int. Cl.² B60T *13/68*
U.S. Cl. 303—40 **5 Claims**



1. A relay valve for use in an air brake system wherein brake actuators are operated by fluid pressure, the valve comprising:
first port means in the valve for receiving a first impulse of fluid pressure from a first source;
second port means in the valve for receiving a second impulse of fluid pressure from a second source;
first solenoid means normally opening the first port for permitting the first impulse of pressure to enter the valve; and
second solenoid means normally closing the second port and operably connected for permitting the second impulse of pressure to enter the valve simultaneously with the first impulse.

3,971,597
ALL TERRAIN VEHICLE

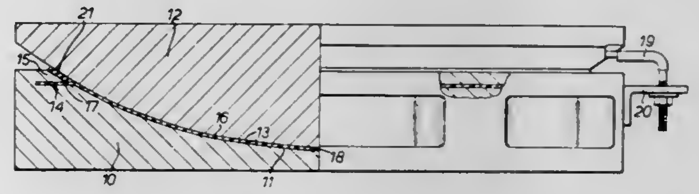
Harold R. Wright, 18950 Woodward Ave., Detroit, Mich. 48203
Filed Mar. 26, 1975, Ser. No. 562,355
Int. Cl.² B62D *35/30*
U.S. Cl. 305—10 **23 Claims**



1. A vehicle to traverse a surface, said vehicle comprising a hollow body having opposite sidewalls, and have a front end and a rear end,
- a track structure extending rigidly, longitudinally of said body,
- a plurality of wheels sequentially disposed to travel longitudinally about said track structure in an endless path, said wheels including an upper span traveling above said track structure, and a lower span traveling beneath said track structure, to engage a surface being traversed,
- said track structure having a lower, fixed runway resting upon said lower span of wheels, whereby said vehicle is supported upon and carried by said lower span,
- said track structure having an upper, fixed runway to support said upper span of wheels,
- endless driven means carried by said body to interengage and drive said wheels in said endless path,
- drive means carried by said body to engage and drive said driven means,
- a power source carried by said body, and means to transmit driving power from said power source to said drive means, wherein the improvement comprises,
- a supplemental runway elongated longitudinally in a position of said track structure and having a surface engaged with a span of wheels,
- retaining means to retain said supplemental runway in said position, and
- adjusting means to afford positive adjustment of said supplemental runway toward and away from said track structure to compensate for slack in said endless drive means.

3,971,598
STRUCTURAL BEARINGS

Sydney James Rudge, Greenford, England, assignor to The Glacier Metal Company Limited, Alperton, Wembley, England
Filed Apr. 4, 1974, Ser. No. 457,892
Claims priority, application United Kingdom, Apr. 4, 1973, 16009/73
Int. Cl.² F16C *17/00*
U.S. Cl. 308—3 R **9 Claims**



1. A structure bearing comprising (1) an upper member, (2) a base member having a part sherical upwardly facing bearing surface supporting said upper member, there being a groove formed in said base member near the top and extending from said part spherical bearing surface substantially horizontally into said base member, and (3) a bearing layer supported on said bearing surface and fixed in position by having its edges engaged in said groove, said bearing layer engaging the upper member in such a manner as to permit universal freedom of angular movement of said upper member relative to the base member.

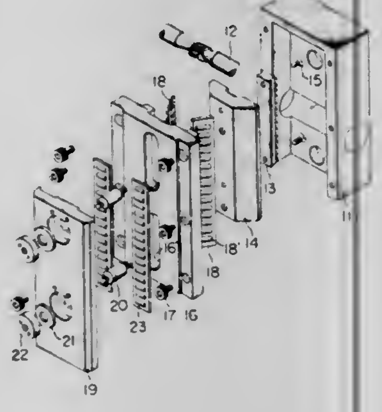
3,971,599
RECTILINEARLY GUIDING DEVICE

Megumu Shio, Kanagawa, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Jan. 21, 1975, Ser. No. 542,704
Claims priority, application Japan, Jan. 31, 1974, 49-12175
Int. Cl.² F16C *29/04*
U.S. Cl. 308—3 A **14 Claims**

1. A device for rectilinearly guiding a stage for carrying thereon a sample, comprising:
a. a stationary member;
b. a stationary race integrally formed with said stationary member and having at least two surfaces forming a certain angle with each other;
c. a movable race movable with said stage in a predetermined direction with respect to said stationary member and having at least two surfaces opposed to said surfaces of said stationary race, respectively;

d. means for driving said movable race;

e. stage-moving sliders comprising a plurality of roll bearings and base plates supporting said bearings, said sliders being disposed between said opposed surfaces of said stationary race and said stage-moving movable race; and

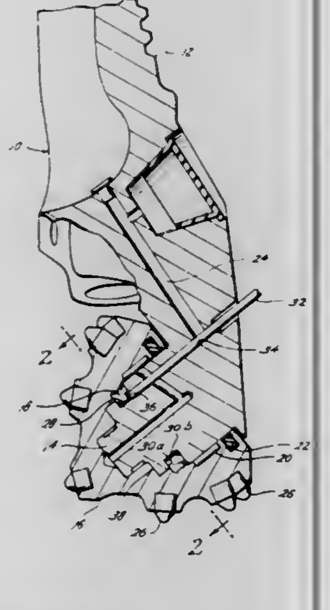


f. resilient pressing means for causing said opposed surfaces of said stationary race and said movable race to impart pressure forces to said roll bearings simultaneously.

3,971,600
DRILL BIT

Henry W. Murdoch, and Percy W. Schumacher, Jr., both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.

Filed July 28, 1975, Ser. No. 599,817
Int. Cl.² F16C *33/66*
U.S. Cl. 308—8.2 **11 Claims**

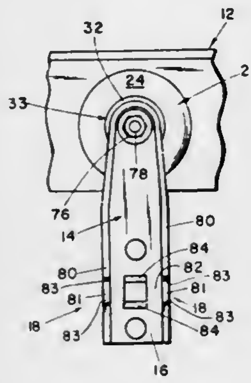


1. A drill bit, comprising
a body having a shaft extending therefrom,
a roller cutter having a hollow central portion,
bearing means for rotatively mounting said roller cutter on said shaft with the outer edge of said roller cutter being in close spaced relationship to the base of said shaft,
an annular thrust bearing secured within said cutter,
means on said shaft for retaining said thrust bearing and said cutter in rotating position around said shaft,
a lubrication system defined in said body and said shaft and communicating with said bearing means and said thrust bearing, and
means sealing between the outer edge of said roller cutter and the base of said shaft whereby said bearing means and said annular thrust bearing and said retaining means are contained within the lubricated space between said roller cutter and said shaft.

3,971,601
SANITARY ANTI-FRICTION TROLLEY WHEEL

Frederick R. Sytsma, Grand Rapids, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Dec. 2, 1974, Ser. No. 528,794
Int. Cl.² B65G *17/20;* **F16C** *13/06, 19/16, 25/06*
U.S. Cl. 308—16 **18 Claims**



1. A trolley wheel assembly comprising, in combination: an anti-friction plastic wheel having a central opening; an annular outer metallic bearing race positioned in said opening; an axial means extending through said opening; an annular inner metallic bearing race positioned about said axial means and spaced from said outer race; and a plurality of anti-friction means disposed in said space defined between said races; said axial means including a shaft having an enlarged head portion, said head portion having a formed surface comprising at least a part of said inner race; said inner race further including a second member, said second member being cylindrical and adapted to fit over said shaft and into abutment with said enlarged head portion of said shaft, the outer surface of said second member comprising at least a portion of said inner race.

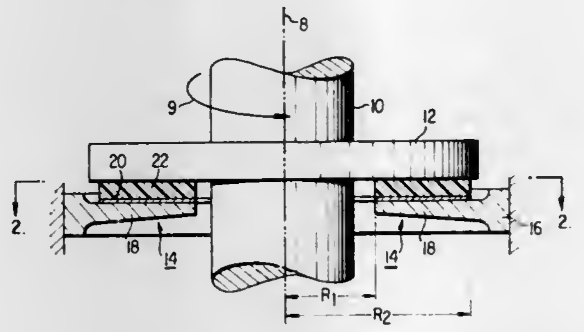
11. A trolley bracket assembly comprising, in combination: a trolley bracket having a trolley wheel supporting end, said end having an opening for receiving a trolley wheel; a trolley wheel comprising an anti-friction plastic wheel with a central opening; a pair of metallic annular outer bearing races in said central opening, said races being spaced axially apart; a set of roller balls for each of said races; an inner race assembly including a mounting shaft having an enlarged head on one end, the opposite end of said shaft adapted for insertion into said bracket opening for securing said trolley wheel to said bracket, said enlarged head including an inner race for one of said set of balls; and a cylindrical member adapted to fit over said shaft into abutment with said enlarged head, said cylindrical member including an inner race for the other of said set of balls.

3,971,602
THRUST BEARING

William J. Anderson, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,182
Int. Cl.² F16C *17/06*
U.S. Cl. 308—160 **7 Claims**

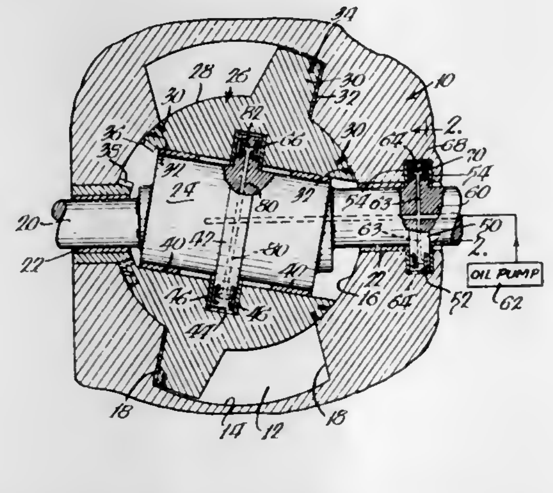
1. A thrust bearing assembly arranged to cooperate with a rotor which rotates in at least one angular direction, comprising,
a mount in annular form,
spokes cantilevered radially inward from said annular form, the cantilevered spokes being arranged at equal angular intervals about the axis of said mount and the coincident axes of said rotor,
a heat resistant annulus resilient relative to and supported by said cantilevered spokes against axial thrust, thereby forming flexible beams between adjacent pairs of said cantilevered spokes, and
thrust pads supported on said resilient beams to receive the thrust of said bearing, said pads being also spaced at like equal intervals angularly between said spoke, the leading edge of each pad being farther circumferentially from its adjacent spoke than the lagging edge of said pad circumferentially from its adjacent spoke.



3,971,603
THRUST BEARING LUBRICATION

Roger Odell Bjerk, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 2, 1975, Ser. No. 618,985
Int. Cl.² F16C *1/24*
U.S. Cl. 308—168 **11 Claims**



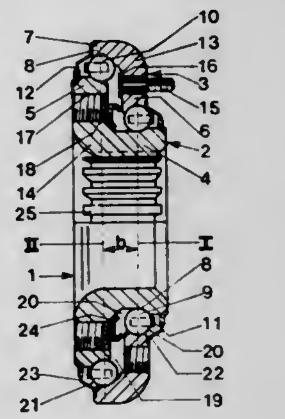
1. A slant axis rotary mechanism comprising:
a housing defining a chamber including an operating cavity;
a shaft journalled in said housing and including an angularly offset portion within said chamber;
a rotor within said chamber and journalled on said angularly offset portion;
at least one thrust collar on said shaft and operatively associated with one of said rotor and said housing;
thrust bearing means on said one of said rotor and said housing in sliding engagement with said thrust collar;
at least one lubricant port in said thrust collar and opening to the interface of said thrust bearing means and said thrust collar; and
means for directing a lubricant under pressure to said port.

3,971,604
BOX BEARING

Jan Hendrikus Kapaan, Ijsselstein, Netherlands, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Nov. 18, 1974, Ser. No. 524,491
Claims priority, application Netherlands, Dec. 10, 1973, 7316847
Int. Cl.² F16C *19/00, 21/00, 33/00*
U.S. Cl. 308—183 **19 Claims**

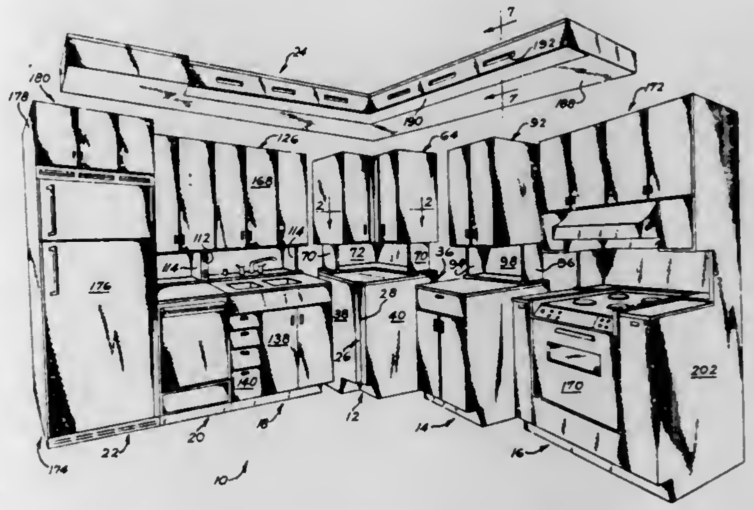
1. A roller bearing for a rotary element comprising a pair of bearing rings having substantially L-shaped axial cross-section portions with an annular running surface adjacent each end of the L-shaped cross-sections, each L-shaped cross-section portion having a radially extending portion, said rings opposing each other to form a substantially box-shaped bearing, first and second groups of a plurality of rolling elements, said rings being arranged to define, between their respective running surfaces, first and second bearing races of first and second diameters respectively, with said first bearing race having a greater diameter than said second bearing race, said first and second groups of rolling elements being arranged in said first and second races respectively, a bearing cage for each of said groups of rolling elements, and axially extending fastening means on said radially extending portion of at least one ring between said first and second races for affixing said one ring in the axial direction to said rotary element, whereby said first and second groups of rolling elements form first and second rows respectively.



3,971,605
MODULAR FURNISHINGS

Russell M. Sasnett, Altamonte Springs, Fla., assignor to Russel M. Sasnett, Louisville, Ky.

Continuation of Ser. No. 435,758, Jan. 23, 1974, which is a continuation of Ser. No. 221,190, Jan. 27, 1972, abandoned. This application Nov. 28, 1975, Ser. No. 636,026
Int. Cl.² A47B *53/00*
U.S. Cl. 312—198 **1 Claim**



1. A modular furnishing assembly comprising a corner module and at least two additional modules laterally and transversely connected adjacent thereto, respectively, each of said modules being free-standing and having: (1) a base cabinet portion including parallel side walls and a counter top; (2) storage means having a top, a bottom, side walls coplanar with the side walls of said base cabinet, and doors providing access thereto, said storage means being integral with said base cabinet portion through column means and panel structure so that no portion of the kitchen wall behind a module is exposed, said integral column means providing support independently for each module and said storage means further being located above and rearwardly offset from said base portion to define a raceway extending upwardly substantially above the counter top of said base cabinet portion to provide for electrical wiring and plumbing is to be installed behind said module, said rearward offset also providing that said doors of said storage

means do not swing outwardly beyond the front plane of said module, said module being further characterized by at least one of said column means being spaced inwardly from the common plane of the side walls of the adjacent storage means and base cabinet portion, thereby defining, in conjunction with said counter top of said base portion and said bottom of said storage means, an inset bounded on three sides only and opening on the fourth side for cooperation with a like inset of any adjacent module in abutting association therewith to provide a tunnel for receiving electrical distribution means; connector means for connecting adjacent modules together along abutting side walls thereof, said connector means being accessible from the front of said units; and lighting means located above the top of and attached to said storage means for illuminating the surroundings and providing a molding between said storage means and the ceiling when the module is installed in the room.

3,971,606
WATER LUBRICATED BEARING DEVICE

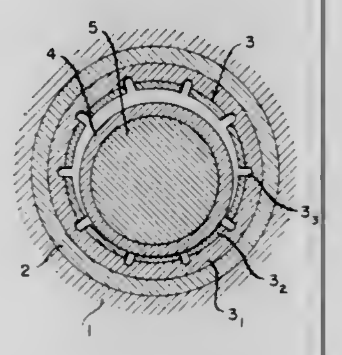
Yoshiki Nakano; Heiichiro Nakamura; Tatsuo Fujita, all of Yokohama; Kanichi Nakamura, and Masaaki Higo, both of Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1974, Ser. No. 472,043

Claims priority, application Japan, Jan. 18, 1974, 49-8250

Int. Cl.² F16C *27/02, 33/20*

U.S. Cl. 308—238 **6 Claims**



1. Water lubricated bearing means, comprising a tubular elastic composite bearing member formed of an elastomeric material of moderate elasticity; a plurality of segmental lining members arranged in circumferentially spaced relation on the inside surface of said bearing member, each of said lining members being formed of a thermoplastic synthetic resin compound selected from the group comprising tetrafluoroethylene, polyethylene or polyacetal and at least one filler, the spaces between said lining members defining lubricating grooves; tubular bushing means containing a cylindrical chamber in which said bearing means is concentrically mounted; and bearing support means containing a cylindrical bore in which said bushing means is concentrically mounted.

3,971,607
FABRIC HAND TOWEL DISPENSER

Conrad W. Schnyder, Triesenberg, Liechtenstein, assignor to Neuco Apparatebau AG, Zug, Switzerland

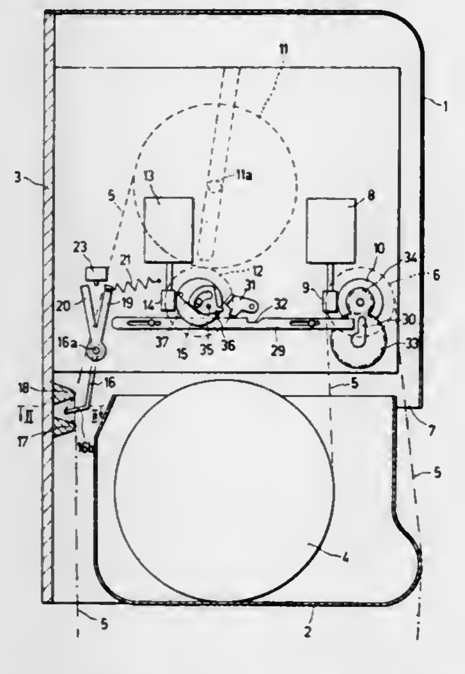
Filed Oct. 24, 1974, Ser. No. 517,585

Claims priority, application Switzerland, Oct. 29, 1973, 15177/73

Int. Cl.² B65H *19/00*

U.S. Cl. 312—38 **6 Claims**

1. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side to the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper flap pivotally mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper flap for urging it yieldably into an operative position in which an edge of said flap extends between said two projections, whereby said flap is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value; means coupled to said flap and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said flap is pushed out between said projections; and a separate detector member including a detector finger mounted for pivoting about the same axis as said flap and adapted to bear against the hand towel passing to the used hand towel reel, said separate detector member further including means arranged for operating a switch for shutting off said electric motor when the end of the hand towel has passed said detector finger.



4. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side of the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper member movably mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper member for urging it yieldably into an operative position in which an edge of said smoothing stripper member extends between said two projections, whereby said member is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value; means coupled to said smoothing stripper member and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said member is pushed out between said projections; and devices for retracting said smoothing stripper member against the action of said biasing means and for holding said member in a retracted position during the dispensing of hand towel, said retracting devices including a lever which is adapted to be pivoted when a pull is exerted on the hand towel passing from the fresh hand towel reel out of the housing, said lever being coupled to said smoothing stripper member through a mechanical connection which includes a draw member which is tensioned and retracts said smoothing stripper member when said lever is pivoted by pull on the hand towel, and said device for holding said smoothing stripper member in its retracted position including a suction cup which is secured to said lever and which is adapted to cooperate with a counter element when said lever is pivoted.

5. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side of the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper flap pivotally mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper flap for urging it yieldably into an operative position in which an edge of said flap extends between said two projections, whereby said flap is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value, and is pushed in between the projections beyond said operative position by said biasing means when the end of the hand towel has passed said edge of the flap; and means coupled to said flap and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said flap is pushed out between said projections and when it is pushed in between the projections beyond said operative position.

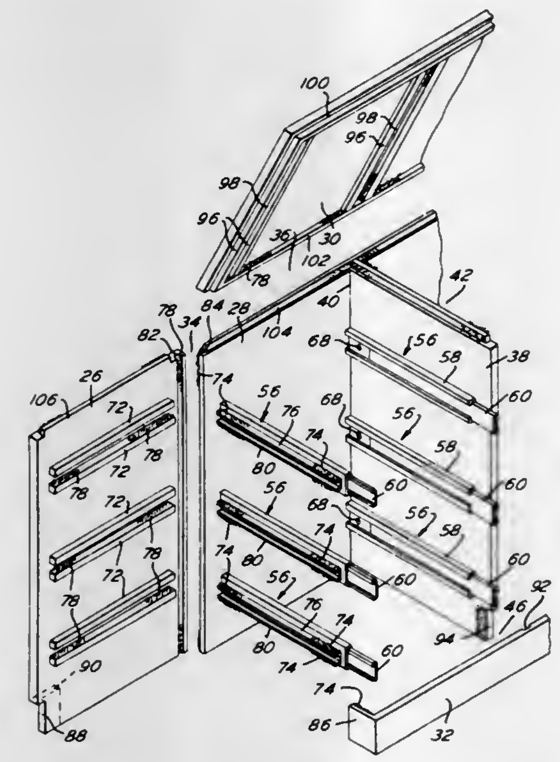
3,971,608
KNOCK-DOWN DRAWER UNIT

Charles C. Gans, 240 E. 35th St., New York, N.Y. 10016

Filed Apr. 17, 1975, Ser. No. 568,968

Int. Cl.² A47B *43/00*

U.S. Cl. 312—257 R **8 Claims**



1. A knock-down drawer unit comprising at least one drawer, a frame for supporting said drawer therein, said frame comprising a vertical side wall and a top wall, said side wall including mounting means having a support bar permanently secured to said side wall, a flange, and a slide assembly permanently connected to said flange and supported on said support bar, said slide assembly slidably supporting said drawer in said frame and comprising an elongated channel member and an elongated slide disposed in said channel member, said flange being disposed on said support bar and releasably secured thereto by a two component releasable fastening tape, one component thereof having a plurality of hook-like elements thereon and the other component thereof having a plurality of loop-like elements thereon, one of said components being permanently secured to said support bar and the other component being permanently secured to said flange, said side wall and top wall of said frame being connected to each other by a freely detachable joint, said joint being secured together by a two component releasable fastening tape, one component thereof having a plurality of hook-like elements thereon and the other component thereof having a plurality of loop-like elements thereon, one of said components being permanently secured to said side wall and the other being permanently secured to said top wall.

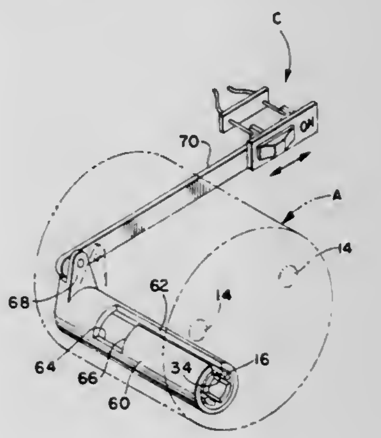
3,971,609
ELECTRICAL CONNECTORS

George W. Knecht, Brooklyn, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 6, 1974, Ser. No. 530,061

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 P **12 Claims**



1. An electrical connector comprising; a body member having a plurality of spaced-apart socket electrical contacts and a ground socket contact spaced from said electrical contacts, said ground contact including a sleeve member having a longitudinal slot therein, a longitudinally-extending bore in said body member spaced from said socket electrical contacts and substantially coincidental with said ground socket contact, an insert secured in said bore, said insert having a centrally located hole therein defining an entrance opening to said ground socket contact, and a keying groove in said insert aligned with said slot and intersecting said hole, said ground socket contact and insert being securable in said body member in a plurality of different rotated positions for locating said slot and keying groove in different locations relative to said socket electrical contacts to provide selective polarization keying.

3,971,610
CONDUCTIVE ELASTOMERIC CONTACTS AND CONNECTORS

Leonard S. Buchoff, Bloomfield; Joseph P. Kosiarski, Englishtown, and Chris A. Dalamangas, Fort Lee, all of N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

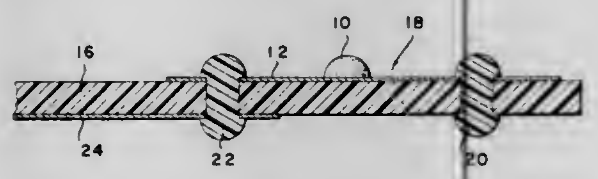
Filed May 10, 1974, Ser. No. 468,652

Int. Cl.² H05K *1/04*

U.S. Cl. 339—17 R **9 Claims**

1. A circuit board carrying at least two conductors on a portion of one side of said board, said at least two conductors being electrically insulated from each other, each conductor having an electrically conductive elastomeric contact integrally fixed thereto, and actuator means positioned in physical proximity to at least two of said elastomeric contacts, the actuator means having a conductive surface for completing

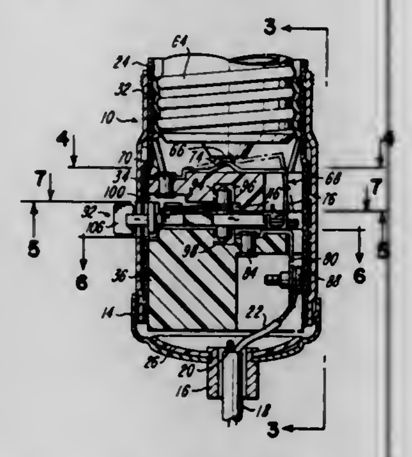
the electrical circuit between said at least two elastomeric contacts, at least one of said elastomeric contacts extending from the surface of said circuit board to said actuator means



for preventing the conductive surface of said actuator means from contacting another elastomeric contact on said board without the application of an externally applied force.

3,971,611
SAFETY SOCKET FOR LAMPS AND THE LIKE

Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440
Filed Oct. 10, 1974, Ser. No. 513,632
Int. Cl.² H01R *13/44, 33/30*
U.S. Cl. 339—34 **10 Claims**



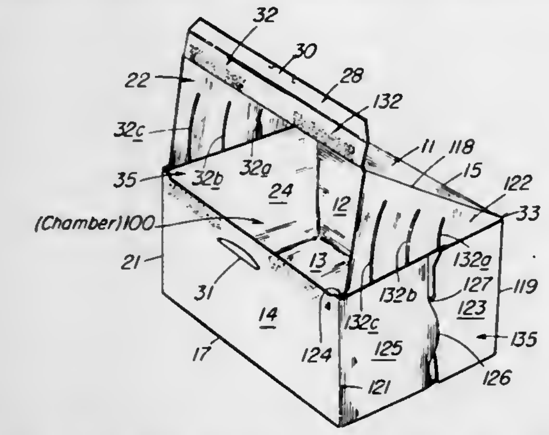
1. In a safety socket of the type having a first contact and a second contact positioned to be engaged by a load device that is inserted and removed by movement along a predetermined axis extending through the socket, the improvement wherein said socket further includes a contact terminal separate from said second contact which is engaged by said second contact when said socket is operative, an insulator member supported in said socket for movement relative to both said contact terminal and said second contact, and means for moving said insulator member to a position wherein it is interposed between said terminal and said second contact in response to removal of a load device from said socket thereby to prevent engagement between said second contact and said terminal, said insulator member being movable from said position in a path other than parallel to the said axis and not movable by force applied thereto in a direction parallel to said axis so that a force must be applied to said insulator member in a direction other than parallel to said axis to permit reengagement between said second contact and said terminal after a load device has been removed.

3,971,612
FLIP-TOP CARTON OF TRUNK TYPE FOR FROZEN ICE CREAM AND COMESTIBLES OF SIMILAR CONSISTENCY

Raymond C. Koenig, Wheaton, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Sept. 22, 1975, Ser. No. 615,728
Int. Cl.² B65D *5/02, 17/12*
U.S. Cl. 229—37 R **5 Claims**

1. A trunk type carton formed from a one piece blank of coated paperboard, and the like, and having a flip-top panel for access to highly viscous or stiffly frozen comestible content hingedly connected along a lateral fold line to a back panel, with the latter, a bottom panel and a front panel hingedly connected successively together by similar lateral fold lines; the end edges of said flip-top panel and the two ends of each of said back, bottom and front panels being provided with end flaps hinged thereto by fold lines and hingedly stackable at each end to form a container having closed ends,

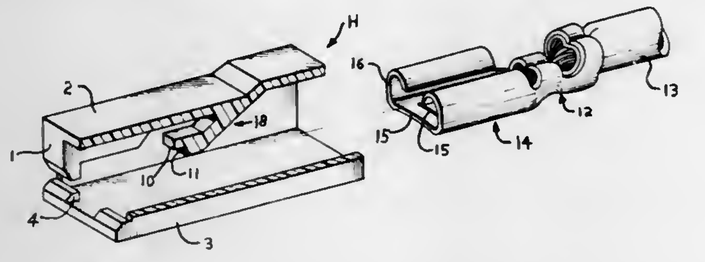
1. said bottom panel having each of its end flaps swung upwardly as the first end flap in each end stack with its outermost face being a substantially smooth surface and with the folded end flaps of said back and front panels in each end stack lapped in against each other over the outer face of said upfolded first end flap as the third and fourth end flaps in each stack and with the latter end flaps anchored together;
2. said flip-top panel being swung down to closure of the top of said carton with its end flaps swung inward to general alignment with said bottom panel end flaps as the second end flap in each end stack and slidably inserted by swing



between said first end flap and said third and fourth anchored end flaps of this end stack, each of said flip-top panel second end flaps having its free edge opposite its hinged fold line so dimensioned and shaped as to permit such swinging insertion freely;
3. each of said second end flaps also having its inner side face which is opposed to the outer side face of said first end flap in each end stack provided with a plurality of lines of embossments spaced appreciably transversely from each other and extending obliquely in generally parallel relation thereacross from the general vicinity of the hinge fold line connection of this second flap to the adjacent end of said flip-top panel, whereby swing out of each end stack in which each of these second end flaps is associated will be in the nature of generally longitudinal glide of each oblique embossment along the opposed substantially smooth surface of said first end flap.

3,971,613
ELECTRICAL HOUSING MEMBER

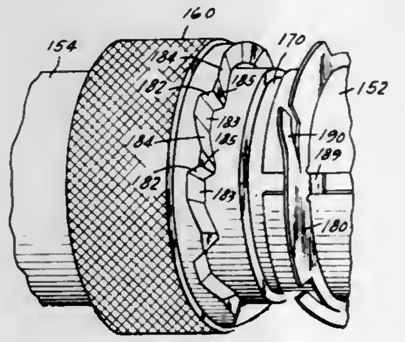
Robert James Kobler, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 572,589, Aug. 15, 1966, abandoned. This application Nov. 4, 1974, Ser. No. 520,572
Int. Cl.² H01R *9/16*
U.S. Cl. 339—59 R **2 Claims**



1. In an insulated clip structure to be used in electrical connections, the combination comprising a sheath of resilient plastic insulating material defining a clip receiving cavity, a clip member which is essentially rigid as related to said sheath, said clip member being provided with a shoulder intermediate the ends thereof, said sheath being open at both ends, the front end of said sheath being provided with a flange serving as a stop for the corresponding end of said clip, said sheath further including a pair of oppositely disposed walls, one of said walls being provided with an internal catch member in the form of a wedge, and at least one of said walls being elongated in transverse section and so sized and shaped as to enable it to yield elastically in a transverse direction thereby to cause said opposite walls to be temporarily forced apart in a transverse direction as said clip following insertion into said sheath from the rear end engages and moves along said wedge, the front end of said wedge establishing a shoulder which is forced to position itself behind and engage said intermediate shoulder of said clip as said clip shoulder passes by said wedge shoulder and said elastically yieldable wall moves back toward said other wall, said engaged shoulders of said sheath and clip together with an engagement between the front end of said clip and said stop flange serving to prevent said clip from any longitudinal movement in either direction within said sheath.

3,971,614
ELECTRICAL CONNECTOR WITH MEANS FOR MAINTAINING A CONNECTED CONDITION

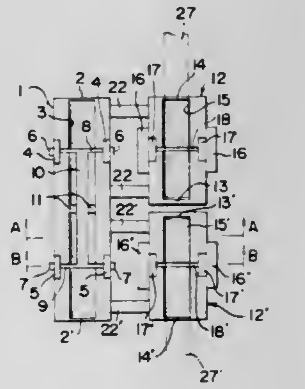
Alfred Paoli, and Bipin J. Shah, both of Chicago, Ill., assignors to Akzona Incorporated, Asheville, N.C.
Filed Nov. 3, 1972, Ser. No. 303,339
Int. Cl.² H01R *13/54*
U.S. Cl. 339—89 R **5 Claims**



1. In a connector having a plug shell, a receptacle shell, and a coupling nut, said coupling nut being mounted for rotation relative to one of said shells and having threads adapted to cooperate with corresponding threads on the other of said shells, the combination comprising a plurality of projections extending axially outwardly from the end of said coupling nut, restraining means including a resilient member connected with said one shell and urged into contact with said projections for impeding rotation of said coupling nut, a retainer member mounted on said one shell on the side of said resilient member remote from said coupling nut for maintaining said resilient member in juxtaposition with said coupling nut, said coupling nut and said retainer member being axially movable relative to each other, whereby the position of said retainer member relative to said coupling nut furnishes a visual indication of the state of said connector, said one shell having an external peripheral groove and said coupling nut having an internal groove aligned therewith, and a snap ring partly disposed in each of said grooves to maintain said coupling nut in mounted relation to said one shell, said snap ring having an axial dimension less than the axial dimension of at least one of said grooves, whereby said coupling nut is shiftable on said one shell between a first position in which said snap ring engages one side of the groove on the coupling nut and the opposite side of the groove on said one shell, and a second position in which said snap ring engages the other side of the groove on the coupling nut and the opposite side of the groove on said one shell.

3,971,615
SERIES CONNECTOR

Syunichi Hashimoto, 36-24, Higashiryoke 2-chome, Kawaguchi, Saitama, Japan
Filed Apr. 3, 1975, Ser. No. 564,708
Claims priority, application Japan, July 30, 1974, 49-90112; June 11, 1974, 49-66950
Int. Cl.² H01R *9/08*
U.S. Cl. 339—98 **2 Claims**

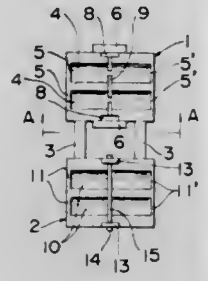


1. A series connector for electrically connecting the ends of a pair of wires, comprising a unitary main body formed of hard insulating synthetic resin and including:

1. a rectangular lower body portion which has in one major surface thereof a longitudinal center groove of semicircular cross-section extending for a substantial distance along the length of said body portion and terminating short of the opposite ends of the latter to thereby form a pair of thin yieldable end walls; a first pair of opposed engaging projections extending uprightly from said major surface adjacent to one end of said body portion, each upright projection having a projection extending laterally and outwardly of the associated upright engaging projection; a second pair of engaging projections extending uprightly from said major surface adjacent to the other end of said body portion, each upright projection having a projection extending laterally and outwardly of the associate upright projection; said lower body portion having first and second transverse grooves extending between said first and second pairs of upright projections, respectively, and intersecting said longitudinal center groove at right angles thereto, a longitudinal recess formed in the bottom of said longitudinal center groove and extending between said first and second transverse grooves; and a pair of opposite engaging pieces formed on the opposite sides of said longitudinal recess midway between the opposite ends thereof;

3,971,616
ELECTRICAL PARALLEL CONNECTOR

Syunichi Hashimoto, 36-24, Higashiryoke, 2-chome, Kawaguchi Saitama, Japan
Filed May 8, 1975, Ser. No. 575,660
Claims priority, application Japan, June 11, 1974, 49-66951
Int. Cl.² H01R *13/38*
U.S. Cl. 339—98 **1 Claim**

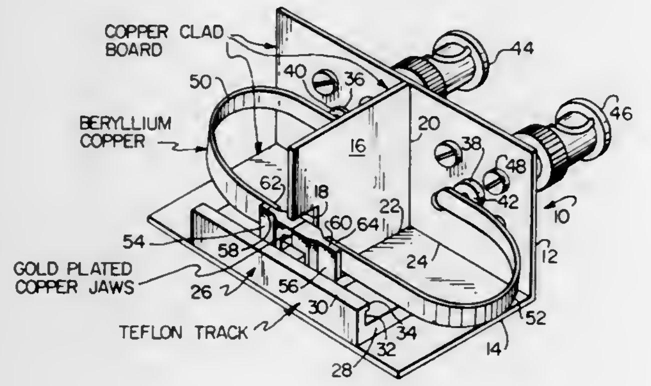


1. An electrical parallel connector comprising an integral unitary structure formed of electrically insulative hard synthetic resin and including a rectangular first connector member and a similarly-shaped second connector member integrally connected to said first connector member by means of flexible connecting strips, said first connector member having a plurality of parallel grooves extending for a substantial portion of the length of the connector member and terminating short of the opposite ends of the connector member to provide end walls which define the opposite ends of the grooves, one end wall of each of the grooves and the adjacent end of the associated connector member being spaced from each other by a distance greater than the distance between the other end wall of the groove and the adjacent end of the connector member to make the one end wall thicker than the other end wall, projections on the opposite sides of the associated connector member projecting outwardly of said major surface for fitting on the opposite sides of said second connector member, first recesses in the outermost side walls of said grooves extending across the side walls into the bottoms of the grooves and positioned adjacent to and inwardly of said projections and a second recess positioned between said first recesses and extending across the common inner side wall of the grooves into the bottoms of the adjacent grooves; and said second connector member having a corresponding number of parallel grooves extending by a substantial portion of the length of the connector member in one major surface thereof and terminating short of the opposite ends of the connector member to provide end walls which define the opposite ends of the grooves in the second connector member, one end wall of each of the grooves and the adjacent end of the connector member being spaced from each other by a distance greater than the distance between the other end wall of the groove and the adjacent end of the connector member to make the one end wall thicker than the other end wall, projections at the opposite side edges of the connector member projecting outwardly of said major surface of the second connector member for engaging in said first recesses in the first connector member and a recess extending between said projections of the second connector member across the bottoms of the grooves in the second connector member; further including a substantially W-shaped electrically conductive connecting blade having alternate prongs and pointed piercing projections received in said first and second recesses in the first connector member and the recess in the second connector member and covered wires received within the mating grooves in the first and second connector members and pierced by said pointed piercing projections.

3,971,617
Patent Not Issued For This Number

3,971,618
HOLDING DEVICE FOR MEASURING THE CAPACITY OF SMALL ELECTRICAL COMPONENTS

Paul O. Prince, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 20, 1975, Ser. No. 560,653
Int. Cl.² H01R *13/12*
U.S. Cl. 339—143 R **7 Claims**

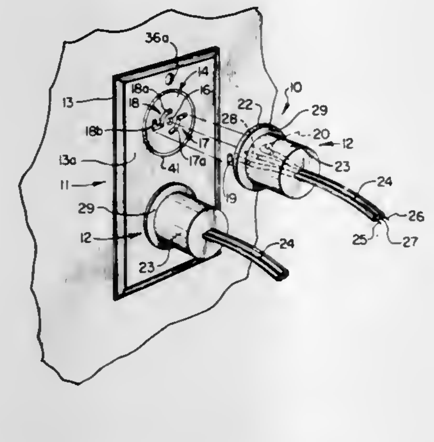


1. A device for holding small electrical components comprising:

a. a combined support and electrostatic shield means;
b. first and second movable electrical contacts for holding an electrical component therebetween;
c. first and second electrically conductive output terminals supported by said support means;
d. first and second electrically conductive spring means for urging said electrical contacts into an abutting relationship to thereby hold said electrical component between said first and second electrical contacts, said first spring means being connected to said first electrical contact and said first output terminal and said second spring means being connected to said second electrical contact and said second output terminal to thereby electrically connect said electrical component with said first and second output terminals;
e. a guide means including a Teflon track having a linear lip portion extending therefrom; securely attached to said support means for maintaining said electrical contacts along a linear path of travel; and
f. said combined support and shield means further comprises a planar electrostatic shield member interposed between said first and second spring means.

3,971,619
SAFE ELECTRICAL CONNECTOR

Donald J. Rohrssen, 511 Broadway, Rock Springs, Wyo. 82901
Continuation of Ser. No. 430,786, Jan. 4, 1974, abandoned. This application May 27, 1975, Ser. No. 580,951
Int. Cl.² H01R *33/46*
U.S. Cl. 339—189 R **8 Claims**



1. An electrical connector comprising

a receptacle having a face plate with one display face and a circuit face, at least one of set openings through the face plate, including an opening for a ground prong and a pair of openings for circuit prongs, electrical contact members offset from but adjacent to at least two openings of the set, said electrical contact members each having an inclined plane projecting outwardly from the circuit face and a detent projecting from the inclined plane whereby circuit prongs will pass over the detents to be securely held against the inclined planes of said contact members and to hold an electrical plug tightly against the display face, electrical connector terminals on the circuit face of the face plate, circuit means on the circuit face respectively interconnecting the electrical connector terminals with the electrical contact members; and

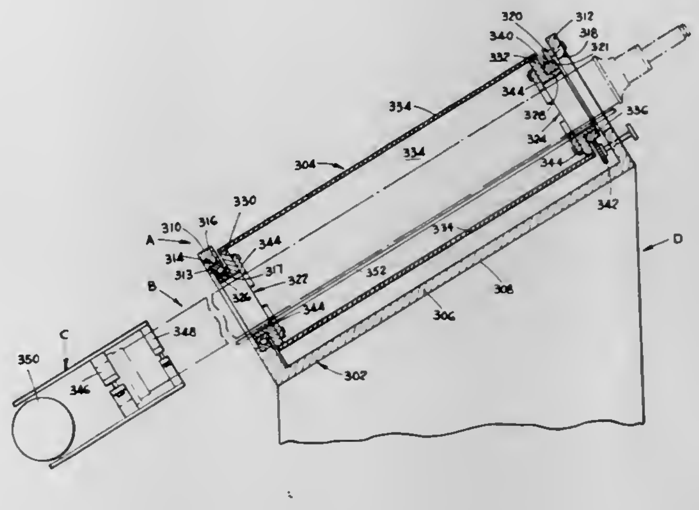
an electrical plug having a plurality of electrical prongs projecting from one face of said plug, a pair of said prongs constituting circuit prongs and each having an angled portion extending therefrom, said angled portions being in essentially the same plane, being shaped to fit through the slots of a set of openings through the face plate, and being arranged to engage the inclined planes of the electrical contact members when said prongs are inserted through the face plate and are turned past the detents.

3,971,620
TELESCOPE ASSEMBLIES

George Everett, Burlington, Unionville, Conn., assignor to Gros-ite Industries, Inc., Farmington, Conn.
Filed May 16, 1974, Ser. No. 470,515
Int. Cl.² G02B *23/02, 21/24*
U.S. Cl. 350—26 **5 Claims**

1. Apparatus for use with a refracting astronomical telescope having an eyepiece end, an objective end, and an optical axis for forming an astronomical telescope assembly, the apparatus comprising:

a frame including a cradle for the attachment thereto of a refracting astronomical telescope for rotation about its optical axis only, the frame being adapted for mounting in a position in which said optical axis is parallel to the axis of the earth's rotation, and with the eyepiece end of the telescope higher than the objective end, the frame having first and second end walls spaced apart on a base and substantially perpendicular thereto and carrying first and second bearing means, the opposite ends of the cradle being rotatably supported by said bearing means for enabling the telescope to be rotated about its optical axis;



a reflector unit for attachment to the objective end of the telescope for rotation with the telescope, the reflector unit having a reflecting surface which intersects said optical axis, means for pivoting the reflecting surface about a second axis substantially perpendicular to said optical axis when the reflector unit is attached to the telescope for directing light into the objective end of the telescope; and

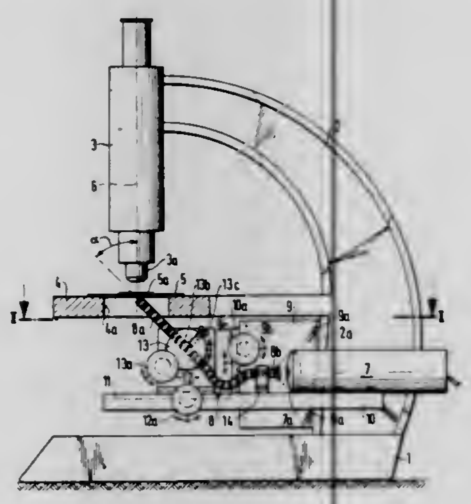
manually operable reflecting surface control means carried by the frame in a position adjacent the eyepiece end of the telescope for remote positioning of the reflecting surface about said second axis.

3,971,621
METHOD AND APPARATUS FOR GENERATING A RELIEF-LIKE CONTRAST AT MICROSCOPIC IMAGES OF A TRANSPARENT PHASE OBJECT

Gunter Albrecht-Buehler, Gainerville, Fla., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Feb. 27, 1974, Ser. No. 446,449
Claims priority, application Switzerland, Mar. 1, 1973, 3001/73
Int. Cl.² G02B *21/06*
U.S. Cl. 350—87 **6 Claims**

2. A microscope for producing a relief-like contrast at a microscope image of a transparent phase object, comprising a microscope objective possessing an optical axis, an object support, an object illumination device generating a mutually incoherent bundle of light rays for oblique illumination of the object, said object illumination device comprising a light source and a light conductor comprising a bundle of glass fibers, said bundle of glass fibers having a frayed end confront-

ing said light source and a light radiating end arranged at the direct region of the point of intersection of the optical axis of



the objective with the object support and enclosing with said axis an angle in the order of about 40° to 50°.

3,971,622
MICROSCOPE ASSEMBLY HAVING BASE MOUNT FOR RECEIVING DIMMER CIRCUIT COMPONENTS

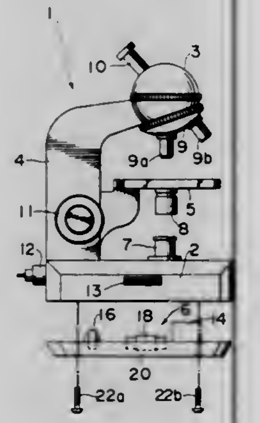
Makoto Yoshinaga, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1974, Ser. No. 517,486

Claims priority, application Japan, Dec. 13, 1973, 48-141328[U]

Int. Cl.² G02B *21/06*

U.S. Cl. 350—87 **2 Claims**



1. A microscope assembly comprising:
lens barrel means;
a base for supporting said barrel means;
the underside of the base having a recess;
a tray-shaped component mounting member having a flat central portion and upwardly sloping sides defining a tray-shaped recess;
said mounting member having spaced openings for loosely receiving threaded fasteners;
said base being adapted to be positioned upon said mounting member whereby said recess and the top surface of said mounting member cooperatively define a hollow substantial rectangular shaped enclosed volume;
said base having openings aligned with the openings in said component mounting member and being threadedly engaged by said fasteners to secure said mounting member to the bottom of said base;
said interior volume being of a size sufficient to fully enclose all of the electrical elements typically incorporated in a dimmer circuit conventionally employed for adjusting the intensity of a light source employed as an illumination means in the microscope;
said base having a first opening along the exterior surface communicating with said recess;
a voltage adjusting knob extending at least partially through said opening for manually adjusting the voltage supplied to the light source;
a second opening being provided in said base and communicating with said recess;
a cable connector extending through said second opening and into said interior volume;
the upper surface of the center portion of said tray-shaped component mounting member being adapted to support at least some of the electrical components typically utilized in a dimmer circuit, said components including at least a transformer and a thyristor being mounted upon said center portion to thereby facilitate maintenance, repair, inspection, and/or replacement of said components when the component mounting member is separated from said base whereby said selected components are freely accessible from the top surface of the component mounting member;
the bottom surface of said component mounting member serving as the supporting surface of the microscope assembly when secured to said base;
said interior volume being the sum of said base recess and said tray-shaped recess.

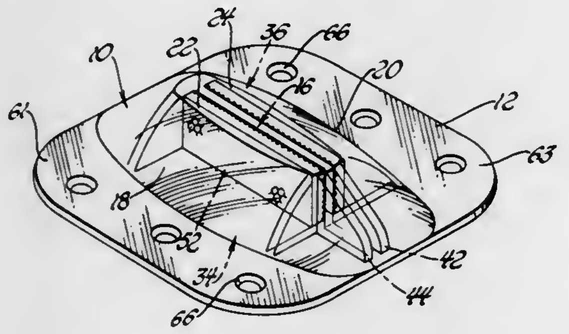
3,971,623
ROADWAY MARKER

Peter Hedgewick, Windsor, Canada; Donald C. Suhr, Farmington Hills, Mich.; John F. Domaracki, and Robin A. Arnott, both of Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Filed Mar. 13, 1975, Ser. No. 558,181

Int. Cl.² G02B *5/124*

U.S. Cl. 350—103 **46 Claims**



1. A pavement marker comprising: a thin walled, shell-like body of substantially uniform wall thickness with a chamber formed therein; said body being at least partially of transparent material to form a transparent outer wall for said chamber so that the interior of said chamber is visible through said transparent outer wall; and marker means located in said chamber so as to be visible through said transparent outer wall, said marker means being spaced from and out of contact with said transparent outer wall such that there is an air space between said marker means and transparent outer wall whereby light rays striking said transparent outer wall externally of said chamber pass through said transparent outer wall and said air space to strike said marker means.

3,971,624
CONTROLLABLE ELECTROCHROMIC INDICATOR DEVICE WITH IONIC CONDUCTING INTERMEDIATE LAYER AND NON-POLARIZABLE ELECTRODES

Peter Bruesch, Nussbaumen; Fritz Lehmann, Baden; Claus Schuler, Widen, and Hans-Rudolf Zeller, Birr, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

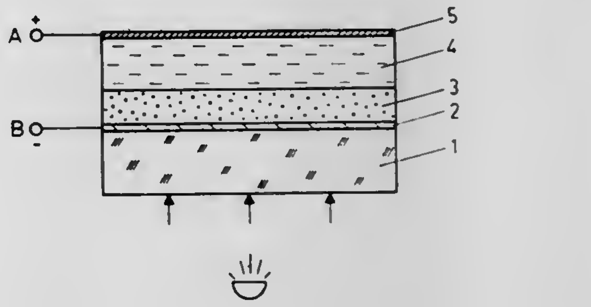
Filed May 6, 1975, Ser. No. 575,008

Claims priority, application Switzerland, June 12, 1974, 8011/74

Int. Cl.² G02B *5/23;* G02F *1/36*

U.S. Cl. 350—160 R **24 Claims**

1. A controllable electrochomic indicator device comprising:
two electrodes,
an electrochromic layer and an adjacent charge-carrier-transmitting insulator layer situated between the two electrodes,
at least one of the electrodes being deposited on a supporting plate and at least one of the electrodes being transparent,
the charge carrier transmitting insulator layer being a good ion conductor and functioning to almost completely block the flow of electrons, and



at least one of the electrodes being non-polarizable and disposed in contact with the ion conductor.

3,971,625
BASIC DYEING

Hans Ortheil, deceased, late of Spartanburg, S.C. (by Hildegard M. Ortheil, administratrix), assignor to Kane and Company, Gastonia, N.C.

Filed Mar. 16, 1973, Ser. No. 342,183

Int. Cl.^{2} D06P *1/68*

U.S. Cl. 8—82 **8 Claims**

1. A dyebath comprising in combination:

a body of liquid ammonia having a liquid organic solvent selected from the group consisting of tetrahydrothiophene 1—1 dioxide, dimethylsulfoxide and dimethylformamide dissolved therein, and a basic dyestuff compatible with said liquid ammonia, dissolved in said liquid organic solvent.

3,971,626
FAT-LIQUORING AGENT FOR WATERPROOFING LEATHER AND SKINS

Rudi Heyden, Hochdahl-Millrath, and Adolf Asbeck, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 29, 1974, Ser. No. 518,247

Claims priority, application Germany, Nov. 3, 1973, 2355025

Int. Cl.^{2} C14C *9/02*

U.S. Cl. 8—94.23 **13 Claims**

1. A process for manufacturing waterproof leather or skins, which comprises impregnating said leather or skins with an effective water-proofing amount of an aqueous fat-liquoring emulsion of a mixture of (A) an acid ester of citric acid with a fatty alcohol having 12 to 22 carbon atoms, and (B) an organic alcohol solvent for said ester of citric acid which is totally or partially soluble in water and which has a boiling point above 100°C., the ratio of component (A) to component (B) being between 9 : 1 and 1 : 9.

3,971,627
EPOXY-AZIDO COMPOUNDS

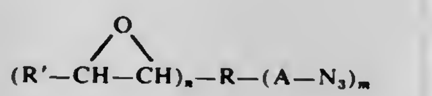
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 448,612, March 6, 1974, Pat. No. 3,941,751, which is a division of Ser. No. 301,003, Oct. 26, 1972, abandoned, which is a division of Ser. No. 85,300, Oct. 29, 1970, abandoned, which is a division of Ser. No. 843,230, July 18, 1969, Pat. No. 3,608,604. This application June 24, 1975, Ser. No. 589,981

Int. Cl.^{2} D06M *13/38;* **C07D** *303/36*

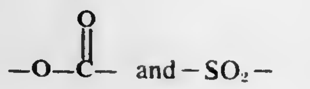
U.S. Cl. 8—115.5 **2 Claims**

1. A polymer in the form of tire cord selected from polyesters, polyolefins, polyamides, polycarbonates, and rayon, modified by reaction with an epoxy-azido compound having the formula



$$(R'-\overset{O}{\overbrace{CH-CH}})_n-R-(A-N_3)_m$$

where R is an organic radical selected from the group consisting of radicals derived by the removal of two or more hydrogen atoms from alkanes, cycloalkanes, alkylcycloalkanes, arenes, alkyl substituted arenes, alkylene-diarenes, dialkylcycloalkanes, alkyloxyalkanes, aryloxyarenes, alkaryloxyarenes, alkaryloxyalkarenes, aralkyloxyalkanes, aralkyloxyaralkanes, alkylthioalkanes, arylthioarenes, alkarylthioarenes, alkarylthioalkarenes, aralkylthioalkanes, aralkylthioaralkanes, alkylsulfonylalkanes, arylsulfonylarenes, alkarylsulfonylarenes, alkarylsulfonylalkarenes, aralkylsulfonylalkanes, aralkylsulfonylaralkanes, and the foregoing radicals with fluoro, chloro, bromo or iodo substituents, R′ is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and aralkyl radicals, A is a radical selected from the group consisting of



$$-O-\overset{O}{\overset{\|}{C}}- \text{ and } -SO_2-$$

and *n* and *m* are integers from 1 to 10.

3,971,628
METHOD FOR INHIBITING RUST FORMATION ON IRON-CONTAINING ARTICLES

Ake Roland Albin Bresle, Stocksund, Sweden, assignor to Aminkemi AB, Bromma, Sweden

Division of Ser. No. 228,312, Feb. 22, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,957

Claims priority, application Sweden, Mar. 9, 1971, 2955/71

Int. Cl.^{2} C23F *11/00, 11/08*

U.S. Cl. 21—2.7 R **8 Claims**

1. A method of inhibiting rust formation on the surfaces of an iron-containing article whose surfaces have lodged thereon corrosion accelerators selected from the group consisting of metal chloride, sulfur-containing compounds and water, said method comprising removing said corrosion accelerators by washing the article with a solution consisting essentially of 0.1 to 1.0 percent by weight of lithium hydroxide in an organic solvent in which lithium chloride and water are at least slightly soluble, and drying the article, whereby a protective layer is formed on the article.

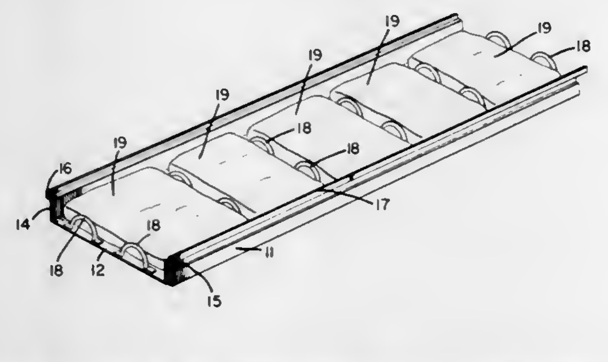
3,971,629
RETORTING TRAY

Louis F. Buix, Crystal Lake; Harry J. Gribnitz, Addison, and Gary A. Hohner, Sleepy Hollow, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,610

Int. Cl.^{2} A61L *3/02;* **A23L** *3/10*

U.S. Cl. 21—105 **9 Claims**



1. A tray for use in the retort sterilization of material contained in sealed flexible pouches, said tray comprising:

a. An elongated bottom;
b. Two elongated sidewalls extending upwards from opposite sides of said bottom;
c. Said sidewalls terminating in nesting means for stacking a plurality of like trays in a nesting configuration;
d. Two narrow ends at opposite ends of said bottom and at a right angle to said side-walls, said narrow ends being open;
e. Protuberances extending upwards from the bottom to space apart flexible pouches on the tray and to control the maximum cross section of the pouch during sterilization to insure complete, uniform and accurate heat penetration and sterilization of the contents of the pouch and to prevent substantial movement of the pouches on the tray, said protuberances being sufficiently open to allow for circulation of a heating medium about the trays;
f. Conduit means for circulating a heating medium around the bottom and the side-walls, said conduit means being attached to the sidewalls of the tray and partially surrounding said tray on three sides.

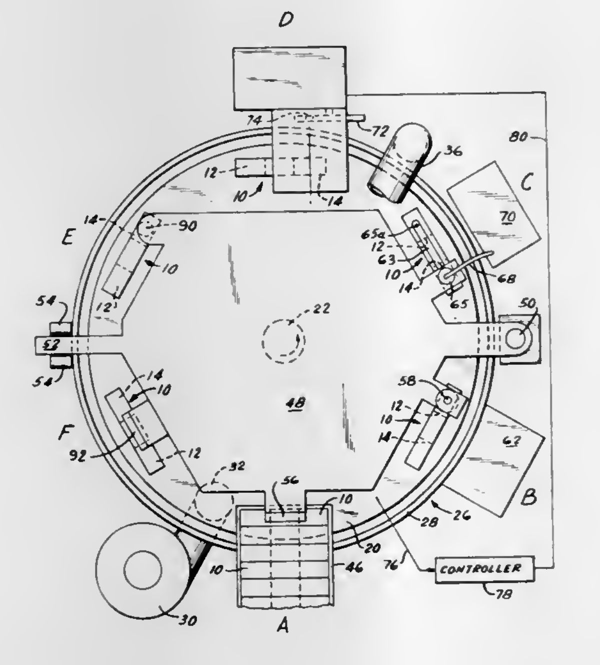
3,971,630
APPARATUS AND METHOD FOR BATCH-TYPE ANALYSIS OF LIQUID SAMPLES

Harold E. Sandrock, Rockville Centre; Edward W. Stark, Garden City, both of N.Y., and Steven A. Gyori, Allendale, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,462

Int. Cl.^{2} G01J *3/46;* **G01N** *21/24, 33/16*

U.S. Cl. 23—230 R **22 Claims**



7. A method for analyzing a constituent of interest in a liquid sample, comprising the steps of:

placing a container with its contents of such sample and at least one reagent in a chamber;

regulating the thermal environment within said chamber within limits;

determining the optical density of said contents within said container within said chamber subsequent to the combination of said contents;

sensing the temperature of said contents at a time other than during said determination and generating a signal in response thereto; and

extrapolating in response to said signal the real temperature of said contents at the time of said determination.

3,971,631
PELLETIZING ALKALI METAL POLYSILICATES

Guillermo Almagro, Aberdeen; Orlando L. Bertorelli; Robert K. Mays, both of Havre de Grace; Lloyd E. Williams, Bel Air, all of Md., and Howard F. Zimmerman, Jr., Athens, Tenn., assignors to J. M. Huber Corporation, Locust, N.J.

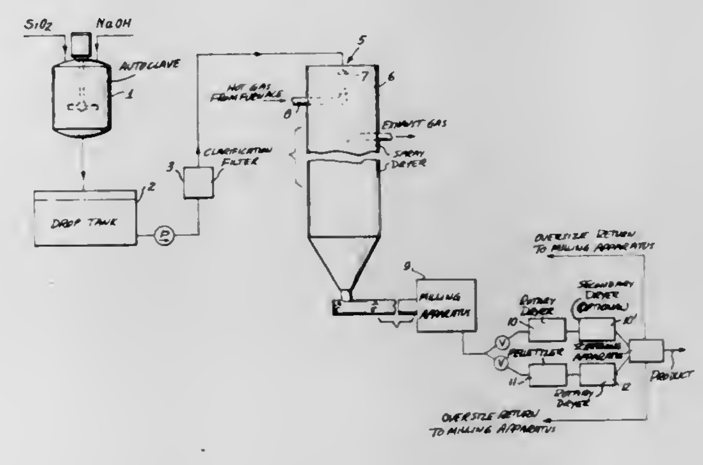
Division of Ser. No. 193,471, Oct. 28, 1971, Pat. No. 3,835,216. This application Aug. 26, 1974, Ser. No. 500,830

Int. Cl.^{2} B01J *2/12, 2/14, 2/02;* **C01B** *33/32*

U.S. Cl. 23—313 AS **1 Claim**

1. A method for pelletizing finely divided alkali metal polysilicate particles comprising the steps of:

1. spray drying a silicate product by passing an aqueous mixture of silicate particles into the upper portion of a drying chamber and dispersing said mixture in the form of fine droplets in said chamber; the temperature of the inlet air to the spray drier being of the order of from about 400° to 1000°F.; whereby said droplets form minute hollow polysilicate microspheres;
2. collecting said spherical polysilicate droplets from the spray dryer and passing to a milling apparatus;
3. fracturing and pulverizing said hollow spheres in said milling apparatus to the extent that the density of the resulting fractured particles is increased to at least 25 lbs/cubic foot, and particles having sharp and uneven surfaces are formed;
4. passing said milled product to a rotating pelletizer vessel;
5. rotating said product in said rotating vessel at a temperature of 30°–150°C. while adding sufficient water thereto to increase the moisture content of the rotating product to 30%, said rotation and moisture content being sufficient to dissolve the outer surfaces of said milled particles and effect incipient fusion of two or more of said particles to form a plurality of free-flowing particles of the pelletized material having continuously even surfaces, a bulk density of at least 55 pounds per cubic foot and a particle size of minus 8 plus 100 mesh; and
6. adding additional dry milled product to the resulting particles to reduce the moisture content to 25%.



3,971,632
SINTERED ABRASION RESISTANT IRON ALLOY HAVING A HOMOGENEOUS CARBIDE NETWORK

Berthold Menrad, Weiler i.d.B.; Karl Ripper, Schwabisch Gmund; Rudolf Ilg, Hofen, and Georg Dietrich, Schwabisch Gmund, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 16, 1973, Ser. No. 406,834

Claims priority, application Germany, Oct. 20, 1972, 2251535

Int. Cl.^{2} C22C *1/05*

U.S. Cl. 29—182.7 **1 Claim**

1. An abrasion resistant sintered iron alloy having a homogenous carbide network in a lamellated, perlitic base structure with interspersed residual austenite and martensite with a composition

1% – 1.35%	graphitic carbon
2% – 2.4%	manganese
1.4% – 1.7%	nickel
1%	copper
0.2%	copper borate

the remainder being essentially iron.

3,971,633
TWO LAYER COATING SYSTEM

Thomas A. Wolfla, and Robert C. Tucker, Jr., both of Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,661

Int. Cl.^{2} B32B *15/04*

U.S. Cl. 29—195 **8 Claims**

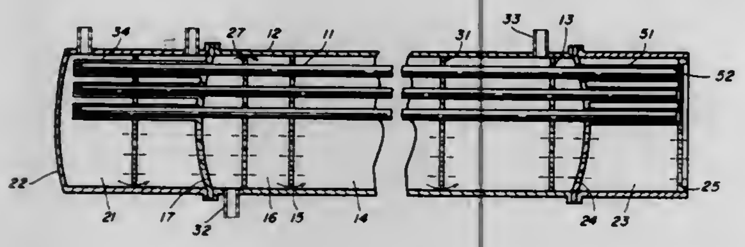
1. A coated structure consisting of a metallic substrate taken from the class of metals consisting of nickel-base and iron-base alloys; a first layer on said substrate consisting of chromium carbides and a binder taken from the class consist-

ing of nickel-chromium, cobalt-chromium, iron-chromium, and superalloys, said first layer being from 0.001 to 0.015 inches thick, and a surface layer consisting of pure chromium carbides said surface layer being from 0.0005 to 0.005 inches thick.

3,971,634
HEAT PIPE METHANATOR

William A. Ranken, and Joseph E. Kemme, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,655
Int. Cl.² C10B *1/00*
U.S. Cl. 48—120 **12 Claims**



1. A coal gas methanator of the type employing heat pipes comprising:
- an elongated pressure shell having a methanation section, a preheat section, a heat exchanger section and a start-up heat exchanger section;
- separating means for separating said heat exchanger section from said methanation section and for separating said start-up heat exchanger section from said methanation section;
- a plurality of heat pipes enclosed in said elongated pressure shell;
- heat pipe supporting means in said separating means;
- A catalyst coating on the exterior walls of said plurality of heat pipes in said methanation section, said catalyst reacting hydrogen and carbon monoxide to produce methane in an exothermic reaction;
- transfer means containing a working fluid within said plurality of heat pipes to transfer the heat of reaction at constant temperature from said methanation section to said preheat section, and to transfer remaining heat to said heat exchanger section; and
- temperature control means including an inert gas in said plurality of heat pipes together with said working fluid to vary the amount of working fluid in the heat exchanger section, keeping the temperature in said methanation section constant.

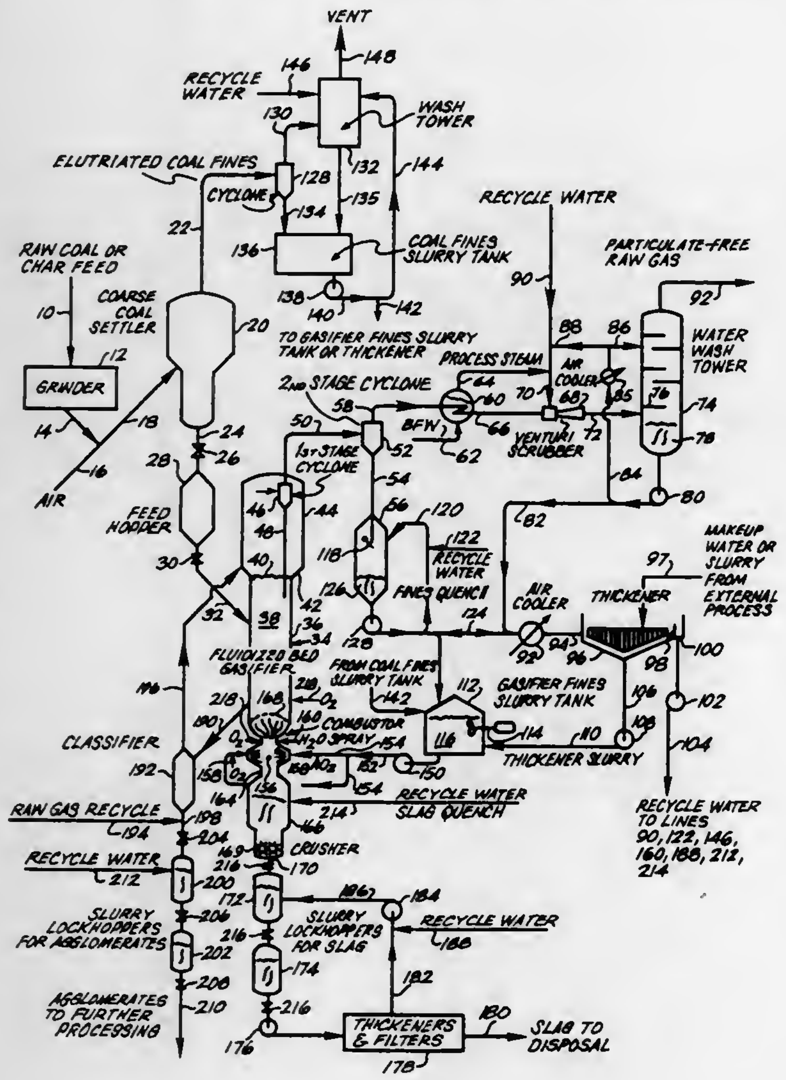
10. In a heat pipe methanator, the combination of:
- a reaction chamber and a heat exchanger;
- a heat pipe having an evaporating section in operative relation with said reaction chamber and a condensing section in operative relation with said heat exchanger;
- thimble means in said heat exchanger for receiving said condensing section;
- means for containing a working fluid in said heat pipe; and
- temperature control means including an inert gas in said heat pipe, held by said working fluid adjacent the end wall of said condensing section.

3,971,635
COAL GASIFIER HAVING AN ELUTRIATED FEED STREAM

Charles W. Matthews, Allegheny County, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,707
Int. Cl.² C10B *1/04;* **C10J** *3/54, 3/56;* **C10K** *1/08*
U.S. Cl. 48—202 **3 Claims**

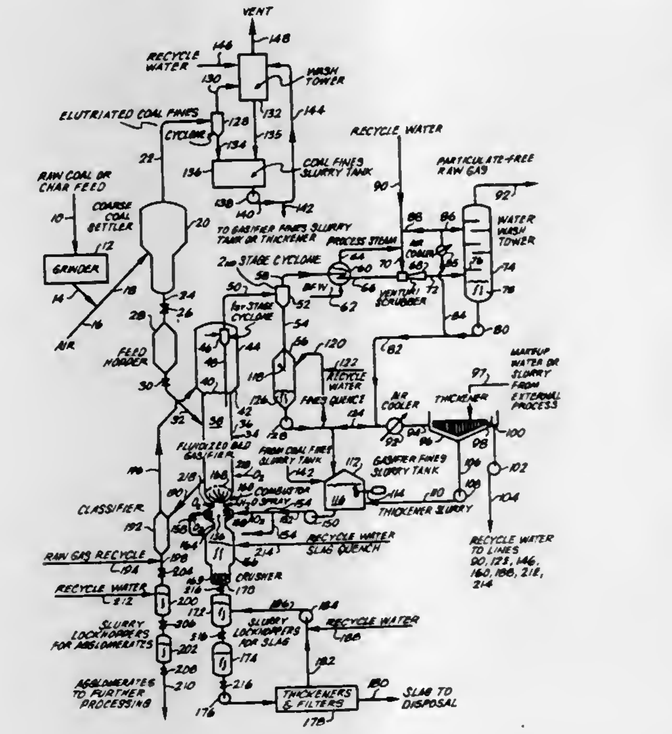
1. A process for gasifying feed ash-containing coal comprising crushing a feed coal stream to produce relatively large particulates and relatively small coal feed particulates, elutriating said relatively small feed particulates from said relatively large feed particulates, passing said relatively small feed particulates and at least one member selected from the group consisting of water and steam in addition to an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing said relatively large feed particulates to a fluidized bed gasifier zone disposed upon grate means with said large feed particulates entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidizied bed of said relatively large feed particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., and a pressure of at least 10 psi at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, adjusting the crusher in said crushing step so that the size of said relatively large feed particulates is sufficient that they remain in said fluid bed for an average particle residence time of 5 to 60 minutes, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized particulates from said fluid bed.



3,971,636
CONDENSATE SCRUBBING OF COAL GASIFIER PRODUCT

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,708
Int. Cl.² C10B *1/04;* **C10J** *3/54, 3/56;* **C10K** *1/08*
U.S. Cl. 48—202 **9 Clalms**

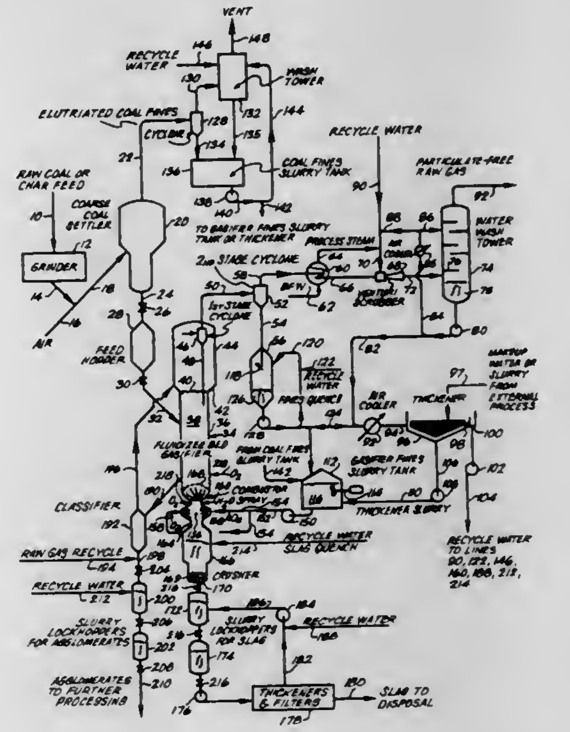


1. A process for gasifying feed ash-containing solid carbonaceous particulates comprising passing a first feed stream comprising a water slurry of carbonaceous particulates including char from said gasification process and oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream of carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a psuedo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen, water vapor, and normally liquid and gaseous pollutants, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates comprising substantially all the solid particulates removed from said gasifier zone, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized solid particulates from said fluid bed, condensing said water vapor in said overhead stream to form condensate, scrubbing said elutriated solid particulates and said pollutants from said overhead stream with said condensate to form a condensate slurry containing said elutriated solid particulates and pollutants, said condensate slurry comprising at least a part of said first feed stream water slurry passed to said combustion zone.

3,971,637
COAL GASIFICATION PROCESS UTILIZING WASTE WATER FROM AN EXTERNAL PROCESS

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,010
Int. Cl.² C10B *1/04;* **C10J** *3/54, 3/56;* **C10K** *1/08*
U.S. Cl. 48—202 **4 Claims**



1. A process for gasifying feed ashcontaining solid carbonaceous particulates comprising passing a first feed stream comprising an aqueous mixture of carbonaceous particulates together with an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream comprising carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, said aqueous mixture comprising at least in part waste water containing at least one member selected from the group consisting of combustible pollutants and slag-forming salts, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., an average particle residence time of 5 to 60 minutes, and a pressure of at least 10 psi at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-

ash weight ratio fluidized solid particulates from said fluid bed.

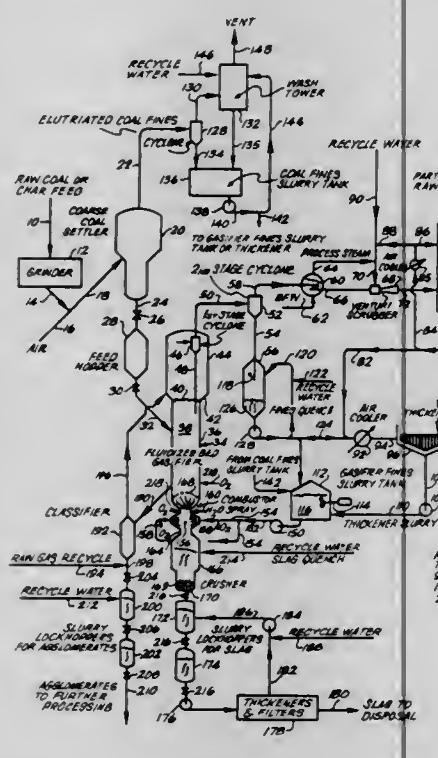
3,971,638
COAL GASIFICATION PROCESS UTILIZING HIGH SULFUR CARBONACEOUS MATERIAL

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,011

Int. Cl.² C10B *1/04;* **C10J** *3/54, 3/56;* **C10K** *1/08*

U.S. Cl. 48—202 **5 Claims**



1. A process for gasifying feed ashcontaining solid carbonaceous particulates comprising passing a first feed stream of carbonaceous particulates together with an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second stream of carbonaceus particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, said first feed stream comprising at least in part sulfur-containing carbonaceous residue material, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam including sulfur dioxide derived from said sulfur-containing carbonaceous material upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen water vapor, and hydrogen sulfide but substantially free of sulfur dioxide, said overhead stream containing elutriated solid particulates from said fluid bed which are fed to said combustion zone as part of said first feed stream, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized particulates from said fluid bed.

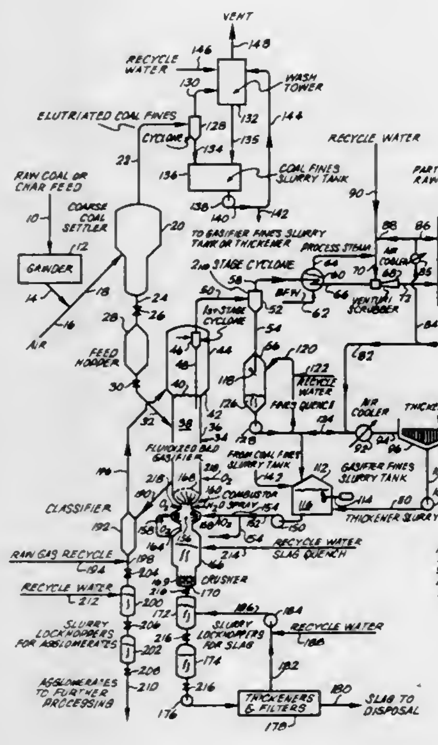
3,971,639
FLUID BED COAL GASIFICATION

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,027

Int. Cl.² C10B *1/04;* **C10J** *3/54, 3/56;* **C10K** *1/08*

U.S. Cl. 48—202 **13 Claims**



1. A process for gasifying feed ash-containing solid carbonaceous particulates comprising passing a first feed stream comprising carbonaceous particulates together with at lest one member selected from the group consisting of water and steam in addition to an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream of carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gasses and steam and to convert ash into molten salg, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates elutriated from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a steam of average carbon-to-ash weight ratio fluidized solid particulates from said fluid bed.

3,971,640
METHOD OF SEPARATING KRYPTON-XENON CONCENTRATE FROM AIR

Georgy Anatolievich Golovko, Pushkin 8, bulvar A. Tolstogo, 16, kv. 29, Leningrad, U.S.S.R.

Filed Mar. 18, 1975, Ser. No. 559,410

Claims priority, application U.S.S.R., Apr. 26, 1974, 2015806

Int. Cl.² B01D *53/04*

U.S. Cl. 55—66 **4 Claims**

1. A method for separation from air of krypton-xenon concentrate containing 1–46 per cent by volume of krypton, 0.1–4 per cent by volume of xenon, 94.9–46 per cent by volume of nitrogen, maximum 2 per cent by volume of oxygen and maximum 2 per cent by volume of hydrocarbons, consisting in that air at a temperature of 90°–110°K is passed through adsorbents having the same temperature and having pores with inlet openings of 5–150 A, on which xenon, krypton, nitrogen, oxygen and hydrocarbons are adsorbed; said gases are then desorbed from the adsorbent by increasing step-wise the temperature of the adsorbent from 90°–110°K to 250°–280°K in the course of time from 1 to 3 hours, and from to 250°–280°K to 500°–650°K in the course of time from 2 to 4 hours.

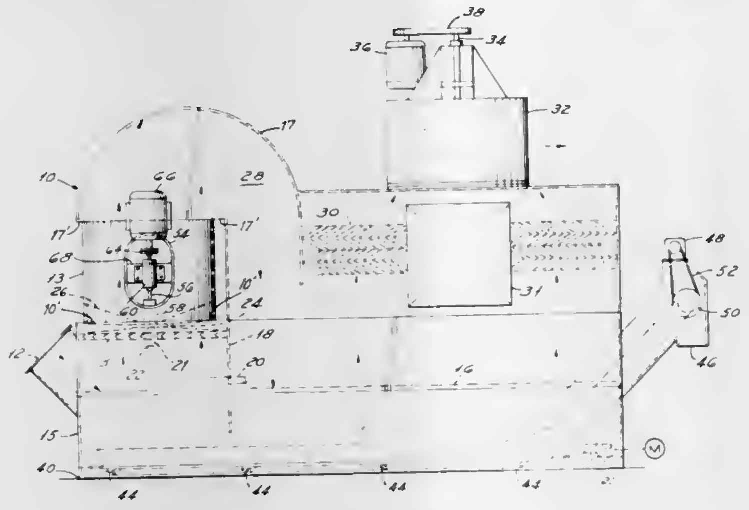
3,971,641
GAS SCRUBBER OF THE WET COLLECTOR TYPE

Earl J. McNamara, Trenton, Mich., assignor to Taylor & Gaskin, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 488,587, July 15, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,170

Int. Cl.² B01D *47/02, 47/08*

U.S. Cl. 55—223 **5 Claims**



1. A gas scrubber of the wet collector type comprising, in combination:

a housing defining a gas inlet and a gas outlet and a liquid reservoir,

gas exhaust means cooperating with the housing for moving gas therethrough under a negative pressure from the inlet to the exhaust means and forcing it out through the gas outlet,

a tunnel extending into the housing in the path of negative pressure gas flow therethrough and open to the atmosphere at least at one end,

a spinner shaft in the tunnel projecting at one end through an opening in a wall thereof and into the path of gas flow through the housing, with the opening being larger than the spinner shaft but closely surrounding the shaft to create an atmospheric flow from the tunnel around the shaft and into the housing sufficient to substantially prevent entry of scrubbing liquid and/or contaminates into the tunnel through the opening around the shaft,

bearing means located entirely within the tunnel and spaced from said opening around the spinner shaft and comprising the sole support for the spinner shaft and supporting it for rotation,

liquid diffusing spinner means mounted on said one end of the spinner shaft outside the tunnel and arranged to diffuse a stream of liquid striking it in a spray pattern extending across the path of gas flow,

and liquid delivery means for withdrawing liquid from the liquid reservoir and directing a stream of the liquid against the diffusing spinner to diffuse the same into a pattern as aforesaid.

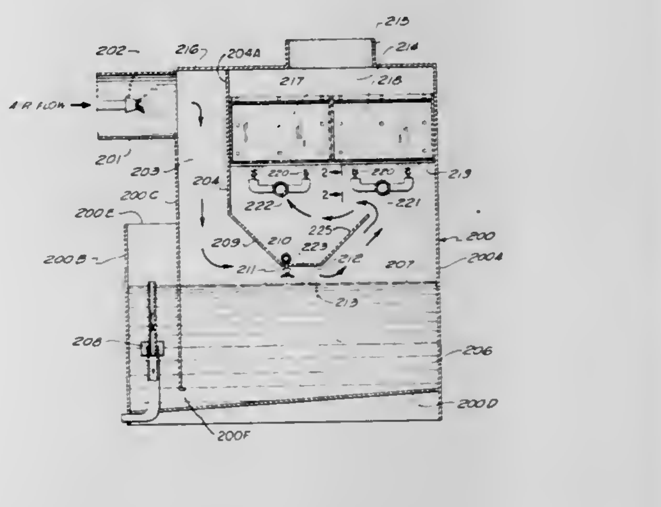
3,971,642
GAS SCRUBBER

Manuel Perez, River Vale, N.J., assignor to Aerosols Control Corporation, Montvale, N.J.

Division of Ser. No. 279,848, Aug. 11, 1972, Pat. No. 3,856,487. This application Dec. 18, 1974, Ser. No. 533,860

Int. Cl.² B01D *47/00*

U.S. Cl. 55—223 **6 Claims**



1. Gas scrubbing apparatus comprising

a box-like housing having a pair of side walls, a liquid-filled sump extending between said side walls at the bottom of said housing, a gas inlet disposed above the surface of the sump liquid between said side walls adjacent one end of said housing for receiving a flow of gas to be scrubbed, and a gas outlet disposed above said sump liquid surface between said side walls adjacent the other end of said housing for discharging said gas flow after scrubbing;

baffle means in the interior of said housing connected between said side walls above said sump liquid surface and cooperating with said surface of the liquid in said sump to form a passageway for said gas flow connecting the gas inlet with the gas outlet, said baffle means having a fixed Venturi baffle comprising a substantially planar central section connected between said housing side walls and disposed substantially parallel to said surface of the liquid in said sump to form a throat portion of reduced cross-sectional area in said passageway having a direction of gas flow therethrough which is substantially parallel to said sump liquid surface, a substantially planar inlet section connected between said side walls and disposed at an acute angle with respect to said central section on the upstream side of said central section, and a substantially planar outlet section connected between said side walls and disposed at an acute angle with respect to said central section on the downstream side of said central section;

spray means mounted on the central section of said fixed Venturi baffle for producing a curtain of liquid spray across said passageway throat portion substantially perpendicular to the direction of gas flow therethrough; and

means for controlling the level of liquid in said sump to thereby control the cross-sectional area of said passageway throat portion, whereby gas passing through said throat portion from said gas inlet to said gas outlet is increased in velocity and turbulence and scrubbed by the liquid spray.

3,971,643

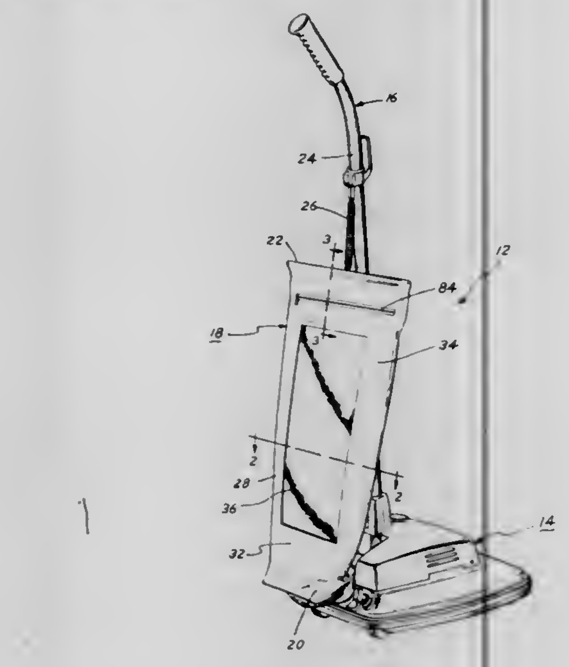
VACUUM CLEANER INCLUDING DUST BAG AND FILTER

Austen B. Hufton, Glen Ellyn, Ill., assignor to Servicemaster Industries, Inc., Downers Grove, Ill.

Filed Mar. 31, 1975, Ser. No. 563,505

Int. Cl.^{2} B01D *46/02*

U.S. Cl. 55—372 **9 Claims**



1. An improved dust bag for an upright vacuum cleaner that has a discharge opening through which air, including various sized entrained dust and dirt particles, flows under pressure and that is used to clean in hospitals and other health care facilities wherein it is important to minimize the dispersion of dust and dirt, the improved dust bag comprising:

inlet conduit means adapted to be connected with the discharge outlet of the upright vacuum cleaner so that air, including the entrained dust and dirt particles from the upright vacuum cleaner, is introduced into and flows through the inlet conduit means;

a generally closed, air pervious, first bag having an exterior wall made of air pervious material and including an inlet connected with the inlet conduit means so that air, including the entrained dust and dirt particles discharged from the upright vacuum cleaner, is introduced, under pressure, into the interior of the first bag, with the air, together with the smaller sized dust and dirt particles, then passing through the air pervious walls of the first bag; means for securing the inlet of the first bag to the inlet conduit means; a generally closed, air impervious, second bag having an exterior wall made of air impervious material and being disposed about the first bag so that the first bag is completely enclosed within the second bag, the lower end of the second bag having an inlet portion connected about the inlet conduit means so that air within the second bag cannot escape from the second bag between the inlet portion of the second bag and the inlet conduit means, the second bag having a relatively flexible, air impervious inner wall that has its marginal edges secured to the exterior wall of the second bag and extends across the interior of the second bag so that the inner wall, together with the exterior wall of the second bag, defines a first compartment and a second compartment within the second bag, with the first bag being disposed entirely within the second compartment; means for securing the inlet portion of the second bag to the inlet conduit means; a first, relatively large opening formed in the portion of the second bag exterior wall defining the first compartment; a second, relatively large opening formed in the inner wall of the second bag, with the second opening being aligned with the first opening and having a size and shape generally corresponding to the size and shape of the first opening and with the first and second openings constituting the path through which air from the first bag passes out of the second bag; a filter including a frame and a fiber glass felt filtering media, with the diameters of the fibers of the filtering media being in the range of 0.75 microns, the filtering media having a shape corresponding to the shape of the first opening and having a size greater than the size of the first opening, the filter frame being disposed and supported within the first compartment of the second bag so that the filtering media is disposed in the path through which air from the first bag passes out of the second bag and is in filtering communication with the air flowing through the first and second openings, so that all air passing through the first and second openings must pass through the filtering media and so that the small sized dust and dirt particles entrained in the air passing through the first and second openings are filtered out of the air with the air flowing through the first and second openings biasing the portions of the inner wall surrounding the second opening against the filter so as to form a seal between these inner wall portions and the filter so that the filter is clamped between the inner wall and the portion of the second bag exterior wall which defines the first compartment.

3,971,644

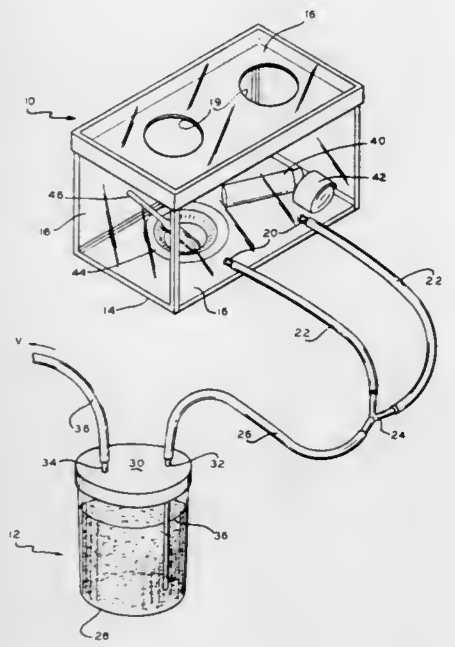
MIXING AND DETOXIFICATION TANK WITH FILTRATION SYSTEM

Edward D. Sugarman, Fayetteville, N.Y., assignor to Wal-Gen Corporation, Syracuse, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,025

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 55—387 **2 Claims**



1. For use with a hospital vacuum source, operating room mixing and detoxification apparatus comprising a tank having a bottom, side walls and a removable top, at least the side walls and top of the tank being made of transparent material, the tank being particularly adapted for mixing a cement that gives off toxic fumes during the mixing, the top of the tank being formed with a pair of open arm holes through which the arms of an operator can extend downwardly into the tank interior to do the mixing, the holes being dimensioned so as to encircle the operator's arms with a close but non-sealing fit whereby ambient room air can pass through the holes around the operator's arms and assist in flushing toxic fumes out of the tank, and filtration means for the tank, the tank having at least one exhaust port located adjacent the bottom thereof, the exhaust port being connected through the filtration means to the hospital vacuum source.

3,971,645

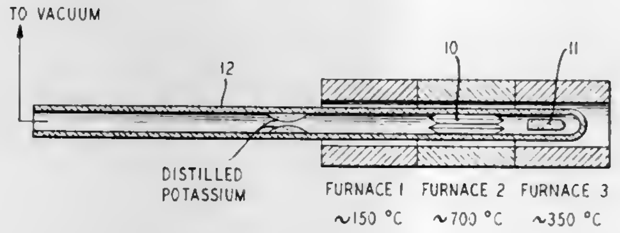
METHOD OF MAKING COMPOUND-GLASS OPTICAL WAVEGUIDES FABRICATED BY A METAL EVAPORATION TECHNIQUE

Klaus Jürgen Bachmann, Piscataway; Suzanne Rose Nagel, North Plainfield; Arthur David Pearson, Bernardsville; Paul Herman Schmidt, Chatham, and Arthur Richard Tynes, Red Bank, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1975, Ser. No. 612,762

Int. Cl.^{2} C03C *17/08*; G02B *5/14*

U.S. Cl. 65—3 A **7 Claims**



1. A method for making a glass preform useful for drawing optical fibers comprising the steps of:

sealing into a high purity silica tube at reduced pressure a quantity of a metal selected from the group consisting of Cs, Rb, K, Cd, Na, Zn, Mg, and Li,

heating the tube to react the metal with the interior wall of the tube to form a metal silicide coating on the interior wall,

heating the tube in the presence of oxygen at a temperature above approximately 1600°C to form a mixture of metal oxide and silica and to simultaneously diffuse the metal significantly into the interior wall of the silica tube,

and heating the tube to collapse the tube thus forming a glass preform with a glass core comprising the metal oxide.

3,971,646

STIRRING OF MOLTEN GLASS

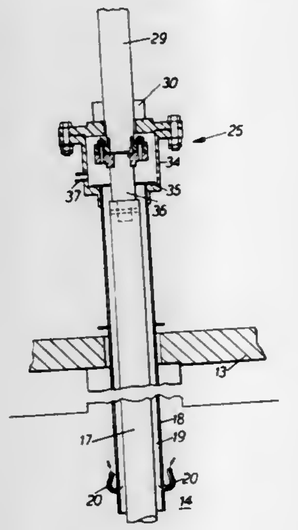
William Jackson Rhodes, Prescot, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Jan. 8, 1975, Ser. No. 539,569

Claims priority, application United Kingdom, Jan. 11, 1974, 1461/74

Int. Cl.^{2} C03B *5/18*

U.S. Cl. 65—157 **12 Claims**



1. In a glass melting furnace, a stirrer for stirring molten glass, which stirrer comprises a stirring member for immersion in the molten glass, a rotary shaft extending upwardly from the stirring member to a roof of the furnace, the shaft being rotatably mounted and connected to a drive device arranged to rotate the stirrer, a stationary hollow casing formed of a material which contains a high percentage of platinum surrounding the rotary shaft in spaced relationship thereto, the casing extending downwardly from the roof of the furnace, terminating above the stirring member, and being separate therefrom, and separate inlet and outlet means in the casing for introducing and removing a flow of inert gas through the space between the casing and the shaft whereby the atmosphere between the shaft and the casing may be different from the atmosphere above the molten glass in the remainder of the furnace, the shaft and stirring member being formed of a material resistant to attack by molten glass and different from the material of the hollow casing.

3,971,647

COMPOSITION FOR THE REGULATION OF PLANT GROWTH

Karl Gaetzi, Basel, and Hanspeter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 340,428, March 12, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,395

Claims priority, application Switzerland, Mar. 17, 1972, 4058/72

Int. Cl.^{2} A01N *5/00*

U.S. Cl. 71—76 **4 Claims**

1. A composition for the growth retardation of soya plants which contains as active compound an effective retarding amount of N^1,N^1-di-iso-propyl-N^2-methyl-N^2-dodecyl-formamidinium-methosulfate, together with a suitable inert carrier therefor.

3,971,648

HERBICIDAL USE OF CARBOXYALKYL ESTER OF N-PHOSPHONOMETHYL GLYCINE

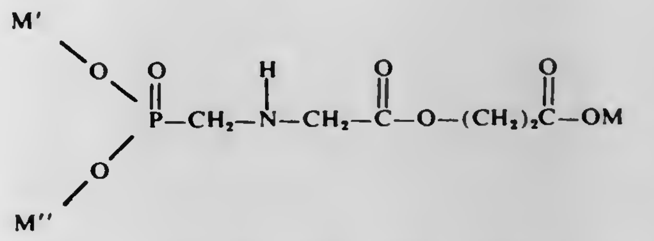
John E. Franz, Crestwood, and Hans L. Nufer, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 417,858, Nov. 21, 1973, Pat. No. 3,868,407. This application Sept. 16, 1974, Ser. No. 506,139

Int. Cl.^{2} D01N *9/36*

U.S. Cl. 71—86 **7 Claims**

1. The herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound of the formula



wherein M is hydrogen, alkali metal, alkaline earth metal, ammonium or organic ammonium, M′ and M″ are hydrogen, alkali metal, alkaline earth metal, ammonium or organic ammonium, said organic ammonium group being derived from an organic amine having a molecular weight below about 300 and containing not more than two amine groups.

3,971,649

S-METHYL-N-[4-(4′-CHLOROPHENOXY)PHENYL] THIOLCARBAMATE

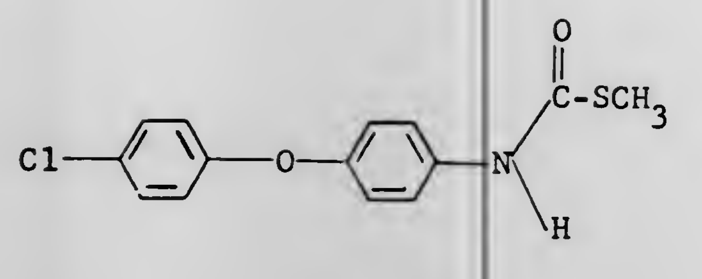
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed July 23, 1975, Ser. No. 598,485

Int. Cl.^{2} C07C *155/02*; A01N *9/12*

U.S. Cl. 71—100 **3 Claims**

2. A method of controlling undesirable vegetation comprising applying to the locus thereof an herbicidally effective amount of a compound having the formula



3,971,650

HERBICIDAL N^1-METHOXYCARBONYL-N^1-ALKYL-3,5-DINITRO-N^4-N^4-DIALKYLSULFANILAMIDE

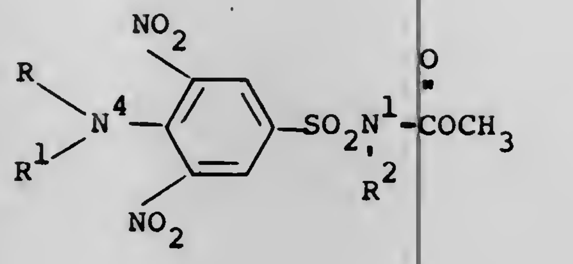
William L. Schinski, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 375,304, June 29, 1973, abandoned. This application Dec. 17, 1974, Ser. No. 533,560

Int. Cl.^{2} A01N *9/14*

U.S. Cl. 71—103 **7 Claims**

1. A herbicidal composition for the selective control of crabgrass which comprises a herbicidally effective amount of the compound of the formula



(1)

wherein R and R^1 individually are cycloalkyl of 3 to 6 carbon atoms or alkyl of 2 to 4 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, and a biologically inert carrier.

3,971,651

PLANT GROWTH MODIFIER AND A PROCESS FOR PREPARATION THEREOF

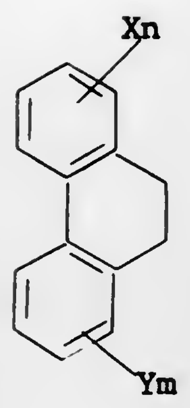
Tohru Hashimoto, Musashino; Akira Kawarada, and Sachiko Tamura, both of Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Division of Ser. No. 331,498, Feb. 12, 1973, Pat. No. 3,917,477. This application Apr. 22, 1975, Ser. No. 570,960

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—122 **6 Claims**

1. A method for inhibiting the growth and germination of higher plants which comprises applying thereto an effective amount of a compound of the formula:



wherein X is selected from the group consisting of hydroxy, methoxy and acetyl and Y is selected from the group consisting of chloro, hydroxy, methoxy and acetyl and *m* and *n* are integers independently having a value of from 1 to 3.

3,971,652

AMMONIACAL EXTRACTION OF COPPER FROM METALLIC MATERIALS

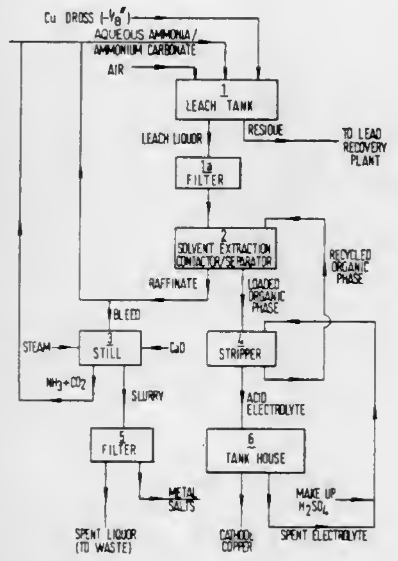
Joseph Lindsey Bryson, deceased, late of Blackwell, England (by Margaret Monteith Bryson, administratrix), assignor to Metallurgical Development Company, Nassau, Bahamas

Continuation-in-part of Ser. No. 334,482, Feb. 21, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 562,894

Claims priority, application United Kingdom, Feb. 21, 1972, 7945/72

Int. Cl.^{2} C01G *1/10;* **C22B** *15/10*

U.S. Cl. 75—.5 A **7 Claims**



1. A method of leaching copper values from copper dross obtained from pyro-metallurgical lead bullion, comprising contacting finely-divided particles of the copper dross in the form of a metallic lead matrix containing copper and copper compound inclusions with an aqueous ammoniacal solution to dissolve copper from the dross, wherein the leaching solution further contains both sulphate and carbonate ions, the ammonium concentration being at least 15 grams per liter, expressed as NH_3, there being from 0.5 to 4.0 moles of ammonia per mole of total carbonate and sulphate ions, and the mole ratio of sulphate to carbonate in the leaching solution being from 1:3 to 3:1.

7. The method as claimed in claim 1 further comprising recovering copper powder in the leachate solution by treatment with a reducing agent.

3,971,653

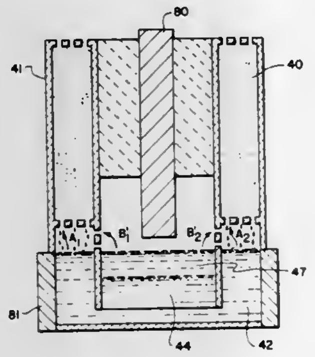
CARBOTHERMIC PRODUCTION OF ALUMINUM

C. Norman Cochran, Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 9, 1974, Ser. No. 530,656

Int. Cl.^{2} C22D *7/02*

U.S. Cl. 75—10 R **9 Claims**



1. A process for producing aluminum, comprising the steps of forming from Al_2O_3 and C in the ratio one mol Al_2O_3 to 3 mols C, a first liquid of Al_2O_3 and Al_4C_3 accompanied by the evolution of gases, creating in said first liquid a zone of increased temperature and/or decreased pressure to decompose said first liquid to a second liquid of Al and C, exhausting said gases during the step of forming said first liquid without said gases passing through said second liquid, and recovering Al from said second liquid.

3,971,654

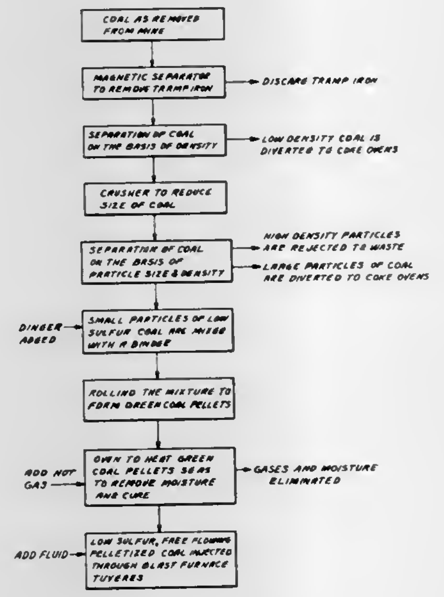
METHOD OF INJECTING PELLETIZED COAL THROUGH BLAST FURNACE TUYERES

Edgar B. Mancke, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 16, 1974, Ser. No. 515,289

Int. Cl.^{2} C21B *5/00*

U.S. Cl. 75—42 **8 Claims**


COAL AS REMOVED FROM MINE
MAGNETIC SEPARATOR TO REMOVE TRAMP IRON
DISCARD TRAMP IRON
SEPARATION OF COAL ON THE BASIS OF DENSITY
LOW DENSITY COAL IS DIVERTED TO COKE OVENS
CRUSHER TO REDUCE SIZE OF COAL
SEPARATION OF COAL ON THE BASIS OF PARTICLE SIZE & DENSITY
HIGH DENSITY PARTICLES ARE REJECTED TO WASTE
LARGE PARTICLES OF COAL ARE DIVERTED TO COKE OVENS
BINDER ADDED
SMALL PARTICLES OF LOW SULFUR COAL ARE MIXED WITH A BINDER
ROLLING THE MIXTURE TO FORM GREEN COAL PELLETS
ADD HOT GAS
OVEN TO HEAT GREEN COAL PELLETS SO AS TO REMOVE MOISTURE AND CURE
GASES AND MOISTURE ELIMINATED
ADD FLUID
LOW SULFUR, FREE FLOWING PELLETIZED COAL INJECTED THROUGH BLAST FURNACE TUYERES

1. The method of smelting iron in a blast furnace having a smelting zone, a hearth section, and a plurality of tuyeres disposed between the smelting zone and hearth section for the introduction of low pyritic sulfur bearing coal pellets into said blast furnace, said method comprising:

a. crushing coal having a disproportionately large amount of pyritic sulfur into fine particles whose size is less than 14 mesh,
b. separating the crushed fine particles by mechanical means into a first portion having a lower pyritic sulfur content than said coal prior to crushing, and a second portion having a higher pyritic sulfur content than said coal prior to crushing,
c. mixing the first portion of the fine coal particles with a binder,
d. forming such mixture of fine coal particles and binder into agglomerates,
e. heating the agglomerates to form stabilized coal pellets low in pyritic sulfur,
f. entraining the stabilized coal pellets in a fluid stream, and
g. introducing the fluid stream of entrained low pyritic sulfur pellets through said tuyeres.

3,971,655

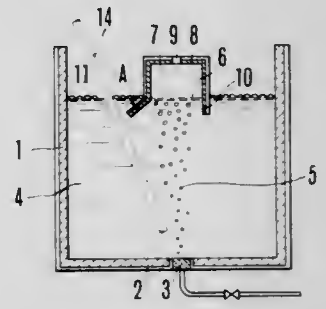
METHOD FOR TREATMENT OF MOLTEN STEEL IN A LADLE

Kiyoshi Takashima; Keizi Arima; Takeshi Shozi, all of Sakai, and Hisashi Mori, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,162

Int. Cl.^{2} C21C *5/34*

U.S. Cl. 75—59 **6 Claims**



1. In a method for refining a melt of molten steel by gas blowing in a ladle, said melt having a layer of slag on the surface thereof wherein an inert gas is bubbled upwardly from the bottom of the ladle through the melt to agitate and induce turbulence in the melt and remove impurities therefrom, said process being carried out under atmospheric pressure, the improvement which comprises partially immersing an inverted receptable having side walls into the surface of the melt such that a portion of the interior of the receptacle is above the surface of the melt and to create a slag-free melt surface within the side-walled area of the receptacle which is in contact with said interior portion, said side wall being immersed into the melt to a depth just sufficient to avoid the introduction of said slag into the interior portion due to turbulence of the melt and wherein the receptacle is positioned so as to entrap substantially all of the inert gas bubbles as they escape from the top of the melt and maintaining a non-oxidizing atmosphere within the interior portion of the receptacle.

3,971,656

SPINODAL CARBONITRIDE ALLOYS FOR TOOL AND WEAR APPLICATIONS

Erwin Rudy, 15750 NW. Oak Hill Drive, Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 370,865, June 18, 1973, abandoned. This application May 29, 1974, Ser. No. 473,501

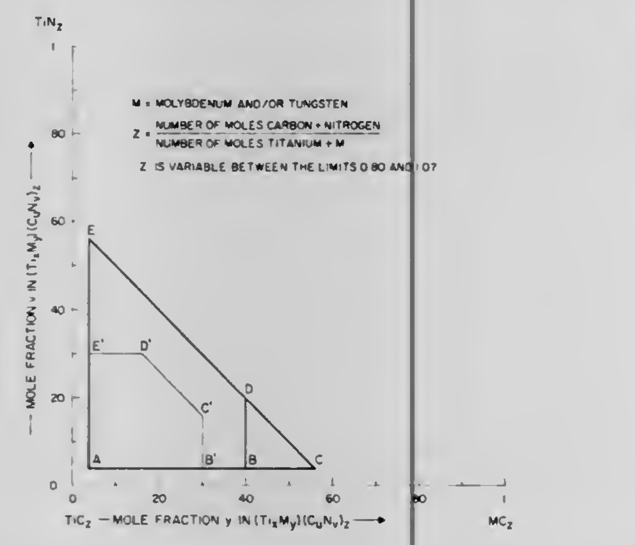
Int. Cl.^{2} C22C *1/05, 29/00*

U.S. Cl. 75—203 **14 Claims**

1. A composition of material comprising sintered carbonitride-binder metal alloys in which the carbonitride has the formula $(Ti_xM_y)(C_uN_v)_z$, where M is a Group VI metal, with $x + y = 1$, $u + v = 1$, and $0.80 \leq z \leq 1.07$, and where the value of y is from 0.04 to 0.40 and the range of the value of v is a function of y, with the upper limit of the value of v as a function of y being defined by the line ED of FIG. 1 and the lower limit of the value of v as a function of y being defined by the line AB of FIG. 1, in which the binder is selected from metals of the iron group and metals of the group VI refractory

transition metals and comprises between 5 and 45 weight percent of the composition, and in which the carbonitride component of the alloy is a two phase mixture comprising a titanium and nitrogen-rich carbonitride solid solution, and another hard phase which is rich in the group VI metal components and poor in nitrogen, and the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen and forms the main interface with the binder alloy.

13. The method of forming a composition of material comprising sintered carbonitride-binder metal alloys, in which the carbonitride has the formula $(\mathrm{Ti}_x\mathrm{M}_y)$ $(\mathrm{C}_u\mathrm{N}_v)_z$, where M is a group VI metal, with $x+y=1$, $u+v=1$, and $0.80 \leq z \leq 1.07$, and where the value of y is from 0.04 to 0.40 and the range of the value of v is a function of y, with the upper limit of the value of v as a function of y being defind by the line ED of FIG. 1 and the lower limit of the vaue of v as a function of y being defined by the line AB of FIG. 1, and in which the carbonitride component of the alloy is a two-phase mixture comprising a titanium and nitrogen-rich carbonitide solid solution, and another hard phase which is rich in the group VI metal components and poor in nitrogen, and the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen and forms the main interface with the binder alloy, comprising the steps of:



- forming carbonitride alloy powders by reacting mixtures of metal and metal carbide powders with niteogen gas at temperatures between 1400° and 1800°C to form a homogeneous solution at these temperatures;
- cooling the carbonitride alloy powder to cause it to decompose into a two-phase mixture comprising a titanium and nitrogen-rich carbonitride solid solution, and another hard phase which is rich in the group VI metal components and poor in nitrogen, with the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen;
- adding binder material to the mixture;
- mechanically milling the mixture under inert fluids until it has uniform consistency and the desired grain size;
- compacting the mixture into a desired shape; and sintering the compacts so formed at an elevated temperature.

3,971,657

SINTERING OF PARTICULATE METAL

Edul M. Daver, Westfield, N.J., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 13, 1974, Ser. No. 442,062
Int. Cl.^{2} B22F *3/10*

U.S. Cl. 75—211 **12 Claims**

1. In a method of making sintered metal articles from particulate metals, the steps of

a. mixing a major proportion of particulate metal comprising aluminum particles having an oxide coating with a minor proportion of a flux consisting essentially of an intimate mixture of potassium fluoaluminate complexes essentially free of unreacted potassium fluoride;
b. disposing, for heating to produce a sintered article, a quantity of the mixture of metal and flux in a substantially uncompacted condition in which the oxide coatings of the aluminum particles are essentially unruptured; and
c. heating the mixture of metal and flux to a temperature for sintering the metal while maintaining said quantity of the mixture in said substantially uncompacted condition throughout performance of the heating step.

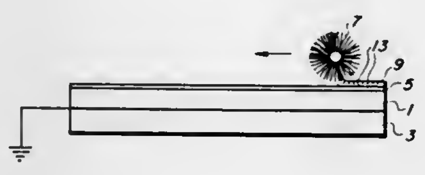
3,971,658

IMAGING PROCESS EMPLOYING FRICTION CHARGING IN THE PRESENCE OF AN ELECTRICALLY INSULATING LIQUID

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 341,217, March 14, 1973, Pat. No. 3,907,559, which is a continuation-in-part of Ser. No. 863,664, Oct. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,438, May 27, 1966, abandoned. This application Apr. 24, 1975, Ser. No. 571,196
Int. Cl.^{2} G03G *13/02, 13/10*

U.S. Cl. 96—1 C **9 Claims**



1. An imaging process comprising:

a. providing a photoconductive insulating layer on an electrically conductive substrate;
b. friction charging said photoconductive insulating layer with a second material in the presence of an electrically insulating layer until an electrostatic charge is produced on said photoconductive insulating layer, said second material differing in triboelectric character from said photoconductive insulating layer;
c. exposing said photoconductive insulating layer to an imagewise pattern of radiation to which said photoconductive insulating layer is responsive; and
d. contacting said photoconductive insulating layer with an electrically insulating developer liquid until an image is formed.

3,971,659

COLOR ELECTROPHOTOGRAPHIC PROCESS USING PHOTOCONDUCTIVE PARTICLES IN LIQUID DEVELOPER

Masamichi Sato, and Hajime Miyazuka, both of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

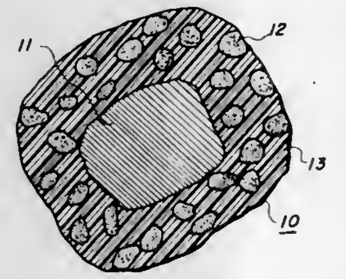
Division of Ser. No. 887,980, Dec. 24, 1969, abandoned. This application Nov. 13, 1974, Ser. No. 523,612
Claims priority, application Japan, Dec. 28, 1968, 44-980
Int. Cl.^{2} G03G *5/12, 13/01, 9/00*

U.S. Cl. 96—1.2 **11 Claims**

1. The method of producing a multicolor reproduction of an original colored object comprising the steps of:

a. charging a photoconductive insulating layer;
b. exposing the charged layer to said original colored object through a colored filter to form a first primary color coded electrostatic latent image on said layer;
c. developing said first electrostatic latent image with a liquid developer having a color complementary to said

first color coded latent image, said liquid developer comprising a carrier liquid having a dielectric constant of less than about 3.4 and a volume resistivity of greater than about 10^{10} ohm-cm so as not to affect an electrostatic latent image formed on an insulating layer, and dispersed in said carrier liquid, a mixture of discrete colored toner particles and discrete photoconductive particles, said colored toner particles substantially lacking the property of photoconductivity and comprising a colorant selected from the group consisting of a pigment and a dye having a thin layer of a resin absorbed therearound, said photoconductive particles comprising particulate photoconductive material having a thin layer of a resin absorbed therearound, said thin layer of said resin absorbed therearound said particulate photoconductive material being sufficiently thin to facilitate exposure of said particulate photoconductive material and dissipate any charge thereon, said photoconductive particles being present in an amount of from about 5 to about 104 parts by weight for every 100 parts by weight of said colored toner particles;



d. contacting said photoconductive insulating layer with an insulating liquid other than the developer liquid to neutralize any residual charge in the portion of said layer developed in step (c);
e. charging said photoconductive insulating layer;
f. exposing the charged layer to said original colored object through a colored filter to form a second primary color coded electrostatic latent image on said layer;
g. developing said second electrostatic latent image with a liquid developer having a color complementary to said second color coded image; said liquid developer comprising a carrier liquid having a dielectric constant of less than about 3.4 and a volume resistivity of greater than about 10^{10} ohm-cm so as not to affect an electrostatic latent image formed on an insulating layer, and dispersed in said carrier liquid, a mixture of discrete colored toner particles and discrete photoconductive particles, said colored toner particles substantially lacking the property of photoconductivity and comprising a colorant selected from the group consisting of a pigment and a dye having a thin layer of a resin absorbed therearound, said photoconductive particles comprising particulate photoconductive material having a thin layer of a resin absorbed therearound, said thin layer of said resin absorbed therearound said particulate photoconductive material being sufficiently thin to facilitate exposure of said particulate photoconductive material and dissipate any charge thereon, said photoconductive particles being present in an amount of from about 5 to about 104 parts by weight for every 100 parts by weight of said colored toner particles;
h. contacting said photoconductive insulating layer with an insulating liquid other than the developer liquid to neutralize any residual charge in the portion of said layer developed in step (g);
i. charging said photoconductive insulating layer;
j. exposing the charged layer to said original colored object through a colored filter to form a third primary color coded electrostatic latent image on said layer; and
k. developing said third electrostatic latent image with a liquid developer having a color complementary to said third color coded image, said liquid developer comprising an insulating liquid having dispersed therein colored particles.

3,971,660

LITHOGRAPHIC PRINTING PLATE COMPRISING HYDROPHILIC LAYER OF POLYVINYLACETATE CROSSLINKED WITH TETRAETHYLORTHOSILICATE

Henry C. Staehle, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 457,733, April 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 289,387, Sept. 15, 1972, abandoned. This application July 17, 1975, Ser. No. 596,873
Int. Cl.^{2} G03F *7/02*

U.S. Cl. 96—33 **16 Claims**

1. A lithographic element comprising a support having thereon a layer having a hydrophilic surface, said layer comprising a crosslinked material that is substantially free from discrete particles and comprises hydrolyzed polyvinyl acetate crosslinked with hydrolyzed tetraethylorthosilicate, said element having thereon an image-bearing layer or an image forming layer.

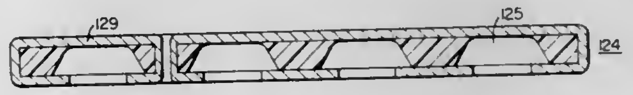
3,971,661

FORMATION OF OPENINGS IN DIELECTRIC SHEET

Frank A. Lindberg, Baltimore; Stephen G. Konsowski, Glen Burnie; Maurice B. Shamash, and Seymour J. Ponemone, both of Randallstown, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 262,871, June 14, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,946
Int. Cl.^{2} H01L *21/84*

U.S. Cl. 96—36.2 **6 Claims**



1. The method of producing in a dielectric sheet at least a first opening in one surface thereof subtended by a metal cover on the opposite surface thereof and at least a second opening in said opposite surface of said sheet subtended by a metal cover on said one surface thereof, said openings being displaced from each other along said sheet, the said method comprising, depositing a coating of metal directly on both said surfaces of said sheet, depositing a photo-resist coating on each of said coatings of metal, producing images respectively on each of said photo-resist coatings, processing said images to remove photo-resist coating from each of said surfaces selectively as determined by said images, the image on the photo-resist coating on said one surface defining the area of said first opening, and the processing of said images exposing to etching only the metal in said last-named area, the image on the photo-resist coating on said opposite surface defining the area of said second opening, and the processing of said images exposing to etching only the metal in said last-named area, the image of said photo-resist coating on said one surface also defining the metal on said one surface which last-named metal subtends said exposed metal on said opposite surface and the processing of said images leaving said subtending metal protected from etching by photo-resist coating, and the image of said photo-resist coating on said opposite surface also defining the metal on said opposite surface which last-named metal subtends said exposed metal on said one surface, and the processing of said images leaving said last-named subtending metal protected from etching by photo-resist coating, subjecting the said imaged and processed sheet as a whole in a single operation to a first etchant to etch both the exposed metal in the area of said first opening and the exposed metal in the area of said second opening, said etchant etching only said last-named metals thereby exposing unetched the dielectric mate-

rials in said areas, said subtending metal on said one surface and said subtending metal on said opposite surface remaining protected against etching respectively by said imaged and processed photo-resist coating on said one surface and by said imaged and processed photo-resist coating on said opposite surface, and, respectively, by said exposed dielectric material in said area on said opposite surface and by said exposed dielectric material in said area in said one surface, etching both said dielectric material in said area on said one surface and said dielectric material in said area on said opposite surface in a single operation with a second etchant to which the metal is resistant and which etches only said last-named dielectric material and removing the residual photo-resist remaining after said imaging and processing from both said surfaces, thereby providing first and second openings respectively in said one surface and said opposite surface, each opening subtended by a metal cover respectively in said opposite surface and said one surface

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3,971,662

SILVER HALIDE COMPLEXING AGENTS OF SULFONES, NITRILES, AND ONIUM SALTS

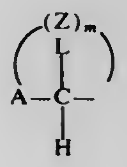
Arthur H. Herz, and Daniel S. Daniel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,889

Int. Cl.² G03C *1/48, 5/54*

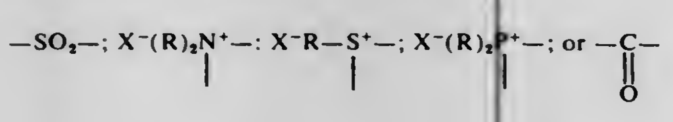
U.S. Cl. 96—76 R **11 Claims**

1. In a photographic silver salt, chemical transfer product comprising (a) a photographic element comprising photographic silver halide, (b) a processing composition, and (c) an image receiving layer comprising development nuclei, said product comprising an organic silver halide complexing agent, the improvement wherein said silver halide complexing agent is a carbon acid of the formula:



wherein

- CH is a carbon acid moiety with a pKa greater than about 8 and less than about 16,
- L is H, alkyl containing 1 to 7 carbon atoms or aryl containing 6 12 carbon atoms,
- *m* is 0 or an integer of 1 through 4,
  - 1. when *m* is 1 through 4,
- Z taken with A and Y represents atoms completing a 4 to 7-member heterocyclic nucleus, and
- A and Y each independently represents

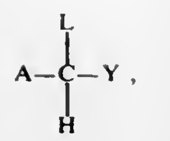


$$-SO_2-;\ X^-(R)_2\underset{|}{N^+}-;\ X^-R-\underset{|}{S^+}-;\ X^-(R)_2\underset{|}{P^+}-;\ \text{or}\ -\underset{\overset{\|}{O}}{C}-$$

where R is alkyl containing 1–7 carbon atoms,

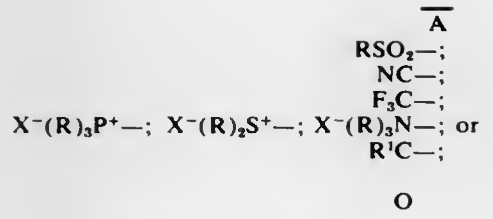
x⁻ is an anion;

2. when *m* is zero as in the formula:

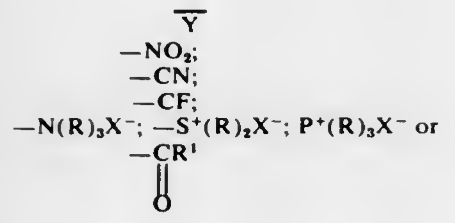


$$A-\overset{\overset{L}{|}}{\underset{\underset{H}{|}}{C}}-Y\ ,$$

A and Y are independently:



$$\begin{array}{r}\overline{A}\\ RSO_2-;\\ NC-;\\ F_3C-;\\ X^-(R)_3P^+-;\ X^-(R)_2S^+-;\ X^-(R)_3N-;\ \text{or}\\ R^1C-;\\ \\ O\end{array}$$



$$\begin{array}{c}\overline{Y}\\ -NO_2;\\ -CN;\\ -CF;\\ -N(R)_3X^-;\ -S^+(R)_2X^-;\ P^+(R)_3X^-\ \text{or}\\ -\underset{\overset{\|}{O}}{C}R^1\end{array}$$

where R^1 is R, OR, NH_2 or NR_2, R is alkyl containing 1 through 7 carbon atoms; X^- is an anion.

3,971,663

LIGHT-SENSITIVE DIAZOTYPE WITH YELLOW DIAZO COUPLERS

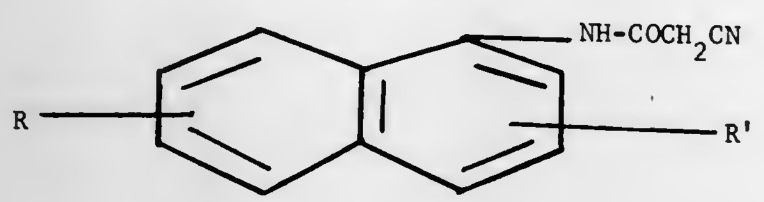
Edward C. Bialczak, 3 Cornfield Lane, Guilford, Conn. 06437

Filed Apr. 11, 1974, Ser. No. 460,130

Int. Cl.² G03C *1/58*

U.S. Cl. 96—91 R **4 Claims**

1. A light-sensitive diazotype material comprising a base support having an acid stabilized coating thereon which comprises a light-sensitive diazonium compound and a coupling component having the general formula



wherein R is hydrogen, a lower alkyl radical, halogen or aryl, and R′ is hydrogen or SO_3M wherein M is a monovalent cation.

3,971,664

FINE GRAIN SILVER HALIDE EMULSIONS WITH POLYHETERONUCLEAR SENSITIZING DYES

Yoshiyuki Nakazawa; Yasuharu Nakamura; Tohru Sueyoshi, and Akira Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

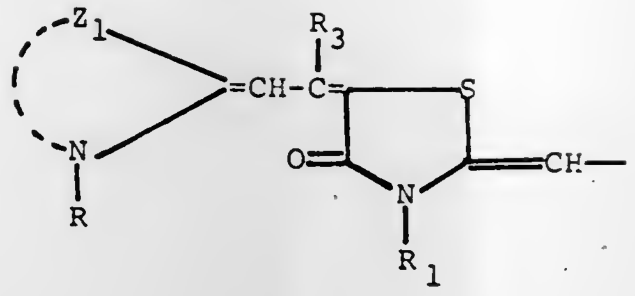
Continuation of Ser. No. 193,138, Oct. 27, 1971, abandoned. This application Dec. 2, 1974, Ser. No. 528,597

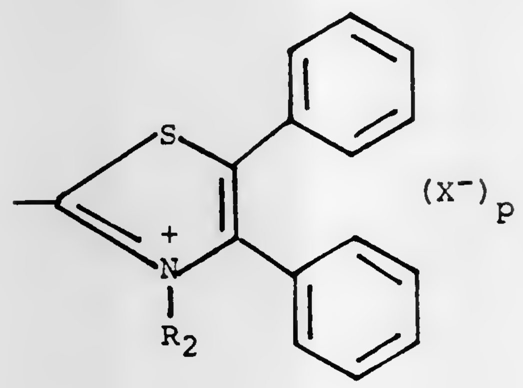
Claims priority, application Japan, Oct. 27, 1970, 45-94881

Int. Cl.² G03C *1/10, 7/14, 1/02*

U.S. Cl. 96—127 **7 Claims**

1. In a process for increasing the spectral sensitivity of a fine grain silver halide emulsion to monochromatic light emitted from a neon-helium laser, the numerical average grain size of the silver halide of said fine grain silver halide emulsion being not greater than 0.18 micron in diameter or at least 95% by number of the silver halide particles having particle sizes not greater than 0.2 micron in diameter, the improvement comprising adding to said emulsion a sufficient amount of at least one sensitizing dye represented by the following formula (I)





(I)

wherein Z_1 represents the group of atoms necessary to form a heterocyclic nucleus selected from the group consisting of a 4,5- diphenyl thiazole nucleus, a benzothiazole nucleus, benzoselenazole nucleus, a naphtho[2,1-d]thiazole nucleus, and a 2-quinoline nucleus, said benzothiazole or benzoselenazole nucleus being substituted by at least one alkoxy group; R and R_1 each represents a lower alkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an acetoxyalkyl group, a carboxyalkyl group, a sulfoalkyl group, an aralkyl group, or an allyl group; R_2 represents an alkyl group, a carboxyalkyl group, a sulfoalkyl group or an aryl group; R_3 represents a hydrogen atom, a lower alkyl group or a carboxyaryl group; X represents an anion; and *p* represents 0 or 1, p being 0 when the compound forms an inner salt; or represented by the following formula:

3,971,665

REFRACTORY COMPOSITIONS

Keiki Suzuki, Onoda; Akitoshi Yoshida, and Shigeki Inoue, both of Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,376

Int. Cl.² C04B *35/02*

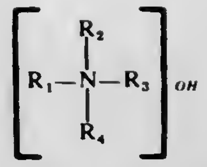
U.S. Cl. 106—58 **9 Claims**

1. A refractory composition by comprising:

a. 100 parts by weight of a basic refractory raw material selected from the group consisting of oxides and hydroxides of magnesium, calcium, chromium and manganese, and mixtures thereof;

b. from 0.1 to 200 parts by weight of a silica component selected from the group consisting of silica sol and silicate and mixtures thereof in terms of SiO_2, said silica sol being dispersed in a solvent selected from the group consisting of water and a hydrophilic organic solvent and mixtures thereof and said silicate being selected from the group consisting of lithium, potassium and sodium silicates, ethyl silicate and partially hydrolyzed ethyl silicate: and

c. from 0.001 to 4 moles of a quaternary ammonium hydroxide per mole of SiO_2 contained in said silica component, said quaternary ammonium hydroxide being expressed by the formula



$$\left[\begin{array}{c}R_2\\ |\\ R_1-N-R_3\\ |\\ R_4\end{array}\right]OH$$

wherein R_1, R_2, R_3 and R_4 respectively are selected from the group consisting of alkyl radicals and hydroxyalkyl radicals having 1 to 4 carbon atoms; and by being prepared by admixing the quaternary ammonium hydroxide with the silica component before or concurrently with the incorporation of said silica component into said basic refractory raw material.

3,971,666

PROCESS FOR RECYCLE OF ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Continuation of Ser. No. 286,613, Sept. 5, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,562

Int. Cl.² C08L *95/00;* C09D *3/24;* B28C *1/22;* G01N *21/16*

U.S. Cl. 106—281 R **8 Claims**

1. In a process for recycling used asphalt-aggregate composition in an apparatus using hot gas producing means for heating said composition, the improvement comprising:

a. detecting the asphalt deficiency of said composition, and

b. mixing and heating said composition without exposure to said hot gas, and adding an amount of make-up asphalt to the composition in response to said detected deficiency while continuing to mix and heat said composition in said apparatus without exposure to said hot gas until substantially homogeneous and to a temperature of at least about 225°F.

3,971,667

INSTALLATION FOR TREATING SUGAR-MILL MOLASSES

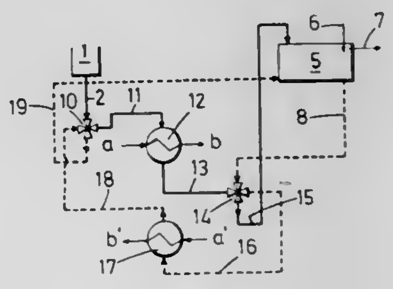
Joseph Emile Albert Blaude, and Georges Francois Michel Frederic Duchateau, both of Tienen, Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Mar. 21, 1975, Ser. No. 560,444

Claims priority, application Belgium, Mar. 25, 1974, 812775

Int. Cl.² C13J *1/04*

U.S. Cl. 127—9 **3 Claims**



1. An apparatus for treating sugar-mill molasses, comprising:

a. a source of diluted molasses,

b. a tank for reacting the diluted molasses with lime,

c. first and second heat exchangers,

d. an inlet line for the tank,

e. a circuit for recirculating part of the reacted molasses back through the tank, and

f. valve means having a first position for coupling the source to the inlet line through the first heat exchanger in a first direction and for coupling the second heat exchanger in the recirculating circuit in a first direction, and having a second position for coupling the source to the inlet line through the second heat exchanger in a second direction opposite to the first direction and for coupling the first heat exchanger in the recirculating circuit in a second direction opposite to the first direction, whereby the periodic switching of the valve means serves to dissolve deposits and crusts that build up in the heat exchangers.

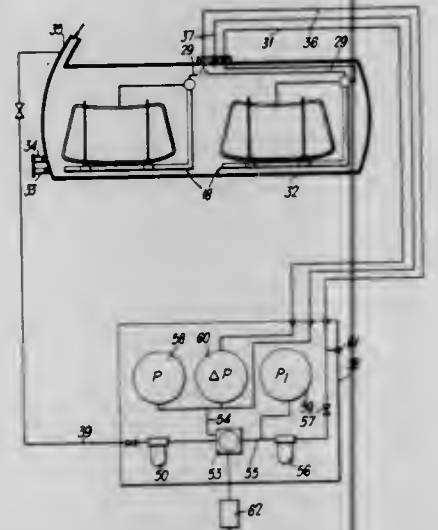
3,971,668
FORMATION OF LAMINATED GLASS ARTICLES

John Pickard, Studley; Richard Melling, Hollywood, and Arthur Joseph Nobbs, Alvechurch, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Aug. 5, 1974, Ser. No. 494,866

Int. Cl.² B32B *31/20*

U.S. Cl. 156—104 **13 Claims**



1. A method of effecting final bonding between two glass sheets with an interlayer of thermoplastic transparent plastics material between the sheets comprising the steps of:

a. providing an assembly of two glass sheets with an interlayer of thermoplastic transparent plastics material between them;
b. heating the assembly to an elevated temperature sufficient to render said material flowable and maintaining such temperature for a selected period of time;
c. subjecting the major faces of the sheets to a pressure in excess of atmospheric pressure during said selected period of time such that the glass sheets and interlayer become fully bonded together;
d. subjecting the exposed periphery of the interlayer at the edges of the sheets during said selected period of time to a pressure in excess of atmospheric pressure but lower than that applied to the faces of the sheets by an amount sufficient to provide a pressure differential between the pressures of steps (c) and (d) which is in the range of 0.14 Kg/cm² to 1.05 Kg/cm², said lower pressure being maintained at the exposed periphery of the interlayer for at least part of the period while the assembly is maintained at said elevated pressure and temperature; and
e. cooling the assembly after full bonding has occurred.

3,971,669
CARBON FIBER COMPOSITES

Andrew Peter Wrzesien, Cheadle Hulme; Ian Whitney, Wirksworth, and Joseph Katona, Manchester, all of England, assignors to Hyfil Limited, England

Filed July 17, 1973, Ser. No. 379,913

Claims priority, application United Kingdom, July 21, 1972, 34114/72

Int. Cl.² B29H *9/04;* **D04H** *3/08*

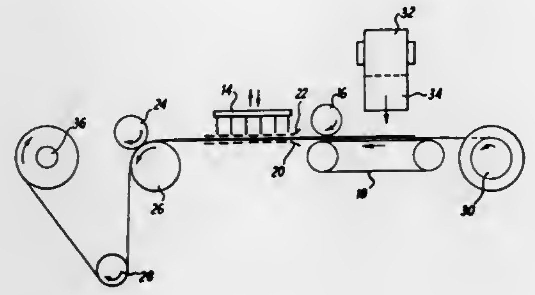
U.S. Cl. 156—181 **5 Claims**

1. A method of producing a composite shaped article comprising the steps of

preparing a high bulk, low density felt from continuous carbonisable filaments in oxidised state and with fibrous elements lying in cross-over relationship in at least two directions along the length of the felt and also through the thickness of the felt;

carbonising said high bulk, low density felt;

pre-sizing said felt by impregnating it whilst still in its high bulk low density state, with a thermosensitive resin highly diluted in a solvent, removing said solvent to leave said resin substantially solely as a coating on said fibrous elements, and converting said resin to a state in which it locks said fibrous elements together by adhesion at the cross-over locations;



applying further resin to the pre-sized felt to occupy the voids between the adhered fibrous elements, and forming the composite article by converting it into an assembly consisting of a contoured reinforcement constituted by said fibrous elements in a permanent matrix constituted from said resin.

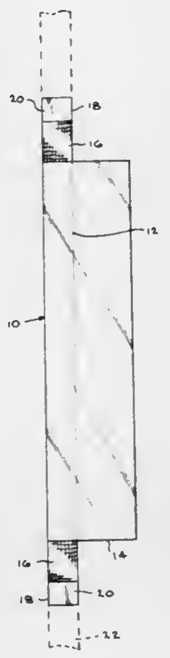
3,971,670
IMPLANTABLE STRUCTURE AND METHOD OF MAKING SAME

Charles A. Homsy, 11526 Raintree Circle, Houston, Tex. 77024

Filed July 17, 1974, Ser. No. 489,453

Int. Cl.² B31F *1/00*

U.S. Cl. 156—196 **12 Claims**



1. The method of forming an elongate implantable structure including the steps of,

heat bonding a flat film onto a flat fabric at temperatures sufficiently low so that the fabric and the film are not weakened on completion of the bonding and remain biocompatible,

folding the composite fabric film structure lengthwise, and heat forming the folded structure to maintain its elongate configuration.

3,971,671
RADIOELECTROCHEMICAL ENERGY CONVERTER

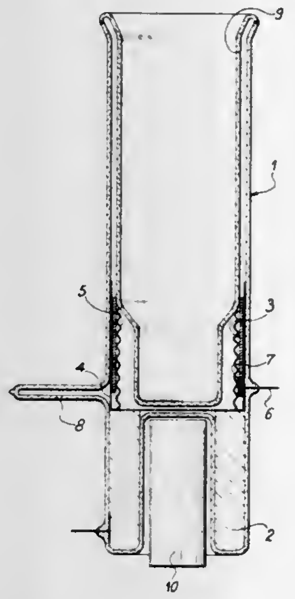
Gérard Duperray, Paris; Charles Eyraud, Lyon; Gérard Lecayon, Brus sur Forges, and Janine Lenoir, Chaponost, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 24, 1974, Ser. No. 508,828

Claims priority, application France, Sept. 28, 1973, 73.34825

Int. Cl.² H01M *8/18, 8/20*

U.S. Cl. 136—86 R **13 Claims**



1. A radioelectrochemical energy converter which utilizes the products of radiolysis of an aqueous solution of an oxidation-reduction pair, said converter comprising a leak-tight jacket adapted to be disposed in a cooperative relationship with a source of radiant energy, said jacket being filled with a pure gas which is identical with the gas evolved as a result of said radiolysis, a porous electrode disposed within said jacket and adapted to communicate with said energy source, said electrode being impregnated with said aqueous solution of said oxidation-reduction pair and being specific to the reaction of said oxidation-reduction pair, a gas electrode free from said solution and specific to the gas evolved as a result of said radiolysis, a porous diaphragm for effecting ionic conductivity between said electrodes, and means for connecting said electrodes to an external circuit.

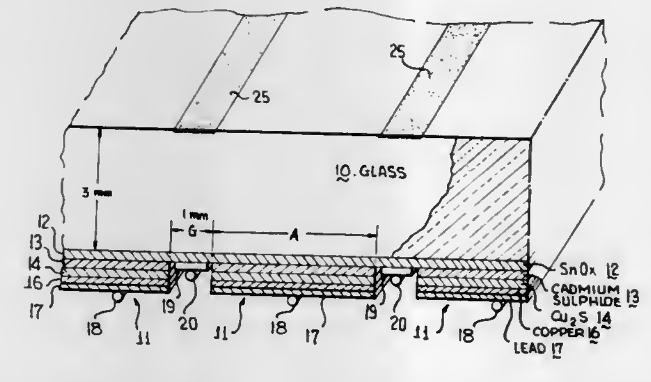
3,971,672
LIGHT DIFFUSER FOR PHOTOVOLTAIC CELL

Curtis M. Lampkin, El Paso, Tex., assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Feb. 3, 1975, Ser. No. 546,711

Int. Cl.² H01L *31/04*

U.S. Cl. 136—89 **5 Claims**



1. A solar cell, including a sheet glass substrate, plural actice photo-sensitive strips coated on one planar surface of said substrate, said active strips being separated by inactive areas and having diffusing surfaces superposed over said inactive areas on the other planar surface of said substrate, whereby radiation passing directly through said substrate to said active strips is undiffused and radiation passing through said diffusing surfaces is refracted in part to said active strips.

3,971,673
ELECTROCHEMICAL CELL WITH FLUID-TIGHT CASING AND METHOD OF CONSTRUCTION

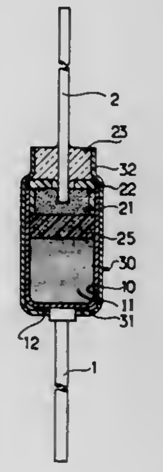
Daniel Coueille, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed June 16, 1975, Ser. No. 586,907

Claims priority, application France, June 28, 1974, 74.22739

Int. Cl.² H01M *2/04*

U.S. Cl. 136—133 **12 Claims**



1. Electrochemical cell having a fluid-tight casing comprising a metal can having a closed bottom and a lateral wall and at least one current output terminal insulated from said can characterized in that said casing comprises additionally a metal sleeve surrounding the lateral wall of the said can, said sleeve being sealingly secured in fluid-tight manner at a first end to the can, and an undeformable electrically insulating seal at *a* second end of said sleeve through which said terminal crosses in a fluid-tight manner, said undeformable seal being of glass and entirely filling and sealing off said second end of said sleeve, and said sleeve being of a material having a coefficient of expansion substantially equal to that of said glass.

3,971,674
SELECTIVE BLACK COATING FOR ALUMINUM

James L. Brandt, Monroeville; William King, Lower Burrell; James Dean Minford, New Kensington, and Clement E. Valchar, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,718

Int. Cl.² C23F *7/06*

U.S. Cl. 148—6.27 **8 Claims**

1. A process for applying to an aluminum surface a selective black coating which is characterized by a high absorptivity in the visible and near infrared wavelengths of 0.38 to 1.9 microns and a low emissivity of infrared wavelengths greater than 6 microns comprising immersing the aluminum for at least 30 minutes in a bath capable of forming said selective black coating, containing at least 200 ppm of a soluble borate salt and a soluble silicate salt at a concentration of at least one-eighth the concentration of the borate salt, said bath having a pH in the range of 8 to 10.

3,971,675
NONFUMING SOLDERING FLUX

Robert C. Thomas, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 286,167, Sept. 5, 1972, abandoned. This application July 1, 1974, Ser. No. 484,526

Int. Cl.^{2} B23K *35/34*

U.S. Cl. 148—26 **5 Claims**

1. A substantially nonfuming solder flux consisting of zinc bromide and an alkali metal bromide selected from the group consisting of sodium, potassium or lithium bromide, wherein the alkali metal bromide is present in an amount from about 50 to about 70 mole percent.

3,971,676
MAGNETIC MATERIAL OF HIGH STRENGTH AND TOUGHNESS

Klaüs Detert, and Hans-Jochen Lipp, both of Neu Isenburg, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 19, 1971, Ser. No. 135,370

Claims priority, application Germany, Apr. 17, 1970 2018462

Int. Cl.^{2} H01f *1/00*

U.S. Cl. 148—121 **7 Claims**

1. A method for preparing a magnetic material suitable for use in rotors in hysteresis motors operating at high r.p.m. from a martensitically hardening steel consisting essentially of at least about 65% iron and a member of the group of 8 to 25% Ni, 5 to 20% Cr, and 1 to 10% Mn, said rotor having high stability and toughness and increased coercive field strength, comprising the steps of treating the steel by austenitizing said steel and then subjecting it to a heat treatment including heating the steel to at least 500°C for a time sufficient to yield a coercive force, H_c, of at least 40 oersteds and provide a tensile strength of at least about 150 kiloponds/mm^2 and a toughness as measured by a reduction in area of at least 15%.

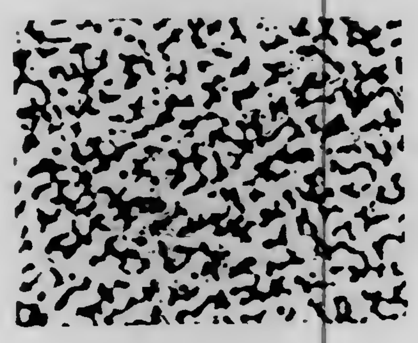
3,971,677
LOW EXPANSION ALLOYS

John Jefferson Mason, Essington, and Peter John Penrice, Birmingham, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,947, Sept. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 437,657, Jan. 29, 1974. This application May 5, 1975, Ser. No. 574,587

Int. Cl.^{2} C22C *38/08*

U.S. Cl. 148—31 **23 Claims**



1. A metallic cast article adapted to be employed under stress at temperatures in excess of ambient temperature and having enhanced utility by virtue of dimensional stability over the temperature range from ambient temperature to at least 300°C and high strength and consisting of an alloy having an as-cast and age-hardened microstructure, said microstructure being characterized by a Ni_3 Ti precipitate and by substantial segregation of elemental constituents within the as-cast structure but, on the average consisting essentially, in percent by weight, of about 27% to about 47% nickel, about 1% to about 4% uncombined titanium, up to about 16% cobalt, up to about 1.5% niobium, up to about 0.1% carbon, with the balance, except for impurities and incidental elements being essentially iron, to provide in said as-cast plus age-hardened alloy a linear thermal expansion coefficient between 20°C and 300°C of less than about 6×10^{-6}/°C and a 0.2% proof stress at 20°C greater than about 350 N/mm^2.

3,971,678
METHOD OF MAKING COLD-ROLLED SHEET FOR ELECTRICAL PURPOSES

Constantin Vlad, Wolfenbuttel, Germany, assignor to Stahlwerke Peine-Salzgitter Aktiengesellschaft, Peine, Germany

Continuation of Ser. No. 365,446, May 31, 1973, abandoned. This application June 20, 1974, Ser. No. 481,320

Claims priority, application Germany, May 31, 1972, 2226379

Int. Cl.^{2} H01F *1/04*

U.S. Cl. 148—111 **6 Claims**

1. A method of making cold-rolled sheet for electrical purposes, said sheet having isotropic magnetic properties, said method comprising the steps of hot rolling at a temperature of from 820° to 1080°C a steel consisting essentially of up to 0.1% carbon, from 0.15% to 0.35% manganese, from 0.3% to 2.4% aluminium, up to 0.25% copper, up to 0.05% sulphur, up to 0.2% phosphorus, up to 2.0% silicon and the balance iron except for impurities, to bring at least 5% of the grains into a {100} <hkl>—orientation, cold-rolling said sheet with a reduction in cross section of from 50% to 85% and subsequently recrystallisation-annealing said sheet at a temperature of from 820° to 1200°C. for a time sufficient to yield a product having a grain length at least five times the sheet thickness.

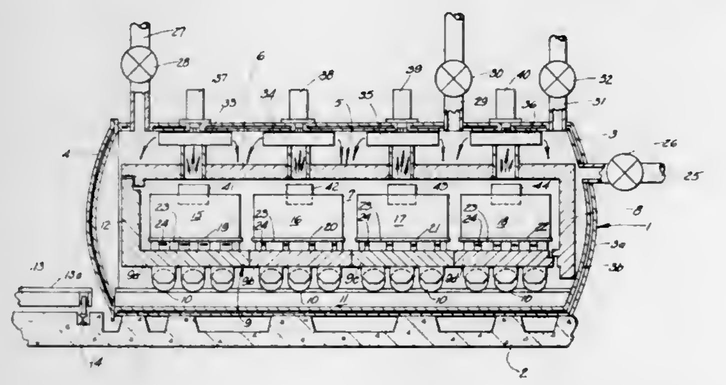
3,971,679
METHOD OF ANNEALING ORIENTED SILICON STEEL

John H. Burger; John R. McClelland, both of Butler, and Robert P. Dunkle, Kittanning, all of Pa., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 2, 1975, Ser. No. 609,189

Int. Cl.^{2} H01F *1/04*

U.S. Cl. 148—113 **13 Claims**



1. A batch-type method of annealing large coils of silicon steel for magnetic purposes having a weight of from about 30,000 to about 40,000 pounds in an annealing furnace of the type comprising an outer enclosure surrounding an insulated heating chamber in which said coils are supported, said furnace being capable of subjecting said coils both to a desired atmosphere and a vacuum, said method comprising the steps of locating said coils to be annealed in said furnace heating chamber, drawing and holding a vacuum within said outer enclosure and said heating chamber to remove air therefrom, backfilling said outer enclosure and said heating chamber with a desired non-oxidizing annealing atmosphere, circulating said annealing atmosphere through said outer enclosure and said heating chamber, heating said coils to a temperature of about 2200°F. and soaking said coils at said temperature with continued circulation of said annealing atmosphere, cooling said coils in three steps comprising an initial cooling step from 2200°F. (1204°C.) to 1700°F. (927°C.), an intermediate cooling step from 1700°F. (927°C.) to 1225°F. (663°C.) and a final cooling step from 1225°F. (663°C.) to 250°F. (121°C.) with continued circulation of said annealing atmosphere, drawing and holding a vacuum within said outer enclosure and said heating chamber to remove said annealing atmosphere therefrom, backfilling said enclosure and said heating chamber with a gas which will not support combustion in the presence of said annealing atmosphere and removing said coils from said furnace.

3,971,680
ELECTROCONDUCTIVE PAPER

Charles A. Schneider, Villa Hills, Ky., and William R. Cake, Bay Village, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

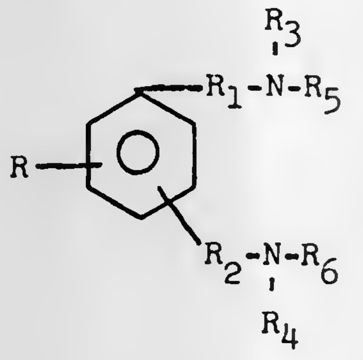
Filed Oct. 9, 1973, Ser. No. 404,549

Int. Cl.^{2} B32B *9/06, 21/06*

U.S. Cl. 428—537 **19 Claims**

1. Electroconductive paper having a resistivity of less than about 10^{11} ohm/sq. cm. at relative humidities of about 10% to 90% which comprises paper and an effective amount of a substantially water-soluble electroconductive quaternary ammonium polymer to render the paper electroconductive; said polymer obtained by reacting

a. approximately 0.8 to 1.3 moles of at least one aromatic ditertiary amine having the formula:



wherein R is hydrogen, an alkyl or substituted alkyl radical of 1 to 4 carbon atoms, R_1 and R_2 are the same or different divalent alkyl or substituted-alkyl radicals of 1 Ito 4 carbon atoms and R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of alkyl and substituted-alkyl radicals of 1 to 4 carbon atoms, and

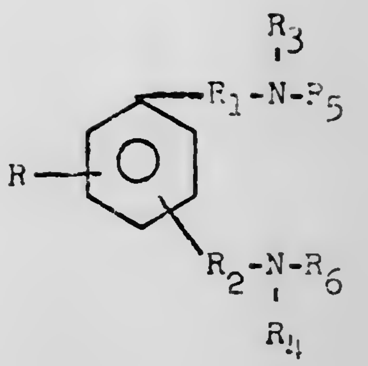
b. about 1.0 mole of at least one anion-containing organic compound having the formula:

$X\text{-}Y_1\text{-}R_7\text{-}Y_2\text{-}X$

wherein R_7 is a divalent organic radical having up to 16 carbon atoms selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, substituted-alkyl radicals, substituted-cycloalkyl radicals and substituted-aryl radicals, Y_1 and Y_2 are either the same or different divalent alkyl radicals of 1 to 4 carbon atoms and X is an anion bonded directly to an alkyl carbon atom.

12. A process for preparing electroconductive paper having a resistivity of less than 10^{11} ohms/sq. cm. at relative humidities of about 10% to 90% which comprises applying to paper an effective amount of a water-soluble electroconductive quaternary ammonium polymer to render the paper electroconductive; said polymer obtained by reacting

a. approximately 0.8 to 1.3 moles of at least one aromatic ditertiary amine having the formula:



wherein R is hydrogen, an alkyl or substituted-alkyl radical of 1 to 4 carbon atoms, R_1 and R_2 are the same or different divalent alkyl or substituted-alkyl radicals of 1 to 4 carbon atoms and R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of alkyl and substituted-alkyl radicals of 1 to 4 carbon atoms and

b. about 1.0 mole of at least one anion-containing organic compound having the formula:

$X\text{-}Y_1\text{-}R_7\text{-}Y_2\text{-}X$

wherein R_7 is a divalent organic radical having up to 16 carbon atoms selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, substituted-alkyl radicals, substituted-cycloalkyl radicals and substituted-aryl radicals, Y_1 and Y_2 are either the same or different divalent alkyl radicals of 1 to 4 carbon atoms and X is an anion bonded directly to an alkyl carbon atom.

3,971,681
COMPOSITE DOUBLE BASE PROPELLANT WITH TRIAMINOGUANIDINIUM AZIDE

William A. Rains; Robert D. Fox, and James P. Flynn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 24, 1962, Ser. No. 175,382

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.8 **7 Claims**

1. A solid rocket propellant composition which consists essentially of from about:

1. 30–60 weight per cent of a double base propellant
2. 5–30 weight per cent of a finely divided metal fuel
3. 5–30 weight per cent of an inorganic oxidizer
4. 10–30 weight per cent of triaminoguanidinium azide.

3,971,682
ETCHING PROCESS FOR ACCURATELY MAKING SMALL HOLES IN THICK MATERIALS

John J. Frantzen, North St. Paul, and Lee C. Barton, St. Anthony Village, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed July 11, 1974, Ser. No. 487,665

Int. Cl.^{2} C23F *1/02*

U.S. Cl. 156—11 **1 Claim**

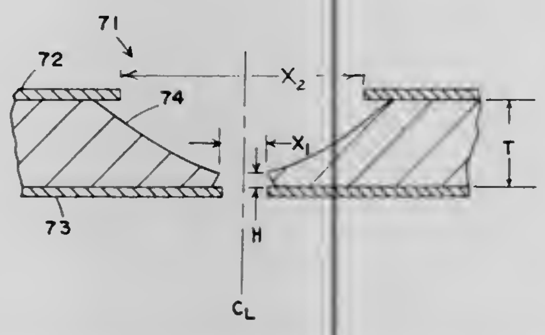
1. A process for making etched openings in a continuous sheet of material whereby the etched openings have a minimum dimension which is less than the thickness of the continuous sheet of material;

forming an etchant resist pattern on opposite sides of a continuous sheet of material having a thickness T, a first etchant resist pattern defining an opening larger than the thickness of the material and a second etchant resist pattern on the opposite side defining an opening having a dimension which is less than 40% of the thickness T of said material;

placing so as to face downward the first side of the continuous sheet of material having etchant resist defining an opening which is larger than the thickness of said material;

applying a removable etchant resist shield over said material and the first etchant resist pattern which defines an opening having a dimension which is less than 40% of the thickness T of said material to completely cover said material and said etchant resist pattern to thereby prevent etchant from attacking said material while the opposite side of said material is being etched;

first spray etching only on the first side of said material having etchant resist defining an opening which is larger than the thickness T of said material by spraying etchant



from below said material until the depth of the etch on the first side of said material produces a region which has a thickness on the order of the minimum dimension of the final opening;

removing the etchant resist shield; and

then simultaneously etching the material from the first and second side of said material to simultaneously remove material from said first and said second sides of said material to thereby produce an opening in said material which has a mimimum dimension which is less than 40% of the thickness T of said material.

3,971,683
METHOD OF ETCHING MATERIALS CONTAINING SILICON

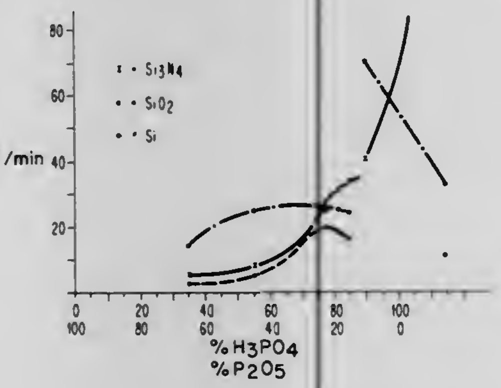
Marian Briska, Boeblingen; Wolfgang Hoffmeister, Gaertringen, and Herbert Kuhlmey, Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,068

Claims priority, application Germany, May 28, 1974, 2425684

Int. Cl.² H01L *21/318;* C09K *13/04*

U.S. Cl. 156—13 **10 Claims**



8. In a method of etching to remove portions of a layer of a first silicon compound in which an etch mask of a second silicon compound is formed on said layer by overcoating said layer with said second silicon compound and removing portions of said second silicon compound to expose the underlying portions of said layer; the improvement which comprises etching said layer with a hot melt consisting essentially of P_2O_5 and anhydrous H_3PO_4 containing from about 12 to 64% by weight of melt of P_2O_5 at a temperature ranging from 160° to 300°C which melt preferentially etches said first silicon compound but which etches said second silicon compound to a degree such that any residual second silicon compound, which was not removed from the portions of said layer to be etched in forming the etch mask, will be removed by the hot melt so that it does not interfere with the complete removal of said layer in the exposed areas.

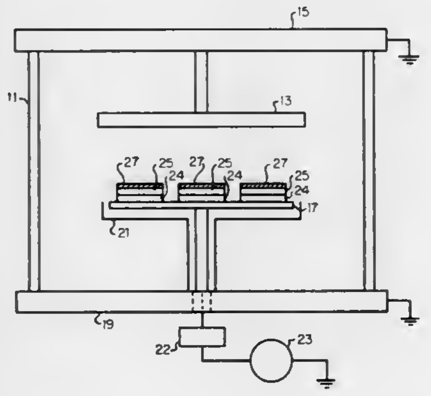
3,971,684
ETCHING THIN FILM CIRCUITS AND SEMICONDUCTOR CHIPS

Steve Yoneo Muto, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 420,990, Dec. 3, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,534

Int. Cl.² C09K *13/00*

U.S. Cl. 156—13 **6 Claims**



1. A method of etchng a surface comprising the steps of:

positioning the surface to be etched on a first electrode plate;

masking the surface to be etched with an etching mask;

enclosing in a container the first electrode plate, the surface to be etched and etching mask, and a second electrode plate positioned opposite the first electrode plate;

introducing a chemically reactive etchant gas into the container; and

electrically biasing the first electrode plate relative to the second electrode plate to ionize the chemically reactive etchant gas in the region between the two plates and to accelerate chemically reactive etchant gas ions toward the first electrode in a direction substanially perpendicular to the surface to be etched, whereby the surface is directionally etched by chemically reactive ions from the chemically reactive gas.

3,971,685
APPARATUS AND PROCEDURE FOR MANUFACTURING ARTICLES HAVING A NON-WOVEN PILE

Walter Hurtes, 433 W. 34th St., New York, N.Y. 10001

Continuation of Ser. No. 436,640, Jan. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 229,065, Feb. 24, 1972, abandoned. This application July 31, 1975, Ser. No. 600,601

Int. Cl.² D04H *11/08;* D06C *3/00*

U.S. Cl. 156—72 **23 Claims**

1. In apparatus for producing a nonwoven pile article, in combination,

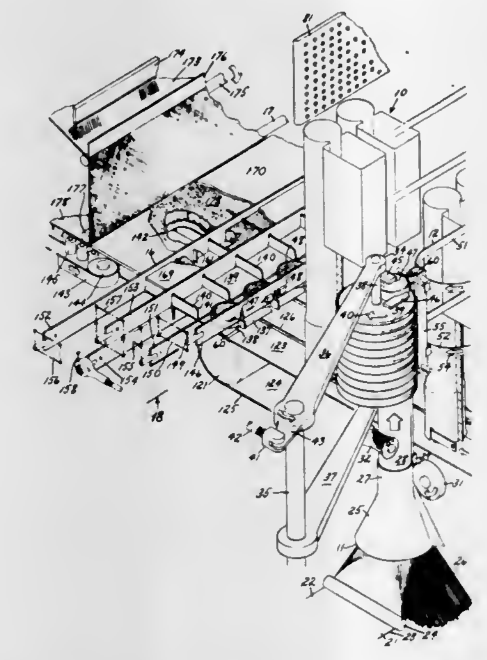
a. means for forming separate pile units each comprising a substantially radially symmetrical array of free-ended fibers substantially axially oriented such that ends of the fibers are at the ends of the pile units, and laterally compressed together and separable in maintained relative axial orientation upon release from lateral compression;

b. means for supporting plural pile units in side-by-side relation;

c. means for successively disposing a plurality of groups of the separate pile units from the forming means in side-by-side relation on said supporting means while maintaining the fibers of each unit laterally compressed together with the fibers of each unit separate from and unconnected to the fibers of each adjacent unit, each group comprising plural units distributed transversely of the supporting means, said disposing means including means for releasing the fibers of each pile unit from lateral compression upon disposition thereof on said supporting means;

d. means for laterally advancing the released pile units longitudinally of the supporting means while permitting expansion thereof and while applying a force to the released pile units on said supporting means for promoting expansion thereof, by separation of the fibers thereof in maintained relative axial orientation, into contact with adjacent pile units, to produce a continuous, substantially uniform assembly of pile fibers; and

e. means for applying an adherent backing to at least one end of the fibers of the expanded pile units to form a pile article wherein the expanded pile units constitute the pile.



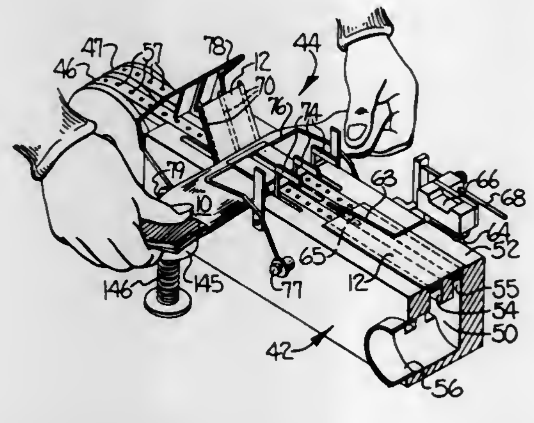
3,971,686
LABEL APPLYING METHOD

Joseph Edward Kienel, Drawer K, Acworth, Ga. 30101

Division of Ser. No. 258,818, June 1, 1972, Pat. No. 3,886,026. This application Mar. 27, 1975, Ser. No. 562,639

Int. Cl.² B29C *17/04*

U.S. Cl. 156—212 **7 Claims**



1. A method for applying a label to an article of merchandise such as men's socks or the like, comprising the steps of:

placing a label upon an endless belt which extends along a path of travel and across a labeling station,

moving the label along the path of travel and to the labeling station by rotating the endless belt and while drawing a partial vacuum below the upper surface of the belt to draw the label into firm engagement with the belt,

holding the label at the labeling station upon its reaching the same by terminating rotation of the endless belt and by maintaining the partial vacuum below the upper surface of the belt,

positioning the article of merchandise transversely across and upon the medial portion of the label while the label is being held at the labeling station, and then

lifting and folding the ends of the label about the article of merchandise while maintaining the article in a relatively fixed position at the labeling station such that the label substantially encircles the article.

3,971,687
METHOD FOR FORMING DOUBLE-WALLED UNITS

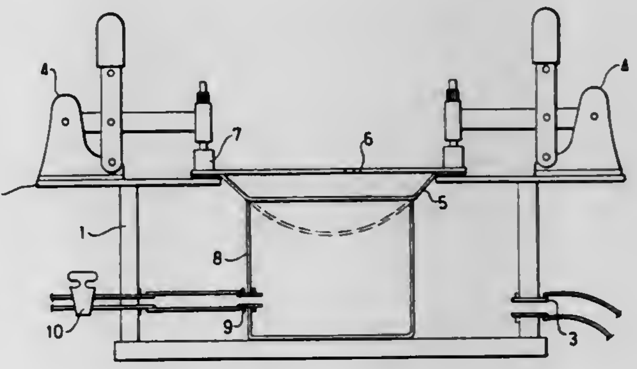
Kent Reaney Greer, Marple Bridge; William Rodney Hampson, Pirton near Hitchin, and Benjamin James Smith, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 490,189, July 19, 1974, abandoned, which is a continuation of Ser. No. 255,637, May 22, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,441

Claims priority, application United Kingdom, May 25, 1971, 16870/71; Feb. 17, 1972, 7428/72; July 5, 1974, 29895/74

Int. Cl.² B32B *31/00*

U.S. Cl. 156—221 **9 Claims**



1. A method of forming a double-walled unit comprising the steps of (1) selecting two sheets of an organic thermoplastic material, a first sheet having a perimeter fitting wholly within or matching the perimeter of the second sheet, (2) providing one of the sheets with at least one aperture to allow the passage of air into the space between the sheets so that each sheet can be shaped independently of the other after they have been bonded together about their perimeter, (3) providing means for bonding the two sheets together about their perimeters and heating at least the unapertured sheet to a temperature above the softening point of the thermoplastic, (4) stretching the unapertured sheet relative to the other bonded sheet by means of different pressures acting on each of the sheets to give a desired shape, the control of the shape being effected by the different pressures applied so that the use of moulds is avoided, and (5) allowing the unit to cool below the softening point of the thermoplastic material.

3,971,688
METHOD OF MAKING AN ELONGATE, TRANSVERSELY REINFORCED METAL SHEET

Richard Abbott, Dearborn Heights, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Dec. 20, 1974, Ser. No. 534,802

Int. Cl.² B32B *15/04, 15/08, 31/12, 7/12*

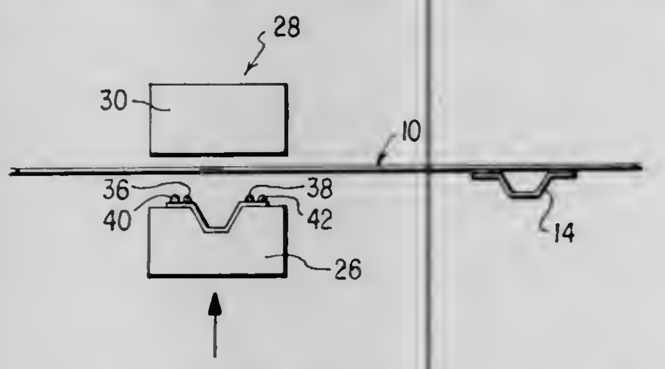
U.S. Cl. 156—295 **6 Claims**

1. The method of making a reinforced metal sheet which comprises the steps of:

a. separately applying a heated, fluid hot melt adhesive and a catalyzed, room temperature curing adhesive in localized side-by-side relation along and within the confines of a bonding surface of a structural member;

b. positioning the structural member of step (*a*) and a metal sheet in spaced registry; and while the hot melt adhesive is fluid,

c. pressing the structural member and the metal sheet together with force sufficient to spread both adhesives out over respectively discrete surface areas cumulatively covering substantially the entirety of said bonding surface and for a time sufficient to allow said hot melt adhesive to set and bond the sheet and structural member together.



3,971,689

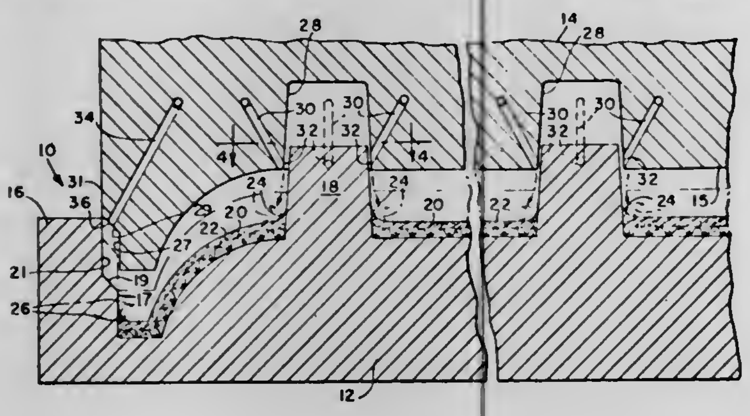
METHOD FOR PRODUCING DECKLE-FREE EDGES AND WINDOWS IN MOLDED FIBER PRODUCTS

William S. Peppler, Chappaqua, N.Y., assignor to Diamond International Corporation, New York, N.Y.

Division of Ser. No. 267,375, June 29, 1972, Pat. No. 3,816,049. This application Jan. 9, 1974, Ser. No. 432,128

Int. Cl.^{2} D21J *3/00*

U.S. Cl. 162—226 2 Claims



1. Method of forming deckle-free edges in a molded fiber product comprising the steps of:

a. applying a fiber pulp slurry on a forming mold provided with block-out means whereby edge portions with deckle at base portions of said block-out means will be formed in a preform of the finished product;

b. peeling said deckle from base portions of said block-out means into upstanding position by directing high-pressure fluid such as air and/or steam against said block-out means from a source separate from and external of said forming mold; and

c. pressing said deckle from said upstanding position down against said preform to thereby form the molded fiber product with deckle-free edge portions reinforced with concentrated pressed fibers.

3,971,690

PROCESS FOR ADHESIVE BONDING AND COATING

Hans-Walter Birnkraut, Oberhausen, and Werner Kluy, Bochum-Stiepel, both of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Filed July 10, 1974, Ser. No. 487,182

Claims priority, application Germany, Jan. 10, 1974, 2400978

Int. Cl.^{2} C09J *3/14*

U.S. Cl. 156—309 6 Claims

1. A process for bonding at least two materials together which comprises placing between said materials a lamina comprising a terpolymer containing about 70 to 90 parts by weight of ethylene; about 0.5 to 10 parts by weight of an ethylenically unsaturated carboxylic acid amide, there being only hydrogen on the amide nitrogen and about 0.5 to 20 parts by weight of an ethylenically unsaturated carboxylic acid ester; the sum of said parts by weight being about 100; and heating the terpolymer to a temperature sufficient to cause it to melt, thereby bonding said materials.

3,971,691

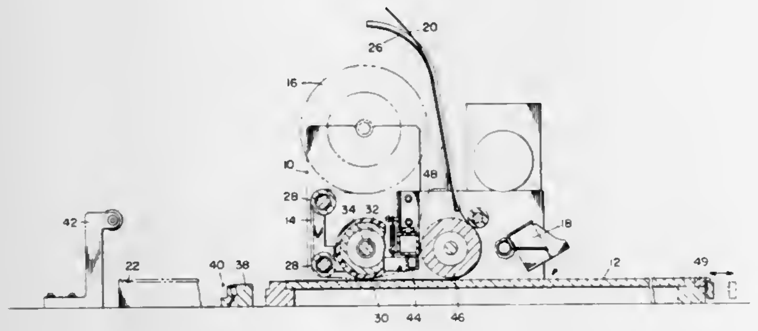
APPARATUS FOR FILM APPLICATION

Michael John Cairns, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 27, 1975, Ser. No. 562,726

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—497 2 Claims



1. Film application apparatus for laying film in wrinkle-free fashion on a flat plate comprising:

a flat plate having vacuum channels in the surface thereof, said flat plate having a front end and a rear end;

a carriage reciprocally mounted on said flat plate to traverse said flat plate;

cover film supply roll rotatably connected to said carriage by friction clutch means to provide resistance to rotation of said film to statically and dynamically tension said film;

pressure roller to press said film in contact with said plate;

eccentric means rotatably connecting said pressure roller to said carriage, initial linear motion of said carriage in one direction from said front end to said rear end moving said pressure roller into contact with said film and initial linear motion in the opposite direction moving said pressure roller to an elevated spaced apart position above said flat plate;

hot wire cutting means positioned adjacent said rear end of said flat plate to sever said film rolled onto the surface of said flat plate when said carriage reaches said rear end of said flat plate;

vertically movable vacuum bar means movably connected to said carriage to force film into contact with said cutting means and to hold the trailing edge of the cover film supply roll when severed;

a stationary vacuum bar positioned adjacent said hot wire cutting means at said rear end of said flat plate to retain the severed portion of the film on said flat plate after said vertically movable vacuum bar forces the film into contact with said hot wire cutting means;

air bar means connected to said carriage and interconnected with said vertically movable vacuum bar to release said trailing edge of the cover film supply roll and blow said film toward said flat plate upon initial movement of said carriage in said one direction; and,

means for feeding a liquid photosensitive material onto said film to form a layer of photosensitive material and means for laminating a backing material onto said layer of photosensitive material, said means for feeding liquid and said means for laminating a backing material, both mounted on said carriage and being activated upon return movement of said carriage in said opposite direction.

3,971,692

RETRO-REFLECTIVE MATERIALS

Nigel I. Anderson, Morgenzicht, Sloane St., Witkoppen, Transvaal, South Africa

Filed July 30, 1974, Ser. No. 493,132

Claims priority, application South Africa, July 2, 1974, 74/4273

Int. Cl.^{2} B44C *1/00*

U.S. Cl. 156—241 30 Claims

1. A method of making a retro-reflective body comprising the steps of applying transparent glass beads in a monolayer to a tacky coating formed on a carrier sheet so that a part of the surface of each bead is embedded in the tacky coating and the remaining part is exposed, coating the exposed parts of the beads at least partially with a reflective material, bringing the reflectively coated surfaces of the beads on the carrier sheet into contact with an adhesive coating on a surface of a backing member, applying pressure to the contacting surface so that the reflectively coated surfaces of the beads become embedded in the adhesive coating and stripping the carrier sheet off the backing member, with the improvement, that the pressure applied to the contacting surface is sufficient to cause the beads to be embedded in the full thickness of the adhesive coating, that the thickness of the adhesive coating on the backing member is less than the nominal diameter range of the beads, and that the thickness of the tacky coating on the carrier sheet is less than that of the adhesive coating on the backing member.

3,971,693

PROCESS AND APPARATUS FOR JOINING OBJECTS TOGETHER

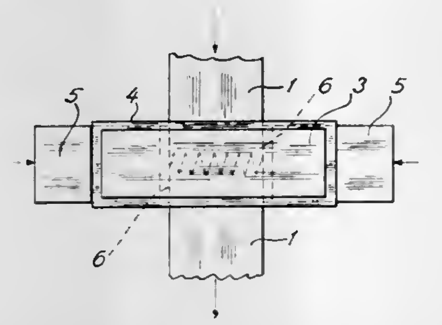
Ib Obel Pedersen, Lerhoj 7, 2880 Bagsvaerd, Denmark

Filed Jan. 22, 1973, Ser. No. 325,236

Claims priority, application Denmark, Jan. 20, 1972, 283/72

Int. Cl.^{2} B29C *27/00;* **H05B** *7/06*

U.S. Cl. 156—273 3 Claims



1. A process for joining oblong objects having a rectangular cross-section together end to end by means of a cement adapted to be hardened through the action of an electric high-frequency field, said process comprising the steps of placing oblong objects end to end with their joint containing cement between a pair of opposed electrode plates adapted to generate a high-frequency field and with two of their faces parallel to said electrode plates, two other faces of said objects being at right angles thereto, applying a layer of a steam-tight, resilient, electrically insulating material to those areas of said faces parallel to and at right angles to said electrode plates situated within the space comprised between said electrode plates, pressing said layers firmly against said areas to prevent steam and gases from escaping therefrom, and supplying high-frequency electric energy to said electrodes to harden said cement.

3. A device for joining oblong objects of rectangular cross-section together end to end by means of a cement adapted to be hardened through the action of an electric high-frequency field, comprising a pair of opposed, parallel normally spaced electrode plates adapted to be forcibly applied to opposite parallel faces of said objects, said electrode plates being coated on their faces adapted to engage said opposite parallel faces of said objects with a layer of steam-tight, resilient, electrically insulating material, and a pair of opposed slides arranged for sliding movement towards and away from each other between said electrode plates in a direction parallel to said plates, said slides having opposed ends provided with a coating consisting of a steam-tight, resilient, electrically insulating material and adapted to engage another pair of opposed parallel faces of said oblong objects substantially over the width of said faces and along the length of the portions thereof disposed between said electrodes.

3,971,694

MANUFACTURE OF RADIAL-CARCASS TIRES

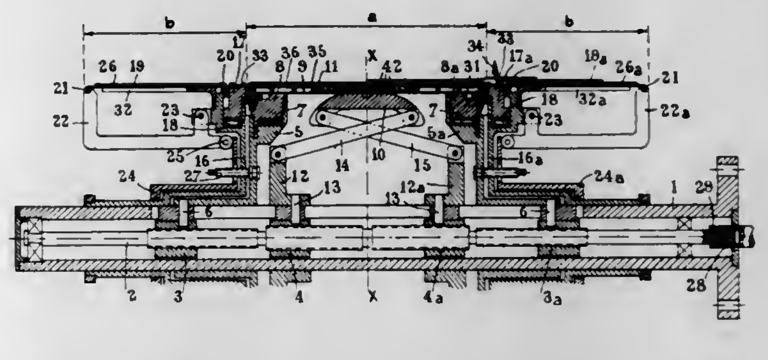
Georges Gazuit, Montlucon, France, assignor to NRM Corporation, Akron, Ohio

Continuation of Ser. No. 28,281, April 22, 1970, abandoned, which is a continuation of Ser. No. 617,658, Feb. 21, 1967, abandoned. This application Apr. 2, 1975, Ser. No. 564,417

Claims priority, application France, Feb. 25, 1966, 66.51107

Int. Cl.^{2} B29H *17/14, 17/26*

U.S. Cl. 156—415 47 Claims



1. A tire building machine including a drum having a flexible surface adapted to be converted from a generally cylindrical to a toric shape, flange means forming the ends of said drum, said surface including flexible straps extending between said flange means, rigid sectors supporting the center of said straps internally, and means to move said flange means toward each other and said sectors radially outwardly in synchronized fashion to obtain such conversion.

3,971,695

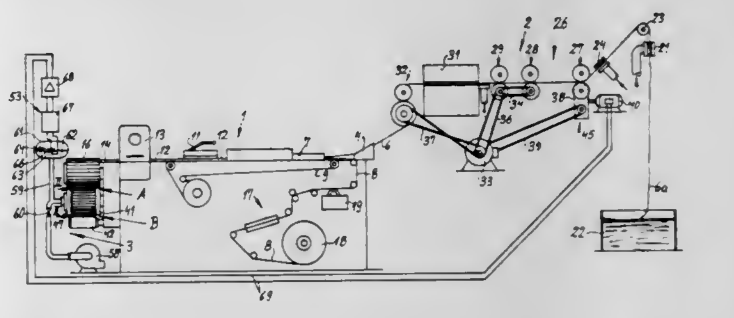
METHOD AND APPARATUS FOR THE PRODUCTION OF FILTER PLUGS

Hans-Jürgen Block, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Jan. 19, 1970, Ser. No. 4,018

Int. Cl.^{2} B31F *1/00*

U.S. Cl. 156—461 19 Claims



1. Apparatus for converting a continuous tow of filamentary filter material and a web of wrapping material into filter plugs, comprising advancing means for conveying the tow lengthwise and including stretching means for stretching the filamentary material; wrapping means for applying the web around the thus stretched tow to form a wrapped filter rod; means for subdividing the rod into filter plugs; testing means including means for conveying a gaseous fluid axially through the filter plugs and measuring means for producing signals indicating the resistance of filter plugs to the flow of such fluid; and

control means responsive to said signals for adjusting said stretching means as a function of deviations of measured resistance from a predetermined value.

7. Apparatus for converting a continuous tow of filamentary filter material and a web of wrapping material into filter plugs, comprising advancing means for conveying the tow lengthwise and including stretching means for stretching the tow with an at least substantially constant force and substantially to the elastic limit of said filamentary material; wrapping means for applying the web around the thus stretched tow to form a wrapped filter rod; and means for subdividing the rod into filter plugs.

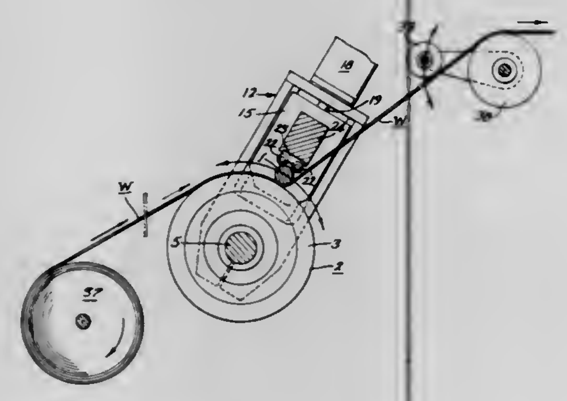
3,971,696
PAPER WEB DECURLING APPARATUS

John L. Manfredi, West Chester, Pa., assignor to The Moore & White Company, Philadelphia, Pa.

Filed Oct. 1, 1975, Ser. No. 618,495

Int. Cl.^{2} D21F *7/00*

U.S. Cl. 162—271 **10 Claims**



1. Decurling apparatus for paper webs comprising,
- a stationary frame structure
- a horizontal shaft rotatably mounted in said stationary support,
- a comparatively large diameter support roll rotatably mounted on said rotatable shaft and having a resilient circumferential surface for supporting a paper web drawn from another roll,
- a pair of radially extending housings mounted in spaced parallel relation on the shaft adjacent opposite ends of said support roll fixed thereon and fixedly secured on said shaft for rotation therewith,
- a relatively small diameter decurling roller rotatably supported in said housings parallel to the support roll and disposed to engage a paper web thereon,
- means for urging the decurling roller into pressure engagement with a paper web on the support roll selectively operable to adjustably vary the pressure of said decurling roller against the paper web and said support roll,
- and means selectively operable to rotate the shaft and and housings thereon about said shaft axis in either direction relative to the stationary frame structure and support roll and thereby position the decurling roller to engage a paper web on said support roll at any desired location circumferentially of the support roll.

3,971,697
PRODUCTION OF ^{123}I

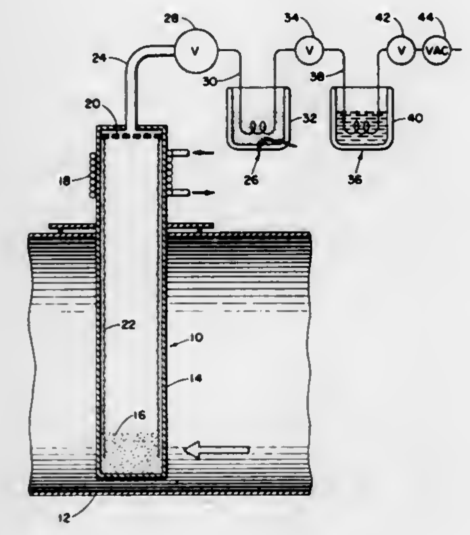
James W. Blue, Bay Village, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 247,434, April 25, 1972. This application July 12, 1973, Ser. No. 380,046

Int. Cl.^{2} G21G *1/10*

U.S. Cl. 176—11 **6 Claims**

1. In combination with a high energy accelerator having a duct containing a beam of particles having high energy between 200 MeV and 2000 MeV and current sufficiently high that the total beam power is greater than two kilowatts, apparatus for producing ^{123}I comprising
- a heat pipe comprising a tubular container extending into said duct, a portion of said tubular container being in the path of said high energy beam,
- a supply of cesium 133 in said portion of said tubular container in said beam, said cesium 133 being bombarded by said beam thereby vaporizing the same and producing radioactive isotopes of xenon including ^{123}Xe and contaminants selected from the group consisting of iodine, tellurium, antimony, tin, indium and cesium by spallation,



- cooling means around a portion of said tubular container remote from said portion of said beam for condensing said vaporized cesium,
- a first trap connected to said heat pipe for receiving said radioactive isotopes of xenon and the contaminants after the same have vaporized and removing said radioactive isotopes of said contaminants, and
- a second trap connected to said first trap for receiving said radioactive isotopes of xenon therefrom and removing the same, said second trap forming a container for holding said radioactive isotopes of xenon for a period of time sufficient for the ^{123}Xe to decay to ^{123}I.

3,971,698
NUCLEAR REACTORS

Paul Heinz Walter Wolff, Rugby, and John Malcolm Peberdy, Huncote, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 6, 1973, Ser. No. 385,707

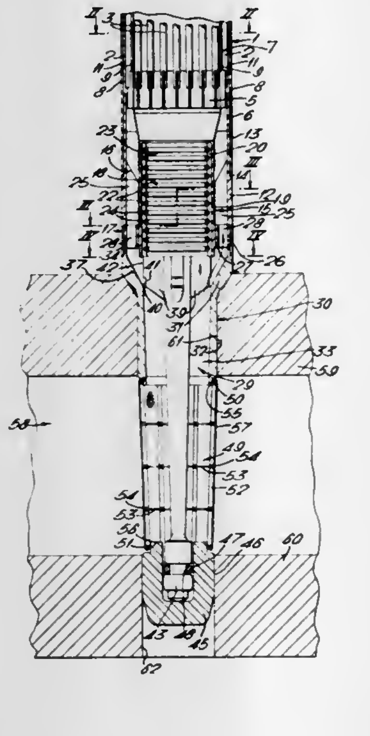
Claims priority, application United Kingdom, Aug. 7, 1972, 36815/72

Int. Cl.^{2} G21C *3/04*

U.S. Cl. 176—43 **2 Claims**

1. A nuclear reactor having a plurality of upstanding fuel element assemblies closely packed side-by-side to form a core, each fuel element assembly comprising:
- a bundle of closely spaced fuel pins,
- a tubular casing enclosing the bundle of fuel pins,
- a tubular lower end fitting for the casing, the end fitting having an inlet port for coolant flow,
- a tubular barrier construction extending co-axially within the casing dividing the fuel pins into inner and outer groups, the outer group containing a single row of fuel pins,
- a barrier extension extending co-axially within the lower end fitting defining inner and outer coolant flow ducts,

- a main gag assembly within the inner duct for restricting flow of coolant over the inner group of fuel pins, and



- a ported gag ring within the outer duct for restricting flow of coolant over the outer group of fuel pins.

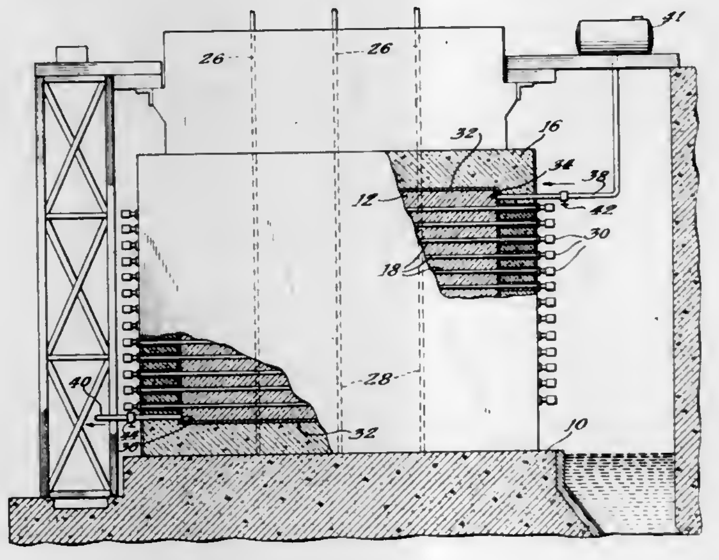
3,971,699
NEUTRONIC REACTOR

Charles W. J. Wende, West Chester, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 19, 1952, Ser. No. 294,349

Int. Cl.^{2} G21C *15/02*

U.S. Cl. 176—52 **2 Claims**



1. The method of operating a water-cooled neutronic reactor having a graphite moderator which comprises flowing a gaseous mixture of carbon dioxide and helium, in which the helium comprises 40–60 volume per cent of the mixture, in contact with the graphite moderator.

3,971,700
PROCESS FOR THE ENZYMATIC RESOLUTION OF DL-PHENYL GLYCINE AMIDE INTO ITS OPTICALLY ACTIVE ANTIPODES

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed June 5, 1975, Ser. No. 584,197

Claims priority, application Netherlands, June 14, 1974, 7407941

Int. Cl.^{2} C12D *13/06*

U.S. Cl. 195—2 **7 Claims**

1. A process for preparing D-phenyl glycine amide and L-phenyl glycine, comprising hydrolyzing DL-phenyl glycine amide with an aminopeptidase and isolating D-phenyl glycine amide, L-phenyl glycine, or both by conventional techniques.

3,971,701
METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Koichi Takinami, Yokohama; Takashi Tanaka, Kawasaki; Michiaki Chiba, Yokohama, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,480

Claims priority, application Japan, Oct. 17, 1973, 48-116666

Int. Cl.^{2} C12D *13/06;* C12K *1/02;* C12B *1/20*

U.S. Cl. 195—47 **5 Claims**

1. A method of producing L-glutamic acid which comprises:

a. culturing an L-glutamic acid producing microorganism in an aqueous culture medium until glutamic acid accumulates in said medium,
  1. said medium containing assimilable sources of carbon and nitrogen, inorganic ions and minor organic nutrients necessary for the growth of said microorganisms, a surfactant, and an amount of biotin too great to permit significant production of glutamic acid by the cultured microorganism in the absence of said surfactant,
  2. said microorganism being a mutuant derived from an L-glutamic acid producing parent strain of Brevibacterium,
  3. said mutant being more sensitive to N-palmitoyl-glutamic acid than said parent strain, and
  4. said surfactant being a fatty acid having a straight chain of 6 to 19 carbon atoms, a salt of said fatty acid, an ester of said fatty acid, or an N-acyl-α-amino acid, the acyl group in said N-acyl-α-amino acid being the acyl radical of said fatty acid; and

b. recovering the accumulated glutamic acid from said medium.

3,971,702
DIAGNOSTIC COMPOSITION FOR SACCHARIDE DETERMINATION

Hideyuki Maekawa, Osaka, and Kaoru Ishitobi, Yao, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 27, 1974, Ser. No. 536,867

Claims priority, application Japan, Jan. 9, 1974, 49-5805; Mar. 8, 1974, 49-27298

Int. Cl.^{2} G01N *31/14;* C12K *1/10, 1/04*

U.S. Cl. 195—63 **39 Claims**

1. A diagnostic composition comprising as a chromogen a diamino-biphenyl derivative having alkyl substituents in the phenyl groups thereof and in which at least one of the hydrogen atoms in either of the amino groups thereof is substituted by at least one lower alkyl group having from one to four carbon atoms and a saccharide oxidase.

3,971,703

METHOD OF DETECTING AND COUNTING BACTERIA

Grace L. Picciolo, Tantallon, and Emmett W. Chappelle, Baltimore, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 475,337, May 31, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,641

Int. Cl.^{2} C12K *1/00*

U.S. Cl. 195—103.5 R **19 Claims**

1. A method of detecting and counting bacteria in a sample which contains bacterial cells and non-bacterial adenosine triphosphate comprising treating said sample by:
   - a. removing soluble and non-bacterial adenosine triphosphate;
   - b. desorbing bound adenosine triphosphate, the desorbed adenosine triphosphate also being removed;
   - c. rupturing bacterial cells, thereby releasing bacterial adenosine triphosphate;
   - d. adding a portion of the treated sample to a luciferase-luciferin solution; and
   - e. measuring the emitted light level.

3,971,704

METHOD AND APPARATUS FOR POLLUTION FREE, DESTRUCTIVELY PROCESSING WASTE

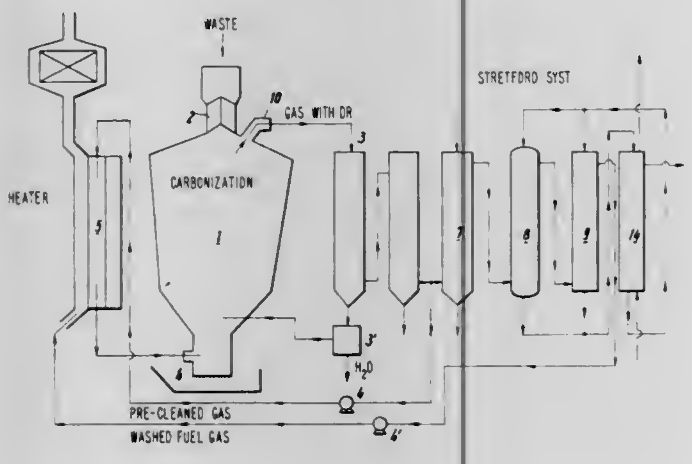
Jürgen von Klenck, Dusseldorf; Erich Michel, Essen, and Klaus-Dieter Gerstenäcker, Dusseldorf, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 10, 1973, Ser. No. 396,007

Claims priority, application Germany, Sept. 8, 1972, 2244753

Int. Cl.^{2} C10B *51/00*

U.S. Cl. 201—2.5 **18 Claims**



1. Method for destructively processing waste comprising the steps of:
   - feeding the waste into a chamber from above for carbonizing therein under exclusion of air and withdrawing coke adjacent the bottom of the chamber;
   - separating gas from the upper portion of the chamber and pre-cleaning the separated gas;
   - heating a portion of the pre-cleaned gas external to the chamber to a temperature sufficient to sustain the carbonization of waste in the chamber as pyrolytic reduction;
   - feeding said heated portion gas into the chamber below the top thereof for upward passage therein to obtain the carbonization of waste in the chamber in counter flow, whereby the gas mixes with gaseous carbonization products as resulting from the reduction of the waste, to be withdrawn therewith pursuant to said separation step; and
   - washing that portion of the pre-cleaned gas not fed to the chamber for obtaining the carbonization.

3,971,705

METHOD OF PRODUCING CHAR FROM PULP MANUFACTURING WASTE LIQUOR

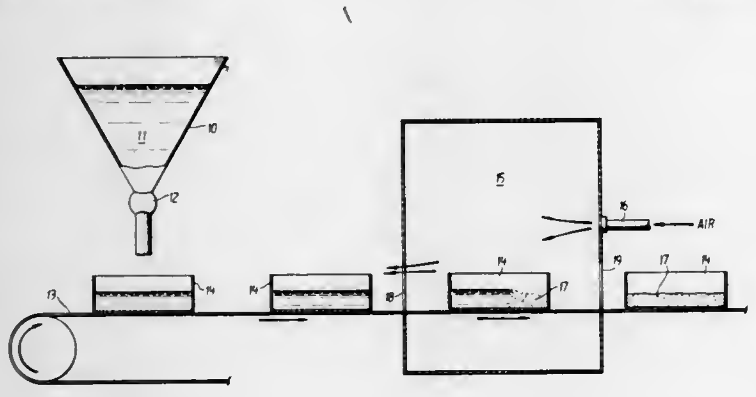
Toshimasa Norita, Tokyo; Hisato Ibara, Kawasaki; Masahiro Murakami, and Masao Okano, both of Tokyo, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,643

Claims priority, application Japan, Aug. 10, 1973, 48-89203

Int. Cl.^{2} C10B *47/18*

U.S. Cl. 201—2.5 **4 Claims**



1. A method of producing char from the waste liquor of a pulp manufacturing process, which comprises confining said waste liquor in a container and feeding said container into an air heating furnace in a manner such that said container is contacted countercurrently with heated air without rotating or stirring the container, whereby said waste liquor is solidified and carbonized and wherein the carbonizing temperature is 200° to 400°C and the carbonizing time is more than 30 minutes.

3,971,706

METHOD OF REJUVENATING ALKALI-CELL DIAPHRAGMS

Stanley T. Hirozawa, Birmingham, and William K. Langdon, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 1, 1975, Ser. No. 618,451

Int. Cl.^{2} C25B *1/16, 1/26*

U.S. Cl. 204—98 **6 Claims**

1. In a process of electrolyzing an aqueous solution of alkali-metal halide in a cell having a porous and hydrophobic diaphragm between the anolyte and catholyte compartments of said cell, the improvement which consists in adding to brine fed to said cell an amount of C_8 to C_{14} glycoside effective to cause wetting of said diaphragm.

3,971,707

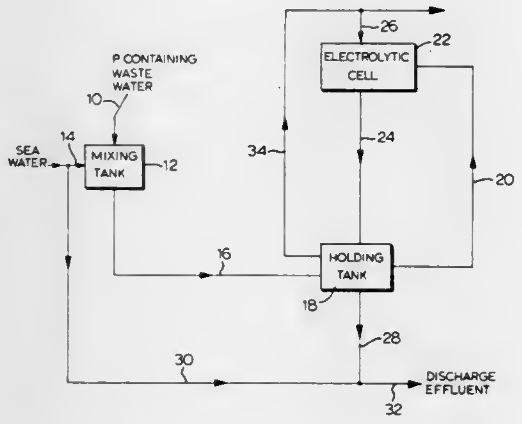
OXIDATION OF PHOSPHORUS IN AQUEOUS MEDIUM

Arun K. Deshpande, St. John's, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed July 25, 1973, Ser. No. 382,491

Int. Cl. C02b *1/82;* **C02c** *5/12*

U.S. Cl. 204—149 **15 Claims**



1. A process for decreasing elemental phosphorus levels in an aqueous medium which comprises subjecting said aqueous medium containing elemental phosphorus to electrolysis in the substantial absence of electrolytes capable of producing atomic chlorine electrolytically at a pH of about 1 to about 10, whereby said elemental phosphorus is oxidized by anodically produced atomic oxygen.

3,971,708

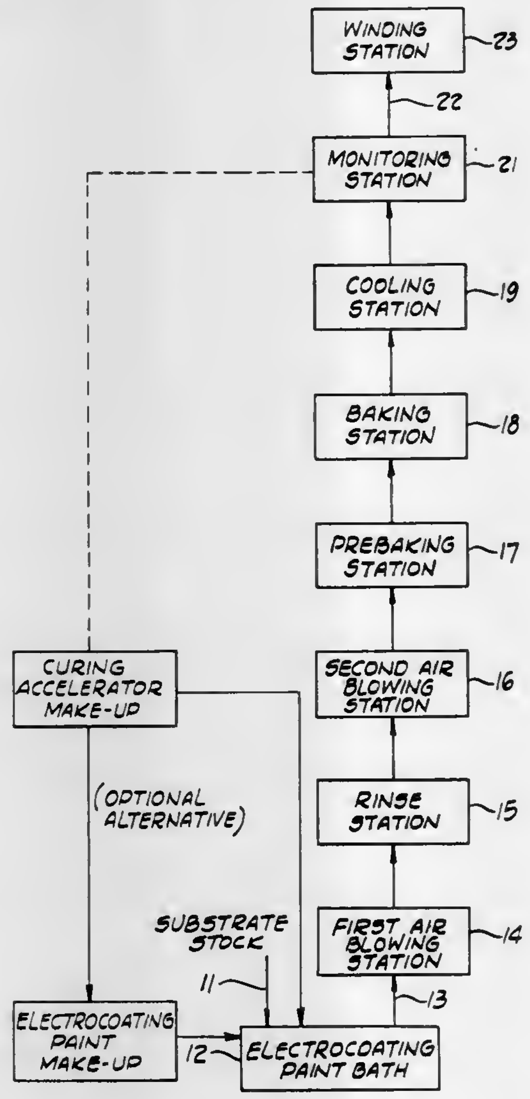
ELECTROCOATING PROCESS

Gerald G. Davis, Cooksville, and Joan M. Keough, St. Johns, both of Canada, assignors to SCM Corporation, Cleveland, Ohio

Filed July 8, 1971, Ser. No. 160,753

Int. Cl.^{2} C25D *13/06, 13/16*

U.S. Cl. 204—181 **12 Claims**



1. In a continuous process for coating continuous electrode stock by electrodeposition of a paint film thereon from an aqueous bath containing a dispersion of cationic or anionic resinous vehicle, a dispersant for said resinous vehicle and a water-dispersible resin which is crosslinkable with said resinous vehicle upon curing, said water-dispersible resin being an aminoplast or phenoplast resin, wherein wet coated electrode stock is withdrawn continuously from said bath and force cured to make finished coated stock, the improvement for regulating flow of the freshly electrodeposited film before and during said force curing and thereby continuously producing finished coated stock virtually free from defects related to said flow which comprises:
   - establishing in said bath a dispersion of curing accelerator acid codepositable with said resinous vehicle, the pKa of said acid being not substantially above about 1 and the proportion of said acid being about that for yielding a substantially continuous cured film;
   - monitoring completeness of the resulting coating on the finished coated stock; and,
   - in response to said monitoring, adjusting concentration of said acid in said bath adequately for maintaining substantially completely coated finished coated stock output.

3,971,709

METHOD FOR FORMING SMOOTH CURED COATED FILMS

Akira Ohsawa, Yokohama; Ryosuke Yamazaki, Kamakura; Osamu Ohe, Tokyo, and Ryoji Okamura, Chigasaki, all of Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,789

Claims priority, application Japan, Oct. 20, 1973, 48-117393

Int. Cl.^{2} C25D *13/06*

U.S. Cl. 204—181 **11 Claims**

1. A method for forming smooth cured coated films, which comprises electrodepositing and coating a film on an electroconductive material in an electrodeposition bath containing a cationically electrodepositing composition, which is composed of a polymer resin having amino groups and at least one of acryloyl groups and methacryloyl groups and of at least one of acrylic acid and methacrylic acid, by using said electroconductive material as a cathode, and curing said coated film by the irradiation of an ionic radiation.

3,971,710

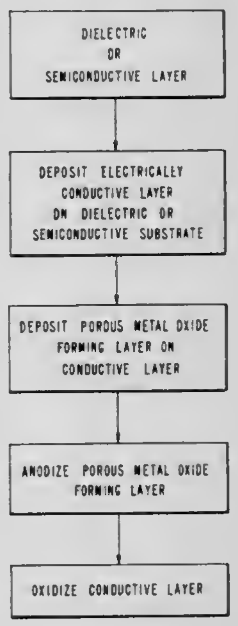
ANODIZED ARTICLES AND PROCESS OF PREPARING SAME

Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignor to IBM, Armonk, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,318

Int. Cl.^{2} C25D *5/02, 11/00*

U.S. Cl. 204—15 **46 Claims**


DIELECTRIC OR SEMICONDUCTIVE LAYER
DEPOSIT ELECTRICALLY CONDUCTIVE LAYER ON DIELECTRIC OR SEMICONDUCTIVE SUBSTRATE
DEPOSIT POROUS METAL OXIDE FORMING LAYER ON CONDUCTIVE LAYER
ANODIZE POROUS METAL OXIDE FORMING LAYER
OXIDIZE CONDUCTIVE LAYER

1. A process for forming anodized porous metal material containing articles which comprises:
   - A. depositing an electrically conductive layer on a dielectric layer;
   - B. depositing a porous metal oxide-forming layer on the electrically conductive layer, the porous metal oxide-forming layer being thicker than the electrically conductive layer;
   - C. anodizing at least a portion of the porous metal oxide-forming layer through the complete thickness of the layer to provide a layer containing porous anodized material;
   - D. the electrically conductive layer deposited in step (A) constituting a material different from the material deposited in step (B) and having a higher conductivity than said substrate, and the conditions of anodization being such that the material deposited in step (A) acts as a valve metal during the anodizing of the porous metal oxide-forming layer and thickness of said conductive layer being such that it requires a higher potential for its anodization than is required for anodization of the porous metal oxide-forming metallic layer; and then

E. treating said electrically conductive layer to render it nonconductive.

3,971,711

PROCESS FOR INCREASING RADIATION-CURABILITY OF A RADIATION-CURABLE RESIN

Kunio Araki; Takashi Sasaki, and Kazuo Goto, all of Takasaki, Japan, assignors to Nitto Boseki Co. and Japan Atomic Energy Research Institute, Tokyo, both of, Japan

Filed July 31, 1973, Ser. No. 384,366

Claims priority, application Japan, Aug. 4, 1972, 47-77709; Aug. 4, 1972, 47-77710

Int. Cl.² C08F *8/00, 2/54;* C08G *63/02*

U.S. Cl. 204—159.19 **5 Claims**

1. A process for curing an unsaturated polyester resin comprising the steps of:

incorporating in said unsaturated polyester resin from about 50 to about 300 parts by weight, per 100 parts by weight of the resin, of one or more compounds of a finely powdered material of an inactive inorganic compound selected from the group consisting of calcium carbonate, clay, quartz powder, gypsum, cement, mica powder, glass powder, diatomaceous earth, talc, asbestos and red mud of bauxite; and

irradiating the resin containing the compounds with an ionizing radiation applied thereto at a dose rate of 10^{-2} – 2×10^7 rad/sec for a total dose of 0.1-10 Mrad, and at a starting temperature of from about −20°C to about 60°C,

whereby secondary radiation being emitted from the compounds and/or the compounds activating themselves promote the radiation-curing reaction.

3,971,712

PROCESS FOR REMOVING SULFUR IMPURITIES FROM A FLUID BY CONTACT WITH SILVER ARTICLES

Jaydee W. Miller, Wallingford, Pa., assignor to Pyromet, Inc., Wallingford, Pa.

Continuation-in-part of Ser. Nos. 4,335, Jan. 20, 1970, abandoned, and Ser. No. 93,750, Nov. 30, 1970, abandoned, and Ser. No. 282,029, Aug. 1, 1972, Pat. No. 3,892,562. This application Nov. 29, 1973, Ser. No. 420,224

Int. Cl.² C10G *23/02*

U.S. Cl. 208—208 R **10 Claims**

1. A process for removing sulfur impurities from a fluid comprising flue gas or hydrocarbonaceous substances, said process comprising contacting said fluid with a porous silver article under conversion conditions which cause said sulfur impurity to be removed by said article from said fluid, said porous silver article having a microstructure consisting essentially of a network of inter-connecting cages composed of agglomerates of substantially spherical globules, wherein a substantial number of said spherical globules are visible in said network and wherein said agglomerates are of about uniform size.

3,971,713

PROCESS FOR REMOVING SULFUR FROM CRUDE OIL

Robert D. Ellender, Jr., Star Rte. 2, Box 357, Sulphur, La. 70663

Continuation-in-part of Ser. No. 421,127, Dec. 3, 1973, Pat. No. 3,850,745. This application May 9, 1974, Ser. No. 468,388

Int. Cl.² C10G *19/00*

U.S. Cl. 208—226 **9 Claims**

1. A crude oil desulfurization process which comprises:

a. contacting said crude oil with calcium hydroxide under ambient conditions to form a desulfurized crude oil product and a residue product; and

b. separating said desulfurized crude oil product from said residue product.

3,971,714

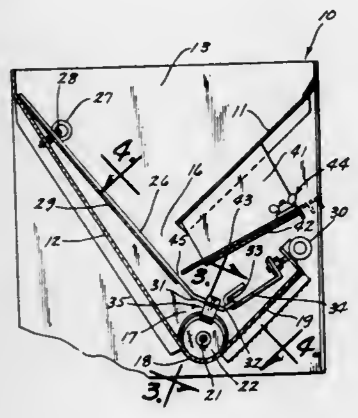
HOPPER SCREENING APPARATUS

Robert D. Jones, and Jerry L. Hall, both of Oskaloosa, Iowa, assignors to Intraco, Inc., Oskaloosa, Iowa

Filed May 19, 1975, Ser. No. 578,535

Int. Cl.² B07B *1/28*

U.S. Cl. 209—257 **15 Claims**



1. A hopper comprising:

a housing;

a container connected to said housing having sidewalls and a discharge opening at the bottom thereof, one of said sidewalls being at an angle between horizontal and vertical, said one wall extending on both sides of said opening;

screening means attached to said container and being positioned substantially along said one wall, said screening means extending on both sides of said opening;

means forming a conveyor loading chamber below said discharge opening, said chamber being in communication with a conveying means, said screening means extending over said chamber; and

means for vibrating said screening means.

3,971,715

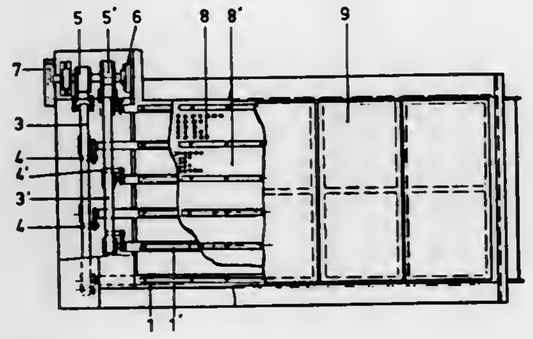
DEVICE FOR SIEVING, SORTING, FILTERING AND THE LIKE

Albert Wehner, Haus 35, Wieladingen, D-7881 Willaringen 2, Germany

Continuation of Ser. No. 336,395, Feb. 27, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,091

Int. Cl.² B07B *1/28*

U.S. Cl. 209—310 **7 Claims**



1. A device for sieving, sorting, filtering and the like, said device extending in an inclined manner between a material feed and a material discharge and having a plurality of parallel spaced carriers, means comprising swinging levers and driving rods associated with said carriers and causing said carriers to carry out swinging movements such that the carriers move 180° out of phase with each other, said carriers forming at least two systems extending in a longitudinal direction which is the transporting direction of the material, the movements of carriers of systems located next to each other forming slots of continuously changing width, and at least one mat set covering said slots and fastened to adjacent carriers of two systems, said mat set consisting of at least two spaced and superposed mats, at least one of the mats comprised in a mat set being a perforated mat and at least one mat being an unperforated mat, wherein due to the relative motion of the carriers each mat set forms a sorting zone with a channel-shaped or hose-shaped sorting surface of continuously changing cross-section extending in the longitudinal direction of the carriers, wherein in the closest distance position of the carriers defining one sorting zone one of the two mats has a concave sag and the other of the two mats has simultaneously a convex arching, whereas in the largest distance position of carriers both mats are tightly tensioned, overstretched and parallel relatively to each other, and wherein the transport of the material is effected by the concerted action of the inclined arrangement of the device and the relative motion of the carriers along with the tensioning and release of the mats, whereby said unperforated mats serve as pressure or rebound mats.

3,971,716

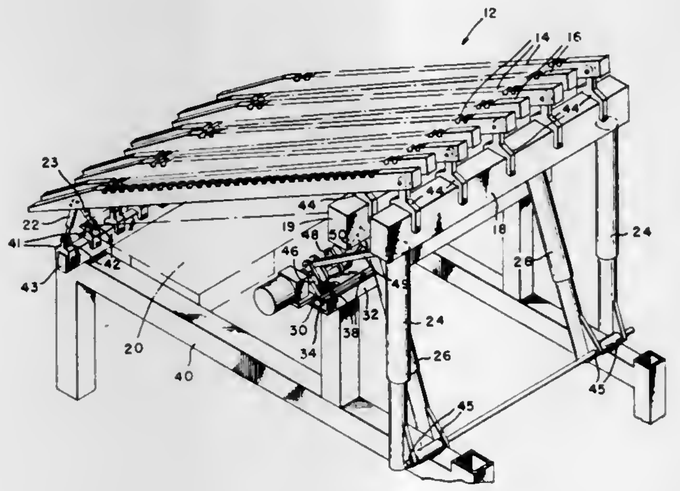
ROCK SEPARATOR

Kenneth C. Foreman, P.O. Box 271, Ketchikan, Alaska 99901

Filed Nov. 27, 1974, Ser. No. 527,619

Int. Cl.² B07B *1/16, 1/42*

U.S. Cl. 209—396 **5 Claims**



1. A rock separator comprising:

a rigid frame;

a first set of parallel interconnected sorting arms;

a second set of parallel, interconnected sorting arms, the sorting arms in said first set being positioned in alternating spaced relationship with the sorting arms in said second set;

means for supporting said first and second sets of sorting arms on said frame;

a shock absorbing support table mounted on said frame, said support table having a mounting surface fixedly secured to said frame and a shock isolation surface resiliently supported by said mounting surface; and

powered means for imparting a random-like reciprocating motion to first and second drive rods connected to said first and second sets of sorting arms respectively, said powered means being mounted on said isolation surface such that the shock imparted to said frame by said arms is substantially isolated from said powered means.

3,971,717

CONDITIONING HIGHLY RADIOACTIVE SOLIDIFIED WASTE

Werner Hild, Leopoldshafen; Helmut Krause; Knut Scheffler, both of Karlsruhe; Hans Gusten, Speyer; Ernst Gilbert, Karlsruhe, and Rainer Köster, Leopoldshafen, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Continuation of Ser. No. 418,939, Nov. 26, 1973, abandoned. This application May 27, 1975, Ser. No. 580,962

Claims priority, application Germany, Nov. 24, 1972, 2257737; Sept. 25, 1973, 2348080; Oct. 23, 1973, 2352982

Int. Cl.² B01J *1/10*

U.S. Cl. 210—59 **11 Claims**

1. A method for conditioning highly radioactive, solidified waste incorporated in a molded glass, ceramic or basaltic body prior to nonpolluting ultimate storage, the method comprising introducing the molded body into waste water, containing a biologically-resistant organic chlorophenol contaminant, from a community or industrial system, introducing a stream of air into said waste water to produce peroxide radicals which attack the chlorophenol and bring about decomposition of the chlorophenol, and maintaining the body in the waste water until the heat output produced by radioactive irradiation from said body is reduced to about one tenth of the amount of heat initially produced by the molded body thereby purifying said waste water.

3,971,718

HYDROCYCLONE SEPARATOR OR CLASSIFIER

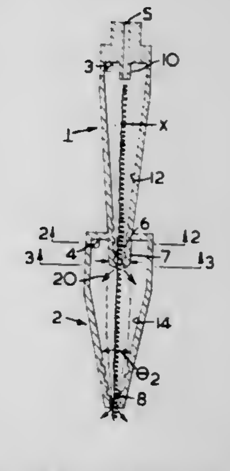
Charles M Reid, Calgary, Canada, assignor to Elast-O-Cor Products & Engineering Limited, Calgary, Canada

Filed July 9, 1974, Ser. No. 487,209

Claims priority, application Canada, July 20, 1973, 177018

Int. Cl.² B01D *21/26*

U.S. Cl. 210—84 **7 Claims**



1. A method for the fractionation of the constituents of a liquid suspension, comprising the following steps: introducing the suspension tangentially into a primary vortex chamber having overflow and underflow outlets with a substantial separation of the constituents being effected within said chamber with a portion of the liquid and a major portion of the lighter constituents passing out of the primary overflow outlet and the remainder of the liquid together with heavier constituents and a minor portion of lighter constituents passing out of the underflow of the primary vortex chamber and into the overflow region of a secondary vortex chamber; introducing a washing fluid tangentially into the secondary vortex chamber, at least a portion of said washing fluid and the heavier constituents proceeding out of the underflow of the secondary vortex chamber and at least a portion of the liquid together with lighter constituents which have entered the secondary vortex chamber moving towards the axis of the secondary vortex chamber by virtue of the action of the vortex in the secondary vortex chamber and moving along and around said axis and out of the overflow region of the latter and thence along the axis of the primary vortex chamber together with said portion of said liquid and said major portion of the lighter constituents separated out in the primary vortex chamber and thence

moving together out of the overflow of the latter; and passing at least a portion of the heavier constituents within groove means towards said secondary vortex chamber, said groove means being provided in a wall of the underflow outlet of the primary vortex chamber helically around the axis thereof and extending to the terminal end of the primary underflow for reducing interference between said liquid and heavier constituents passing through the underflow of the primary vortex chamber into the secondary vortex chamber and the oppositely moving liquid and lighter constituents passing from said secondary chamber into said primary vortex chamber.

3,971,719

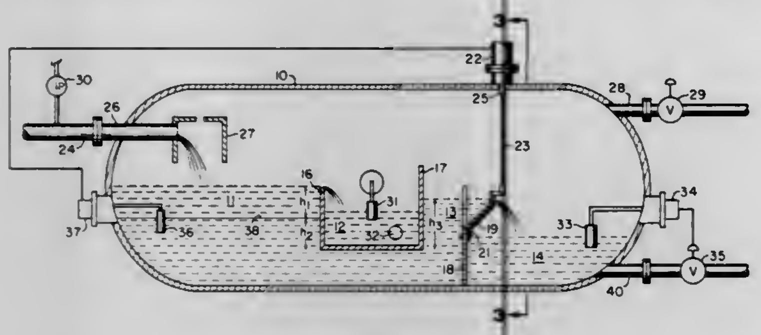
THREE-PHASE SEPARATOR

Beldon A. Peters, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 9, 1974, Ser. No. 530,585

Int. Cl.² B01D *15/24*

U.S. Cl. 210—104 **5 Claims**



1. In a three-phase oil field separator which includes an emulsion compartment and an oil compartment separated by an oil weir and a water compartment and a water collection compartment separated by a water bulkhead, the improvement comprising a water weir movably mounted on said bulkhead, liquid level control means automatically responsive to changes in the height of the oil-water interface in said emulsion compartment, and means for raising said water weir attendant to a decrease in the height of said oil-water interface and for lowering said water weir attendant to an increase in the height of said oil-water interface, said means being responsive to said liquid level control means so that the height of the oil-water interface is maintained substantially constant.

3,971,720

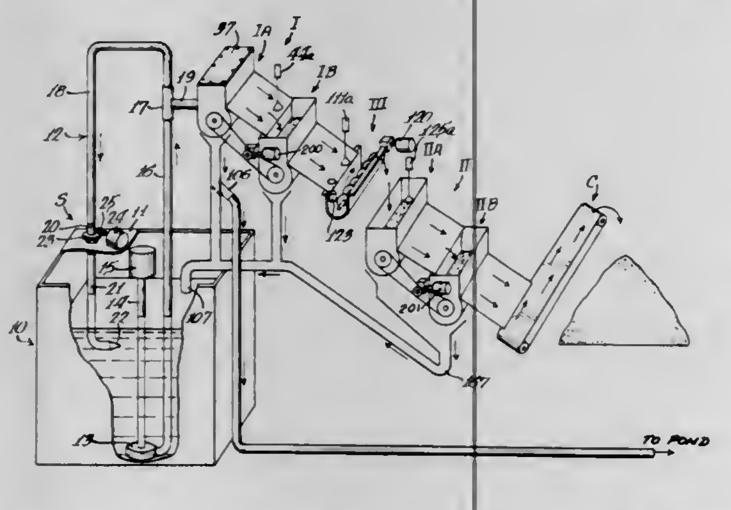
METHOD OF AND APPARATUS FOR PROCESSING CATTLE EXCREMENT

Roger Swanson, Geneva; Duncan M. Thompson, Riverside, and Robert J. Shulick, St. Charles, all of Ill., assignors to Babson Brothers Company, Oak Brook, Ill.

Filed May 9, 1975, Ser. No. 576,188

Int. Cl.² B01D *37/04*

U.S. Cl. 210—196 **30 Claims**



1. Apparatus for separating from ruminant animal feces the undigested fibrous material that is preponderantly short pieces which consist of bundles of capillary tubes, said apparatus comprising, in combinations:

a supply tank to receive a slurry that contains ruminant animal feces and added liquids including urine;
means in said supply tank for agitating the slurry to make it substantially homogeneous;
a first stage separator to separate the slurry into a filtrate consisting preponderantly of liquid and fine solids, and a filter mass consisting preponderantly of short pieces of fibrous material, said separator including,
a first stage hopper,
a foraminous separator drum which is rotatable on a horizontal axis at the bottom of the hopper,
a squeeze roller surmounting the separator drum slightly downstream of the vertical diameter of said drum,
means urging the squeeze roller against the separator drum with heavy pressure to compress the capillary tubes and express the majority of the liquid therefrom,
a filtrate discharge for the separator drum,
and a filter mass scraper blade bearing on the separator drum downstream from the squeeze roller;
means for pumping the slurry from the tank into the hopper;
and means for rotating the separator drum to force the filter mass forwardly beneath the roller and onto the scraper;
a second stage separator which includes a second stage hopper,
a foraminous separator cylinder which is rotatable on a horizontal axis at the bottom of the second stage hopper,
a pressure roller surmounting the separator cylinder slightly downstream of the vertical diameter of said cylinder,
means urging the pressure roller against the separator cylinder with a pressure several times greater than that exerted by the first stage squeeze roller so as to further compress the capillary tubes and express additional liquid and finer solids therefrom,
a filtrate discharge for the separator cylinder,
a filter mass scraper plate bearing on the separator cylinder downstream from the pressure roller,
and means for rotating the separator cylinder to force a filter mass forwardly beneath the pressure roller and onto the scraper plate;
and means for delivering the filter mass from the scraper blade to the second stage hopper.

3,971,721

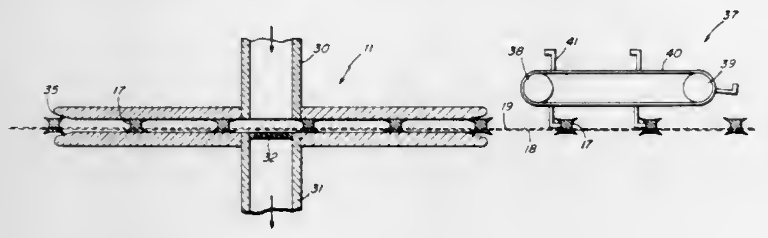
CONTINUOUS FILTER

John E. Fogarty, Jr., 12 Sherbourne, Westboro, Mass. 01581

Filed Dec. 31, 1974, Ser. No. 537,780

Int. Cl.² B01D *33/00*

U.S. Cl. 210—401 **18 Claims**



1. A filter apparatus for pressurized material in flowable form comprising:

a. means for forming a filter zone;
b. pressurized inlet and outlet conduit means for directing a flow of said material through said filter zone;
c. elongated channel means extending transversely in relation to the flow axis of said conduit means, said channel means having first and second aligned channel sections in communication at opposite sides with said filter zone, said channel sections being formed or imperforate walls;
d. an elongated perforate filter web for filtering said material, said filter web being adapted to extend longitudinally through said first channel section, across said filter zone, and through said second channel section, said filter web having a thickness less than the corresponding internal dimension of said channel sections;
e. means for moving said filter web longitudinally; and
f. a plurality of seal members fixed to and extending across said filter web transversely to the longitudinal axis thereof and spaced at intervals along the length thereof, said seal members having a thickness greater than the thickness of said filter web, said seal members being adapted to cooperate in internal sealing engagement with the imperforate walls of said channel sections, the lengths of said channel sections being greater than the spacing between successive seal members on said filter web.

3,971,722

FILTER ELEMENTS

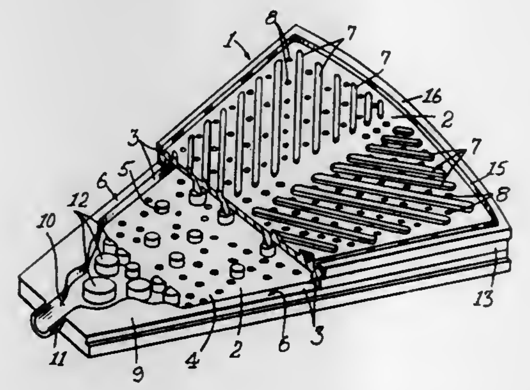
Colin Michael Radford, 14 Sandown Mews, Rivonia Road, Sandown, Sandton, Transvaal, South Africa

Filed Jan. 17, 1975, Ser. No. 542,047

Claims priority, application South Africa, July 17, 1974, 4561

Int. Cl.² B01D *39/00*

U.S. Cl. 210—486 **9 Claims**



1. A filter element comprising a pair of moulded panels secured together to define an internal cavity, a plurality of radially spaced, generally laterally extending supporting ribs on the outer surfaces of the panels, a plurality of drainage perforations between each of a plurality of radially adjacent twos of the ribs and communicating with the cavity and a drainage outlet from said cavity.

3,971,723

GLASS FOR FARADAY ROTATOR ELEMENT

Hidemi Tajima, Tokyo; Yoshiyuki Asahara, Kanagawa, and Tetsuro Izumitani, Tokyo, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Sept. 12, 1974, Ser. No. 505,292

Claims priority, application Japan, Sept. 12, 1973, 48-102817

Int. Cl.² H01F *1/00;* C03C *3/04, 3/08, 3/30*

U.S. Cl. 252—62.51 **3 Claims**

1. In a glass for use as an element of a Faraday rotator, consisting essentially of, by mol%, 10 to 30 Tb_2O_3, 10 to 30 Al_2O_3, 0 to 5 ZrO_2, 0 to 1 Sb_2O_3, 0 to 1 As_2O_3, 0 to 2 AlF_3, SiO_2 and B_2O_3 to give a total of 100 mol%, the improvement being that the glass contains 30 to 80 SiO_2 plus B_2O_3 with the proviso that SiO_2 is more than or is equal to 15 and B_2O_3 is more than or is equal to 10.

3,971,724

DISPLAY DEVICE BACKGROUND COMPONENT COMPOSITION AND METHOD

Ernest L. Fasano, 134 Ninth St., Piscataway, N.J. 08854

Filed Aug. 27, 1974, Ser. No. 501,062

Int. Cl.² H01B *3/00;* G02B *5/23*

U.S. Cl. 252—63.2 **6 Claims**

1. A visual background layer for use in electro-optic display devices, said visual background layer having high dielectric qualities and a black, deep matte surface comprising the calcined mixture of the black higher oxides of iron, cobalt, chromium, and nickel incorporated into a film of dielectric glass.

2. A process of manufacturing a black, deep matte, medium having high dielectric qualities, comprising the steps of:

A. forming an oxide stain mix by
  1. combining the following metals or their oxides in the stated proportions

Metal	Metal Oxide	WT/%*
Fe	Fe_3O_4	12–15
Co	Co_2O_3	37–44
Cr	Cr_2O_3	15–18
Ni	Ni_2O_3	2–3

together with the following silicates in the stated proportions

Silicates	WT/%
Ca. SiO_2	8–18
$Al_2O_3.SiO_2$	4–6
MgO. SiO_2	2–4

*= calculated as the oxide

  2. calcining in air the mixture recited in step (A)(1), above, for from 3 to 5 hours in the temperature range 1200° – 1350°C until the "bisque" state is attained;
  3. deagglomerating the calcined mixture;
  4. washing the deagglomerated mixture in hot, di-ionized water to remove substantially all water-soluble ionic impurities;
  5. drying the washed mixture to remove said de-ionized water; and then
  6. grinding the dried mixture to a fine powder;

B. forming a fritted glass mixture by
  1. combining the following components in the stated proportions

Oxide	WT/%
SiO_2	53–65
B_2O_3	25–33
Al_2O_3	10–14

  2. smelting the combined components recited in step (B)(1), above, for from 2 to 4 hours at a temperature of from 800° – 1200°C;
  3. fritting the smelted glass thus produced;
  4. ball-milling the fritted smelt to a particle size of less than −325 mesh; and then
  5. drying the milled frit for from 3 to 5 hours at a temperature of from 125° – 150°C;

C. forming a pigment by
  1. combining the oxide stain mix produced in step (A), above, with the fritted glass mixture produced in step (B), above, in the stated proportions

Element	WT/%
fritted glass mixture	45±5
oxide stain mix	20±3

2. calcining the mixture obtained in step (C)(1), above, for from 1 to 2 hours at a temperature of about 400°C;
3. ball-milling the calcined mixture in an anhydrous purified, non-ionic vehicle with alumina and feldspar, according to the following proportions, until the combined mixture has a particle size of from 5 to 20 microns, preferably 7 to 9 microns

Element	WT/%
Al_2O_3 (Alumina)	20±3
$Ca.Al_2O_2SiO_2$ (Feldspar)	15±2; and then

4. drying the milled mixture for from 5 to 8 hours at a temperature of from 5 to 8 hours; and

D.

1. grinding the pigment set forth in step (C), above, into some suitable vehicle thereby to form the desired black, deep matte, medium.

3,971,725

2-MERCAPTOQUINOXALINE-1-OXIDES, SALTS THEREOF AND 2-(1-OXOQUINOXALINYL) DISULFIDES IN DETERGENT COMPOSITIONS

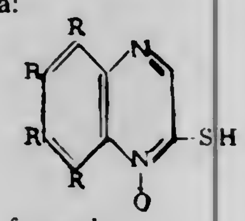
Miriam Lois Douglass, Bound Brook, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 303,778, Nov. 6, 1972, Pat. No. 3,852,443, which is a division of Ser. No. 808,413, Nov. 26, 1969, Pat. No. 3,733,323. This application Jan. 9, 1974, Ser. No. 431,824

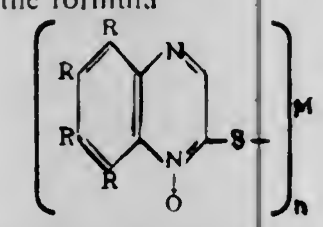
Int. Cl.² C11D *3/48, 9/50*

U.S. Cl. 252—106 **6 Claims**

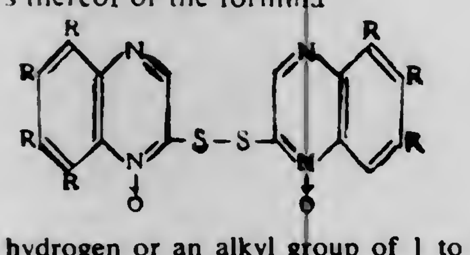
1. A detergent composition which includes an anionic, cationic, nonionic, or amphoteric surface active compound and a fungicidal or bactericidal amount of a compound selected from the group consisting of 2-mercaptoquinoxaline-1-oxides of the formula:



salts thereof of the formula



and disulfides thereof of the formula



wherein R is hydrogen or an alkyl group of 1 to 12 carbon atoms, M is selected from the group consisting of alkali metals, alkaline earth metals, transition element metals, Group III-A metals, Group IV-A metals, Group V-A metals, ammonium and quaternary ammonium, wherein the substituents on the quaternary nitrogen are selected from the group consisting of alkyl groups of 1 to 18 carbon atoms, and arylalkyl groups of 7 to 24 carbon atoms, and *n*, representing the valence of M, is either 1, 2 or 3.

3,971,726

PROCESS FOR LOWERING THE BULK DENSITY OF ALKALI MAKING BUILT SYNTHETIC DETERGENT COMPOSITIONS

Frank R. Smith, Jr., North Plainfield; Edward J. Kenney, Bernardsville, and Walter A. DiSalvo, North Arlington, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 298,936, Oct. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 124,111, March 15, 1971, Pat. No. 3,886,098, which is a continuation-in-part of Ser. No. 203,365, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 224,694, Feb. 9, 1972, Pat. No. 3,849,327. This application Apr. 22, 1974, Ser. No. 462,682

Int. Cl.² C11D *9/12, 15/04*

U.S. Cl. 252—132 **11 Claims**

1. A method of spray drying alkali metal carbonate beads useful to be post-treated with a polyethoxylated nonionic organic detergent to produce a heavy duty detergent composition, the bulk density of said bead being in the range of about 0.2 to 0.35 gram per milliliter comprising admixing with a 40–75% solids content aqueous crutcher mix containing said alkali metal carbonate from about 0.75 to 4% of an alkali metal soap of a higher fatty acid and up to about 2% by weight nonionic detergent, heating and spray drying the resulting mixture, the carbonate content being approximately 20–75% by weight, and thereafter post-treating said mix with additional amounts of said nonionic detergent such that the final bead contains about 5–15% of said nonionic.

3,971,727

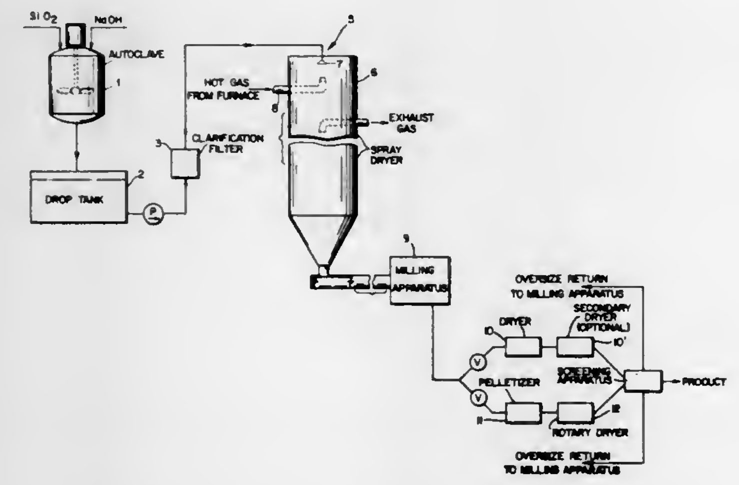
ALKALI METAL POLYSILICATES, METHODS FOR THEIR PRODUCTION AND DETERGENT COMPOSITIONS EMPLOYING SAME

Orlando L. Bertorelli; Robert K. Mays, both of Havre de Grace; Lloyd E. Williams, Bel Air, all of Md., and Howard F. Zimmerman, Jr., Athens, Tenn., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 193,484, Oct. 28, 1971, Pat. No. 3,879,527. This application Jan. 6, 1975, Ser. No. 538,830

Int. Cl.² C11D *3/08*

U.S. Cl. 252—135 **1 Claim**



1. A washing composition of a synthetic organic detergent selected from the group consisting of anionic, nonionic, and amphoteric surface active compounds and, as a builder, an alkali metal polysilicate comprising the spray dried and pulverized product obtained by hydrothermally reacting an aqueous mixture of finely divided silica, an alkali metal hydroxide and a sulfate salt of an alkali metal, said hydrothermal treatment comprising conducting the reaction of the aqueous mixture at a temperature in the range of from 280° to 410°F. for a period of at least 2.5 hours, in a closed vessel at pressures of from about 65 psig. to 290 psig., said polysilicate complex having polysilicate ions in a highly polymerized, irreversible state and having a SiO_2/Na_2O weight ratio in the range of from 1.8:1 to 2.7:1; a density in the range of from 30 to 60 pounds per cubic foot and a moisture content less than 25 percent; said detergent and said builder being present in said washing composition in a weight ratio of from 1:10 to 10:1.

3,971,728

SEQUESTERING AGENT

Gene C. Robinson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 313,863, Dec. 11, 1972, Pat. No. 3,829,383, which is a continuation-in-part of Ser. No. 262,547, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,638, March 7, 1972, abandoned. This application May 17, 1974, Ser. No. 470,720

Int. Cl.² C11D *3/20;* **C02B** *5/00*

U.S. Cl. 252—180 **8 Claims**

1. An aqueous solution which contains sequesterable calcium ions or sequesterable magnesium ions or a mixture thereof to which has been added a water soluble salt of a cis-2,5-disubstituted tetrahydrofuran in which the substituents are carboxy groups or carboxymethyl groups in a concentration sufficient to sequester said sequesterable substances which are present in the solution and wherein said solution has a pH above 7.

3,971,729

PREPARATION OF GAS GENERATION GRAIN

Hubert G. Timmerman, Manhattan Beach, Calif., assignor to Specialty Products Development Corporation, Medino, Ohio

Filed Sept. 14, 1973, Ser. No. 397,296

Int. Cl.² C06B *29/08*

U.S. Cl. 252—187 R **10 Claims**

1. A process for preparing a deflagration gas generation mixture comprising the steps of:

mixing substantially anhydrous nickel formate powder with an oxidizer compound powder;

blending the mixture with a liquid having more water than sufficient to form nickel formate dihydrate;

agglomerating the blended mixture; and

substantially completely dehydrating the agglomerated mixture.

3,971,730

CHLORINATING COMPOSITION OF CHLORINE MONOXIDE IN 1,1,1-TRICHLOROETHANE

Gerald L. Kochanny, Jr.; Thomas A. Chamberlin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. Division of Ser. No. 281,475, Aug. 17, 1972, Pat. No. 3,872,176, which is a continuation-in-part of Ser. No. 799,484, Feb. 14, 1969, abandoned. This application Sept. 9, 1974, Ser. No. 504,020

Int. Cl.² C01B *11/02*

U.S. Cl. 252—187 R **1 Claim**

1. A liquid chlorinating composition comprising chlorine monoxide dissolved in 1,1,1-trichloroethane.

3,971,731

BENZODIFURAN COMPOUNDS

Peter Hartmann, Cologne-Stammheim, and Hans Theidel, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

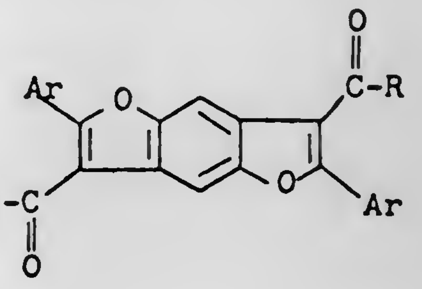
Division of Ser. No. 440,858, Feb. 8, 1974. This application Mar. 20, 1975, Ser. No. 560,185

Claims priority, application Germany, Feb. 9, 1973, 2306515

Int. Cl.² C09K *11/00;* **D06L** *3/12*

U.S. Cl. 252—301.32 **3 Claims**

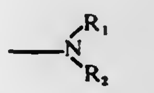
1. A composition of matter comprising a synthetic fiber forming polymer and an effective amount of an optical brightening benzodifurane compound having the formula



(I)

wherein

R is alkoxy, aralkoxy, aryloxy, cycloalkoxy, hydroxyl, an oxygen atom linked to the radical Ar, or the group



$$-N\begin{matrix}R_1\\R_2\end{matrix}$$

wherein

R₁ and R₂ independently of one another are hydrogen, alkyl, aralkyl or aryl; or

R₁ and R₂ taken together form a saturated carbocyclic or heterocyclic ring; and

Ar is an aromatic-carbocyclic or aromatic-heterocyclic radical.

3,971,732

APPARATUS FOR FIXING RADIOACTIVE WASTE

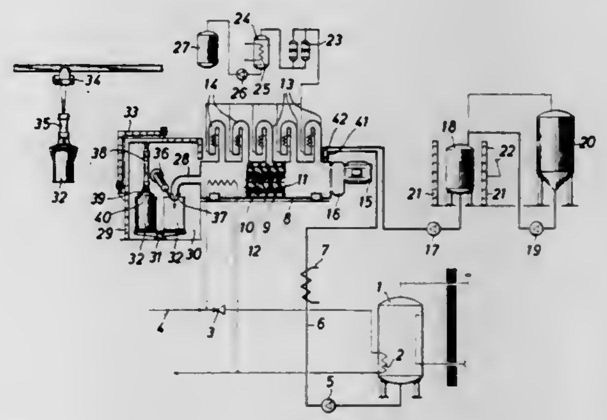
Gerhard Meier, Karlsruhe, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe and Firma Werner & Pfleiderer, Stuttgart, both of Germany

Filed Dec. 5, 1974, Ser. No. 530,144

Claims priority, application Germany, Dec. 12, 1973, 2361732

Int. Cl.² G21F *9/16*

U.S. Cl. 252—301.15 **10 Claims**



1. In an apparatus for fixing radioactive or toxic waste including an extruder having a mixing chamber; means for feeding the waste and a carrier material to the mixing chamber; means for mixing the waste and the carrier material in the mixing chamber and advancing the mixture therein; means defining a heating zone in said mixing chamber for heating the material therein; a vapor outlet device communicating with the heating zone; an observation window closing off an upper portion of the vapor outlet device remote from the mixing means; a condenser connected after the vapor outlet device; a distillate accumulator connected after the condenser; means defining an extruder outlet through which the mixture is discharged from the extruder; a loading device connected to the extruder outlet for successively charging containers with the mixture emerging from the extruder outlet; the improvement comprising

a. first means disposed in said vapor outlet device for cleaning said observation window;

b. second means disposed in said vapor outlet device for removing deposits from a portion of said vapor outlet device that is adjacent said mixing means;

c. two alternatingly operating, vertically oriented filters connected between said condenser and said distillate accumulator for removing carrier particles from the condensate withdrawn from said condenser; each filter having means defining a filter inlet at an upper part of the filter and connected to said condenser; and means defining a filter outlet at a lower part of the filter and connected to said distillate accumulator and;

d. an interrupter bowl forming part of said loading device and being movably supported adjacent said extruder outlet for receiving the material from said extruder outlet during an exchange of an empty container for a filled container below said extruder outlet.

3,971,733

WATER-WETTABLE WAX COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Edwin Francis Hawkins, Cockeysville, Md., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,572

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—311 **11 Claims**

1. A textile lubricating water-wettable wax composition consisting essentially of a particulate hydrocarbon wax having a chain length of from about 30 to 55 carbon atoms, a melting point ranging from about 65°C. to about 105°C., and a penetration ranging from about 1 to about 6; about 1 to 10 percent based on the weight of said hydrocarbon wax of a conditioning agent selected from the group consisting of a finely-ground calcium silicate, magnesium silicate, and precipitated ultrafine silica, and an emulsifier selected from the group consisting of:

a. a hydrophilic oil-in-water emulsifier having an HLB of from about 10 to about 20, and

b. mixtures of said hydrophilic oil-in-water emulsifier with a lipophilic emulsifier, wherein there is sufficient hydrophilic emulsifier present to render the overall mixture hydrophilic; said particulate hydrocarbon wax having a particle size of 1 to 5 microns, the ratio of total emulsifier to said particulate hydrocarbon wax being about 3 to 20 percent by weight.

3,971,734

SULFITE COMPOSITIONS, AQUEOUS SULFITE SOLUTIONS AND METHOD OF DECREASING THEIR RATE OF OXIDATION

Harley E. Bush, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 392,344, Aug. 28, 1973, Pat. No. 3,899,293. This application Mar. 3, 1975, Ser. No. 555,070

Int. Cl.^{2} C09K *3/00, 15/32;* **C23F** *9/00;* **C01F** *1/00*

U.S. Cl. 252—389 A **18 Claims**

1. A sulfite composition which comprises a major proportion of a sulfite compound selected from the group consisting of alkali metal sulfites, alkali metal bisulfites, ammonium sulfite, ammonium bisulfite, and mixtures thereof, and from 1 to 20% by weight, based on the concentration of said sulfite compound, of a stabilizing compound which consists of a water soluble salt of an organic polyphosphonic acid containing at least two phosphonic acid groups per molecule, wherein said composition does not contain any metallic cations which function as catalysts for reacting said sulfite compound with oxygen.

3,971,735

METHANOL PRODUCTION CATALYST AND PROCESS FOR PREPARING THE SAME

Setunobu Asano; Tadashi Nakamura, and Yasuo Yamamoto, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,872

Claims priority, application Japan, Oct. 24, 1973, 48-119764

Int. Cl.^{2} B01J *21/02, 21/04, 23/06, 23/72*

U.S. Cl. 252—432 **7 Claims**

1. A catalyst suited for the production of methanol which comprises the oxides of copper, zinc, aluminum and boron, wherein the proportion of catalyst components is 30–70% Cu, 15–50% Zn, 1–16% Al and 0.3–5.3% B, all the percentages being expressed by the metal atom ratio.

3,971,736

CATHEPSIN IN D INHIBITORS

Arthur F. Wagner, Princeton, N.J.; Frederick W. Holly, Glenside, Pa.; Tsau-Yen Lin, Piscataway; Tsung-Ying Shen, Westfield, both of N.J., and Ralph F. Hirschmann, Blue Bell, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 21, 1975, Ser. No. 542,884

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **10 Claims**

1. A compound of the formula:

$$W\text{-}[X\text{-Pro-Phe-Phe-}Y\text{-}Z]_nH$$

or pharmaceutically acceptable acid addition salt thereof, wherein

n is 1, 2 or 3; *W* is hydrogen;

an amino acid residue in the D- or L- configuration selected from pyroglutamyl, prolyl, valvyl, or

glycyl;

indole-3-acetyl;

isovaleryl;

dansyl;

D-glucuronyl;

t-butyloxycarbonyl;

cholyl; or 2-deoxy-2-acetamidoglucopyranosyl;

X is D-phenylalanine;

Y is L-proline or L-valine; and

Z is D-leucine, D-tryptophan, D-phenylalanine, D-nor-leucine, D-allo-i-leucine, D-alanine, D-proline or D-valine.

3,971,737

[2-METHYL-Ala^6]LRH

Victor M. Garsky, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,525

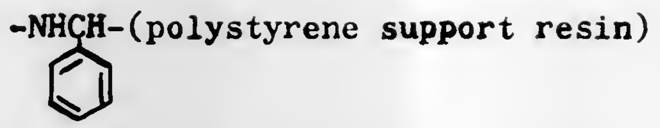
Int. Cl.^{2} C07C *103/52;* **A61K** *37/26*

U.S. Cl. 260—112.5 LH **4 Claims**

1. A compound selected from the group consisting of L-p-Glu-L-His-L-Trp-L-Ser-L-Tyr-2-methyl-Ala-L-Leu-L-Arg-L-Pro-Gly-NH$_2$ and L-p-Glu-L-His(N^{im}-R^4)-L-Trp-L-Ser(R^3)-L-Tyr(R^2)-2-methyl-Ala-L-Leu-L-Arg(N^g-R^1)-L-Pro-Gly-R and non-toxic salts thereof;

wherein;

R is a member selected from the group consisting of —NH$_2$,—OH, —O(lower)alkyl of 1 to 6 carbon atoms, —O—benzyl,



-NHCH-(polystyrene support resin)

and —OHC$_2$—(polystyrene support resin);

R^1 is a member selected from the group consisting of —H and a protecting group for the N , N and N nitrogen atoms of arginine selected from nitro, tosyl, benzyloxycarbonyl, adamantyloxycarbonyl and tert-butyloxycarbonyl;

R^2 is selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl; and

R^4 is selected from the group consisting of hydrogen and a protecting group for the imidazole nitrogen atom of histidine selected from tosyl, benzyl, trityl, 2,4-dinitrothiophenyl, 2,2,2-trifluoro-L-benzyloxycarbonylaminoethyl and 2,2,2-trifluoro-L-butyloxycarbonylaminoethyl.

3,971,738

HEAVY METAL COMPLEXES OF AZO COMPOUNDS CONTAINING A HALOGENO-2,3-DIHYDROXY PYRIDINE COUPLING COMPONENT

Alfred Fasciati, Bottmingen, Switzerland, and Gerhard Back, Loerrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

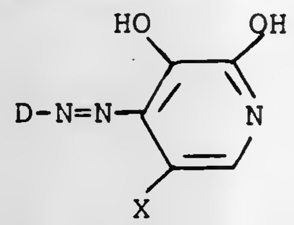
Continuation-in-part of Ser. No. 374,708, June 28, 1973, abandoned, which is a continuation of Ser. No. 136,599, April 22, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,578

Claims priority, application Switzerland, Apr. 23, 1970, 6071/70

Int. Cl.^{2} C09B *45/14, 45/24, 45/34*

U.S. Cl. 260—146 R **3 Claims**

1. A 1:1 or 1:2 chromium, cobalt, copper or nickel complex of a dyestuff of the formula



herein

X is fluoro, chloro or bromo,

D is phenyl or napthyl that contains, in the position ortho to the azo bridge; hydroxyl, amino or carboxyl, or if D is phenyl, also methoxy, and where said phenyl is further unsubstituted or substituted by chloro, methoxy, acetylamino, nitro, methyl, acetyl, carbonamido, sulfonamido, methylsulfonyl, sulfo, N-β-hydroxyethylsulfonamido, N-methylsulfonamido, N,N-dimethylsulfonamido, ethylsulfonyl, benzoylamino, β-hydroxyethylsulfonyl, (3′-methoxy, 4′-amino-)-phenyl-, mono- or disulfophenylazo, carboxysulfophenylazo, disulfonapthylazo, phenylazo, or an acylamino fiber reactive group wherein acyl is chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, acrylyl, β-chloroacrylyl, β-bromoacrylyl, α-chlorocryly, α-bromoacrylyl, α,β-dibromoacrylyl, trichloroacylyl, chlorocrotonyl or propionyl,

and where said napthyl is further unsubstituted or substituted by sulfo, sulfonamido, nitro, acetylamino or sulfophenylazo.

3,971,739

TRI OR TETRADENTATE METAL AZO PIGMENT COMPLEXES

James McGeachie McCrae, Stewarton, and Christopher Midcalf, Kilbarchan, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

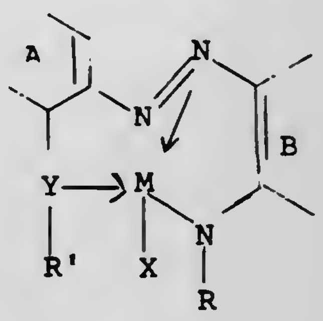
Filed Sept. 20, 1974, Ser. No. 507,643

Claims priority, application United Kingdom, Sept. 22, 1973, 44556/73

Int. Cl.^{2} C09B *45/18, 45/22*

U.S. Cl. 260—151 **6 Claims**

1. A tri- or tetradentate metal complex having the formula



wherein A is an phenyl or naphthyl residue, B is an phenyl or naphthyl residue, R is an alkyl having 1 to 20 carbon atoms or phenyl or biphenyl residue, R′ is a carbon chain, which may form part of a carbocyclic ring, having from 1 to 3 carbon atoms between the X and Y substituents, X and Y are the same or different and each is O or S, and M is a Cu, Zn or Ni metal atom.

3,971,740

MONOAZO COMPOUNDS

Nalin Binduprasad Desai; Ponnusami Jayaraman, both of Goregaon-Bombay, India; Visvanathan Ramanathan, Basel; Klaus Artz, Muttenz, both of Switzerland; Navnitrai Nagarji Naik, Goregaon-Bombay, India, and Walter Jenny, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

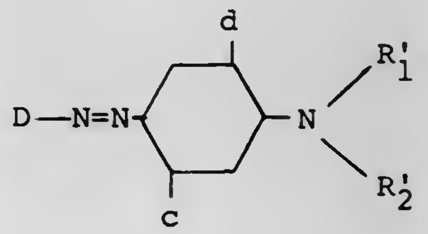
Continuation of Ser. No. 208,468, Dec. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 806,291, March 11, 1969, Pat. No. 3,679,657. This application Mar. 5, 1974, Ser. No. 448,305

Claims priority, application Switzerland, Mar. 18, 1968, 3958/68

Int. Cl.^{2} C09B *29/08, 29/26, 43/00, 43/12*

U.S. Cl. 260—158 **3 Claims**

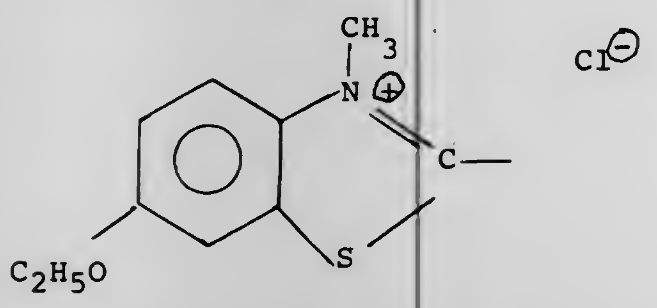
1. A dyestuff of the formula



wherein

D is selected from the group consisting of thiazole-(2)-, 5-nitrothiazole-(2)-, 5-methylsulphonylthiazole-(2)-, 5-cyanothiazole-(2)-, 4-methyl-5-nitrothiazole-(2)-, 4-methylthiazole-(2)-, 4-phenylthiazole-(2)-, 4-(4′-chloro)- phenylthiazole-(2)-, 4-(4′-nitro)- phenylthiazole-(2)-, pyridine-(3)-, quinoline-(3)-, pyrazole-(3)-, 1-phenylpyrazole-(3)-, indazole-(3)-, 1,2,4-thiazole-(3)-, 5-(methyl, ethyl, phenyl or benzyl)-1,2,4-triazole-(3)-, 1-(4′-methoxyphenyl)-pyrazole-(3)-, benzthiazole-(2)-, 6-methylbenzthiazole-(2)-, 6-methoxybenzthiazole-(2)-, 6-chlorobenzthiazole-(2)-, 6-cyanobenzthiazole-(2)-, 6-thiocyanatobenzthiazole-(2)-, 6-nitrobenzthiazole-(2)-, 6-carbethoxybenzthiazole-(2)-, 4- or 6-

methylsulphonylbenzthiazole-(2)-, 1,3,4-thiadiazole-(2)-, 1,3,5-thiadiazole-(2)-, 4-(phenyl or methyl)-1,3,5-thiadiazole-(2)-, 5-phenyl-1,3,4-thiadiazole-(2)-, 3-nitro-5-methylsulphothiophene-(2)-, 3,5-bis(methylsulpho)-thiophene-(2)-, 3-methylisothiazole-(5)-, 4-cyanopyrazole-(2)-, 2-(4′-nitrophenyl)-4-cyanopyrazole-(3)-, phthalimide-(3)-, or



- R_1' and R_2' are each hydrogen, alkyl of 1 to 4 carbon atoms, benzyl, β-phenylethyl; β-chloroethyl, β,β,β-trifluoroethyl, β,γ-dichloropropyl, β-cyanoethyl, β-ethoxyethyl, δ-methoxybutyl, β-hydroxyethyl, β,γ-dihydroxypropyl, β-nitroethyl, (β-carbomethoxy)-ethyl, (β-carboethoxy)-ethyl, (β-carbopropoxy)-ethyl, (β-carbomethoxy)-propyl, (γ-carbomethoxy)-propyl, (β-carboethoxy)-propyl, (γ-carboethoxy)-propyl, (β-acetyl)-aminoethyl, (β-formyl)-aminoethyl, β-acetoxyethyl, β,γ-diacetoxypropyl, β-methanesulfonylethyl, β-ethanesulfonylethyl, β-(p-chlorobenzenesulfonyl)-ethyl, β-methylcarbamyloxyethyl, β-phenyl-carbamyloxyethyl, (β-methoxy)-carbonyloxyethyl, (β-ethoxy)-carbonyloxyethyl, (β-isopropoxy)-carbonyloxyethyl, γ-acetamidopropyl, β-(p-nitrophenoxy)-ethyl, β-(p-hydroxyphenoxy)-ethyl, β-(β′-acetylethoxycarbonyl)-ethyl, β-[(β′-cyano)ethoxycarbonyl]-ethyl, β-[(β′-hydroxy) ethoxycarbonyl]-ethyl, β-[(β′-methoxy)ethoxycarbonyl]-ethyl, β-carboxyethyl, β-acetylethyl, γ-aminopropyl, β-diethylaminoethyl, or β-cyanoacetoxyethyl,
- *d* is hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio or phenoxy,
- *c* is hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio, phenoxy, chloro, bromo, CF_3—, methylsulfonyl, methylsulfonylamino, ethanesulfonylamino, p-toluenesulfonylamino, phenoxycarbonylamino, methoxycarbonylamino, or aminocarbonylamino, and in which one or two of *c*, *d*, R_1', or R_2' is substituted by a group of the formula

$-X-CO-N(R)-SO_2-R_2$

wherein

- R_2 is alkyl of 1 to 4 carbon atoms, cyclohexyl, p-tolyl, 2,5-dimethylphenyl, phenyl, 4-chloro, bromo or fluorophenyl,
- X is —O—, —S— or —NR—, and
- R is hydrogen, alkyl of 1 to 3 carbon atoms, or cyclohexyl.

3,971,741

WATER-INSOLUBLE POLYAZO DYESTUFF COMPRISING TWO OR THREE IDENTICAL AZO DYESTUFFS JOINED TO A CENTRAL NUCLEUS BY CARBOXYL BRIDGES

Georg Dehmel, and Johannes Blahak, both of Cologne-Buchheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

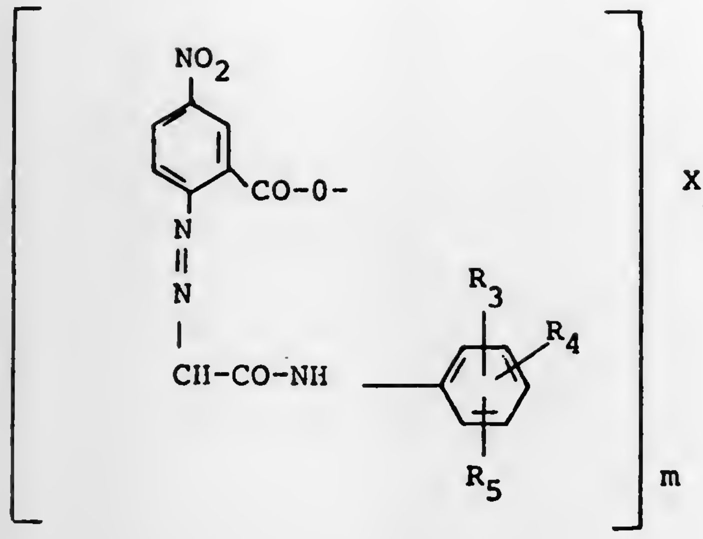
Continuation of Ser. No. 276,027, July 28, 1972, abandoned. This application July 9, 1974, Ser. No. 486,742

Claims priority, application Germany, July 29, 1971, 2138014; Apr. 18, 1972, 2218645

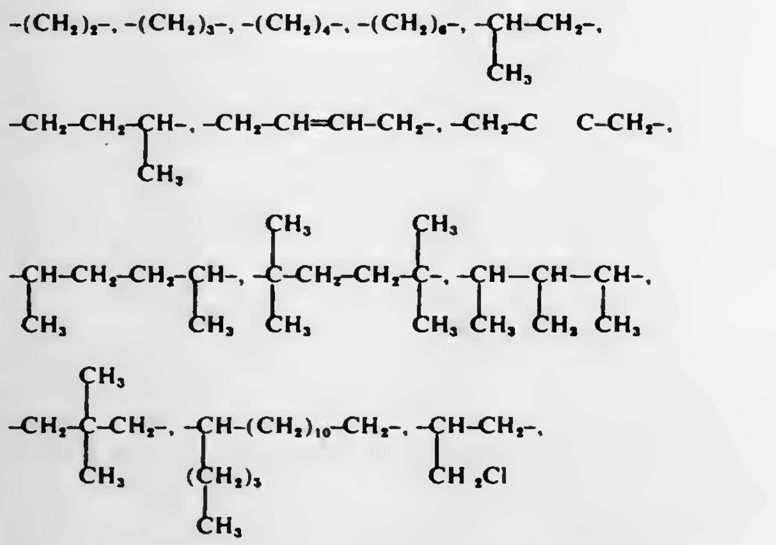
Int. Cl.² C09B *35/14, 35/36, 43/12;* **D06P** *1/10*

U.S. Cl. 260—173 1 Claim

1. Polyazo dyestuff of the formula



wherein X_1 is



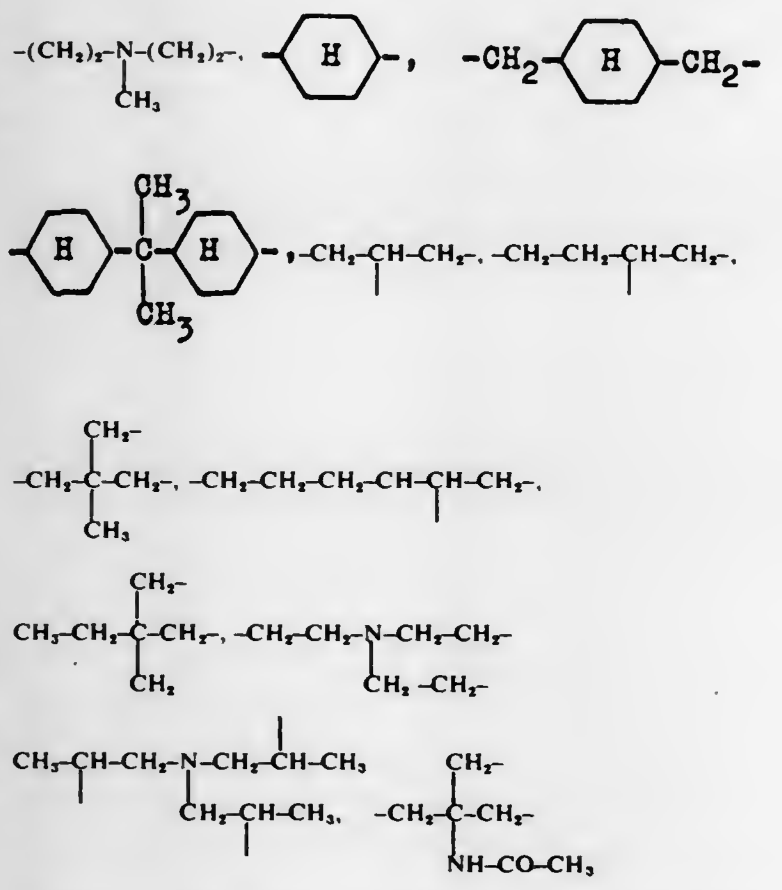
$-(CH_2)_2-, -(CH_2)_3-, -(CH_2)_4-, -(CH_2)_6-, -\underset{CH_3}{CH}-CH_2-,$

$-CH_2-CH_2-\underset{CH_3}{CH}-, -CH_2-CH=CH-CH_2-, -CH_2-C \quad C-CH_2-,$

$-\underset{CH_3}{CH}-CH_2-CH_2-\underset{CH_3}{CH}-, -\overset{CH_3}{\underset{CH_3}{C}}-CH_2-CH_2-\overset{CH_3}{\underset{CH_3}{C}}-, -\underset{CH_3}{CH}-\underset{CH_3}{CH}-\underset{CH_3}{CH}-,$

$-CH_2-\overset{CH_3}{\underset{CH_3}{C}}-CH_2-, -\underset{(CH_2)_3-CH_3}{CH}-(CH_2)_{10}-CH_2-, -\underset{CH_2Cl}{CH}-CH_2-,$

$-(CH_2)_2-S-(CH_2)_2-, -(CH_2)_2-O-(CH_2)_2-, -(CH_2)_2-S-S-(CH_2)_2-,$



$-(CH_2)_2-\underset{CH_3}{N}-(CH_2)_2-,$

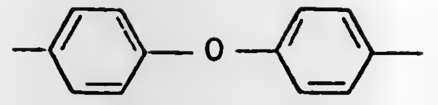
$-CH_2-\underset{|}{CH}-CH_2-, -CH_2-CH_2-\underset{|}{CH}-CH_2-,$

$-CH_2-\overset{CH_2-}{\underset{CH_3}{C}}-CH_2-, -CH_2-CH_2-CH_2-CH-\underset{|}{CH}-CH_2-,$

$CH_3-CH_2-\overset{CH_2-}{\underset{CH_2}{C}}-CH_2-, -CH_2-CH_2-\underset{CH_2-CH_2-}{N}-CH_2-CH_2-$

$CH_3-\underset{|}{CH}-CH_2-\underset{CH_2-\underset{|}{CH}-CH_3}{N}-CH_2-\overset{|}{CH}-CH_3, -CH_2-\overset{CH_2-}{\underset{NH-CO-CH_3}{C}}-CH_2-$

phenylene, naphthylene, diphenylene, chloronaphthalene, chlorophenylene, chlorodiphenylene, methylphenylene, methylnaphthalene, methyldiphenylene, or



- R_3 and R_4, independently of each other, are hydrogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, chloro, bromo, alkylcarbonylamino of 2–5 carbon atoms, alkoxycarbonyl of 2–5 carbon atoms, phenoxy, nitro, cyano, trifluoromethyl, carbamyl, phenylcarbonylamino, phenyloxamido, phenylcarbamyl, or any of said last three radicals which is further substituted by chloro, bromo, alkyl of 1–2 carbon atoms or alkoxy of 1–2 carbon atoms,
- R_5 is hydrogen, chloro, bromo, alkyl of 1–2 carbon atoms or alkoxy of 1–2 carbon atoms,

and

- *m* if 2 or 3.

3,971,742

ORGANO-CHALCOGEN COMPOSITIONS

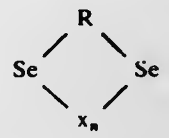
Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 210,275, Dec. 20, 1971, Pat. No. 3,905,958, which is a division of Ser. No. 59,495, July 30, 1970, Pat. No. 3,671,467. This application Dec. 13, 1973, Ser. No. 424,496

Int. Cl.² C08G *79/14*

U.S. Cl. 260—2 M 3 Claims

1. A method for controlling the photoresponsiveness of tellurium comprising fusion of intimate mixture of tellurium with at least one compound of the formula:



wherein

- R is selected from divalent hydrocarbylene radicals of from 5 to 50 carbon atoms, divalent heterocyclic, alicyclic and aromatic radicals having from 3 to 50 carbon atoms;
- *n* is a positive integer; and
- *x* is the radical —Se—R—Se—; or linear polymers comprising recurring units represented by the formula:

$$\text{+}Se-A-Se\text{+} \qquad \text{I}$$

wherein

- A is selected from the group consisting of divalent alkylene radicals having from 9 to 20 carbon atoms, divalent aromatic radicals having from 6 to 50 carbon atoms and divalent heterocyclic radicals,

the relative weight ratio of tellurium to cyclic diselenide in the intimate mixture ranging from about 1:1 to about 12:1.

3,971,743

EPOXY-AZIDO COMPOUNDS

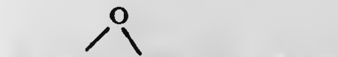
David S. Breslow, Madelyn Gardens, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 448,612, March 6, 1974, Pat. No. 3,941,751, which is a division of Ser. No. 301,003, Oct. 26, 1972, abandoned, which is a division of Ser. No. 85,300, Oct. 29, 1970, abandoned, which is a division of Ser. No. 843,230, July 18, 1969, Pat. No. 3,608,604. This application Feb. 7, 1975, Ser. No. 548,129

Int. Cl.² C08L *15/02;* **C07D** *303/36*

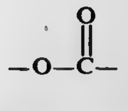
U.S. Cl. 260—3.3 1 Claim

1. A process of cross-linking of polymer which comprises the steps of (1) modifying by heating a polymer selected from hydrocarbon polymers, cellulose esters, cellulose ethers, polyesters, poly(alkylene oxide) polymers, polyamides, allyl pentaerythritol derivatives, poly(vinyl alkyl ethers), poly(vinyl acetals), vinyl chloride polymers, nitrocellulose, chlorinated natural rubber, sulfochlorinated polyethylene, polysulfide rubber, polyurethane rubber, poly(vinyl acetate), ethylene--vinyl acetate copolymers, poly(vinylidene chloride), vinylidene chloride--acrylonitrile copolymers, ethyl acrylate---2-chloroethyl vinyl ether copolymers, poly(ethyl acrylate), poly(ethyl methacrylate), poly[3,3-bis(chloromethyl)oxetane], vinyl modified poly(dimethylsiloxane), polychloroprene, and butadiene--acrylonitrile copolymers in admixture with from about 0.1% to about 20% by weight of an epoxy-azido compound having the formula



$(R'-\overset{O}{\overbrace{CH-CH}})_n-R-(A-N_3)_m$

where R is an organic radical selected from the group consisting of radicals derived by the removal of two or more hydrogen atoms from alkanes, cycloalkanes, alkylcycloalkanes, arenes, alkyl substituted arenes, alkylenediarylenes, dialkylcycloalkanes, alkyloxyalkanes, aryloxyarenes, alkaryloxyarenes, alkaryloxyalkarenes, aralkyloxyalkanes, aralkyloxyaralkanes, alkylthioalkanes, arylthioarenes, alkarylthioarenes, alkarylthiolkarenes, aralkylthioalkanes, aralkylthioaralkanes, alkylsulfonylalkanes, arylsulfonylarenes, alkarylsulfonylarenes, alkarylsulfonylalkarenes, aralkylsulfonylalkanes, aralkylsulfonylaralkanes, and the foregoing radicals with fluoro, chloro, bromo or iodo substituents, R′ is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and aralkyl radicals, A is a radical selected from the group consisting of



$-O-\overset{O}{\overset{\|}{C}}-$

and $-SO_2-$and *n* and *m* are integers from 1 to 10 and (2) treating the thus modified polymer with an amount of polyfunctional agent sufficient to insolubilize the product, said polyfunctional agent being selected from the group consisting of polycarboxylic acids and polyamines.

3,971,744

METHOD FOR PREPARATION OF EMULSIONS, CONCENTRATED DISPERSIONS AND PASTES

Slavko Hudecek, and Ivana Gavrilova, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed July 11, 1974, Ser. No. 487,562

Claims priority, application Czechoslovakia, July 16, 1973, 5087-73

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 EM 21 Claims

1. A method of producing emulsions, concentrated dispersions and pastes comprising the steps of initially forming a plasticizing medium by mixing at least one plasticizer with an ingredient selected from the group consisting of fatty acids having more than 12 C atoms, alcohols having more than 8 C atoms and combinations of said fatty acids and alcohols, dissolving in the medium thus obtained 5 to 30 wt.% of a mixture of monomers selected from the group consisting of at least one monomer containing at most two carboxylic groups and a second monomer containing more than one vinyl group, thereafter polymerizing said monomer mixture in said plasticizing medium in the presence of a free-radical initiator for a time sufficient to form a particulate polymer having a maximum particle size of 100 μm and thereafter transforming said polymer into its Na, K or NH_4 salt by contacting the polymer with an aqueous solution of the corresponding hydroxide or carbonate.

3,971,745
AMINO TERMINATED IONIC POLYURETHANE EMULSION WITH POLYEPOXIDE EMULSION

Robert C. Carlson, Hudson, Wis., and Albert H. Stoskopf, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 21, 1973, Ser. No. 427,233
Int. Cl.^{2} C08J *3/24;* **C08K** *5/15;* **C08L** *75/08*
U.S. Cl. 260—29.2 TN **4 Claims**

1. An aqueous emulsion comprising a blend of

a. polyurethane emulsion comprising 10 to 70 percent by weight internally emulsified, ionic polyurethane polymer containing terminal amino groups, and

b. polyepoxide emulsion comprising 10 to 70 percent by weight polyglycidylether polyepoxide resin, said polyepoxide resin being present in an amount of 1 to 10 percent by weight, based on the combined weight of the polyurethane and polyepoxide resin solids, said aqueous emulsion having a suitable pH and said amount of said polyepoxide resin and said pH being such as to provide a dry film from said aqueous emulsion having improved wet strength.

3,971,746
SYNTHETIC POLYISOPRENE RUBBER LATEX

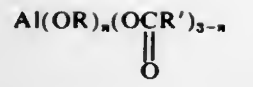
Koji Hirai; Takayuki Okamura, and Kiyoshi Fujii, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Mar. 28, 1975, Ser. No. 562,876
Claims priority, application Japan, Mar. 29, 1974, 49-36145; Nov. 29, 1974, 49-137878
Int. Cl.^{2} C08L *9/10*
U.S. Cl. 260—29.7 D **27 Claims**

1. A polyisoprene rubber latex derived from synthetic cis-1,4-polyisoprene rubber and comprised of a stable aqueous dispersion of a modified polyisoprene rubber comprising of a carboxylated polyisoprene rubber with from about 0.03 to 20 carboxy groups per 100 recurring units of isoprene monomer in said cis-1,4-polyisoprene rubber said stable aqueous dispersion of modified polyisoprene rubber being obtained from an oil-in-water emulsion comprised of between about 4% to 20% by weight organic solvent solution of said modified polyisoprene rubber, an emulsifying agent and water after removal of said organic solvent from said emulsion.

3,971,747
CURABLE COMPOSITIONS

Howard M. Bank, Freeland, and Keith W. Michael, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Apr. 11, 1975, Ser. No. 567,148
Int. Cl.^{2} C08L *83/00, 63/00*
U.S. Cl. 260—37 SB **36 Claims**

1. A method of preparing compositions containing silicon-oxygen-carbon bonds comprising reacting under substantially anhydrous conditions

- A. an organosilicon compound containing at least one SiOH group with
- B. a compound containing at least one epoxy group, said reaction being carried out in the presence of a catalytic amount of
- C. an aluminum compound selected from the group consisting of
  - a. al$(OR)_3$ in which R is either a hydrogen atom or selected from the group consisting of alkyl radicals contaning from 1 to 20 inclusive carbon atoms or aryl and aryl-containing hydrocarbon radicals containing from 6 to 24 inclusive carbon atoms;
  - (b) 
$\mathrm{Al(OR)}_n(\mathrm{O}\underset{\substack{\| \\ \mathrm{O}}}{\mathrm{C}}\mathrm{R'})_{3-n}$

in which R is as previously defined, R′ is selected from the group consisting of the hydrogen atom, alkyl radicals containing from 1 to 30 inclusive carbon atoms and aryl or aryl-containing radicals of at least 6 carbon atoms, *n* having a value of from 0 to 2 and condensates of such compounds;

  - c. aluminum salts of the formula

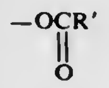
$H^+ Al^-(OR)_4$

in which R is as previously defined;

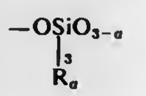
  - d. aluminosiloxy compounds of the formula

$=ALOSIR_3{}^2$

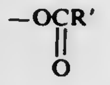
in which R^2 is selected from the group consisting of —OR radicals in which R is as defined,


$-\mathrm{O}\underset{\substack{\| \\ \mathrm{O}}}{\mathrm{C}}\mathrm{R'}$

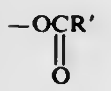
radicals in which R′ is as defined, monovalent hydrocarbon or halohydrocarbon radicals containing from 1 to 30 inclusive carbon atoms, and siloxane moieties of the formula


$-\mathrm{O}\underset{\substack{|_3 \\ \mathrm{R}_a}}{\mathrm{Si}}\mathrm{O}_{3-a}$

in which R^3 is selected from the group consisting of OR radicals in which R is as defined,


$-\mathrm{O}\underset{\substack{\| \\ \mathrm{O}}}{\mathrm{C}}\mathrm{R'}$

radicals in which R′ is as defined and monovalent hydrocarbon or halohydrocarbon radicals containing from 1 to 30 inclusive carbon atoms, and *a* has a value of from 1 to 3; The remaining aluminum valences being satisfied by —OAl=, —OR,


$-\mathrm{O}\underset{\substack{\| \\ \mathrm{O}}}{\mathrm{C}}\mathrm{R'}$

or —OSIR$_3{}^2$ bonding, R, R′ and R^2 being as previously defined; and

  - e. aluminum chelates formed by reacting compounds (a), (b) or (c) with sequestering agents in which the coordinating atoms are oxygen.

3,971,748
GRAPHITE POWDER-POLYPHENYLENE MIXTURES AND COMPOSITES

Chen-Shen Wang, Naperville, and Eli W. Blaha, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Oct. 7, 1975, Ser. No. 620,317
Int. Cl.^{2} C08L *65/02*
U.S. Cl. 260—37 R **10 Claims**

1. A moldable resin mixture comprising:

- a. about 25 to 95% graphite powder;
- b. about 5 to 75% branched polyphenylene comprising benzene ring structures bonded into a polymer chain wherein the linear infrared absorbance spectrum integrated peak area within the frequency range 726–930 cm^{-1} is distributed as follows: from 10 to 18% of the integrated peak area is within the frequency range 854–930 cm^{-1}, from 15 to 30% is within the frequency range 850–853 cm^{-1}, from 13 to 20% is within the frequency range 778–805 cm^{-1}, and the remainder of the integrated peak area within the frequency range 726–930 cm^{-1} is within the frequency range 726–777 cm^{-1}; and
- c. 0 to about 30% branched nitropolyphenylene comprising benzene ring structures bonded into a polymer chain and from 0.25 to 15 percent by weight of nitrogen wherein infrared absorbance occurs at frequencies of about 1345 cm^{-1} and about 1525 cm^{-1} and at least 8% of the linear infrared absorbance spectrum integrated peak area within the frequency range 726–930 cm^{-1} is within the frequency range 856–930 cm^{-1}.

3,971,749
METHOD OF PREPARING SMALL PARTICLES OF POLYPROPYLENE

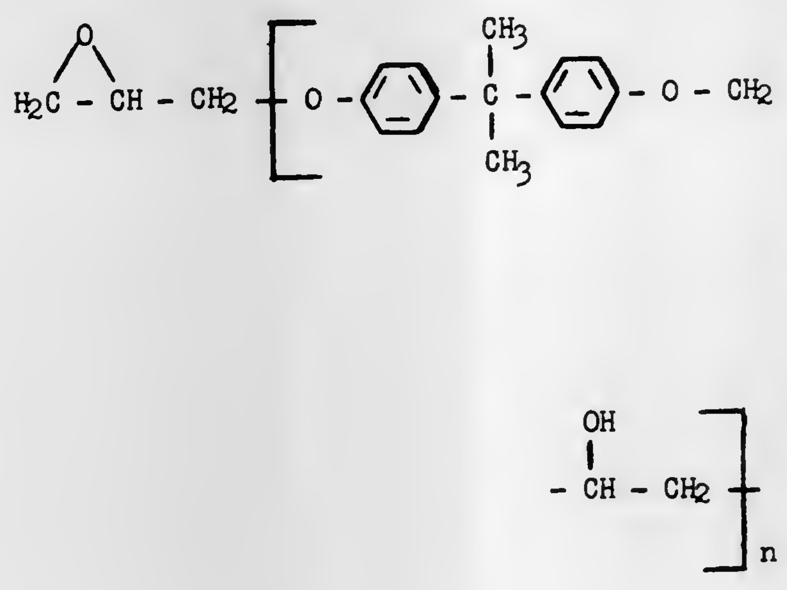
Harry W. Blunt, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of Ser. No. 454,990, March 26, 1974, abandoned. This application July 7, 1975, Ser. No. 594,149
Int. Cl.^{2} C08K *5/01, 5/02, 5/05*
U.S. Cl. 260—33.4 PQ **5 Claims**

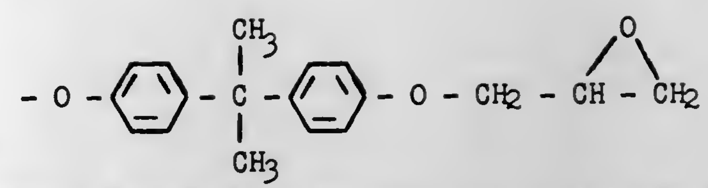
1. A method of preparing a dispersion of polypropylene in the form of discrete substantially spherical particles of about 1 to 100 microns in diameter which comprises preparing a homogeneous solution of about 10 to 25% concentration by weight of polypropylene at an elevated temperature in a normally liquid organic material which is a solvent for polypropylene at a temperature of at least 120°C. and which has a solubility parameter of about 6.6 to 10.3 (Cal/cc)$^{1/2}$, a dipole moment of about 0 to 1.7 Debye units and a hydrogen bonding parameter of about 0 to 18.7 cm.$^{-1}$, thereafter cooling said solution to room temperature under quiescent conditions to precipitate the polypropylene, subjecting the precipitated polymer to high shear conditions and recovering a dispersion of particles in the organic liquid.

3,971,750
FIRE RESISTANT EPOXY RESINS CURED WITH PHOSPHORUS TRIHALIDES

Kevin M. Foley, Hebron; Reuben H. Bell, Cincinnati, and Frank P. McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 21, 1975, Ser. No. 569,905
Int. Cl.^{2} C08G *51/10, 30/10*
U.S. Cl. 260—37 EP **18 Claims**

1. A curable epoxy system consisting essentially of an uncured epoxy resin and a hardening agent of phosphorus trihalide wherein the uncured epoxy resin is represented by the structure:



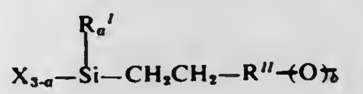


wherein *n* ranges from essentially zero to about 30 and wherein the uncured epoxy resin and hardening agent have a ratio of epoxy equivalent weight to halogen equivalent weight ranging from 3:1 to 1:3.

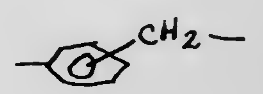
3,971,751
VULCANIZABLE SILYLETHER TERMINATED POLYMER

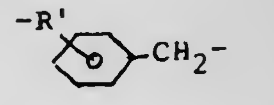
Katsuhiko Isayama, and Itaru Hatano, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed June 9, 1975, Ser. No. 584,827
Int. Cl.^{2} C08L *83/00, 71/00*
U.S. Cl. 260—37 R **20 Claims**

1. A composition comprising a polyether consisting essentially of chemically combined units of the formula —R‴—O—, having a molecular weight of between 500 to 15,000, and terminal silylether groups of the formula

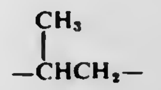

$\mathrm{X}_{3-a}-\overset{\substack{\mathrm{R}'_a \\ |}}{\mathrm{Si}}-\mathrm{CH_2CH_2}-\mathrm{R''}-(\mathrm{O})_b$

wherein R′ is an alkyl or aryl radical having from 1 to 12 carbon atoms, —R″—, is a member selected from the group consisting of —CH$_2$—,





and —R′—OCH$_2$—, wherein R′ is a divalent hydrocarbon radical having 1 to 12 carbon atoms and selected from the group consisting of alkylene radicals, cycloalkylene radicals, arylene radicals and aralkylene radicals; —R— is a divalent alkylene radical selected from the group consisting of —CH$_2$CH$_2$—,


$-\overset{\substack{\mathrm{CH_3} \\ |}}{\mathrm{C}}\mathrm{HCH_2}-$

and —CH$_2$CH$_2$CH$_2$CH$_2$—, X is a member selected from the class consisting of halogen radicals, alkoxy radicals, acyloxy radicals, ketoximato radicals, amino radicals, amide radicals and mercaptide radicals; *a* is a whole number equal to 0, 1 or 2 and *b* is a whole number equal to 0 to 1.

3,971,752
FLAME RETARDING POLYESTER COMPOSITION

Toshikazu Aoyama, Nagoya; Yukinori Kimata, Gifu; Hotuma Okasaka, Nagoya; Hiroshi Kodama, Nagoya, and Naoya Yoda, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed Dec. 23, 1974, Ser. No. 535,952
Claims priority, application Japan, Dec. 26, 1973, 49-144066
Int. Cl.^{2} C08K *3/22, 5/03, 5/06*
U.S. Cl. 260—40 R **5 Claims**

1. A flame retarding thermoplastic polyester composition reinforced by glass fiber which comprises 100 parts by weight

of a glass fiber reinforced thermoplastic polyester, 2 to 19 parts by weight of at least one flame retarding agent selected from the group consisting of decabromodiphenylether and decabromodiphenyl, and 12 to 30 parts by weight of antimony trioxide, wherein the ratio by weight of bromine atom to antimony atom is within the range of 0.15 to 0.27, wherein the glass fiber reinforced thermoplastic polyester comprises 98 to 40 parts by weight of thermoplastic polyester and 2 to 60 parts by weight of glass fiber.

3,971,753
POLYMER COMPOSITES AND PREPARATION THEREOF

Arthur C. Frechtling, Watchung; Norman W. Johnston, East Windsor, and Richard G. Shaw, Asbury, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,281

Int. Cl.² C08K *9/04*, *9/10*

U.S. Cl. 260—42.14 **23 Claims**

1. A composite comprising a filler substrate, an organic free radical polymerization initiator, which has been decomposed into free radicals, containing carboxyl or carboxamide groups, said initiator bonded through said groups to said substrate and ethylenically unsaturated monomer which has been polymerized to a resin matrix by said initiator free radicals.

3,971,754
X-RAY OPAQUE, ENAMEL-MATCHING DENTAL FILLING COMPOSITION

Anton Jurecic, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 10, 1973, Ser. No. 423,329

Int. Cl.² A61K *5/06;* **C08K** *3/40*, *9/06;* **C08L** *33/12*

U.S. Cl. 260—42.15 **7 Claims**

1. In a dental filling composition having a binder resin made of condensation products from the reaction of bisphenol A with glycidyl methacrylate, said binder being in the presence of a diluent and intermixed with a fused glass filler in finely divided particulate form containing 25 to 50 weight percent SiO_2 and a sufficient amount of fluxing agent to bring the fusion temperature below 1350°C, the improvement comprising said glass filler including, at the time of fusing thereof, about 5 to 60 percent by weight of a compound selected from the class consisting of oxides and carbonates of lanthanum, hafnium, strontium and tantalum, to provide a non-toxic, x-ray opaque and optically translucent restorative matrix resistant to oral fluids.

3,971,755
POLYMER COMPOSITIONS CONTAINING TITANIUM DIOXIDE HAVING IMPROVED VISIBLE AND ULTRAVIOLET LIGHT STABILITY

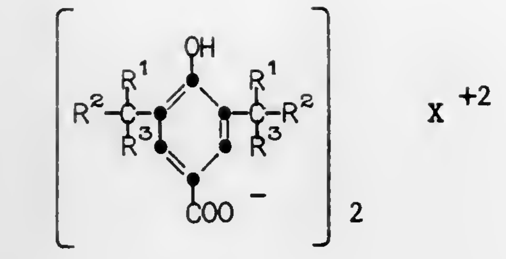
Joseph Salvatore Zannucci, and Gerald Ray Lappin, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,401

Int. Cl.² C08K *3/22*, *3/24*

U.S. Cl. 260—42.45 **3 Claims**

1. An ultraviolet light stabilized pigmented polymeric composition comprising (1) a polymeric composition normally susceptible to degradation due to visible or ultraviolet light selected from the group consisting of polypropylene and polypropylene containing graft reacted acrylic acid, (2) titanium dioxide and (3) as the ultraviolet stabilizer about 0.01 to 5 weight percent of a zinc salt of a compound having the formula



wherein R^1, R^2 and R^3 are the same or different and each represents an alkyl group having 1 to 8 carbon atoms; and X^{+2} is Zn^{+2}.

3,971,756
FLAME RETARDANT POLYCARBONATE COMPOSITION

Charles A. Bialous, Evansville; John B. Luce, Mount Vernon, and Victor Mark, Evansville, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 9, 1974, Ser. No. 496,115

Int. Cl.² C08K *5/42;* **C08L** *69/00*

U.S. Cl. 260—45.7 R **4 Claims**

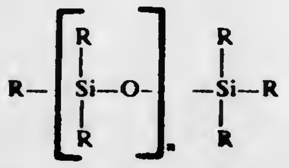
1. A flame retardant polycarbonate composition comprising:

a. an aromatic carbonate polymer in admixture with

b. an organic alkali metal salt or an organic alkaline earth metal salt of an acid selected from the group consisting of:

monomeric or polymeric aromatic sulfonesulfonic acids,
sulfonic acids of aromatic ketones,
heterocyclic sulfonic acids,
halogenated non-aromatic carboxylic acids,
sulfonic acids of aromatic sulfides,
monomeric or polymeric aromatic ether sulfonic acids,
aliphatic and olefinic sulfonic acids,
monomeric or polymeric phenol ester sulfonic acids,
unsubstituted or halogenated oxocarbon acids,
sulfonic acids of monomeric and polymeric aromatic carboxylic acids and esters,
halocycloaliphatic aromatic sulfonic acids,
monomeric or polymeric aromatic amide sulfonic acids,
monomeric or polymeric aromatic sulfonic acids,
of mixtures thereof, and

c. a siloxane in suficient quantity to render the polycarbonate composition non-dripping; said siloxane being of the following formula:



$$R-\left[\begin{matrix}R\\|\\Si-O-\\|\\R\end{matrix}\right]_n\begin{matrix}R\\|\\-Si-R\\|\\R\end{matrix}$$

wherein the R's are independently selected from the group consisting of hydrogen, hydroxy, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, alkenyl from 2 to 8 carbon atoms; alkynyl from 2 to 10 carbon atoms, aryl from 6 to 18 carbon atoms, aryloxy from 6 to 10 carbon atoms and wherein the R's may be substituted by halogen, hydroxy, amino, alkoxy of 1 to 6 carbon atoms, aryloxy of 6 to 10 carbon atoms, arylthio and alkylamino wherein the alkyl portion contains 1 to 6 carbon atoms, arythio and arylamino wherein the aryl portion contains 6 to 10 carbon atoms and wherein *n* is an integer having a value of one or more.

3,971,757
3-ALKYL-4-OXO-IMIDAZOLIDINES AND THEIR 1-OXYLS

Michael Rasberger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

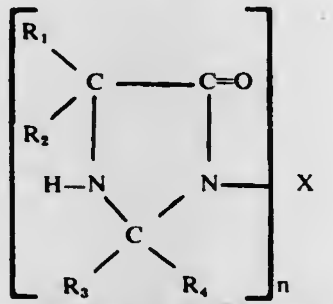
Filed June 5, 1974, Ser. No. 476,365

Claims priority, application Switzerland, June 22, 1973, 9185/73

Int. Cl.² C08K *5/00;* **C07D** *49/34*

U.S. Cl. 260—45.8 N **12 Claims**

1. Compounds of the formula



wherein R_1 and R_2 and R_3 and R_4, together with the carbon atoms to which they are bonded, form cycloalkyl radicals, *n* is an integer of 1 or 2, and X, if *n* is 1, is an alkyl group of 8 to 18 carbon atoms, allyl, methallyl, propargyl or benzyl group, and if *n* is 2, an alkylene group with 2 to 4 carbon atoms or alkylene with 2 to 10 carbon atoms which is interrupted by ester groups.

3,971,758
PLASTIC COMPOSITIONS CONTAINING ACRYLONITRILE-BUTADIENE-STYRENE POLYMER AND A BIS-PHENOXY FLAME RETARDANT

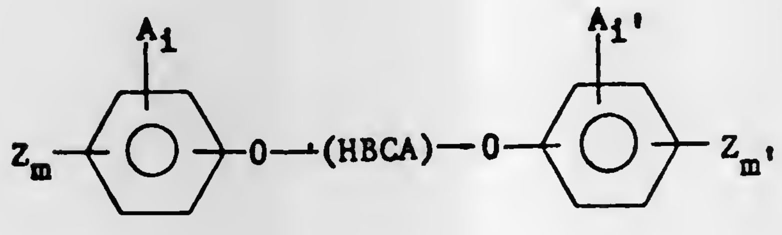
Arnold L. Anderson, and Robert J. Nulph, both of Alma, Mich., assignors to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,819

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA **14 Claims**

1. A plastic composition consisting essentially of acrylonitrile-butadiene-styrene polymer having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,759
PLASTIC COMPOSITIONS CONTAINING POLYSTYRENE AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

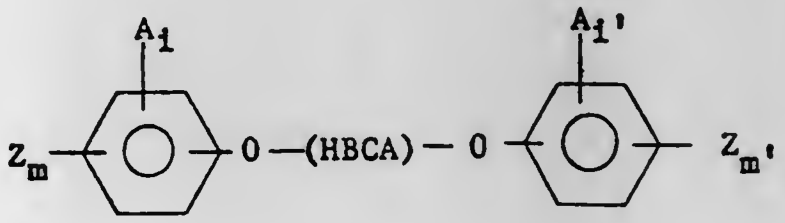
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,855

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA **14 Claims**

1. A plastic composition consisting essentially of polystyrene having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1-5; *i* and *i'* are integers having a value of 0-2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,760
PLASTIC COMPOSITIONS CONTAINING POLYURETHANE AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

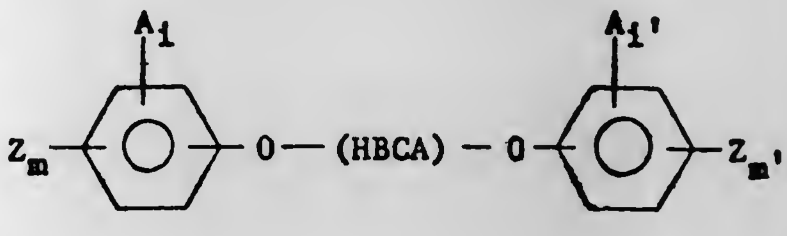
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,788

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA **14 Claims**

1. A plastic composition consisting essentially of polyurethane having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,761

PLASTIC COMPOSITIONS CONTAINING POLYACRYLATES AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

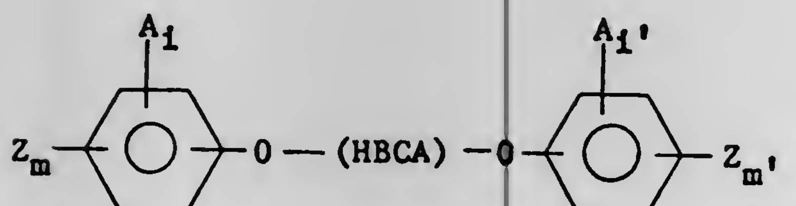
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,776

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA **14 Claims**

1. A plastic composition consisting essentially of polyacrylate having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *n'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo-benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,762

PLASTIC COMPOSITIONS CONTAINING POLY(PHENYLENE OXIDE) AND A BIS-PHENOXY FLAME RETARDANT

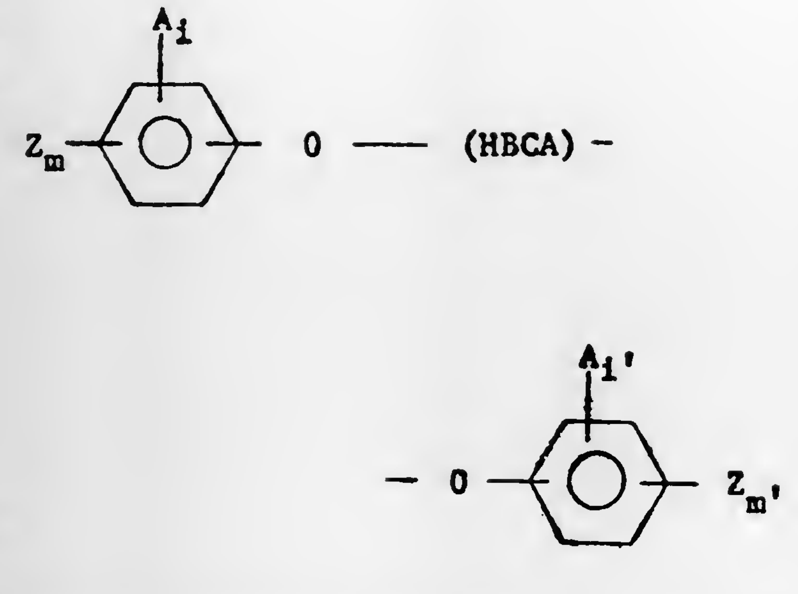
Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,858

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA **14 Claims**

1. A plastic composition consisting essentially of poly(phenylene oxide) having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,763

PLASTIC COMPOSITIONS CONTAINING POLYESTERS AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

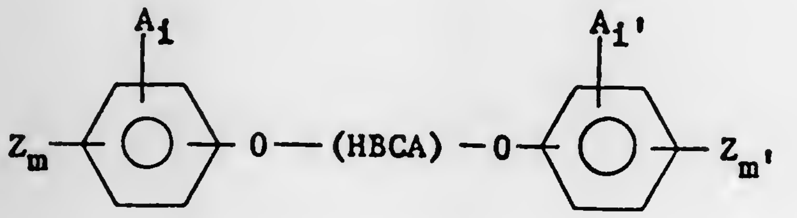
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,899

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9·KA **14 Claims**

1. A plastic composition consisting essentially of polyester having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo-benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,764

PROCESS FOR PRODUCING A CATIONIC POLYURETHANE

Horst Schürmann; Josef Bung, both of Duren, Germany, and Hendrikus Alouisius Van Aalten, Zevenaar, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 26, 1974, Ser. No. 536,365

Int. Cl.² C08G *18/38*

U.S. Cl. 260—77.5 AM **24 Claims**

1. A process for the production of a cationic polyurethane which comprises:

converting a monomeric aliphatic dihydroxy compound substituted with an aliphatic side-chain of at least 10 carbon atoms, by reaction with a polyisocyanate into a preliminary adduct with terminal —NCO groups; and

chain-lengthening said adduct by reacting the terminal —NCO groups with

A. an aliphatic monomeric diol containing a tertiary nitrogen atom which is subsequently converted into the corresponding ammonium compound, or

B. an aliphatic monomeric diol containing a tertiary nitrogen atom previously converted into the corresponding ammonium compound.

3,971,765

ANAEROBICALLY-CURING ADHESIVES

George Edward Green, Cherry Hinton, and Bernard Peter Stark, Stapleford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

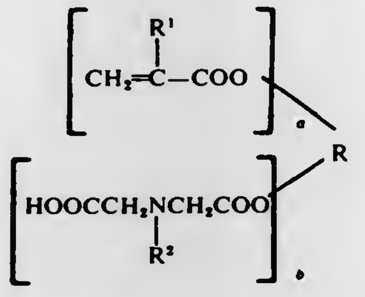
Filed Dec. 9, 1974, Ser. No. 531,029

Claims priority, application United Kingdom, Dec. 27, 1973, 59766/73

Int. Cl.² C08G *69/44, 73/16;* **C08F** *18/14, 120/02*

U.S. Cl. 260—78 A **31 Claims**

1. Anaerobically-polymerisable compositions comprising a polymerisable monomer and a redox-activatable initiator of free-radical polymerisation, in which the said monomer is an ester of the general formula



where

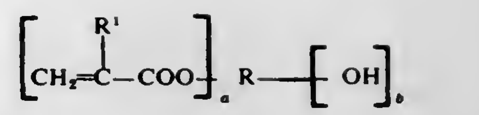
a is an integer of 1 to 4, and b is an integer of 1 or 2,

R denotes the residue, after removal of (*a* + *b*) alcoholic hydroxyl groups, of an aliphatic, cycloaliphatic, araliphatic, or heterocycloaliphatic alcohol,

R^1 denotes —H, —Cl, $—CH_3$, or $—C_2H_5$, and

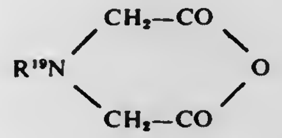
R^2 denotes a hydrogen atom or an aliphatic, cycloaliphatic, aromatic, araliphatic, heterocyclic, or heterocycloaliphatic group of 1 to 24 carbon atoms.

25. Anaerobically-polymerisable compositions comprising a polymerisable monomer and a redox-activatable latent initiator of free-radical polymerisation, in which the said monomer comprises an ester made by the esterification of an hydroxyl-containing acrylate ester of formula



$$\left[CH_2{=}\overset{\displaystyle R^1}{\overset{|}{C}}{-}COO\right]_a R\left[OH\right]_b$$

with b g-mol. of an anhydride of formula



per g-mol. of the said acrylate ester, where

R, R^1, a, and b have the meanings assigned in claim 1, and

R^{19} denotes a hydrogen atom or an aliphatic, cycloaliphatic, aromatic, araliphatic, heterocyclic, or heterocycloaliphatic group of 1 to 24 carbon atoms.

3,971,766

PRESSURE-SENSITIVE ADHESIVE AND PRESSURE-SENSITIVE ADHESIVE TAPE OR DRAPE

Tomoyoshi Ono, Hino, and Yoshihiko Matsuguma, Hachioji, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed June 6, 1973, Ser. No. 367,474

Claims priority, application Japan, June 14, 1972, 47-58582; July 26, 1972, 47-74089

Int. Cl.² C08F *220/10*

U.S. Cl. 526—317 **11 Claims**

1. A pressure-sensitive adhesive comprising as a main constituent a copolymer comprising:

1. 94 to 98 mol% based on the total of components (1) and (2) of at least one alkyl acrylate monomer with the alkyl group containing 1 to 14 carbon atoms, the average number of the carbon atoms being 4 to 12, or a mixture of said alkyl acrylate with another monomer selected from the group consisting of methyl methacrylate, vinyl acetate and mixtures thereof, in a mol ratio of said alkyl acrylate to said other monomer of at least 5 to 1,
2. 2 to 6 mol% based on the total of components (1) and (2) of a monomer selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof, and
3. 0.002 to 0.05 mol% based on the total of components (1) and (2) of a polyfunctional compound copolymerizable with the monomers (1) and (2) and having at least two non-conjugated carbon-to-carbon double bonds per molecule with the proviso that the amounts of component (1) and component (2) totals 100 mol%; said copolymer prepared by copolymerizing components (1), (2) and (3) by solution polymerization or emulsion polymerization.

3,971,767

OLEFIN POLYMERIZATION CATALYST SYSTEM AND PROCESS FOR POLYMERIZATION OF OLEFINS

Robert Alton Setterquist, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 471,811, May 20, 1974. This application July 30, 1975, Ser. No. 600,295

Int. Cl.² C08F *2/06, 4/02, 4/76*

U.S. Cl. 526—65 **12 Claims**

1. In a process for the polymerization or copolymerization of at least one 1-olefin monomer to produce linear, solid polyolefins of high molecular weight by the use, as polymerization catalyst, of a transition metal composition, in which the transition metal is a metal of Group IV(a) of the Periodic Table of the Elements, the improvements which consists essentially of employing as the transition metal composition a transition metal hydrocarbyl hydride aluminate supported on alumina in which said hydrocarbyl radical is selected from the group consisting of radicals having the structure $RCH_2—$ in which R— is aryl, aralkyl in which no hydride radical is attached to the carbon atom bonded to the methylene group, or tertiary butyl, and in which from about 60% to substantially 100% of the radicals other than aluminate bonded to the transition metal are hydride radicals.

3,971,768

VAPOR PHASE REACTOR OFF-GAS RECYCLE SYSTEM FOR USE IN THE VAPOR STATE POLYMERIZATION OF MONOMERS

Edwin F. Peters, Winfield; Michael J. Spangler, Dolton; Glenn O. Michaels, South Holland, and James L. Jezl, St. Charles, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 533,021

Int. Cl.² C08F *2/34, 10/00, 14/06*

U.S. Cl. 526—68 **14 Claims**

1. An essentially isobaric, essentially total, reactor off-gas recycle process comprising:

a. removing from a horizontal, vapor state reactor operating at polymerization conditions, off-gases containing at least quench liquid vapor and one or more polymerizable monomers from above a stirred, subfluidized bed of polymer distributed within the one or more polymerization sections of said reactor and removing entrained polymer from said off-gases to form a reactor off-gas stream;

b. condensing quench liquid from and removing any remaining entrained polymer from said reactor off-gas stream to form liquid recycle which contains at least said quench liquid and said any remaining entrained polymer and gaseous recycle which contains a reduced amount of said quench liquid vapor;

c. leading said gaseous recycle together with at least make-up of said one or more polymerizable monomers to one or more inlets spaced along said reactor and positioned largely underneath the surface of said bed and introducing said gaseous recycle and said at least make-up into said reactor;

d. leading a first portion of said liquid recycle to a plurality of inlets spaced along said reactor and located above the surface of said bed and introducing said portion into said reactor;

e. leading a second smaller portion of said liquid recycle together with make-up of at least one catalyst component to one or more inlets spaced along said reactor and introducing said portion into said reactor; and

f. introducing make-up quench liquid into said reactor.

3,971,769

SULFOALKYL AMINOPHENYL DISAZO DYES

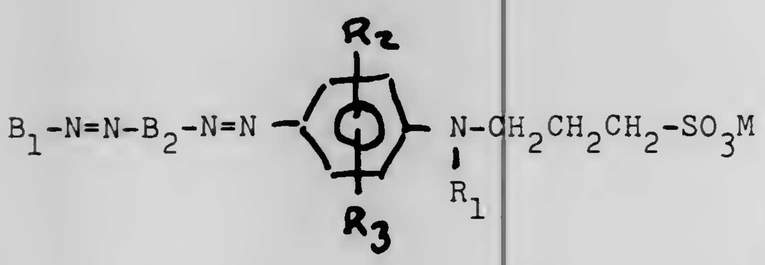
James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 4,096, Jan. 17, 1970, abandoned, Continuation-in-part of Ser. No. 102,231, Dec. 28, 1970, abandoned. This application July 5, 1973, Ser. No. 376,606

Int. Cl.² C09B *31/18;* **D06P** *3/24, 3/40;* **C09B** *31/02*

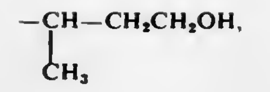
U.S. Cl. 260—186 **3 Claims**

1. A water-soluble compound having the structure:

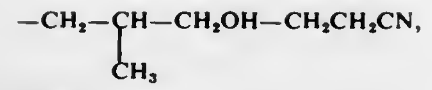


wherein

R₁ is alkyl having 1–8 carbon atoms, benzylcyclohexyl, —CH₂CH₂OH,

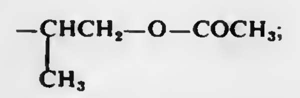


$$-\underset{\displaystyle CH_3}{\underset{|}{C}}H-CH_2CH_2OH,$$



$$-CH_2-\underset{\displaystyle CH_3}{\underset{|}{C}}H-CH_2OH-CH_2CH_2CN,$$

$-CH_2CH_2-O-COCH_3$ or



$$-\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2-O-COCH_3;$$

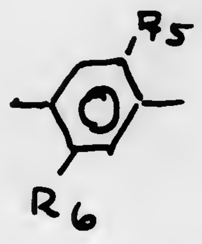
R_2 is —H, -alkyl having 1 to 4 carbon atoms, halogen, —O—alkyl having 1 to 4 carbon atoms or $-NH-COR_4$;

R_3 is —H, —alkyl having 1 to 4 carbon atoms, —O—alkyl having 1 to 4 carbon atoms or $-NH-COR_4$;

R_4, as used in R_2, R_3, R_5 and R_6, represents -alkyl having 1 to 4 carbon atoms, -tolyl, -phenyl or -halophenyl;

B_1 is phenyl or phenyl substituted with nitro, halogen, cyano, lower alkyl, lower alkoxy, trifluoromethyl, alkylsulfonyl, acetyl, carboxamido, sulfonamido, N-alkyl-sulfonamido, N,N-dialkylsulfonamido, N-alkylcarboxamido and carboxyl;

B_2 is 1,4-naphthylene or



R_5 is —H, -alkyl, -alkoxy, or $-NHCOR_4$;

R_6 is —H, -alkyl, -alkoxy, $-NHCOR_4$, $-NH-SO_2-R_4$ or halogen; and

M represents —H, —Na, —K, —Li or $-N-NH_4$.

3,971,770

DISULFIMIDE DISAZO DYESTUFFS

Richard Sommer, Leverkusen; Georg Rainer, Constance, and Gerhard Wolfrum, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

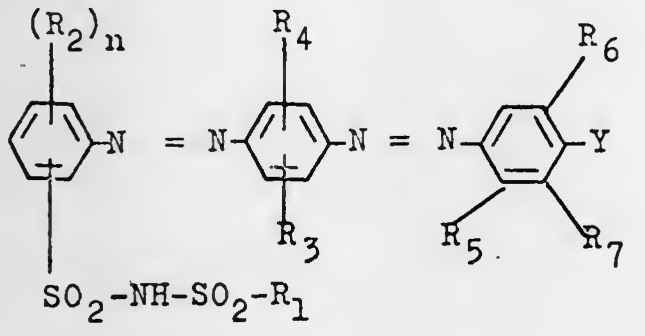
Continuation-in-part of Ser. No. 37,031, May 13, 1970, abandoned. This application Dec. 5, 1973, Ser. No. 422,064

Claims priority, application Germany, May 17, 1969, 1925288

Int. Cl.² C09B *33/02;* **D06P** *3/24*

U.S. Cl. 260—186 **9 Claims**

1. Sulfonic acid-free disazo dyestuff which in the form of the free acid has the formula



in which R_1 is phenyl or phenyl substituted with methyl or C_1-C_4-alkyl;

R_2 is chlorine, bromine, C_1-C_4-alkyl or C_1-C_4-alkoxy;

R_3 and R_4 are identical or different and are hydrogen, C_1-C_4-alkyl or C_1-C_4-alkoxy;

R_5, R_6 and R_7, independently of one another are hydrogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen, $-CONH_2$, carboxylic acid mono-C_1-C_2-alkylamide, carboxylic acid dimethylamide, carbo-C_1-C_2-alkoxy or carboxyl;

Y is hydroxyl or NR_8-R_9;

R_8 and R_9 each is C_1-C_4-alkyl;

C_1-C_4-alkyl substituted by hydroxyl or nitrile; or benzyl; and

n is 0, 1 or 2.

3,971,771

MONOAZO COMPOUNDS

Hans-Joerg Angliker, and Richard Peter, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

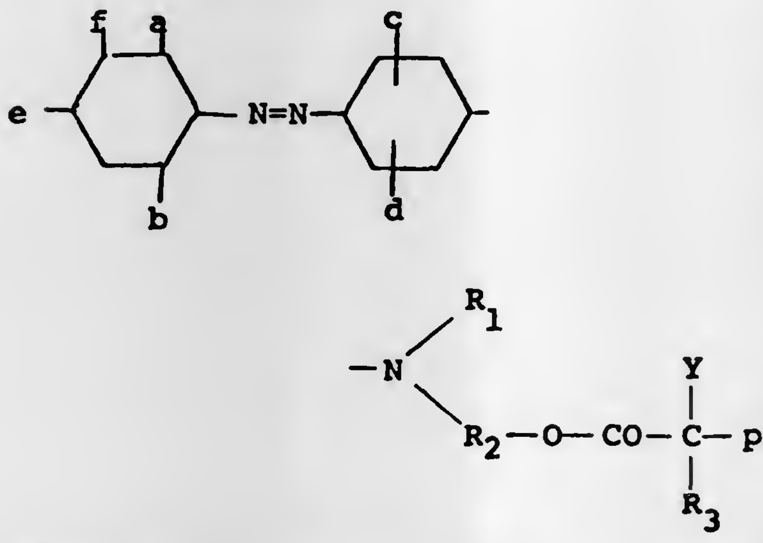
Continuation of Ser. No. 195,492, Nov. 3, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,518

Claims priority, application Switzerland, Nov. 11, 1970, 16658/70

Int. Cl.² C09B *29/08, 29/26*

U.S. Cl. 260—207 **5 Claims**

1. A compound of the formula



wherein

a is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, cyano, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, or alkylsulfonyl of 1 to 4 carbon atoms,

b is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, cyano or trifluoromethyl,

e is nitro, cyano, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, sulfonamido, N-C_1-C_4-alkylated sulfonamido, or alkylsulfonyl of 1 to 4 carbon atoms,

f is hydrogen, halogen, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, or aminocarbonyl,

c and *d* independently are hydrogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, phenyl, phenoxy, benzyl, phenylethyl or phenylthio, and

c additionally represents bromo, trifluoromethyl, C_1-C_6-alkylcarbonylamino, C_6-C_7-arylcarbonylamino, C_1-C_6-alkoxycarbonylamino, C_6-C_7-aryloxycarbonylamino, C_1-C_6-alkylsulfonylamino, C_6-C_7-arylsulfonylamino, C_1-C_6-alkylaminocarbonylamino, C_6-C_7-arylaminocarbonylamino, formylamino, ureyl or chloroacetylamino,

R_1 is C_1-C_8-alkyl or C_1-C_8 alkyl substituted by phenyl, chloro, fluoro, hydroxy, cyano, cyanoethoxy, phenyloxy, phenylmercapto, C_1-C_4-alkoxy, C_1-C_4-alkoxy, formyloxy, C_1-C_{18}-alkylcarbonyloxy, C_6-C_7-arylcarbonyloxy, formylamido, C_1-C_8-alkylcarbonylamino, C_6-C_7-arylcarbonylamino, C_1-C_6-alkylsulfonyloxy, C_6-C_7-arylsulfonyloxy, C_1-C_6-alkylsulfonylamino, C_6-C_7-arylsulfonylamino, vinylsulfonyl, C_1-C_{18}-alkoxycarbonylox C_6-C_7-aryloxycarbonyloxy, C_1-C_{18}-alkylaminocarbonyloxy, C_6-C_7-arylaminocarbonyloxy, phenylacetyloxy, cinnamoyloxy, oleyloxycarbonyloxy, oleylaminocarbonyloxy, cyclohexylcarbonyloxy, or benzyloxycarbonyloxy,

R_2 is C_1-C_4-alkylene which is unsubstituted or substituted by chloro, bromo or hydroxy,

Y is halo, phenoxy, C_1-C_4-alkoxy, formyloxy, C_1-C_4-alkylcarbonyloxy, C_1-C_4-alkoxycarbonyloxy or C_1-C_4-alkylaminocarbonyloxy, and

R_3 and ph are independently phenyl or phenyl substituted by nitro, chloro, bromo, C_1-C_2-alkoxy or C_1-C_2 -alkyl, and

R_3 additionally represents hydrogen.

3,971,772

STEROIDAL[16α,17-b]1,4-DIOXANES AND STEROIDAL[16α,17-b]1,4-DIOXINS

Christopher M. Cimarusti, Hamilton; Seymour D. Levine, North Brunswick, and Frank L. Weisenborn, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 538,978, Jan. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 433,974, Jan. 16, 1974, abandoned. This application May 19, 1975, Ser. No. 578,695

Int. Cl.² C07J *5/00*

U.S. Cl. 260—239.55 R **36 Claims**

1. A 3,20-diketo pregnene having an 11β-hydroxy group or an 11-keto group and having fused on the 16 and 17 positions a 1,4-dioxane ring or a 1,4-dioxin ring.

3,971,773

STEROIDAL 9,11β-DIHALO-[16α,17-b]1,4-DIOXANES

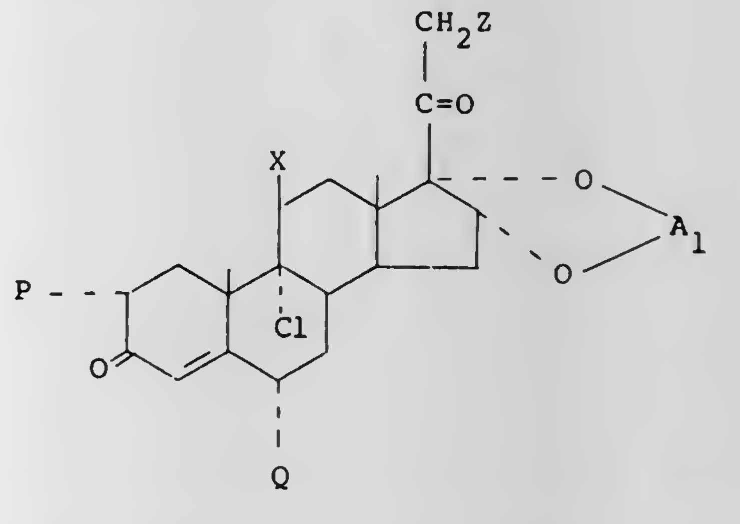
Christopher M. Cimarusti, Hamilton; Frank L. Weisenborn, Titusville, and Seymour D. Levine, North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 522,195, Nov. 8, 1974, abandoned. This application June 2, 1975, Ser. No. 583,149

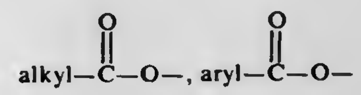
Int. Cl.² C07D *471/00*

U.S. Cl. 260—239.55 R **10 Claims**

1. A steroid having the structure

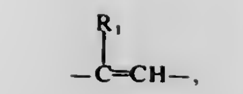


and the 1,2-dehydro and 6,7-dehydro derivatives thereof, wherein Z is hydrogen, hydroxy,

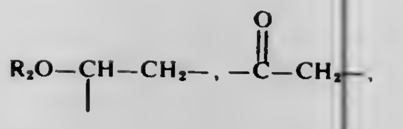


$$alkyl-\overset{\displaystyle O}{\overset{\|}{C}}-O-,\ aryl-\overset{\displaystyle O}{\overset{\|}{C}}-O-$$

or halogen; X is chlorine or fluorine; A_1 is $-CH_2-CH_2-$,

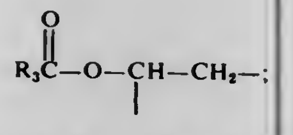


$$-\overset{R_1}{\overset{|}{C}}{=}CH-,$$



$$R_2O-\underset{|}{C}H-CH_2-,\ -\overset{O}{\overset{\|}{C}}-CH_2-,$$

or



$$R_3\overset{O}{\overset{\|}{C}}-O-\underset{|}{C}H-CH_2-;$$

R_1 is hydrogen, alkyl or aryl; R_2 is hydrogen or alkyl; R_3 is alkyl, cycloalkyl or aryl; and P and Q are independent of each other and are hydrogen, methyl or halogen.

3,971,774

2-(NITROMETHYLENE)-1,3-DIAZEPINES

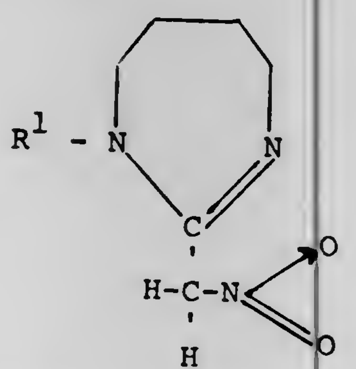
Charles H. Tieman; Willy D. Kollmeyer, and Steven A. Roman, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 510,100, Sept. 27, 1974, which is a continuation-in-part of Ser. No. 412,373, Nov. 1, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 630,065

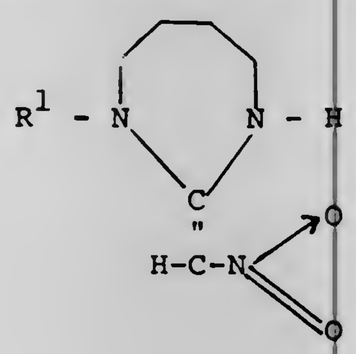
Int. Cl.^{2} C07D *239/02*

U.S. Cl. 260—239 BC **1 Claim**

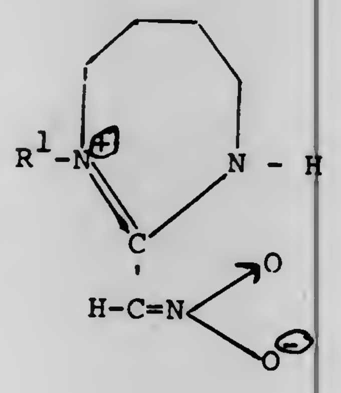
1. A compound of the group consisting of compounds of the formula:



derivatives thereof wherein the alpha hydrogen is replaced by middle halogen and resonance hybrids represented by the formulae:



and



wherein R^1 contains up to eight carbon atoms and is alkyl or alkenyl.

3,971,775

PROCESS FOR PREPARING PENICILLIN ANTIBIOTICS

Brian Richard Cowley, Ruislip, and David George Martin, Stoke Poges, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

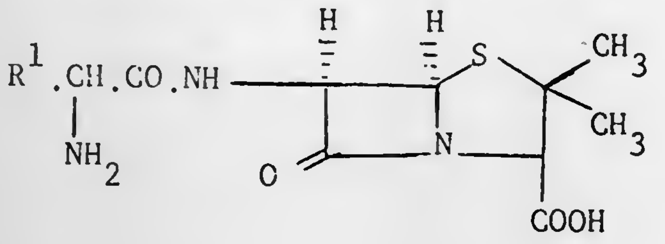
Filed May 2, 1975, Ser. No. 574,345

Claims priority, application United Kingdom, May 9, 1974, 20584/74

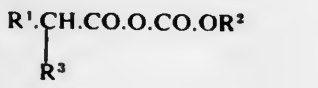
Int. Cl.^{2} C07D *499/68*

U.S. Cl. 260—239.1 **10 Claims**

1. In a process for the preparation of an α-aminoacylpenicillin antibiotic of formula



wherein R^1 represents phenyl or phenyl substituted by chloro, bromo, hydroxy, lower alkyl, nitro, lower alkylamino, di(-lower alkyl)amino, lower alkanoyl, lower alkanoylamido, lower alkoxy or lower alkylthio, by acylating 6-aminopenicillanic acid with a mixed anhydride of formula



$$R^1.\underset{\underset{R^3}{|}}{C}H.CO.O.CO.OR^2$$

(I)

wherein R^1 is as defined above, R^2 represents lower alkyl and R^3 represents a protected amino group wherein the protecting group is acid labile, and thereafter cleaving the acid-labile amine protecting group from the resulting N-protected α-aminoacylpenicillin derivative, the improvement whereby there is obviated the need for a solvent evaporation stage during isolation of an α-aminoacylpenicillin product, which improvement consists of the steps (i) contacting the 6-amino penicillanic acid with about 1.5-3 moles of a tri(lower alkyl)amine in the presence of a solvent selected from the group consisting of methylene chloride and chloroform at a temperature of from about 10°C to the reflux temperature of the solvent to yield a solution of a tri(lower alkyl)amine salt of 6-aminopenicillanic acid in said solvent; (ii) adding an anhydrous acid to the 6-aminopenicillanic acid salt solution to neutralise the residual tri(lower alkyl)amine therein; (iii) contacting the resulting neutralised solution with a solution of the mixed anhydride in methyl isobutyl ketone at a temperature of from about −50°C to about +30°C to yield a solution of the N-protected α-aminoacylpenicillin derivative; (iv) contacting said solution with water and a strong acid selected from the group consisting of mineral acids and toluene-p-sulphonic acid to cleave the acid-labile amine protecting group; and (v) recovering the α-aminoacylpenicillin or an acid addition salt thereof from the resulting water-containing system.

3,971,776

THIO-β-LACTAM PENICILLINS

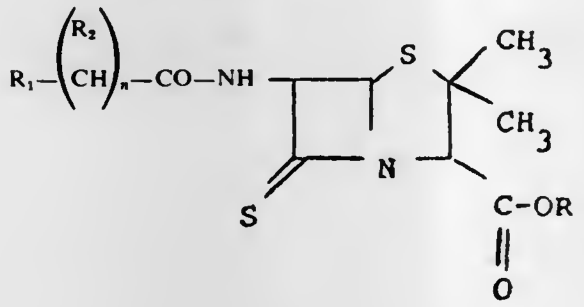
Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 19, 1975, Ser. No. 551,221

Int. Cl.^{2} C07D *499/44, 499/46, 499/48*

U.S. Cl. 260—239.1 **8 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal; R_1 is hydrogen, lower alkyl, saturated or unsaturated cycloalkyl of 3 to 7 carbons, phenyl, lower alkoxyphenyl, phenoxy, phenyl-lower alkyl, thienyl, furyl, oxazolyl, isoxazolyl, or thiazolyl and said heterocyclics bearing phenyl, halophenyl, halo or lower alkyl substituents; R_2 is hydrogen, amino, carboxy or ureido; and *n* is 0 or 1.

3,971,777

NOVEL STEROIDS AND THEIR USE

Geneviéve Rousseau, Paris, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel-UCLAF, Paris, France

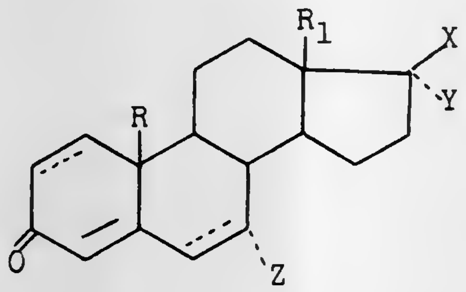
Filed Sept. 8, 1975, Ser. No. 611,126

Claims priority, application France, Sept. 18, 1974, 74.31501

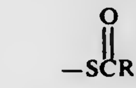
Int. Cl.^{2} C07J *33/00*

U.S. Cl. 260—239.5 **24 Claims**

1. A compound of the formula

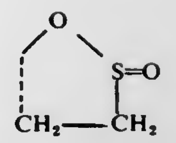


wherein R is selected from the group consisting of hydrogen and methyl, R_1 is alkyl of 1 to 4 carbon atoms, Z is selected from the group consisting of hydrogen and

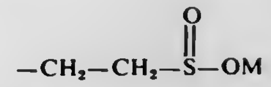


$$-S\overset{O}{\overset{\|}{C}}R_2,$$

of α-configuration, R_2 is alkyl of 1 to 4 carbon atoms, the dotted lines in the A and B rings represent optional 1 or 2 double bonds in the 1(2) position when R is methyl and in the 6(7) position when Z is hydrogen and X and Y together form the group



and when X is OH, Y is



$$-CH_2-CH_2-\overset{O}{\overset{\|}{S}}-OM$$

and M is selected from the group consisting of hydrogen, —NH_4 and alkali metals.

3,971,778

CEPHALOSPORINS HAVING (α-ETHERIFIED OXIMINO)ACYLAMIDO GROUPS AT THE 7-POSITION

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

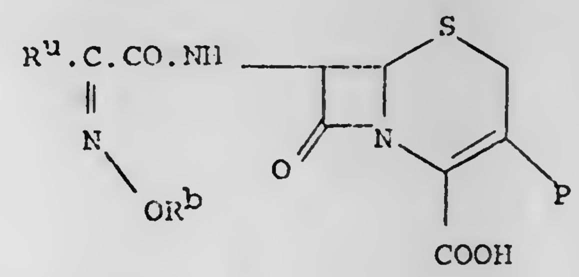
Continuation-in-part of Ser. No. 252,666, May 12, 1972,. This application Nov. 7, 1972, Ser. No. 304,524

Claims priority, application United Kingdom, Oct. 25, 1972, 49255/72

Int. Cl.^{2} C07D *501/20*

U.S. Cl. 260—243 C **32 Claims**

1. A compound selected from the group consisting of a highly active cephalosporin antibiotic highly stable to β-lactamases of the formula



wherein

R^u is thienyl or furyl;

R^b is lower alkyl; lower alkyl substituted by amino, bromo or lower alkoxy; or cycloalkyl of 3–7 carbon atoms; and

P is vinyl or a group of the formula —CH_2Y in which Y is —SW where W is 5-methyl-1,3,4-thiadiazol-2-yl, 1-methyltetrazol-5-yl, 1-ethyltetrazol-5-yl, 5-phenyl-1,3,4-oxadiazol-2-yl or nitrobenzothiazolyl; alkylthio of 1–4 carbon atoms; lower alkylcarbonylthio; a group of the formula —O.CO.R^9 where R^9 is alkyl or alkenyl of up to 4 carbon atoms, phenyl or cycloalkyl of 3–6 carbon atoms; or azido, said cephalosporin antibiotic being in the form of a syn-isomer free of the corresponding anti-isomer to the extent of at least 75% based on the total weight of said antibiotic; and a physiologically acceptable salt thereof.

3,971,779

7-[2-(5-AMINO-1,3,4-THIADIAZOL-2-YLTHIO)ACETAMIDO]CEPHALOSPORINS

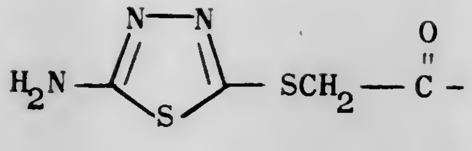
Abraham Nudelman, Bala Cynwyd, Pa., assignor to American Home Products Corporation, New York, N.Y.

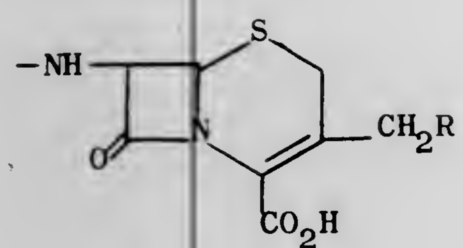
Filed Feb. 7, 1975, Ser. No. 547,832

Int. Cl.^{2} C07D *501/34*

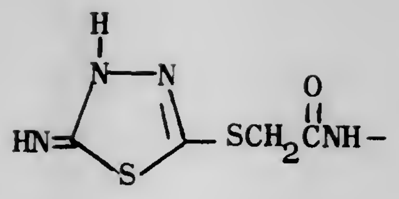
U.S. Cl. 260—243 C **3 Claims**

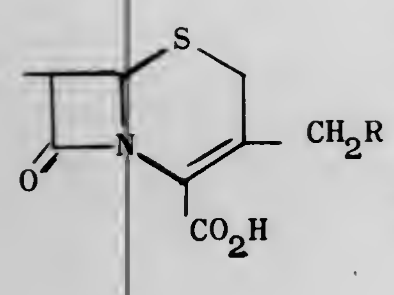
1. A chemical compound having the formula:

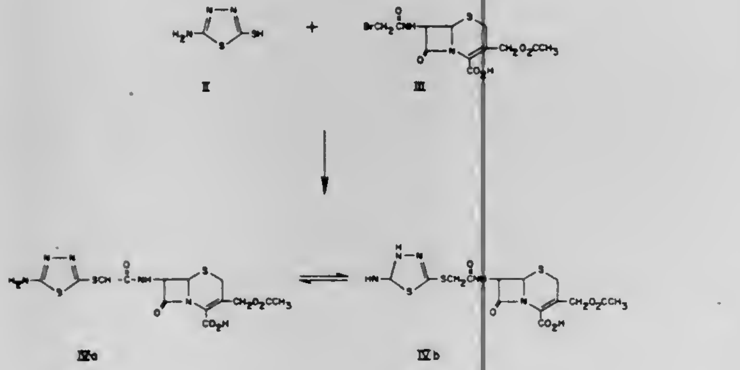




or





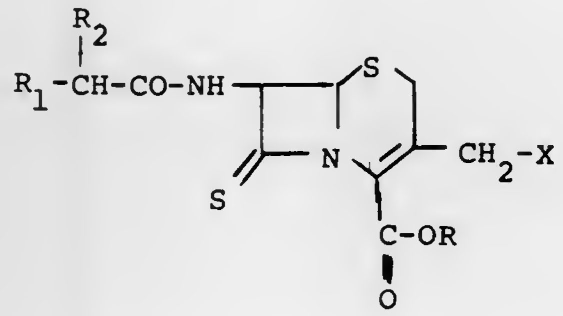


wherein
R is hydrogen or acetoxy and the pharmaceutically acceptable addition salts thereof.

3,971,780
THIO-β-LACTAM CEPHALOSPORINS

Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Feb. 19, 1975, Ser. No. 551,222
Int. Cl.² C07D *501/20, 501/02*
U.S. Cl. 260—243 C **13 Claims**

1. A compound of the formula

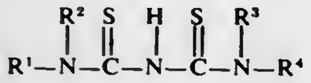


wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal; R_1 is hydrogen, lower alkyl, saturated or unsaturated cycloalkyl of 3 to 7 carbons, phenyl, phenyl-lower alkyl, phenoxy, thienyl, furyl, oxazolyl, isoxazolyl, or thiazolyl; R_2 is hydrogen, amino, carboxy, hydroxy or ureido; and X is hydrogen, hydroxy or lower alkanoyloxy.

3,971,781
METAL SALTS OF 1,1,5,5-TETRASUBSTITUTED DITHIOBIURETS AND THEIR USE AS POPULATION CONTROL AGENTS

William R. Diveley, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Division of Ser. No. 359,164, May 10, 1973. This application Oct. 28, 1975, Ser. No. 626,526
Int. Cl.² C07D *401/12, 413/12, 295/16*
U.S. Cl. 260—246 B **3 Claims**

1. A compound selected from the group consisting of the metal salts of 1,1,5,5-tetrasubstituted dithiobiurets of the formula:



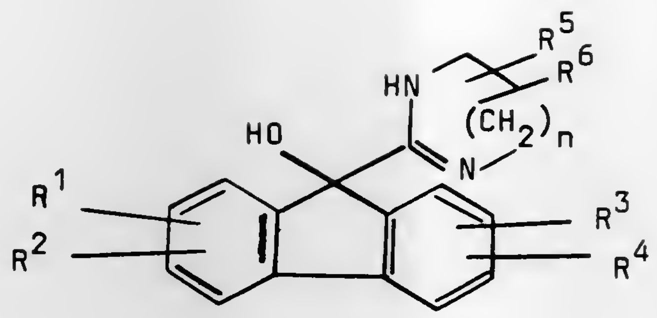
$$R^1-\overset{R^2}{N}-\overset{S}{\overset{\|}{C}}-\overset{H}{N}-\overset{S}{\overset{\|}{C}}-\overset{R^3}{N}-R^4$$

in which R^1 and R^2 when taken together with the nitrogen to which they are bonded and R^3 and R^4 when taken together with the nitrogen to which they are bonded are selected from the group consisting of N-morpholinyl, N-piperidyl, N-pyrrolidyl and N-aziridinyl.

3,971,782
FLUORENE DERIVATIVES

Alan Chapman White, Windsor, and Robin Michael Black, Porton, both of England, assignors to John Wyeth & Brother, Maidenhead, England
Filed Nov. 4, 1975, Ser. No. 628,621
Claims priority, application United Kingdom, Nov. 20, 1974, 50180/74
Int. Cl.² C07D *233/06, 239/06*
U.S. Cl. 260—251 R **3 Claims**

1. A compound selected from the group consisting of a fluorene derivative of formula

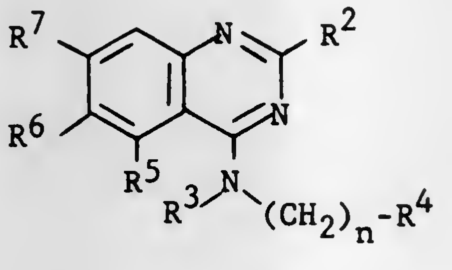


and a pharmaceutically acceptable acid addition salt thereof, wherein R^1, R^2, R^3 and R^4 each represents a member from the group consisting of hydrogen, hydroxyl, lower alkyl, lower alkoxy and halogen, R^5 and R^6 each represents a member from the group consisting of hydrogen and lower alkyl and n represents 1 or 2.

3,971,783
4-AMINOQUINAZOLINE DERIVATIVES AS CARDIAC STIMULANTS

Ian Thompson Barnish, Ramsgate; David Alexander Cox, Canterbury, and Anthony Garth Evans, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.
Continuation-in-part of Ser. No. 444,656, Feb. 21, 1974, abandoned. This application Apr. 26, 1974, Ser. No. 464,673
Claims priority, application United Kingdom, Mar. 7, 1973, 11018/73
Int. Cl.² C07D *401/12, 417/12*
U.S. Cl. 260—256.4 Q **9 Claims**

1. A compound of the formula

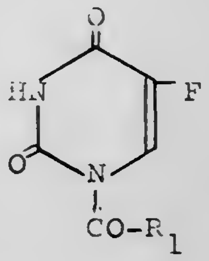


or a pharmaceutically acceptable acid-addition salt thereof;
wherein R^2 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, hydroxyalkyl having from one to six carbon atoms and alkoxyalkyl having from two to six carbon atoms;
R^3 is selected from the group consisting of hydrogen, benzyl, alkyl having from one to six carbon atoms, phenyl and alkoxyphenyl having from one to six carbon atoms in said alkoxy group;
R^4 is selected from the group consisting of pyridyl, quinolyl, thiazolyl, imidazolyl, pyrazinyl, indolyl, hydroxypyridyl, alkylpyridyl having from one to six carbon atoms in said alkyl group and alkylthiazolyl having from one to six carbon atoms in said alkyl group;
R^5 is hydrogen;
R^6 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, alkoxy having from one to six carbon atoms, hydroxy and amino;
R^7 is alkoxy having from one to six carbon atoms; and
n is 1, 2, 3 or 4;
providing that R^4 is linked to $(CH_2)_n$ through a ring-carbon atom.

3,971,784
5-FLUOROURACIL DERIVATIVES

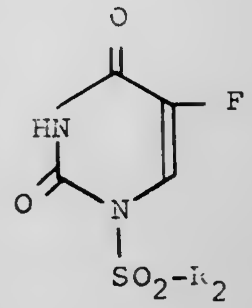
Masao Tada, Sendai, Japan, assignor to Mitsui Pharmaceuticals, Incorporated, Tokyo, Japan
Filed Nov. 25, 1974, Ser. No. 527,143
Claims priority, application Japan, Nov. 28, 1973, 48-132795; Nov. 28, 1973, 48-132796
Int. Cl.² C07D *239/54*
U.S. Cl. 260—256.5 R **27 Claims**

1. A 5-fluorouracil derivative represented by the formula



wherein R_1 represents phenyl, halogen substituted phenyl, nitro substituted phenyl, methylphenyl, methoxyphenyl or 2-furyl.

11. A 5-fluorouracil derivative represented by the formula



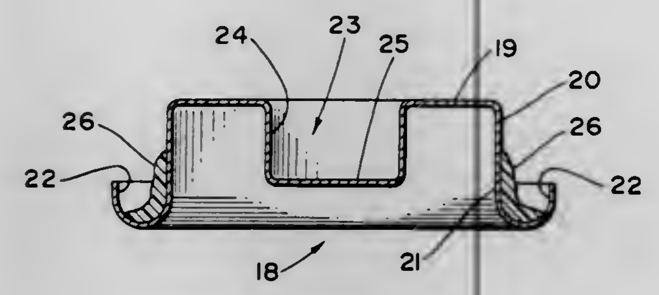
wherein R_2 represents methyl, ethyl, phenyl, methyl or ethyl substituted phenyl, halogen substituted phenyl, nitro substituted phenyl, acetamido substituted phenyl, naphthyl, thiofuryl, quinolyl or camphoryl.

3,971,785
PROCESS FOR THE MANUFACTURE OF FLOWED-IN AEROSOL CAN GASKETS

Thomas A. Messina, Waltham, and Patrick J. Droney, Arlington, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.
Continuation of Ser. No. 302,005, Oct. 30, 1972, abandoned. This application Feb. 13, 1975, Ser. No. 549,564
Int. Cl.² B29C *25/00*
U.S. Cl. 264—268 **4 Claims**

1. A method for lining an aerosol can mounting cup with a sealing gasket consisting of:
a. depositing in the annular channel of the mounting cup a layer of a composition comprising (1) a liquid prepolymer of a free isocyanate groups-containing reaction product of a polyisocyanate with a polyhydroxy compound and (2) a finely divided carbon dioxide blocked polyamine;
b. heating the cup and said composition deposited therein to a temperature sufficient to cause decomposition of said polyamine with time, but said heating being for a time

sufficient to gel said composition only and insufficient to cause substantial decomposition of said polyamine; and



c. then allowing said composition to cure further at ambient temperature in an atmosphere containing moisture.

3,971,786
PYRIDYL ALKYLGUANIDINE COMPOUNDS, COMPOSITION THEREWITH, AND METHODS OF INHIBITING H-2 HISTAMINE RECEPTORS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

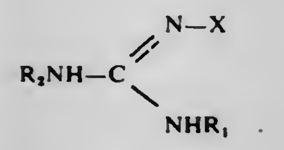
Continuation-in-part of Ser. No. 384,992, Aug. 2, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,532

Claims priority, application United Kingdom, Sept. 5, 1972, 41161/72

Int. Cl.² A61K *31/44;* **C07D** *213/34*

U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula:



$$R_2NH-C(=N-X)-NHR_1$$

wherein R_1 is hydrogen or lower alkyl; R_2 is a grouping of the formula:

$$\text{Het}-(CH_2)_mZ(CH_2)_n-$$

wherein Het is a pyridyl ring which is optionally substituted by lower alkyl, trifluoromethyl, hydroxy, halogen or amino; Z is sulphur, oxygen, NH or a methylene group; *m* is 0, 1 or 2 and *n* is 2 or 3, the sum of *m* and *n* being from 2 to 4; X is SO_2R_4 or $N{=}CHR_5$ R_4 is phenyl optionally substituted by halogen, lower alkyl or amino; and R_5 is phenyl or a pharmaceutically acceptable acid addition salt of said compound.

3,971,787
(4-QUINOLYLAMINO)BENZAMIDES

John Leheup Archibald, Windsor; John Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Taplow, England

Continuation-in-part of Ser. No. 334,799, Feb. 22, 1973, Pat. No. 3,875,165. This application Jan. 23, 1975, Ser. No. 543,217

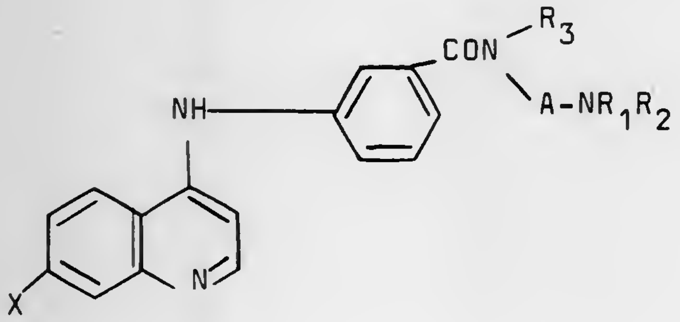
Claims priority, application United Kingdom, Feb. 5, 1973, 5531/73

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² C07D *215/44, 401/12*

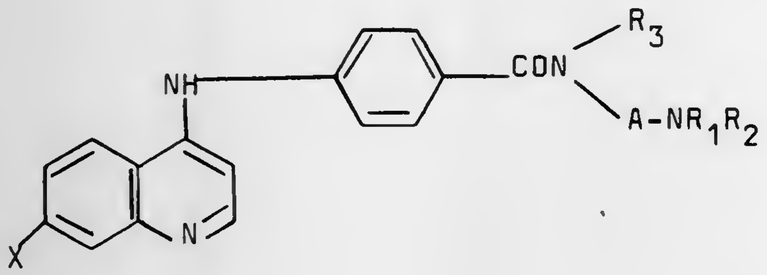
U.S. Cl. 260—286 R **2 Claims**

1. A compound selected from those having the formulae



(II)

and



(III)

and their pharmaceutically acceptable acid addition salts, wherein X is halogen, the group $—A—NR_1R_2$ is di(lower alkyl) amino(lower alkyl) and R_3 is lower alkyl.

3,971,788
2-METHYL-3-PHENYL-1,2,3,10b-TETRAHYDROINDENO[1,2,3-ij]-ISOQUINOLINE HYDROBROMIDE

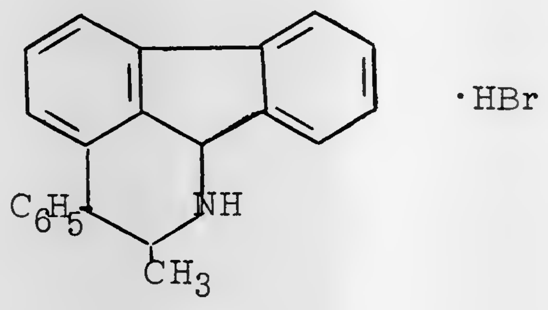
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,478

Int. Cl.² C07D *217/02*

U.S. Cl. 260—286 R **1 Claim**

1. A compound of the formula:



3,971,789
O-(4-QUINOLYLAMINO)BENZAMIDES

John Leheup Archibald, Windsor; John Terence Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Taplow, England

Continuation-in-part of Ser. No. 334,799, Feb. 22, 1973, Pat. No. 3,875,165. This application Jan. 23, 1975, Ser. No. 543,218

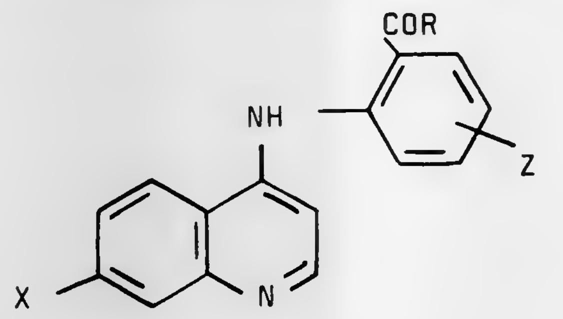
Claims priority, application United Kingdom, Oct. 21, 1972, 48593/72; Feb. 5, 1973, 5531/73

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

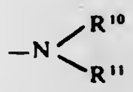
Int. Cl.² C07D *215/44, 401/12*

U.S. Cl. 260—286 R **4 Claims**

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein X is selected from halogen and trifluoromethyl; Z is selected from the group consisting of hydrogen, halogen and lower alkyl; and R is selected from di(lower alkyl)aminopiperidino and a group having the formula



$$-N(R^{10})R^{11}$$

wherein R^{10} is selected from hydrogen and lower alkyl and R^{11} is selected from di(lower alkyl)amino(lower alkyl) and 1-(lower alkyl)piperidinyl.

3,971,790
2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

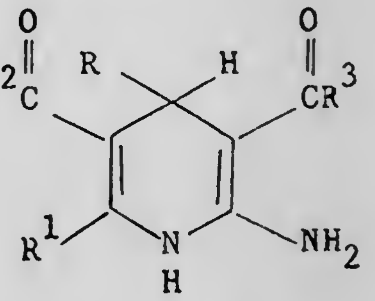
Division of Ser. No. 438,603, Feb. 1, 1974, Pat. No. 3,929,798, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application May 5, 1975, Ser. No. 574,347

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D *215/32, 401/04*

U.S. Cl. 260—287 K **6 Claims**

1. A compound of the formula:



wherein

R is quinolyl, isoquinolyl or pyridyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

R^1 and R^2 together are alkylene of 2 to 4 carbon atoms; and

R^3 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

3,971,791
2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

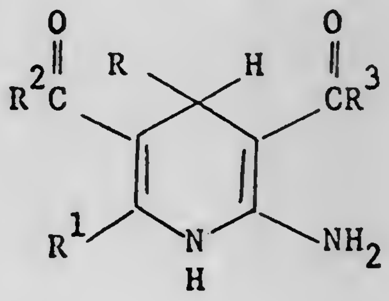
Division of Ser. No. 438,603, Feb. 1, 1974, Pat. No. 3,929,798, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application May 6, 1975, Ser. No. 575,018

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D *215/32, 405/04, 409/04*

U.S. Cl. 260—287 K **4 Claims**

1. A compound of the formula:



wherein

R is thienyl or furyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

R^1 and R^2 together are alkylene of 2 to 4 carbon atoms; and

R^3 lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

3,971,792
PROCESS FOR THE MANUFACTURE OF 4-AMINO-3-AMINOMETHYLPIPERIDINE

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Constance, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

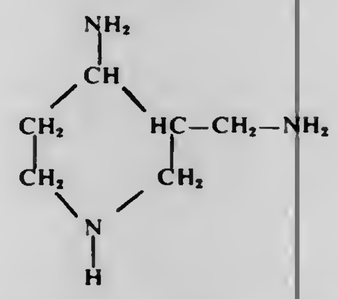
Continuation-in-part of Ser. No. 316,308, Dec. 18, 1972, abandoned, which is a division of Ser. No. 125,382, March 17, 1971, Pat. No. 3,717,593. This application June 10, 1974, Ser. No. 477,890

Claims priority, application Switzerland, Mar. 23, 1970, 4337/70

Int. Cl.^{2} C07D *211/98*

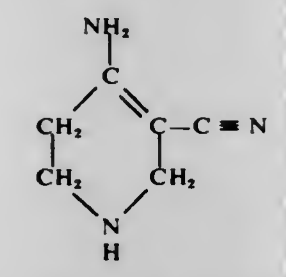
U.S. Cl. 260—293.52 **8 Claims**

1. In a process for the manufacture of 4-amino-3-aminomethyl-piperidine of the formula



(I)

by reduction of 4-amino-3-cyano-1,2,5,6-tetrahydropyridine of the formula



(II)

the improvement comprising hydrogenating said 4-amino-3-cyano-1,2,5,6-tetrahydropyridine under pressure and in the presence of ammonia and a hydrogenation catalyst.

3,971,793
CERTAIN 6-(DIALKYLAMINO, PYRROLIDINO AND PIPERIDINO)ETHOXY-4,7-DIMETHOXY-5-(3-PHENYL-1-HYDROXYPROPYL)2,3-DIHYDROBENZOFURANS

Claude P. Fauran, Paris; Jeannine A. Eberle, Chatou; Guy R. Bourgery, Colombes; Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon la Foret, all of France, assignors to Delalande S.A., Courbevoie, France

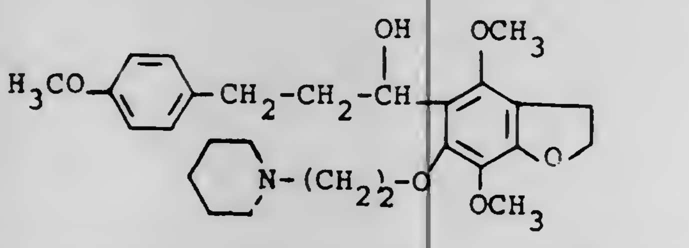
Continuation-in-part of Ser. No. 274,997, July 25, 1972, Pat. No. 3,850,937. This application Feb. 1, 1974, Ser. No. 438,744

Claims priority, application France, Feb. 12, 1973, 73.04872

Int. Cl.^{2} C07D *211/22, 307/86*

U.S. Cl. 260—293.58 **8 Claims**

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof.

3,971,794
THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

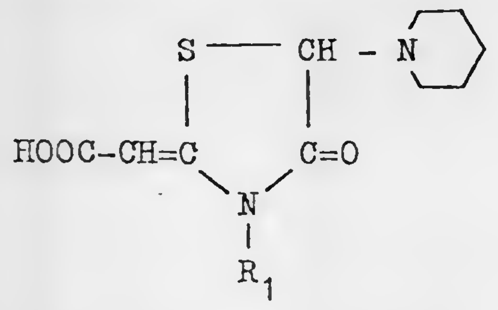
Filed Feb. 27, 1975, Ser. No. 553,715

Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.^{2} C07D *295/12*

U.S. Cl. 260—293.68 **8 Claims**

1. A thiazolidinone-acetic acid derivative of the formula:



wherein R_1 is a lower alkyl radical containing 1 to 4 carbon atoms or a physiologically compatible salt thereof.

3,971,795
PIPERIDINE DERIVATIVES

Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

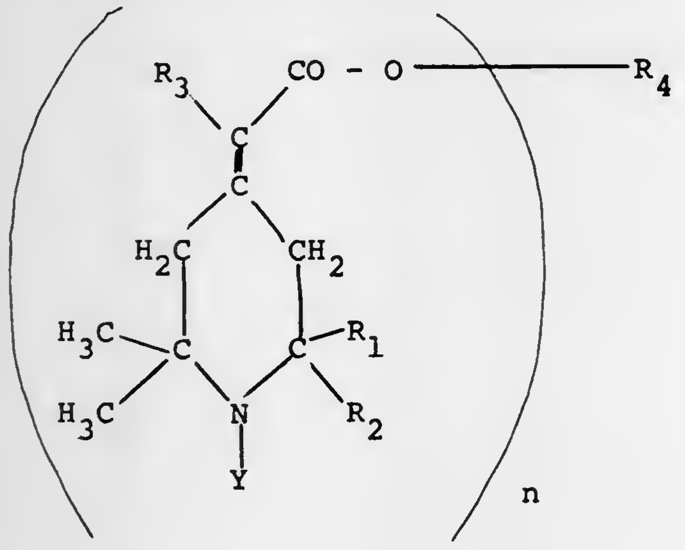
Filed July 17, 1973, Ser. No. 380,041

Claims priority, application United Kingdom, July 28, 1972, 35486/72

Int. Cl.^{2} C07D *211/30*

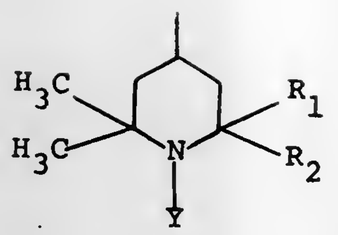
U.S. Cl. 260—293.88 **11 Claims**

1. A compound of the formula



wherein

- n is 1, 2, 3 or 4,
- Y is hydrogen or a straight- or branched alkyl residue having from 1 to 12 carbon atoms, an alkenyl residue having from 3 to 12 carbon atoms or an aralkyl residue having from 7 to 12 carbon atoms,
- R_1 and R_2 are the same or different and each is a straight- or branched alkyl residue having from 1 to 12 carbon atoms or R_1 and R_2, together with the carbon atom to which they are attached, form a cycloalkyl group having from 5 to 12 carbon atoms,
- R_3 is hydrogen or a straight- or branched alkyl residue having from 1 to 4 carbon atoms,
- R_4 is a hydrocarbyl residue having from 1 to 20 carbon atoms, or, when n is 1, R_4 is, in addition, hydrogen or has the structure:



wherein Y, R_1 and R_2 are as defined above.

3,971,796
1,4-DIHYDROPYRIDINE ESTERS

Friedrich Bossert, Wuppertal; Egbert Wehinger, Neviges; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

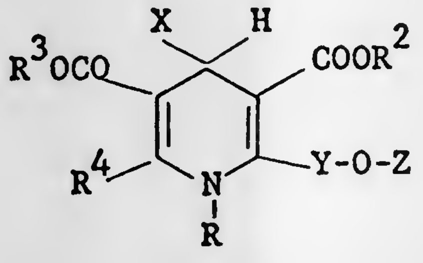
Continuation of Ser. No. 485,300, July 2, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 609,153

Claims priority, application Germany, July 12, 1973, 2335466

Int. Cl.^{2} C07D *213/55*

U.S. Cl. 260—294.8 F **20 Claims**

1. A compound selected from the group consisting of a dihydropyridine of the formula:



and the pharmaceutically acceptable nontoxic salts thereof, wherein

- Y is alkylene of 1 to 4 carbon atoms;
- Z is alkyl of 1 to 4 carbon atoms;
- R is hydrogen, alkyl of 1 to 4 carbon atoms, or alkenyl of 2 to 4 carbon atoms;
- each of R^2 and R^3, independent of the other, is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms or cycloalkyl of 3 to 10 carbon atoms;
- R^4 is hydrogen, alkyl of 1 to 6 carbon atoms or Z—O—Y— wherein Z and Y are as defined above; and
- X is phenyl or naphthyl, unsubstituted or substituted by one or two members independently selected from the group consisting of halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, cyano, nitro, azido, phenyl, hydroxy, amino, alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, acetamido, propionamido, acetoxy, propionyloxy, methyl-$S(O)_m$ or ethyl-$S(O)_m$ in which m is 0, 1 or 2.

3,971,797
S,S′-BIS(PYRIDYLMETHYL)-CARBONODITHIOATES

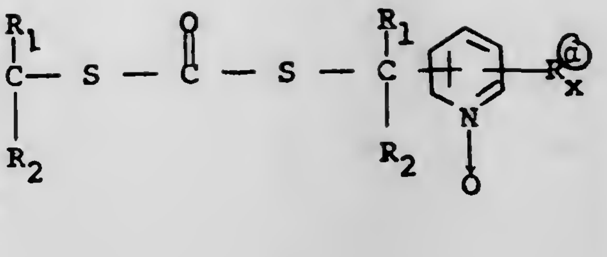
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel; Dennis M. Mulvey, Milford, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 368,774, June 15, 1973, abandoned. This application May 16, 1974, Ser. No. 470,231

Int. Cl.^{2} C07D *213/59*

U.S. Cl. 260—294.8 E **3 Claims**

1. A compound of structural formula:



or pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, C_{1-3} alkyl, or phenyl; R_2 is hydrogen or C_{1-3} alkyl; m is 0 or 1; x is an integer from 0–4, and R is

1. 3 or 5 hydroxy,
2. 3, 5, or 6 C_{1-3} alkoxy,
3. 2, 3, 4, 5, or 6 C_{1-5} alkyl,
4. 2, 3, 4, 5, or 6 mercapto-C_{1-3} alkyl, or
5. 4 or 5 hydroxy-C_{1-3} alkyl.

3,971,798
PYRIDINE DERIVATIVE, PROCESSES OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Daniel Humbert, Paris, and Roger Ratouis, Saint-Cloud, both of France, assignors to Roussel-UCLAF, Paris, France

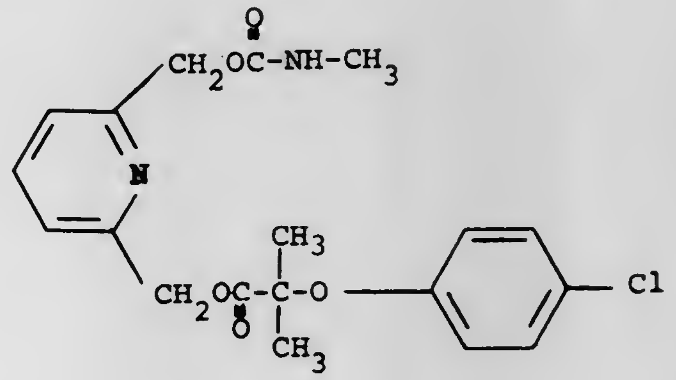
Filed July 2, 1974, Ser. No. 485,244

Claims priority, application France, July 5, 1973, 73.24737

Int. Cl.^{2} C07D *213/24*

U.S. Cl. 260—295 CA **3 Claims**

1. The 2-(p-chlorophenoxy) 2,2-dimethylacetate of 6′-(N-methylaminocarbonyloxymethyl) 2′-pyridyl methyl of the formula:



or a non-toxic acid addition salt thereof.

3,971,799
PREPARATION OF 3,5,6-TRICHLOROPICOLINIC ACID

Stanley D. McGregor, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,054

Int. Cl.^{2} C07D *213/26*

U.S. Cl. 260—295 R **7 Claims**

1. A process of preparing 3,5,6-trichloropicolinic acid which comprises:

a. reacting, by contacting under reflux conditions for from about 15 minutes to about 2 hours, stoichiometric proportions of tetrachloropicolinic acid and hydrazine in the presence of an excess of an alkali metal reaction medium in water;

b. reacting, by contacting for about 5 minutes to about 1 hour, the thus formed 3,5,6-trichloro-4-hydrazinopicolinic acid intermediate with from about a 10 to 20 percent excess of an alkaline hypochlorite in the presence of an aqueous alkali metal hydroxide; and

c. acidifying the reaction mixture to a pH of about 2 with a mineral acid and recovering the 3,5,6-trichloropicolinic acid product.

3,971,800

DERIVATIVES OF 1H-TRIAZOLO[4,5-c]PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

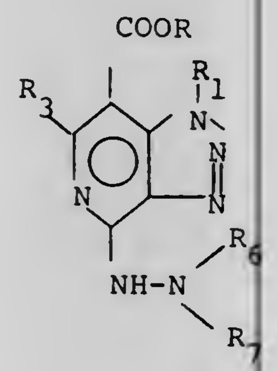
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 471,537, May 20, 1974, Pat. No. 3,929,812. This application Sept. 10, 1975, Ser. No. 612,060

Int. Cl.^{2} C07D *213/55*

U.S. Cl. 260—295.5 B **4 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl; and R_3, R_6 and R_7 each is hydrogen, lower alkyl or phenyl.

3,971,801

DERIVATIVES OF 1H-TRIAZOLO[4,5-c]PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

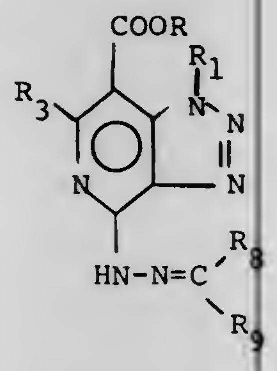
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 471,537, May 20, 1974, Pat. No. 3,929,812. This application Sept. 10, 1975, Ser. No. 612,061

Int. Cl.^{2} C07D *213/55*

U.S. Cl. 260—295.5 B **4 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl; R_3 and R_8 each is hydrogen, lower alkyl or phenyl; and R_9 is lower alkyl or phenyl.

3,971,802

CERTAIN N'-ALKYL-N'-(2'-ALKOXYCARBONYLBENZENESULFONYL)-N-(2-THIAZOLYL)GLYCINEAMIDES

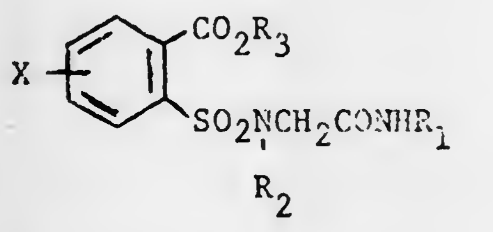
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 462,212, April 19, 1974, Pat. No. 3,927,002, which is a division of Ser. No. 353,607, April 23, 1973, Pat. No. 3,853,862. This application Apr. 4, 1975, Ser. No. 565,230

Int. Cl.^{2} C07D *277/46*

U.S. Cl. 260—306.8 R **3 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of; 2-thiazolyl and 4,5-dimethyl-2-thiazolyl;

R_2 is alkyl having from 1 to 3 carbon atoms;

X is selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro and bromo and

R_3 is alkyl having from 1 to 3 carbon atoms.

3,971,803

3-HYDROXYBENZYL-OXADIAZOLONE AND -THIADIAZOLONE DERIVATIVES

Siegfried Rosenberger, Riehen, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

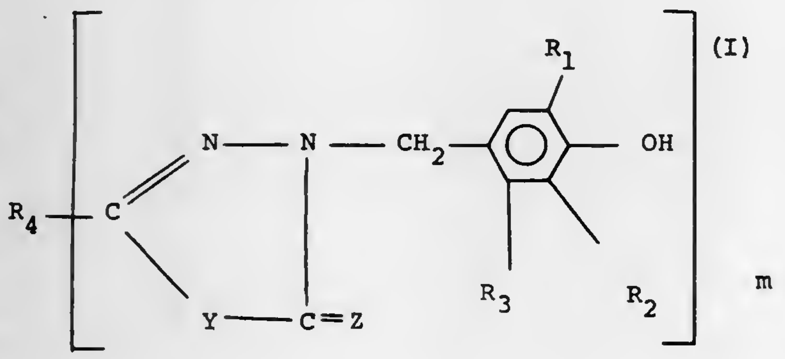
Filed May 15, 1974, Ser. No. 469,988

Claims priority, application Switzerland, May 21, 1973, 7190/73

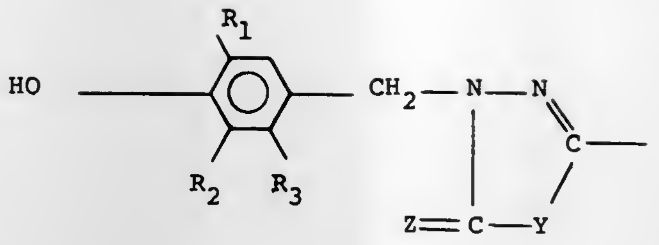
Int. Cl.^{2} C07D *271/10*

U.S. Cl. 260—307 A **6 Claims**

1. A compound of the formula



wherein R_1 is alkyl with 1 to 8 carbon atoms, R_2 is hydrogen or alkyl with 1 to 8 carbon atoms, R_3 is hydrogen or methyl, R_4, if *m* = 1, is hydrogen; alkyl with 1 to 18 carbon atoms; a group of the formula $C_xH_{2x+1}—Q—C_yH_{2y}—$, wherein Q is an oxygen or sulphur atom and *x* and *y* are integers of which the sum is 2 to 20; cyclohexyl, cyclooctyl, or methylcyclohexyl; alkylthio or alkyloxy with 1 to 18 carbon atoms; benzyl, phenylethyl, phenylpropyl, diphenylmethyl, benzyl; phenylethyl or phenylpropyl substituted by up to 2 alkyls of 1 to 4 carbon atoms each and/or by hydroxyl; unsubstituted phenyl or naphthyl; phenyl substituted by up to 2 substituents selected from halogen, hydroxyl, alkyl with up to 12 carbon atoms, alkoxy with 1 to 12 carbon atoms, or alkoxycarbonyl with 2 to 5 carbon atoms; or a group



wherein R_1, R_2 and R_3 have the above meaning and *y* and *z* independently of one another are oxygen or sulphur, or, if *m*=2, R_4 is alkylene of 1 to 8 carbon atoms, a group of the formula $—C_xH_{2x}—Q—C_yH_{2y}—$, wherein Q is an oxygen or suphur atom and *x* and *y* are integers of which the sum is 2 to 4, phenylene, diphenylene, or naphthylene, Y and Z independently of one another are oxygen or sulphur and *m* is the number 1 or 2.

3,971,804

BIS-TRIFLUORO METHYL-IMINO-IMIDAZOLONES

Arno Widdig, Blecher; Ingeborg Hammann, Cologne, and Helmut Kaspers, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

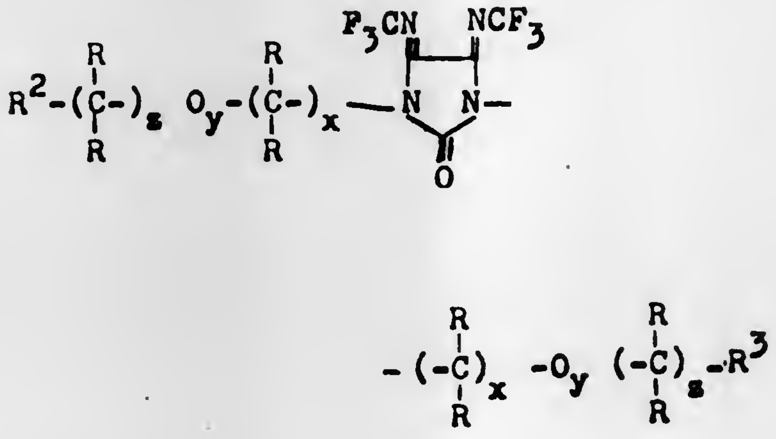
Filed Jan. 21, 1975, Ser. No. 542,885

Claims priority, application Germany, Jan. 24, 1974, 2403224

Int. Cl.^{2} C07D *49/34*

U.S. Cl. 260—309.7 **14 Claims**

1. A bis-trifluoromethyl-iminoimidazolone of the formula



in which

each R independently is hydrogen or methyl,

R^2 is a radical selected from the group consisting of bridged hydrocarbon rings; fused hydrocarbon rings; directly linearly linked hydrocarbon rings; hydrocarbon rings linked through oxygen, alkylene, oxyalkylene or alkylenoxyalkylene; and substitution products of any of the foregoing with halogen, alkyl or alkoxy with 1 to 4 carbon atoms; said radicals comprising at least two hydrocarbon rings, at least one of which is non-aromatic;

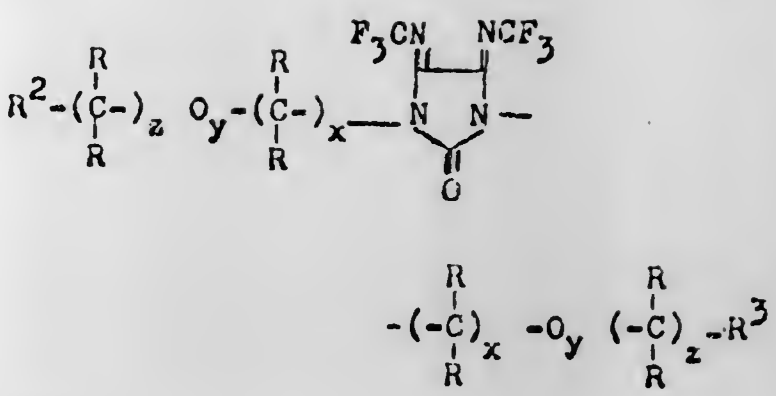
R^3 is hydrogen or a radical selected from the group consisting of alkyl, alkenyl or alkynyl with up to 8 carbon atoms; substitution products of any of the foregoing with halogen or alkoxy with 1 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; cycloalkyl with 5 to 7 carbon atoms and substituted by alkyl with 1 to 4 carbon atoms; phenylalkyl with up to 4 carbon atoms in the alkyl part; phenyl; substitution products of these phenylalkyl and phenyl radicals with halogen, alkyl, haloalkyl or alkoxy with 1 to 4 carbon atoms; and any of the radicals listed under R^2;

each *x* independently is an integer from 0 to 4,

each *y* independently is 0 or 1 except that y must be 0 if *x* is 0, and

each *z* independently is an integer from 0 to 4.

14. A process for the preparation of a bis-trifluoromethyl-imino-imidazolone of the formula



in which

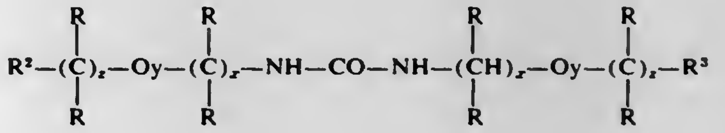
each R independently is hydrogen or methyl,

R^2 is a radical selected from the group consisting of bridged hydrocarbon rings; fused hydrocarbon rings; directly linearly linked hydrocarbon rings; hydrocarbon rings linked through oxygen, alkylene, oxyalkylene or alkylenoxyalkylene; and substitution products of any of the foregoing with halogen, alkyl or alkoxy with 1 to 4 carbon atoms; said radicals comprising at least two carbon rings, at least one of which is non-aromatic;

R^3 is hydrogen or a radical selected from the group consisting of alkyl, alkenyl or alkynyl with up to 8 carbon atoms; substitution products of any of the foregoing with halogen or alkoxy with 1 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; cycloalkyl with 5 to 7 carbon atoms and subsituted by alkyl with 1 to 4 carbon atoms; phenylalkyl with up to 4 carbon atoms in the alkyl part; phenyl; substitution products of these phenylalkyl and phenyl radicals with halogen, alkyl, haloalkyl or alkoxy with 1 to 4 carbon atoms,

each *x* independently is an integer from 0 to 4, each *y* independently is 0 or 1 except that *y* must be 0 if *x* is 0, and

each *z* independently is an integer from 0 to 4, by mixing a urea of the formula



$$R^2—(\underset{R}{\overset{R}{C}})_z—Oy—(\underset{R}{\overset{R}{C}})_x—NH—CO—NH—(\underset{R}{\overset{R}{CH}})_x—Oy—(\underset{R}{\overset{R}{C}})_z—R^3$$

in the presence of a hydrogen fluoride acceptor at a temperature of about −50°C to +120°C with N,N'-bis-(trifluoromethyl)tetrafluoro-ethylene-1,2-diamine which in situ generates perfluoro-2,5-diazahexa-2,4-diene of the formula

TI $F_3C—N=CF—CF=N—CF_3$

which reacts with the urea.

3,971,805

IMINOISOINDOLINONE PIGMENTS AND PROCESS FOR THEIR MANUFACTURE

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

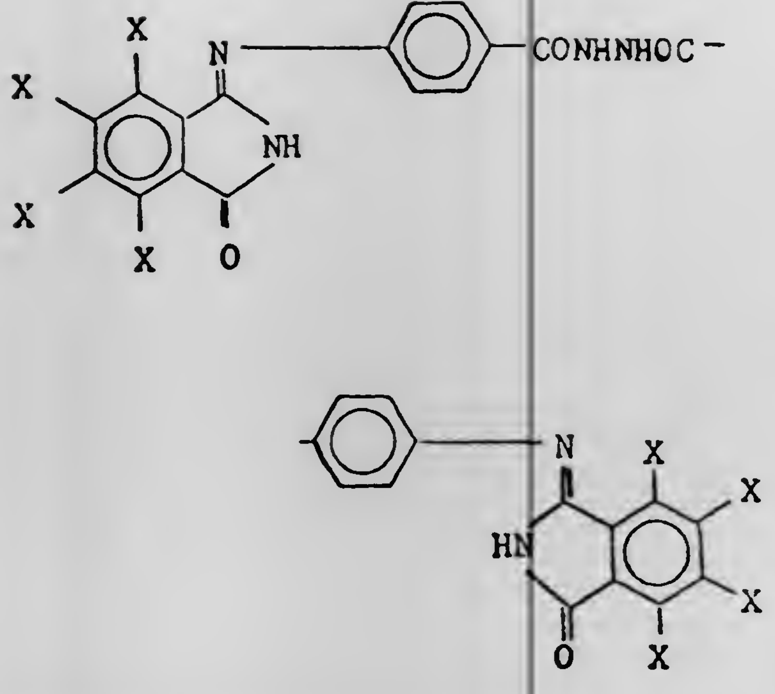
Filed Apr. 17, 1975, Ser. No. 569,041

Claims priority, application Switzerland, Apr. 30, 1974, 5909/74

Int. Cl.^{2} C07D *209/46*

U.S. Cl. 260—325 PH **2 Claims**

1. An iminoisoindolinone pigment of the formula



wherein the X denote chlorine or bromine atoms.

3,971,806
INDOLOTHIOPYRONES

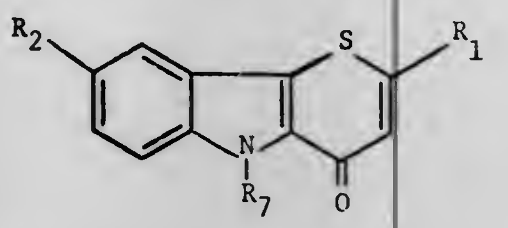
Richard E. Brown, East Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 9, 1974, Ser. No. 468,349

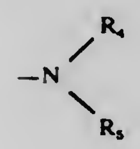
Int. Cl.² C07D *513/02*

U.S. Cl. 260—326.28 **16 Claims**

1. A compound of the formula IX:

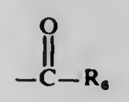


wherein R_1 **is hydrogen**, 1 to 4 carbon lower alkyl or phenyl; R_2 is hydrogen or halogen; and R_7 is hydrogen, 1 to 4 carbon lower alkyl, 3 to 4 carbon lower alkenyl, 3 to 4 carbon lower alkynyl, nitro-substituted-phenyl, or ω-substituted 1 to 4 carbon lower alkyl wherein the substituent is:



$$-N\begin{matrix}R_4\\ \\ R_5\end{matrix}$$

—COOH, or



$$-\overset{\overset{\displaystyle O}{\|}}{C}-R_6$$

wherein R_4 and R_5 each represent hydrogen or 1 to 4 carbon lower alkyl; and R_6 is 1 to 4 carbon lower alkoxy or amino.

3,971,807
CATIONIC DYESTUFFS

Alfred Brack, Odenthal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

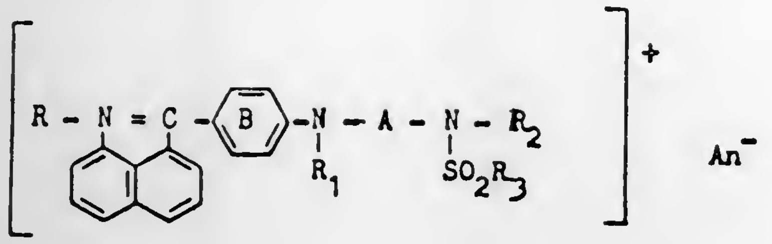
Filed Dec. 6, 1974, Ser. No. 530,444

Claims priority, application Germany, Dec. 6, 1973, 2360876

Int. Cl.² C07D *209/56*

U.S. Cl. 260—326.9 **7 Claims**

1. Dyestuff of the formula



in which

R is C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6 -haloalkenyl, ethylene bonded to the β-position of the naphthalene ring, or C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide;

R_1 is hydrogen, C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6-haloalkeny alkylene selected from the group consisting of $-CH_2-CH_2-(CH_2)_3-CH_2-CH(CH_3)-CH(CH_3-$, and $-CH_2-CH_2-CH(CH_3)-$ bonded to ring B in the 0-position or C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide;

R_2 is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkyl substituted by halogen or C_1–C_4-alkoxy, C_3–C_6-alkenyl, C_3–C_6-haloalkenyl, cyclopentyl, cyclohexyl, halocyclopentyl, halocyclohexyl, C_1–C_4-alkylcyclopentyl, C_1–C_4-alkylcyclohexyl, phenyl, halophenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, nitrophenyl, cyanophenyl, pyridinyl pyrimidinyl, triazinyl, triazolyl, thiazolyl, imidazolyl, tetrazolyl, benzyl, 2-phenylethyl, 2-phenylpropyl-(2) or any of said benzyl, 2-phenylethyl, or 2-phenylpropyl-(2) substituted in the phenyl nucleus by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_3 is C_1–C_6-alkyl, C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide, C_3–C_6-alkenyl, C_3–C_6-haloalkenyl, cyclopentyl, cyclohexyl, halocyclopentyl, halocyclohexyl, C_1–C_4-alkylcyclopentyl, C_1–C_4-alkylcyclohexyl, phenyl, halophenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, nitrophenyl, cyanophenyl, pyridinyl, pyrimidinyl, triazinyl, triazolyl, thiazolyl, imidazolyl, tetrazolyl, di-C_1–C_4-alkylamino, morpholino, piperidino, piperazino, benzyl, 2-phenylethyl, 2-phenylpropyl-(2) or any of said benzyl, 2-phenylethyl, or 2-phenylpropyl-(2) substituted in the phenyl nucleus by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_2 and R_3, additionally maY be joined together to form a cyclic sulphonamido;

A is C_2–C_4-alkylene;

An $^{(-)}$is an anion;

Ring B may be fused to another benzene ring; and the cyclic and acyclic radicals in the above formula may be further substituted by C_1–C_4-alkoxy, β-methoxyethoxy, β-cyanoethoxy, allyloxy, halogen, amino, C_1–C_4-alkylamino, benzylamino, acetylamino, methylsulphonylamino, phenylsulphonylamino, dimethylamino, phenylamino, methylsulphonyl, phenylsulphonyl, methoxycarbonyl, ethoxycarbonyl, carbamoyl, or cyano, and the cyclic radicals may additionally be substituted by C_1–C_4-alkyl.

3,971,808
SPIRODIPYRANS AND CHROMOGENIC MATERIALS FOR COPYING PROCESSES

Hans Baumann, and Andreas Oberlinner, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

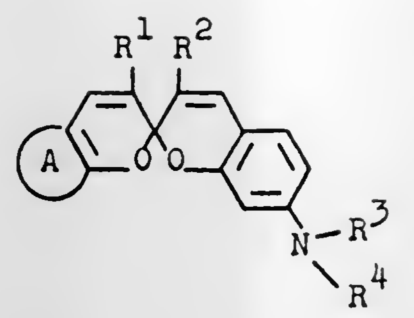
Filed May 7, 1974, Ser. No. 467,829

Claims priority, application Germany, May 11, 1973, 2323803

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **6 Claims**

1. A spirodipyran of the formula



in which

A is an unsubstituted benzene or (2,1-b)-naphthalene nucleus, or a benzene or a (2,1-b)-naphthalene nucleus substituted by one chloro, bromo, methoxy, ethoxy or carbalkoxy containing a C_1 to C_4 alkoxy,

R^1 is phenyl, phenyl substituted by chloro, bromo or alkyl of from 1 to 4 carbon atoms,

R^2 is hydrogen, alkyl of from 1 to 8 carbon atoms or phenyl, and

R^3 and R^4 are methyl, ethyl or propyl.

3,971,809
3A,4,7,7A-TETRAHYDRO-4-PHENYLETHYL-7A-ALKYL-5(6H)-INDANONES AND PROCESS FOR THE PREPARATION THEREOF

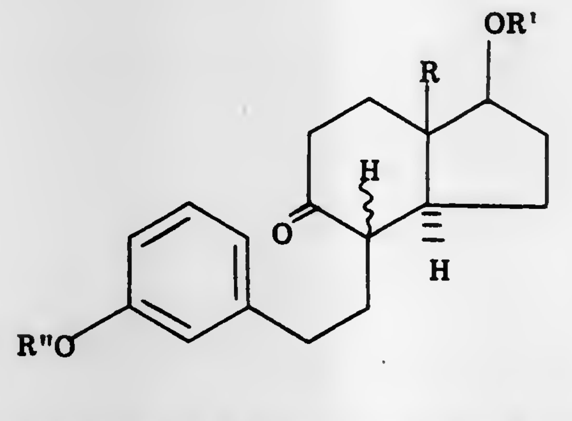
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 375,558, July 2, 1973, Pat. No. 3,856,864, which is a continuation-in-part of Ser. No. 295,032, Oct. 4, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,261

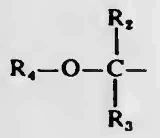
Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.9 **2 Claims**

1. A compound of the formula



wherein R is lower alkyl, R′ is a group of the formula



$$R_4-O-\underset{\displaystyle R_3}{\overset{\displaystyle R_2}{C}}-$$

wherein R_2 is hydrogen, R_3 and R_4 taken together are lower alkylene of 4 carbon atoms and R″ is lower alkyl.

3,971,810
SOLID PESTICIDAL CHLORINATED PHENOLIC CONCENTRATES

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 423,457, Dec. 10, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,502

Int. Cl.² A01N *9/26*

U.S. Cl. 424—347 **5 Claims**

1. A pesticidal chlorinated phenolic concentrate in the form of a solid homogeneous mixture prepared by:

heating an aromatic hydrocarbon carrier to its melting point, said carrier being a solid at temperatures in the range of from about 0° to 50°C;

dissolving a chlorinated phenolic derivative in the melted carrier, said chlorinated phenolic derivative being a solid at temperatures in the range of from about 0° to 50°C; and

cooling the resultant mixture to form said concentrate;

said concentrate comprising from about 1 to 75 weight percent of said chlorinated phenolic derivative and 99 to 25 weight percent of said carrier.

3,971,811
5-(4-CHLOROPHENYL)-2-FURYL PHENYL KETONE

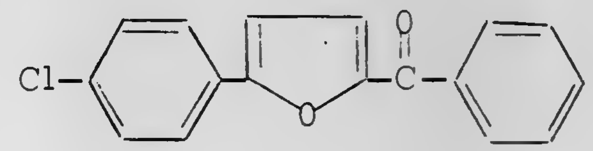
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 16, 1975, Ser. No. 586,874

Int. Cl.² C07D *307/46*

U.S. Cl. 260—347.8 **1 Claim**

1. The compound 5-(4-chlorophenyl)-2-furyl phenyl ketone of the formula:



3,971,812
ANTHRAQUINONE DYESTUFFS

Walter Hohmann; Klaus Wunderlich, both of Leverkusen, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 49,526, June 24, 1970, Pat. No. 3,686,232. This application Aug. 11, 1972, Ser. No. 279,756

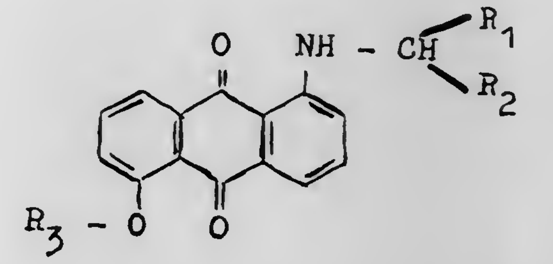
Claims priority, application Germany, June 27, 1969, 1932646; Mar. 23, 1970, 2013789; Mar. 23, 1970, 2013790

The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

Int. Cl.² C09B *1/512, 1/515*

U.S. Cl. 260—380 **5 Claims**

1. A compound of the formula



in which R_1 and R_2 are C_1–C_3-alkyl or C_1–C_3 alkyl substituted by chloro, bromo, hydroxy or cyano; and

R_3 is hydrogen; C_1–C_5-alkyl; or C_1–C_5 alkyl substituted with hydroxy, lower alkoxy, or lower alkoxy lower alkoxy.

3,971,813
GLYCIDYL COMPOUNDS CONTAINING PHOSPHORUS

Daniel Porret, Binningen; Jürgen Habermeier, Pfeffingen, and Dieter Baumann, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,835

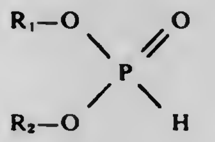
Claims priority, application Switzerland, Oct. 13, 1972, 15041/72

Int. Cl.² C07D *233/02*

U.S. Cl. 260—309.5 **3 Claims**

1. An adduct prepared by reacting a hydantoin compound selected from the group consisting of 1,3-diglycidyl-5,5-dime-

thylhydantoin, the triglycidyl compound produced from 1,3-bis-(5,5-dimethylhydantoinyl-3)-propan-2-ol, 1-(glycidyloxymethyl)-3-glycidyl-5,5-dimethylhydantoin, 1,3-diglycidyl-5,5-pentamethylenehydantoin, bis-(3-glycidyl-5,5-dimethylhydantoinyl-1)-methane and 1,3-diglycidyl-5,5-dimethylhydantoin, and a compound of the formula I



(I)

wherein R_1 and R_2 each represent an alkyl of 1 to 4 carbon atoms, monochloroethyl or together form an alkylene of to 5 carbon atoms, wherein said adduct contains from 1 to 8% phosphorus and has an epoxide content between 1 to 6 equivalents/kg.

3,971,814
BENZO(b)THIOPHENE DERIVATIVES

Peter Johannes Stoss, Wildtal; Manfred Franz Reinhold Herrmann, Gundelfingen, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

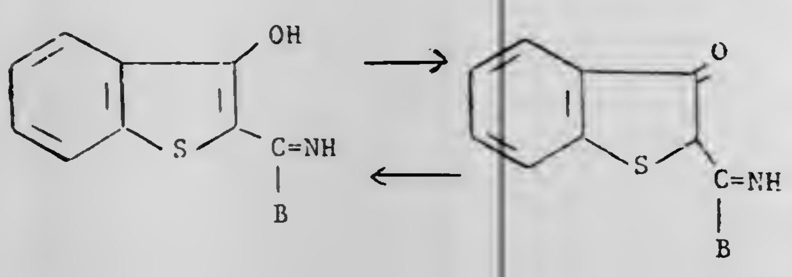
Division of Ser. No. 419,305, Nov. 27, 1973, Pat. No. 3,907,826. This application Apr. 9, 1975, Ser. No. 566,469

Claims priority, application Germany, Nov. 27, 1972, 2258036

Int. Cl.² C07D *333/64*

U.S. Cl. 260—330.5 **20 Claims**

1. Novel benzo(b)thiophene compounds of the formula:



wherein B is selected from the group consisting of:

$—NH_2$,
$—NH\text{-}CH_2—CH_3$,
$—N\text{-}(CH_2\text{-}CH_3)_2$,
$—NH\text{-}CH_2—CH_2\text{-}CH_2—CH_3$,
$——NH\text{-}(CH_2)_2—OH$,
$—NH\text{-}(CH_2)_2—OCH_3$,
$—NH\text{-}(CH_2)_2—OCH_2—CH_3$,
$—NH\text{-}(CH_2)_3—OCH_3$,
$—NH\text{-}(CH_2)_3—oc_2H_5$,
$—NH\text{-}(CH_2)_3\text{-}O\text{-}CH(CH_3)_2$,
$—NH\text{-}(CH_2)_3—O\text{-}C_4H_9$, and
$—NH\text{-}(CH_2)_3—O—CH_2CH(CH_3)_2$.

3,971,815
ACID MIX PROCESS

John A. Sagel, Mount Healthy, Ohio, and Clarence Edward Weber, Cold Spring, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 13, 1974, Ser. No. 523,390

Int. Cl.² C11D *1/12, 1/28*

U.S. Cl. 260—400 **15 Claims**

1. In the process of sulfating an organic detergent precursor the steps including contacting the detergent precursor with a sulfating agent, the improvement thereon comprising carrying out the reaction in the presence of an effective amount of benzoic acid to lower the acid mix viscosity.

3,971,816
ESTERS OF CARBOXYLIC ACIDS FORMALLY SUBSTITUTED BY SODIUM OR POTASSIUM IN THE ALPHA-POSITION AND THE METHOD FOR THEIR PREPARATION

Lubomir Lochmann, and Jiri Trekoval, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 21, 1974, Ser. No. 525,855

Claims priority, application Czechoslovakia, Nov. 26, 1973, 8135-73; Sept. 4, 1974, 6085-74

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.9 R **8 Claims**

1. Esters of carboxylic acids substituted with sodium or potassium initially in the alpha-position of the general formula I

$$R^1R^2CMCOOR^3 \qquad (I)$$

where

R^1 is phenyl or tolyl,
R^2 is alkyl with 1 to 6 carbon atoms in the straight or branched chain
R^3 is alkyl with 1 to 12 carbon atoms in the straight or branched chain,
M is sodium or potassium.

3,971,817
PROCESS FOR THE MANUFACTURE OF MONOMETHYL-TIN TRICHLORIDE

Hans Wolf Jung, Anderten; Rudolf Maul, Lorsch, Hesse; Siegfried Kintopf, Bensheim, Bergstrasse; Wilfried Kloss, Kolmback uber Bensheim, and Reinhard Knapp, Heppenheim, Bergstrasse, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,357

Claims priority, application Switzerland, Aug. 16, 1973, 11804/73

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **14 Claims**

1. Process for the manufacture of monomethyl-tin trichloride b disproportionation of dimethyl-tin dichloride and tin tetrachloride at temperatures between 80°C and 200°C, in the presence of catalysts, characterised in that 0.1 to 20% by weight, relative to the quantity of the starting components, of a compound, or a mixture of compounds, of the formula I

$$R_aEX_b \qquad (I)$$

wherein E represents nitrogen, phosphorus, arsenic or antimony, X represents chlorine, bromine or iodine, R denotes identical or different, linear or branched, alkyl groups with 1 to 18 carbon atoms, *a* represents the numbers 3 or 4, and *b* represents the numbers 0 or 1 or 2, and the sum of *a* and *b* is equal to 3 or 5 and, if E represents nitrogen, *b* can only denote 1, is employed as the catalyst.

3,971,818
METHOD OF PREPARING OLEFINIC SILOXANE BY GLC

Chi-Long Lee, and Ollie W. Marko, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1974, Ser. No. 528,959

Int. Cl.² C07F *7/08, 7/18*

U.S. Cl. 260—448.2 E **9 Claims**

1. A method of reacting an acetylenic alcohol with a siloxane compound having at least three silicon-bonded hydrogen atoms bonded to at least three different silicon atoms in the presence of a platinum catalyst to provide an olefinic siloxane compound wherein the olefinic siloxane compound is an inhibitor for the platinum catalyst

comprising coating the inside of an injection port of a gas liquid chromatographic column with a layer of a platinum catalyst, heating the injection port to a temperature of from 300°C. to 375°C. and the column at a temperature from 100°C. to 375°C., injecting into the heated injection port and column a mixture of the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms with an inert carrier gas where residence times in said injection port are from 0.5 to 10 seconds and collecting from said column an olefinic siloxane compound which is, below 100°C., an inhibitor for the reaction betwen the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms in the presence of a platinum catalyst.

3,971,819
3-AMINO, 4-THIO-SUBSTITUTED, 5-SULPHAMYL-BENZOIC ACID DERIVATIVES

Peter Werner Feit, Gentofte, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

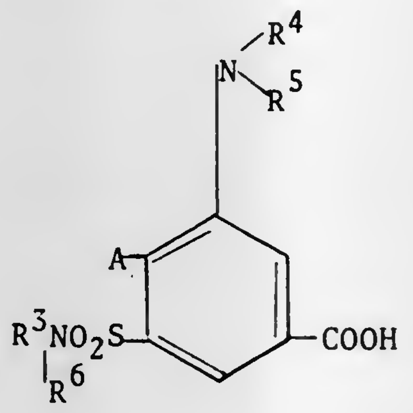
Division of Ser. No. 887,409, Dec. 22, 1969, Pat. No. 3,806,534. This application Nov. 15, 1973, Ser. No. 416,163

Claims priority, application United Kingdom, Dec. 24, 1968, 61339/68; June 18, 1969, 38038/69; July 29, 1969, 30898/69

Int. Cl.² C07C *149/20, 149/40, 121/78*

U.S. Cl. 260—465 D **3 Claims**

1. A compound of the formula



in which A is R^2 — S —, R^2, R^3, and R^4 are saturated or unsaturated aliphatic hydrocarbon radicals having from 1 to 7 carbon atoms, cycloalkyl and cycloalkenyl radicals having from 3-8 carbon atoms, phenyl-lower alkyl radicals having from 7 to 10 carbon atoms or cycloalkyl — lower alkyl radicals having from 4 to 12 carbon atoms, R^2 and R^3 may also be mono- or bi-cyclic carbocyclic aryl radicals, R^5 is a lower alkyl radical, R^6 is a lower alkyl radical or a lower alkanoyl groups, R^3, R^4, R^5 and R^6 may also be a hydrogen atom, R^2 may also be substituted with chlorine, fluorine, methyl, trifluoromethyl, carboxy, carbethoxy, dimethyl amino, hydroxy, methoxy, benzyloxy, or sulfamyl groups and R^4 may be substituted with chlorine, methyl, and methoxy groups; pharmaceutically acceptable salts thereof, and esters thereof with lower alkanols, phenol, cyanomethanol or benzyl alcohol.

3,971,820
PROCESS FOR THE PRODUCTION OF DIAMINOMALEONITRILE

Tatsumi Kobayashi, Kurashiki; Eiji Nishiwaki, Arai; Shigeharu Yamazoe, Tokyo; Mitsuyuki Hoshino, Urawa; Sadafumi Yoshino, and Katsunori Mikuma, both of Kurashiki, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 400,858, Sept. 26, 1973. This application Nov. 25, 1974, Ser. No. 526,631

Claims priority, application Japan, Nov. 30, 1973, 48-133596

Int. Cl.² C07C *120/00, 121/30*

U.S. Cl. 260—465.5 R **11 Claims**

1. In a process for the production of diaminomaleonitrile by tetramerization of hydrogen cyanide in the presence of a basic catalyst selected from the group consisting of alkalimetal cyanide, alkalimetal hydroxide, ammonia and alkylamines, the improvement therein which comprises tetramerizing hydrogen cyanide in the liquid phase at a temperature in the range of −20° to 130°C for a time period of from about 20 minutes to about 7 hours, in the presence of at least one cocatalyst selected from the group consisting of:

- a. thiophenol, thionaphthol, benzylthiol, and the aforesaid thiols having at least one substituent selected from the group consisting of halogen, mercapto, and a lower alkyl,
- b. dialkyl disulfides containing 2 to 16 carbon atoms,
- c. diphenyl disulfide, dinaphthyl disulfide, benzyl disulfide and said disulfides having at least one substituent selected from the group consisting of halogen, mercapto and a lower alkyl.

3,971,821
PRODUCTION OF AMINOBENZALDEHYDES

Hans Baumann, Ludwigshafen; Klaus Grychtol, Bad Durkheim, and Andreas Oberlinner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

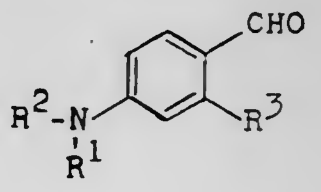
Filed Dec. 9, 1974, Ser. No. 531,090

Claims priority, application Germany, Dec. 20, 1973, 2363458

Int. Cl.² C07C *87/60, 101/00, 121/78*

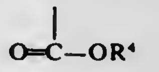
U.S. Cl. 260—465 E **7 Claims**

1. A process for the production of an aminobenzaldehyde compound of the formula



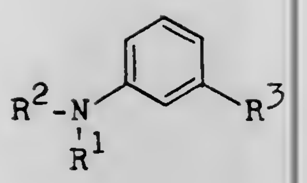
(Ia)

wherein R^1 and R^2 may be identical or different and each is alkyl of 1 to 8 carbon atoms or aralkyl of 7 to 12 carbon atoms; and R^3 is nitro, cyano or



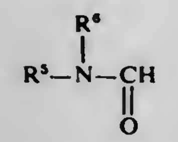
$$O{=}\overset{|}{C}{-}OR^4$$

in which R^4 is alkyl of 1 to 8 carbon atoms, cyclopentyl, aralkyl of 7 to 12 carbon atoms or phenyl; which process comprises reacting an aniline of the formula



(II),

wherein R^1, R^2 and R^3 have the above-noted meanings, in the presence of an acid halide of phosphorous acid, phosphoric acid, carbonic acid, oxalic acid, sulfurous acid or sulfuric acid with a formamide of the formula



$$R^5-\overset{\overset{R^6}{|}}{N}-\underset{\underset{O}{\|}}{CH}$$

(III),

wherein R^5 and R^6 may be identical or different and each is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, or R^5 and R^6 together with the adjacent nitrogen atom may further form a heterocyclic ring member selected from the group consisting of piperidine, pyrrolidine and morpholine, with the proviso that said R^1 to R^6 may further contain substituents which are inert under the reaction conditions.

3,971,822
ASPARTYL AMIDE SWEETENING AGENTS

Ichiro Chibata, Suita; Munetugu Miyoshi, Nishinomiya; Hiroshi Ito, Itami; Toshiyuki Fujii, Toyonaka, and Keisuke Kawashima, Takatukl, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

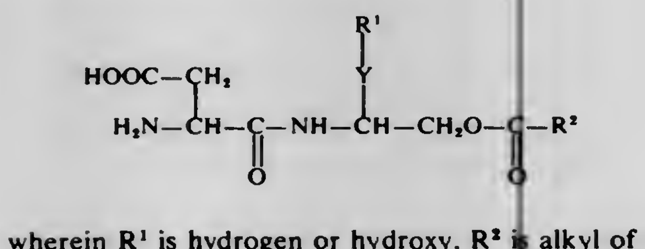
Filed June 25, 1975, Ser. No. 590,020

Claims priority, application Japan, July 19, 1974, 49-83406; Sept. 17, 1974, 49-107293

Int. Cl.^{2} C07C *69/00, 69/52, 99/00*

U.S. Cl. 260—468 R **28 Claims**

1. A compound of the formula:



$$H_2N-\overset{\overset{HOOC-CH_2}{|}}{CH}-\underset{\underset{O}{\|}}{C}-NH-\overset{\overset{\overset{R^1}{|}}{\overset{Y}{|}}}{CH}-CH_2O-\underset{\underset{O}{\|}}{C}-R^2$$

wherein R^1 is hydrogen or hydroxy, R^2 is alkyl of one to five carbon atoms, alkenyl of two to three carbon atoms, cycloalkyl of three to five carbon atoms or methylcycloalkyl of four to six carbon atoms, and Y is alkylene of one to four carbon atoms.

3,971,823
CYCLITOLAMINES

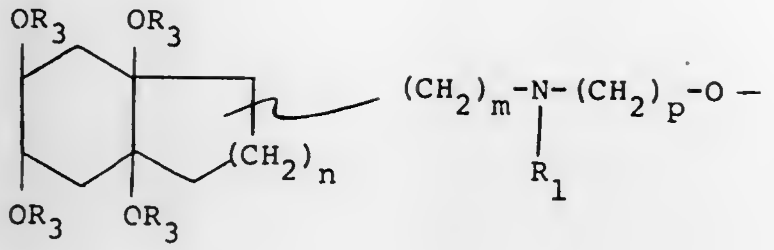
Frederic P. Hauck, Somerville, N.J.; Joseph E. Sundeen, Yardley, Pa., and Joyce Reid, Highland Park, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

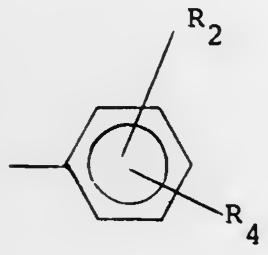
Filed Dec. 2, 1975, Ser. No. 636,891

Int. Cl.^{2} C07C *93/00, 93/12*

U.S. Cl. 260—490 **17 Claims**

1. A compound having the structure





or a pharmaceutically acceptable salt thereof, wherein R_1 is alkyl, phenylalkyl or phenylalkyl wherein the ring is substituted by 1 or 2 groups selected from the group of halogen, alkyl or alkoxy having 1–6 carbon atoms, said alkyl moieties having 1–6 carbon atoms; R_2 is hydrogen, halogen, alkyl, or alkoxy; R_3 is alkanoyl having 1–7 carbon atoms; R_4 is hydrogen or alkanoyl having 1–7 carbon atoms; n is 1, 2 or 3; m is 1, 2, 3 or 4; and p is 2, 3 or 4; with the proviso that when R_4 is alkanoyl, R_3 and R_4 are the same.

3,971,824
p-BENZOYLOXYBENZOATE

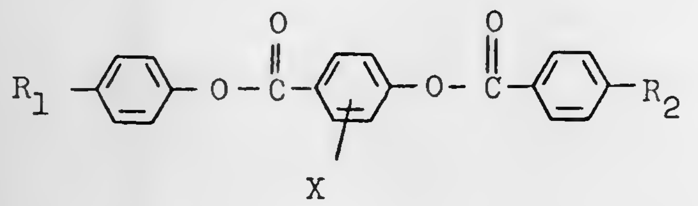
James P. Van Meter, and Bruce H. Klanderman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 388,516, Aug. 15, 1973, Pat. No. 3,915,883, which is a continuation-in-part of Ser. No. 247,563, April 26, 1972, abandoned. This application June 11, 1975, Ser. No. 585,919

Int. Cl.^{2} C07C *69/76*

U.S. Cl. 260—473 R **2 Claims**

1. A liquid crystalline compound of the formula:



wherein:

R_1 is an alkyl group of about 4 to 8 carbon atoms,

R_2 is an alkyl group of about 4 to 8 carbon atoms or an alkoxy group having about 4 to 8 carbon atoms, and

X is a halogen atom.

3,971,825
PHARMACEUTICALLY USEFUL PROSTENOIC ACID DERIVATIVES

Kiyoshi Sakai; Takashi Yusa, and Kenji Inoue, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

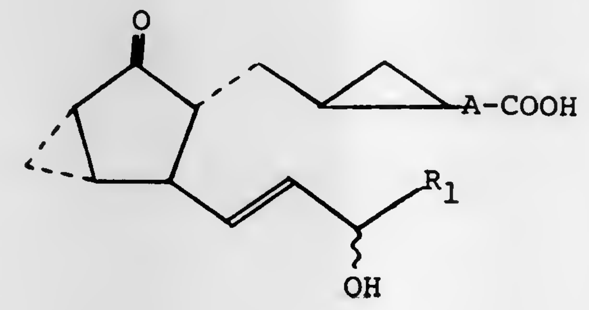
Filed Nov. 26, 1974, Ser. No. 527,353

Claims priority, application Japan, Dec. 6, 1973, 48-137588

Int. Cl.^{2} C07C *61/38, 69/74*

U.S. Cl. 260—514 D **12 Claims**

1. A compound selected from prostenoic acid derivatives having the formula



wherein

A is a linking group selected from the class consisting of a direct single bond and an alkylene group having from 1 to 8 carbon atoms; and

R^1 is an alkyl group having from 1 to 10 carbon atoms; and pharamaceutically acceptable salts thereof.

3,971,826
15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

Hans-Jurgen E. Hess; Michael R. Johnson; Jasjit S. Bindra, and Thomas K. Schaaf, all of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

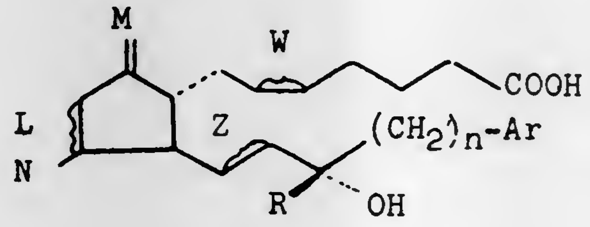
Continuation-in-part of Ser. No. 271,220, July 13, 1972, abandoned, and a continuation-in-part of Ser. No. 425,519, Dec. 17, 1973, abandoned. This application July 3, 1974, Ser. No. 485,599

Claims priority, application New Zealand, July 4, 1974, 485596

Int. Cl.^{2} C07C *63/592*

U.S. Cl. 260—520 B **17 Claims**

1. A compound of the structure:



and the C_{16} epimer thereof wherein

Ar is biphenyl;

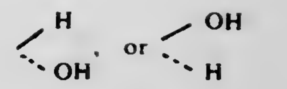
R is hydrogen or lower alkyl;

n is an integer from 1 to 5;

W and *L* are each a single bond or cis double bond;

Z is single bond or trans double bond; with the proviso that when *n* is one and *Z* is a single bond, *W* is a single bond;

M is keto,



N is hydrogen or α-hydroxyl;

and wherein *L*, *M* and *N* are so selected as to complete the structure of a prostaglandin of the A, E or F series.

3,971,827
MANUFACTURE OF POLY-(CIS)-ISOPRENOLS

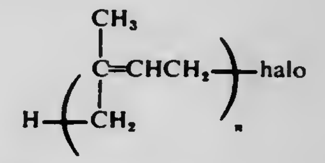
John S. Baran, Winnetka, and Barnett S. Pitzele, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,096

Int. Cl.^{2} C07C *57/18, 57/02, 29/02*

U.S. Cl. 260—526 N **5 Claims**

1. A process for the production of γ-alkylated acids which comprises the steps of successively contacting 2-butynoic acid with an alkali metal salt of 2,2,6,6-tetramethylpiperidine and a halo-polyene of the formula



$$H\left(CH_2-\overset{\overset{CH_3}{|}}{C}=CHCH_2\right)_n\text{halo}$$

wherein n is 1 or 2.

5. A process for the production of cis-isoprenol which comprises the steps of:

a. successively contacting 2-butynoic acid with an alkali metal salt of 2,2,6,6-tetramethylpiperidine and 1-bromo-3-methyl-2-butene to produce 7-methyloct-6-en-2-ynoic acid as the major product and 2-ethenylidene-5-methyl-4-hexenoic acid as the minor product;

b. esterifying the acids of step a to produce the corresponding methyl 7-methyloct-6-en-2-ynoate and methyl-2-acetyl-5-methyl-4-hexenoate;

c. chromatograhically separating the compounds of step b to isolate methyl 7-methyloct-6-en-2-ynoate;

d. contacting the isolated product of step c with lithium dimethyl cuprate and methyl copper to produce methyl (Z)-3,7-dimethylocta-2,6-dienoate; and

e. reducing the product of step d to produce (Z)-3,7-dimethylocta-2,6-dien-1-ol.

3,971,828
N-(MERCAPTOACYL)AMINOACIDS

Itaru Mita, Ashiya; Shigeo Okumura, Takarazuka; Shigeru Yamabe, Kobe; Yoshihiko Funae, Suita, and Junzo Matumoto, Osaka, all of Japan, assignors to Santen Pharmaceutical Co. Ltd., Osaka, Japan

Division of Ser. No. 398,934, Sept. 20, 1973, Pat. No. 3,897,480. This application Dec. 23, 1974, Ser. No. 535,686

Claims priority, application Japan, Oct. 3, 1972, 47-110491; May 11, 1973, 48-52924

Int. Cl.^{2} C07C *149/243*

U.S. Cl. 260—534 S **2 Claims**

1. N-(2-mercaptopropionyl)β-alanine.

2. N-(2-mercaptopropionyl)5-aminocaproic acid.

3,971,829
PREPARATION OF METHYLENE-BRIDGED POLYPHENYLPOLYAMINE MIXTURES

Edward Thomas Marquis, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 18, 1974, Ser. No. 524,568

Int. Cl.^{2} C07C *85/08*

U.S. Cl. 260—570 D **10 Claims**

1. An improved process for the preparation of a mixture of methylene-bridged polyphenylpolyamines containing diaminodiphenylmethane having a high 4,4'-isomer content and higher molecular weight, higher functionality polymethylene

polyphenylpolyamines by the catalyzed condensation reaction of aniline and formaldehyde, comprising the steps of:

- mixing and reacting aniline and formaldehyde in the presence of up to about 3.0 weight percent of a co-catalyst system comprising about 0.1 to less than about 3.0 weight percent silica-alumina and about 0.1 to less than about 3.0 weight percent oxalic acid, based upon the weight of aniline present, at a temperture of about 150° to about 250°C. and a pressure of from about atmospheric to about 300 psig; and
- recovering the reaction product mixture of methylene-bridged polyphenylpolyamines.

3,971,830
PROCESS FOR THE SEMIHYDROGENATION OF CITRAL TO CITRONELLAL

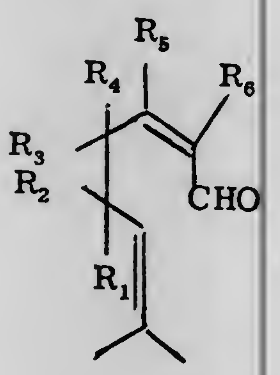
Peter S. Gradeff, Andover, N.J., assignor to Rhodia, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 211,794, Dec. 23, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,469

Int. Cl.^{2} C07C *47/20*

U.S. Cl. 260—601 R **14 Claims**

1. In the process for the selective hydrogenation of the olefinic group in a conjugated position to the carbonyl group in dienic aldehydes having the formula:



wherein R_1, R_2, R_3, R_4, and R_6 are selected from the group consisting of hydrogen and lower alkyl groups having from one to about five carbon atoms and R_5 is a lower alkyl group having from one to about five carbon atoms, which comprises hydrogenating the dienic aldehyde in the presence of a palladium metal catalyst, alkali, and water, the improvement which comprises carrying out the hydrogenation at a temperature within the range from about 5° to about 200°C, and at a pressure within the range from atmospheric pressure to about 500 psi, in the presence of a palladium metal catalyst in an amount within the range from about 0.001 g to about 1 g of palladium metal per 100 g of dienic aldehyde with a lower alkanol having from one to about five carbon atoms in a liquid aqueous alkaline reaction medium, the alkali being in an amount within the range from about 0.05 to about 5% by weight of the dienic aldehyde, and the alkanol being in an amount within the range from about 10 to about 200% by weight of the dienic aldehyde.

3,971,831
PROCESS FOR THE SEMIHYDROGENATION OF CITRAL TO CITRONELLAL

Emile Mourier, Sainte-Foy-Les-Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

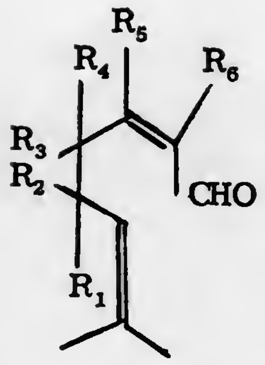
Filed May 2, 1973, Ser. No. 356,677

Claims priority, application France, May 4, 1972, 72.15883

Int. Cl.^{2} C07C *47/20*

U.S. Cl. 260—601 R **15 Claims**

1. In the process for the selective hydrogenation of the olefinic group in a conjugated position to the carbonyl group in dienic aldehydes having the formula:



wherein R_1,R_2,R_3,R_4 and R_6 are selected from the group consisting of hydrogen and lower alkyl groups having from one to about five carbon atoms and R_5 is a lower alkyl group having from one to about five carbon atoms, which comprises hydrogenating the dienic aldehyde in the presence of a palladium metal catalyst, alkali and water, the improvement which comprises carrying out the hydrogenation at a temperature above about 10°C and at a pressure within the range from atmospheric pressure to about 500 psi in the presence of a palladium metal catalyst in an amount within the range from about 0.001 g to about 1 g of palladium metal per 100 g of dienic aldehyde in solution in a lower alkanol having from one to about five carbon atoms with an alkali or alkaline earth metal salt of a boric acid in an amount of at least about 0.05% up to about 5% by weight of the dienic aldehyde, the alkanol being in an amount within the range from about 10% to about 200% by weight of the dienic aldehyde, in the presence of at most 0.1% water.

3,971,832
PROCESS FOR PRODUCING ORTHO-METHYLPHENOLS

Yoshihisa Watanabe; Makoto Takeda, and Makoto Imanari, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Continuation of Ser. No. 164,139, July 19, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,849

Claims priority, application Japan, July 17, 1970, 45-62682

Int. Cl.^{2} C07C *214/32*

U.S. Cl. 260—621 R **4 Claims**

1. A process for the ortho-methylation of phenols selected from the group consisting of phenol, o-cresol, m-cresol, 2,3-xylenol, and 2,5-xylenol with methanol in the vapor phase, to produce o-methylphenols which comprises contacting the vaporized phenol with methyl alcohol at a temperature in the range 250°C to 500°C in the presence of an orthomethylating catalyst, the catalytic active of which essentially consists of a pre-baked trimanganese tetroxide previously baked at a temperature in the range 950°C to 1500°C.

3,971,833
METHOD FOR THE PREPARATION OF ALCOHOL-FREE ALKALI AND ALKALINE EARTH METAL ALCOHOLATES

Arnold Lenz, Cologne-Stammheim, and Walter Rogler, Bonn, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 25, 1974, Ser. No. 482,977

Claims priority, application Germany, July 2, 1973, 2333634

Int. Cl.^{2} C07C *31/30*

U.S. Cl. 260—632 A **16 Claims**

1. A process for the preparation of an alcohol-free alkali or alkaline earth metal alchoholate dissolved in an inert hydrocarbon solvent which comprises contacting at least an equimolar amount of an alkali or alkaline earth metal in an inert hydrocarbon solvent, which solvent is inert to said alkali or alkaline earth metal, with a monovalent C_1–C_{24} alcohol at an elevated pressure equivalent to autogenous pressure and at a temperature of at least 160°C and below the temperature at

which alkali or alkaline earth metal alcoholate decomposes under the prevailing pressure.

3,971,834
MODIFIED ACRYLATE RESIN

Christopher W. Uzelmeier, Laurel Springs, and Paul D. Jones, Cherry Hill, both of N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1975, Ser. No. 562,513

Int. Cl.^{2} C08L *63/02*

U.S. Cl. 260—837 R **6 Claims**

1. An ultraviolet curable acrylate resin composition with improved adhesion to metal surfaces consisting essentially of a reaction product of (i) a secondary monoamine selected from the group consisting of dimethylamine, diethylamine, methylethylamine, diisopropylamine, piperidine, toluidine, diallylamines, methylcyclohexyl amine, N-methyhydroxyl amine, methylethanolamine, butylethanolamine, N-acetylethanolamine and phenylethanolamine, (ii) acrylic acid and (iii) a polyepoxide in a ratio of between about 0.2 and about 0.9 chemical equivalents of the monoamine per chemical equivalent of the polyepoxide and between about 0.8 and about 0.1 chemical equivalents of the acrylic acid per chemical equivalent of the polyepoxide wherein said polyepoxide is a glycidyl ether of 2,2-bis(4-hydroxyphenyl)propane and wherein said reaction product is prepared by contacting components (i), (ii) and (iii) at reaction temperatures of about 125°F to about 200°F.

3,971,835
VINYL HALIDE POLYMER IMPACT MODIFIERS

Robert M. Myers, Philadelphia; David L. Dunkelberger, Levittown, both of Pa., and Daniel T. Carty, Willingboro, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 184,913, Sept. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 56,007, July 17, 1970, abandoned. This application Aug. 5, 1974, Ser. No. 494,810

Int. Cl.^{2} C08L *51/00*

U.S. Cl. 260—876 R **9 Claims**

1. A modified composition of vinyl halide polymer comprising about 60 to 98 weight percent poly(vinyl halide) and about 2 to 40 weight percent of a three stage, sequentially produced graft polymer comprising

A. 5 to 50 parts by weight of a non-rubbery, hard stage polymer formed by polymerization of a monomer charge of 50 to 100 weight percent of a vinylaromatic compound, 0 to 50 weight percent of a different monovinylidene monomer interpolymerizable therewith, and 0.1 to 10 weight percent of a polyfunctional cross-linking monomer based on the weight of the monomer charge:

B. 20 to 70 parts by weight of a second stage rubbery polymer (A) formed by sequentially polymerizing in the presence of the hard polymer Stage (A), a second monomer of 50 to 100 weight percent of an alkyl acrylate or mixtures thereof wherein the alkyl group of the alkyl acrylate has about 2 to 8 carbon atoms, 0 to 50 weight percent of a monovinylidene monomer interpolymerizable therewith, and 0.2 to 6.0 weight percent of a polyfunctional cross-linking monomer, and

C. 15 to 40 parts by weight of a third stage polymer formed by sequentially polymerizing in the presence of the Stage (A) and Stage (B) polymer product, a monomer charge of 50 to 100 weight percent of an alkyl methacrylate wherein the alkyl group has about 1 to 4 carbon atoms, and 0 to 50 weight percent of a vinylidene monomer interpolymerizable therewith and 0 to 1.0 weight percent of an alkyl mercaptan of 3 to 12 carbon atoms, and 0 to 10 weight percent of a polyfunctional crosslinking monomer further characterized in that the refractive index of the first two stages of the graft polymer is substantially equal to the refractive index of the poly(vinyl halide).

3,971,836
AMINE-STABILIZED DIALKYL DITHIOPHOSPHATES

Lawrence Evans Strow, and Franklin Anderson Bolth, both of Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

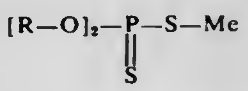
Filed Aug. 16, 1974, Ser. No. 497,905

Int. Cl.^{2} C07F *9/17*

U.S. Cl. 260—963 **6 Claims**

1. A storage-stable flotation promoter comprising:

an aqueous solution of a dialkyl dithiophosphate of the following general formula:



$$[R\text{—}O]_2\text{—}\underset{\underset{S}{\|}}{P}\text{—}S\text{—}Me$$

where R is an alkyl group having 3 to 6 carbon atoms and Me is a disassociating cation, said solution being neutralized with caustic sufficient to remove all initial acidity; and

0.5 to.5% by weight of a trialkyl amine.

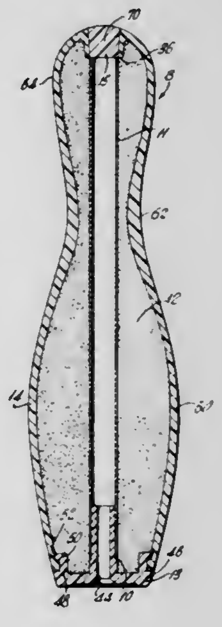
3,971,837
PROCESS FOR MANUFACTURING A COMPOSITE FOAMED SYNTHETIC RESIN BOWLING PIN

Tadashi Hasegawa, 3 Tsukimigaoka Yatomi-cho, Mizuho, Nagoya, and Tetsuo Yamaguchi, 57 Hatama Oota-cho, Tokai, both of Japan

Filed Sept. 10, 1973, Ser. No. 395,830

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 264—46.6 **7 Claims**



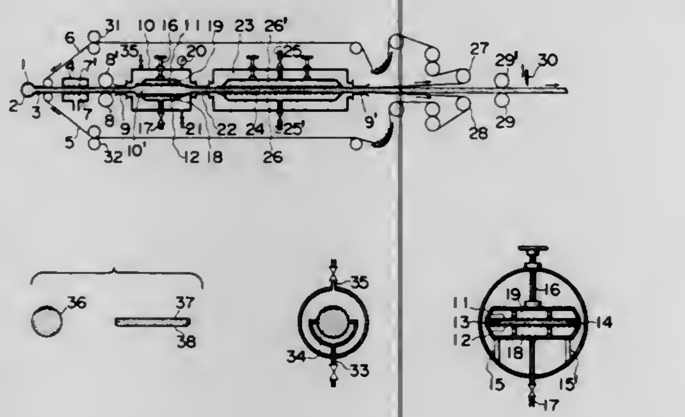
1. In a method for producing a bowling pin having a substantially rigid tube, a base support element composed of a flattened disc, one surface of which is modified to form an axially aligned collar and sleeve, to which sleeve is secured one end of said tube, said collar and sleeve being disposed coaxially about an orifice in said disc; said collar being formed in a position intermediate between said sleeve and the outer periphery of said disc, and terminating in a transversely disposed cylindrical flange having a diameter less than that defined by the outer periphery of said disc; a body of expanded resin surrounding said tube and disposed within said collar and the upper surface of the foregoing disc; a shell of solid thermoplastic resin disposed about said body and continuous with the outer periphery of the disc and in interlocking engagement with said disc and flange of said base support element said method comprising the steps of securing said one end of said tube on the sleeve and about the central orifice of said base support element; centering said tube and base support element within a first mold having the contour of an undersized bowling pin in such manner that the outer surface of said disc is in contact with the inner wall of said mold at one end

thereof and the outer peripheries of said disc and collar are disposed in recesses in said mold and introducing a foamable thermosetting resin reaction mixture into said mold and about the length of said tube and within the confines of said collar on said base support element; foaming and curing said resin and removing the resulting assembly from said first mold; centering said assembly in a second mold wherein the outer surface of said disc is disposed in contact with an inner end wall of said second mold, said second mold having a larger cross-sectional diameter than said first mold and having a contour similar to that of said first mold so that said assembly is, as a result, in spaced relationship to the interior side walls of said second mold; and, introducing between said side walls and said assembly a molten thermoplastic resin to provide said shell interlocked with said collar of said base support element.

3,971,838

PROCESS FOR CONTINUOUSLY PRODUCING SHAPED ARTICLES OF POLYSTYRENE FOAM

Masahide Yazawa, Tokyo, Japan, assignor to Polymer Processing Research Institute Ltd., Tokyo, Japan
Filed Aug. 17, 1973, Ser. No. 389,406
Claims priority, application Japan, Aug. 18, 1972, 47-82559
Int. Cl.² B29D *27/00*
U.S. Cl. 264—51 7 Claims



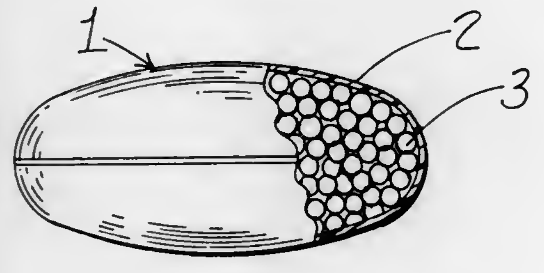
1. In the known process for the continuous production of a foam product wherein preliminarily expanded beads of polystyrene are formed into a confined moving mass, moving the confined mass of the beads through a heating zone wherein the mass is directly heated with steam so as to cause said mass of beads to reexpand and adhere together, the improvement which comprises:

a. enveloping the moving mass of the preliminarily expanded beads of polystyrene so as to cover the top, bottom and lateral side surfaces thereof with at least one steam permeable cloth belt having a sufficient width to form overlapping parts of the cloth belt around the exterior surface of the mass of beads,
b. causing said mass of beads enveloped in steam permeable cloth belt to move through a pressurized steam heating zone which is provided with a pressure sealing zone on both the inlet and the outlet openings thereof,
c. applying mechanical pressure to said enveloped mass of beads at a point adjacent to the inlet of said pressurized steam heating zone so as to prevent the mass of beads in said envelope from flowing backwards through the enveloping cloth belt,
d. retaining the enveloped mass of beads in said pressurized steam heating zone for a long enough time to cause reexpansion of the mass of beads,
e. reducing the reexpanded volume of the mass of beads prior to leaving the pressurized steam heating zone so as to secure the mutual firm adhesion of the beads and to achieve a definite shape for the foamed mass leaving the pressurized steam heating zone,
f. applying mechanical pressure to the enveloped foamed mass at a point adjacent to the outlet of the pressure sealing zone so as to minimize the leakage of steam from said pressurized steam heating zone,
g. cooling the enveloped foamed mass, and
h. separating the enveloping cloth belt from the foamed mass and recovering as a final product a foamed mass of polystyrene.

3,971,839

PARTICLE FILLED SELF-CONFORMABLE CUSHION AND METHOD OF MAKING SAME

Don A. Taylor, Box 4, Wadsworth, Ohio 44281
Filed Dec. 6, 1971, Ser. No. 204,972
Int. Cl.² D04H *1/54*; B29C *6/02*
U.S. Cl. 264—112 9 Claims

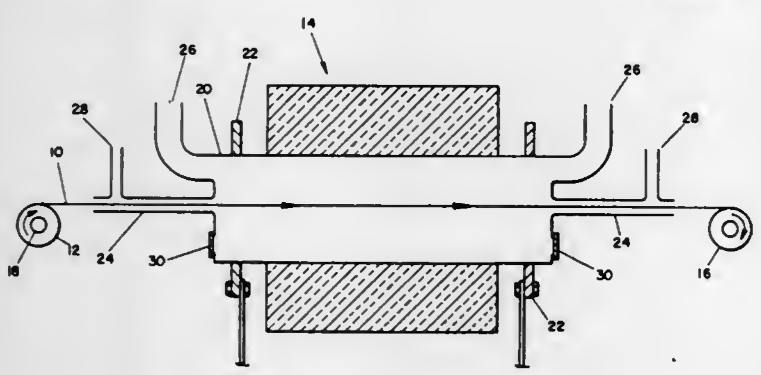


1. A method of making a cushioning structure comprising:
supporting in loosely packed condition in a confining space a charge of discrete particles which are composed of raw thermo-meltable material and which are in a size range upwardly from about powder size and to large enough so that each particle is readily distinguishable visually by the unaided eye as an individual particle separate and apart from the other particles;
applying heat under controlled temperatures and time to the charge to melt those of the particles at the surface of the charge, and for a predetermined distance inwardly from the surface of the charge, at selected areas of the surface of the charge while limiting the heating so that the particles farther inwardly remain in their original and unmelted condition; and
applying molding pressure to the exterior of the charge at said areas while said melted particles are in melted condition to shape the melted material into a covering encapsulating at least in part the unmelted particles.

3,971,840

PRODUCTION OF HIGH STRENGTH CARBIDE FIBERS BY HEAT TREATMENT

James Economy, Eggertsville; Ruey Y. Lin, Williamsville, and William D. Smith, Tonawanda, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.
Filed Mar. 27, 1973, Ser. No. 345,376
Int. Cl.² B29C *25/00*
U.S. Cl. 264—231 5 Claims



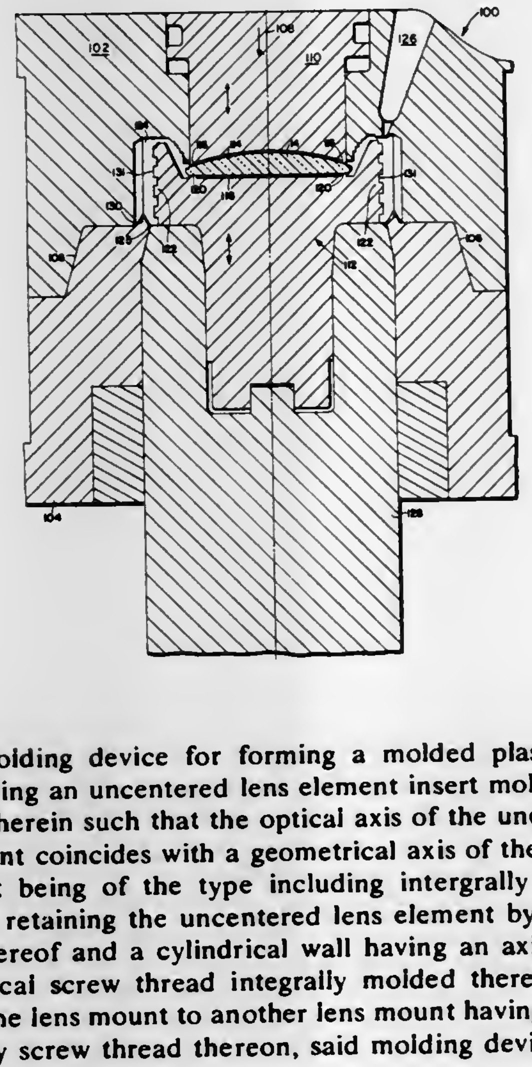
1. A process for strengthening a curled carbide-containing fiber, said fiber comprising a material selected from the group consisting of carbides of boron, chromium, molybdenum, hafnium, zirconium, tantalum, niobium, and mixtures thereof, comprising the steps of:

1. heating, at a temperature in the range of about 2050°C to about 2300°C, for a period of about 0.2 to about 10 minutes, the curled carbide-containing fiber while, simultaneously,
2. subjecting the curled carbide-containing fiber to tensile stress in the range of about 200 to about 3500 psi to essentially remove internal fiber stresses, straighten the fiber and thereby increase the tensile strength of the carbide-containing fiber.

3,971,841

MOLDING DEVICES AND PROCESS FOR MAKING A MOLDED PLASTIC LENS MOUNT

Leon Rubinstein, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed June 20, 1974, Ser. No. 481,128
Int. Cl.² B29C *1/14*; B29D *11/00*
U.S. Cl. 264—275 19 Claims

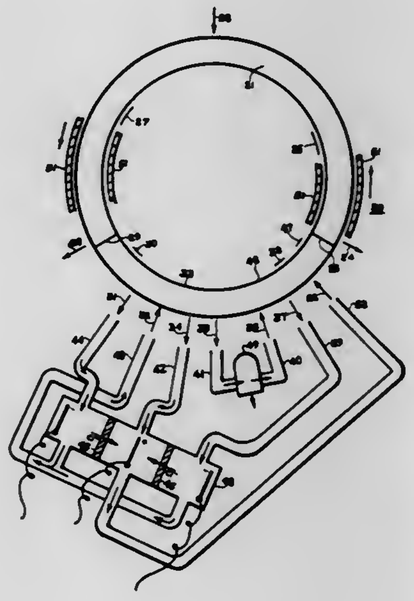


1. A molding device for forming a molded plastic lens mount having an uncentered lens element insert molded and centered therein such that the optical axis of the uncentered lens element coincides with a geometrical axis of the mount, the mount being of the type including intergrally molded means for retaining the uncentered lens element by the periphery thereof and a cylindrical wall having an axially disposed helical screw thread integrally molded therewith for coupling the lens mount to another lens mount having a complementary screw thread thereon, said molding device comprising:
a cavity mold including first and second mold sections movable relative to one another between an open position and a closed position wherein said first and second mold sections are aligned, on a common geometrical axis of said mold, in abutting relation, said first and second mold sections are aligned, on a common geometrical axis of said mold, in abutting relation, said first and second mold sections including cooperating means therein for defining an internal cavity within said closed mold into which plastic may be injected to form the mount, said cavity being complementary in shape to the shape of the molded plastic mount and being disposed within said closed mold such that the geometrical axis of the mount coincides with said geometrical axis of said mold;
said means for defining said cavity including first and second opposed zonal clamps mounted, on said geometrical axis of said mold, said first and second zonal clamps including low friction rings on their respective opposed ends for engaging opposite optical surfaces of the uncentered lens element, said first zonal clamp being mounted for axial displacement towards said second zonal clamp, when said mold is in said closed position and prior to the injection of the plastic, for causing said low friction rings to exert a compressive force on the uncentered lens element thereby displacing the uncentered lens element in directions transverse to said geometrical axis of said mold until the optical axis of the uncentered lens element is coincident with said geometrical axis of said mold and said second zonal clamp being mounted for both axial rotation and displacement to facilitate release of the molded plastic mount from said mold subsequent to the forming of the mount and when said first and second mold sections are in said open position;
said means defining said cavity including surfaces within said closed mold which form the retaining means around the periphery of the uncentered lens element held by said zonal clamps for retaining the uncentered lens element in the mount, and surfaces which form the cylindrical wall and the helical screw thread thereon, when plastic is injected into the mount; and
means in at least one of said first and second mold sections for holding the molded plastic mount subsequent to the injection of plastic such that said second zonal clamp, mounted for axial rotation and displacement, may be rotated and displaced to disengage the molded mount and said mold surface forming the helical screw thread to facilitate the release of the molded mount from said mold.

3,971,842

CONTINUOUS DISPLACEMENT CHROMATOGRAPHIC SEPARATION

John R. Ewbank, Southampton, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Aug. 8, 1974, Ser. No. 495,695
Int. Cl.² C22B *60/02*; B01D *15/08*, *33/00*
U.S. Cl. 423—7 7 Claims



2. In a method in which an ion exchange bed is employed for separating a mixture by preferential sorption rates in an ion exchange bed having a significant length relative to a cross sectional dimension, there being a plurality of regions along the length of said ion exchange bed, one of said regions being a separation region, the improvement which consists of:
surrounding the ion exchange bed with a chamber having a plurality of modifying zones in which solutions are withdrawn, injected, or pressurized, each modifying zone permitting flow of solutions between the core of the bed and the liquid transfer zone adjacent the sidewalls of the bed without substantial distortion of the desired cross sectional patterns of the liquid flow along the length of the bed;

withdrawing from a zone adjacent the front boundary of said separation region, a solution containing increased concentrations of ions of a selected component of said mixture, such increased concentration being attributable to chromatographic displacement phenomena and such solution withdrawal being from side walls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

withdrawing from a zone adjacent a rear boundary of the separation region a solution containing a controlled decreased concentration of ions of said selected component, such decreased concentration being attributable to chromatographic displacement phenomena, such solution withdrawal being to sidewalls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

feeding to an intermediate portion of the separation region a stream of a solution containing the mixture of ions to be separated at a rate totaling the rates of withdrawal from said boundaries, the total liquid flow through the separation region being several times said rate of feeding the mixture to be separated, the large ratio of total liquid flow to feed flow in the separation region being attributable to chromatographic displacement phenomena, such solution feeding being to side walls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

supplying to a region in advance of the separation region a solution for the maintenance of an appropriate chemical reaction at the constantly advancing front boundary of the separation region;

supplying to a region rearward of the separation region a solution, a portion of which solution flows forwardly to provide a chemical reaction at the rear boundary of the constantly advancing separation region, the length of the separation region remaining substantially constant because the migration speeds of the front and rear boundaries are substantially identical;

supplying regenerating solutions to a regenerating region of the length of the ion exchange bed, whereby each portion of the length of the ion exchange bed may be repetitively used;

said solutions being supplied to maintain the speed of migration of the boundaries of the separation region at a controlled speed; and

controlling the relative speed of movement between the length of the ion exchange bed and its surrounding chamber to be exactly equal to the migration speed of the boundaries, whereby the relative positions of the chamber and the boundaries is maintained stationary, and whereby the injection of solutions and withdrawal of solutions is constantly accurate notwithstanding such relative migration of boundaries along the length of the ion exchange bed and such relative movement between the ion exchange bed and its surrounding chamber.

3,971,843

PROCESS FOR LIQUID/LIQUID EXTRACTION OF GALLIUM

Jacques Helgorsky, Frepillon, and Alain Leveque, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 3, 1975, Ser. No. 592,884

Claims priority, application France, July 12, 1974, 74.24263; Apr. 10, 1975, 75.11200; Apr. 16, 1975, 75.11797

Int. Cl.² C01G *15/00*; C01F *7/02*

U.S. Cl. 423—112 **12 Claims**

1. The process for the recovery of gallium present as a compound in solution in aqueous alkaline solutions which also contain compounds of aluminum and sodium in solution comprising contacting the aqueous solution with a water-insoluble, organic solvent-soluble substituted hydroxyquinoline in solution in a water immiscible organic solvent selected from the group consisting of halogenated and unhalogenated aliphatic and aromatic hydrocarbons whereby gallium and some of the sodium and aluminum values transfer from the aqueous phase into the organic phase, separating the organic phase from the aqueous phase, contacting the organic phase with a dilute aqueous solution of an inorganic acid to remove sodium and aluminum to the aqueous phase, leaving gallium values in solution in the organic phase, separating the organic phase from the aqueous phase, and then contacting the remaining organic phase with an aqueous solution of a more concentrated inorganic acid to remove gallium values from the organic phase to the aqueous phase, and then separating the gallium values from the aqueous phase.

11. The process for the recovery of gallium present as a compound in solution in aqueous alkaline solution which also contains compounds of aluminum and sodium in solution comprising contacting the aqueous solution with a water insoluble, organic solvent soluble substituted hydroxyquinoline in solution in a water immiscible organic solvent selected from the group consisting of halogenated and unhalogenated aliphatic and aromatic hydrocarbons whereby gallium and some of the sodium and aluminum values transfer from the aqueous phase into the organic phase, separating the organic phase from the aqueous phase, contacting the organic phase with a concentrated aqueous solution of a strong inorganic acid capable of complexing the gallium values in anionic form, which will remain in solution in the organic phase, while sodium and aluminum values transfer to the aqueous phase, separating the organic phase from the aqueous phase, and then contacting the organic phase with a dilute aqueous solution of inorganic acid to remove gallium values from the organic phase to the aqueous phase, and then separating the gallium values from the aqueous phase.

3,971,844

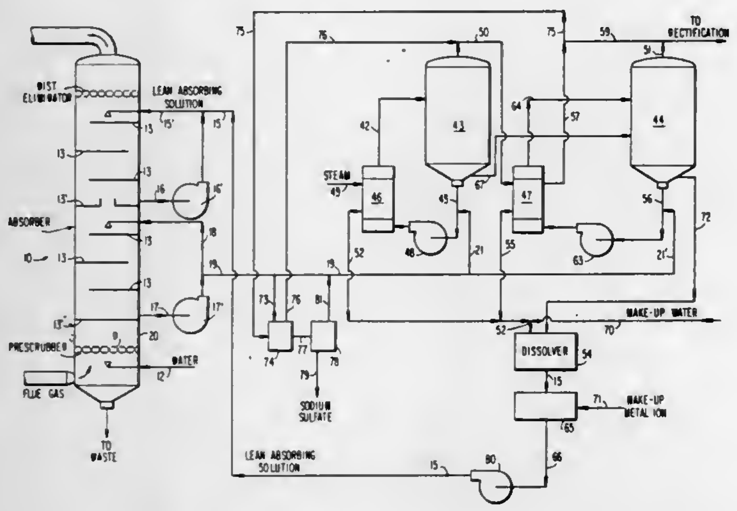
METHOD FOR REMOVING SODIUM SULFATE FROM AQUEOUS SOLUTIONS

Raymond T. Schneider, Lakeland, Fla., assignor to Davy Powergas Inc., Lakeland, Fla.

Filed Feb. 19, 1974, Ser. No. 443,326

Int. Cl.² C01B *17/00*

U.S. Cl. 423—182 **9 Claims**



1. In a process for removing sulfur dioxide from a sulfur dioxide-containing gas in a sulfur dioxide removal system comprising containing the gas in an absorption zone with an aqueous absorbing solution of sodium sulfite to absorb sulfur dioxide, and the solution contains sodium disulfite and sodium sulfate, and desorbing sulfur dioxide from said resultant aqueous solution in a desorption zone, the improvement comprising withdrawing a sufficient portion of the aqueous solution from the sulfur dioxide removal system to avoid an unduly high concentration of sodium sulfate in the aqueous solution, treating the withdrawn solution having an *s/c* of about 0.7:1 to 0.95:1 with sulfur dioxide for a period of time sufficient to provide an increase in the *s/c* of at least about 0.02:1 and the *s/c* of the withdrawn aqueous solution, after contact with the sulfur dioxide, is about 0.85:1 to 1:1 crystallizing and separating sodium sulfate from said treated withdrawn solution, and passing the resultant mother liquor to the sulfur dioxide removal system.

3,971,845

RECOVERY OF HYDROFLUORIC ACID FROM AQUEOUS FLUOSILICIC ACID

Wolf Becker, and Wolfgang Weiss, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 26, 1973, Ser. No. 400,810

Claims priority, application Germany, Sept. 30, 1972, 2248149

Int. Cl.² C01B *33/08*, *33/10*, *33/12*, *7/22*

U.S. Cl. 423—483 **5 Claims**

1. A process for recovering hydrofluoric acid from aqueous fluosilicic acid consisting essentially of water and fluosilicic acid which comprises heating said aqueous fluosilicic acid at a temperature of from 100° to 300°C. and under a pressure of from 7 to 80 atmospheres gauge to obtain a hydrogen fluoride containing aqueous phase and a silicon tetrafluoride containing gaseous phase and separating said hydrogen fluoride containing aqueous phase and silicon tetrafluoride containing gaseous phase.

3,971,846

PREPARATION OF BERYLLIUM HYDRIDE AND ALUMINUM HYDRIDE

James S. Skelcey, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 30, 1964, Ser. No. 342,850

Int. Cl. C01b *6/00*; C01f *1/00*, *3/00*, *7/00*

U.S. Cl. 423—645 **3 Claims**

1. A novel process for preparing beryllium hydride and aluminum hydride which comprises:

a. adding a solution of beryllium borohydride to a solution of lithium aluminum hydride such that the ratio of lithium aluminum hydride to beryllium borohydride on a gram mole basis ranges from about 2 to about 5 and precipitating beryllium hydride in the resulting mixture, the solvent for said lithium aluminum hydride and beryllium borohydride being a liquid material inert to the reactants and products and dissolving said beryllium borohydride and lithium aluminum hydride but being a substantially non-solvent for beryllium hydride,
b. separating said solid beryllium hydride from the reaction mass,
c. stripping said solvent from the residual reaction mixture,
d. heating the resulting substantially dry product mass at an elevated temperature of from about 45° to about 140° C. for a period of from about 0.25 to about 24 hours, and
e. recovering a substantially ether free, ether-insoluble aluminum hydride of hexagonal crystal structure.

3,971,847

HYDROGEN-RICH GAS GENERATOR

John Houseman, Pasadena, Calif., assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 428,444, Dec. 26, 1973, Pat. No. 3,920,416. This application Feb. 27, 1975, Ser. No. 553,687

Int. Cl.² C01B *1/13*

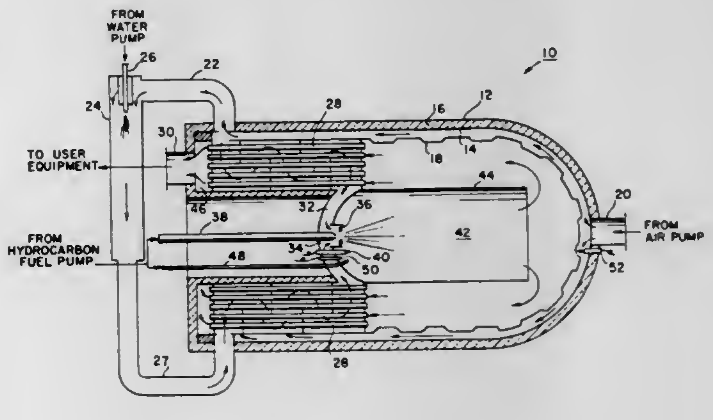
U.S. Cl. 423—650 **1 Claim**

1. A method of generating a hydrogen rich gas in a hydrogen generator having a partial oxidation region comprising

introducing a liquid hydrocarbon fuel in the form of a spray into said partial oxidation region,

preheating air with the heat generated as a result of igniting the hydrocarbon fuel spray, injecting water into said preheated air to form a mixture of steam and air, further heating indirectly said mixture of steam and air,

mixing said further heated steam and air with said hydrocarbon fuel spray within said partial oxidation region,



igniting said hydrocarbon fuel spray mixed with said steam and air within said partial oxidation region to form a hydrogen rich gas, and

removing all of said hydrogen rich gas from said partial oxidation region.

3,971,848

LUBRICATING COMPOSITION FOR MUCOSA OR EPIDERMIS

Fumio Kasahara, Chiba, and Kazuo Takeshita, Fujisawa, both of Japan, assignors to Kimitsu Chemical Laboratory Co. Ltd. and Showa Yakuhinkako Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 209,733, Dec. 20, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,503

Claims priority, application Japan, Dec. 21, 1970, 45-114920

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **4 Claims**

1. A composition which in aqueous solution forms a mucosal or epidermal lubricant, said composition consisting essentially of a mixture of fucoidin and alginic acid salt in a weight ratio of alginic acid salt to fucoidin of from 1.6:1 to 3.6:1, said fucoidin being obtained from phaephyceae and comprisng principally calcium salts of methyl pentose monosulfate and glucose monosulfate, said fucoidin being decomposed by acid, being capable of remaining in aqueous solution in the presence of calcium salts, being inert to dilute alkali, forming an insoluble salt upon reaction with a trivalent metal, forming a mucilageneous squeous solution and being sparingly soluble in methanol, ethanol and propanol.

3,971,849

1,N^6-ETHENO-5′-ADENOSINE CARBOXYLATES FOR INCREASING CORONARY SINUS PARTIAL PRESSURE OF OXYGEN

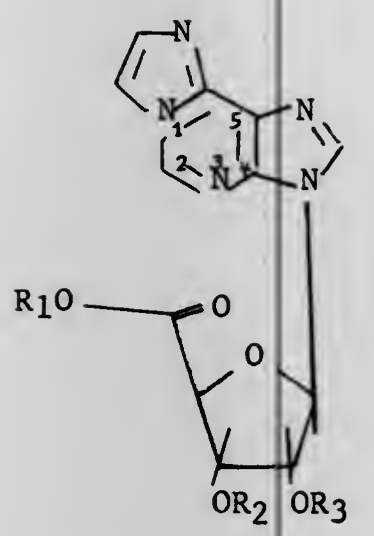
Raj Nandan Prasad, Pierrefonds, and David Lyon Garmaise, Montreal,both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 317,325, Dec. 21, 1972, Pat. No. 3,830,795. This application May 21, 1974, Ser. No. 471,940

Int. Cl.² A61V *31/70*

U.S. Cl. 424—180 **2 Claims**

1. A method of increasing coronary sinus partial pressure of oxygen in a patient in need of such treatment comprising administering an effective coronary sinus partial pressure of oxygen increasing amount of a compound of the formula



wherein R_1 is loweralkyl, loweralkenyl, loweralkynl or cycloalkyl of 3 to 6 carbon atoms; and R_2 and R_3 each are hydrogen, acetyl, propionyl or butyryl, or R_2 and R_3 taken together form isopropylidene or benzylidene; or the pharmaceutically acceptable acid addition salts thereof to said patient.

3,971,850
N-SUBSTITUTED-N-(1-SUBSTITUTED-1-METHYL-2-PROPYNYL)-α-(SUBSTITUTED PHENOXY) ALKYLAMIDES AND THEIR USE AS MITICIDES

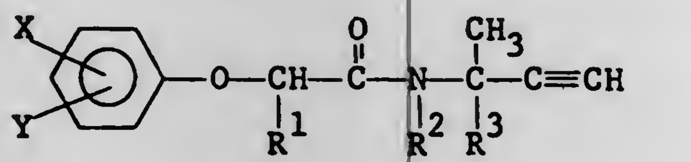
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,665

Int. Cl.² A01N *9/20;* **C07C** *103/19*

U.S. Cl. 424—324 **18 Claims**

1. A compound having the formula



$$X,Y\text{-}C_6H_3\text{-}O\text{-}\underset{R^1}{\underset{|}{CH}}\text{-}\overset{O}{\overset{\|}{C}}\text{-}\underset{R^2}{\underset{|}{N}}\text{-}\overset{CH_3}{\overset{|}{\underset{R^3}{\underset{|}{C}}}}\text{-}C{\equiv}CH$$

wherein X is either fluorine or trifluoromethyl; Y is either hydrogen or chlorine; R^1 is either methyl or ethyl; and where X is fluorine, R^2 is hydrogen and R^3 is methyl; and where X is trifluoromethyl, R^2 and R^3 are independently selected from the group consisting of hydrogen and methyl.

3,971,851
METHOD OF MAKING LIVERWURST

Friedrich Otto, Hameln, Weser, Germany, assignor to A. Stephan u. Sohne, Hameln, Weser, Germany

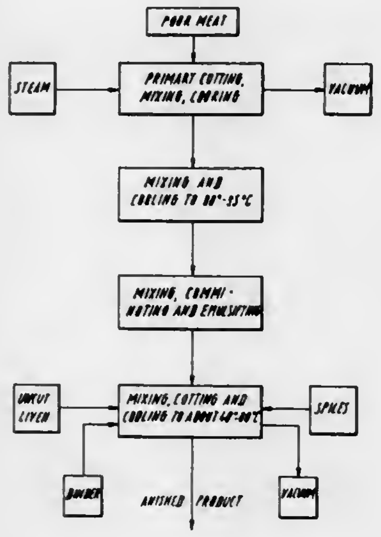
Filed Dec. 19, 1974, Ser. No. 534,510

Claims priority, application Germany, Dec. 24, 1973, 2364485

Int. Cl.² A23K *1/00*

U.S. Cl. 426—646 **8 Claims**

1. A rapid method of making liverwurst, liver paste and the like, comprising the steps of continuously agitating pork trimmings in a vessel while subdividing them into a mass of chunks of initial size; admitting saturated steam into the presence of the mass contained in said vessel to cook the mass while continuing the agitation; terminating the cooking when the mass in said vessel reaches a temperature of about 125°C, and thereupon cooling the agitated mass in said vessel to about 60°–95°C; maintaining a vacuum condition in said vessel until said mass has been heated to a temperature of about 80°C by said steam; comminuting and emulsifying the cooled mass in said vessel while continuing the agitation until said chunks are reduced to a final size smaller than said initial size; admitting liver pieces and binder material into the emulsified agitated mass in said vessel and effecting comminution of the liver pieces while continuing the agitation and further cooling the resulting mixture in said vessel to about 40°–80°C; and admitting spices into the mixture in said vessel to obtain a spiced product.



PORK MEAT
STEAM
PRIMARY CUTTING, MIXING, COOKING
VACUUM
MIXING AND COOLING TO 80°-35°C
MIXING, COMMINUTING AND EMULSIFYING
UNCUT LIVER
MIXING, CUTTING AND COOLING TO ABOUT 40°-80°C
SPICES
BINDER
FINISHED PRODUCT
VACUUM

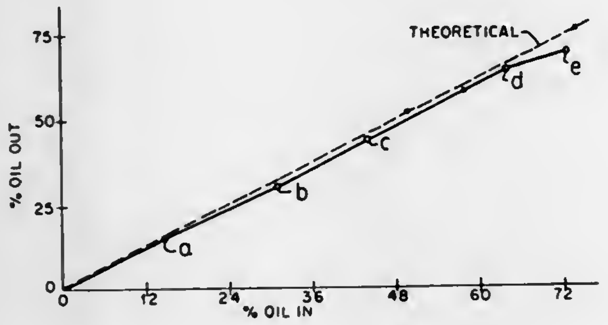
3,971,852
PROCESS OF ENCAPSULATING AN OIL AND PRODUCT PRODUCED THEREBY

Joseph Brenner; Gary H. Henderson, both of Middletown, and Robert W. Bergensten, Kerhonkson, all of N.Y., assignors to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed June 12, 1973, Ser. No. 369,306

Int. Cl.² A23L *1/06;* **A61K** *7/46;* **B01J** *13/02*

U.S. Cl. 426—103 **12 Claims**



2. The process of encapsulating an oil in a solid matrix comprising a mixture of a hydrolyzed starch and a polyhydroxy compound present in an amount at least 20% of the mixture and selected from the group consisting of alcohols, plant-type sugars, lactones, monoethers and acetals which comprises forming a solution of the modified starch and the polyhydroxy compound in water, emulsifying the oil in said solution and spray drying said emulsion to remove water therefrom.

3. A composition consisting essentially of a water-soluble cellular matrix of hydrolyzed starch and at least one other polyhydroxy compound and having globules of oil in the cells thereof, said other polyhydroxy compound being at least about 20% of the matrix by weight and being a water-soluble member selected from the class consisting of alcohols, plant-type sugars, lactones, monoethers and acetals said composition having been produced by the process of claim 2.

10. A composition according to claim 3 in which the oil is a flavor oil.

3,971,853
FROZEN CONFECTION AND METHOD AND APPARATUS FOR MAKING SAME

John V. Crowder, Bethpage, N.Y., assignor to Consolidated Foods Corporation, Chicago, Ill.

Filed Dec. 29, 1970, Ser. No. 102,411

Int. Cl.² A23G *9/04, 9/24, 9/26*

U.S. Cl. 426—249 **3 Claims**

1. A method of making a frozen confection from a plurality of ingredients comprising the steps of providing first and second normally liquid ingredients having first and second colors, reducing said first and second ingredients to a substantially frozen form, conveying said first and second ingredients to a nozzle with said first ingredient being arranged within said second ingredient, directing said first ingredient laterally of its flow path into said second ingredient to substantially intermix them, introducing a third normally liquid ingredient in its substantially liquid state to a portion of the interface between said second ingredient and said nozzle, and discharging all of said ingredients into a mold.

3,971,854
METHOD OF PRODUCING FREEZE-DRIED, COOKED BEEF STEAK AND RESULTING PRODUCT

Larry C. Hinnergardt, Franklin, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,203

Int. Cl.² A23L *1/31*

U.S. Cl. 426—281 **6 Claims**

1. Method of producing freeze-dried, cooked beef steaks which are rapidly rehydratable and which are tender and juicy following rehydration which comprises, mechanically tenderizing beef muscle by penetrating the beef muscle from which said beef steaks are to be prepared by inserting sharp, narrow cutting means into and through said beef muscle at least one time, withdrawing said cutting means from said beef muscle, pumping into said beef muscle at a plurality of substantially equally spaced apart points an aqueous solution containing from about 3.0 to about 5.0 percent sodium tripolyphosphate and from about 5.0 to about 10.0 percent sodium chloride until said beef muscle has absorbed from about 8 percent to about 12 percent of said aqueous solution, freezing said beef muscle containing said aqueous solution, cutting said beef muscle into slices suitable for cooking as steaks, cooking said slices to produce cooked beef steaks, freezing said cooked beef steaks, and freeze-vacuum-dehydrating said cooked beef steaks to a moisture content less than about 2.0 percent.

3,971,855
PREVENTION OF FUNGI AND MOLDS IN POULTRY AND ANIMAL FEEDSTUFFS WITH METHYL ROSANILINE CHLORIDE ADDITIVE

Dennis E. Jackson, Springfield, Mo., assignor to Naremco, Inc., Springfield, Mo.

Division of Ser. No. 307,372, Nov. 17, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,720

Int. Cl.² A23K *3/00*

U.S. Cl. 426—321 **5 Claims**

1. A poultry or animal feed product protected against microbial activity, fungi and mold growths, comprising a basal feed ration containing ground feed materials in intimate admixture with a substantially dry, finely-divided, non-toxic, mineral carrier having from about 0.05% to 5.0% by weight of methylrosaniline chloride dispersed thereon, said mineral carrier having incorporated therein by adsorption or reaction from about 0.1% to 10% by weight of a non-toxic acid based on the weight of the carrier, said acid being one which is adsorbed by or forms water soluble reaction products with said carrier, to thereby facilitate the release of said methylrosaniline chloride from the carrier in the presence of moisture.

3,971,856
PROCESS FOR PREPARING SOY PROTEIN CONCENTRATE

Rasik D. Daftary, Decatur, Ill., assignor to Archer Daniels Midland Company, Decatur, Ill.

Filed Mar. 3, 1975, Ser. No. 554,572

Int. Cl.² A23J *1/14, 3/00;* **A23L** *1/20*

U.S. Cl. 426—417 **5 Claims**

1. A process for preparing a full-fat soy protein concentrate which is very bland in taste and very light in color and contains substantially all of the original protein content, which comprises the sequential steps of:

1. adding dehulled, cracked soybeans to water at 180°–212°F and maintaining the soybeans in the water at that temperature for 10–50 minutes,
2. removing the soybeans from the water,
3. washing the soybeans in fresh hot water, and
4. drying the washed soybeans to 8–15% moisture.

3,971,857
MULTIFUNCTIONAL SWEETENING COMPOSITION

Ivan Fruda, Pleasantville, and Jerome Francis Trumbetas, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,015

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **9 Claims**

1. A process for producing a low calorie sweetening composition which is readily soluble in aqueous systems, low in hygroscopicity and devoid of any aftertaste which alters the sweetness thereof which comprises:

a. forming an aqueous solution of glucose;
b. heating the glucose solution until the glucose is completely solubilized;
c. adding a catalytic amount of phosphoric acid to the heated solution in order to catalyze the polymerization of the glucose;
d. evaporating the heated solution to form an acidified glucose syrup;
e. vacuum heating the acidified glucose solution to obtain a polyglucose residue;
f. forming an aqueous solution of dipeptide sweetener with the polyglucose in a respective weight ratio range of about 1:19 to about 3:7.
g. drying the dipeptide sweetener/polyglucose solution.

3,971,858
EXTRACTING TEA USING AN AQUEOUS SOLUTION OF AMMONIUM BICARBONATE OR AMMONIA

Peter Dudley Collier; Alistair Penman, both of Rushden, and Frederick John Trussell, Ampthill, all of England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Aug. 30, 1974, Ser. No. 501,955

Claims priority, application United Kingdom, Sept. 5, 1973, 41649/73; Oct. 26, 1973, 50085/73

Int. Cl.² A23F *3/00*

U.S. Cl. 426—597 **12 Claims**

1. A method of obtaining a tea extract containing soluble tea solids in substantially higher yields than obtained by simple hot water extraction, comprising the steps of extracting tea leaves with an aqueous solution of a material selected from the group consisting of ammonium bicarbonate and ammonia to produce an aqueous tea extract, separating the extracted leaves from the aqueous tea extract and discarding the leaves.

3,971,859
TECHNIQUE FOR PREPARING EDIBLE FOOD FLAVOR PELLETS

Eric G. Huessy, Eden Prairie, Minn., assignor to Peavey Company, Minneapolis, Minn.
Continuation of Ser. No. 225,602, Feb. 11, 1972, abandoned.
This application July 9, 1974, Ser. No. 486,813
Int. Cl.² A23L *1/22*
U.S. Cl. 426—618 3 Claims

1. The method of preparing edible food flavoring pellets for incorporation in dry baking mixes and the like which comprises:

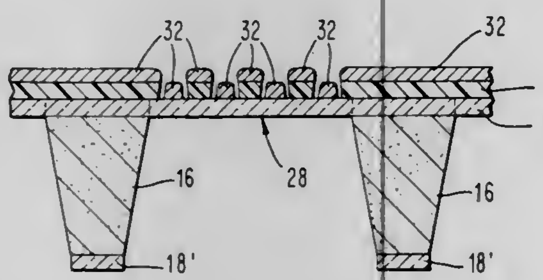
a. preparing a homogeneous protein rich mixture with the following formulation:

Ingredient	Percentage
Wheat germ	30 – 50
Soy flour	10 – 30
Sugar	10 – 15
Water	7 – 11
Vegetable oil	4 – 6
Cornstarch	3 – 5
Sorbitol	1 – 3
Artificial flavoring	1 – 5
Sodium chloride	1.90
Lactic acid	0.45
Sodium citrate	0.22

b. separating said formulation into integral pellets; and
c. immersing said integral pellets into a bath of vegetable oil heated to a temperature of between 350° and 400°F. for a period of between about 30 seconds and 100 seconds.

3,971,860
METHOD FOR MAKING DEVICE FOR HIGH RESOLUTION ELECTRON BEAM FABRICATION

Alec N. Broers, Purdy Station, and Thomas O. Sedgwick, Crompond, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 358,186, May 7, 1973, abandoned, which is a division of Ser. No. 158,463, June 30, 1971, abandoned. This application Feb. 26, 1975, Ser. No. 553,184
Int. Cl.² B05D *3/06*
U.S. Cl. 427—43 3 Claims



1. A method for making devices for high resolution electron beam fabrication comprising the steps of:
coating two parallel surfaces of a semiconductor wafer substrate with first and second layers of a base material on opposing surfaces,
coating said first and second layers of base material with a suitable photoresist material,
exposing the first of said photoresist layers in a predetermined pattern,
developing said exposed photoresist to expose the first of said base material layers in said predetermined pattern,
etching said first base material layer with a suitable etchant to thereby expose the surface of said substrate thereunder in said predetermined pattern,
removing the photoresist layers from said base material layers,
etching the surface of said substrate until it is completely dissolved thereby producing thin windows consisting of the second of said base material layers according to said predetermined pattern,
depositing an electron resist on said second base material layer,
exposing said resist to an electron beam at the location of said thin windows in a predetermined pattern,
developing said resist in said predetermined pattern to expose the surface of said second base material layer, and
depositing a metal on said surface of said second base material layer and thereafter removing the unexposed resist and metal thereon to provide a highly resolved metal pattern on said second base material layer.

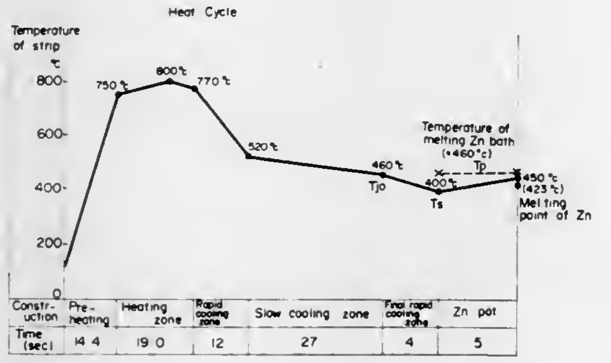
3,971,861
ALLOY PLATING SYSTEM

Lionel de Waltoff, La Prairie, Canada, assignor to Handy Chemicals Limited, La Prairie, Canada
Filed Oct. 25, 1974, Ser. No. 518,170
Int. Cl.² C23C *3/02*
U.S. Cl. 427—247 9 Claims

1. In an aqueous electroless plating solution containing a nickel salt, a tin salt and a hypophosphite, the improvement which comprises including in said solution thiourea in an amount of at least 1% by weight up to the saturation concentration of thiourea and maintaining the pH value of the solution in the range of about 2 to 5.

3,971,862
CONTINUOUS HOT-DIP GALVANIZING PROCESS FOR STEEL STRIP

Yoshikazu Fukuoka, and Hiroshi Miwa, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 386,575, Aug. 8, 1973, abandoned. This application July 7, 1975, Ser. No. 593,186
Claims priority, application Japan, Aug. 10, 1972, 47-79510
Int. Cl.² C23C *1/00*
U.S. Cl. 427—329 3 Claims



1. In a continuous hot-dip galvanizing process wherein a flux is omitted and wherein a steel strip is annealed in line in a heating furnace at a temperature of more than 750°C., and then the strip is slowly cooled in a furnace having a reducing atmosphere followed by introducing the strip to a molten zinc bath, the improvement which comprises
subjecting said annealed strip to a final rapid cooling following said slow cooling to provide a temperature of the strip from 300° to 460°C. just before it is passed into the molten zinc bath, said temperature being below or equal to the temperature of zinc bath, whereby the formation of dross is substantially reduced.

3,971,863
COATED HEAT FUSIBLE INJECTION MOLDABLE PHENOL-ALDEHYDE PELLETS

Thornton R. Calkins, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.
Continuation-in-part of Ser. No. 304,016, Nov. 6, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,114
Int. Cl.² B32B *27/42*
U.S. Cl. 428—407 8 Claims

1. A coated heat fusible thermosettable injection moldable phenol-aldehyde pellet consisting essentially of a phenol-aldehyde resin, crosslinking agents and fillers having a diameter of at least one-sixteenth inch which comprises the pellets having a coating on the surface thereof wherein said coating comprises in admixture (1) a metallic salt of a long chain fatty acid of 8–20 carbon atoms and (2) a material selected from the group consisting of (a) a alkyl ester of an aromatic acid, (b) an alkyl ester of an aliphatic acid, (c) mixtures of (a) and (b), and (d) mixtures selected from the group consisting of (a), (b), and (c) with a material selected from the group consisting of polyglycols, polyglycol esters and mixtures of polyglycols and polyglycol esters; wherein said coating composition contains 0.5 to 10 parts of (2) per 1 part of (1).

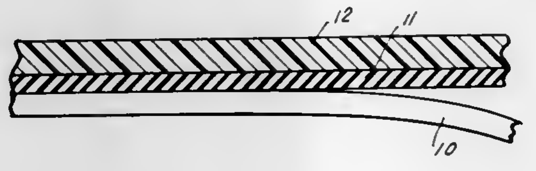
3,971,864
POLYURETHANE LAMINATES

William R. Beestrice, New Kensington; Joseph Cherenko, Valencia, and William I. Frey, Curtisville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 30, 1974, Ser. No. 510,672
Int. Cl.² B32B *27/40*
U.S. Cl. 428—423 7 Claims

1. A transparent laminate suitable for use as a window comprising a layer of rigid transparent material selected from the group consisting of glass and rigid transparent plastic materials laminated to a first major surface of a layer of polyurethane having a tendency to bloom and an essentially continuous layer of wax covering the second major surface of said layer of polyurethane, said layer of wax having a minimum thickness sufficient to protect said second major surface from blooming and a maximum thickness less than that which significantly affects the optical quality of the laminate.

3,971,865
ADHESIVE RESIN COMPOSITION

Masao Murakami; Akio Amaya, and Masaru Kawakita, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 9, 1975, Ser. No. 566,224
Int. Cl.² C09J *7/02, 3/12, 3/16;* B32B *7/12*
U.S. Cl. 428—40 20 Claims



1. An adhesive composition comprising in intimate admixture,
A. a nitrile rubber with carboxyl groups
  1. said nitrile rubber being a terpolymer comprised of acrylonitrile, butadiene, and on a 100 weight basis, from about 0.5 to 7 weight percent of at least one material selected from the group consisting of acrylic acid and methacrylic acid,
  2. the weight ratio of acrylonitrile to butadiene in said nitrile rubber ranging from about 15/85 to 50/50,
  3. said nitrile rubber having a molecular weight greater than about 10^5, and a Mooney viscosity of from about 40 to 75 ML_8 at 100°C.
  4. said nitrile rubber having an initial solubility such that at most about 28 parts by weight thereof are soluble in 100 parts by weight of methyl ethyl ketone at ambient temperatures, and
B. a polyamide resin formed by the condensation polymerization of polymeric fatty acids with an alkylene-polyamine
  1. said polymeric fatty acids being polymerized from monocarboxylic aliphatic acids having from 8 through 24 carbon atoms per molecule, and having a molecular weight ranging from about 140 to 400,
  2. said alkylene-polyamines being characterized by having the generic formula: $H_2N + CH_2 - CH_2 - NH +_n H$ where *n* is an integer from 1 through 5,
  3. said polyamide resin having an amine value of from about 90 to 350 and by having a molecular weight of from about 500 to 5000,
C. the weight ratio of said polyamide resin to said nitrile rubber in said adhesive composition ranging from about 0.5/100 to 1/1.

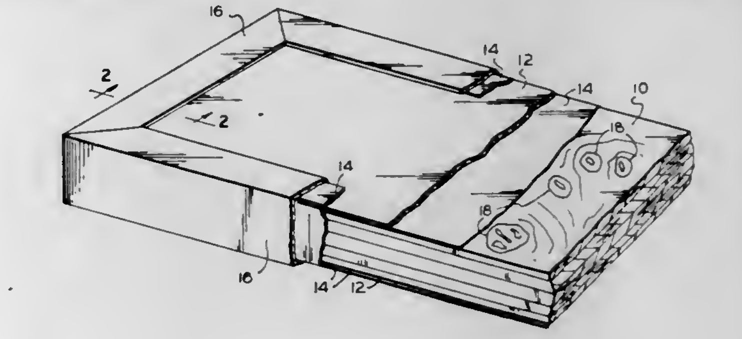
3,971,866
THERMOFORMABLE RELEASE LINER

Erlin J. Johnson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 7, 1974, Ser. No. 477,411
Int. Cl.² B32B *1/00, 7/06*
U.S. Cl. 428—40 13 Claims

1. A contoured article comprising a drawn thermoformed base sheet, a layer of pressure-sensitive adhesive united to said base sheet, and a release liner temporarily adhered over substantially the whole area of said layer of adhesive, said liner (1) in its unelongated form requiring less than about 3 pounds per inch width tensile load to exhibit a 10 percent elongation at 325°F and greater than about 3 pounds per inch width tensile load to exhibit a 10 percent elongation at 150°F, (2) comprising (a) a thin thermoplastic reinforcing layer of a first material that, in its unelongated form, requires greater than about 1000 pounds per square inch tensile stress to exhibit a 10 percent elongation at 150°F and can be elongated to at least 200 percent of its original length at 325°F and (b) at least one bodying layer united to the reinforcing layer of a second material that can be elongated to at least 200 percent of its original length at 325°F while remaining as a continuous film adhered to the reinforcing layer, and (3) being removable from the adhesive layer as a continuous sheet by hand-pulling.

3,971,867
DECORATIVE ACOUSTICAL BUILDING PANEL

Robert L. Randall, 7800 SW. 89th, Portland, Oreg. 97223
Filed July 29, 1974, Ser. No. 492,703
Int. Cl.² B32B *1/04;* E04B *1/82;* E04C *2/38;* G10K *11/04*
U.S. Cl. 428—45 6 Claims



1. A decorative acoustical building panel comprising:
a. a core member of ligno-cellulosic board material;
b. a layer of sound-absorbent textile material overlaying substantially the two major surfaces of said core member and adhesively affixed thereto; and
c. a peripheral frame formed of U-shaped channel members extending substantially completely around the perimeter

of said textile-overlaid core member, covering the exposed edges thereof and secured thereto substantially only by adhesive bonding.

3,971,868
FABRIC TAPE FOR SLIDE FASTENER STRINGERS WITH MEANS TO PREVENT UNRAVELING AT ITS SEVERED ENDS

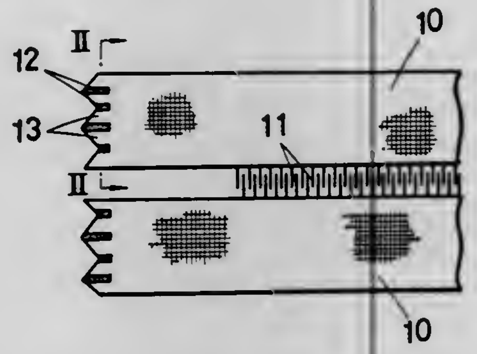
Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Feb. 4, 1975, Ser. No. 546,877

Claims priority, application Japan, Feb. 7, 1974, 49-15867[U]

Int. Cl.² A47H *1/00;* **A44B** *19/24*

U.S. Cl. 428—194 **2 Claims**



1. In a slide fastener stringer tape which is made of a fabric at least partly including synthetic fibers and which has at least one end formed by severance of the stringer tape from a continuous length of such tape, the improvement comprising a plurality of separated thermally fused regions formed at the severed end portion of said stringer tape to prevent the unraveling of the fabric, said thermally fused regions being spaced apart from each other in the transverse direction of said stringer tape, in each thermally fused region, the synthetic fibers therewithin being fused to bond the fabric together.

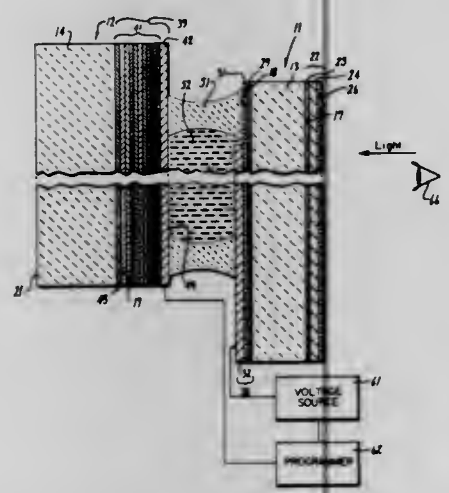
3,971,869
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD

Robert M. Gelber, Healdsburg, and Edward A. Small, Jr., Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 338,178, March 5, 1973, abandoned, which is a division of Ser. No. 171,572, Aug. 13, 1971, Pat. No. 3,736,047. This application Dec. 18, 1974, Ser. No. 533,893

Int. Cl.² B32B *3/00*

U.S. Cl. 422—195 **16 Claims**



1. In a member for use with a liquid crystal display device, an insulative substrate having first and second surfaces, a plurality of layers of a dielectric material disposed on one of said surfaces, a layer of conductive material disposed on said dielectric layers, said conductive layer having a pattern therein formed by the absence of conducting material, said dielectric layers and said conducting layer being formed so that in the visual region of 400 to 700 nanometers, the dielectric layers in combination and the conducting layer have substantially the same reflectance and being virtually identical in appearance whereby the pattern is substantially invisible to the naked eye when the liquid crystal display device is not activated.

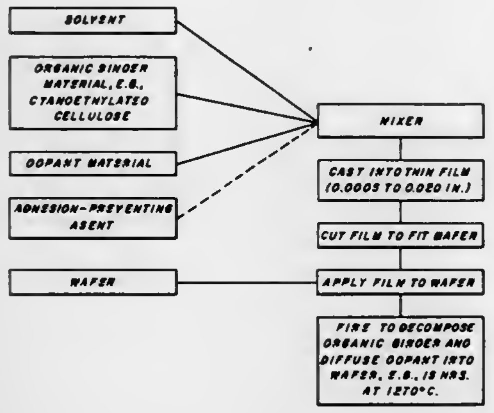
3,971,870
SEMICONDUCTOR DEVICE MATERIAL

Ralph W. Christensen, Butler, Pa.; Everett C. Smith, Sarver, Pa., and George Tibol, Fairview, N.J., assignors to Semi-Elemento, Inc., Solitron Devices, Inc., Santa Clara, Calif., a part interest to each

Continuation of Ser. No. 166,592, July 27, 1971, which is a division of Ser. No. 801,667, Feb. 24, 1969, Pat. No. 3,630,793. This application Jan. 24, 1974, Ser. No. 436,337

Int. Cl.² C08L *1/26;* **B32B** *15/18*

U.S. Cl. 428—336 **2 Claims**


SOLVENT
ORGANIC BINDER MATERIAL, E.G., CYANOETHYLATED CELLULOSE
DOPANT MATERIAL
ADHESION-PREVENTING AGENT
WAFER
MIXER
CAST INTO THIN FILM (0.0005 TO 0.020 IN.)
CUT FILM TO FIT WAFER
APPLY FILM TO WAFER
FIRE TO DECOMPOSE ORGANIC BINDER AND DIFFUSE DOPANT INTO WAFER, E.G., 15 HRS. AT 1270°C.

1. A self-supporting flexible film having a thickness of about 0.0005 to 0.02 inches consisting essentially of from 90 to 97% of a dopant component consisting essentially of a finely divided semiconductor dopant material selected from the group consisting of phosphorous pentoxide, arsenic, antimony, iron, cobalt, boron nitride, boric acid, indium, methyl borate and gallium, said dopant component homogeneously admixed with from 3 to 10% of a volatile organic binder selected from the group consisting of cyanoethylated cellulose, methyl cellulose, polyvinyl alcohol, starch and vinyl butyral.

3,971,871
TEXTURIZING SIZE AND GLASS FIBERS COATED WITH SAME

Harold L. Haynes, Granville, and Michael J. Harvey, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 408,229, Oct. 19, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 572,974

Int. Cl.² C08L *3/08, 3/06*

U.S. Cl. 428—392 **10 Claims**

1. Glass fibers having a coating consisting essentially of the following solids in approximate parts by weight: 1.25 to 3.00 of a starch having a degree of substitution of from approximately 0.01% to 0.1% of an ether or ester radical of a tertiary amine and that is generally devoid of primary amines, 0.2 to 0.8 of a nonionic lubricant, 0.04 to 0.16 of a nonionic lubricant emulsifier, 0.1 to 0.6 of Bis-beta-3-(2-heptadecylimidazolyl) ethyl amine, and 0 to 1.0 of a humectant.

3,971,872
PROCESS FOR THE PRODUCTION OF AN ABRASION RESISTANT OPTICAL ELEMENT

Albert R. LeBoeuf, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 30, 1974, Ser. No. 510,348

Int. Cl.² B05D *5/06*

U.S. Cl. 428—412 **10 Claims**

1. An allyl diglycol carbonate lens having a transparent abrasion resistant coating upon at least one surface obtained by (1) hydrolyzing said surface of said lens in an aqueous alkaline solution; (2) coating said lens with an aqueous coating composition comprising a mixture of an acid polysilicic ester of an alcohol containing from 1 to 12 carbon atoms and having up to four silicic acid ester groups per silicon atom, and a polyvinyl alcohol comprising 90% to 100% hydrolyzed polyvinyl acetate; and (3) drying and curing said coating at an elevated temperature.

3,971,873
METHOD OF PRODUCING HIGH BRIGHTNESS CORROSION RESISTANT FINISH ON THE SURFACE OF ALUMINUM AND ITS ALLOYS

Herbert K. Price, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Apr. 23, 1974, Ser. No. 463,341

Int. Cl.² B32B *15/08, 27/30*

U.S. Cl. 428—463 **11 Claims**

1. An article composed of aluminum or an aluminum base alloy having a recrystallized metallurgical structure, and having adhered directly on the metal surface thereof a transparent thermoplastic solvent-soluble resinous coating composition consisting essentially of (*a*) between about 10% and about 40% by weight of a terpolymer of vinyl chloride, vinyl acetate and maleic acid and (*b*) between about 60% and about 90% by weight of a lower alkyl methacrylate ester polymer, said coated article exhibiting a spectral reflectance of at least 95%.

3,971,874
OPTICAL INFORMATION STORAGE MATERIAL AND METHOD OF MAKING IT

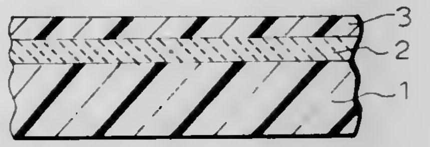
Takeo Ohta, Nara, and Mutsuo Takenaga, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 26, 1974, Ser. No. 500,468

Claims priority, application Japan, Aug. 29, 1973, 48-97615; Aug. 29, 1973, 48-97616; Aug. 29, 1973, 48-97617

Int. Cl.² C23C *3/04;* **G01D** *15/34*

U.S. Cl. 428—432 **11 Claims**

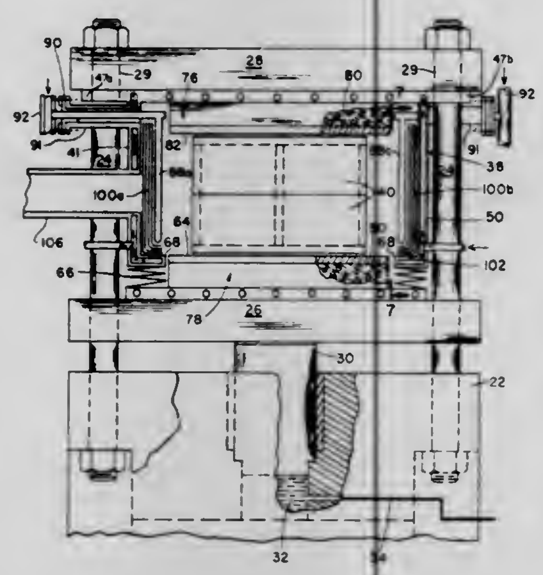


1. In an optical information storage material having a base and a film deposited on said base the state of which can be changed between the low optical density state and the high optical density state by the application of electrical, optical or thermal energy, the improvement wherein said film comprises TeO$_{x1}$ in which $0 < x1 < 2.0$.

3,971,875
APPARATUS AND METHOD FOR VACUUM HOT PRESS JOINING, COMPACTING AND TREATING OF MATERIALS

John A. Regalbuto, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jan. 4, 1974, Ser. No. 430,857
Int. Cl.² H05B *3/66*
U.S. Cl. 13—31 **19 Claims**



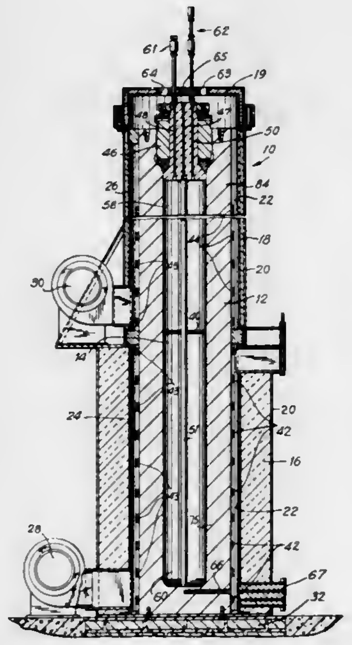
1. A simplified essentially gastight furnace chamber device for convenient repetitive reuse in an open bed type press, providing for work materials to be easily placed into and removed from the chamber and heated within a chemical reaction inhibiting environment such as a high degree of vacuum or inert gas while subjected to pressure from the press acting externally against a collapsible wall section of the chamber comprising:

- a. an essentially gastight, reusable furnace chamber formed as a unitary enclosure adapted to be operatively positioned between opposing press platens of an open bed type press that provides for application of mechanical pressure to objects located between the press platens, said chamber having a continuous external boundary wall including rigid top and bottom wall portions and a side wall portion integrally connecting said top and bottom wall portions, said chamber being dimensionally contractible and expansible in use;
- b. the interior of said chamber having a work receiving area adapted to receive and hold work materials therein to be formed, compacted, joined or treated;
- c. a relatively large access opening substantially the full height and width of said work receiving area opening through said chamber side wall and communicating the exterior of said chamber with the interior of said work receiving area for easy passage through said boundary wall of work materials to be placed into or removed from said work receiving area;
- d. access door means at said chamber boundary wall operative for opening and closing said access opening to provide substantially gastight sealing of the chamber interior about the work materials placed therein when secured closed and for inserting into and removing of work materials from the chamber interior when open;
- e. means for securing said access door sealed over said opening and for releasing the door when it is to be opened;
- f. means operatively connected with said chamber interior for providing a chemical reaction inhibiting environment thereto;
- g. heating means positioned in said chamber operative when activated to supply heat to work materials placed therein; and
- h. expandable and contractable means positioned in said side wall portion to form said chamber external boundary wall to have a dimensionally stable section and a collapsible dimensionally non-stable boundary wall section each containing one of said rigid top and bottom wall portions, the non-stable section providing for repetitively increasing and decreasing the height of said chamber by expansion and contraction such that the press platens can be engaged externally directly against said rigid top and bottom wall portions of the chamber to apply pressure therethrough to the work materials therein; and said non-stable wall section being operatively repetitively recoverable to its original operatively expanded dimensions after being dimensionally contracted in use to provide for contracting and expanding the volume of the work receiving area in the applying and releasing of the external pressures to or from the work materials within;
- i. whereby mechanical force may be applied to work materials within said chamber interior in a substantially even distribution of pressure across said materials by means of pressing forces applied against one of said wall sections when one of the press platens is moved against the exterior of said chamber.

3,971,876
TEMPERATURE CONTROL APPARATUS

Donald E. Witkin, and Arnold G. Bowles, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Division of Ser. No. 536,372, Dec. 26, 1974, Pat. No. 3,922,527. This application July 3, 1975, Ser. No. 592,888
Int. Cl.² H05B *1/02*
U.S. Cl. 13—31 **11 Claims**



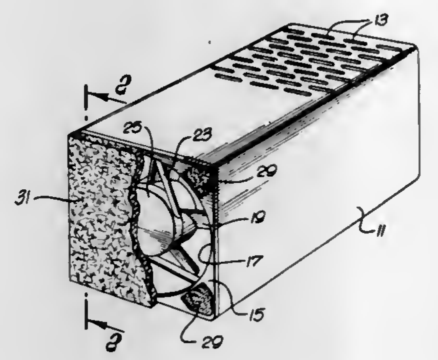
1. Apparatus for controlling the temperature distribution in a pressure vessel having a large thermal time lag comprising,

- an enclosed, high strength walled chamber, the chamber being divided into an upper and a lower portion by a baffle,
- a first and a second heating element associated with the upper portion,
- a third heating element associated with the lower portion,
- a first temperature sensing means for providing an output indicative of temperature in the upper portion,
- a second temperature sensing means for providing an output indicative of temperature in the lower portion,
- a first temperature controller for providing an output signal responsive to the output of the first temperature sensing means,
- a differential temperature controller for providing an output signal responsive to a difference in outputs of the first and second temperature sensing means,
- a first driver responsive to the output signal of the first temperature controller for applying energy to the first heating element,
- a driver means responsive to the output signal of the differential temperature controller for applying energy respectively to the second and third heating elements, and
- the total energy applied to said second and third heater elements by said driver means being substantially independent of the value of the output signal from the differential temperature controller.

3,971,877
REMOVABLE FILTERS ON ELECTRONIC CHASSIS AND METHOD OF ASSEMBLING SAME

Lawrence Y. Lee, Santa Ana, Calif., assignor to Lawrence Y. Lee, Santa Ana, Calif.

Filed Sept. 29, 1975, Ser. No. 617,919
Int. Cl.² H01B *7/34, 9/06;* **H01G** *3/03, 5/10*
U.S. Cl. 174—16 R **11 Claims**



6. Apparatus for attaching an air permeable, open cell filter element having an interconnected lattice structure over the air inlet passage of a fan-forced convection cooling electronic chassis, comprising:

- a flat sheet member attached to said electronic chassis adjacent said air inlet passage; and
- plural semiresilient hook members protruding from said flat sheet member on the side opposite said chassis, said hook members positioned within the interstices of said open cell filter element and engaging said lattice structure.

10. A method of attaching an open cell filter element to the air inlet opening of a forced convection cooled electronic chassis, comprising:

- attaching a fastener having plural protruding hook members to said electronic chassis adjacent said air inlet opening;
- placing said open cell filter element over said air inlet opening in direct contact with said fastener; and
- applying pressure to said filter element to directly interengage said open cells and said plural hook members.

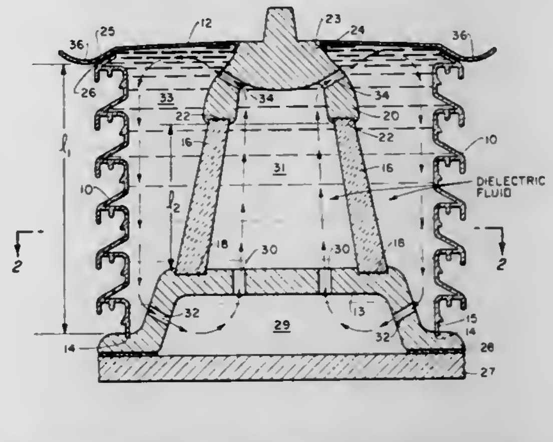
3,971,878
VLF ANTENNA TOWER BASE INSULATOR

Kwang Ta Huang, Port Hueneme, and James L. Brooks, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,556
Int. Cl.² H01B *17/34*
U.S. Cl. 174—30 **10 Claims**

1. A VLF antenna base insulator comprising:

- a. a metal base member having a raised central portion forming a first chamber, and a flanged rim about the bottom edge thereof;
- b. a plate means adjacent the bottom of said base member for sealingly enclosing said first chamber;
- c. a hollow central core member of insulating material for providing high mechanical support strength, said central core member being seated on top of the raised central portion of said base member; said base member thus enclosing the bottom of said hollow central core member;
- d. a cap member enclosing the top of said hollow central core member, thus enclosing a second chamber formed by the inner wall of said hollow core member, said base member and said cap member;
- e. a cylindrical housing of surface insulating material comprising a plurality of sheds and petticoats which form the outer insulator wall of the VLF antenna base insulator; the outer surface distance along the longitudinal axis of said cylindrical housing being very long as compared to the axial length thereof;
- f. the bottom edge of said cylindrical housing being sealed against the flanged rim of said base member;
- g. a metal cover sealingly engaging the top of said cap member and the upper edge of said cylindrical housing, thus enclosing a third chamber formed by the inner wall of said cylindrical housing, the outer wall of said hollow central core member, said base member, said cap member and said cover;
- h. mechanical bearing forces and stresses exerted axially on said VLF antenna base insulator assembly being borne by said base member, central hollow core member and cap member, without any such mechanical forces being transmitted to said cylindrical housing;
- i. at least one passageway between each of said first and second chambers, said first and third chambers, and said second and third chambers;
- j. said first, second and third chambers and said passageways being filled with a dielectric fluid, said dielectric fluid which also acts as a coolant being circulated through said first, second and third chambers via said passageways due to the natural density differences in the fluid as caused by heat generated thereabout by normal a.c. electrical fields formed while the VLF antenna is in use.



3,971,879
HIGH FREQUENCY CABLE WITH BRIDGING STRIP

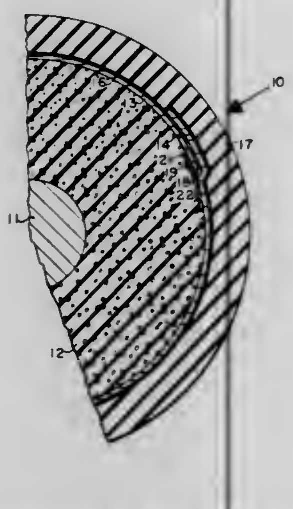
Lee J. Rosenberg, Deerfield, and E. Mark Wolf, Sycamore, both of Ill., assignors to The Anaconda Company, New York, N.Y.

Filed Jan. 31, 1972, Ser. No. 222,205
Int. Cl.² H01B *11/06*
U.S. Cl. 174—36 **3 Claims**

1. A television-frequency communication cable comprising:

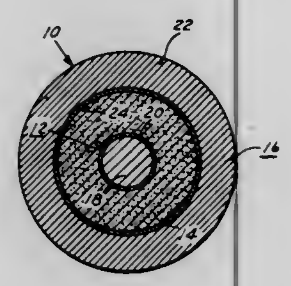
- A. an elongated metallic conductor,
- B. a wall of expanded polyolefinic insulation surrounding said conductor,
- C. a metal tape surrounding said wall, said tape comprising a longitudinal overlapped seam,
- D. a solid, abrasion-resistant synthetic-resinous jacket surrounding said tape,
- E. a layer of adhesive bonding the outer surface of said tape to said jacket and bonding said tape to itself at said seam, said adhesive comprising a fine longitudinal hiatus between the metallic portions of said tape,

F. a longitudinal strip of metal under said seam, said strip being compressed against said tape by said insulation, being free from bonding to said tape, and said strip comprising continuous areas of metal-to-metal contact with said tape on both sides of said hiatus.



3,971,880
PHASE STABLE TRANSMISSION CABLE

Dewey F. Harris, Monument, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.
Division of Ser. No. 515,307, Oct. 16, 1974, Pat. No. 3,909,555. This application Aug. 4, 1975, Ser. No. 601,511
Int. Cl.^{2} H01B *7/18*
U.S. Cl. 174—36 **1 Claim**

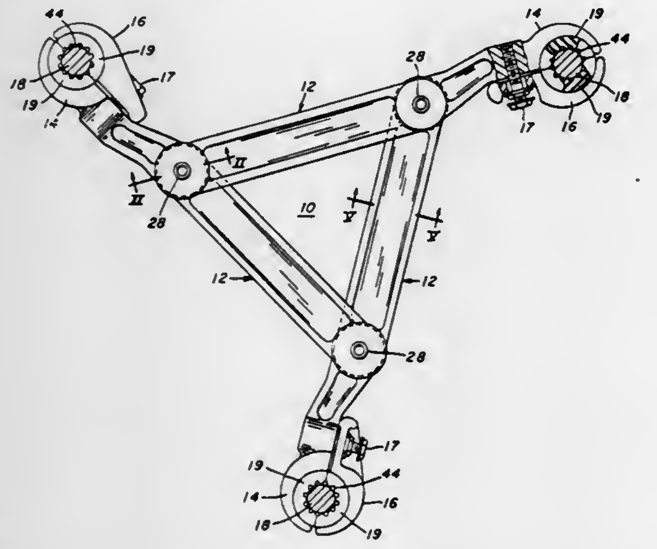


1. A high temperature electrical length stable radio frequency cable comprising a center conductor, a spaced concentric conductive sheath and a dielectric insulating medium between said sheath and the center conductor wherein the sheath comprises a hollow tubular member of a metal or metal alloy of low coefficient of thermal expansion with a relatively thin layer of low electrical resistivity metal bonded to the inside thereof and wherein the dielectric material is selected from the group consisting of silica, magnesia and alumina.

3,971,881
DAMPING SPACER FOR THREE CONDUCTOR BUNDLE

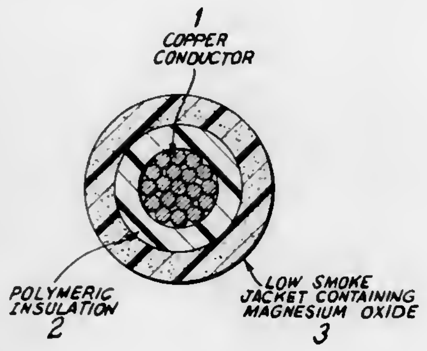
Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 29, 1975, Ser. No. 626,975
Int. Cl.^{2} H02G *7/14, 7/12*
U.S. Cl. 174—42 **15 Claims**

1. A frameless damping spacer for spacing three parallel, overhead conductors, the damping spacer comprising three, rigid, spacer arms and conductor clamping members, said clamping members being respectively located at one end of each of the spacer arms, an integral housing provided at the other end of each spacer arm, an opening provided in each arm near the clamping member, and an opening extending through said housing, said spacer arms being disposed to align the opening near the clamping member of one arm with the opening provided in the housing of another arm to form a triangular shape spacing structure, with a pair of spacer arms being disposed together at each corner of the structure, such that one spacer arm is located adjacent one end of the housing of another spacer arm, a rigid pin extending through the opening in the one arm near its clamping member and through the opening in the housing of the other arm disposed in alignment therewith, and, a close coil, vibration damping means located around the pin and in the opening of the housing.



3,971,882
ELECTRICAL CABLE HAVING AN OUTER SHEATH WITH IMPROVED PYROLYSIS PROPERTIES

Dominic A. Alia, Oakland, N.J., assignor to The Okonite Company, Ramsey, N.J.
Division of Ser. No. 316,848, Dec. 20, 1972, Pat. No. 3,821,139. This application Feb. 14, 1974, Ser. No. 442,333
Int. Cl.^{2} H01B *7/02*
U.S. Cl. 174—110 SR **2 Claims**



2. In combination in an electrical cable, at least one conductor, an essentially smokeless insulating jacket enclosing said conductor, said jacket consisting essentially of chloro-sulfonated polyethylene and chlorinated polyethylene having uniformly dispersed therethrough at least about 2.5% by weight of magnesium oxide effective to impart an intumescence property to said composition when subjected to elevated temperatures.

3,971,883
SILICONE RUBBER-ETHYLENE VINYL ACETATE ADHESIVE LAMINATES AND PREPARATION THEREOF

Lawrence A. Meeks, Cincinnati, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.
Filed Sept. 12, 1975, Ser. No. 612,595
Int. Cl.^{2} H01B *7/00;* C09J *5/02;* B32B *13/12*
U.S. Cl. 174—120 SR **19 Claims**

13. An insulated ignition wire comprising a central conductor, a first insulating material surrounding the central conductor and a second insulating material surrounding the first insulating material and bonded thereto, wherein said first insulating material is crosslinked ethylene-vinyl acetate and said second insulating material is crosslinked silicone rubber and wherein the interfacial surfaces of said first and second insulating material are bonded by a powder bonding agent in an amount of 0.00001–0.001 gram per square inch of surface, said bonding agent being silica or a mixture of silica and a member of the group consisting of a silane and polyfunctional monomer.

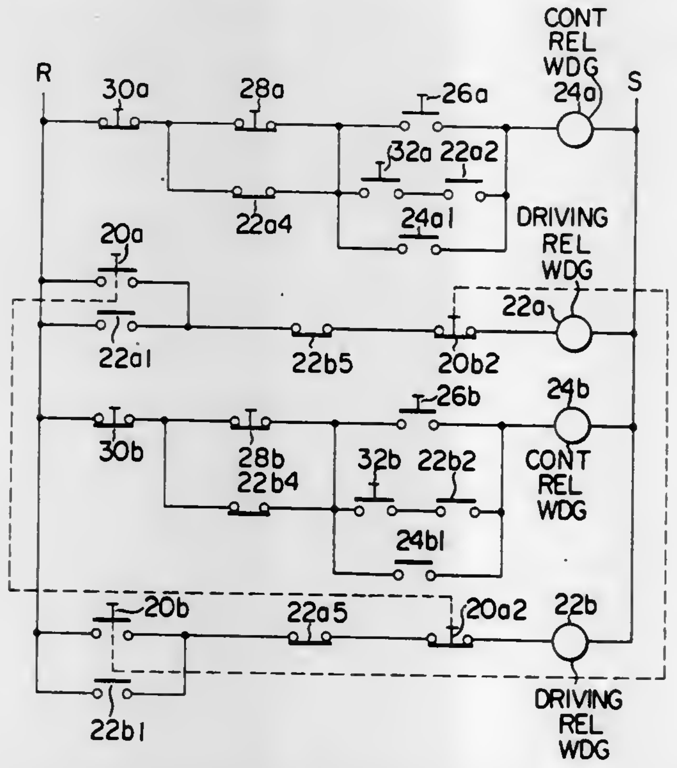
3,971,884
ETHYLENE-VINYL ACETATE SILICONE RUBBER ADHERENT LAMINATES AND METHOD OF PRODUCTION

Lawrence A. Meeks, Cincinnati, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.
Filed Sept. 12, 1975, Ser. No. 612,596
Int. Cl.^{2} H01B *7/00;* C09J *5/02;* B32B *13/12*
U.S. Cl. 174—120 SR **12 Claims**

9. An insulated ignition wire comprising a central conductor, a first insulating material surrounding the central conductor and a second insulating material surrounding the first insulated material and bonded thereto by a surface bonding agent, wherein said first insulating material is a crosslinked ethylene-vinyl acetate copolymer, said second insulating material is crosslinked silicone rubber, and said bonding agent is selected from the group consisting of silane and polyfunctional monomers.

3,971,885
REMOTE CONTROL SYSTEM FOR PASSENGER CONVEYORS

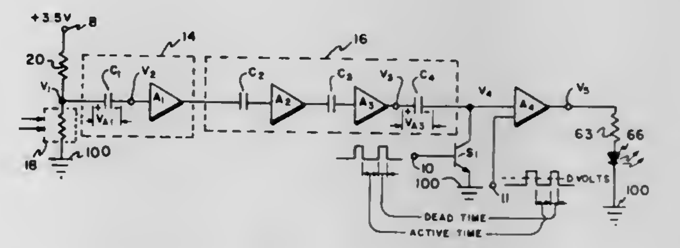
Katsumi Kito, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed July 17, 1975, Ser. No. 596,609
Claims priority, application Japan, July 17, 1974, 49-82512
Int. Cl.^{2} H04N *7/18*
U.S. Cl. 178—6.8 **6 Claims**



1. A control system for remotely controlling the operation of a plurality of passenger conveyors, comprising one monitor switch for each of the passenger conveyors, television receiver means responsive to the operation of each of said monitor switches to remotely monitor the operation of that passenger conveyor operatively associated with the operated monitor switch, remotely operated switch means operative to remotely control the operation of the respective passenger conveyors, and means for remotely controlling the operation of each of the passenger conveyors only when the latter is monitored by said television receiver means.

3,971,886
METHOD OF CONTROLLING A REFERENCE TEMPERATURE TO RESTORE DC LEVEL FOR A THERMAL IMAGING SYSTEM

Sen-Te Chow, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 1, 1975, Ser. No. 564,179
Int. Cl.^{2} H04N *5/14*
U.S. Cl. 178—7.1 **7 Claims**



1. A DC restoration and automatic reference temperature level system for a thermal imager comprising:
- a scanner having an oscillating reflecting mirror;
- an afocal lens system for receiving radiation from a target image reflected from said mirror and sweeping said radiation on a plurality of detectors;
- a plurality of video channels connected at the output from said plurality of detectors for transmitting video signals therethrough;
- a plurality of integrators;
- a voltage clamping means connected to a common terminal of said plurality of video channels, said common terminal is clamped to ground periodically at a point where there is a long time constant during the unclamped time and a short time constant during the clamped time to provide a DC voltage restoration and wherein said common terminal comprises an input to a plurality of light-emitting-diode circuits and a first input to said plurality of integrators;
- a positive voltage bias connected as a second input to said plurality of integrators;
- a comparator circuit for comparing the outputs from said plurality of integrators and for selecting the largest average voltage over the integrated active period when the plurality of video channels are unclamped;
- a video signal amplifier for amplifying said largest average voltage;
- a thermo-electric cooler controlled by the output from said video signal amplifier; and
- an IR window having a reference temperature strip thereon positioned at the focal plane of said afocal lens and having an input to said reference temperature strip from said thermo-electric cooler for establishing a reference temperature on said strip during dead time of said imager that is commensurate with said target temperature during the active time of said imager to prevent suppressive streaking of a cold target image by a hot target image.

3,971,887
DYNAMIC MAGNETIC BUBBLE DISPLAY SYSTEM

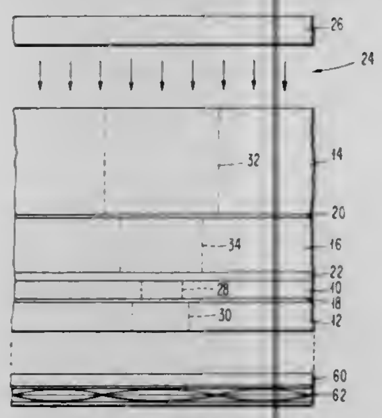
Burn Jeng Lin, Shrub Oak, and Yeong Show Lin, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 9, 1975, Ser. No. 575,908
Int. Cl.^{2} H04N *5/66*
U.S. Cl. 178—7.3 D **18 Claims**

1. An optical processing and display device for producing multi-tone display patterns comprising
- a plurality of separate magnetic bubble array layers arranged in a stack, said magnetic bubble array layers being each of a different thickness, each of said magnetic bubble array layers being composed of material that supports

magnetic bubble domains which are movable in predetermined paths in said array,

electrical signal means connected to each of said magnetic bubble array layers for selectively propagating magnetic bubble domains through said predetermined paths of said layers,

said magnetic bubble domains selectively propagated through said paths of said layers having dimensions proportional to and determined by the thickness of the layers



in which they are propagated such that the bubble domains in the separate layers of bubble arrays in said stack are of different predetermined sizes,

and means for directing light through said stack of bubble array layers, the intensity of transmission of the light directed through said stack of bubble array layers being varied a different amount by each layer of the bubble domains in each layer in accordance with the thickness of each layer.

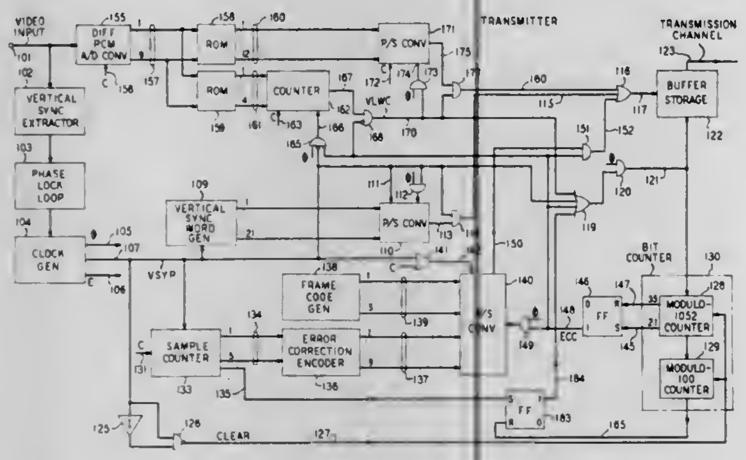
3,971,888
SYNCHRONIZATION SYSTEM FOR VARIABLE LENGTH ENCODED SIGNALS

Yau Chau Ching, Morganville, and Ming-Chwan Chow, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1975, Ser. No. 564,285

Int. Cl.² H04N *5/04*

U.S. Cl. 178—69.5 TV **20 Claims**



1. A synchronization system for use in the transmission of a data stream of variable bit length code words comprising first counting means for cumulatively counting said code words, second counting means operative concurrently with said first counting means for cyclically counting the cumulative number of bits in said data stream, encoding means operative when said second counting means reaches a predetermined count for generating a synchronization word by encoding the current count of said first counting means, and means for inserting said synchronization word into said data stream so that the inserted synchronization word indicates a selected code word in said data stream.

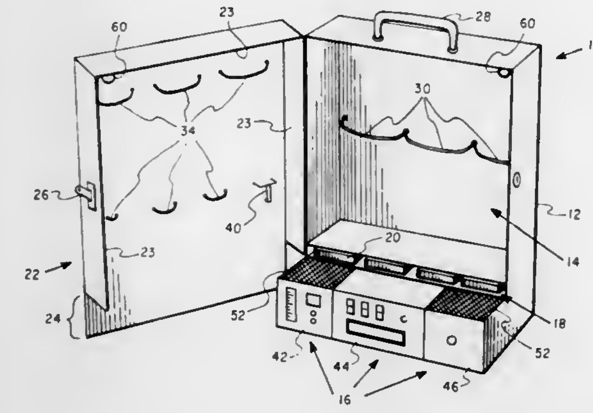
3,971,889
PORTABLE BAR ADAPTED FOR MOUNTING ELECTRONIC EQUIPMENT

Robert A. Hays, 717 SW. 6th, Apt. 18, Newport, Oreg. 97365

Filed Apr. 22, 1974, Ser. No. 462,613

Int. Cl.² H04R *27/00*

U.S. Cl. 179—1 AT **7 Claims**



1. A portable bar adapted for mounting electronic equipment comprising:

- a. a normally upright case including an upper compartment having means for holding a plurality of beverage bottles in upright positions and a bottom compartment disposed in fixed relation to said upper compartment to extend beneath said upper compartment and protrude perpendicularly forwardly therefrom so as to form a generally L-shaped case, said bottom compartment defining a space beneath said upper compartment, and having a protruding top and front, and being adapted to house said electronic equipment partially beneath said upper compartment to minimize the depth of said case;
- b. openable cover means attached to the front of said case for simultaneously covering said upper compartment and said protruding top and front of said bottom compartment; and
- c. holding means on the interior of said cover means for detachably mounting bar implements.

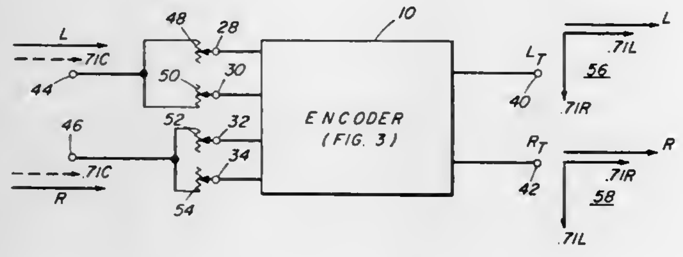
3,971,890
METHOD AND APPARATUS FOR QUADRAPHONIC ENHANCEMENT OF STEREOPHONIC SIGNALS

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,329

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **8 Claims**



1. The method of processing first and second stereophonically related signals respectively containing left (L) and center (C) components and right (R) and center (C) components wherein the C signal components to the extent they are present are common and in phase with their respective L and R components, to produce two signals which when reproduced by a four-channel decoder and loudspeaker system produce a sound field simulative of that produced from a quadraphonically-encoded record, said method comprising the steps of:

- transferring at least a first predetermined reduced amplitude proportion of said first and second signals to first and second output channels, respectively, without relative phase shift between them,

- transferring said first predetermined reduced amplitude proportion of said first signal to said second output channel with a phase shift of about 90° lagging relative to the first signal in said first output channel, and
- transferring said first predetermined reduced amplitude proportion of said second signal to said first output channel with a phase shift of about 90° lagging relative to the first signal in said first output channel.

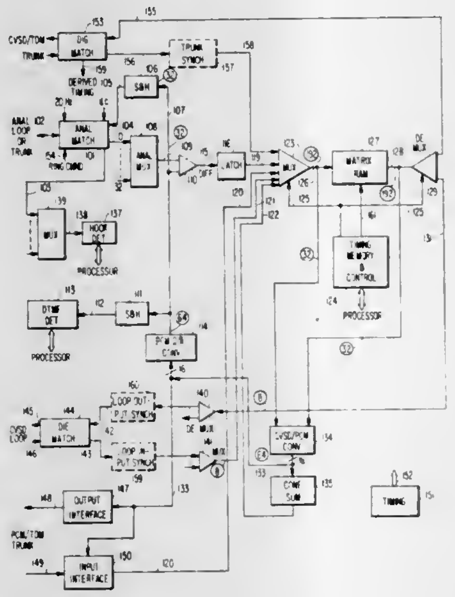
3,971,891
ADAPTABLE TIME DIVISION SWITCH

John R. Wolcott, Orlando, Fla., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Mar. 14, 1975, Ser. No. 558,605

Int. Cl.² H03K *13/22;* **H04J** *3/00;* **H04L** *3/00;* **G06F** *5/00*

U.S. Cl. 179—15 AP **32 Claims**



1. A digital converter for converting information arranged in continuously variable slope delta (CVSD) format into a pulse code modulated (PCM) format, comprising:

- a. a first digital adder for adding first and second inputs and for providing the sum thereof as an output,
- b. means responsive to a predetermined number of consecutive CVSD bits representing said information for applying a first relatively low binary value as a first input to said first digital adder when said consecutive bits are not identical, and for applying a second relatively high binary value as a first input to said first digital adder when said consecutive bits have identical values,
- c. first subtractor means responsive to the output of said first adder means for subtracting a binary shifted version of said output from said output, unshifted, to provide a difference value, said difference value being connected as the second input to said first adder,
- d. a second digital adder for adding first and second inputs thereto and for providing a sum thereof as an output,
- e. true/complement means responsive to the output from said first adder and the last of said consecutive CVSD bits for applying said output in true form to the first input of said second adder when said last CVSD bit is a first value, and for applying the complement of said output to the first input of said second adder when said last CVSD bit is a second value, opposite said first value,
- f. second subtractor means responsive to the output of said second digital adder means for subtracting a binary shifted version of the output of said second adder from an unshifted version of the output of said second adder to provide a difference value, said difference value being connected as the second input to said second adder,
- g. wherein the said output from said second digital adder is in PCM format and represents said information.

8. A telephone switching network comprising:

- a. first multiplexing means adapted to receive a multiplicity of CVSD and CVSD/TDM inputs and provide a CVSD/TDM output; said output representing signals before switching,
- b. switching means connected to receive said CVSD/TDM signals from said multiplexer means and selectively rearrange the data in the channels of said CVSD/TDM signals, the output therefrom representing said signals after switching,
- c. first demultiplexing means for connecting selected ones of the channels in the output of said switching means to selected output ports thereof,
- d. a CVSD/PCM converter for converting CVSD signals at an input thereof into PCM signals at an output thereof, said input being connected to the input and output of said switching means whereby selected channels from said unswithed and said switched CVSD/TDM signals are routed to said converter, and
- e. means for connecting said switching means to an analog loop to enable said switching network to switch analog signals, said means comprising:
  - i. a differential amplifier having one input connected to receive input analog signals, and a second input, the output therefrom being connected as a CVSD signal to said first multiplexing means,
  - ii. a PCM to analog converter having an input connected to the output of said CVSD/PCM converter and an output connected to said second input of said differential amplifier.

3,971,892
TIMING APPARATUS FOR PCM/TDM SWITCHING NETWORKS

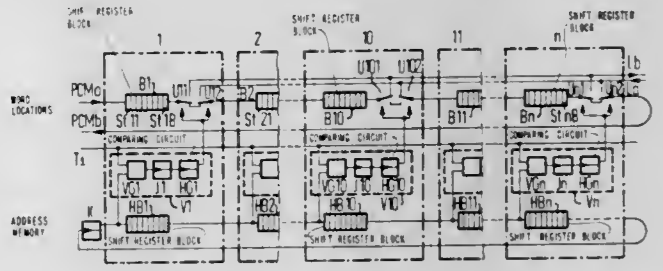
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 21, 1975, Ser. No. 569,660

Claims priority, application Germany, Apr. 22, 1974, 2419251

Int. Cl.² H04Q *11/00*

U.S. Cl. 179—15 BA **2 Claims**



1. Timing apparatus for pulse code modulation, time division multiplex (PCM/TDM) switching networks in a TDM telecommunication system wherein for each call the same time slot is used on incoming and outgoing PCM/TDM trunks, said timing apparatus including a number of word-organized storage locations equal to the number of PCM words per sampling pulse frame and an equal number of address memory locations, individually assigned to word-organized storage locations, for storing the addresses of the time slots during which PCM information words stored temporarily in word-organized storage locations will be retransmitted, the timing apparatus comprising:

first shift register means comprising a number of series-connected blocks of bistable stages, said blocks, respectively, forming said word-organized storage locations,

means connecting an input of the first in the series sequence of said first shift register blocks to incoming conductors of a PCM/TDM trunk and means connecting an output of the last in the series sequence of said first shift register blocks to outgoing conductors of the PCM/TDM trunk,

a pair of simultaneously actuated switches interposed between each succeeding pair of blocks of said first shift register means, each of said switches having a control input, the output of a block being connected to an input of the next succeeding block when the switches constituting the pair interposed therebetween are in their non-operating positions,

service trunk means having incoming and outgoing conductors one of said switches in each said pair, when in its operating position, connecting an output of a said block of said first shift register means to an outgoing conductor of said service trunk means, the other of said switches of the pair, when in its operating position, connecting an input of the next succeeding block of said first shift register means to an incoming conductor of said service trunk means,

second shift register means comprising a number of blocks of bistable stages formed into a series-connected ring for registering a time slot address,

a number of bit comparator means, an input of each said block of said second shift register means being connected to an input of a said bit comparator means associated therewith,

timing circuit means, common to the address memory locations, carrying a time position code corresponding to the time slot being processed, other inputs of said bit comparator means being connected to said timing circuit means,

each said bit comparator means including means for actuating the said control inputs of a said pair of switches coupled thereto when said time position code equals the said time slot address registered in the said block of said shift register means coupled to that bit comparator means, thereby indicating a word-organized storage location and connecting same to said service trunk means.

3,971,893
CONTROL SYSTEM AND PROCESS FOR A SPACE-DIVISION SWITCHING NETWORK

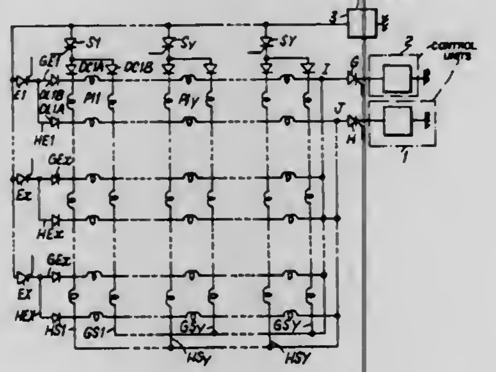
Christian Yves Tournier, and Jean Bernard Kerihuel, both of Paris, France, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 408,598, Oct. 23, 1973. This application July 28, 1975, Ser. No. 599,354

Claims priority, application France, Oct. 31, 1972, 72.38597

Int. Cl.² H04Q *9/00*

U.S. Cl. 179—18 GE **10 Claims**



1. A control system for a space-division multistage switching network, the network including a plurality of crosspoints arrayed in matrix planes in which each crosspoint has a rank in a particular row, i.e., a row rank and a rank in a particular column, i.e., a column rank, each crosspoint including four switching coils belonging to different categories, the coils being so arranged that coils of the same category of the various crosspoints in a row or a column of a matrix plane are connected to complete a row winding or a column winding having a row rank and a column rank, crosspoint switching being controlled by means of four pulses in the form of two pairs of pulses, pulses of a pair having the same value and the four pulses being applied to control the coils of the concerned crosspoint over the respective row winding and column winding, the said control system comprising:

a plurality of winding selection units to select each winding when that winding is to be energized during crosspoint switching, means coupling two of said winding selection units respectively to different ends of the selected winding, one of said selection units being coupled to select a winding according to either the row rank or the column rank common to crosspoints whose coils form the concerned winding and the other one of said selection units being coupled to provide a switching pulse of selected value to the selected winding,

each winding selection unit coupled to select a winding according to either a row rank or a column rank including a connection common to two windings respectively, including coils of different categories which are respectively located at a crosspoint in a matrix plane, those two windings being allotted to the rank of the crosspoint and including connections common to each pair of coils for a crosspoint of the same rank in each of the different matrix planes of a stage of the multi-stage switching network, and

each winding selection unit coupled to provide a pulse of selected value is allotted to only one matrix plane in a stage and is connected, for each selection unit associated to that stage, to one of the two windings which are connected to that rank selection unit in the concerned matrix plane.

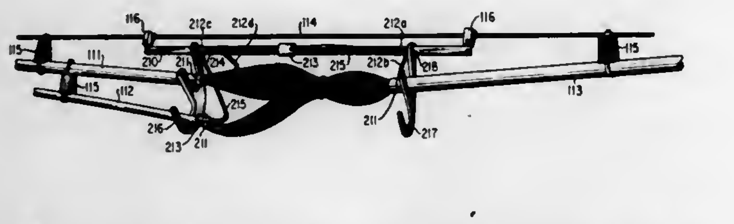
3,971,894
CABLE SPLICE CLOSURE

Carl Walter Faust, Dover, and Arnold Ray Smith, Chester, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 15, 1976, Ser. No. 649,489

Int. Cl.² H02G *7/06, 15/10*

U.S. Cl. 174—41 **7 Claims**



1. Apparatus for enclosing cable splice connections between multiple conductors in at least one cable having an electrical ground sheath and supported by a messenger cable and corresponding mulitple conductors in at least one other cable having an electrical ground sheath and supported by said messenger cable, said apparatus including

a unitary support member,

means for attaching said support member to said messenger cable, said attaching means also for providing an electrical connection between said support member and said messenger cable,

means, affixed to said support member, for providing a flexible electrical connection between said ground sheaths in said one and said other cable and said support member,

unitary flexible means for enclosing said splice connections, said flexible means having an inner surface and first and second parallel edges, a portion of said inner surface supported atop said support member such that said first and second parallel edges are juxtaposed to one another, and

means for securing said juxtaposed first and second parallel edges to one another.

3,971,895
TELEPHONE CONFERENCE ARRANGEMENT

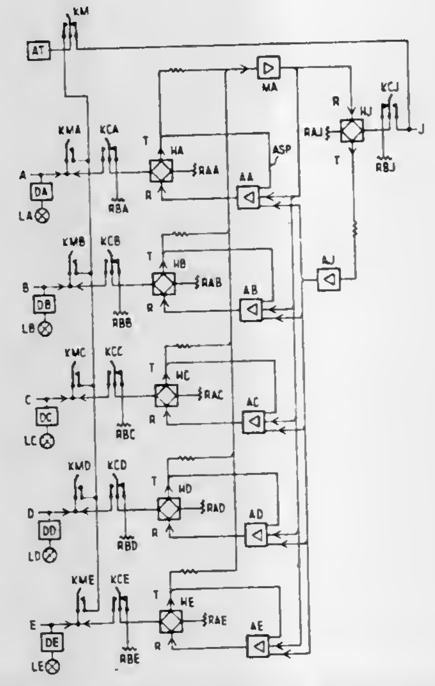
John Edward Hollis, High Wycombe; and John Albert Barrett, Holyport, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Apr. 3, 1975, Ser. No. 564,814

Claims priority, application Great Britain, Apr. 5, 1974, 15539

Int. Cl.² H04M *3/56*

U.S. Cl. 179—1 CN **5 Claims**



1. A telephone conference circuit having a plurality of 2-wire access-paths available for connection to individual telephones of participants of a conference situation, characterized in that it has similar circuit-section for each of said access-paths, and each circuit-section comprises (a) a hybrid transformer, a switching device and a balancing means and having said hybrid transformer substantially balanced by said balancing means in a first state of said switching device and by the access path, when occupied, in a second state of the switching device, and (b) a buffer amplifier connected in the receive channel of the 4-wire side of the associated hybrid transformer, and in which the transmit channel of the 4-wire side of the hybrid transformers of all said circuit-sections are connected to the input path of a mixing amplifier which during a conference call supplies a composite signal to an input of each said buffer amplifier: each said buffer amplifier having a second input path to which a signal derived from the transmit channel of the associated hybrid transformer is applied.

3,971,896
TWO-TONE GENERATOR USING SWITCHING TRANSISTORS IN LC RESONANT CIRCUITS CONTROLLED BY PUSH-BUTTON

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Nov. 13, 1974, Ser. No. 523,497

Claims priority, application Japan, Nov. 16, 1973, 48-128315; Feb. 9, 1974, 49-15855; Feb. 9, 1974, 49-15856

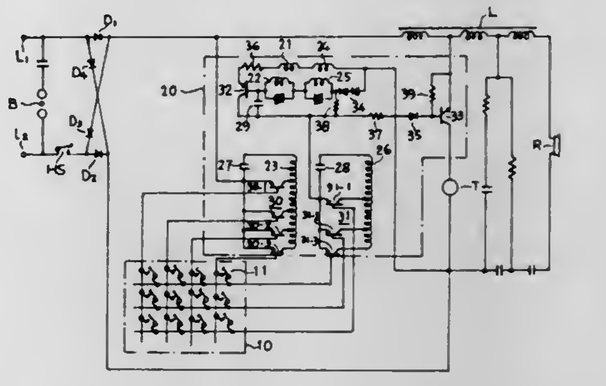
Int. Cl.² H04M *1/50;* **H03B** *5/12*

U.S. Cl. 179—84 VF **4 Claims**

1. A tone generator, for producing a multifrequency signal in the form of two selectable tone signals, comprising:

a two-tone oscillator having two LC resonance circuits each comprised of a coil and a capacitor;

a plurality of switching transistors having the collector-emitter paths thereof coupled to corresponding ones of said two resonance circuits to switch the values of the inductances of the coils in response to the turning ON of the collector-emitter paths, said switching transistors comprising a first group of NPN transistors having their respective collector-emitter paths each connected in common between the capacitor and respective taps progressively along the coil comprising a first of said resonance circuits, and a second group of PNP transistors having



their respective collector-emitter paths each connected in common between the capacitor and respective taps progressively along the coil comprising the second of said resonance circuits;

a plurality of switches individually controllable and each having a contact connected in series between the bases of a respective pair of transistors one of which is respectively included in the first group and one in the second group; and

current means electrically coupled to said switching transistors for flowing, in the base-emitter paths of respective selected ones of said switching transistors of the two LC resonance circuits, base currents greater than the peak values of respective AC currents developed in the two LC resonance circuits to turn-ON said selected ones of said switching transistors and switch the inductances of said coils thereby to select the tones developed by said oscillator, said selected switching transistors being selected by closure of the contact of a selected one of the switches to electrically connect their bases and complete a flow path for the current supplied by said current means.

3,971,897
CIRCUIT ARRANGEMENT FOR A SELECTIVE SIGNAL RECEIVER, PARTICULARLY FOR USE IN TELEPHONE SYSTEMS

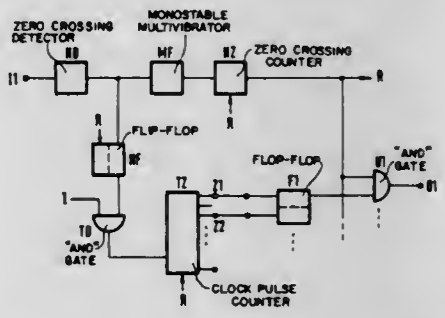
Wolf Ohl, Korntal, and Herbert Ball, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,708

Claims priority, application Germany, Aug. 16, 1973, 2341223

Int. Cl.² H04M *1/50;* **H04Q** *1/46*

U.S. Cl. 179—84 VF **4 Claims**



1. A circuit arrangement for a selective signal receiver which, for frequency recognition, counts the zero crossings of an input signal occurring at each signal-frequency half cycle and measures the time distances between the zero crossings, particularly for use in telephone systems, comprising a circuit operable between a normal "off" state and an "on" state, a zero-crossing counter coupled to said circuit, said circuit responding to the occurrence of a zero crossing to change to the "on" state and provide a counting pulse for the zero-crossing counter, said circuit remaining in said "on" state for a

dwell time which is only little shorter than the duration of the signal-frequency half cycle and remaining uninfluenced by additional zero crossings occurring during said dwell time, said circuit which measures the time distance between the zero crossings including means for counting clock pulses during said dwell time and means for providing an output at the end of said dwell time if the number of clock pulses counted is within a prescribed range.

3,971,898

VISUAL INDICATING CONTROL CIRCUIT IN KEY TELEPHONE SYSTEM

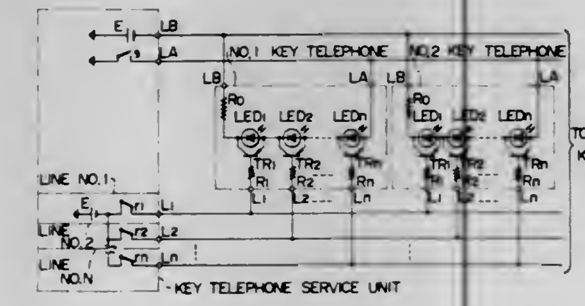
Tokuhisa Hijikata, and Koichi Sekiguchi, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,476

Claims priority, application Japan, Apr. 9, 1974, 49-40335; Dec. 19, 1974, 49-146544

Int. Cl.^{2} H04M *1/22*

U.S. Cl. 179—99 **8 Claims**



1. A visual indicator control circuit for use in key telephone systems including a plurality of lines comprising:
a direct current power supply,
a plurality of light emitting diodes provided in a key telephone set coupled in series across said power supply,
a plurality of transistors provided in the key telephone set having collector-emitter paths connected in parallel with said light emitting diodes,
control circuit means provided in a key service unit coupled to the base electrodes of said transistors for selectively switching said transistors corresponding to the use status of each line to their non-conductive state whereby said light emitting diodes are selectively energized to indicate the use status of said lines.

3,971,899

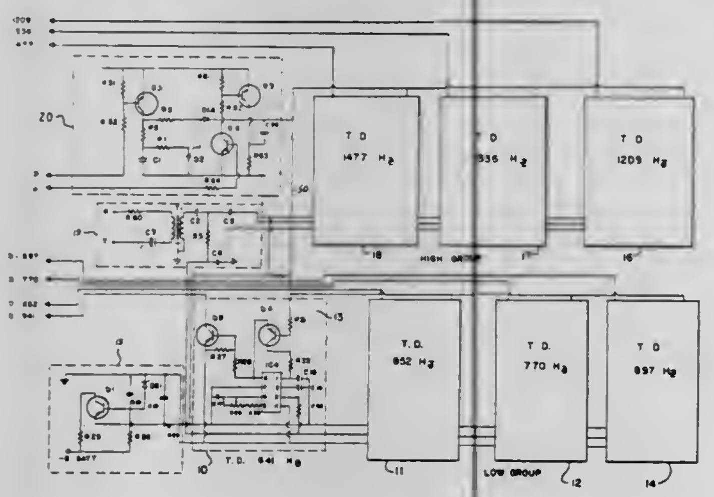
SIGNALLING DEVICE FOR KEY TELEPHONE SYSTEMS

Alexander C. McIntosh, P.O. Box 1673, Bellevue, Wash. 98009

Continuation-in-part of Ser. No. 569,396, April 18, 1975, Pat. No. 3,941,944. This application July 17, 1975, Ser. No. 596,960

Int. Cl.^{2} H04M *1/50*

U.S. Cl. 179—99 **11 Claims**



1. A telephone signalling device comprising tone detection means responsive to calling signal tones occurring on a telephone line to which the device is connected, said signal tones emanating from one or more touch-tone telephones connected to said telephone line, said tone detection means including a plurality of tone detectors each having a phase lock loop element having a voltage controlled oscillator and means to generate an output signal proportional to the phase difference between the tone presented thereto and said voltage controlled oscillator, and latching transistor means connected to each phase lock loop element so as to latch the loop element in its operating state and hold the phase lock loop elements unresponsive to other tones while the latching transistor means is activated, means to activate said latching transistor means for a predetermined time period responsive to the reception of a set of signal tones by said tone detectors, and a matrix of switching elements selectively activated by said tone detection means, said switching elements each being connected to a telephone instrument and actuating an indicator at said telephone instrument.

3,971,900

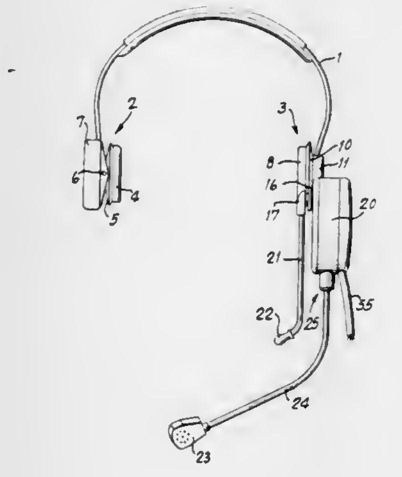
COMMUNICATIONS HEADSET WITH ROTATABLE AND TILTABLE ELECTRICAL CONNECTOR

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 555,529, March 5, 1975. This application June 26, 1975, Ser. No. 590,592

Int. Cl.^{2} H04M *1/05;* H01R *39/08*

U.S. Cl. 179—156 A **7 Claims**



1. A reversible headset comprising:
a. headband means for supporting the headset on a wearer's head, said headband means including a yoke adapted to extend transversely over the wearer's head;
b. boom means projecting forwardly from one end of the yoke;
c. housing means supported on the projecting boom means;
d. a reversible microphone;
e. electrical connector means supported on said housing means;
f. conduit having one end supporting the microphone and the other end supported by the connector means, said conduit being curved so that the microphone is disposed laterally of the housing means;
g. conductor means connected at one end to the microphone and extending through the connector means into the housing means; and
h. articulated means in the connector means supporting the conduit for continuous rotation thereof about one axis and tilting thereof about any axis transverse to said one axis to adjust the operating position of the microphone with respect to the wearer's mouth, while maintaining electrical connections between the microphone and the housing means.

3,971,901

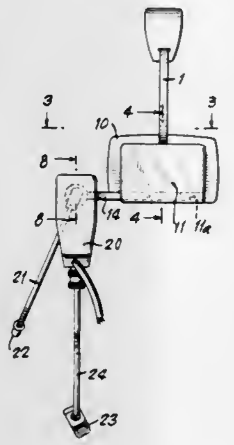
COMMUNICATIONS HEADSET WITH REVERSIBLE MOUNTING MEANS

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,529

Int. Cl.^{2} H04M *1/05*

U.S. Cl. 179—156 A **20 Claims**



1. A reversible headset comprising:
a. headband means for supporting the headset on a wearer's head, including a pad adapted to engage either side of the head and having an aperture extending therethrough from front to back and open at both ends so that when said headband means is on a wearer's head, there is always a front opening aperture in the pad, whether the pad is on the left or right side of the head;
b. beam means having one end slidable into either end of said aperture so that when said one end of the beam means is inserted in the front end of the aperture, the other end of the beam means projects forwardly from the pad;
c. transducer housing means mounted on the forwardly projecting beam means;
d. an earphone transducer within the housing means; and
e. ear tube means having one end adapted to engage an ear of the wearer and defining an acoustic path between the ear and the transducer;
f. said headset being reversible from a first configuration in which the ear tube means is adjacent one of the wearer's ears to a second configuration in which the ear tube means is adjacent the other of the wearer's ears by removing the beam means from one end of the aperture and inserting it in the opposite end of the aperture.

3,971,902

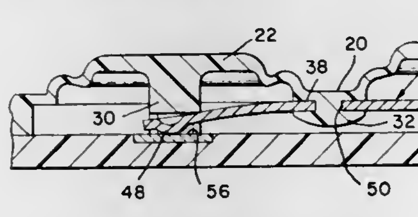
KEYBOARD SWITCH ASSEMBLY HAVING ONE PIECE PLURAL PUSHBUTTON ACTUATOR AND RESILIENT MOUNTING STRUCTURE FOR PLURAL CANTILEVER BEAM CONTACTS

LaVern Dale Wulf, Harrisburg, and Henry William Demler, Jr., Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1975, Ser. No. 560,858

Int. Cl.^{2} H01H *13/14, 1/28*

U.S. Cl. 200—5 A **2 Claims**



1. A data entry keyboard system, comprising: a. a base member of insulating material having deposited thereon a plurality of spaced, first electrical contacts arranged in two spaced, parallel rows, and a second electrical contact positioned at an end of and between the two rows, said first and second contacts adapted for connection to electrical circuits;
b. an electrically conductive and resilient contact strip having an elongated central bar with depending legs at either end and cantilever beams spaced along either side of and laterally extending from the central bar, said legs being fixed to the base member with one leg in engagement with the second electrical contact and with the central bar and cantilever beams spaced above the plurality of first electrical contacts with the ends of the beam being in alignment therewith, and further said central bar having a plurality of apertures spaced therealong; and
c. a single molded sheet of resilient material positioned over the contact strip and fastened to the base member at the edges thereof to define a cavity containing the contact strip, said molded sheet having on its upper surface a plurality of raised portions forming keys with a molded convex perimeter around each key and positioned intermediate the surface of the key and surface of the molded sheet, said convex perimeter biasing the key away from the base member, and a plurality of depending studs each positioned under a key and in alignment with the ends of the cantilever beams so that as a key is depressed the stud pushes the end of the beam into contact with the first electrical contact positioned therebelow so that an electrical circuit may be completed between the first electrical contact and the second electrical contact, further said molded sheet having depending therefrom a plurality of retaining means adapted to be received in the apertures so as to attach the central bar to the molded sheet, said retaining means having a resiliently deformable nose of greater diameter than the aperture and an annular groove behind the nose to receive the wall defining the aperture.

3,971,903

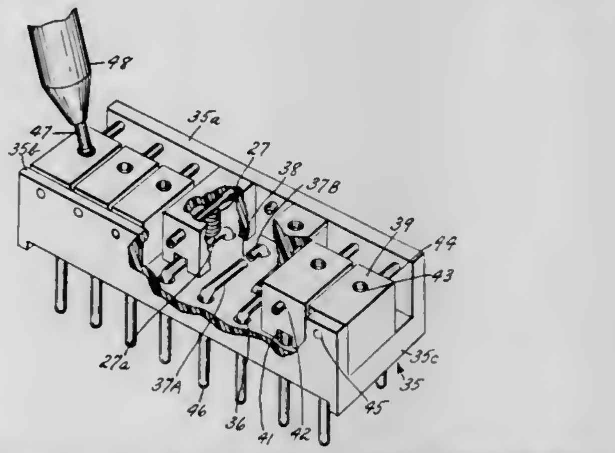
MULTI SLIDER SWITCH

Jerzy J. Wilentchik, 222 Lake Ave., Yonkers, N.Y. 10701

Filed Nov. 25, 1974, Ser. No. 526,908

Int. Cl.^{2} H01H *15/06*

U.S. Cl. 200—16 C **20 Claims**



1. A switching device adaptable to a variety of switch functions comprising in combination:
an insulating board; a plurality of conductors arranged on said board according to a predetermined, repetitive pattern separated from each other by a plurality of insulative gaps, the latter substantially narrower than the width of said conductors; an insulating cover having a rectangularly shaped flat mid-section with perpendicular sides for enclosing said conductors and said insulative gaps and for retaining said board in a spaced, parallel relationship with said midsection, said midsection having a plurality of slots located opposite said gaps, forming edges parallel to one of said sides in accordance with said conductor pattern; at least one slider having internal and external portions separated by a groove parallel to said midsection, said external portion being manually displaceable along the length of one of said slot edges, extending into said groove for the purpose of retaining said slider in said slot

and for guiding its displacement therealong; said internal slider portion being located between said board and said midsection, extending to within close proximity of said conductors and having a bore perpendicular to said board and to said midsection; a spring loaded contact substantially wider than the width of said gap, protruding out of said bore, positioned by the surfaces forming said bore along the length and in conductive engagement with respective ones of said conductors coincidently to displacement of said slider along said slot edges; index means comprised of a spring loaded projection in said slider and of a plurality of indentations in said cover, said projection being adapted to protrude yieldingly into one of said indentations coincidently with said contact being stationed astride a respective pair of conductors on either side of said gap; and terminal means connected to said conductors accessible from outside of said cover.

3,971,904

SWITCH ASSEMBLY FOR GAS TAP ASSEMBLY HAVING CAM OPERATED LEAF SPRING CONTACTS AND SPLIT HOUSING CAM DETENT STOP

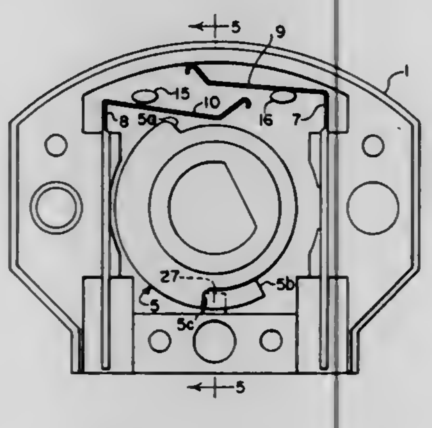
William Edward Ward, Clanfield, England, assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 517,270, Oct. 23, 1974, abandoned. This application May 22, 1975, Ser. No. 580,084

Claims priority, application United Kingdom, Oct. 23, 1974, 49303/74

Int. Cl.^{2} H01H *21/80*, *9/06*

U.S. Cl. 200—6 BB **8 Claims**



1. A switch for selective ignition of gas from a gas tap assembly having a rotatable gas tap spindle comprising first and second housing members which are securable together and which have a central aperture therethrough that receives said gas tap spindle therein, a rotatable cam having a cam member with a cam surface thereon, a central aperture in said rotatable cam for receiving said gas tap spindle, a locking means for locking said cam onto said gas tap spindle, and an extension segment in said rotatable cam narrower than said cam surface, first and second L-shaped contact members each having a terminal portion and a contact portion, the contact portion of one of said contact members being positioned to overlie the contact portion of said other contact member and both of said contact members being disposed to overlie said cam so that said cam surface and extension segment control the position of the lower contact portion with respect to the upper contact portion, and a stop member on one of said housing members for limiting rotation of said cam of a width which allows said extension segment to rotate past said stop member for a limited portion of the rotation of said cam during which said contact members are disengaged, with said cam surface being of a length such that said contacts are in engagement over substantially the remaining portion of rotation of said cam between its two extreme positions of rotation.

3,971,905

SWITCH FOR A PRINTED OR LIKE CIRCUIT

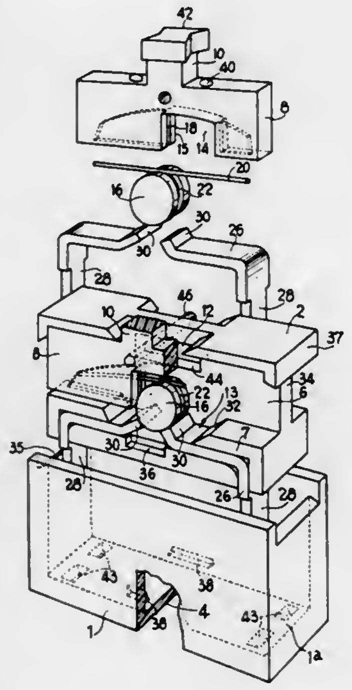
Jacques Delaage, Paris, France, assignor to Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E., Paris, France

Filed Mar. 12, 1975, Ser. No. 557,577

Claims priority, application France, Mar. 20, 1974, 74.09422

Int. Cl.^{2} H01H *15/18*

U.S. Cl. 200—77 **12 Claims**



1. A switch for a printed or like circuit comprising a housing having an end wall and, disposed inside the housing: two metal contact means in projecting relation to the end wall of the housing, pins extending out of the housing and respectively connected to said metal contact means, means defining a rectilinear slideway substantially parallel to the end wall of the housing and means defining an aperture in the slideway in the region of the metal contact means, a flat slide of electrically insulating material movable in the slideway in a plane and comprising on one side of the slide an actuating means accessible from outside the housing and in an opposite side of the slide means defining a cavity, a freely rotatable contact roller disposed in the cavity, a spring supported in the slide and engaging the contact roller for elastically biasing the roller outwardly of the cavity, the cavity of the slide having two confronting lateral surfaces located on opposite sides of the contact roller and capable of coming selectively in contact with the contact roller, one of the lateral surfaces contacting the contact roller and urging the contact roller to a position in which the contact roller interconnects said contact means when the slide is urged in one direction to a first position by the actuating means and the other of the lateral surfaces contacting the contact roller and urging the contact roller to a position of rest out of contact with said contact means when the slide is urged in an opposite direction to a second position.

3,971,906

TRIGGER-LOCK CONTROL

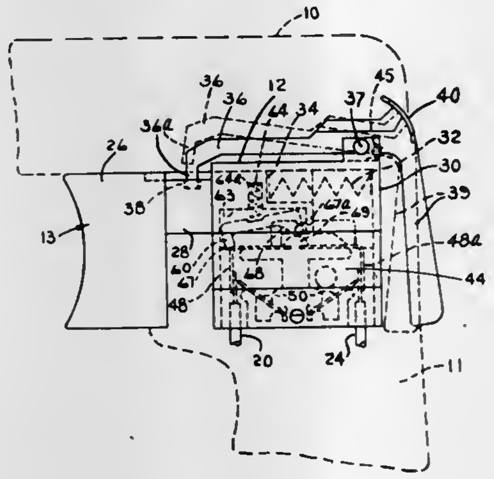
Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Filed Nov. 1, 1974, Ser. No. 520,016

Int. Cl.^{2} H01H *3/20*

U.S. Cl. 200—157 **4 Claims**

1. A lock control in combination with a trigger-actuated motor control switch for a power tool, comprising a trigger and a rigidly connected elongated slide portion, a housing for switch components, said slide portion reciprocatably mounted in said housing, said switch components in said housing including separated electrical power-on and power-off contacts longitudinally aligned along said slide portion, means operatively connected with said slide portion for moving horizontally between said contacts for changing connection with said contacts upon reciprocation of said slide portion, spring means urging said trigger and slide portion in a first predetermined contact position relative to one of said contacts, said slide portion being reciprocatable to a second contact position relative to the other of said contacts, a locking member on said slide portion near the upper edge thereof to lock said slide portion when said tool is in non-working position, an oscillatable lever providing lock means having a horizontal pivot on the top of said housing guiding said lock means into engagement with said locking member when said slide portion is in one of said contact positions, and an actuator member integral with said oscillatable lever and having an actuatingly engageable portion easily operated by a hand grasping said tool; whereby an operator may grasp said tool and move said actuator member to disengage said lock means from said locking member, and then by said trigger, reciprocate said slide portion into said second contact position.



3,971,907

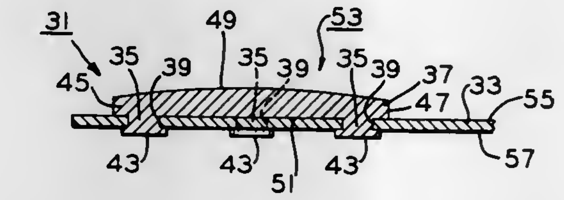
ELECTRICAL ASSEMBLY, ELECTRICAL CONTACT AND METHOD OF MOUNTING AN ELECTRICAL CONTACT

David C. Lennon, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 22, 1974, Ser. No. 445,300

Int. Cl.^{2} H01R *9/00*

U.S. Cl. 200—238 **12 Claims**



1. An electrical contact adapted to be mounted to a supporting member having generally opposite sides with a plurality of predeterminately spaced openings extending therebetween, said electrical contact comprising a contact body having a pair of generally opposite faces, one of said faces being adapted for electrical contacting engagement to effect electrical energization of said electrical contact and the other of said faces being adapted for seating engagement on one of the opposite sides of the supporting member, said other face including an outer peripheral portion adapted to be clamped tightly against the one opposite side of the supporting member so as to prevent deforming displacement movement away therefrom of said outer peripheral portion in response to bending moments created in said contact body upon the generation of heat in said electrical contact when it is electrically energized, a plurality of integrally formed means on said contact body and predeterminately disposed in spaced apart relation at least closely adjacent said outer peripheral portion for respectively extending through the openings in the supporting member when said other face is in seating engagement with the one opposite side of the supporting member, and said integrally formed means including means for deformation into clamping engagement with the other of the opposite sides of the supporting member generally about the openings thereof and at least in part spaced in overlaying relation with said outer peripheral portion so as to tightly clamp it against the one opposite side in opposition to the deforming displacement movement away therefrom occasioned in response to the bending moments created in said contact body upon the heating of said electrical contact when it is electrically energized.

3,971,908

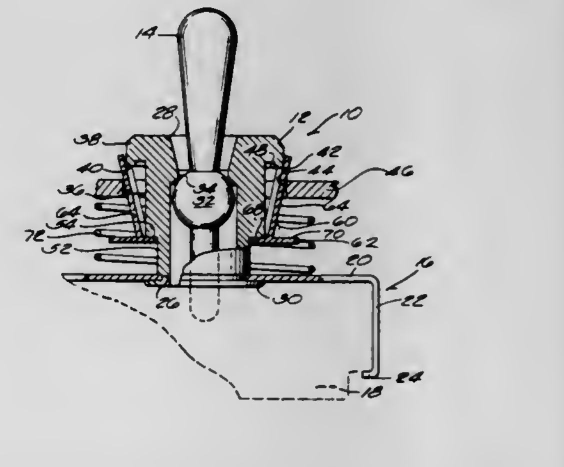
SNAP-IN ARRANGEMENT FOR MOUNTING DEVICES IN A SUPPORT PANEL APERTURE

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 3, 1975, Ser. No. 564,747

Int. Cl.^{2} H01H *9/02*

U.S. Cl. 200—296 **7 Claims**



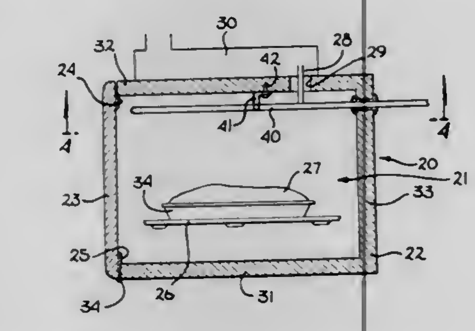
1. A snap-in mounting assembly for an electrical device adapting the device to be mounted from the back of and through an aperture in a support panel to secure the device to the panel so that an operator element of the device is accessible from the front of the panel comprising

- an elongated bushing carrying the operator element of the device and inserted through a panel aperture, said bushing having a main body, an enlarged outer end portion including an inner ledge extending radially outwardly from the outer surface of said body and terminating in an outer corner, and an annular slot located in the underside of said ledge;
- a retainer having an annular base slidably mounted on said bushing for relative axial and axially movable thereon, a plurality of resilient fingers connected to and normally extending axially in an outwardly diverging direction from said base and being radially compressible between a normally expanded position where their outer free ends extend radially outwardly beyond the outer periphery of said bushing outer end portion and beyond the inner periphery of the panel aperture and a radially inwardly compressed position where their outer free ends are releasably held in said slot prior to mountig the electrical device on the panel, and said retainer has abutment means removing abutting the back of the panel to limit axial movement of said retainer relative to the panel as said bushing is inserted into the panel aperture during mounting so that, upon continued axial movement of said bushing through the panel aperture, axial movement of said bushing relative to said retainer causes said free ends of said fingers to be released from said slot, allowing said fingers to return to said expanded position; and
- means for biasing said bushing in an axial direction away from the back of the panel to wedge said fingers between said ledge outer corner and the inner wall of the panel aperture, thereby locking the device on the panel.

3,971,909
MICROWAVE OVEN ANTENNA

William L. Wallick, 7414 Leescott Ave., Van Nuys, Calif. 91406

Filed Mar. 31, 1975, Ser. No. 563,646
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 F **6 Claims**

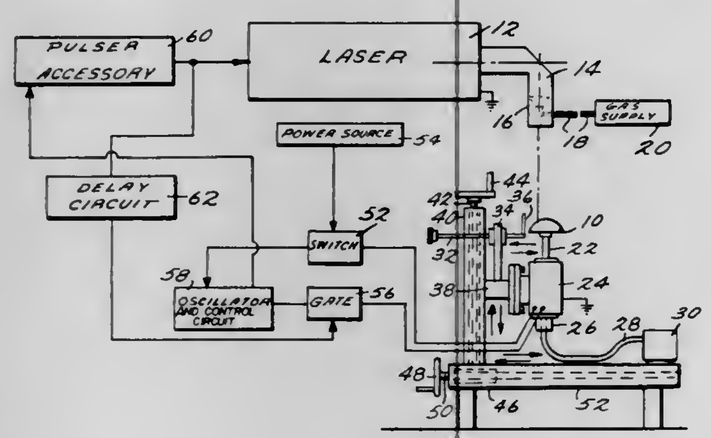


1. An oven comprising
a. means for defining an oven cavity;
b. element means disposed in said oven cavity;
c. means for supplying microwave energy to said element means causing said element means to radiate microwave energy therefrom;
d. ground means coupled to said element means for altering the phase angle of radiation of said radiated microwave energy.

3,971,910
APPARATUS FOR PERFORATING CONTACT LENSES

Cornell S. Marschalko, 3401 N. Emerson St., Arlington, Va. 22207, and George K. Meszaros, 4616 48th St., NW., Washington, D.C. 20016

Division of Ser. No. 173,612, Aug. 20, 1971. This application Jan. 16, 1975, Ser. No. 541,692
Int. Cl.² B23K *27/00*
U.S. Cl. 219—121 L **4 Claims**

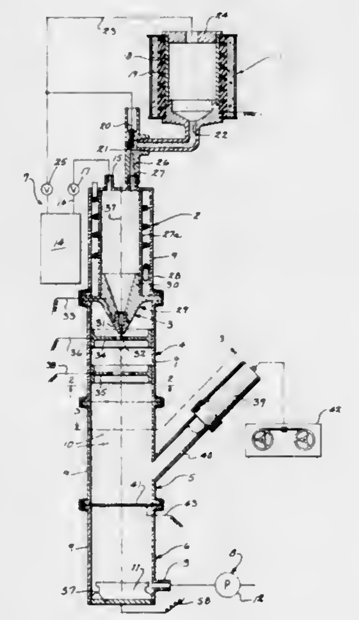


1. Apparatus for forming holes through a contact lens comprising: means for generating a laser beam capable of forming a hole through a contact lens; a carriage; means for supporting said carriage and for adjusting the position of the same along a path extending normal to the direction of the laser beam; an electric motor fixed to said carriage; a hollow open-ended index shaft of lesser diameter than a contact lens arranged coaxial with said motor, said index shaft being supported by and rotatably driven about its axis by said motor; motor control means for controlling said motor to index said shaft about its axis; means for applying a vacuum to the interior of the shaft whereby a contact lens placed on the open end of the index shaft will be held in contact with said end; a lens centering device supported by said carriage, said device including a lens-engagable member adjustable toward and away from the axis of said index shaft for engaging the edge of a contact lens to thereby center the lens with respect to said index shaft.

3,971,911
PROJECTION FORMING OF THREE-DIMENSIONAL METAL OBJECTS

Fred M. Dann, 130 Cliff, Sun Prairie, Wis. 53590, and James Reigel, 4725 Cottage Grove Road, Madison, Wis. 53716

Division of Ser. No. 374,307, June 28, 1973, Pat. No. 3,892,506. This application Apr. 15, 1975, Ser. No. 568,254
Int. Cl.² C21D *1/40*
U.S. Cl. 219—162 **8 Claims**



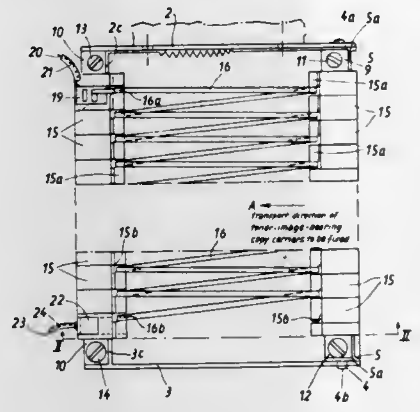
1. A process for projection forming of a three-dimensional object from metallic particles such as metal powder and the like, comprising the steps of:
a. forming a moving stream of the said particles,
b. heating said stream of particles to a coherent bonding state,
c. continuously imposing a variable two-dimensional planular image on the stream of heated particles,
d. and subsequently causing said particles to impinge on a target and build up a three-dimensional object corresponding in shape to the image continuously imposed in step (c).

3,971,912
FIXING ARRANGEMENT FOR FUSING TOWER IMAGES

Wilm Krüger, Puchheim-Bahnhof; Günther Schatka, Pfaffenhofen, and Joachim Pietruska, Furstenfeldbruck, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed June 23, 1975, Ser. No. 589,067
Claims priority, application Germany, June 21, 1974, 2429734
Int. Cl.² H05B *1/00;* **G03G** *15/20*
U.S. Cl. 219—216 **11 Claims**

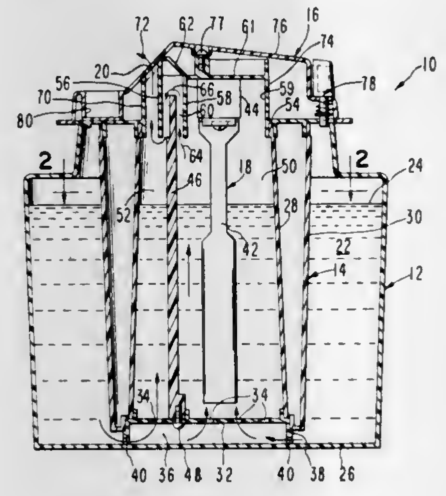
1. In a copying machine wherein a toner-image-bearing copy carrier moves in a predetermined direction along a predetermined transport path, an arrangement for fixing toner images by fusing the toner thereof, comprising, in combination, a heating winding having a plurality of turns; and holding means comprising a plurality of discrete holding units each engaging and holding at least one respective one of said turns, said discrete holding units being arranged in two spaced groups, and said turns of said heating winding extending in a plurality of stretches from one group to the other in the direction of said transport path for heating the toner on copy carriers passing therealong, wherein said discrete holding units of the one group are arranged in a first row and those of the other group in a second row parallel to and spaced from said first row, with both rows extending transverse to the direction of said transport path, wherein said discrete holding units are each provided with a holding portion defining a holding opening through which passes one of the turns of said heating winding, the opening having an unblocked end, and wherein the discrete holding units of each of said rows are so configurated and disposed relative to each other that the unblocked end of each holding unit is blocked off by the material of an adjoining holding unit to an extent preventing falling out of the respective turn of said heating winding.



3,971,913
NON-SPLITTING ELECTRIC ROOM VAPORIZER

Paal Myklebust, Baraboo, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed July 26, 1974, Ser. No. 491,971
Int. Cl.² H05B *3/60;* **A61L** *9/02;* **F22B** *1/30*
U.S. Cl. 219—284 **4 Claims**

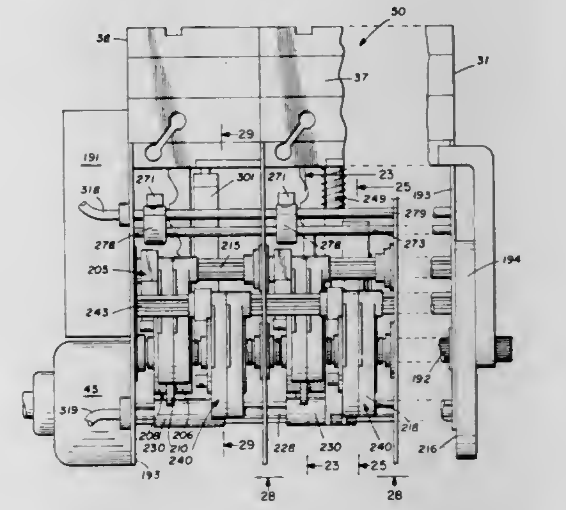


1. A vaporizer comprising: an open top receptacle adapted to receive water to be vaporized to steam; a subhousing having a perforate bottom and removably disposed in said receptacle, said subhousing being provided with a top member for closing the top of the receptacle when the subhousing is disposed therewithin; a continuous, first, upright partition in said subhousing extending from the bottom thereof to near but spaced relation to said top member for dividing said subhousing into a first and a second chamber;
said first chamber being in communication with the receptacle through the perforate bottom of said subhousing; electrode means carried by said top member and extending into said first chamber for vaporizing water; second and third generally parallel partitions secured to and extending downwardly from said top member into respective ones of said first and second chambers on opposite sides of and spaced from said first partition and said subhousing bottom, said top member having an orifice in fluid connection with said second chamber at a location spaced from said third partition, each said second and third partition being of a length sufficient to provide, in combination with said first partition, a serpentine path from the electrodes in said first chamber to the orifice in said second chamber, whereby any steam generated in said first chamber must flow along said serpentine path toward said orifice, thereby tending to be freed of any entrapped water particles prior to egress from said orifice.

3,971,914
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex., and George William Childs, deceased, late of Dallas, Tex. (by Patricia M. Childs, executrix), assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,922
Int. Cl.² G07C *13/00*
U.S. Cl. 235—54 R **1 Claim**



1. A voting machine having a plurality of aligned rows of voting keys arranged within a frame member, said keys being movable between a non-voted and a voted position to register vote selections; a card punch mechanism actuable by said keys in said voted position; and a tally mechanism actuable by said keys; comprising:
electrical motor drive means for operating said machine;
a drive shaft connected to said motor drive means for rotative motion; and
main registering means for registering the vote selections by sequencing the machine through a vote register cycle including a vote registration electrical switch in communication with said drive motor for electrically activating said motor drive means to drive said machine through said vote registration cycle, first means in communication with said drive shaft for engaging said keys in the voted position with said card punch mechanism and said tally means to register said voted selections, and clear means in communication with said drive shaft for engaging said voted keys to move said voted keys to said unvoted position.

3,971,915
SUN ANGLE CALCULATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Anne Flippin, Friendswood, and Arthur L. Schmitt, Dickinson, both of Tex.

Filed Dec. 11, 1974, Ser. No. 531,576
Int. Cl.² G06C *27/00*
U.S. Cl. 235—61 NV **2 Claims**

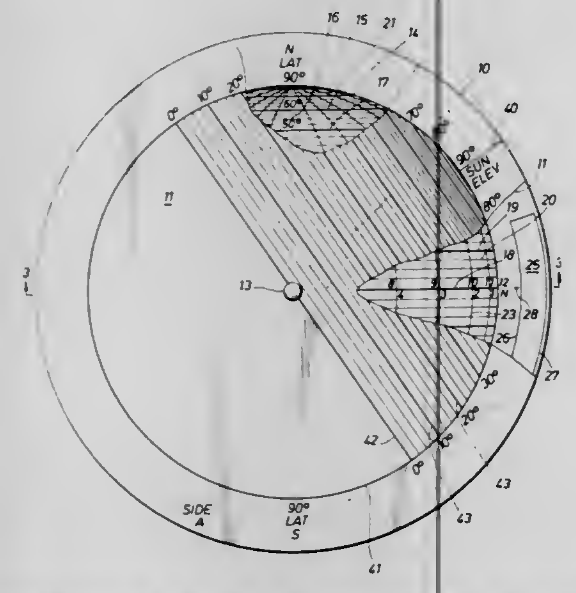
1. Apparatus for determining the angle of sun elevation for a particular geographical location at a given time and date, said apparatus comprising:
a circularly shaped base member having a central axis, said base member having on one side thereof a first set of indicia in the form of parallel lines arranged within a circular area for representation of latitudes between locations in said circular area representative of North and South poles of the earth, a second set of indicia on said

base member which are in the form of elliptical curve lines extending as meridians between said North and South pole locations and arranged for representation of Solar Time values;

a transparent plate superposed on said base member and mounted for rotation about said central axis, said transparent plate having a third set of indicia in the form of parallel lines on one-half of said plate arranged as lines of latitude for representation of sun angle,

said first and third sets of parallel line indicia being proportioned in degrees of latitude and being capable of a matching overlay in one position of said transparent plate member relative to said base member;

a perpendicular sun elevation line inscribed on said transparent plate extending radially of said central axis and



perpendicular to the parallel lines of said third set of indicia in a position which would bisect said third set of indicia, and a fourth set of date scale indicia arcuately disposed to either side of the equator line of said first set of latitudes indicia, said fourth set of indicia being scaled relative to said central axis to represent solar declination for the days of the year; and

whereby said transparent plate may be oriented with the radial sun elevation line coincident with an indicium representing said given date in the date scale indicia to compensate for solar declination and thereby indicate the sun angle for said geographical location as indicated by the location relative to said sun angle indicia of the intersection point of the elliptical curve line corresponding to solar time at the geographical location with the line representing latitude of said geographical location.

3,971,916
METHODS OF DATA STORAGE AND DATA STORAGE SYSTEMS

Roland Moreno, Paris, France, assignor to Societe Internationale, France

Filed Mar. 21, 1975, Ser. No. 560,873

Claims priority, application France, Mar. 25, 1974, 74.10191; Mar. 17, 1975, 75.08184; Mar. 17, 1975, 75.08185

Int. Cl.² G06K *5/00, 1/14, 19/00;* **G06F** *7/02*

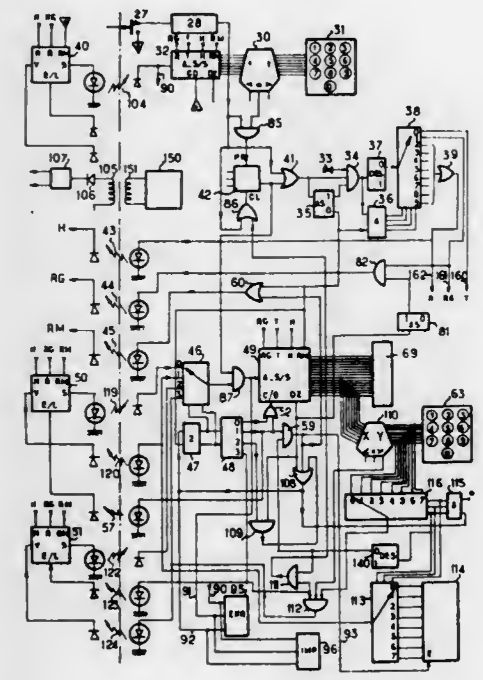
U.S. Cl. 235—61.7 B **38 Claims**

1. A data storage system comprising at least one portable electronic device and at least one data-transfer device, characterized in that said portable electronic device comprises:

readily portable plural-section, addressable data memory means;

coupling means operable temporarily to connect said memory means with said data transfer means;

memory control circuits interconnected with the coupling means and with the memory means; said memory means and said control circuits being constructed in the form of logic microstructures; and in that said data transfer device comprises data transfer means operable to transfer data into said memory means;



said system being further characterized by inhibitor means preventing the transfer of data of predetermined sections of said memory means.

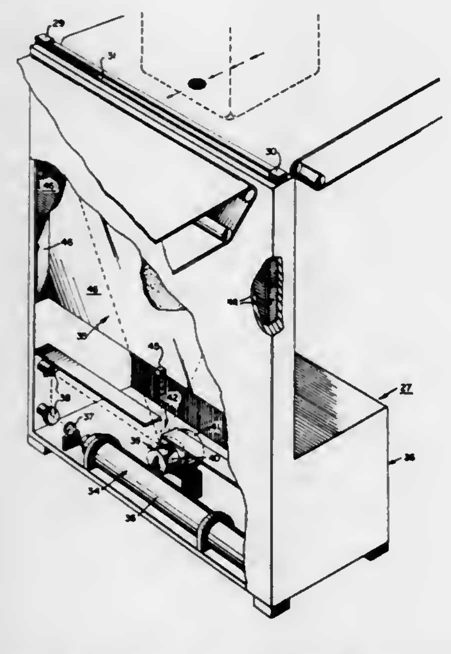
3,971,917
LABELS AND LABEL READERS

James A. Maddox, and Jeffery R. Maddox, both of R.F.D. 2, Church St., Georgetown, Conn. 06829

Division of Ser. No. 175,672, Aug. 27, 1971. This application Aug. 1, 1974, Ser. No. 493,978

Int. Cl.² G06K *7/10;* **G08C** *9/06;* **G03B** *21/28*

U.S. Cl. 235—61.11 E **5 Claims**



1. Label reader apparatus for reading and translating an encoded lable having a plurality of discrete bands of contrasting radiation reflectivity levels, comprising:

A. a source of radiation for impingement upon the coded label;

B. a scanning slit juxtaposed in spaced relationship to said readiation source;

C. a movable beam redirecting surface adapted for projecting and sweeping the projected radiation beam across the scanning slit, comprising

1. a polygonal shaped mirror drum having
   a. a polygonal shaped support comprising a polygonal cylinder having a plurality of substantially flat circumferential surfaces, and
   b. a plurality of mirrors respectively adjustably mounted to the circumferential surfaces of the support, assuring sweeping movement of said beam by said plurality of surfaces in substantially the same plane, and
2. a motor connected to said mirror drum for rotation thereof;

D. a label information assembly comprising:
   a. means for translating the reflected radiation into an output signal, and
   b. a label-reading sub-assembly for determining when the label code has been read; and

E. a light pipe positioned between said movable beam redirecting surface and said scanning slit and adapted for receiving the label reflections and directing the label reflections toward the label information assembly.

3,971,918
METHOD AND APPARATUS FOR MEASURING THE NUMBER OF STACKED CORRUGATED CARDBOARDS

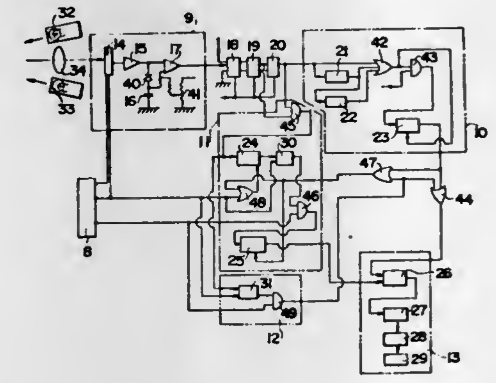
Minoru Saito, Odawara, Japan, assignor to Nihon Electronic Industry Co. Ltd., Japan

Filed Dec. 12, 1974, Ser. No. 532,081

Claims priority, application Japan, Dec. 28, 1973, 49-2654

Int. Cl.² G06M *9/00*

U.S. Cl. 235—92 SB **9 Claims**



1. In a method of measuring the number of a plurality of stacked corrugated cardboards wherein one end of the stack is scanned vertically by means of a scanning light beam so as to successively detect the flat sheets and the corrugated sheets of the corrugated cardboards, wherein the improvement comprises scanning horizontally one end of the stack in the range of a predetermined width by a photoelectric sensor, said sensor including a plurality of linearly arranged photodiodes, sequentially actuating said photodiodes in linear order by electric pulses, detecting the results of the horizontal scanning of a flat base sheet of at least one of the corrugated cardboards, detecting the result of the horizontal scanning of the corrugated sheet of at least one of said corrugated cardboards, detecting the result of the horizontal scanning of a wavy base sheet of at least one of the corrugated cardboards, and operating a means for counting in accordance with the results of said three detecting operations.

3,971,919
PROGRAMMABLE BILLING SYSTEM

Louis J. Fantozzi, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 344,321, March 23, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,037

Int. Cl.² G06B *27/06*

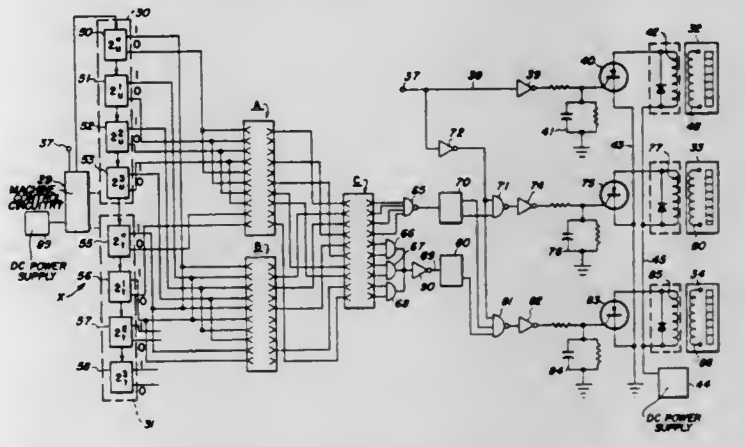
U.S. Cl. 235—92 SB **1 Claim**

1. A programmable billing meter system for use in a copying machine including:

a counter arranged to receive a copy count pulse each time the machine produces a copy, and to store the copy count information, the counter including a series of flip-flops,

a plurality of billing meters, and

programmable means electrically interposed between the counter and the billing meters for enabling and disabling the meters upon the occurrences of predetermined copy counts whereby copy count information is entered into



the billing meters in programmed order, the programmable means including a first connector for sensing the O state of each flip-flop in the counter array, a second connector for sensing the 1 state of each flip-flop in the counter array, a third connector having outputs which are gated to the billing meters, repositionable electrical leads between the outputs of the first and second connectors and the inputs of the third connector capable of being arranged in a programmed manner.

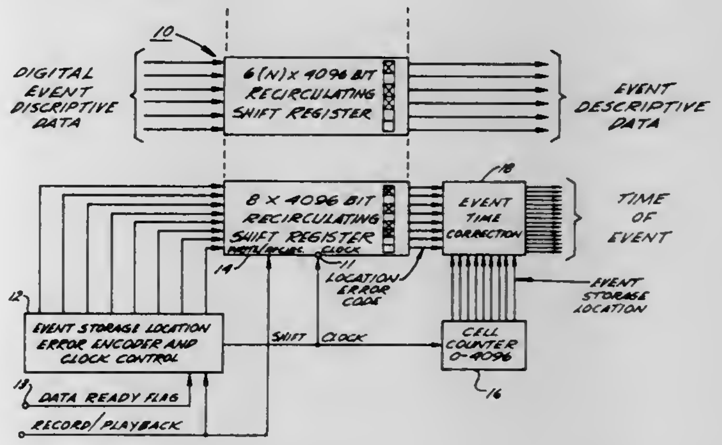
3,971,920
DIGITAL TIME-OFF-EVENT ENCODING SYSTEM

Robert P. Johnson, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed May 5, 1975, Ser. No. 574,830

Int. Cl.² H03K *21/00*

U.S. Cl. 235—92 SH **7 Claims**



1. A shift register storage system for receiving and storing digital data words including a first storage register means and a clock operated at a fixed clock rate to produce pulses such that location of said data words in said register means reflects time of arrival of each said data word wherein the improvement comprises:

gating means to produce additional clock pulses in response to the arrival of data words,

a first counter to provide incremental digital time error data reflecting the difference between data arrival time and the time of said fixed clock pulses,

an up-down counter to tally any excess of said additional clock pulses over said fixed clock pulses,

switching means to prevent said fixed clock pulses from clocking said first shift register when said excess tally is other than zero, a cell counter synchronized with and having a counting capacity equal to the length of said first shift register means such that the output of said cell counter enumerates the cells of said first shift register means, and

additional shift register means synchronized with said first shift register means and said cell counter and receiving and storing the outputs of said first counter and said up-down counter such that the precise time of arrival of each stored data word may be calculated during data retrieval from the corresponding stored outputs of said first counter and said up-down counter and the output of said cell counter.

3,971,921

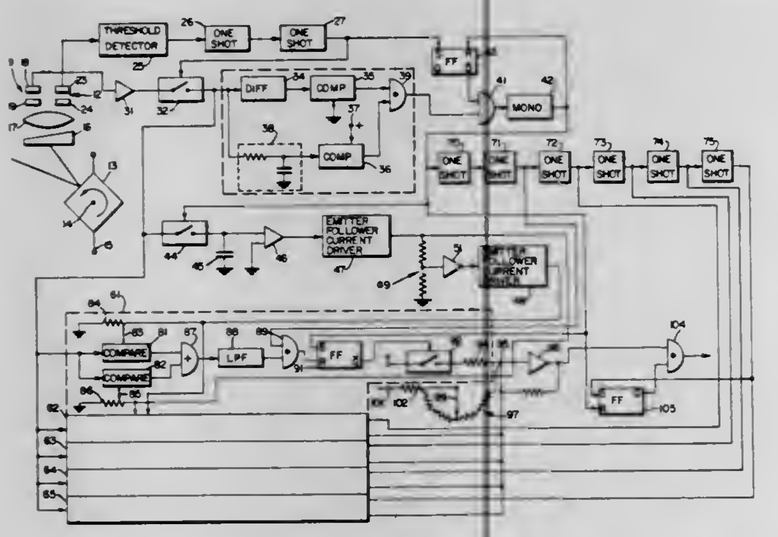
APPARATUS FOR DISTINGUISHING TIME VARYING ANALOG SIGNALS

David E. Schmit, and Frank L. Wedig, Jr., both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jan. 13, 1975, Ser. No. 540,604

Int. Cl.^{2} G01J *3/42, 3/08*

U.S. Cl. 235—151.35 **12 Claims**



1. Apparatus for scanning a field of view and enabling a particular source of optical radiation in the field of view to be distinguished from other sources of optical radiation comprising means having a narrow instantaneous field of view for optically scanning the field of view, detector means responsive to energy of the source imaged by the scanning means for deriving an analog signal having an amplitude versus time variation that is a convolution of dispersed spectral energy from the source while the field of view is being scanned, a waveform recognition network selectively responsive to the analog signal, means for enabling the network in response to the scanning, said network including means for detecting the peak amplitude value of an initial undulation of the analog signal, means for comparing a value of the analog signal occurring a predetermined time subsequent to enabling of the network with a predetermined percentage of the detected peak amplitude value, and means responsive to the comparing means for signalling the presence of the particular source in the field of view.

3,971,922

CIRCUIT ARRANGEMENT FOR DIGITALLY PROCESSING A GIVEN NUMBER OF CHANNEL SIGNALS

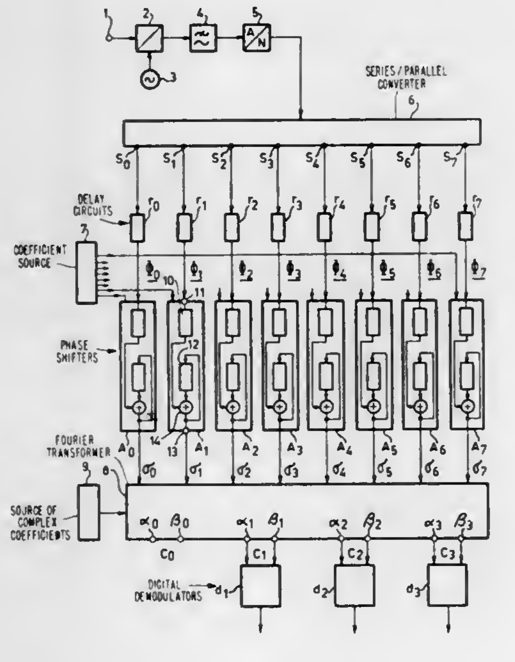
Maurice Georges Bellanger, Antony, and Jacques Lucien Daguet, St.-Maur-des-Fosses, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Nov. 29, 1974, Ser. No. 528,506

Int. Cl.^{2} G06F *7/38*

U.S. Cl. 235—152 **10 Claims**

1. An arrangement for converting a single side-band frequency division multiplex signal into a corresponding base band channel signals, including a series parallel converter distributing binary coded signal samples (code words) of the multiplex signal equally in time in a cyclical manner over a given number of parallel signal paths while the signal samples in each of these signal paths occur at a frequency which is equal to the bandwidth of a channel signal in which arrangement each of the signal paths incorporates a delay circuit for eliminating the mutual time shifts of the signal samples applied within a cycle to said series parallel converter, a calculating member being provided in series with said delay circuit to which in addition to the output samples of the co-operating delay circuits a given number of filter coefficients is applied which are provided by a source for a given number of filter coefficients, the outputs of said calculating members being coupled to inputs of a discrete Fourier transformer whose outputs are connected to demodulators characterized in that each calculating member is formed as a recursive digital filter to which binary coded signal samples are applied having an input sampling frequency which is equal to the bandwidth of a channel signal and to which also filter coefficients originating from said source are applied, which filter coefficients characterize an amplitude-frequency characteristic of a low-pass filter having a cut-off frequency which corresponds to the half bandwidth of a channel signal and which characterize a phase-frequency characteristic, the phase-frequency characteristic indicating the difference between the phase-frequency characteristic of a calculating member and the phase-frequency characteristic of a calculating member connected to the output of a reference delay circuit, each recursive filter having a sawtooth-shaped characteristic which is constituted by straight lines varying with a given angle of inclination in a parallel manner and intersecting the frequency axis in case of integral multiples of the said input sampling frequency while the slope of said sawtooth characteristic is opposite to the slope of the phase-frequency characteristic of the co-operating delay circuit.



3,971,923

RAMP FUNCTION GENERATOR

John L. Linder, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 436,415, Jan. 25, 1974. This application Mar. 31, 1975, Ser. No. 564,022

Int. Cl.^{2} H03K *4/08;* **G06J** *1/00*

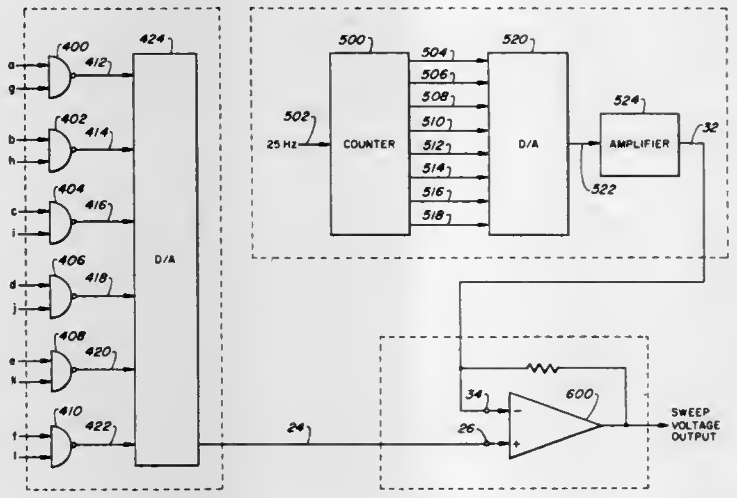
U.S. Cl. 235—150.53 **1 Claim**

1. A circuit for generating a ramp function signal comprising:

a. means for providing a constant-frequency A-C signal having an output;

b. a multiple-bit binary counter circuit having an input and a plurality of outputs, said input being connected to said output of said means for providing a constant frequency signal, said plurality of outputs having a digital signal thereon;

c. a digital-to-analog converter having a plurality of inputs and an output, said plurality of inputs being connected to said plurality of outputs of said multiple-bit counter such that said digital signal is transmitted in parallel to said digital-to-analog converter, said output of said digital-to-analog converter being said ramp function signal, said counter counting up until filled and then returning to zero such that said digital-to-analog converter outputs a periodic ramp signal wherein the ramp signal starts each period at zero and ends each period at a maximum value.



3,971,924

ELECTRONIC CALCULATOR DISPLAYING A PARTIAL RESULT OBTAINED FROM A PORTION OF A NUMERICAL EXPRESSION

Masayoshi Ozawa, Machida; Minoru Machida, Tokyo; Yoichi Kawabata, Tokyo, and Mitsuaki Seki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1974, Ser. No. 465,570

Claims priority, application Japan, May 7, 1973, 48-50907; May 7, 1973, 48-50908

Int. Cl.^{2} G06F *7/38*

U.S. Cl. 235—156 **5 Claims**

1. An electronic calculator comprising:

a keyboard having numerical keys, operator keys of addition, subtraction, multiplication and division, a left parenthesis key and a right parenthesis key;

first detecting means operative in response to the depression of said left parenthesis key for producing a first detection signal;

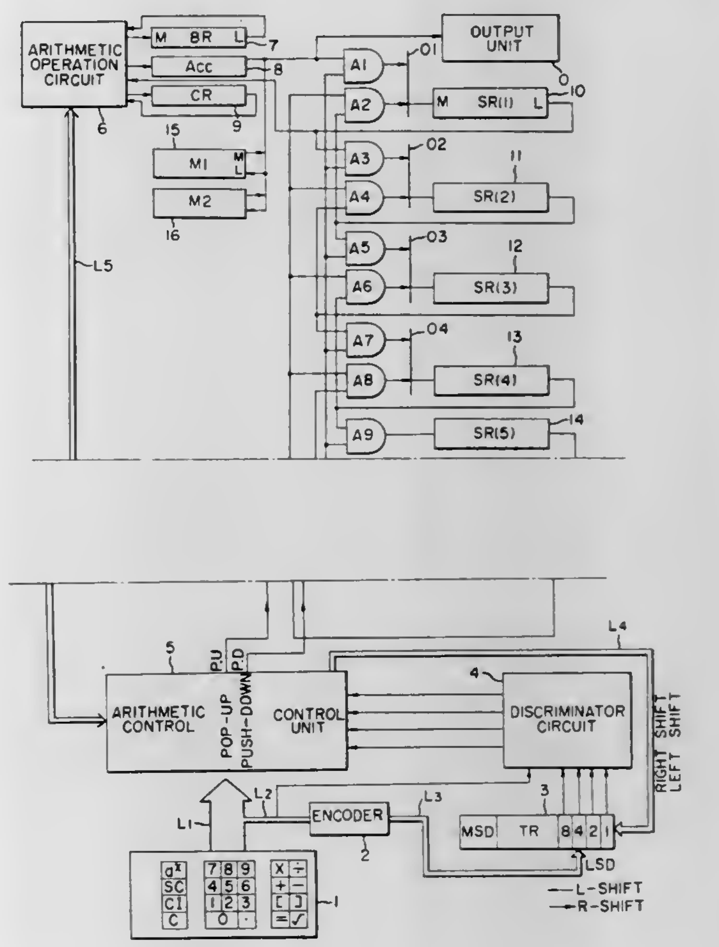
second detecting means operative in response to the depression of said right parenthesis key for producing a second detection signal;

a plurality of data register means for storing data from said numerical keys, said plurality of data register means comprising result register means for storing a partial result indicating output;

order register means for storing orders from said operator keys;

arithmetic control means operative in response to said first and second detection signals provided from said first and second detecting means, respectively, for performing partial result arithmetic operations on the data stored in the data register means during an interval defined by the depression of said left parenthesis key and said right parenthesis key, for producing a corresponding partial result indicating output, for transferring the output to said result register and for holding said partial result indicating output in said result register means until a subsequent depression of one of said operator keys; and

display means for displaying the contents of said result register, said display means having an input coupled to receive the contents of said result register.



3,971,925

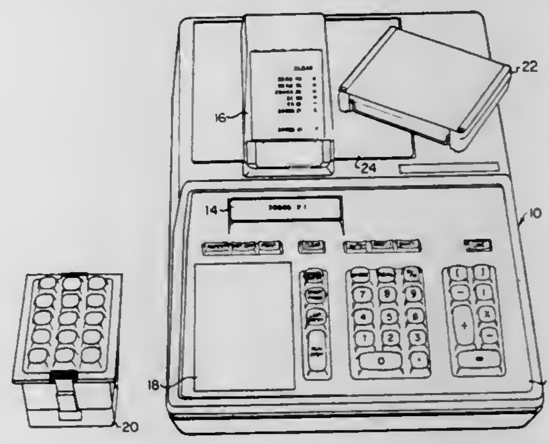
ADAPTABLE PROGRAMMED CALCULATOR HAVING PROVISION FOR PLUG-IN KEYBOARD AND MEMORY MODULES

Freddie W. Wenninger; Donald E. Morris; Jindrich Kohoutek; David S. Maitland; Douglas M. Clifford; Louis T. Schulte, and John C. Keith, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 318,451, Dec. 26, 1972, abandoned. This application June 6, 1974, Ser. No. 477,552

Int. Cl.^{2} G06F *15/06*

U.S. Cl. 235—156 **42 Claims**



1. In an electronic calculator including a keyboard input unit for entering information into the calculator, a memory unit for storing sequences of instructions to be performed by the calculator in making selected calculations, computing means responsive to information from the keyboard input unit and to operating states within the calculator itself for selectively performing selected ones of the sequences of instruc-

tions stored in the memory unit to make selected calculations employing data entered from the keyboard input unit and to give an output indication of the results of those calculations, wherein the improvement comprises a plug-in modular keyboard section, integrally including at least one key and an associated read-only memory containing additional sequences of instructions, for providing the user with additional keyboard functions.

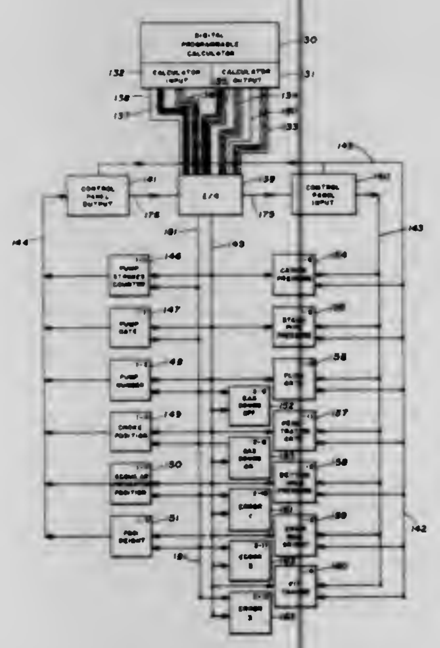
3,971,926
SIMULATOR FOR AN OIL WELL CIRCULATION SYSTEM

Gerald S. Gau, and Mario Zamora, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed May 28, 1975, Ser. No. 581,464

Int. Cl.² G06F *15/46;* E21B *47/04*

U.S. Cl. 235—184 **45 Claims**



1. In an apparatus for simulating the circulating of a fluid in the circulation system of an oil well extending from the surface of the earth to a point intersecting an underground formation, which apparatus is used in conjunction with a programmable digital calculator programmed to calculate fluid pressure at a plurality of points in the circulation system, wherein the apparatus includes:
  manually adjustable means for indicating the pump rate of a pump in the circulation system;
  manually adjustable means for indicating the density of the fluid being pumped;
  manually adjustable means for indicating the relative opening of a choke in the circulation system;
  manually adjustable means for indicating the opened and closed positions of a blowout preventer in the circulation system;
  manually adjustable means for indicating the opened and closed positions of a valve controlling fluid communication between the choke and the oil well annulus in the circulation system; and,
  display means for displaying a plurality of fluid pressures calculated by the programmable calculator in response to the indicated pump rate, density of the fluid being pumped, the relative opening of the choke, the position of the blowout preventer, and the position of the valve, wherein the display includes at least the fluid pressure in a standpipe and the fluid pressure in an oil well casing in the circulation system; the improvement comprising:
  first circuit means, responsive to changes in the manually adjustable pump rate indicating means, for providing to the digital programmable calculator at least periodically a digital representation of the pump rate and a digital repesentation of a sum of pumping strokes for the pump in the circulation system; and,
  second circuit means, responsive to changes in the manufally adjustable relative choke opening indicating means, for providing to the digital programmable calculator at least periodically a digital representation of the choke opening.

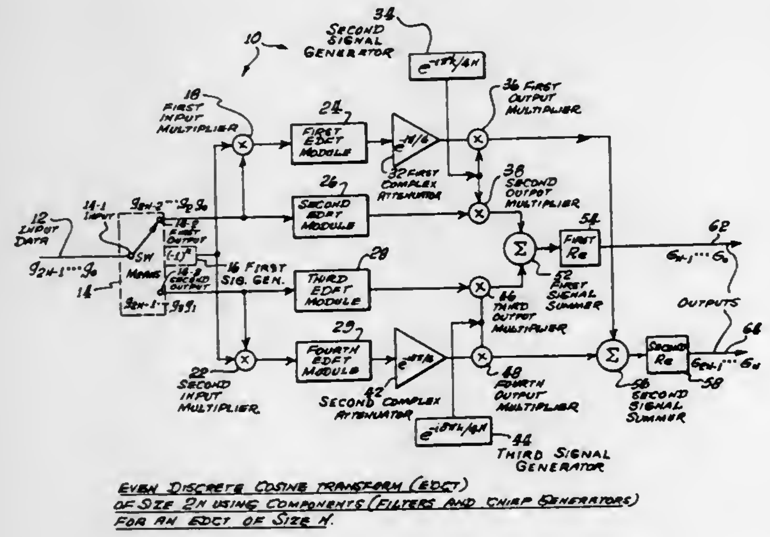
3,971,927
MODULAR DISCRETE COSINE TRANSFORM SYSTEM

Jeffrey M. Speiser, and Herbert M. Federhen, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1975, Ser. No. 628,433

Int. Cl.² G06G *7/22;* G06F *15/34*

U.S. Cl. 235—186 **3 Claims**



1. Apparatus for performing an even discrete cosine transform (EDCT) on an input signal of size 2N, with components for an EDCT of size N, comprising:
  switching means, having an input and two alternately energized outputs, a first output and a second output, for distributing data points $g_0, \ldots, g_{2N-1}$ of an input signal, the last data points $g_N, \ldots, g_{2N-1}$ being made zeroes.
  means for generating a signal $(-1)^n$, $n = 0, 1, \ldots, 2N-1$;
  a first input multiplier, whose two inputs are connected to the first output of the switching means and to the signal generating means;
  a second input multiplier, whose two inputs are connected to the second output of the switching means and to the signal generating means;
  a first EDFT module, whose input is connected to the output of the first input multiplier, which performs a discrete Fourier transform (DFT) on its input signal;
  a second EDFT module, substantially identical to the first module, whose input is connected to the first output of the switching means;
  a third EDFT module, substantially identical to the first module, whose input is connected to the second input of the switching means;
  a fourth EDFT module, substantially identical to the first module, whose input is connected to the output of the second input multiplier;
  a first complex attenuator, whose input is connected to the output of the first EDFT module, which shifts the phase of a signal at its input by $-\pi/4$ radians;
  a second means for generating a signal, which generates a signal

$$e\,\frac{i\pi k}{4N}\ ,$$

$k = 0, 1, \ldots, 2N-1$;
  a first output multiplier, whose inputs are connected to the outputs of the first phase shifters and the second signal generating means;
  a second output multiplier, whose inputs are connected to the outputs of the second EDFT module and the second complex attenuator;
  a second complex attenuator, whose input is connected to the output of the fourth EDFT module, which shifts the phase of a signal at its input by $-3\pi/4$ radians;
  a third means for generating a signal, which generates a signal

$$e\,\frac{i3\pi k}{4N}\ ;$$

  a third output multiplier, whose inputs are connected to the outputs of the third EDFT module and the third signal generating means;
  a fourth output multiplier, whose inputs are connected to the outputs of the second complex attenuator and the third signal generating means;
  a first signal summer, whose two inputs are the outputs of the second and third output multipliers;
  first circuit for taking the real part of an input signal, connected to the output of the first signal summer, the output signal being $G_0, \ldots, G_{N-1}$, the first N terms of the even discrete cosine transform;
  a second signal summer, whose two inputs are the outputs of the first and fourth output multipliers; and
  second circuit for taking the real part of an input signal, connected to the output of the second signal summer, the output signal being $G_N, \ldots, G_{2N-1}$, the last N terms of the even discrete cosine transform.

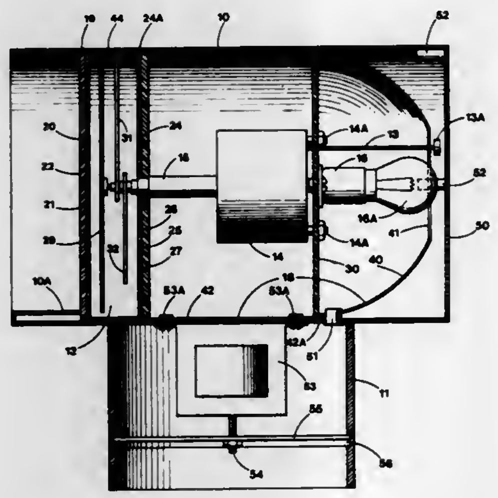
3,971,928
DISPLAY SYSTEM

Jordan Kirsch, 78 Huron Ave., and James L. Hamilton, 21 Stearns St., both of Cambridge, Mass. 02138

Filed Apr. 10, 1974, Ser. No. 459,660

Int. Cl.² F21V *33/00;* G01D *11/28;* G04B *47/00*

U.S. Cl. 240—2.1 **8 Claims**



1. An assembly including,
  a housing having opposite ends,
  a plurality of movable members within the housing,
  a motor and shaft supporting said movable members and positioned within said housing with said movable members adjacent one end of the housing,
  a light source within the housing and comprising a single bulb adjacent the other end of said housing,
  at least one light diffusing sheet extending across the housing intermediate said movable members and said bulb and motor,
  a reflector system at the other end of said housing partially enclosing said bulb and oriented for reflecting light from said bulb onto said sheet with said light partially converging in front of said motor,
  said reflector system comprising a partial hemispherical reflective element and a cylindrical member coaxial and adjacent to said reflective element,
  said motor positioned within said cylindrical member and said bulb positioned within said hemispherical element,
  and a diffuser intermediate said bulb and motor and extending across the interior of said housing.

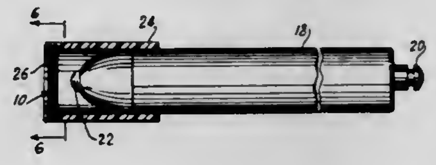
3,971,929
SAFELIGHT FILTER

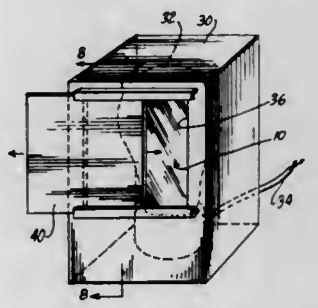
John Buckland Erdell, 50 Morningside Drive, New York, N.Y. 10025

Continuation-in-part of Ser. No. 429,860, Jan. 2, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 571,985

Int. Cl.² F21V *9/00;* F21L *15/04*

U.S. Cl. 240—10.6 R **9 Claims**

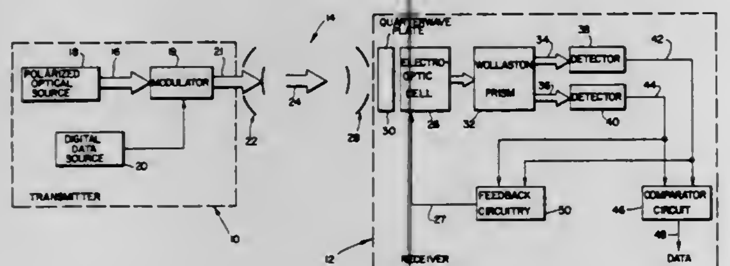




1. In a darkroom safelight for color film processing, having a light source, an enclosure for said light source and a window in said enclosure through which light is transmitted from the light source, a light filter extending across said window, said light filter comprising a plurality of superposed filter layers, namely:
  a. a first filter comprising at least one layer of color negative film exposed to white light and developed with color developer,
  b. a second filter comprising at least one layer of magenta color filter with a minimum density of approximately 10%, and
  c. a third filter comprising at least one layer of color filter with a minimum density of approximately 10%,
  d. said third filter being of a complementary subtractive color relative to the color magenta.
  5. The combination of claim 1, wherein:
  the light source and enclosure therefor consist of a portable battery-powered flashlight.
  6. The combination of claim 1, wherein:
  the light source and enclosure therefor consist of a light fixture mechanically supported in a darkroom and containing an incandescent lamp of low power, of the order of 15 watts.

3,971,930
POLARIZATION COMPENSATOR FOR OPTICAL COMMUNICATIONS

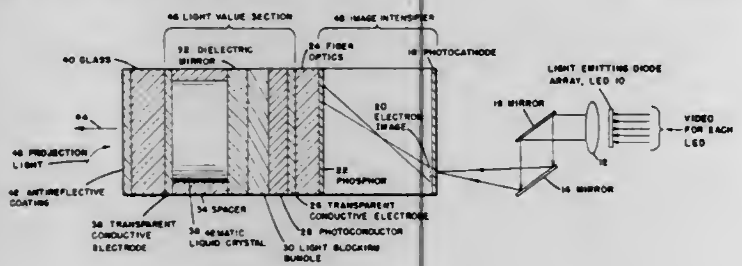
Michael W. Fitzmaurice, Gambrills, Md., and James B. Abshire, Greeneville, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 24, 1974, Ser. No. 463,925
Int. Cl.^{2} H04B *9/00*
U.S. Cl. 250—199 **13 Claims**



1. A method of transmitting digital data from a first site to a second site comprising: at the first site, polarization modulating an optical carrier from a polarizing energy source to a selected one of a pair of values in response to an input of a binary signal value from a binary signal producing means; transmitting the modulated carrier from the first site to the second site via an optical path that distorts the polarization state of the carrier in a random manner to introduce cross-talk between the polarizations for the binary signal values; receiving the carrier containing cross-talk at the second site; introducing a differential phase retardation on mutually orthogonal polarization components of the carrier when received at the second site in response to the amplitude of the polarization components of the received wave to remove the cross-talk from the carrier at the second site; and the step of introducing a differential phase retardation including the steps of; coupling the received carrier through an optical differential phase retardation cell, and controlling the cell by a feedback means so that optical waves of substantially only one linear polarization are coupled through it at a particular time instant when the optical carrier received at the second site has a first polarization corresponding to a first binary value.

3,971,931
LED IMAGE TUBE LIGHT VALVE

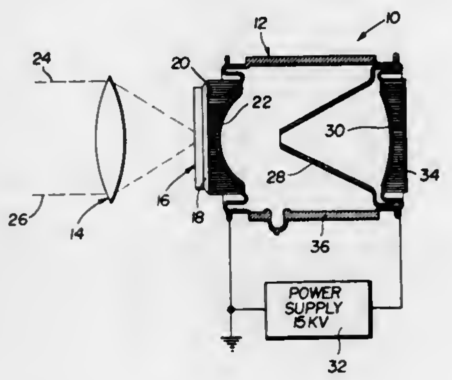
Robert E. Jehle, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 23, 1975, Ser. No. 543,383
Int. Cl.^{2} G02F *1/13*
U.S. Cl. 250—213 R **8 Claims**



1. A light projection device for transforming a dim, high resolution image into a bright, high resolution image for projection onto a screen, comprising:
- a linear array of light emitting means for producing said dim, high resolution image;
- image intensifier means for producing an intensified image from said dim, high resolution image;
- a fiber optic plate connected to said image intensifier means to transversely convey said intensified image;
- light valve means for transforming said intensified image into an electrical potential gradient and a gradient of transparency proportional to said intensified image to control the gradient of intensity of a high intensity projection light to produce said bright, high resolution image.

3,971,932
APPARATUS FOR ENHANCING THE LONG WAVELENGTH RESPONSE OF PHOTODETECTORS

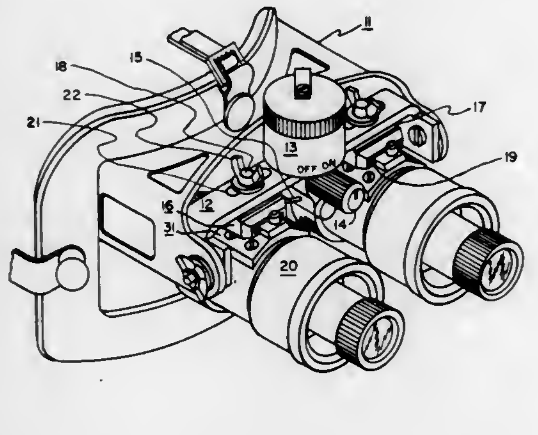
Kenneth G. Sewell, Dallas, and William B. Volz, Richardson, both of Tex., assignors to Varo, Inc., Garland, Tex.
Filed Dec. 2, 1974, Ser. No. 528,806
Int. Cl.^{2} H01J *31/50*
U.S. Cl. 250—213 VT **12 Claims**



1. Photodetection apparatus comprising: photosensitive means usefully responsive to electromagnetic energy in a first wavelength region; passive energy conversion means for receiving electromagnetic energy of a wavelength longer than said first wavelength region and in a region to which said photosensitive means is insensitive and emitting electromagnetic energy in said first wavelength region in response thereto, said energy conversion means being substantially optically transparent to radiations in said first wavelength region; and means optically coupling said energy conversion means to said photosensitive means, whereby said photosensitive means provides information concerning incident electromagnetic energy in both said first wavelength region and at said longer wavelength.

3,971,933
QUICK DISCONNECT FOR NIGHT VISION OPTICS

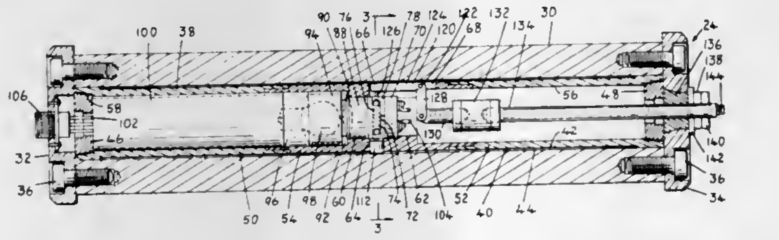
James R. Adamson, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed June 18, 1975, Ser. No. 588,091
Int. Cl.^{2} H01J *31/50*
U.S. Cl. 250—213 VT **4 Claims**



1. An image intensifier which converts a low light light level (invisible) image to a visible image comprising:
- a support member including;
  - an electrical power source attached to said support member having at least one electrical terminal,
  - a female bayonet socket, also attached to said support member, and
  - at least one resilient electrical contact mounted in said socket connected to said one terminal,
- an optical unit mated to said female socket including;
  - an electrical image intensifier tube,
  - a lens means mounted on said tube to focus at least the invisible image in said intensifier tube,
  - a male bayonet member complimentary in shape and mated with said female member rigidily attached to said tube and lens means, and
  - a rigid electrical contact mounted on said male member oriented to press on said resilient contact as said male and female members are mated.

3,971,934
PHOTOELASTIC LOAD MEASUREMENT ALARM DEVICE

Joseph Coatta, 560 Raymur Ave., Vancouver, British Columbia, Canada (V6A 3L2), and Charles Leslie Emery, R.R. No. 1, Roseneath, Ontario, Canada
Filed Aug. 4, 1975, Ser. No. 601,648
Int. Cl.^{2} G02F *1/01*
U.S. Cl. 250—225 **32 Claims**

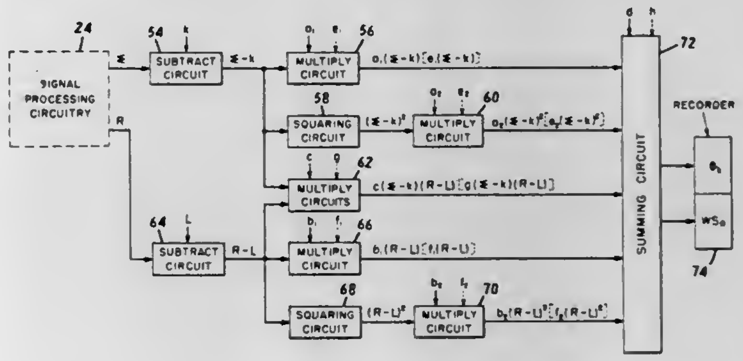


1. A photoelastic device adapted to measure stress on a structural member comprising:
- a. a source of light adapted to produce a beam of plane polarized light, said source having a first polarization plane,
- b. an analyzer plate transversely positioned in the path of the beam, the analyzer plate adapted to transmit light in a second polarization plane,
- c. a transparent isotropic photoelastic plate positioned in the path of the beam between the light source and the analyzer plate, the photoelastic plate adapted to retard the beam of light in accordance with the occurrence of strain in the photoelastic plate,
- d. a photocell adapted to receive the light transmitted by the analyzer plate and to produce an output signal which varies with the intensity of the light received, said light source, analyzer plate, photoelectric plate and photocell all being fixedly secured relative to the said structural member.
- e. means adapted to transmit stress from the structural member to the photoelastic plate to thereby vary the retardation of the beam of light in accordance with the stress applied to the structural member, and
- f. receiver means electrically connected to the photocell and adapted to receive the output signal from the photocell and calibrated to indicate the load on the structural member at at least one point over the range of the device.

3,971,935
TWO DETECTOR PULSED NEUTRON POROSITY AND WATER SALINITY APPARATUS AND METHODS

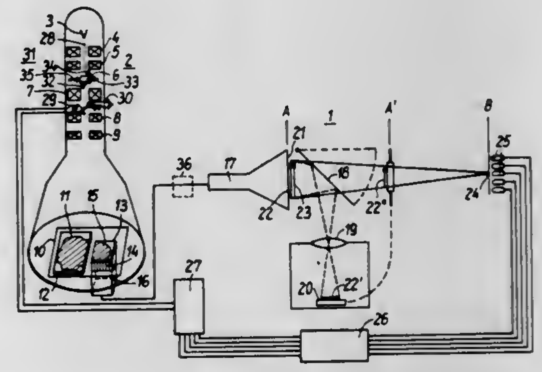
William B. Nelligan, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Continuation of Ser. No. 356,151, May 1, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,958
Int. Cl.^{2} G01V *5/00*
U.S. Cl. 250—262 **52 Claims**

1. Apparatus for investigating a characteristic of an earth formation traversed by a borehole, comprising:
- neutron source means for irradiating the formation with a pulse of neutrons;
- first and second detector means spaced at different distances from the neutron source for generating signals in response to gamma radiation within the borehole following said neutron pulse;
- first gating means for passing signals generated by the first detector means during (1) a first time interval following said neutral pulse in which the generated signals are representative of the neutron population in the formation opposite said first detector means and (2) a second time interval in which the generated signals are representative of background radiation at the first detector means;
- second gating means for passing signals generated by the second detector means during (1) a first time interval in which the generated signals are representative of the neutron population in the formation opposite said second detector means and (2) a second time interval in which the generated signals are representative of background radiation at the second detector means;
- means for combining the signals passed by the first gate means during the first and second time intervals thereof to provide a first background-corrected measurement of the neutron population in the formation;
- means for combining the signals passed by the second gate means during the first and second time intervals thereof to provide a second background-corrected measurement of the neutron population in the formation; and
- means for forming a function of the first and second background-corrected neutron population measurements as an indication of at least one of the porosity of the formation and the salinity of the formation fluid.



3,971,936
CORPUSCULAR BEAM MICROSCOPE, PARTICULARLY ELECTRON MICROSCOPE, WITH ADJUSTING MEANS FOR CHANGING THE POSITION OF THE OBJECT TO BE IMAGED OR THE IMAGE OF THE OBJECT

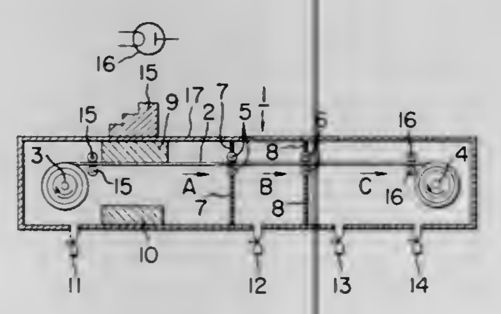
Walter Hoppe, Martinsried near Munich, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany
Filed Aug. 6, 1975, Ser. No. 602,461
Claims priority, application Germany, Aug. 27, 1974, 2441288
Int. Cl.^{2} H01J *37/26*
U.S. Cl. 250—311 **12 Claims**



1. In a corpuscular beam microscope such as an electron microscope having adjusting means which result in a change in the object image, the improvement comprising:

a. means for storing a reference object image;
b. means for deriving a convolution of the actual microscope image with said stored reference object image; and
c. means for evaluating said convolution to obtain an error signal to be used for setting said adjusting means.

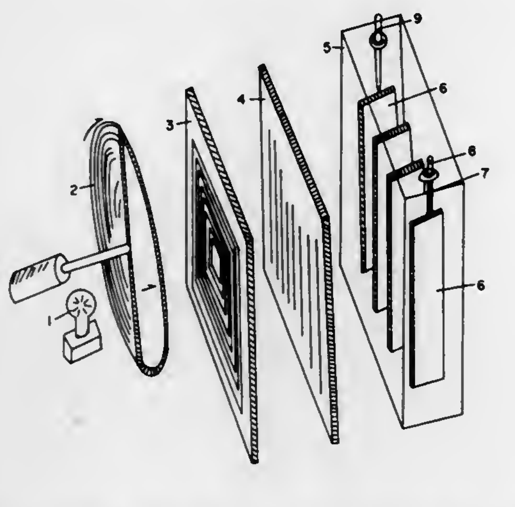
3,971,937
RADIOGRAPHY APPARATUS FOR FORMING AN ELECTROSTATIC LATENT IMAGE OF A BODY TO BE EXAMINED BY THE IONIZATION OF GAS
Koichi Kinoshita, Narashino, Japan, assignor to Kinoshita Laboratory, Tokyo, Japan
Filed Nov. 13, 1974, Ser. No. 523,519
Claims priority, application Japan, Nov. 14, 1973, 48-128058
Int. Cl.² G03G *15/044*
U.S. Cl. 250—315 A **14 Claims**



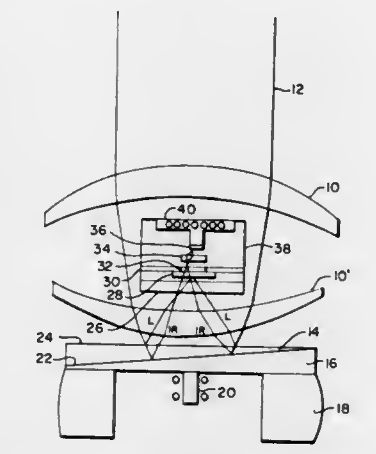
1. A radiography apparatus for foming an electrostatic latent image of a body to be examined by the ionization of gas, comprising:
a first gas chamber having therein electrodes opposed in a predetermined spaced-apart relationship, the electric field produced by said electrodes being filled with ionizing gas at a predetermined pressure, an insulating film being disposed adjacent one of said electrodes;
a second gas chamber filled with gas, at a pressure which is substantially in equilibrium relationship with the pressure of the ionizing gas in said first gas chamber, said gas in said second chamber being less ionizable than said gas in said first gas chamber;
a film passage through which said insulating film moves between said first and said second chamber, said film passage providing a connection between said first and said second chamber in an air-tight manner with respect to the atmosphere; and
means for transporting said insulating film, said means locating said film in proximity to one of said electrodes in said first gas chamber and transporting said film through said film passage from one of said chambers to the other.

3,971,938
METHOD OF GENERATING ELECTRICITY FROM RADIANT ENERGY CALLED VARIABLE POLARIZABILITY CAPACITY GENERATOR
Louis Richard O'Hare, 1818 Marlborough Court, Fort Collins, Colo. 80521
Filed Mar. 5, 1973, Ser. No. 338,088
Int. Cl.² G01T *1/00*
U.S. Cl. 250—336 **9 Claims**

1. A method of generating electricity comprising:
periodically changing the dielectric constant in an electric condenser's dielectric material by causing a periodic change in the electron polarization of said dielectric by the influence of electromagnetic radiation causing an increase in electron polarization of the dielectric when this material absorbs radiation by means of intermittent interaction of said radiation with said dielectric,
employing said radiation absorbing dielectric as the dielectric material between electric condenser plates thereby effecting a variable condenser whose capacitance changes under the influence of radiation, admitting said radiation to and periodically interrupting it from said radiation variable condenser,
using the repeatedly changing capacitance of said variable condenser in a series electric circuitry with a transformer and a fixed condenser to produce a current flow in the transformer's primary winding by the periodically elevated and then depressed voltage on the plates of the variable condenser as its capacitance changes under the influence of surges of electromagnetic radiation from period to period as this radiation is admitted or impeded respectively, and
to thereby transfer useful electric energy to an electric load by the transformer's secondary winding.

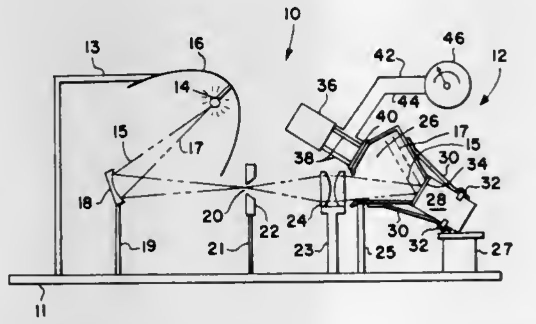


3,971,939
UNITARY LASSER/IR SEEKER
Clarence C. Andressen, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 19, 1975, Ser. No. 605,951
Int. Cl.² G01J *1/00*
U.S. Cl. 250—339 **14 Claims**



1. A combination infrared (IR) and laser (L) seeker comprising:
spectral filter means which is transmissive to IR energy and non-transmissive to L energy, said means having a front surface and a rear surface which slopes with respect to said front surface. the rear surface being coated to reflect IR energy and the front surface being reflective to L energy;
spinning gyroscope means on which said spectral filter means is mounted to spin therewith;
lens means forward of said filter means for focusing incoming IR and L energy, the energy emerging from the lens being converged on the front surface of said spectral filter means, L energy being reflected forward from the front surface and IR energy being reflected forward from the rear surface to a more forward focal point than the focal point of the L energy, the focused IR energy moving in a circle around the focused L energy as the spectral filter means spins;
L-energy detection means on which the reflected L energy is focused;
IR-energy detection means; and
lens means in the path of said reflected IR energy for focusing it on said IR detection means.

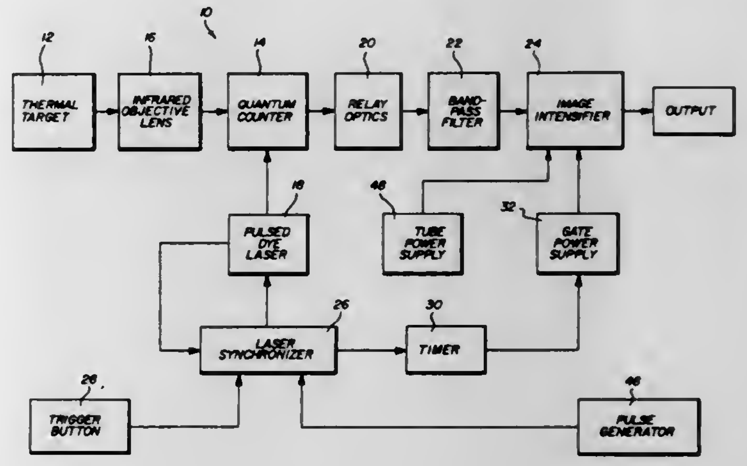
3,971,940
DETECTOR ABSORPTIVITY MEASURING METHOD AND APPARATUS
James C. Fletcher, Administrator of the National Aeronautics and Space Administraton, with respect to an invention of, and Ronald E. Sheets, Westminster, Calif.
Filed Mar. 19, 1975, Ser. No. 559,845
Int. Cl.² G01J *1/00*
U.S. Cl. 250—340 **10 Claims**



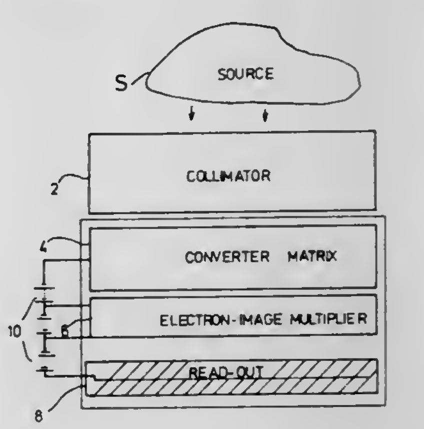
10. A method of measuring the absorptivity of a radiation detector which comprises:
providing a cavity radiometer which absorbs radiant energy and converts it into thermal energy, one inner surface of which is removable;
providing thermal measuring means which indicates the amount of radiant energy converted to thermal energy by said cavity radiometer;
supplying focused radiant energy to said cavity radiometer so that it impinges only on said removable inner surface whereby said thermal measuring means indicates the total amount of radiation incident upon said removable inner surface;
removing said removable inner surface and replacing it with a radiation detector which is to be measured for absorptivity;
supplying the exact amount of focused radiant energy as previously to said cavity radiometer, so that it impinges only on the active area of the radiation detector substituted for said removable inner surface, whereby said thermal measuring means indicates the amount of radiation reflected from the radiation detector and together with the measurement of total incident radiant energy furnishes sufficient information to determine the absorptivity of the radiation detector.

3,971,941
QUANTUM COUNTER WITH TEMPORAL DISCRIMINATION
Kenneth G. Sewell, Dallas; James R. Herrington, Garland, and William B. Volz, Richardson, all of Tex., assignors to Varo, Inc., Garland, Tex.
Filed Feb. 12, 1975, Ser. No. 549,285
Int. Cl.² H01J *31/49*
U.S. Cl. 250—330 **7 Claims**

1. A direct viewing and imaging system comprising: a quantum mechanical substance arranged to receive target radiation and to fluoresce responsive thereto for developing an output with a predetermined lifetime; a source of pulsed pump radiation coupled to said quantum mechanical substance, said pump radiation having a predetermined pulse duration less than said lifetime; detector means optically coupled to the output of said quantum mechanical substance; and means for selectively decoupling said detector means and said quantum mechanical substance for the duration of a pulse of said pump radiation whereby to eliminate "noise" signals associated with said source.



3,971,942
GAMMA-RAY CAMERA INCLUDING NOVEL CONVERTER MATRIX USEFUL THEREIN
Ady Seidman, Tel Aviv; Zohar Avrahami, Ramat Gan; Benjamin Sheinfux, Tel Aviv; Jan Grinberg, Holon, and Uri Shimoni, Kiron, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel
Filed Sept. 5, 1974, Ser. No. 503,284
Claims priority, application Israel, Sept. 5, 1973, 43166
Int. Cl.² G01T *1/20*
U.S. Cl. 250—363 S **19 Claims**



1. A gamma-ray camera characterized in that it includes a collimator receiving and collimating the gamma rays; a metal converter matrix converting the gamma rays to electrons; said metal converter matrix including a metal plate having a face formed with a plurality of spaced parallel surfaces extending substantially parallel to the direction the gamma rays exit from the collimator; an electron-image multiplier receiving the electrons and producing a multiplied electron output; and means for reading-out the output of the electron-image multiplier.

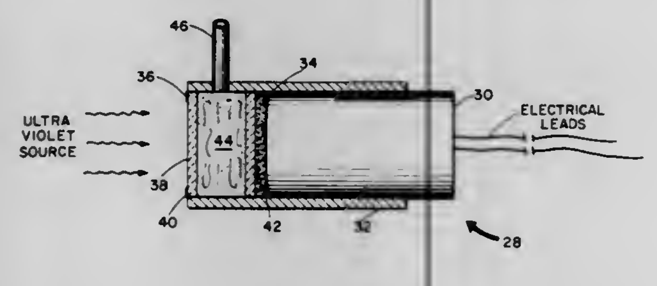
3,971,943
ULTRAVIOLET RADIATION MONITOR
Michel L. Jeunehomme, Novi, and Robert A. Essad, Sterling Heights, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.
Filed Feb. 4, 1975, Ser. No. 546,855
Int. Cl.² G01J *1/42*
U.S. Cl. 250—372 **21 Claims**

1. An ultraviolet radiation transducer for generating an electrical output signal correlated to the intensity of ultraviolet radiation flux incident thereon, comprising:
phototransducer means for generating said electrical signal in response to the ultraviolet radiation flux incident thereon, said phototransducer means having a relatively

high spectral response in the range of 200 to 270 nanometers of radiation wavelength;

first optical means for filtering ultraviolet radiation incident on said phototransducer means and having a high relative spectral response to radiation having a wavelength between about 200 and 270 nanometers and having a rapidly decreasing relative spectral response from about 270 nanometers to about 330 nanometers wavelength of radiation; and,

second optical means for filtering ultraviolet radiation incident on said phototransducer means and having a relative spectral response which is comparatively low for radiation having a wavelength of 200 nanometers, the relative spectral response rapidly increasing as the radiation wavelength increases.



3,971,944

NEUTRON DOSIMETRY

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,057

Int. Cl.² G01T *3/00*

U.S. Cl. 250—391 **5 Claims**

1. A method of measuring neutron radiation within a nuclear reactor comprising placing one or more oxide wires comprising a dosimeter target oxide within the reactor and measuring the radioactivity induced in said wires by said neutron radiation, said wires being extruded from an oxide extrusion mix, sintered to 40–60% theoretical density, and cut to the desired length, said oxide extrusion mix comprises an oxide dilution containing at least 0.1% by weight of the dosimeter target oxide in a diluent oxide.

3,971,945

X-RAY DIAGNOSTIC APPARATUS FOR USE WITH AN X-RAY PHOTOGRAPHING DEVICE PROVIDING FOR A PRE-SET X-RAY EXPOSURE TIME

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

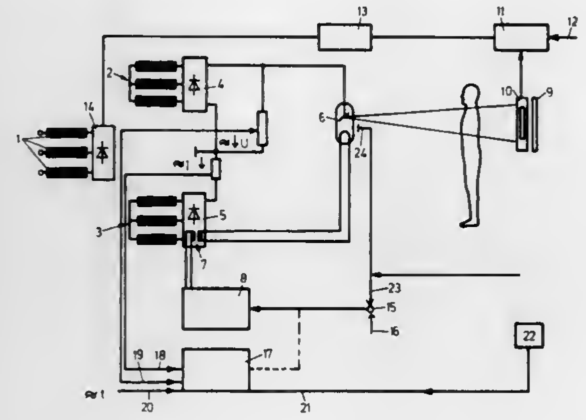
Filed Apr. 26, 1974, Ser. No. 464,654

Claims priority, application Germany, June 4, 1973, 2328322

Int. Cl.² H05G *1/30*

U.S. Cl. 250—402 **4 Claims**

1. In an X-ray diagnostic apparatus for the operation of an X-ray photographing device requiring a fixedly preset exposure time for X-ray image; a control circuit for the X-ray dosage power with reference to a patient, said control circuit including dosage output measuring means, comparator means connected to said measuring means adapted to compare the actual value of the dosage output with a reference value, said control circuit effecting an optimum film darkening for a particular exposure time, and setting means for the voltage of an X-ray tube in said apparatus controlled by an output of said comparator means for correlating the actual value of said dosage power with the reference value, the improvement comprising means in said control circuit for determining and adjusting the X-ray tube current so as to always automatically generate the highest permissible X-ray tube power output for a particular transpired exposure time.



3,971,946

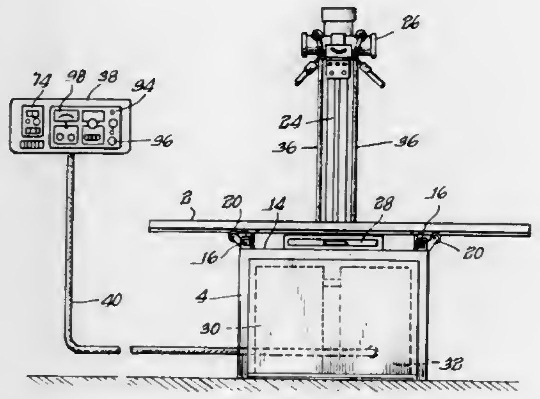
X-RAY APPARATUS WITH IMPROVED HOUSING FOR COMPONENTS

James R. Craig, Glenview, and George W. Otto, Jr., Elmhurst, both of Ill., assignors to American Radiologic Systems Inc., Melrose Park, Ill.

Filed Dec. 12, 1974, Ser. No. 532,013

Int. Cl.² H05G *1/10*

U.S. Cl. 250—422 **8 Claims**



1. X-ray apparatus comprising a pedestal, a table on said pedestal and movable thereon, a tube stand mounted for movement longitudinally of said table and carrying and X-ray tube, a bucky grid and X-ray film carrier below the table and movable with the tube stand, X-ray power unit and control means both housed within the pedestal so as to underlie the table; said power unit having components including a high voltage transformer having a primary winding and a secondary winding for providing operating voltage in the order of kilovoltage to said X-ray tube, said control means having components including an additional transformer providing a supply voltage for said primary winding, and said control means further having switch means for opening and closing a circuit from said additional transformer to said primary winding; means forming a conductive connection between components of the power unit and components of the control means, a control unit remote from said pedestal and having means including timer circuitry for initiating a cycle of operation that includes the closing and opening of said switch means, thereby to produce an X-ray exposure, said switch means and a part of said timer circuitry being in the housing in which said additional transformer is located, and an electrical cable connecting said control unit to said control means, the voltage in said cable and across components in said control unit being not in excess of about 30 volts.

3,971,947

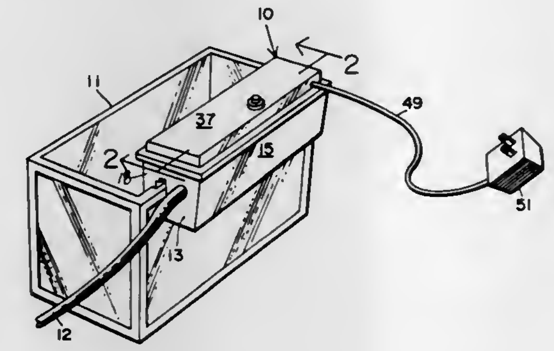
ULTRAVIOLET WATER PURIFIER

Douglas N. Lambert, 9451 Haitian Drive, Miami, Fla. 33157, and Richard H. Bennett, 8731 SW. 125th St., Miami, Fla. 33156

Filed Dec, 19, 1974, Ser. No. 534,627

Int. Cl.² G01N *21/24, 21/26;* **A01K** *63/00;* **A61L** *3/00*

U.S. Cl. 250—437 **4 Claims**



1. A water purifier comprising a receptacle comprising an inlet mounted at one side of said receptacle, outlet means compelling the flow of water along substantially the full length of said receptacle, an ultraviolet lamp, means mounting said ultraviolet lamp above said water and extending along said receptacle whereby water flowing therethrough is exposed to ultraviolet rays being emitted by said lamp, a depending baffle mounted adjacent said inlet in said receptacle and terminating in spaced relation to a bottom wall of said receptacle forming an opening and compelling water entering said receptacle to flow downwardly and be discharged through said opening, filtering means mounted in said receptacle adjacent to said depending baffle, a second depending baffle mounted adjacent to said filtering means and extending to below the surface of water positioned in said receptacle thereby forming a chamber above said filtering means for trapping bubbles entering said receptacle.

3,971,948

X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING A TRANSVERSE LAYER IMAGE

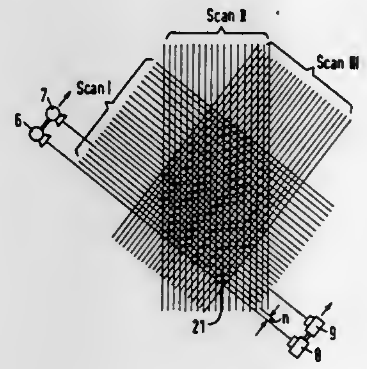
Manfred Pfeiler, Erlangen, and Gerhard Linke, Erlangen-Frauenaurach, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Aug. 2, 1974, Ser. No. 494,272

Claims priority, application Germany, Aug. 6, 1973, 2339758

Int. Cl.² G01M *23/00*

U.S. Cl. 250—445 T **3 Claims**



1. In an X-ray diagnostic apparatus for producing a transverse-layer image; including a first X-ray measuring arrangement having an X-ray source generating an X-ray of a transverse diffusion perpendicular to the layer being equal to the layer thickness and parallel to the layer being equal to or lesser than the layer thickness, a first radiation receiver means in said arrangement for measuring the radiation intensity behind an object at successive equidistant points, and drive means for said measuring arrangement for effecting a linear scanning movement across the entire object expanse perpendicular to the direction of the central X-ray in alternating sequence at successive equidistant angular increments over a range of 180°, said angular increments being measured about a rotational point on said central X-ray approximately centrally of said layer plane, the improvement comprising; a second measuring arrangement being disposed in parallel offset relationship with respect to the linear direction of movement of said first measuring arrangement including an X-ray source generating X-rays of different radiation energy value in comparison with the x-rays of the X-ray source of said first measuring arrangement, a second radiation receiver means in said arrangement for measuring the radiation intensity behind the object at successive equidistant points for receiving the X-rays of different radiation value; a calculator for formulating two absorption coefficients or their proportional magnitudes for each image point in dependence upon the measured signals of said first and second measuring arrangements for the two different values of the radiation energy, said calculator being adapted to form respective quotients and through stored calibrating tables provide the median ordinate value or corresponding parameter for each image point.

3,971,949

OPERATIVE LOCATION FOR THE EXAMINATION OF PATIENTS BY MEANS OF X-RAYS

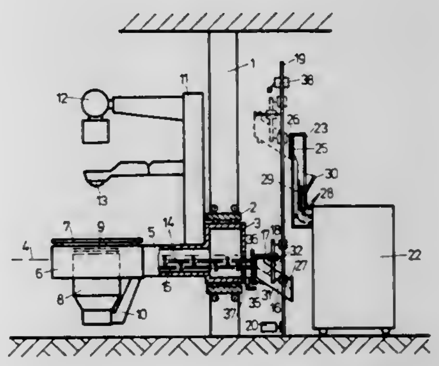
Wolfgang Bräther, and Alfred Hahn, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 9, 1974, Ser. No. 513,493

Claims priority, application Germany, Oct. 13, 1973, 2351542

Int. Cl.² G01M *23/00*

U.S. Cl. 250—446 **10 Claims**



9. In an operative location for the examination of patients by X-rays, including a patients' support bed tiltable about a horizontal, vertically adjustable pivoting axis; an X-ray exposure installation having a picture plane extending in parallel with said patients' support bed; an overhead X-ray tube oriented towards said picture plane, and an automatic developing arrangement for X-ray film sheets, the improvement comprising: conveying means for the exposed X-ray film sheets compensating for the elevational adjustability and inclinability of said X-ray exposure installation being disposed intermediate said picture plane and said automatic developing arrangement, said developing arrangement being immovably positioned on the floor of said location; a light-tight covered chute having a U-shaped feed hopper being located below said pivoting axis and leading towards said automatic developing arrangement; a plurality of nozzles being locaated in the walls of said chute and of said feed hopper; and means for supplying pressurized air to said nozzles.

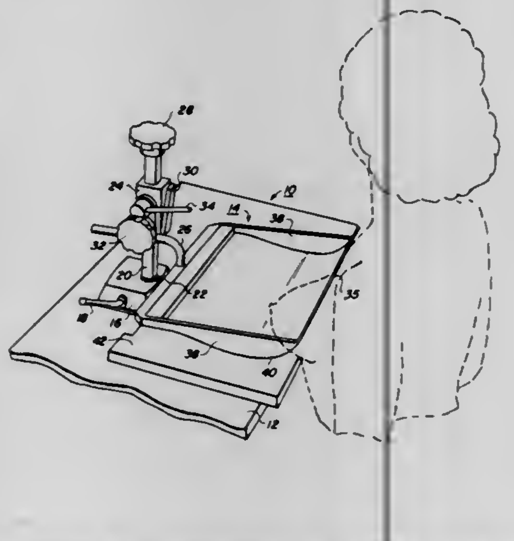
3,971,950
INDEPENDENT COMPRESSION AND POSITIONING DEVICE FOR USE IN MAMMOGRAPHY

David T. Evans, Manhattan Beach; Ellen M. Proctor, Pasadena; Frank R. Brion, Arcadia, and Theodorus M. Ceelen, La Verne, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,797

Int. Cl.^{2} G21K *5/08;* **G01N** *21/00, 23/00;* **A61G** *13/00*

U.S. Cl. 250—451 **15 Claims**



1. Apparatus for compressing and positioning an object to be examined by subjecting the object to penetrating radiation comprising:
  - a base member,
  - a member supported by said base member and extending along a first vertical axis,
  - a slide assembly mounted to said vertically extending member and adapted for movement therealong,
  - a compression member extending along a first horizontal axis and mounted to said slide assembly via a support member,
  - means operatively associated with said slide assembly for enabling said compression member to be positioned in the direction of said first horizontal axis,
  - means operatively associated with said slide assembly for enabling said support arm to be pivoted about said first horizontal axis, and
  - means operatively associated with said slide assembly for enabling said compression member to be vertically tilted relative to said first vertical axis.

3,971,951
APPARATUS FOR MEASURING TWO DIFFERENT FLUORESCENCES OF A SAMPLE

Katsuji Rikukawa, Tokyo, and Kenji Onogi, Chigasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

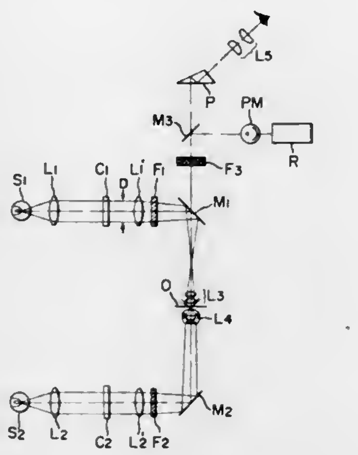
Filed Oct. 10, 1974, Ser. No. 513,869

Claims priority, application Japan, Oct. 17, 1973, 48-115687

Int. Cl.^{2} G01J *1/58*

U.S. Cl. 250—458 **9 Claims**

1. Fluorometric apparatus for measuring two different fluoroscences of a sample, the apparatus comprising a first illumination optical system for irradiating the sample with a first excitation light modulated at a first frequency and having a first wavelength, the first excitation light being reflected to the sample and the sample emitting a first fluorescent light, a second illumination optical system for irradiating the sample with a second excitation light modulated at a second frequency and having a second wavelength, the second excitation light being transmitted through the sample and the sample emitting a second fluorescent light, filter means for the passage therethrough of the first and second fluorescent lights emitted by the sample and for preventing said excitation lights from passing therethrough, and detecting means responsive to said first and second fluorescent lights passed through said filter means for detecting the individual intensities of the first and second fluorescent lights.



3,971,952
METHOD OF DETECTING ABNORMAL BEHAVIOR OF MAMMALIAN CELLS

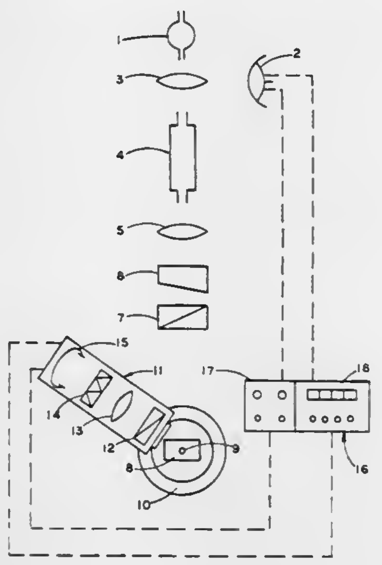
Michael Inbar, and Meir Shinitzky, both of Rehovoth, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovoth, Israel

Filed Sept. 12, 1974, Ser. No. 505,530

Claims priority, application Israel, Sept. 14, 1973, 43224

Int. Cl.^{2} G01N *21/38*

U.S. Cl. 250—461 B **8 Claims**



1. A method of detecting in vitro abnormal behavior of mammalian cells comprising the steps of:
  - isolating from a living body of a mammal, cells which it is desired to examine,
  - exposing said cells to electromagnetic radiation in the range of from about 200 to about 700 nm thereby to cause an electromagnetic signal to emerge from the lipid layer of the surface membrane of said cells,
  - measuring at least one parameter of said electromagnetic signal thereby to obtain an indication of the fluidity of said lipid layer,
  - comparing said indication obtained in the measuring step with a corresponding indication obtained from normal cells of the same type,
  - thereby to determine whether or not the fluidity of said lipid layer of said mammalian cells tested significantly differs from the corresponding value of said normal cells of the same type, a difference indicating abnormal behavior of said mammalian cells tested.

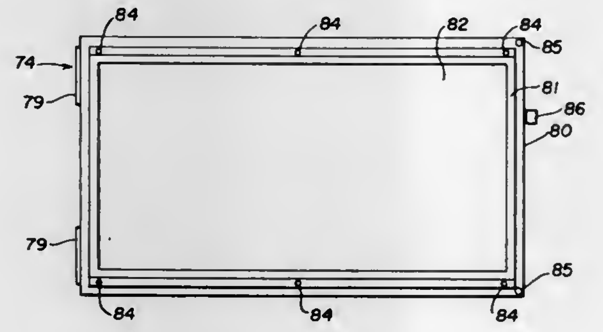
3,971,953
X-RAY TABLE

Cecil K. Bridgeman, Islington, Canada, assignor to Picker X-Ray Mfg. Limited, Ontario, Canada

Division of Ser. No. 320,142, Jan. 2, 1973, Pat. No. 3,891,850, which is a continuation of Ser. No. 93,268, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,943, Oct. 4, 1968, abandoned, which is a continuation-in-part of Ser. No. 657,121, July 31, 1967, abandoned. This application Nov. 27, 1974, Ser. No. 527,750

Int. Cl.^{2} G11B *1/00*

U.S. Cl. 250—469 **21 Claims**



1. In an X-ray device, a radiographic exposure station assembly comprising:
  - a. a pair of intensifying screens defining an exposure station therebetween and each having a surface for engaging a piece of radiographic film positioned in the station;
  - b. screen positioning mechanism connected to the screens and adapted to move the screens relatively from a film engaging exposure position to a spaced film handling position, the film handling position permitting film to be inserted into and removed from the exposure station; and,
  - c. evacuating means for evacuating the exposure station while ambient air pressure external of the station is substantially unaffected whereby the ambient air pressure will force the screen surfaces into tight intimate engagement with a piece of film positioned in the exposure station when the station is evacuated.

3,971,954
ULTRAVIOLET CAMERA SYSTEM FOR DENTAL PHOTOGRAPHY AND MOUTHPIECES THEREFOR

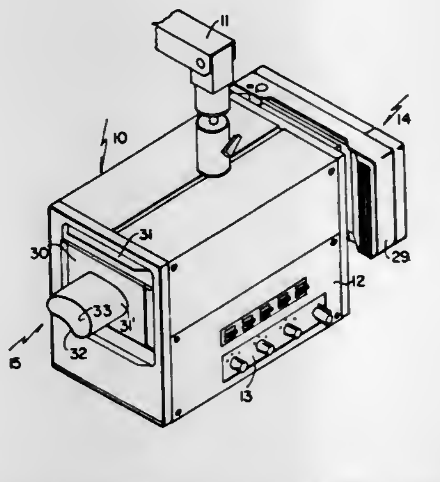
Israel Kleinberg, Smithtown, N.Y.; Alex Domokos, Winnipeg, Canada, and Cosmo Castaldi, West Hartford, Conn., assignors to Alphametrics Ltd., Winnipeg, Canada

Filed Nov. 11, 1974, Ser. No. 522,983

Claims priority, application United Kingdom, Nov. 12, 1973, 52440/73

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—475 **12 Claims**



1. A system for photographing the surfaces of the teeth and adjacent soft tissues, within the mouth of a patient, in conjunction with a camera and comprising in combination a hollow mouthpiece assembly detachably engageable within the said mouth of the patient, a source of ultraviolet light operatively connected to said mouthpiece whereby said ultraviolet light illuminates said teeth, and means to operatively connect said mouthpiece to the associated camera, the wave length of said ultraviolet light being between 200 and 380 nanometers.

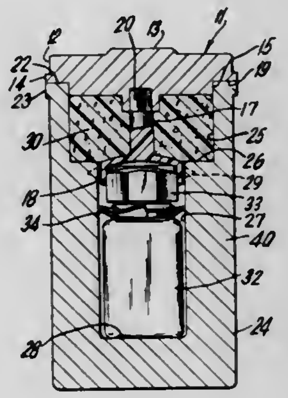
3,971,955
SHIELDING CONTAINER

Robert E. Heyer, Hopatcong, and Bernard J. Bolter, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 14, 1975, Ser. No. 604,752

Int. Cl.^{2} G21F *5/00*

U.S. Cl. 250—507 **10 Claims**



1. A shielding container for radiopharmaceuticals comprising a cover and a cylindrical body wherein said cover includes a disk shaped lid having a depending member and cap cover, said cylindrical body is formed with a squared off well and an outer recess communicating with said well, a sealed bottle containing radiopharmaceutical material having a retaining ring located around its neck is located in said well, said cap cover contacting the bottle cap, and a pad of absorbent, flexible, resilient material located around said depending member and filling said outer recess.

3,971,956
MEASUREMENT OF SURFACE ROUGHNESS

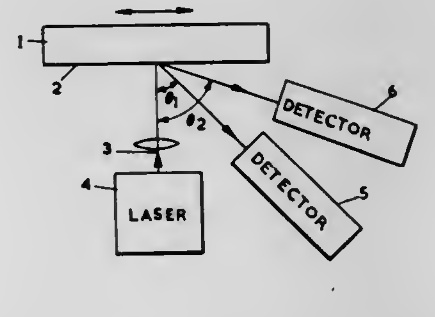
Eric Jakeman, Birtsmorton, and Peter Nicholas Pusey, Malvern, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 20, 1975, Ser. No. 542,406

Claims priority, application United Kingdom, Jan. 21, 1974, 2765/74

Int. Cl.^{2} G01N *21/30*

U.S. Cl. 250—571 **8 Claims**



1. A method of measuring surface roughness comprising the steps of directing a beam of electromagnetic radiation onto a portion of a surface to be measured, applying relative movement between the surface and the beam in a direction having a component normal to the beam, detecting average intensity and average of the square of intensity of radiation scattered at at least one angle from the surface, and processing the detected radiation to determine height of irregularities of the surface.

3,971,957

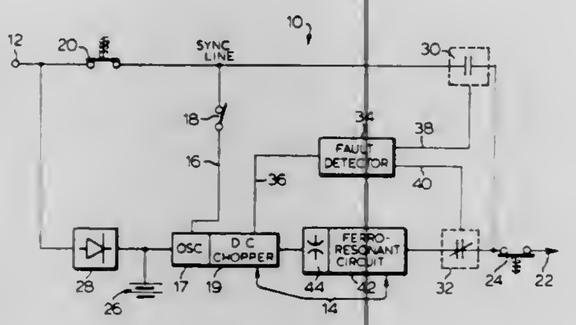
ELECTRICAL LOAD TRANSFER CONTROL SYSTEM

Alfred Max Hase, 6 Manorwood Road, Scarborough, Ontario, Canada

Filed May 30, 1975, Ser. No. 582,200

Int. Cl.^{2} H02J *9/00*

U.S. Cl. 307—64 **9 Claims**



1. For use in an electrical power system having two power sources, where the first power source is an ordinarily available aternating current source and the second power source is an inverter having an output synchronized to said first power source, and where the load is an alternating current load which is normally connected to the output of said second power source; a control system for providing an essentially uninterrupted power flow to said load in the event of failure of said second power source by transferring said load to said first power source, and for isolating said second power source from said first power source when said first power source is connected to said load, comprising:

first controllable and normally open switch means having a first operating period to close, and being connected to said first power source and to said load;

second controllable and normally closed switch means having a second operating period to open, and being connected to said second power source and to said load;

each of said first and second switches being such that the respective power source is both current and voltage isolated from said load when that switch is open;

fault sensing means connected to said second power source for sensing any fault therein while said second power source is connected through said second switch means to said load; said fault sensing means being connected to said first switch means so as to emit a first control signal to cause said first switch means to close when a fault in second power source is sensed, and being connected to said second switch means so as to emit a second control signal simultaneously with said first control signal to cause said second switch means to open;

and a ferroresonant circuit having an energy storage element connected between said second power source and said load so as to be connected to said load even after any failure of said second power source for at least the length of time of said second operating period;

said first operating period being shorter than said second operating period so that said first switch means is closed before said second switch means is opened after a fault in said second power system has been sensed; said energy storage element having at least sufficient energy storage capacity substantially to provide the energy requirement of said load for the length of time of said first operating period plus the operating period of said fault sensing means.

3,971,958

PULSE GENERATOR FOR PROVIDING INFORMATION AS TO THE RATE OF ROTATION AND PHASING OF AN ENGINE TO AN ELECTRONIC APPARATUS INTENDED TO GOVERN THE FUEL FEED TO AN INTERNAL COMBUSTION ENGINE OF THE FUEL INJECTION TYPE

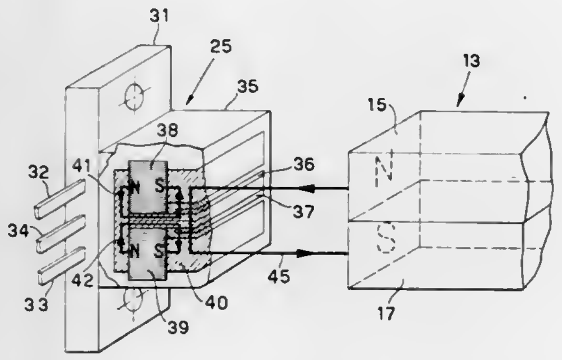
Edoardo Rogora, and Walter Giraudi, both of Milan, Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 387,637, Aug. 13, 1973, abandoned, which is a continuation of Ser. No. 225,228, Feb. 10, 1972. This application Mar. 26, 1974, Ser. No. 454,937

Claims priority, application Italy, Feb. 20, 1974, 48585/74

Int. Cl.^{2} H03K *3/00*

U.S. Cl. 307—106 **1 Claim**



1. A pulse generator for providing information as to the speed of rotation and phase angle of an engine to an electronic apparatus for regulating the fuel feed to an internal combustion engine of the injection type, having a plurality of cylinders, comprising: a number of magnetosensitive switching devices formed by a number of magnetoresistive elements equal to the half of the number of the cylinders of the engine, said magnetoresistive elements being of differential tripolar type, formed by two magnetoresistors and by two permanent magnets, each of which is able to affect one magnetoresistor, means for producing a magnetic field for switching said magnetosensitive switching device mechanically connected to the main shaft so as to be rotated at a speed which is proportional to that of the mainshaft and with a preselected phase relationship with respect to said mainshaft, said field producing means being formed by two permanent magnets with pole pieces of suitable angular extension being arranged so as to have opposite magnetic polarities juxtaposed, said magnetic field periodically affecting said switching devices and causing their temporary switching with a duration and a frequency which are a function of the speed of rotation of the engine shaft and with a phase relationship which is a function of the phase relationship aforementioned, a circuit connected to said magnetoresistive elements for processing the signals delivered by said differential magnetoresistive elements, said circuit comprising at least one pair of amplifiers which operate as tension comparing switches, each amplifier being fed with a signal delivered by a magnetoresistive element and formed by an alternative tension which oscillates about an average value and with a reference signal formed by a tension of predetermined value, the amplifier being able to transform the first signal into a train of sharp pulses, the two reference signals which are fed to the amplifiers being formed by tensions of different values so that the two trains of pulses at the outputs of the two amplifiers are dephased of a suitable fixed angle.

3,971,959

TIMING MODE SELECTOR

Norman Eustace Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,392

Int. Cl.^{2} H03K *21/32, 21/36*

U.S. Cl. 307—225 R **1 Claim**

1. Timing mode selector comprising in combination

a clock pulse generator for supplying a continuous series of timing pulses,

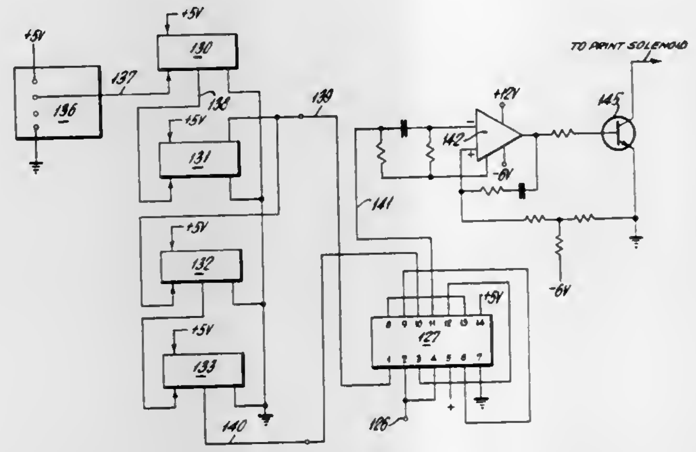
a first pair of integrated-circuit counters,

said counters being connected in series to the output of said generator for providing a predetermined first mode pulse rate output,

a second pair of integrated-circuit counters,

said second counters being connected in series to said first mode output for providing a predetermined second mode pulse rate output,

a unitary integrated circuit for alternatively selecting said first or second mode output comprising four NAND gates, each of said NAND gates having two input circuits and an output,



means for connecting a mode-control signal to said unitary integrated circuit,

said mode-control signal having an on-state for one of said modes and an off-state for the other of said modes,

an output circuit from said unitary integrated circuit for transmitting the selected one of said modes,

first circuit means for connecting said first and second mode pulse rate outputs to the inputs of two of said NAND gates,

second circuit means for connecting said mode-control signal connecting means to two other inputs of said NAND gates, and

third circuit means for connecting said output circuit to one of said NAND gate outputs.

3,971,960

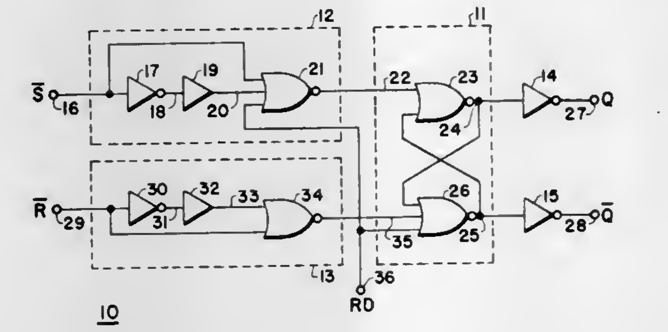
FLIP-FLOP FALSE OUTPUT REJECTION CIRCUIT

Rodney J. Means, and Gene A. Schriber, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 5, 1975, Ser. No. 555,470

Int. Cl. H03K *3/286, 3/353*

U.S. Cl. 328—206 **7 Claims**



1. A digital logic circuit comprising:

a. storage means having a first storage state and a second storage state for storing digital information;

b. first input means coupled to said storage means and adapted to respond to a first input signal for causing said storage means to assume said first storage stage;

c. second input means coupled to said storage means and adapted to respond to a second input signal for causing said storage means to assume said second storage state; and

d. false output rejection circuit means coupled to the output of said storage means for generating a corrected replica of said first storage state when time asynchronism between said first input signal and said second input signal cause said storage means to assume a logically indeterminate state.

3,971,961

PULSE AMPLIFIER

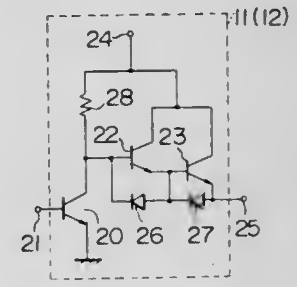
Mamoru Inami; Yoshiaki Tanaka, and Tsuyoshi Ono, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 26, 1974, Ser. No. 536,653

Claims priority, application Japan, Dec. 28, 1973, 49-2750; Feb. 15, 1974, 49-18162

Int. Cl.^{2} H03K *3/26, 5/08, 19/36*

U.S. Cl. 307—268 **11 Claims**



1. A pulse amplifier for producing sharp pulses of high amplitude, comprising, in combination, input and output terminals, a first transistor connected to said input terminal and arranged to change its on-off states in accordance with the presence and absence of input pulses applied to said input terminal, a second transistor having its base connected to the collector of said first transistor, a third transistor having its base connected to the emitter of said second transistor and having its collector connected in common with the collector of said second transistor to a power supply and having its emitter connected to said output terminal, so that said second and third transistors change their on-off states in alternate relationship with said first transistor, first circuit means connecting the base of said third transistor to the base of said second transistor for applying the potential at the base of said second transistor instantaneously to the base of said third transistor, and second circuit means connecting the output terminal to the collector of said first transistor to receive current from an external circuitry when said second transistor is non-conducting.

3,971,962

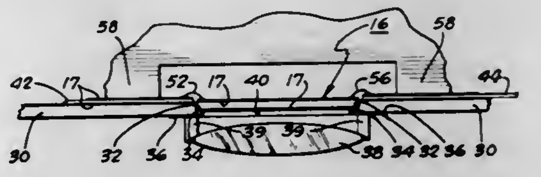
LINEAR TRANSDUCER ARRAY FOR ULTRASONIC IMAGE CONVERSION

Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 21, 1972, Ser. No. 291,002

Int. Cl.^{2} H01L *41/08*

U.S. Cl. 310—8.1 **13 Claims**



1. An ultrasonic transducer for converting a portion of a focused compressional acoustic image field of an area to be viewed to electric impulses representative of the incident focused compressional image field and which are used to produce a detailed image of the said area, including an array of piezoelectric elements arranged in a single curved line, said curve being defined by the configuration of the said focused compressional acoustic image field to be converted, whereby said array of piezoelectric elements converts a single line

across said focused compressional acoustic image field to electric impulses.

3,971,963

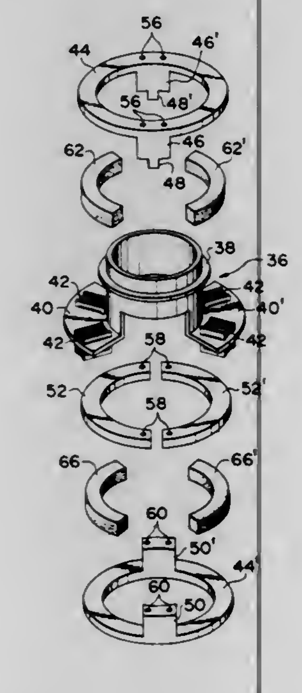
ELECTOMAGNETIC ROTARY MOTION DEVICE AND EXPOSURE CONTROL DEVICE USING THE SAME

Hiroshi Koike, No. 5-10, 1-chome, Minami-Azabu, Minato, Tokyo; Shoji Suzuki, No. 11-4-208, 4-chome, Minami-Dai, Sagamihara, Kanagawa, and Takeki Asakawa, No. 3-2, 2-chome, Minami-Azabu, Minato, Tokyo, all of Japan

Filed Sept. 11, 1973, Ser. No. 396,207

Int. Cl.^{2} H02K *21/26*

U.S. Cl. 310—154 **7 Claims**



1. An electromagnetic rotary motion device which comprises, in combination:

A. a stator unit, as a stationary magnetic flux generating means, having an axis therethrough and comprising:

1. first and second annular outer pole pieces, disposed so as to be axially spaced apart and mutually parallel, which have identical radii of curvature and inner pole surfaces in axially opposed relationship,

2 first and second semi-circular permanent magnets, having outer magnet surfaces which are attached to said inner pole surfaces, first and second inner magnet surfaces which are axially spaced apart in opposed relationship, and said identical radii of curvature,

3 an intermediate pole piece which is disposed approximately between and in parallel to said first and second permanent magnets, is spaced sufficiently far apart from said inner magnet surfaces to form first and second air gaps therebetween so that a magnetic field is established across said air gaps and like field poles appear at said inner magnet surfaces and opposite like field poles appear at said outer magnet surfaces, in said first and second outer pole pieces, and in said intermediate pole piece;

B. a rotor unit, as an armature means comprising:

1 a bored non-magnetic cylinder having a flange extending radially outwardly from the circumferential edge thereof and an opening formed in said flange, and

2. an armature mounted on said flange within said opening and having the coil thereof wound so that portions extend axially and radially to define arcuately disposed opening which is located on one side of said flange;

C. a non-magnetic rigid mounting means for said stator unit; and

D. a rotatable mounting means for said rotor unit whereby said rotor unit is rotatably mounted with said axis as the axis for said cylinder and said intermediate pole piece is disposed within said arcuately disposed opening without contacting said coils throughout the range of rotation of said rotor unit.

3,971,964

CYLINDRIC GRID ELECTRODE STRUCTURE FOR ELECTRONIC TUBES COMPRISING CARBON FILAMENTS COATED WITH PYROLYTIC GRAPHITE

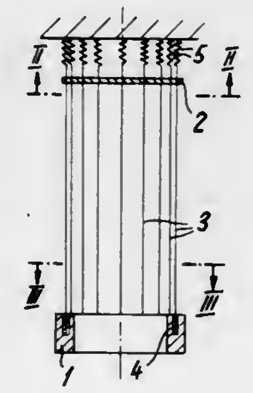
Julius Slosiar, Chavannes-pres-Renens, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 21, 1974, Ser. No. 516,761

Claims priority, application Switzerland, Nov. 7, 1973, 15649/73

Int. Cl.^{2} H01J *1/48, 19/42*

U.S. Cl. 313—355 **2 Claims**



1. A grid electrode structure for electronic transmitter tubes characterized by the fact that the portion thereof which constitutes the grid proper consists of carbon in thread or filamentary form which is completely covered by a layer of pyrolytic graphite.

3,971,965

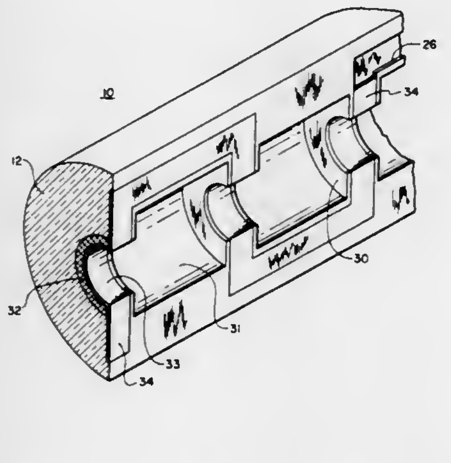
INTERNALLY-FOCUSED TRAVELING WAVE TUBE

Halsted W. Baker, Forked River, and Arthur H. Gottfried, Rumson, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,546

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—3.5 **8 Claims**



1. In a traveling-wave type electron tube the improvement comprising:

an elongated housing having a central evacuated passageway therethrough;

a plurality of annular magnets, concentric with said central evacuated passageway, supported within said housing at predetermined spaced locations along the length of said passageway; and

circuit means supported within said housing having annular portions concentric with and coincident with said magnets.

3,971,966

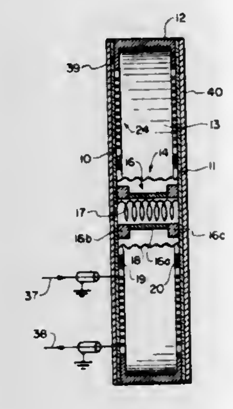
PLANAR RING BAR TRAVELLING WAVE TUBE

Arthur H. Gottfried, Rumson; Louis J. Jasper, Jr., and John J. Tancredi, both of Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,737

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—39.3 **10 Claims**



1. A pill box shaped traveling wave tube comprising an electrically conductive annular collector, an electron gun including a cathode positioned coaxial with said collector for providing a radial electron beam, and a slow-wave circuit disposed between said cathode and said collector, said slow-wave circuit being a ring-bar structure having a plurality of closed concentric coplanar rings of differing radii coaxial with said cathode and said collector and positioned adjacent at least one of two transverse boundaries of said radial beam, said slow-wave circuit further including a plurality of radially disposed electrically conductive bars, adjacent ones of said rings being connected only by a single one of said radial bars, and successive bars being angularly disposed relative to one another.

3,971,967

FLUORESCENT LAMP INSTALLATION HAVING SEPARATE FILAMENT TRANSFORMERS AND REMOTELY LOCATED BALLAST

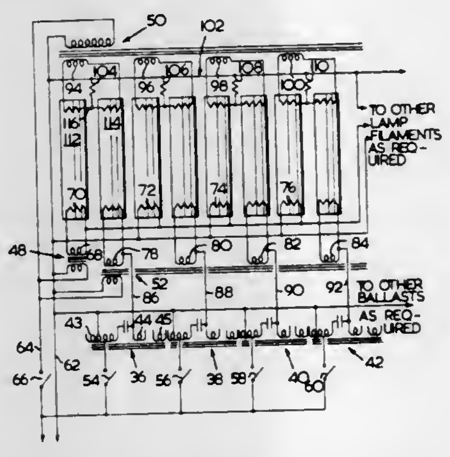
Henry H. Hawkins, West Vancouver, Canada, assignor to H. H. Hawkins Ltd., W. Vancouver, Canada

Filed Jan. 16, 1975, Ser. No. 541,685

Claims priority, application Canada, May 17, 1974, 200238

Int. Cl.^{2} F21V *21/14;* **H05B** *41/14*

U.S. Cl. 315—97 **10 Claims**



1. A fluorescent lamp installation comprising:

a plurality of pairs of discharge lamps each lamp having a pair of filaments;

a plurality of current limiting ballasts located remote from said lamps;

means for connecting one side of each ballast to a source of supply;

means connecting the other side of each ballast to one filament of one of a pair of lamps with no more than one lead per pair of lamps;

means for connecting the other side of said supply to one filament of the other lamp of said pair;

means to supply current to the filaments of each pair of lamps so that the other filaments of said one and said other lamp in the pair are connected together and said one filament of each lamp in the pair are isolated from each other, wherein said lamp filament current supply means is mounted close to said lamps.

3,971,968

ULTRAVIOLET RADIATION SOURCE INCLUDING TEMPERATURE CONTROL AND PRESSURE CONTROL OPERATING MEANS

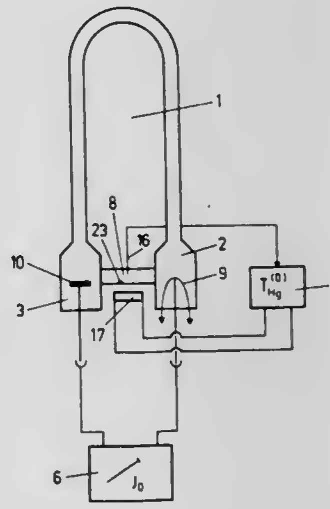
Robert Bachmann, Dottingen; Pieter Bearda, Turgi; Walter Stoidl, Gebenstorf; Gerold Brandli, Aarau, and Rudolf Rieder, Wettingen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 20, 1975, Ser. No. 551,425

Claims priority, application Switzerland, Mar. 4, 1974, 2994/74; June 20, 1973, 8456/74; Sept. 18, 1974, 12672/74

Int. Cl.^{2} H01J *61/067, 61/30;* **H05B** *41/36*

U.S. Cl. 315—108 **30 Claims**



1. Apparatus for generating ultraviolet radiation of high spectral radiance whereby the radiation is produced in a discharge tube having a thermoemissive cathode and a discharge space and filled with mercury/argon by means of a wall-stabilized direct-current gas discharge at a mercury pressure P_{Hg} of between 5×10^{-1} Torr and a current density j of the discharge current I of between 1 and 25A/cm^2, comprising;

a discharge tube having a discharge space, a cathode space, and an anode space, and incorporating a pressure-equalizing space connecting the cathode space to the anode space so that the sum of the volume of the cathode space, anode space and pressure-equalizing space is greater than the volume of the discharge space,

the pressure of the argon being between 0.01 and 10 Torr,

first control means for regulating the current density j of the discharge current I to a constant value j_o between l and 25A/cm^2, and,

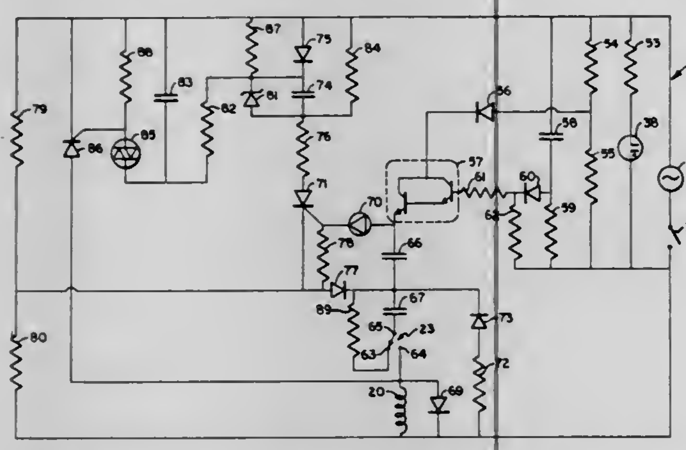
second control means for regulating the pressure p_{Hg} of the mercury to such a value that the yield η of the line of wavelength 2537A, i.e. the ratio of the spectral radiation power for the wavelength λ = 2537A to the electrical power stored in the discharge, is at least 80% of the maximum yield η_{max} for the chosen current density j_o.

3,971,969

ELECTRICALLY OPERATED STAPLING DEVICE

Harry T. Wines, Flushing; John J. Power, Westbury, and Gilbert Knauer, Oceanside, all of N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,254
Int. Cl.^{2} H01H *47/32*
U.S. Cl. 317—148.5 B **11 Claims**



1. In an electrically powered stapling device comprising driving means for driving a staple and a solenoid having a solenoid coil and a solenoid armature interconnected with and adapted to move said driving means in a staple-driving direction when electric current is passed through the coil, the improvement comprising an electronic pulser circuit connected to the solenoid and adapted to supply the solenoid with at least two unidirectional current pulses from a source of alternating current supplied to the pulser circuit, said pulses causing said driving means to advance and drive a single staple, said pulser circuit comprising:

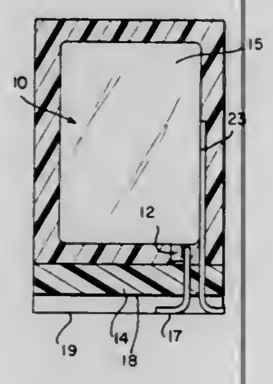
a. actuator means for causing actuation of the stapler;
b. window means for defining a beginning time and an end time of a fixed interval in the output cycle of said alternating current source;
c. gate means responsive to said actuator means and said window means to produce a trigger signal during said fixed interval when said actuator means is actuated;
d. means responsive to said gate means for producing an enabling signal having a predetermined duration which extends into at least two alternate half-cycles from said source of alternating current; and
e. control means responsive to said enabling signal for passing to said solenoid coil at least two alternate half-cycles from said alternating current source.

3,971,970

ELECTRICAL COMPONENT WITH LOW IMPEDANCE AT HIGH FREQUENCY

Gerald A. Voyles, and Edward M. Moss, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Nov. 27, 1974, Ser. No. 527,606
Int. Cl.^{2} H01G *9/05*
U.S. Cl. 317—230 **10 Claims**



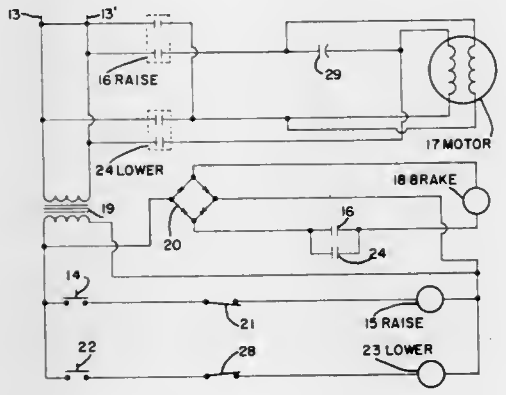
1. An electrical component having low impedance at high frequency input signals comprising a dielectric oxide film-forming metal anode with an anode lead projecting from the anode, electrolyte contacting surfaces of the anode to form a body, surfaces of the body at an angle with respect to each other, and a cathode lead contacting the body, the cathode lead including an elongated cathode strip having at least two major surfaces, one of the major surfaces bonded to at least one of the surfaces of the body, the anode lead and the cathode strip spaced a short distance from each other and each projecting from the body a relatively short distance in a spaced, substantially parallel relationship.

3,971,971

ELECTRIC HOIST CONTROL AND BRAKING SYSTEM

David C. Wycoff, Roanoke, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 15, 1974, Ser. No. 524,081
Int. Cl.^{2} H02P *1/40*
U.S. Cl. 318—203 A **9 Claims**



1. A braking apparatus for electric motors subject to overhauling loads comprising:

an alternating current power source;
an electric alternating current motor having a normal operating speed;
a control system for starting, stopping, and controlling the direction and limit of travel of said motor; and
a fixed capacitor permanently connected to at least one of the motor windings such that at any time power is removed from said motor, said capacitor being selected in cooperation with the residual magnetic field of the motor stator windings and their associated impedance characteristics to effect a resonant condition causing said motor to become self-excited and to develop braking torque upon continued rotation of said motor above a speed substantially below normal operating speed for the purpose of limiting said speed with power off and said capacitor and said motor windings alone cooperate to effect running performance of said motor.

3,971,972

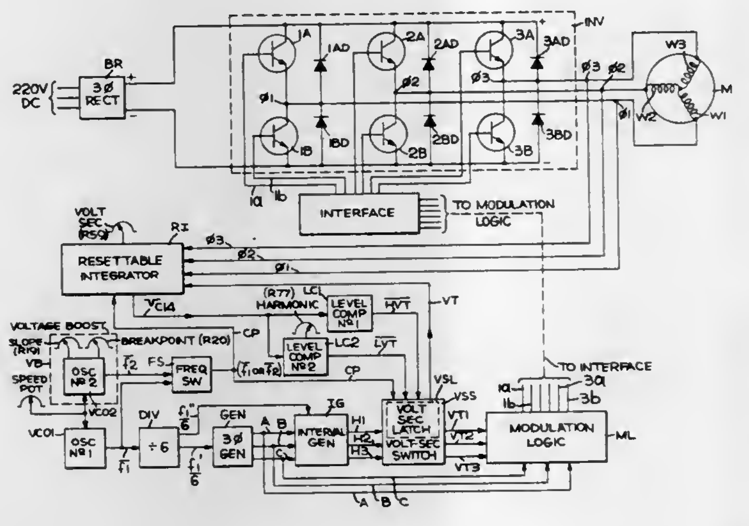
TRANSISTOR INVERTER MOTOR DRIVE HAVING VOLTAGE BOOST AT LOW SPEEDS

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 14, 1975, Ser. No. 558,294
Int. Cl.^{2} H02P *5/40*
U.S. Cl. 318—227 **32 Claims**

1. In a three-phase bridge inverter drive for supplying variable frequency and variable magnitude voltage to an electric motor,

integrator means for deriving constant volt/hertz pulses whose frequency is a function of an analog speed signal and which vary in width as a function of the time integral of the inverter output voltage,
means for deriving three-phase reference waves displaced 120° apart each of which has a period which includes a predetermined number of said constant volt/hertz pulses,
means for controlling the fundamental output voltages of individual phases of the bridge inverter in accordance with respective said three-phase reference waves and including pulse width modulating means for switching individual phases of said bridge inverter in accordance with said constant volt/hertz pulses, and



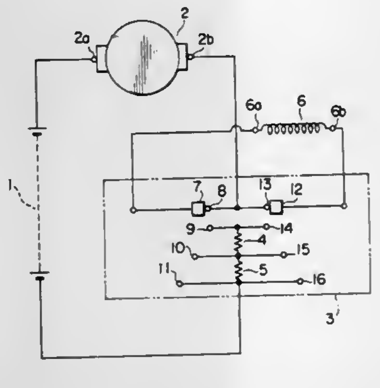
voltage boost means for increasing the frequency of said constant volt/hertz pulses at motor speeds below a predetermined speed to thereby increase the number of constant volt/hertz PWM pulses during each cycle of motor frequency voltage and provide a boost in inverter output voltage at low frequencies.

3,971,973

RHEOSTATIC CONTROL SYSTEM FOR A DC MOTOR

Yoshinori Nakano, Tokoname, Japan, assignor to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of Kariya, Japan

Filed July 23, 1974, Ser. No. 491,126
Claims priority, application Japan, July 24, 1973, 48-83814
Int. Cl.^{2} H02P *7/08*
U.S. Cl. 318—251 **12 Claims**



1. A motor control system for an electric car including a D.C. motor having an armature, a field coil, two polarity changing terminals and two power supply terminals, one of which is connected to one terminal of a D.C. power supply, said D.C. motor forming a drive source for the electric car, said two polarity changing terminals being connected between terminals of either said armature or said field coil and said two power supply terminals being connected between terminals of the other, whereby the forward-backward rotation of said motor is controlled by changing the polarity of the voltage applied across said two polarity changing terminals from said D.C. power supply for forwardly or backward moving the electric car, said motor control system comprising:

a. forward actuating means,
b. independently actuable backward actuating means,
c. slidable variable resistor means connected to said D.C. power supply and said D.C. motor and including at least a stopping stationary contact and a speed controlling resistor, one of which is connected to either one of the remainder of said two power supply terminals and the other terminal of said D.C. power supply and the other of which is connected to the other, a forward slidable contact connected to one of said two polarity changing terminals and actuated by said forward actuating means to make electrical contact with or break electrical contact of said stopping stationary contact and said speed controlling resistor, and a backward slidable contact connected to the other of said two polarity changing terminals and actuated by said backward actuating means to make electrical contact with or break electrical contact of said stopping stationary contact and said speed controlling resistor,

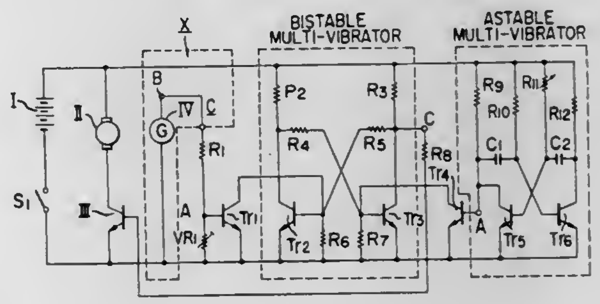
whereby the forward movement and the speed of the electric car are controlled by the operation of said forward actuating means and the backward movement and the speed of the electric car are controlled by the operation of said backward actuating means.

3,971,974

APPARATUS FOR CONTROLLING THE SYNCHRONOUS DRIVE FOR DIRECT-CURRENT MOTORS

Toshikazu Ichiyanagi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1974, Ser. No. 467,741
Claims priority, application Japan, May 9, 1973, 48-51377
Int. Cl.^{2} H02P *5/00*
U.S. Cl. 318—341 **12 Claims**



1. A system for controlling the synchronous drive for direct-current motors comprising a direct-current power source, a direct-current motor connected with said power source, rotational speed detection means for detecting the rotational speed of said direct-current motor and generating a signal in proportion to said speed, means for generating a predetermined reference signal to rotate the direct-current motor at a constant speed, and controlling means for controlling an applied voltage of the direct-current motor, said controlling means including means for receiving both signals as described above and comparing the same to generate a motor-speed controlling signal in response to the output therefrom, and means for regulating a signal applied to the motor disposed in relation to said signal generation means and said rotational speed detection means in order to regulate a crest value of an output generated by said signal generation means, whereby time for applying the voltage to the direct-current motor may be set such that said motor is maintained at a constant speed.

3,971,975

SWITCHING REGULATOR EMPLOYING BIASED SATURABLE CORE REACTORS

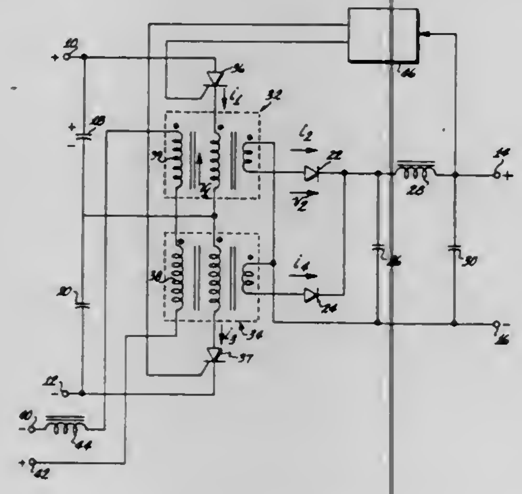
Luther L. Genuit, Scottsdale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 26, 1975, Ser. No. 590,541
Int. Cl.^{2} H02M *3/315*
U.S. Cl. 321—18 **7 Claims**

1. A switching regulator for providing a high current low voltage regulated output from a high voltage source comprising:

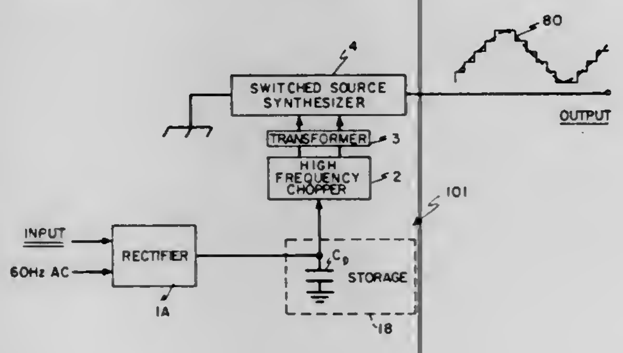
a. first and second input terminals for receiving said high voltage source;
b. first and second output terminals for said regulated output;
c. capacitive commutating means connected across said first and second input terminals;
d. first and second biased saturable reactor transformers each having a primary winding and a secondary winding;

e. first and second control switching devices;
f. mean serially connecting said first switching device, the primary winding of said first transformers, the primary winding of said second transformer, and said second switching device between said first and second input terminals and means connecting the common terminals of said primary windings to said commutating means;
g. an output rectification and filter means including first and second Schottky Barrier Diode rectifiers, each of said rectifiers connected to a first terminal of a secondary winding of said first and second transformers and to an output terminal through capacitive-reactive filter means with conductive means connecting the other output terminal and the second terminals of said secondary windings;



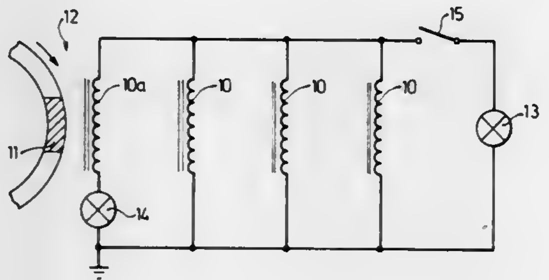
h. transformer reactor biasing means including first and second serially connected bias coils each magnetically coupled to a primary winding of said first and second transformers and a bias choke serially connected therewith for storing and transferring energy through said bias coils to said output rectification and filter means; and
i. control signal means responsive to the output voltage and providing control signals to alternately render conductive said first and second controlled switching devices.

3,971,976
ELECTRIC POWER SUPPLY
Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Feb. 10, 1975, Ser. No. 548,480
Int. Cl.^{2} H02M *5/45*
U.S. Cl. 321—4 **31 Claims**



1. A frequency changer for power systems that comprises, in combination:
a source of DC potential;
means for changing the DC output voltage of said source to a series of high-frequency voltage pulses;
a transformer connected to receive the series of high-frequency voltage pulses as input to the primary winding thereof and to produce as output from the secondary winding thereof a transformed series of high-frequency voltage pulses; and
an electric stage having an input and an output, first bilateral switch means and second bilateral switch means, said electric stage further including rectifying means connected to receive the output from the transformer secondary and operable to rectify the same, said electric stage further including supply voltage means connected to receive and store the rectified voltage, the first bilateral switch means and the second bilateral switch means acting in combination such that the input and the output of the electric stage are connected together and therefore at equal potential or such that the supply voltage means is connected between the input and the otput of the stage such that the output of the stage is positive with respect to the input of the stage or the output is negative with respect to the input of the stage as conditions of system operation.

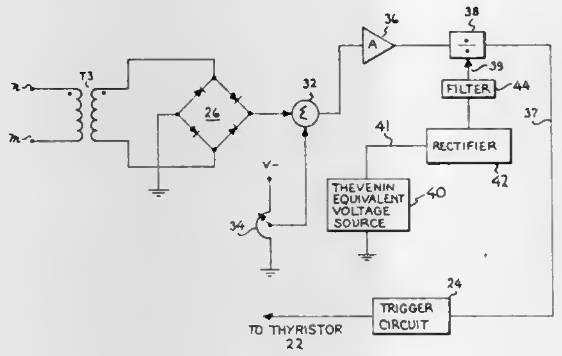
3,971,977
MAGNETO GENERATOR SUPPLIED BATTERY-LESS ELECTRIC POWER SUPPLY SYSTEM PARTICULARLY FOR MOTOR VEHICLES
Adam Hirt, Wachendorf, and Herbert Roderer, Nurnberg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 14, 1975, Ser. No. 549,992
Claims priority, application Germany, Feb. 27, 1974, 2409365
Int. Cl.^{2} B60Q *1/26*; B62J *5/06*
U.S. Cl. 322—1 **8 Claims**



1. Generator electric power supply system, particularly for motor vehicles without batteries to supply at least two loads (13, 14) and having a control switch (15) for selectively connecting at least one of the loads (13) to the supply system, in which the supply system comprises
a permanent magnet field (11) generator (12) having a plurality of armature windings (10, 10′, 10″, 10*a*) connected in parallel and in electromagnet coupled relation to the field (11),
the improvement comprising the circuit combination of
one of the loads (13) and said switch (15) being connected in series and the series connection (13, 15) of the load-and-switch being connected in parallel to said generator windings (10, 10′, 10″, 10*a*) with
a second load (14) being connected in series with at least one of the generator windings (10*a*) and in advance of the connection of said at least one generator winding (10*a*) to the parallel connection of the other generator windings (10, 10′, 10″), said generator windings being located relative to said field (11) to have in-phase voltages induced therein.

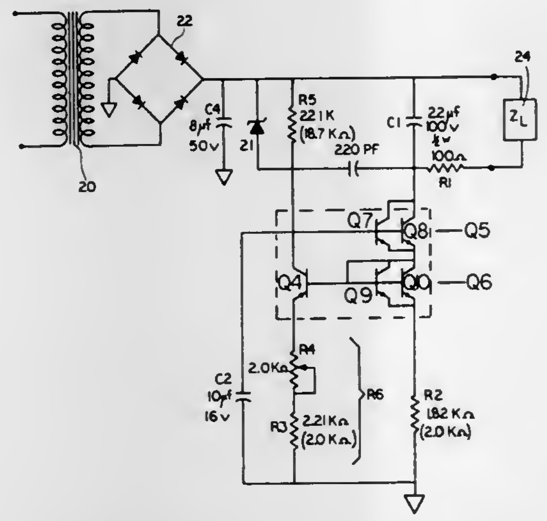
3,971,978
GENERATOR CONTROL SYSTEM
George S. Chambers, Waynesboro, and Lawrence J. Lane, Stuarts Draft, both of Va., assignors to General Electric Company, Salem, Va.
Filed Aug. 26, 1975, Ser. No. 607,784
Int. Cl.^{2} H02P *9/14*
U.S. Cl. 322—68 **8 Claims**

1. In a generator field excitation system of the type in which the generator output is utilized to provide an excitation current to the generator field winding through an exciter circuit and which further includes means responsive to control pulses to selectively short-circuit the field winding during a portion of each cycle of normal generator operation, means to develop said control pulses comprising:
a. circuit means for providing said control pulses in response to a variable input signal;
b. means to provide a reference signal of desired magnitude;
c. means to provide an additional signal proportional to the amount of field excitation;



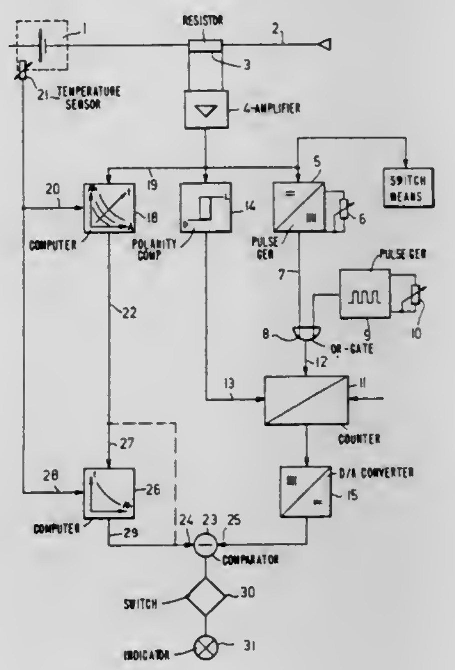
d. means to compare said reference signal and said additional signal to provide an error signal proportional to the algebraic sum thereof:
e. means to provide a correction signal proportional to the Thevenin equivalent voltage of the exciter circuit; and,
f. means to divide said error signal by said correction signal to provide said variable input signal.

3,971,979
CURRENT/VOLTAGE TRANSDUCER
Glenn A. Mayfield, Columbus, Ohio, assignor to Esterline Corporation, New York, N.Y.
Filed Oct. 10, 1974, Ser. No. 513,530
Int. Cl.^{2} G05F *3/08*
U.S. Cl. 323—1 **9 Claims**



1. In a magnitude transducer for driving an output load with a direct current which is directly proportional to the magnitude of a voltage or current sinusoid at a selected part of an electrical circuit, said transducer being of the type including a coupling means connected at its input to said electrical circuit, a rectifier means connected to the output of said coupling means for providing a rectified sinusoid corresponding to the magnitude of said voltage or current sinusoid, and a current mirror circuit having a reference input branch connected to the output of said rectifier means and having said output load connected between the output branch of said current mirror circuit and the output of said rectifier means, said current mirror circuit including a first semiconductor junction sampling means for sampling the current in one of said branches and a second semiconductor means for controlling the current in the other branch, wherein the improvement comprises: an emitter resistor connected in each of said branches, the resistance of said emitter resistors being offset from being integrally proportional so as to provide a current imbalance in said current mirror by an amount sufficient to provide a non-linear characteristic in said current mirror for compensating other non-linearities of said transducer to provide improved transducer linearity.

3,971,980
BATTERY TESTING APPARATUS
Leopold Jungfer; Dieter Kautschitsch, both of Feistritz, and Richard Weber, Klagenfurt, all of Austria, assignors to Firma Akkumulatorenfabrik Dr. Leopold Jungfer, Feistritz im Rosental, Austria
Filed Dec. 20, 1974, Ser. No. 535,201
Claims priority, application Austria, Jan. 11, 1974, 245/74
Int. Cl.^{2} G01N *27/42*
U.S. Cl. 324—29.5 **8 Claims**



1. An apparatus for measuring the charge condition of a secondary cell, comprising, in combination:
electric sensing means coupled to said cell and operable for producing a first signal substantially proportional to current flowing in or out of said cell;
first conversion means coupled to said first signal and operable for producing a second signal substantially proportional to the consumed ampere-hours of said cell measured from a predetermined full charge condition and compensating for any subsequent charging;
a temperature sensor operable for producing a third signal as a function of the temperature near said cell;
second conversion means coupled to said first and third signals and operable for producing a fourth signal substantially proportional to the estimated available ampere-hours of said cell with respect to said full charge condition as a function of said first signal, and said third signal; and
a comparator coupled to said second and fourth signals and operable for producing a fifth signal representing the relative amplitudes of said second and fourth signals, whereby said fifth signal represents a measure of the charge condition of said cell.

3,971,981
MAGNETISM DETECTING SYSTEM

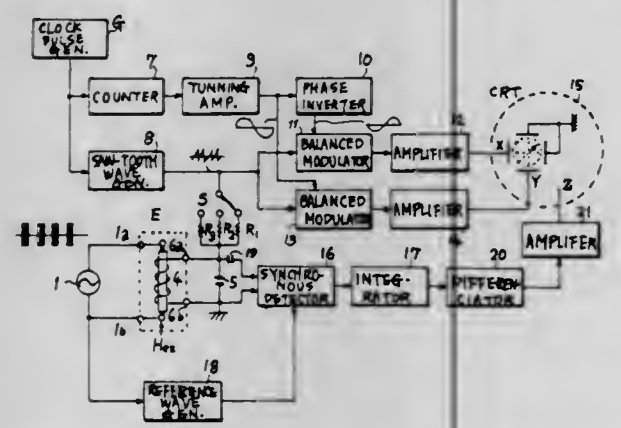
Yukio Nakagome, Yokohama; Teruji Watanabe, Niza; Takasuke Fukui, Tokyo, and Shizuo Suzuki, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Sept. 26, 1974, Ser. No. 509,445

Claims priority, application Japan, Oct. 1, 1973, 48-109320; Nov. 2, 1973, 48-123875

Int. Cl.² G01R *33/02;* **G01C** *17/28*

U.S. Cl. 324—43 R **4 Claims**



1. A magnetism detecting system, comprising: reference magnetic field means for sequentially generating reference magnetic fields along radial scanning lines defined by dividing a plane to be scanned at regular angular intervals of a desired angle with respect to an origin positioned at the common intersecting point of said scanning lines;

magnetic field detecting means associated with said reference magnetic field means for detecting the direction and magnitude of an unknown magnetic field to be detected along each of said scanning lines;

display means connected to said reference magnetic field means for developing a planar display of said plane with respect to said origin in synchronism with the scanning of each of said scanning lines; and

compare means connected to said magnetic field detecting means and said display means for applying a detected output to said display means when the unknown magnetic field to be detected and said reference magnetic field coincide with each other in direction and in magnitude to angularly display the direction and radially display the magnitude of the detected unknown magnetic field on said planar display.

3,971,982
PLURAL FREQUENCY MULTI-PHASE TRANSDUCER ARRANGEMENT FOR DETECTING THE PRESENCE AND LOCATION OF FAULTS IN A METAL BODY AND COMPENSATING FOR BODY MOVEMENTS

Bengt Törnblom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

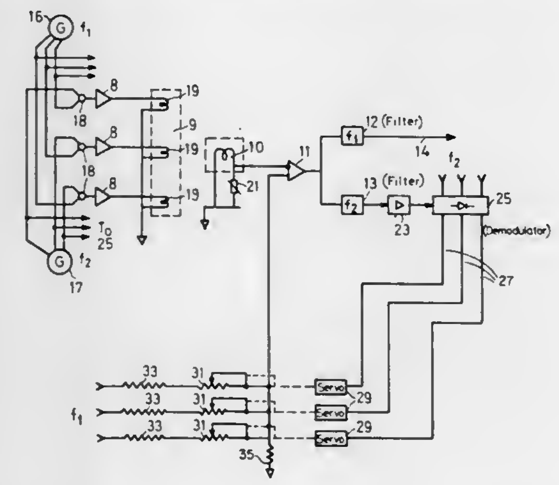
Continuation-in-part of Ser. No. 570,619, April 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 480,427, June 18, 1974. This application Apr. 30, 1975, Ser. No. 573,252

Claims priority, application Sweden, Apr. 23, 1974, 7405409

Int. Cl.² G01R *33/12*

U.S. Cl. 324—37 **1 Claim**

1. Apparatus for testing metal bodies comprising:
- a. a first multi-phase generator having a first frequency:
- b. a second multi-phase generator having the same number of phases as said first generator but having a different frequency
- c. means for summing the outputs of said first and second multi-phase generators;
- d. a first plurality of transducers coils comprising at least one coil for each phase of said first and second multi-phase generators, the individual coils being coupled to the individual phase outputs of said means for summing so as to induce a moving field in said body when fed with a multi-phase current from said multi-phase generator;
- e. a single secondary coil surrounding said metal body, said secondary coil detecting variations in the magnetic field generated by said transducers coils which occur when faults and irregularities in the body being tested are encountered; and means responsive to the output of said secondary coil at one of said frequencies for correcting the output of said secondary coil at the other frequency for variations of the position of the test object within said secondary transducer coil.



3,971,983
FERROMAGNETIC METAL DETECTOR UTILIZING GRADIOMETERS POSITIONED ON OPPOSITE SIDES OF THE DETECTION AREA WITH OVERLAPPING SENSITIVITY

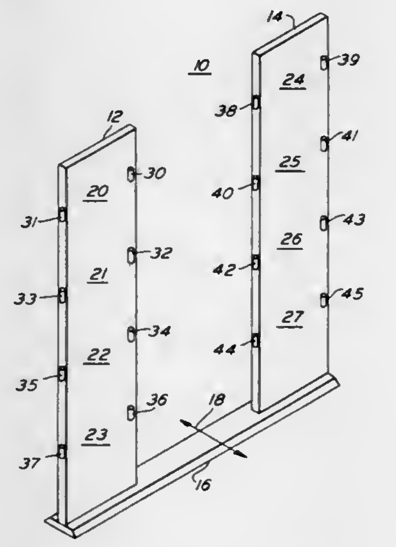
James R. Jaquet, Wilmington, Del., assignor to Infinetics, Inc., Wilmington, Del.

Filed June 6, 1972, Ser. No. 260,152

The portion of the term of this patent subsequent to July 27, 1992, has been disclaimed.

Int. Cl.² G01R *33/00*

U.S. Cl. 324—41 **20 Claims**



1. Apparatus for detecting the presence of a ferromagnetic object passing through a station and indicating the location of said ferromagnetic object, comprising:

a first and a second member at said station, said first and second member having a plurality of gradiometers mounted thereon, each of said plurality of gradiometers having a predetermined pattern or area of sensitivity to magnetic fields which is substantially less than the total area between said first and second members, each of said plurality of gradiometers generating an output signal indicative of a change in the earth's magnetic field in response to the presence of a ferromagnetic object;

means for individually processing output signals generated by each of said plurality of gradiometers, said processing means being comprised of a plurality of processing channel means, each processing channel means receiving the output of at least one respective gradiometer and being operative to generate a digital signal in response to a predetermined change in the earth's magnetic field within the pattern or area of sensitivity to magnetic fields of said at least one respective gradiometer of said plurality of gradiometers; and

means for indicating the position of said ferromagnetic object between said first and second members of said station, said indicating means including a plurality of indicators, each of said indicators being responsive to the digital signal generated in a respective one of said processing channel means.

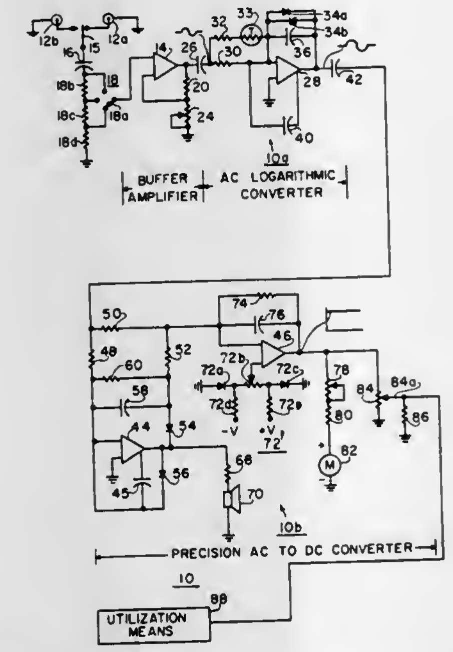
3,971,984
WIDE-RANGE LOGARITHMIC RESPONDING TRANSLATION CIRCUIT

Stephen Michael Bench, Lake Zurich, Ill., assignor to B-Cubed Engineering, Inc., Elgin, Ill.

Filed Sept. 4, 1974, Ser. No. 502,948

Int. Cl.² G01R *15/10, 19/22*

U.S. Cl. 324—132 **18 Claims**



1. A translation circuit for deriving a substantially unidirectional output signal from a given alternating current input signal wherein said unidirectional output signal is logarithmically proportional to said input signal, said circuit comprising, in combination:

input means for receiving said input signal;

means for substantially symmetrically amplifying said input signal to provide an alternating current interim signal at an output thereof which is substantially continuously proportional to the logarithm of said input signal;

said amplifying means having a bidirectional feedback loop for coupling alternating current feedback signals indicative of said interim signal to the input of said amplifying means, and said feedback loop including means responsive to said input signal for controlling the gain of said amplifying means over a range of gains including the open loop gain of said amplifying means; and,

means for rectifying said interim signal to provide said unidirectional output signal wherein said rectifying means comprises a precision AC/DC converter including at least one operational amplifier having an input coupled to an output of said means for amplifying said input signal, and said operational amplifier having a feedback loop which includes means for reducing the input threshold voltage of said operational amplifier wherein said threshold voltage is divided by the open loop gain of said operational amplifier.

3,971,985
AUTOMATIC CONTROL SYSTEM FOR CONDITION-RESPONSIVELY SWITCHING OVER TRANSCEIVER AND RADIO OR TAPE RECORDER AUDIO SIGNALS

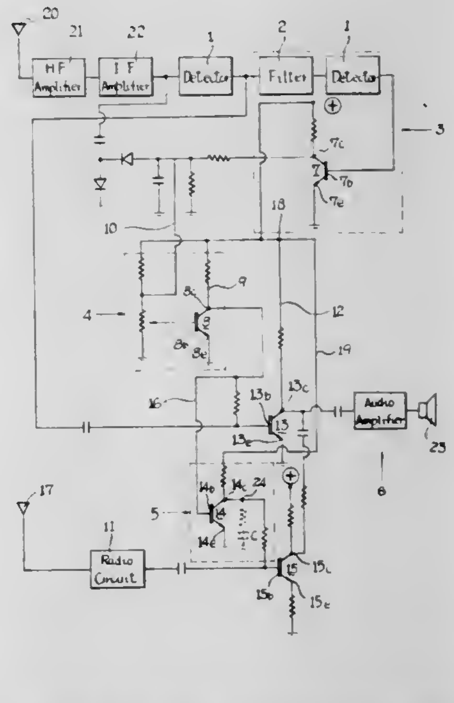
Kazuo Arai, Kitamoto, Japan, assignor to Nissan Denshi Company Limited, Ohmiya, Japan

Filed Mar. 7, 1975, Ser. No. 556,491

Claims priority, application Japan, Nov. 15, 1974, 49-137575[U]; Dec. 28, 1974, 49-2433[U]

Int. Cl.² H04B *1/40*

U.S. Cl. 325—21 **2 Claims**



1. Automatic signal switching apparatus for interrupting the reproduction of audio signals from a source during the receipt of signals from a transceiver and reproducing the transceiver signals comprising signal reproducing means, a first amplifying transistor connected to said source to said reproducing means for feeding signals from said source to said reproducing means, a second amplifying transistor connected to said transceiver and to said reproducing means, a squelch control transistor having a base and emitter and collector electrodes, means applying a potential between the emitter and collector of said control transistor, means coupling the base of said control transistor to said transceiver to modify conductivity of said transistor upon receipt of a transceiver signal and produce a potential change of a least one of said electrodes, means couling the last said electrode to said first amplifying transistor to inactivate it upon the occurrence of said potential change and terminate the reproduction of said source signals and means coupling the last said electrode to said second amplifying transistor to activate it and feed said transceiver signals to said reproducing means whereby signals from said source will be reproduced during the absence of a transceiver signal and will be interrupted during the presence of a transceiver signal.

3,971,986
REMOTE CONTROL SYSTEM FOR RADIO RECEIVER

Yasuhiro Hideshima, and Masakatsu Toyoshima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,211

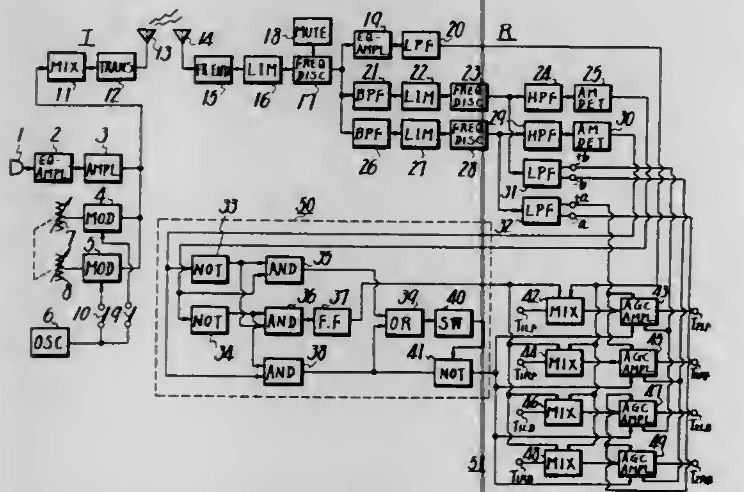
Claims priority, application Japan, Aug. 23, 1973, 48-94714

Int. Cl.² H04B *1/00*

U.S. Cl. 325—37 **5 Claims**

1. An information transmitting system comprising a transmitter and at least one receiver, said transmitter including:
- a. means for producing first and second carrier signals each having a predetermined frequency;
- b. first means for modulating said first and second carrier signals with a first remote control signal;

c. second means for controlling the center frequency of said first carrier signal in such a manner that the center frequency of said carrier is shifted within a predetermined frequency range;
d. third means for controlling the center frequency of said second carrier signal in such a manner that the center frequency of said carrier is shifted within a predetermined frequency range; and
e. means for transmitting said first and second modulated carrier signals; and said receiver including:

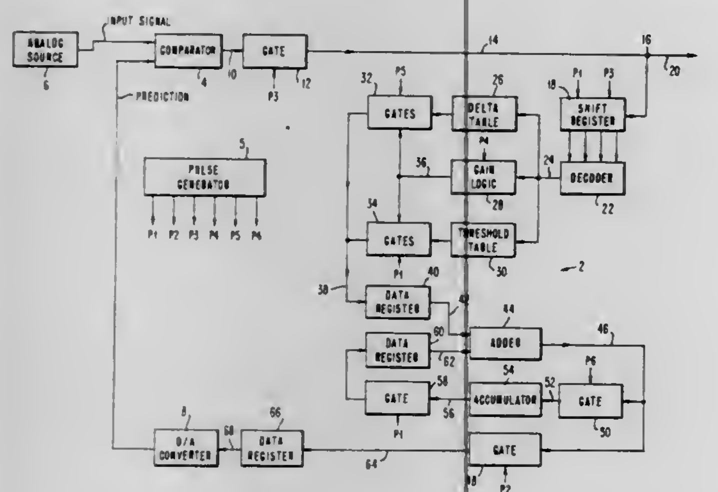


a. means for receiving said first and second modulated carrier signals;
b. means for demodulating said first remote control signal from said first and second modulated carrier signals;
c. means for detecting the center frequency changes of said first carrier and producing a second remote control signal; and
d. means for detecting the center frequency changes of said second carrier and producing a third remote control signal, thereby to provide three control signals for controlling said receiver.

3,971,987
GAIN METHOD AND APPARATUS FOR A DELTA MODULATOR

Francis P. Carrubba, North Haven, Conn.; Peter A. Franaszek, Ossining, and David D. Grossman, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,044
Int. Cl.² H03K *13/22*
U.S. Cl. 325—38 B 4 Claims



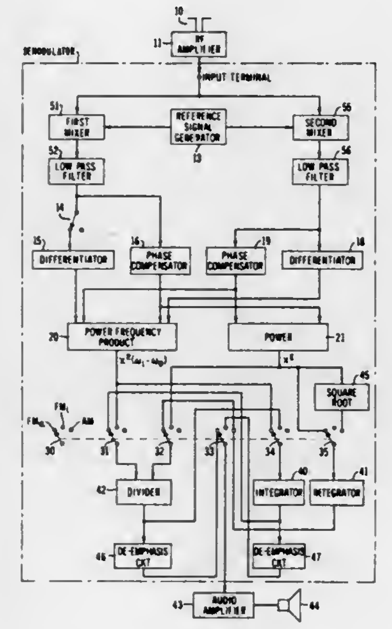
1. In a delta modulator, a method of generating and then decoding code symbols representing increments of signal level, with each code symbol being determined in accordance with the difference in signal level between an input signal and a prediction signal which is a representation of said input signal, with said prediction signal being formed by accumulation of successive signal increments which depend on the history of said code symbols, said method comprising the steps of:

storing a sequence of generated code symbols, said sequence including the most recent code symbol and a given number of preceding code symbols, with the pattern of stored code symbols at any instant defining a state of signal activity;
selecting three signals in accordance with the state of signal activity represented by the stored code symbol pattern, namely an incremental signal level, a threshold value and a modifier signal;
modifying said incremental signal level and said threshold value an amount determined by said modifier signal;
forming a new prediction signal by accumulation of successive modified signal level increments which are summed with successive modified threshold values; and
generating a new code symbol in response to comparing said new prediction signal with said input signal;
said method including the steps of decoding comprising:
storing a sequence of said code symbols, said sequence including the most recent code symbol and a given number of preceding code symbols, with the pattern of code symbols at any instant defining a state of signal activity;
selecting an incremental signal level in accordance with the state of signal activity represented by the stored code signal pattern;
selecting a smoothing value in accordance with the state of signal activity represented by the stored code signal pattern;
selecting a multiplier signal, having an integer value, in accordance with the state of signal activity represented by the stored code signal pattern;
multiplying said incremental signal level and said smoothing value by the selected multiplier signal; and
forming a decoded signal in response to accumulating successive multiplied signal level increments which are summed with successive multiplied smoothing values.

3,971,988
AM/FM RECEIVER USING SPECTRAL PARAMETER ESTIMATORS

Jeffrey Neil Denenberg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 6, 1975, Ser. No. 555,739
Int. Cl.² H04B *1/06*; H03D *3/00*
U.S. Cl. 325—316 [illegible] Claims



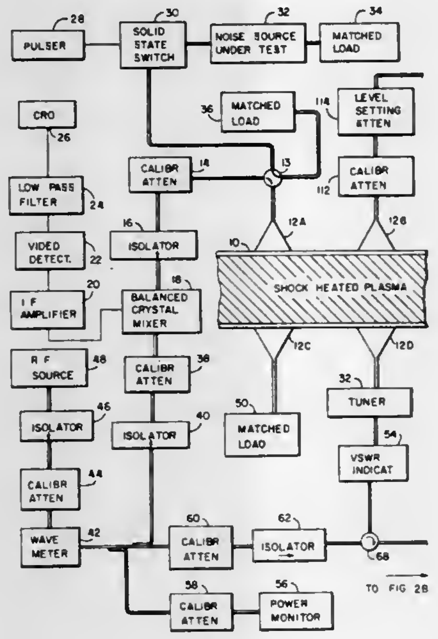
2. A receiver for producing signals corresponding to the modulating signals of applied frequency modulated radio frequency signals comprising:

an antenna;
radio frequency amplification means comprising:
an input connected to said antenna;
an output terminal; and
means for generating a signal at said last mentioned output terminal corresponding to a signal present at said input amplified by a predefined factor; and
a demodulation circuit comprising:
an input;
an output;
and means for generating at said demodulation circuit output a signal corresponding to an estimate of the power mean frequency of said applied signal utilizing: a circuit for generating a signal corresponding to the instantaneous power of said applied signal and a circuit for generating a signal corresponding to the instantaneous power frequency product of said applied signal, first and second integrator circuits for integrating said instantaneous power and said instantaneous power frequency product signals and a divider circuit for providing said estimate of said power mean frequency signal corresponding to the ratio of said integrated power frequency product signal to said integrated instantaneous power signal.

3,971,989
METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF NOISE POWER AT ALL RADIO FREQUENCIES

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,644
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 11 Claims



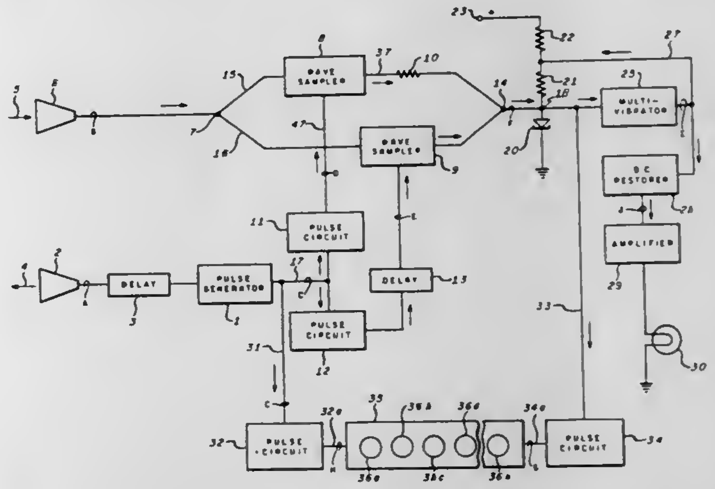
1. A method of measuring data suitable for use in measuring noise power of a noise source under test utilizing a shock-heated gas in a gas-driven shock tube, as a primary standard, said shock tube having an observation section, and an expansion chamber comprising the steps of:

shock-heating said gas in the expansion chamber of said shock tube to generate a shock wave therein;
measuring the radiation generated by the shock-heated gas in said observation section with a microwave measuring system as a signal related to the noise power generated by said shock-heated gas;
measuring a signal representative of the noise power generated by said noise source under test;
determining the ratio of said signal representative of the noise power generated by said shock-heated gas and the signal representative of the noise power generated by said noise source under test; and
determining the degree of impedance mismatch between the shock-heated gas in the observation section of said shock tube and the microwave measuring system;
whereby the noise power of said noise source under test can be calculated, as a function of said ratio and said degree of mismatch.

3,971,990
BASE-BAND PULSE OBJECT SENSOR SYSTEM

Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 377,853, July 9, 1973, which is a division of Ser. No. 134,990, April 19, 1971, Pat. No. 3,772,697. This application Feb. 26, 1975, Ser. No. 553,345
Int. Cl.² H04B *1/16*
U.S. Cl. 325—400 3 Claims



1. Gain control apparatus for control of the amplitude of and for selecting base-band signals propagating is non-dispersive transmission line means between input means and utilization means responsive to selected ones of said base-band signals, said non-dispersive transmission line means including first and second parallel-connected non-dispersive transmission lines, said gain control apparatus comprising:

first and second wave-sampling means respectfully disposed in series relation within said respective first and second parallel-connected non-dispersive transmission lines,
attenuator means disposed within said first parallel-connected transmission line in series with said first wave sampling means, and
wave sampler pulsing means for activating said first and second wave sampling means in first and second discrete time intervals for propagation of selected attenuated base-band signals to said utilization means during said first time interval and of selected directly propagated base-band signals to said utilization means during said second time interval.

3,971,991
TELEVISION TUNING SYSTEM WITH VARACTOR MALFUNCTION DETECTION

Akio Tanaka, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 4, 1974, Ser. No. 503,122
Int. Cl.² H04B *1/16*
U.S. Cl. 325—464 11 Claims

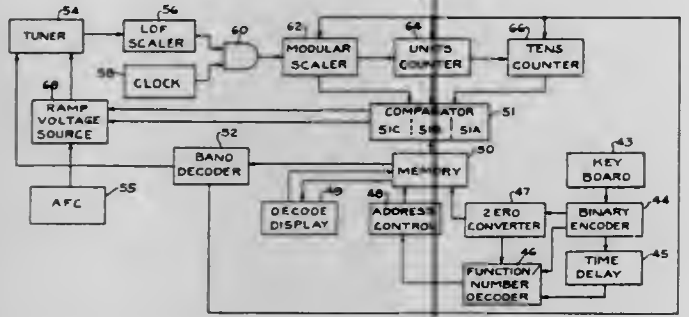
1. A television tuning control system comprising:
a tuner having a varactor diode tuning element operating in several predetermined discrete frequency bands contain-

ing a plurality of fixed bandwidth signals indentified by assigned channel numbers;

tuning frequency counting means, employing preset counts corresponding to said frequency bands and sampling the frequency of said varactor diode tuning element, for deriving from the frequency of said tunable element, information indicative of the channel number of the corresponding receivable television channel;

channel number selection means;

comparison means coupled between said tuning frequency counting means and said channel number selection means for comparing desired channel number information from said channel number selection means with derived channel number information from said tuning frequency counting means;



tuning voltage means coupled between said varactor diode tuning element and said comparison means, for driving said tuning element to change frequency in response to said comparison means;

channel band determination means coupled between said channel number selection means and said tuning frequency counting means for segregating selected channel numbers according to their location in said several predetermined discrete frequency bands and establishing said preset counts for said tuning frequency counting means; and

malfunction detection means coupled between said counting means and said tuning voltage means for detecting an improper number of pulses from said counting means and forcing said tuning voltage means to drive said varactor diodes tuning element in a direction opposite to that indicated by said comparison means.

3,971,992
APPARATUS FOR PRESETTING RECEIVERS OF THE SYNTHESIZING TYPE

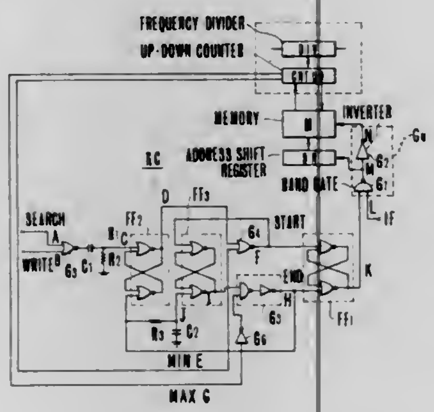
Noboru Saikaishi; Tsuneo Yamada; Tetsuo Takahashi, and Yukio Numata, all of Tokyo, Japan, assignors to Trio Electronics Incorporated, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,789

Claims priority, application Japan, Dec. 28, 1973, 49-2115

Int. Cl.^{2} H04B *1/32*

U.S. Cl. 325—464 **4 Claims**



1. Apparatus for presetting a receiver comprising a memory device, and up-down counter constructed to send out control signals at the counts thereof corresponding to the opposite ends of a frequency band to which said receiver can respond and to exchange data with said memory, an address shift register for designating an address in said memory device, means for generating a search signal and a write signal, a flip-flop circuit conditioned by said search and write signals to be set and reset by said control signals when said search and write signals are supplied to said flip-flop circuit, and a gate circuit responsive to said flip-flop circuit and to detecting an intermediate frequency output for sending a write enabling signal to said memory device for storing the content of said up-down counter in said memory device and for sending a shift signal to said address shift register each time said intermediate frequency output is obtained between the set and reset states of said flip-flop circuit.

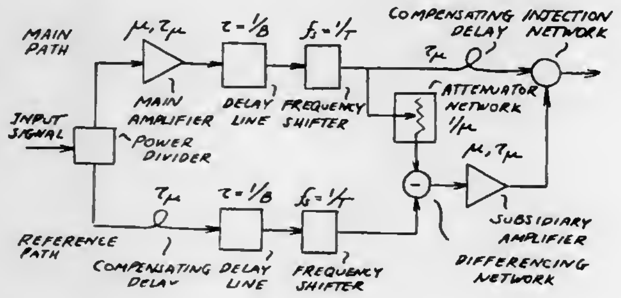
3,971,993
HIGH CAPACITY RECIRCULATING DELAY LOOP INTEGRATOR

James N. Constant, 1603 Danbury Drive, Claremont, Calif. 95612

Filed Apr. 21, 1972, Ser. No. 246,299

Int. Cl.^{2} H03B *1/04*

U.S. Cl. 328—127 **6 Claims**



1. A signal integrating system comprising a recirculating delay loop integrator including a delay network having feed-forward error correction and time delay means wherein said network includes:

a power divider defining a first main signal path and a second reference signal path,

said first path including a first main amplifier and a first delay line,

said second path including a second compensating delay line for compensating the delay time of said first amplifier, and a third delay line having a delay time substantially equal to that of said first delay line;

a differencing network having said first and second paths as inputs and providng an output varying as a function of error introduced in signals in said first path by said first amplifier,

with an attenuator connected between said first path and said differencing network;

a second amplifier having the differencing network output as an input; and

an injection network having said first path and said second amplifier output as inputs and providing an output for recirculation to said power divider,

with a fourth compensating delay line connected between said first path and said injection network for compensating the delay time of said second amplifier.

3,971,994
FREQUENCY COMPARISON CIRCUIT

Geoffrey Shepherd, Oldham, England, assignor to Ferranti, Limited, Hollinwood, England

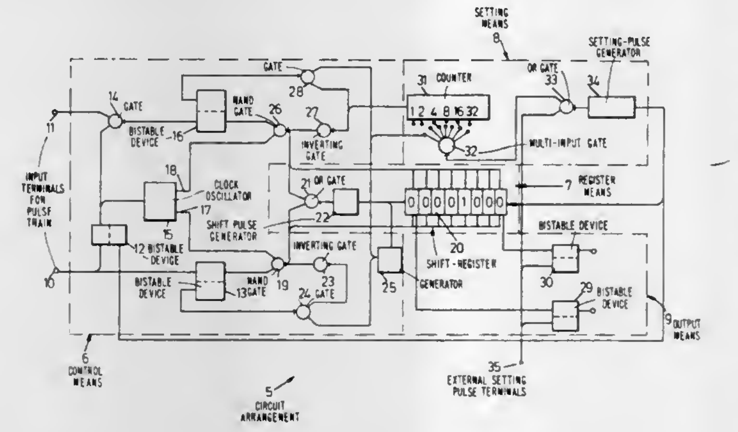
Filed Feb. 11, 1974, Ser. No. 441,315

Claims priority, application United Kingdom, Feb. 17,1973, 6769/73

Int. Cl.^{2} G01R *23/00;* **H03D** *13/00;* **H03K** *5/20*

U.S. Cl. 328—133 **10 Claims**

1. A pulse frequency comparison circuit arrangement for comparing the repetition frequencies of two pulse trains comprising register means operable to store a binary number and responsive to a pulse of one of said trains to cause the number to be increased and responsive to a pulse of the other of said trains to cause the number to be decreased, control means connected to said register means and adapted to receive said pulse trains and being operable to sample the pulse trains alternately and provide an output to the register means in response to the application any pulse appearing on each train since the previous sample of that train to the register means such that pulses of each train are applied, one at a time, and cause oscillation of the stored binary number between two adjacent values when the frequencies are the same and cause the binary number to increase or decrease when the frequencies are different, setting means connected to said control means and responsive to a predetermined number of pulses of one pulse train to cause the register means to store a predetermined binary number, and output means connected to said register means and operable to provide an indication when a specified upper or lower binary number is stored in said register means.



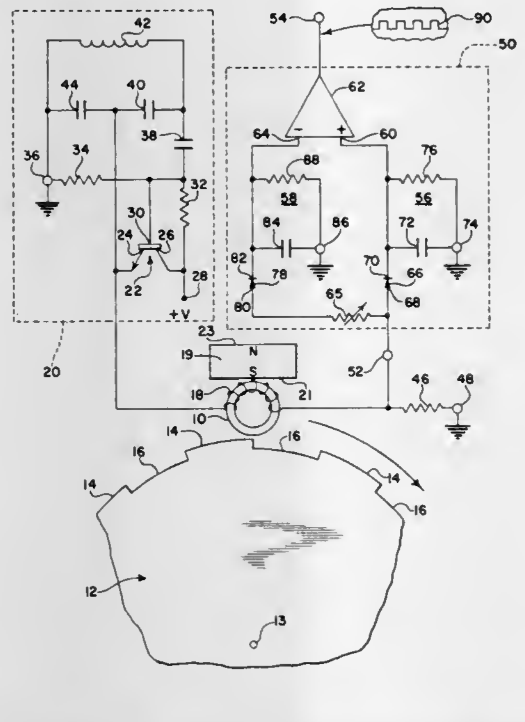
3,971,995
WHEEL VELOCITY SENSOR WITH EXCITER RING RUNOUT COMPENSATION

Rand Jeffrey Eikelberger, Glenview, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 8, 1975, Ser. No. 602,938

Int. Cl.^{2} H03H *7/06*

U.S. Cl. 328—149 **2 Claims**



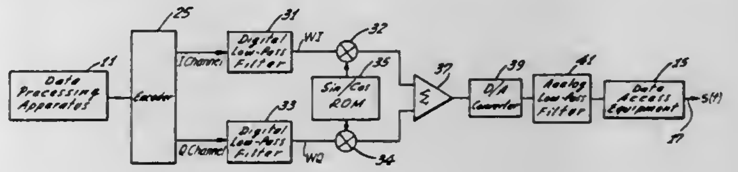
1. A velocity sensing circuit comprising a toroidal magnetic core positioned adjacent a rotating exciter member, the rotational velocity of which is to be sensed, having an alternating series of projections and spaces on its periphery, a winding inductively wound on said core, an alternating signal source coupled to said winding to supply a carrier signal thereto, an output circuit means comprising a comparator having a first noninverting input terminal and a second inverting input terminal, first demodulation means having a first input junction coupled to receive the composite modulated signal appearing on said winding and an output junction coupled to said first input terminal of said comparator having a first RC time constant of a value such that the desired velocity modulation signal and any undesired runout modulation signal may both be demodulated by said first demodulation means and a second demodulation means having a second input junction coupled to receive the composite modulated signal appearing on said winding and an output junction coupled to said second input terminal of said comparator which has a second RC time constant which is substantially larger than said first RC time constant and is of a value such that the desired velocity signal is not substantially demodulated and only the undesired runout modulation signal is substantially demodulated and applied to said second terminal by said second demodulation means.

3,971,996
PHASE TRACKING NETWORK

David M. Motley, Santa Ana, and King Y. Cheng, Tustin, both of Calif., assignors to Hycom Incorporated, Irvine, Calif. Continuation of Ser. No. 376,464, July 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,657, Jan. 18, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,567

Int. Cl.^{2} H03K *5/18;* **H04B** *1/10*

U.S. Cl. 328—155 **22 Claims**



1. A phase tracking network for correcting the phase of a noncoherently demodulated signal comprising:

a phase correction network having an inphase channel and a quadrature channel and adapted to receive at least a first portion of the noncoherently demodulated signal in the inphase channel and a second portion of the noncoherently demodulated signal in the quadrature channel, the phase correction network including means for substantially correcting the phase of the noncoherently demodulated signal to provide at least one phase corrected signal in both of said channels;

first means responsive to the phase corrected signal to provide at least one detected data signal;

second means responsive to at least one of the detected data signal and the phase corrected signal to provide a phase correction signal; and

said correcting means being responsive to the phase correction signal to make a correction to the phase of the noncoherently demodulated signal.

13. A phase tracking network adapted to correct the phase of a first signal, said phase tracking network comprising:

phase correction means for substantially correcting the phase of the first signal to provide at least one phase corrected signal;

first means responsive to the phase corrected signal to provide a phase error signal;

second means responsive to the phase error signal to provide a first phase correction signal for correcting a first kind of phase error in the first signal;

third means responsive to the phase error signal to provide a second phase correction signal for correcting a second kind of phase error in the first signal, said first kind of phase error being different from said second kind of phase error;

means for combining the first and second phase error signals to provide a combined phase correction signal;

said phase correction means being responsive to said combined phase correction signal to correct the first and second kinds of phase error in the first signal; and

said first signal being noncoherently demodulated and said phase correction means including means for substantially correcting the phase of the noncoherently demodulated signal to provide said one phase corrected signal.

3,971,997

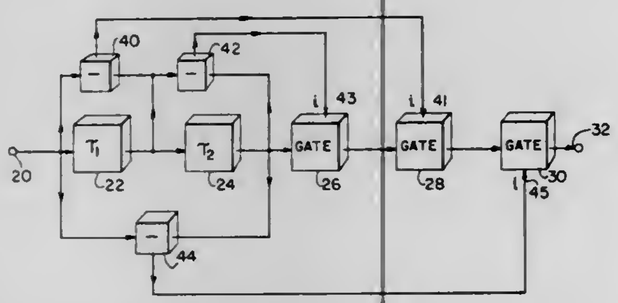
SEA SPIKE SUPPRESSION TECHNIQUE

Bernard L. Lewis, Oxon Hill, and Irwin D. Olin, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1975, Ser. No. 581,502

Int. Cl.² H04B *1/10*

U.S. Cl. 328—165 **9 Claims**



1. A method of detecting interference in received signal energy comprising the steps of:

examining said energy for interference modulation in a predetermined frequency range related to the interference inducing phenomena;

producing an interference-detected signal upon detection of at least one modulation component existing at at least one predetermined frequency;

using said interference-detected signal to eliminate the presence of the interference-modulated signal.

3,971,998

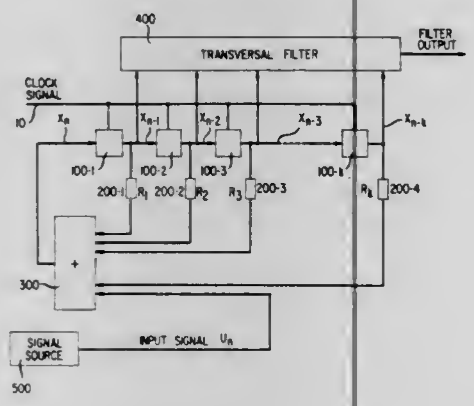
RECURSIVE DETECTOR-OSCILLATOR CIRCUIT

Bhaskarpillai Gopinath, Berkeley Heights, N.J., and Robert Paul Kurshan, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 2, 1975, Ser. No. 574,028

Int. Cl.² H04B *15/00;* H03B *1/04*

U.S. Cl. 328—167 **14 Claims**



1. A signal detection circuit comprising:

a shift register;

means for multiplying the output signals of selected stages of said shift register by predetermined integers to cause the characteristic function of said circuit to be a cyclotomic polynomial;

means for forming a non-modulo sum of an input signal and of said integer multiplied signals; and

means for applying said sum to the first stage of said shift register.

3,971,999

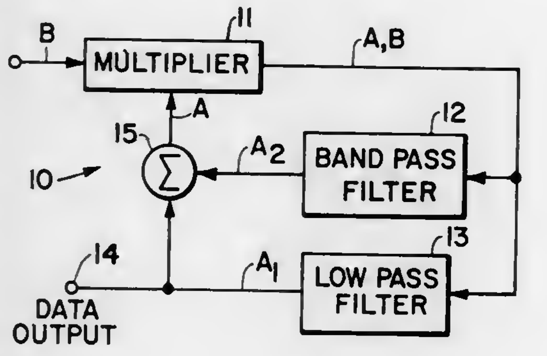
COHERENT PHASE DEMODULATOR FOR PHASE SHIFT KEYED SUPPRESSED CARRIER SIGNALS

Gunars Bilsens, and Raymond Oscar Figueroa, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,273

Int. Cl.² H03D *3/00*

U.S. Cl. 329—105 **2 Claims**



2. A method of demodulating a suppressed carrier signal, phase modulated with data signal comprising the steps of:

multiplying the suppressed carrier signal by a feedback signal;

separating the products of the multiplication by filtering through a bandpass filter and a low pass filter respectively to produce a phase-coherent carrier and a data signal;

using the output terminal for the low pass filter as an output terminal for the data signal; and

adding the phase-coherent carrier to the recovered data signal to produce the feedback signal.

3,972,000

PHASE FILTER FOR REDUCING THE EFFECTS OF THE NOISE COMPONENTS ALTERING DISCRETE PHASE MODULATED SIGNALS

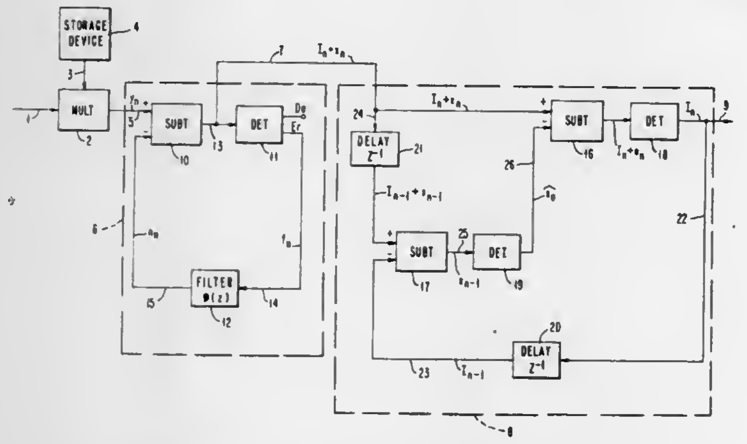
André Eugené Desblache, Nice, France; Thomas Edwin Stern, Bronx, N.Y., and Philippe Emmanuel Thirion, St-Paul-de-Vence, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1975, Ser. No. 596,557

Claims priority, application France, Aug. 30, 1974, 74.30001

Int. Cl.² H03D *3/00;* H04B *1/10;* H04L *27/22*

U.S. Cl. 329—105 **9 Claims**



1. In a phase filter for minimizing the effects of noise components altering the value of the phase of a digital signal in a digital data transmission system in which the phase of said digital signal can assume Q distinct values representing the data, with said phase filter including two decision filters, with the first decision filter cancelling residual noise components representing the phase intercept component and the phase shift component introduced by frequency shift, and the second decision filter minimizing the random noise component representing phase jitter and white noise, the combination comprising:

input means for receiving said digital signal;

said first decision filter including;

first means for providing a first difference signal in response to taking the difference between the received digital signal from said input means and a first error signal corresponding to an estimated value of said residual noise component,

a first detector responsive to said first difference signal for separating the data portion from the residual noise portion of said first difference signal;

a first linear filter responsive to said residual noise portion of said first difference signal for generating said first error signal,

said second decision filter including;

second means for providing a second difference signal in response to taking the difference between said first difference signal and a second error signal corresponding to an estimated value of said random noise component,

second detector responsive to said second difference signal for separating the data portion from the random noise portion of said second difference signal, with a data representative signal being provided at an output, and

a second linear filter responsive to said data representative signal for generating said second error signal.

8. In a phase filter to reduce the effects of the noise components altering the phase value of the received signal, in a digital data transmission system in which the phase of the emitted signals can assume Q discrete distinct values representing the data, at the sampling time, the combination comprising:

input means adapted to receive the phase value of the signal received at the sampling times,

a subtractor a first input of which is connected to said input means, and a second input of which receives an error signal,

a detector-separator connected to the output of said subtractor to separate the integral and fractional parts of the signal provided by said subtractor, said integral and fractional parts respectively corresponding to a data representative signal and to a noise residual component and being respectively supplied to first and second outputs of said detector-separator,

a first linear filter connected to said second output of said detector-separator,

a second linear filter connected to said second output of said detector-separator, and

an adder, two inputs of which are respectively connected to the outputs of said first and second linear filters, and an output for providing said error signal which is connected to said second input of said subtractor.

9. In a phase filter for reducing the effects of the noise components altering the phase value of a received signal, in a digital data transmission system in which the phase of the emitted signals can assume Q discrete distinct values representing the data, at the sampling times, the combination comprising:

input means adapted to receive the phase value of the signal received at the sampling times;

a subtractor a first input of which is connected to said input means and a second input of which receives an error signal;

a detector-separator connected to the output of said subtractor, to separate the integral and fractional parts of the signal supplied by said subtractor, said integral and fractional parts respectively corresponding to a signal representing the data and to a noise residual component which includes a residual random component and being respectively provided to first and second outputs of said detector-separator;

a first linear filter with transfer function

$$W(z) = \frac{2(1-\alpha)z^{-1} + (\alpha^2-1)z^{-2}}{(1-z^{-1})^2}$$

where,

z is the z-transform notation; and

α being a coefficient lying in the range

$\mathbf{0 < \alpha < 1}$;

connected to said second output of said detector-separator;

a first delay element introducing an elementary delay T equal to the sampling time period, connected to said second output of said detector-separator;

a first adder with two inputs, a first input of which is connected to the output of said first delay element;

an adaptive predictive filter the input of which is connected to the output of said first adder to generate said residual random component from the signals supplied by said first adder;

a second delay element identical to said first delay element the input of which is connected to the output of said adaptive predictive filter and the output of which is connected to the second input of said first adder; and

a second adder the inputs of which are respectively connected to the outputs of said first linear filter and said adaptive predictive filter, and the output of which is connected to said second input of said subtractor.

3,972,001

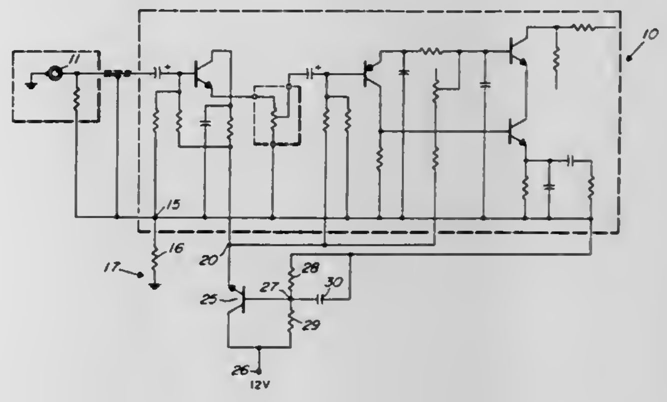
COMMON MODE REJECTION DYNAMIC FILTER CIRCUIT

Chris A. Petri, West Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 8, 1975, Ser. No. 566,640

Int. Cl.² H03F *1/26*

U.S. Cl. 330—22 **3 Claims**



1. In amplifying circuitry having power receiving junctions and a common junction, a common mode rejection, dynamic filter circuit for substantially eliminating hum and the like, comprising:

a. impedance means including a resistor connected from the common junction of the amplifying circuitry to ground for electrically separating the amplifying circuitry from ground;

b. a transistor biased to operate in a linear region and connected from the power receiving junctions of the amplifying circuitry to a source of power, said transistor having a control electrode; and

c. a capacitor coupling the control electrode of said transistor to the common junction of the amplifying circuitry for controlling said transistor to vary the power applied thereto in a common mode with variations of potential at the common junction.

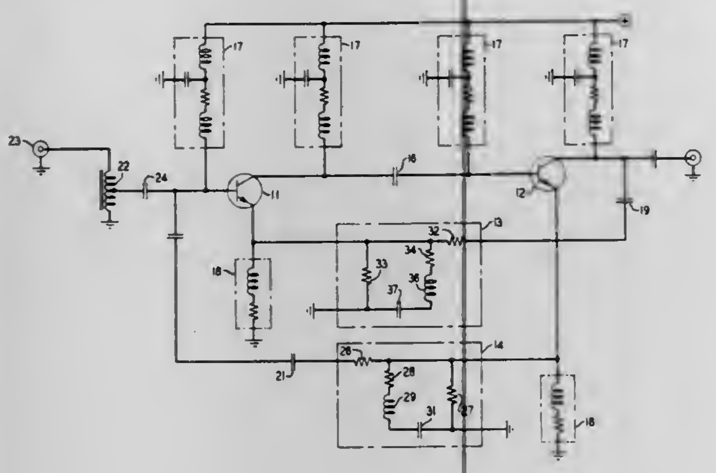
3,972,002
DUAL FEEDBACK AMPLIFIER

Thomas Joseph Aprille, Jr., Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1974, Ser. No. 537,433

Int. Cl.² H03F *1/34*

U.S. Cl. 330—28 **4 Claims**



1. A broadband amplifier circuit comprising:

a high gain noninverting amplifier element having an input circuit path and an output circuit path,

input means for coupling said input circuit path to a signal source having an impedance Z_S,

output means for coupling said output circuit path to a load having an impedance Z_L,

first frequency dependent feedback means having a voltage transfer function *a* connected between said circuit paths for coupling in series with said input circuit path a voltage substantially equal to *a* times the output voltage of said amplifier element,

second frequency dependent feedback means having a current transfer function *b* connected between said circuit paths for coupling in shunt with said input circuit path, a current substantially equal to *b* times the current in said output circuit path,

the parameters of said feedback means being chosen to satisfy the expressions

$$G = \frac{1}{|ab|} \quad \text{and} \quad \frac{a}{b} = \frac{Z_S^*}{Z_L} = \frac{Z_S}{Z_L^*}$$

in order to generate a desired frequency dependent amplifier circuit gain characteristic *G*, an amplifier circuit input impedance substantially equal to Z_S^*, the conjugate of said source impedance Z_S, and an amplifier circuit output impedance substantially equal to Z_L^*, the conjugate of said load impedance Z_L, $1/|ab|$ being the reciprocal of the magnitude of the product of said transfer functions.

3,972,003
HIGH SPEED CURRENT DETECTION AMPLIFIER CIRCUIT

Paul Robert Schroeder, Wescosville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1974, Ser. No. 496,147

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **5 Claims**

1. An amplifier circuit comprising:

a first switching circuit means having a control terminal and first and second output terminals;

a second switching circuit means having a control terminal and first and second output terminals, the first output terminals of the first and second switching means serving as separate amplifier circuit output terminals;

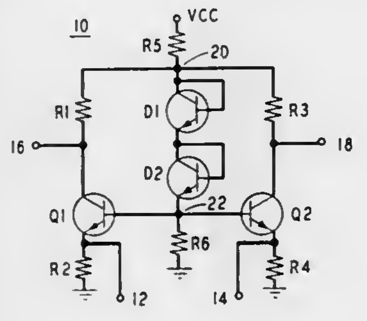
the second output terminals of the first and second switching means serving as amplifier circuit input terminals;

a first resistor circuit means being coupled to the second output terminal of the first switching means;

a second resistor circuit means having first and second terminals, the first terminal of the second resistor means being coupled to the first output terminal of the first switching means;

a third resistor circuit means being coupled to the second output terminal of the second switching means;

a fourth resistor circuit means having first and second terminals, the first terminal of the fourth resistor means being coupled to the first output terminal of the second switching circuit means;



the second terminals of the first and third resistor circuit means being coupled together,

range extender circuit means for increasing the operating range over which the amplifier is useful;

the control terminals of the first and second switching circuit means being coupled together; and

circuit means for providing an essentially constant current source, the circuit means being coupled to the second terminals of the first and third resistor means and to the control terminals of the first and second switching means through the range extender circuit means.

3,972,004
CHARGE PREAMPLIFIER

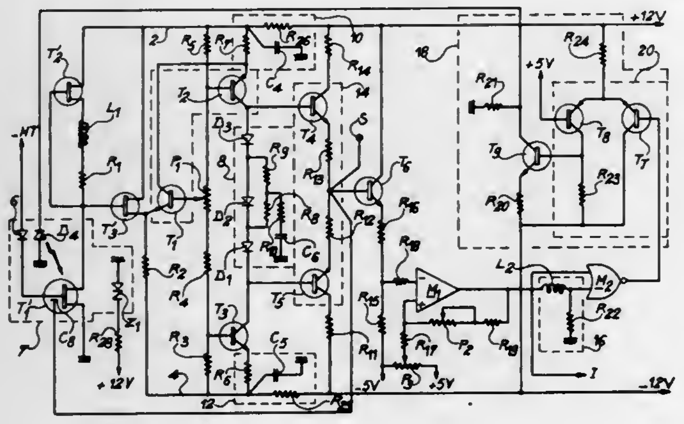
Gérard Libs, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 26, 1974, Ser. No. 527,201

Claims priority, application France, Nov. 27, 1973, 73.42158

Int. Cl.² H03F *3/16*

U.S. Cl. 330—35 **5 Claims**



1. A charge preamplifier essentially comprising an input stage driven by the signal to be amplified, said stage being connected to an amplification stage which is in turn associated with an output stage, and a circuit for applying feedback from the output to the input of said preamplifier, said feedback being of the optoelectronic type, said input stage being such as to comprise a field-effect transistor cooled below ambient temperature, the signal to be amplified being applied to the input gate of said transistor, the load resistance of said transistor being provided by a second field-effect transistor mounted in series with an inductance coil.

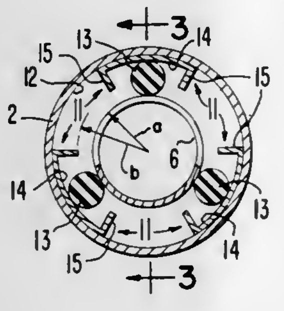
3,972,005
ULTRAWIDE BAND TRAVELING WAVE TUBE AMPLIFIER EMPLOYING AXIALLY CONDUCTIVE CIRCUIT LOADING MEMBERS

John E. Nevins, Jr., Encino, Calif., and Lester M. Winslow, Buffalo Grove, Ill., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 16, 1969, Ser. No. 885,578

Int. Cl.² H01J *25/34*

U.S. Cl. 330—43 **4 Claims**



1. In a traveling wave tube amplifier, means forming a helix derived slow wave circuit, a conductive sheath surrounding said slow wave circuit, means for projecting a stream of electrons along said slow wave circuit for electromagnetic interaction with signal wave energy on said slow wave circuit to produce an amplified output signal, means at the downstream end of said slow wave circuit for extracting the amplified output signal, THE IMPROVEMENT COMPRISING, means forming a conductive circuit loading structure disposed outside of and adjacent said slow wave circuit and extending along said circuit over more than one-half of its length for interrupting circumferentially directed currents associated with fields around the outside of said slow wave circuits while conducting currents along the length of said slow wave circuit to provide a phase velocity for signal wave energy which increases with frequency over the passband of said slow wave circuit to provide a nearly constant synchronism parameter over the passband of said slow wave circuit, said conductive loading structure including a plurality of elongated conductive vane members surrounding said slow wave circuit, said vane members being oriented to project radially inwardly from the wall of said conductive sheath towards said slow wave circuit, said vane members being axially directed of said slow wave circuit and terminating adjacent said slow wave circuit in radially spaced relation therefrom.

3,972,006
BANDPASS FILTER

Frank A. Ruegg, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 20, 1974, Ser. No. 507,687

Int. Cl.² H03F *1/36*

U.S. Cl. 330—107 **2 Claims**

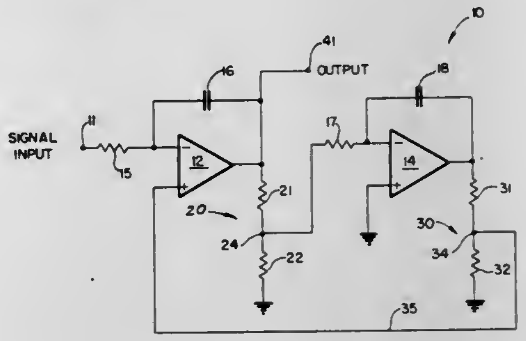
1. A bandpass filter circuit having a signal input terminal and a signal output terminal comprising:

at least first and second differential input amplifier stages, said signal input terminal being electrically connected to one differential input of said first amplifier stage and said signal output terminal being connected to an output of said first amplifier stage,

first capacitive feedback means electrically interconnected between the output of said first amplifier stage and said one differential input of said first amplifier stage,

second capacitive feedback means electrically interconnected between the output of said second amplifier stage and one input of the said second amplifier stage and adapted to pass signals thereto,

first adjustable resistor means interconnecting the output of said first amplifier stage to ground and second adjustable resistor means interconnecting the output of said second amplifier stage to ground,



circuit means connecting the output of said second amplifier stage to a second input of said first amplifier stage through part of said second adjustable resistor means and circuit means electrically connecting said one input of said second amplifier stage to the output of said first amplifier stage via part of said first adjustable resistor means, and

means connecting the second input of said second amplifier stage to ground.

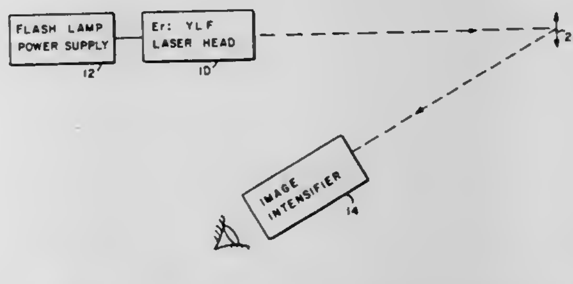
3,972,007
LASER

Charles S. Naiman, Brookline, Mass.; E. P. Chicklis, Merrimack, N.H., and Arthur Linz, Winchester, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 249,172, May 1, 1972, Pat. No. 3,833,805. This application Apr. 29, 1974, Ser. No. 465,193

Int. Cl.² H01S *3/16*

U.S. Cl. 331—94.5 F **5 Claims**



1. A laser which operates at room temperature comprising:

a laser rod having strong fluorescence in the 0.85 um region;

aflashlamp optically coupled to said laser rod;

means for supplying electrical power to said flashlamp; and a cavity.

3,972,008
METHOD AND APPARATUS FOR GENERATING COHERENT RADIATION IN THE ULTRA-VIOLET REGION AND ABOVE BY USE OF DISTRIBUTED FEEDBACK

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Melvin M. Saffren, Altadena, Calif.

Filed Dec. 17, 1974, Ser. No. 533,556

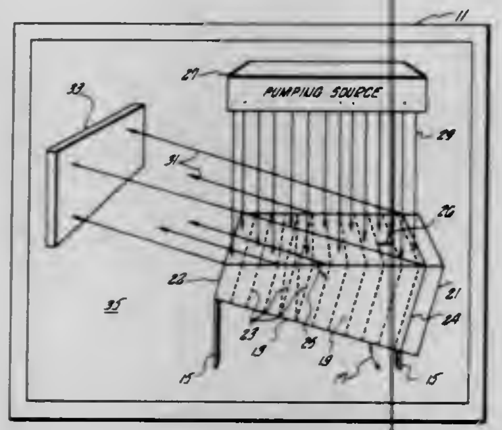
Int. Cl.² H01S *3/081*

U.S. Cl. 331—94.5 C **30 Claims**

1. A method for generating coherent radiation in the ultraviolet region, comprising:

establishing a bath of a liquid noble gas,

maintaining a standing wave in said bath; and exciting the atoms of said noble gas to emit photons, whereby said photons are distributively reflected by the

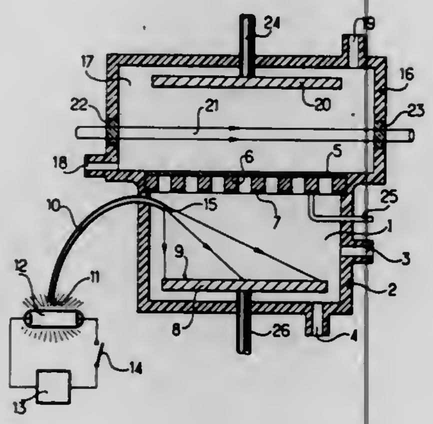


standing wave to produce further photon emission from other atoms of said liquid noble gas.

3,972,009
ELECTRON BEAM GENERATOR AND GAS LASER HEAD IN COMBINATION THEREWITH

Michel Duchet, Briis-sur-Orges, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 13, 1975, Ser. No. 558,113
Claims priority, application France, Apr. 4, 1974, 74.11991
Int. Cl.² H01S *3/09*
U.S. Cl. 331—94.5 PE **6 Claims**

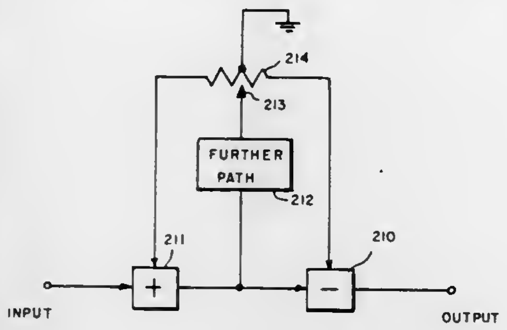


1. An electron beam generator comprising: an enclosure having a wall and containing a gas at low pressure; a first anode having a metallic sheet which is impermeable to the gas, forming part of said enclosure wall; a first metallic cathode contained in the latter, one of the faces of said cathode being situated facing said anode; means for applying to said anode a positive electric potential in relation to said cathode so as to set up a flux of electrons going from said cathode towards said metallic sheet, the latter being sufficiently thin to allow part of the flux to pass and hence form the electron beams; and means for illuminating said one face of the cathode that faces said anode by a source of ultra-violet radiation at the moment of the applying of the potential.

3,972,010
COMPRESSORS, EXPANDERS AND NOISE REDUCTION SYSTEMS

Ray Milton Dolby, 731 Sansome St., San Francisco, Calif. 94111

Division of Ser. No. 395,562, Sept. 10, 1973, Pat. No. 3,903,485, which is a continuation of Ser. No. 227,144, Feb. 17, 1972, abandoned, which is a continuation of Ser. No. 789,703, Jan. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 569,615, Aug. 2, 1966, abandoned. This application Dec. 20, 1974, Ser. No. 537,574
Claims priority, application United Kingdom, Jan. 10, 1968, 1540/68
The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.
Int. Cl.² H04B *1/64*
U.S. Cl. 333—14 **2 Claims**



1. A dynamic range processing method for processing an input signal to produce an output signal having a dynamic range selectively compressed or expanded relative to the dynamic range of said input signal, said method comprising

processing a first signal to produce a second signal by restricting, above a low-level threshold, the amplitude of said second signal,

selectively, for compressing said dynamic range, deriving said first signal from said output signal so that said first signal has dynamic range linearity relative to said output signal, and combining said second signal with a third signal derived from and having dynamic range linearity relative to said input signal, said combining being in such sense as to boost said third signal, and to produce said output signal, and

selectively, for expanding said dynamic range, deriving said first signal from said input signal so that said first signal has dynamic range linearity relative to said input signal, and combining said second signal with a fourth signal derived from and having dynamic range linearity relative to said input signal, said combining being in such sense as to buck said fourth signal, and to produce said output signal.

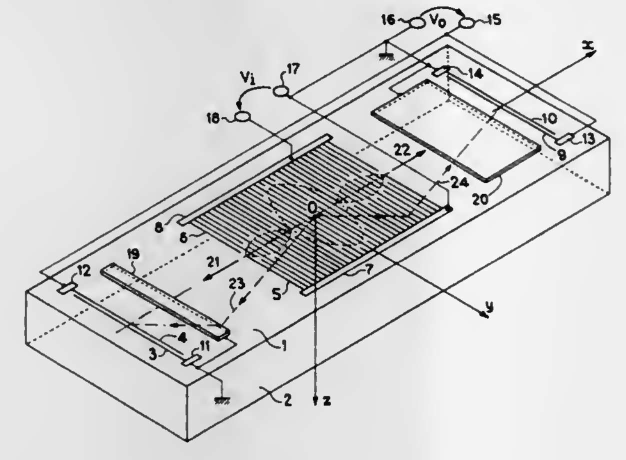
3,972,011
SURFACE ELASTIC WAVE ELECTROMECHANICAL DEVICE

Gérard Coussot, and Olivier Menager, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 8, 1975, Ser. No. 594,088
Claims priority, application France, July 12, 1974, 74.24364
Int. Cl.² H03H *9/26, 9/32;* **H01L** *41/08*
U.S. Cl. 333—30 R **10 Claims**

1. An electromechanical surface elastic wave device for transmitting an electrical signal from one pair of terminals to a further pair of terminals, said device comprising: a substrate having a face for propagating surface elastic waves, and first and second electromechanical transducer means arranged at said face and respectively connected to said one pair and said further pair of terminals; said first and second electromechanical transducer means being arranged to effect selective energy transfer through the medium of said surface elastic waves; said first electromechanical transducer means comprising two

identical transducer structures having a common radiation axis and separated from one another by an interval; said second electromechanical transducer means comprising a further transducer structure producing bi-directional radiation along said radiaton axis; said further transducer structure being arranged in said interval midway between said identical transducer structures thereby providing two opposed arms

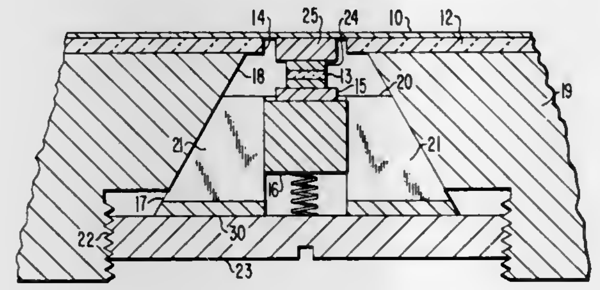


transmitting said surface elastic waves in opposite directions; at least one of said opposed arms being equipped with intermediate means selectively changing the propagation characteristics of said surface elastic waves; the interconnection of said identical transducer structures ensuring in the absence of said intermediate means substantially zero electrical energy transfer between said one pair and said further pair of terminals.

3,972,012
APPARATUS FOR MOUNTING A DIODE IN A MICROWAVE CIRCUIT

Shing-gong Liu, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,815
Int. Cl.² H01P *3/00;* **H01L** *23/42, 23/44, 23/02*
U.S. Cl. 333—84 M **12 Claims**



1. An apparatus for mounting a diode in a microwave circuit, said microwave circuit including a conductor affixed to a substrate, said substrate having an aperture for receiving said diode to make contact with the surface portion of said conductor in register with said aperture, comprising:

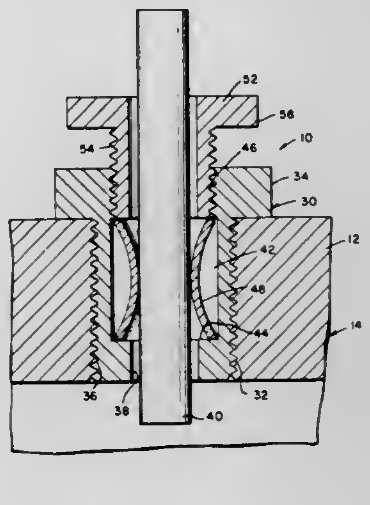
means for resiliently pressing said diode into electrical contact with said conductor through said aperture; and

support means for fixedly supporting said resilient means, said support means having an elastically deformable portion to hold said diode substantially rigidly in contact with said conductor whereby said support means is prevented from jamming in position.

3,972,013
ADJUSTABLE SLIDING ELECTRICAL CONTACT FOR WAVEGUIDE POST AND COAXIAL LINE TERMINATION

Sanford S. Shapiro, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 17, 1975, Ser. No. 566,881
Int. Cl.² H01P *1/28, 3/06*
U.S. Cl. 333—97 R **13 Claims**



1. An adjustable sliding electrical contact structure comprising:

a bushing for securement into the outer body wall of a waveguide, an interior space within said bushing terminated at one end by an axially facing wall and at the other end by a clamp movable with respect to said bushing, through said bushing, a conductor post positioned through said bushing opening;

a clamp member positioned in said interior space between said facing wall and said clamp and embracing said post, said clamp member being structured so that, when said clamp is urged toward said facing wall to stress said clamp member, said clamp member is forced into resilient engagement with said post.

3,972,014
FOUR QUADRANT SYMMETRICAL SEMICONDUCTOR SWITCH

Jearld L. Hutson, 2019 W. Valley View Lane, Dallas, Tex. 75234

Filed Nov. 11, 1974, Ser. No. 522,603
Int. Cl.² H01L *29/747*
U.S. Cl. 357—39 **23 Claims**

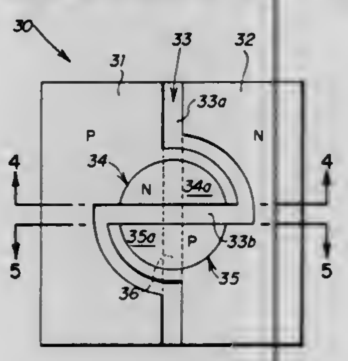
1. A semiconductor switching device having symmetrical performance characteristics comprising:

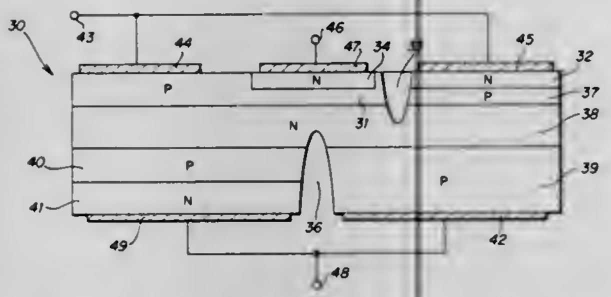
a. a semiconductor body formed from a plurality of semiconductor layers of alternating first and second conductivity types;

b. at least three electrodes in contact with outer surfaces of said body;

c. first means for physically and electrically isolating areas of one of said outer surfaces; and

d. second means having segments which bisect a plane through said first means for physically and electrically isolating areas of a second of said outer surfaces so as to provide conduction of said device by the application of

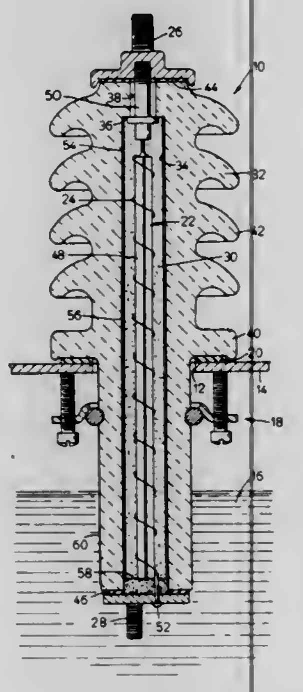




any of four gating quadrant combinations to said electrodes.

3,972,015
HEAT INSULATED FUSED HIGH VOLTAGE BUSHING

Harvey W. Mikulecky, Racine, Wis., assignor to RTE Corporation, Waukesha, Wis.
Continuation of Ser. No. 385,436, Aug. 3, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,388
Int. Cl.² H01H *85/02*
U.S. Cl. 337—202 **5 Claims**

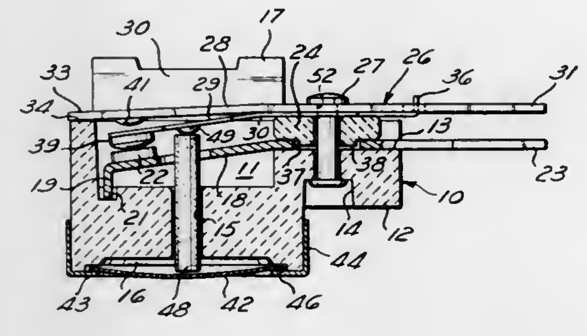


1. A fused high voltage bushing for connecting a high voltage cable to an electrical device housed within a casing, said bushing comprising

- a housing formed of a ceramic dielectric material and having a passage,
- an electric terminal at each end of said passage,
- means for sealing said terminals to each end of said passage,
- a fusible element within said passage electrically connected to each of said terminals,
- a layer of conductive material on the inside surface of said passage,
- means for connecting said layer to one of said terminals,
- means within said passage for thermally insulating the surface of said passage from the heat generated on fusing of said element,
- and a granular dielectric material completely filling the space between said insulating means and said fusible element.

3,972,016
THERMOSTAT

Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio
Filed June 28, 1974, Ser. No. 483,924
Int. Cl.² H01H *37/52*
U.S. Cl. 337—354 **9 Claims**

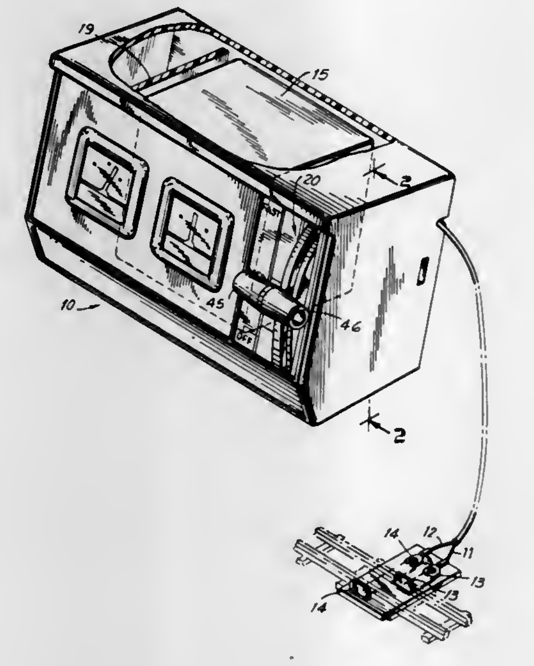


1. A thermostat or the like comprising a body providing a switch cavity and a switch mounting portion on one side thereof, a switch including fixed contact means and movable contact means, said movable contact means including a movable contact and a terminal member, a single rivet securing both contact means to said body, said body and said contact means each providing interengaging locating surfaces substantially spaced from said rivet cooperating with said rivet to prevent relative movement between said body and contact means, and a condition-sensitive snap device mounted on said body and connected to operate said contact means, one of said contact means closing said cavity, and said interengaging locating surfaces being on the side of said cavity remote from said rivet one of said contact means including spring means prestressed by said rivets and operating to prevent looseness of said switch when a temperature of said thermostat changes, and said condition-sensitive snap device being a bimetal snap disc.

3,972,017
DC POTENTIAL CONTROLLER

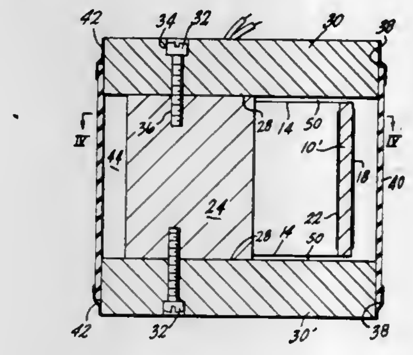
John L. Dohanic, Jr., Girard, and Gerald J. Cornell, Lake City, both of Pa., assignors to Louis Marx & Co., Inc., Glen Dale, W. Va.
Filed July 22, 1975, Ser. No. 597,932
Int. Cl.² H01C *5/02*
U.S. Cl. 338—165 **10 Claims**

1. A D.C. potential controller comprising supply means adapted to have a D.C. potential having a predetermined polarity and magnitude applied thereto, said supply means including a first fixed terminal means referenced to said predetermined polarity and potential and a second fixed terminal means referenced to a reference potential, control means for producing a potential of varying magnitude and polarity, said control means including regulating means displaceable between a first and second polarity selecting position, said regulating means being coordinately displaceable from one of said first and second polarity selecting positions through a third position, said regulating means further including first and second moving contacts disposed thereon in spaced apart relationship, each of said moving contacts being electrically coupled to one of said first and second fixed terminals when said regulating means is coordinately displaced through said third position, and first and second output current means disposed in contact with said moving contact means when same are displaced through said third position, said first output current means including means for linearly varying the current therein in response to said coordinate displacement of said regulating means through said third position.



3,972,018
ELECTROMECHANICAL TRANSDUCER

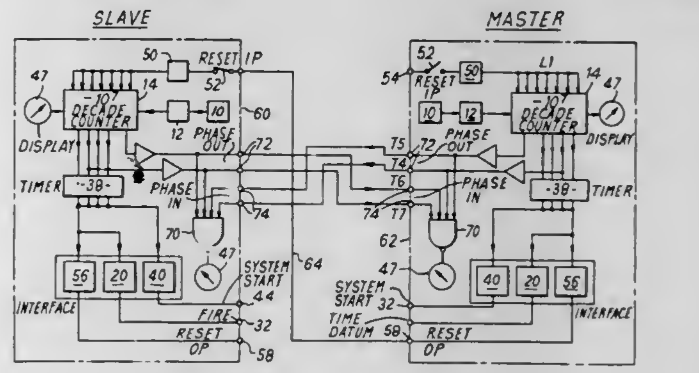
David J. Erickson, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.
Filed Aug. 10, 1972, Ser. No. 279,715
Int. Cl.² H04B *13/00*
U.S. Cl. 340—10 **4 Claims**



1. An electromechanical transducer utilizing an arcuate piezoelectric element vibrating in flexure comprising, in combination, a piezoelectric element of arcuate bowed configuration having an axis, a convex outer surface, a concave inner surface and spaced lateral edges defining the limits of the element's arcuate configuration, a mechanical rigid restraining member affixed to said element's edges restraining said edges from movement relative to each other and restricting movement of said element to flexure intermediate said edges, an electrode affixed to at least one of said surfaces for energizing said element to produce flexure thereof, said element and said restraining member defining an inner chamber having ends, end caps attached to said restraining member extending over said chamber ends, a flexible boot affixed to and extending between said end caps enclosing said element and restraining member defining an outer chamber within which said element and restraining member are encased, a fluid within said outer and inner chambers, and port means establishing communication between said outer and inner chamber.

3,972,019
TIME SYNCHRONIZATION

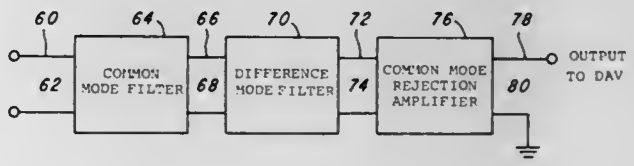
Edward James Bassett, Orpington, England, assignor to Seismograph Service Corporation, Tulsa, Okla.
Filed July 9, 1973, Ser. No. 377,718
Int. Cl.² G01V *1/22*
U.S. Cl. 340—15.5 TS **2 Claims**



1. Apparatus for obtaining accurate time synchronisation at remote points without direct communication of the time between these points utilising separate timing units which can be used at separate points and which can be brought together at one point for synchronisation, wherein each of said units comprises a constant frequency oscillator for producing a time wave, a frequency divider in each unit comprising a counter having multiple stages for producing from the time wave in each respective unit time pulses at intervals of time which are the same in different units, and means for synchronising the time pulses of one unit with those of the other unit when the two units are brought together and connected to each other, said synchronising means including means in each unit for combining the outputs of a number of the stages of the counter of that unit, means for comparing the phases of the resulting time pulses of the two units when they are connected together and means for providing a visual indication of the relative phases of the time pulses of the two units, each unit including means for providing pulses after the units have been synchronised and while the units are at remote points and operating independently of each other to cause the units to produce signals which are accurately related in time with each other.

3,972,020
TRANSFORMERLESS INPUT FOR SEISMIC DATA ACQUISITION SYSTEM

Paul E. Carroll; Warren Moore, Jr., and William C. Voigt, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 11, 1974, Ser. No. 531,563
Int. Cl.² G01V *1/36*; H04B *3/28*
U.S. Cl. 340—15.5 AF **9 Claims**



1. In a data acquisition system having at least one transducer and wherein the signal produced by each of said transducers is coupled by a separate pair of wire lines to a data acquisition unit, the combination between each of said transducers and said data acquisition unit comprising:

- a. filter means including a common mode filter and a difference mode filter,
  - i. said common mode filter further comprising at least one common mode filter section with differential input and output, said filter section having a first pair of magnetically coupled inductors each connected between an

input and an output of the section and a pair of capacitors connected in series between the outputs of the section with means for coupling the node between said pair of capacitors to a common reference potential,
ii. said difference mode filter further comprising at least one difference mode filter section with differential input and output and having a second pair of inductors each connected between an input and an output of the section with a capacitor connected between the output terminals of the section,
iii. the pair of inductors of each common mode filter section being bifilar would to have direct mutual coupling and the pair of inductors of each difference mode filter section being wound to have reverse mutual coupling, and
b. amplifier means having high common mode rejection.

3,972,021
SYSTEM FOR MONITORING SPACES BY ELECTRO-OPTICAL MEANS

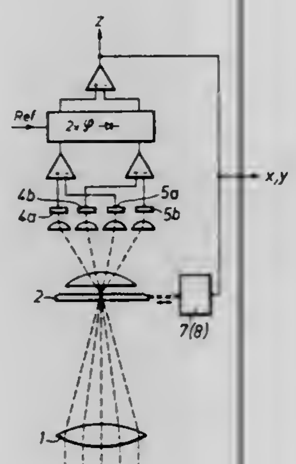
Ludwig Leitz, Laufdorferweg 33; Knut Heitmann, Lerchenweg 16, and Eckart Schneider, Lauerstr. 3, all of 633 Wetzlar, Germany

Filed May 21, 1975, Ser. No. 579,568

Claims priority, application Germany, May 27, 1974, 2425466

Int. Cl.^{2} G08G *1/00*

U.S. Cl. 340—38 P **16 Claims**



1. In a system for monitoring spaces by electro-optical means, the improvement comprising:
optical imaging means (1) for detecting objects present in said spaces to be monitored and beam splitting means (2) for grating-resolution of images of said objects into geometric, mutually complementary components, said imaging and beam splitting means defining an imaging correlation sensor system having photoelectric detectors (4, 5) for separately converting light fluxes corresponding to components of said images into analogue electrical signals and electrical means for measuring signal phase and amplitude and their variations, and for analyzing said signals with respect to the presence and/or motion of said objects within said spaces.

3,972,022
INDICATOR OF VEHICLE SERVICE INTERVALS

Kenji Goto, and Norio Shibata, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

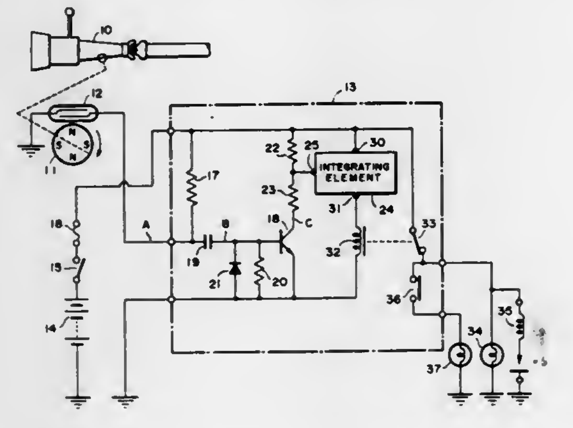
Filed Nov. 4, 1974, Ser. No. 520,892

Claims priority, application Japan, Nov. 5, 1973, 48-124262; Feb. 1, 1974, 49-13446

Int. Cl.^{2} G01C *22/02*

U.S. Cl. 340—52 D **16 Claims**

1. An indicator for detecting and displaying the arrival of the time limit at which inspection and reconditioning of a vehicle must be carried out, comprising transducing means having a magnet rotatively driven by an output shaft of a transmission and a reed switch disposed in close proximity to the magnet, the reed switch being alternately closed and opened with the rotation of said magnet to transduce the number of rotations of the transmission output shaft into a distance signal, traveled distance integrating means including an electrolytic integrating element for integrating the electrical output signal of said transducing means by an electrochemical integrating operation and generating an alarm signal when the integrated amount of said applied input attains a predetermined value, and display means for performing an alarm displaying operation in response to the application of the alarm signal from said electrolytic integrating element.



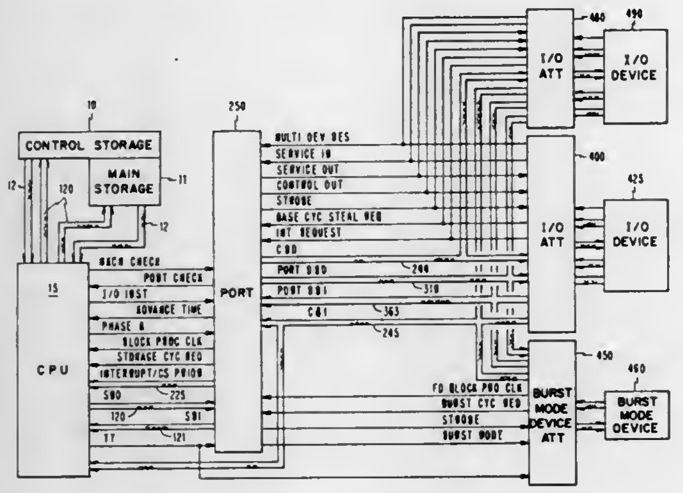
3,972,023
I/O DATA TRANSFER CONTROL SYSTEM

Ronald E. Bodner; Mario N. Cianciosi; Thomas L. Crooks, all of Rochester, Minn.; Israel B. Magrisso, Coral Springs, Fla.; Keith K. Slack, Rochester, Minn., and Richard S. Smith, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,471

Int. Cl.^{2} G06F *3/00*

U.S. Cl. 340—172.5 **71 Claims**



1. In a computer system having storage for storing instructions including I/O instructions, a central processing unit including means for fetching and decoding instructions, local storage register means for storing address data and control data, port means connected to said central processing unit, I/O attachments connected to said port means and I/O devices connected to said I/O attachments, the improvement comprising:
means within said central processing unit for transferring to said port means an I/O instruction retrieved from said storage and address data retrieved from said local storage register means,
means within said port means responsive to receiving said I/O instruction and said address data for forming a command and I/O attachment address data and simultaneously transmitting to said I/O attachments said formed command and I/O attachment address data together with a synchronizing signal indicating to said I/O attachments that said command and I/O attachment address data should be decoded, and
response means within said I/O attachments for decoding said I/O attachment address data and responding to said command to provide control signals to I/O devices connected to said I/O attachments and generating a response signal to said port means whereby said port means deactivates said synchronizing signal and generates a response control signal to said central processing unit to cause the same to provide said port means with data for said I/O attachments, said port means upon receiving said data from said central processing unit generates another synchronizing signal to said I/O attachments and sends said data thereto whereby said I/O attachments upon receiving said data de-activates said response signal, said port means upon detecting de-activation of said response signal de-activates said another synchronizing signal and generates another response control signal to said central processing unit to indicate thereto that execution of said I/O instruction is complete.

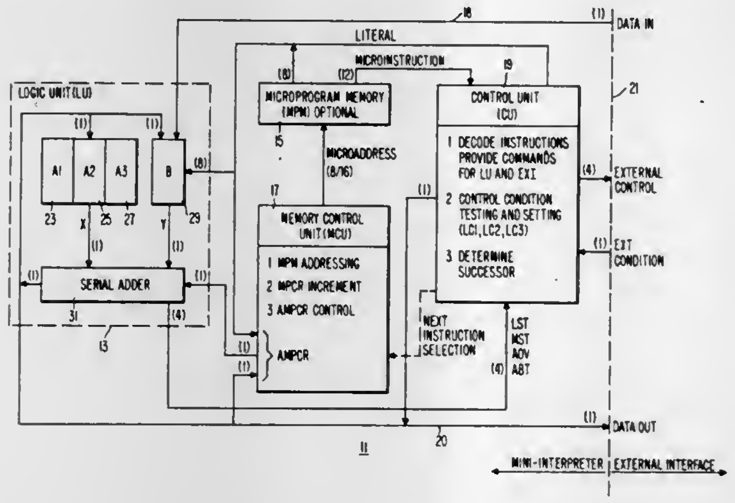
3,972,024
PROGRAMMABLE MICROPROCESSOR

Franklin T. Schroeder, Exton, and John P. McAllister, Wayne, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1974, Ser. No. 455,060

Int. Cl.^{2} G06F *9/20, 9/16*

U.S. Cl. 340—172.5 **5 Claims**



1. In a microprocessing apparatus for cyclically processing microinstructions addressably stored in a microprogram memory means, certain ones of said microinstructions including address bits, the improvement comprising:
an incrementable first register for storing address bits to addressably select microinstructions for retrieval from said microprogram memory means;
a second register for storing address bits loadable into said first register;
means, responsive to address bits stored in said first register and operative during a single process cycle, for retrieving from said microprogram memory means a selected one of said certain ones of said microinstructions and loading the address bits included therein into said second register;
means for incrementing within said single process cycle the contents of said first register; and
means for swapping within said single process cycle said incremented contents of said first register and said loaded address bits in said second register.

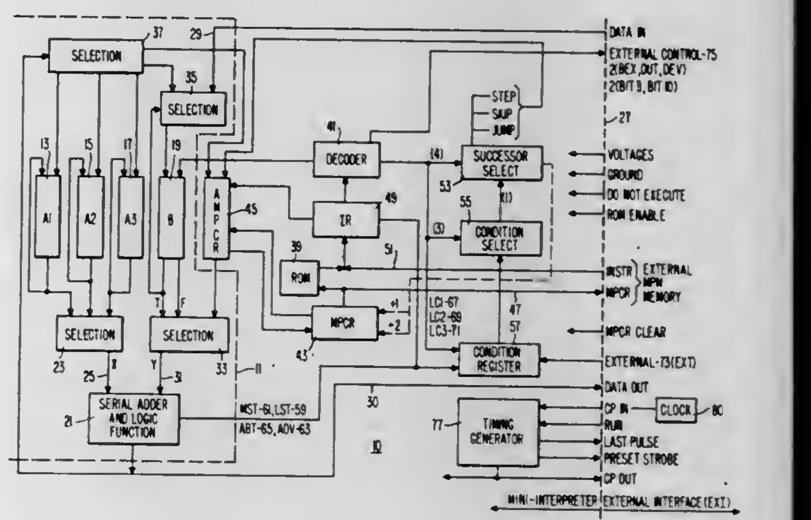
3,972,025
EXPANDED MEMORY PAGING FOR A PROGRAMMABLE MICROPROCESSOR

Vincent J. Taddei, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 4, 1974, Ser. No. 503,112

Int. Cl.^{2} G06F *9/16, 13/00*

U.S. Cl. 340—172.5 **7 Claims**



1. An expanded memory microprocessing system comprising:
a plurality of microprogram memory pages, each page therein for storing a plurality of addressable microinstructions;
a microprogrammable microprocessor for sequentially executing microinstructions, said microprocessor having
a single address register of size sufficient to address only a single microprogram memory page,
means for designating a particular microprogram memory page in said plurality of pages, and
an instruction register for receiving microinstructions prior to the executing thereof;
means connecting said plurality of memory pages with said address register for addressing in parallel all pages in said plurality of pages;
means external to said microprocessor and responsive to said designating means for enabling said particular page designated thereby; and
means for fetching an addressed microinstruction from an enabled page and for transferring said addressed microinstruction to said instruction register.

3,972,026
LINKED LIST ENCODING METHOD AND CONTROL APPARATUS FOR REFRESHING A CATHODE RAY TUBE DISPLAY

Thomas Frank Waltman, Mountain View, and Richard Ricker Lyman, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

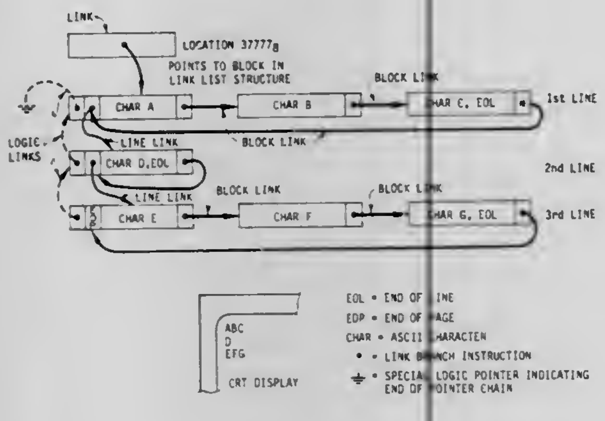
Filed Sept. 23, 1974, Ser. No. 508,600

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—172.5 **24 Claims**

1. A display refresh method comprising the steps of:
encoding data representing figures to be displayed as data characters;
encoding data representing enhancement features and execution path instructions as control characters;

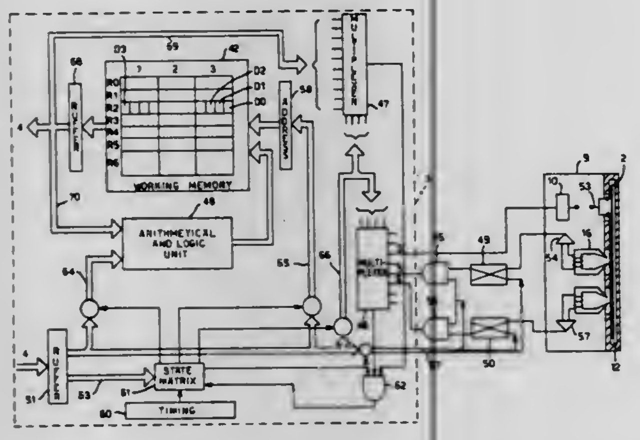
combining the data and control characters to form linked list data blocks; and



interpreting the linked list data blocks to form displayable lines.

3,972,027
SKEW COMPENSATION FOR A MAGNETIC CARD READING-WRITING UNIT

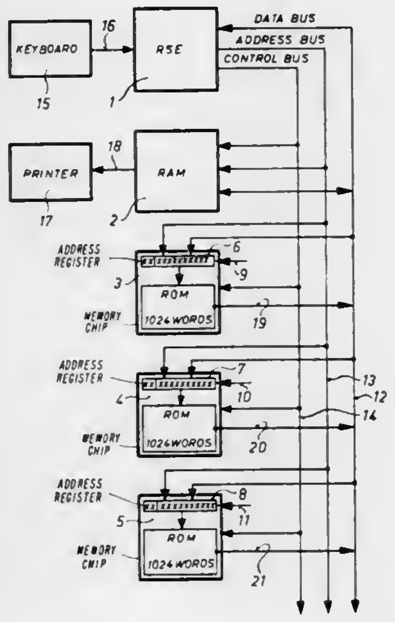
Gastone Garziera, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Dec. 6, 1974, Ser. No. 530,315
Claims priority, application Italy, Dec. 28, 1973, 70878/73
Int. Cl.² G06F *11/00*; G11B *5/09*; G06F *13/04*
U.S. Cl. 340—172.5 **7 Claims**



1. In an electronic computer: a central processing unit; an information storing memory; a reading-writing unit for reading from and writing information on a magnetic card in form of bits distributed along a pair of magnetized tracks and including means for simultaneously writing one reference signal of a pair of reference signals on each of said tracks; means for transferring the formation between the reading-writing unit and the memory; and delay compensation means responsive to the reading of said pair of reference signals to control the means for transferring to compensate for any introduced delay to transfer said information to said memory in the order it was written.

3,972,028
DATA PROCESSING SYSTEM INCLUDING A PLURALITY OF MEMORY CHIPS EACH PROVIDED WITH ITS OWN ADDRESS REGISTER

Gerald Weber, and Jurgen Sorgenfrei, both of Braunschweig, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Dec. 20, 1974, Ser. No. 535,089
Claims priority, application Germany, Dec. 22, 1973, 2364408
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **6 Claims**



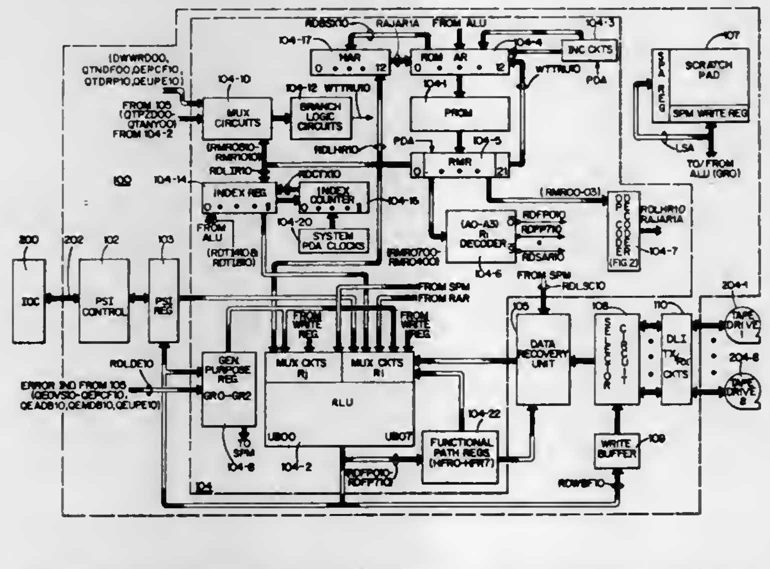
1. In a circuit arrangement composed of a plurality of chips containing highly integrated circuit components for use in a data processing device, one said chip containing components interconnected to form an arithmetic and control unit for performing the arithmetic operations and controlling the operation of said arrangement and at least two others of said chips each constituting a memory chip containing components defining a memory having a plurality of addressable "memory locations, said arrangement also including a plurality of conductors interconnecting said chips and defining a collecting bus, the improvement wherein each said memory chip further includes components interconnected to define an address register having a first group of address bit locations arranged to contain an address word for addressing any selecing memory location of the memory on its respective memory chip, and having a second group of address bit locations arranged to contain a bit sequence for selecting the memory of one of said memory chips for read-out, there being a respective bit sequence corresponding to ach said memory chip, and each said register having a counting pulse input and being arranged to count through successive memory word addresses in response to pulses applied to its counting pulse input.

3,972,029
CONCURRENT MICROPROCESSING CONTROL METHOD AND APPARATUS

Myrl Kennedy Bailey, Jr., North Billerica, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Dec. 24, 1974, Ser. No. 536,126
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **25 Claims**

1. A peripheral controller coupled to a first interface for receiving bytes from a processing system and coupled to a second interface for transferring said received bytes to an output device, said controller comprising:

- an addressable control store including a plurality of addressable locations for storing microinstructions of an initial sequence and microinstructions of at least two microprograms including microinstructions for generating signals for receiving and transferring bytes from said first and second interfaces;
- an address register connected to said store for storing an address for accessing said locations;
- an output register coupled to said store for temporarily storing the microinstruction contents of an accessed location during a cycle of operation;
- an auxiliary register coupled to said output register and to said address register; and,
- decoder means coupled to said output register for generating control signals in response to decoding microinstructions read out into said output register, said decoder means including first means operative upon the read out of a predetermined one of said microinstructions contained in said initial sequence to generate a first one of said control signals for loading said auxiliary register with signals corresponding to a constant field included in said predetermined one of said microinstructions, said constant field of said predetermined one of said microinstructions being coded to specify a location of a microinstruction in one of said microprograms, said address register being conditioned by a first type of branch microinstruction in said initial sequence to load said address register with an address to branch said control store to a microinstruction stored in an initial location within the other microprogram and said decoder means further including second means operative during a cycle of operation upon read out of a predetermined one of said microinstructions contained in said other microprogram to generate a second one of said control signals for loading said address register with the contents of said auxiliary register and said first means generating said first control signal during a next cycle of operation upon read out of a next microinstruction stored in the next location of said other microprogram for again loading said auxiliary register with signals corresponding to another constant field included in said next microinstruction read out into said output register, said constant field of said next microinstruction being coded to specify a return location of a microinstruction in said other microprogram.

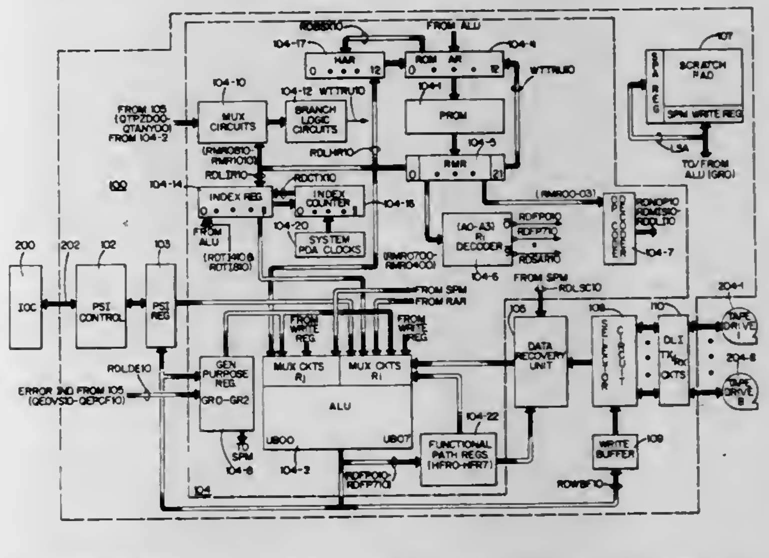


3,972,030
PERIPHERAL CONTROL CAPABLE OF DYNAMICALLY EXECUTING COMMAND SEQUENCES

Myrl Kennedy Bailey, Jr.; North Billerica, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Jan. 2, 1975, Ser. No. 537,993
Int. Cl.² G06F *9/16*
U.S. Cl. 340—172.5 **23 Claims**

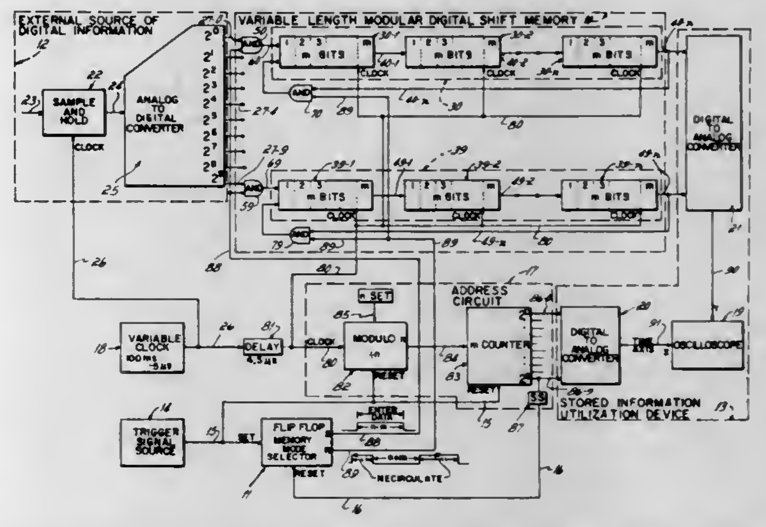
1. A peripheral controller operative to control a plurality of input/output devices in response to command byte signals received from a processing system, said controller comprising:

- an addressable control store having a plurality of storage locations for storing a plurality of microprogram routines independently used to execute different input/output operations in response to different codings of said command byte signals, each of said microprogram routines including a plurality of microinstructions having a predetermined sequence of microinstructions, said control store including decoder means for generating control signals in response to microinstructions read out from said control store;
- addressable storage means operatively coupled to said control store, said storage means including a plurality of locations for storing status and control information signals used in performing said input/output operations, a predetermined one of said storage locations for storing in response to a command specified by said command byte signals a bit pattern coded for indicating when said controller is executing a series of operations requiring execution of a plurality of said microprogram routines; and,
- processing means coupled to receive signals from said control store, said decoder means and said storage means, said processing means being operative in response to control signals generated by said decoder means in response to said predetermined sequence of microinstructions to access said coded bit pattern contents from said predetermined location of said storage means and test the value of said bit pattern for determining when said controller is executing said series of operations in response to said command.



3,972,031
VARIABLE LENGTH SHIFT REGISTER ALTERNATELY OPERABLE TO STORE AND RECIRCULATE DATA AND ADDRESSING CIRCUIT THEREFOR

Don H. Riemenschneider; William L. Townsend, and Joseph W. Pehoushek, all of Cincinnati, Ohio, assignors to Zonic Technical Laboratories, Inc., Cincinnati, Ohio
Filed Aug. 15, 1974, Ser. No. 497,757
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **15 Claims**


EXTERNAL SOURCE OF DIGITAL INFORMATION
VARIABLE LENGTH MODULAR DIGITAL SHIFT MEMORY
SAMPLE AND HOLD
ANALOG TO DIGITAL CONVERTER
m BITS
CLOCK
AND
DIGITAL TO ANALOG CONVERTER
VARIABLE CLOCK
ADDRESS CIRCUIT
COUNTER
OSCILLOSCOPE
STORED INFORMATION UTILIZATION DEVICE
TRIGGER SIGNAL SOURCE
FLIP FLOP MEMORY MODE SELECTOR
SET
RESET
ENTER DATA
RECIRCULATE

1. A digital information storage system having a storage capacity of *c* bits selectively variable in multiples of *m* and *nm* bits, where *c*, *n* and *m* are integers, said system comprising:

- *n* *m*-bit digital shift registers,
- variable connection means to interconnect one or more of said *m*-bit shift registers in cascade to produce a single

shift register means having an effective bit storage capacity of *c* bits which is selectively variable between *m* bits and *nm* bits in multiples of *m* bits,

a sample signal generator for producing sample signals at a predetermined sampling frequency, said sample signals being input to said single shift register means to shift bits therein at said sampling frequency,

a first resettable counter means responsive to said sample signals for providing a first signal for every *c*/*m* sample signals input thereto,

a second resettable counter responsive to said first signals for providing a second signal for every *m* first signals input thereto,

a trigger signal generator, said trigger signal generator being connected to reset said first and second counters upon generation of a trigger signal, and

shift register control means responsive to said trigger signals and said second signals for entering information into said single shift register means from an external source and recirculating information in said single shift register means, respectively,

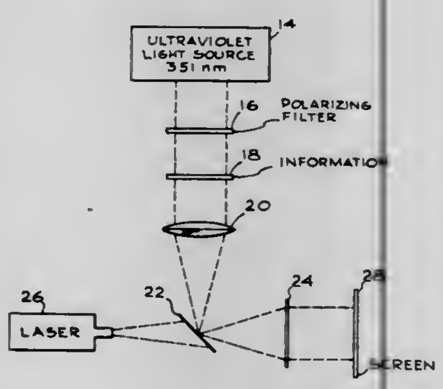
said second resettable counter also providing a series of time-spaced digital signals having a continuously changing numerical value which at any given time is correlated to the address of the data output from said single shift register means at said given time with respect to the data stored coincident with the trigger signal which effected entry of said data into said single shift register means.

3,972,032

MEMORY SYSTEM USING ION IMPLANTED PHOTODICHROIC MATERIALS

Thomas J. Magee, Belmont, and Matt Lehmann, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 9, 1974, Ser. No. 504,058
Int. Cl.² G11C *11/42, 13/04*
U.S. Cl. 340—173 CC **6 Claims**



1. A method of controllably implanting storage sites in photodichroic alkali halide material comprising

irradiating the surface of a slab of said material with ions having a predetermined energy for a predetermined time to achieve a predetermined depth of storage site implantation.

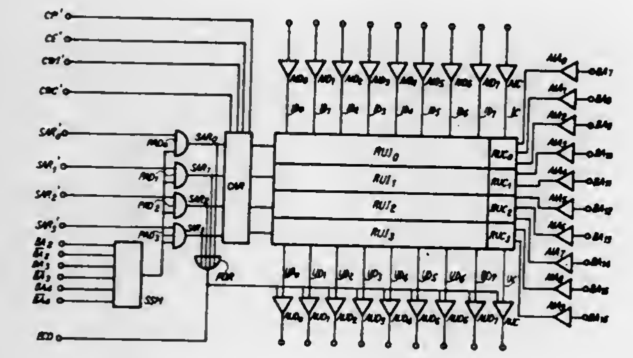
3,972,033

PARITY CHECK SYSTEM IN A SEMICONDUCTOR MEMORY

Ezio Cislaghi, Sedriano (Milan); Claudio Gentili, Cornaredo (Milan), and Ermanno Maccario, Pregnana Milanese (Milan), all of Italy, assignors to Honeywell Information Systems Italia, Caluso, Italy

Filed Dec. 23, 1974, Ser. No. 535,751
Claims priority, application Italy, Dec. 27, 1973, 32158/73
Int. Cl.² G11C *7/00, 29/00*
U.S. Cl. 340—173 R **7 Claims**

4. A semiconductor memory, comprising:a plurality of circuit sections; means for recording different portions of an information word on different circuit sections; and means for recording a check bit for each of said different portions of said information word on a one of said circuit sections other than the circuit section upon which the corresponding portion of said information word is recorded.

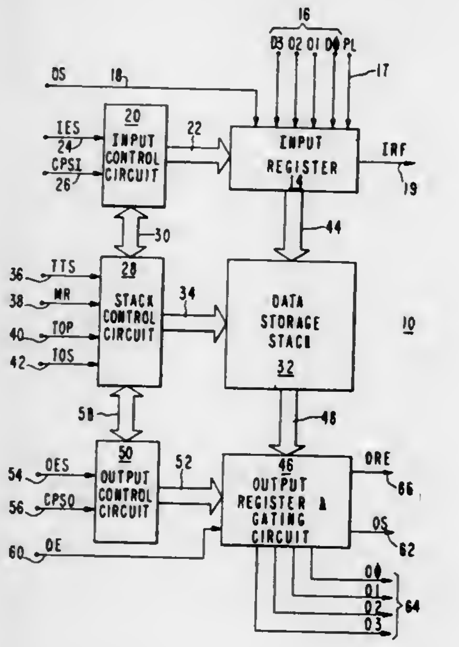


3,972,034

UNIVERSAL FIRST-IN FIRST-OUT MEMORY DEVICE

Richard B. Derickson, III, and Krishna Rallapalli, both of San Jose, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 12, 1975, Ser. No. 576,840
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **22 Claims**



1. A single chip large scale integration device having a set of data input pins, a set of data output pins, and control signal input pins, of a first-in first-out memory, comprising:

a. input means having control input terminals, data input terminals coupled to the data input pins of said device, and data output terminals, said input means being disposed for accepting data from an outside source on said data input pins;

b. a data storage means having data input terminals coupled to said data output terminals of said input means and having data output terminals, said data storage means comprising an asynchronous circuit having a multiplicity of sets of individual storage devices and each of said sets of individual storage devices being adapted for accepting data only when in a neutral state;

c. output means having control input terminals, data input terminals coupled to said data output terminals of said storage means, and data output terminals coupled to the data output pins of said device; and

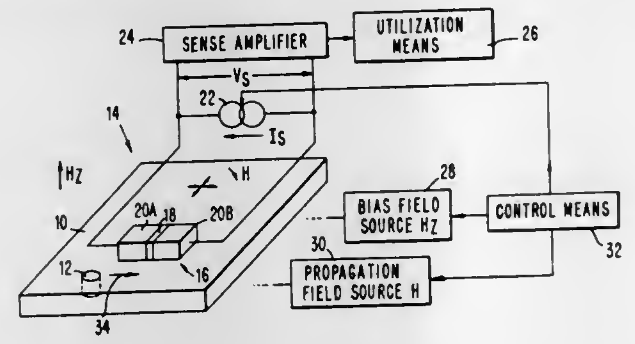
d. circuit means having input terminals coupled to the control signal input pins of said device, and output terminals coupled to said control input terminals of said input and output means for independently controlling the loading of data into an extraction of data from said memory, whereby data loaded into said input means asynchronously flows through said data storage means as a function only of data extracted from said output means.

3,972,035

DETECTION OF MAGNETIC DOMAINS BY TUNNEL JUNCTIONS

Frederic Holtzberg, Pound Ridge; Ashok F. Mayadas, Somers; William A. Thompson, Yorktown Heights, and Stephan von Molnar, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 265,943, June 23, 1972, Pat. No. 3,840,865. This application Apr. 2, 1974, Ser. No. 457,324
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **8 Claims**



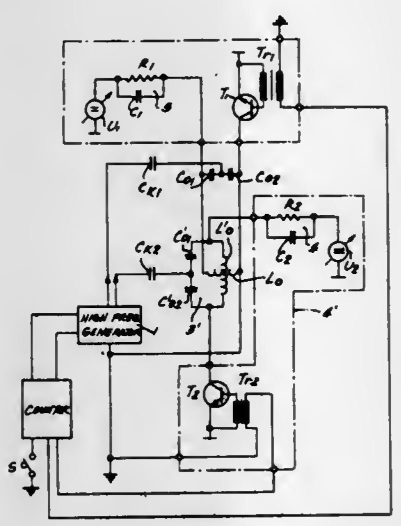
8. A sensor for detection of magnetic bubble domains in a magnetic medium, said sensor comprising a conducting material and a magnetic semiconductor located in contact therewith, there being a tunnel junction formed between said conductor and said magnetic semiconductor whose tunneling resistance depends upon the presence and absence of a magnetic bubble domain sufficiently close to said tunnel junction that the stray magnetic field associated with said domain will intercept said tunnel junction.

3,972,036

ARRANGEMENT FOR RAPID SWITCHING OF A HIGH FREQUENCY MAGNETIC FIELD

Franz Navratil, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 8, 1974, Ser. No. 458,754
Claims priority, application Germany, Apr. 12, 1973, 2318530
Int. Cl.² G11C *11/14*; H03F *3/55*
U.S. Cl. 340—174 TF **6 Claims**



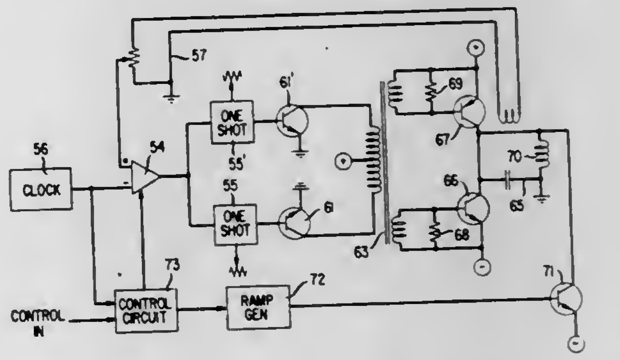
1. An arrangement for rapidly switching on and off a high frequency rotary magnetic field, comprising: a pair of crossed coils; high frequency generating means connected to said coils and feeding said coils a sine-shaped current which is out of phase by 90° at one coil with respect to the other, a separate capacitance connected across each of said coils to form respective parallel resonant circuits, and a pair of switching circuits connected in parallel to respective ones of said resonant circuits, each of said switching circuits comprising a controllable voltage source, a timing circuit connecting said controllable voltage source to one end of the respective parallel resonant circuit and a switch connecting the other end of the respective parallel resonant circuit to a reference potential.

3,972,037

PHASE CORRECTING DRIVE CIRCUIT FOR A MAGNETIC BUBBLE FIELD-ACCESS MEMORY

William Emil Hess, Jr., Piscataway, and George Philip Vella-Coleiro, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,820
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **10 Claims**



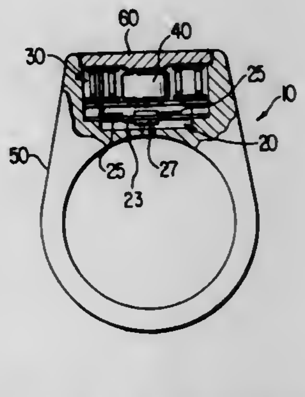
5. A magnetic bubble memory arrangement comprising a circuit for regulating the phase of the current in a tuned circuit with respect to a clock signal, said circuit comprising pulse generating means responsive to said clock signal and a timing control signal for providing refresh pulses to said tuned circuit, and feedback means coupled to said tuned circuit and being adapted for applying to said pulse generating means a timing control signal in phase with the current in said tuned circuit for providing said refresh pulses in phase with said current.

3,972,038

ACCELEROMETER TELEMETRY SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Eph Konigsberg, Sierra Madre, Calif.

Filed Mar. 28, 1975, Ser. No. 563,049
Int. Cl.² G08C *19/16*
U.S. Cl. 340—189 M **6 Claims**



1. A miniaturized accelerometer telemetry system for monitoring the hand movements of a subject comprising:

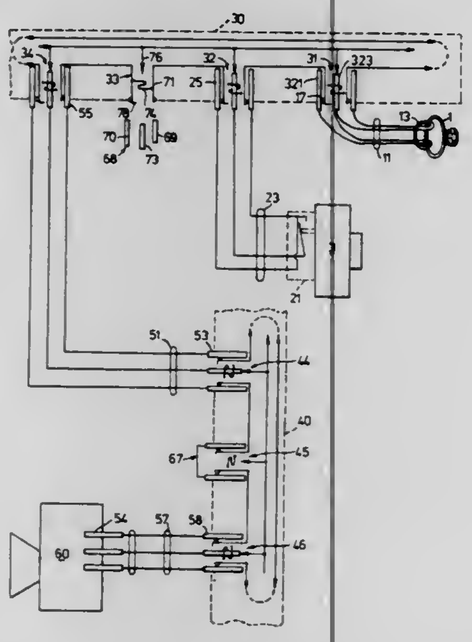
an accelerometer for detecting accelerational movements and for producing an electrical output signal in accordance therewith;

transmitter means;
modulator means for modulating the output of said transmitter with the output signal produced by said accelerometer;
a housing, adapted to be worn on the person, for housing said accelerometer, said transmitter means and said modulator means;
said accelerometer comprising an annular ring and a central support beam extending diametrically across said ring, a seismic mass affixed to said beam at the center of said ring so as to permit axial movements of said seismic mass, and first and second semiconductor strain gages, bonded to said beam on opposite sides of said mass, the electrical resistance of said gages varying in relationship to the stresses endured in each of said beams.

3,972,039
ARTICLE REMOVAL AND PILFERAGE DETECTION SYSTEM AND APPARATUS

Steven Grant Marshall, 143 Village of Nagog Woods, Acton, Mass. 01718

Filed Mar. 14, 1974, Ser. No. 451,049
Int. Cl.² G08B *21/00*
U.S. Cl. 340—280 **3 Claims**



1. An alarm system to respond to the removal of a treasure from its assigned place, comprising:
- a. an indicator subsystem containing a signal transmitter;
- b. distributing means including at least three runs of wire extending from said subsystem to said treasure, and terminations of said runs such that a circuit of current is maintained from said subsystem outward along a first of said runs, and back to said subsystem along a second of said runs, and such that said third run extends with at least one of said other runs and is isolated therefrom to maintain a predetermined potential difference;
- c. wherein said subsystem incudes detection circuit means so connected that cutting said circuit causes said transmitter to transmit an alarm, and so that making an electrical connection between said third run and said circuit even momentarily causes said transmitter to transmit an alarm;
- d. said subsystem comprises a plug-in strip;
- e. said strip comprising a plurality of identical connector receptacles;
- f. each of said receptacles having three sockets for mating plug having three pins;
- g. each of said receptacles having a spring to maintain the interconnection of two of said sockets until said pins are inserted, said spring being deflected by the outward motion of one of said pins upon withdrawal to make connection between one of said two and the third of said sockets;
- h. wherein each of said two sockets is electrically connected to one and only one of said two sockets of another of said receptacles; and
- i. wherein all of said third sockets are electrically interconnected each to all of the others.

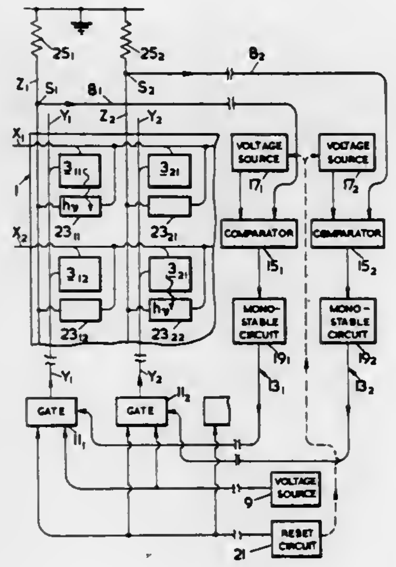
3,972,040
DISPLAY SYSTEMS

Cyril Hilsum, Malvern, and Adrian Leonard Mears, Leckhampton, near Cheltenham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 12, 1974, Ser. No. 496,716

Claims priority, application United Kingdom, Aug. 15, 1974, 38635/73

Int. Cl.² G08B *5/36*
U.S. Cl. 340—324 M **9 Claims**

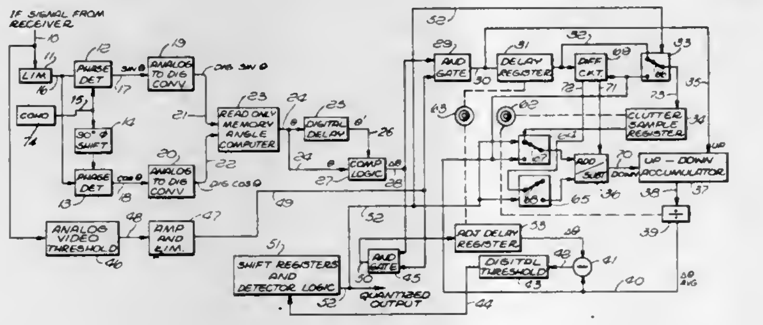


1. A refreshed display system incorporating electro-optic display elements capable of electrically latching the elements into a fixed state, said system comprising a matrix of said elements arranged in rows and columns, a grid of row electrodes each associated with a corresponding one of said rows and each connected to the elements in its corresponding row, a grid of column electrodes each associated with a corresponding one of said columns and each connected to the elements in its corresponding column, said elements being at intersections between said row and column electrodes, means for generating a pulsed operating signal having a refreshing cycle and capable of causing the elements at selected intersections to provide an otpical display signal pulse once per refreshing cycle, a memory and control arrangement capable of providing refreshed operation of said selected elements, said arrangement comprising a plurality of electrical gates associated with one of said electrode grids, each gate being connected to an individual electrode in said grid and capable when open of gating at least a part of said electrical operating signal to said individual electrode and its corresponding elements, a plurality of sensing means each associated with an individual one of the electrodes of said one grid and each capable of detecting in response to an interrogation signal the state of a physical property of the elements connected to its associated individual electrode in order to indicate whether those elements are selected to be operated, a plurality of feedback loops each separately connected between an individual one of said sensing means and an individual one of said gates and means for applying to each of the electrodes of the other of said electrode grids an interrogation signal once per refreshing cycle to cause each of said sensors to open its associated gate whenever it detects said physical property to indicate selection of an element.

3,972,041
ADAPTIVE CLUTTER VELOCITY CANCELLATION SYSTEM FOR PULSED DIGITAL MTI SYSTEM

Shirly L. Howard, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 125,257, March 17, 1971, abandoned. This application Feb. 25, 1975, Ser. No. 552,926
Int. Cl.² G01S *9/42*
U.S. Cl. 343—7.7 **11 Claims**

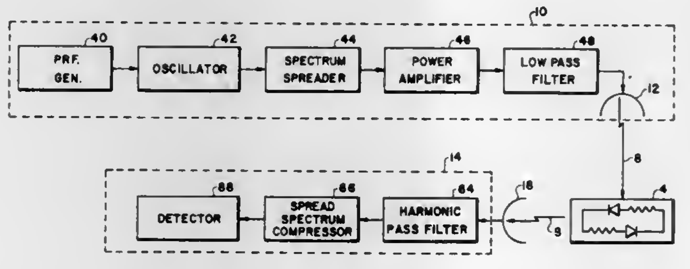


1. A digital pulse Doppler radar system comprising:
means for digitally encoding received echo signals discretely within each of a succession of relatively short duration range increments each of fixed range position within successive repetition periods of said radar system, said means encoding said signals to have digital magnitudes which are a function of the instantaneous Doppler phase angle of received signals in each of said range increments;
means for differencing said digitally encoded signals between adjacent pulse repetition periods to cancel signals exhibiting substantially no echo signal phase change;
means for sampling a predetermined band of said range increments during successive pulse repetition periods to determine an average velocity factor as a function of the average moving signal velocity over said band;
and means responsive to said average factor and to the individual signal velocities for producing a quantized output during each range increment in which a signal velocity varies from said average moving target velocity within said band.

3,972,042
METAL TARGET DETECTION SYSTEM

Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 2, 1974, Ser. No. 528,828
Int. Cl.² G01S *9/233*
U.S. Cl. 343—17.2 PC **8 Claims**

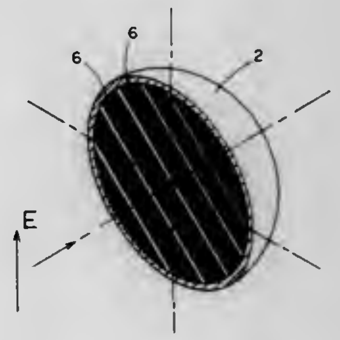


1. A metal detection system comprising:
means for radiating a spread spectrum signal to a metal target having a non-linear electrical response characteristic, said target radiating a harmonic signal in response to said spread spectrum signal;
means for receiving the harmonic signal; and
means for compressing and detecting the harmonic signal.

3,972,043
CROSS-POLARIZING LENS REFLECTOR

Silvan Stanley Locus, Van Nuys, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 3, 1975, Ser. No. 546,692
Int. Cl.² H01Q *15/22*
U.S. Cl. 343—18 B **6 Claims**

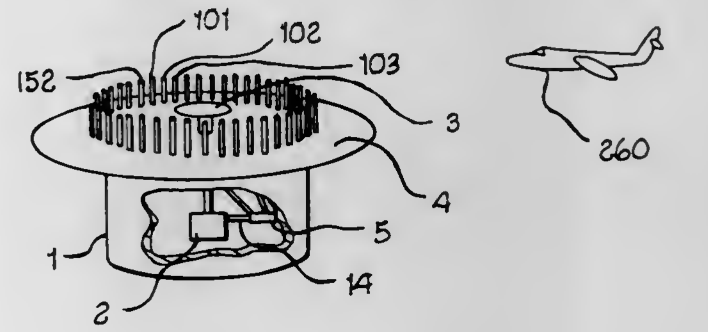


6. A passive cross-polarizing radar reflector comprising spaced parallel strips of reflecting material placed perpendicular to the propagation direction of an incident electromagnetic wave, the ratio of strip width to spacing being from about 12:1 to 13:1 to give a desired fraction of cross-polarization in the return signal, the strip width being small compared to the wavelength of the incident wave.

3,972,044
ANTENNA SYSTEM FOR DOPPLER VOR GROUND STATIONS

Andrew Alford, 120 Cross St., Winchester, Mass. 01890

Filed Apr. 8, 1974, Ser. No. 459,068
Int. Cl.² G01S *1/38*
U.S. Cl. 343—106 D **6 Claims**



1. A radiating antenna system, radiating horizontally polarized waves comprising means providing a conductive horizontal elevated sheet of limited dimensions,
- A. First radiating means centrally located with respect to said conductive sheet, said radiating means having a substantially omnidirectional radiation pattern and radiating a first frequency,
- B. First transmitter means for energizing said first radiating means,
- C. Second omnidirectional radiating means, comprising a plurality of directional antennas arranged on the conducting sheet around the first means, each oriented to radiate maximum radiation toward the first radiating means, said second means radiating a second frequency,
- D. Second transmitter means for sequentially energizing said second radiating means,
- E. Whereby the radiation center of said second radiating means effectively moves around said first omnidirectional radiation means.

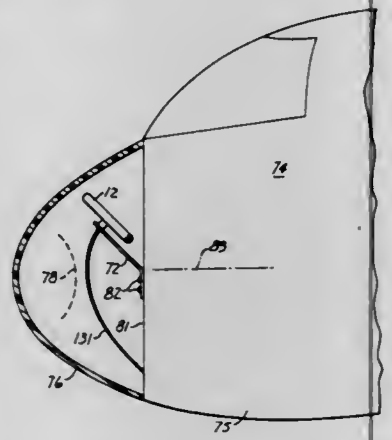
3,972,045
AIRCRAFT WITH TELEVISION SYSTEM

Ludwig A. Perret, La Canada, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 20, 1974, Ser. No. 471,253

Int. Cl.² H01Q *1/28*

U.S. Cl. 343—705 **4 Claims**



1. Apparatus for entertaining passengers in an aircraft, comprising in combination:

a rotary supporting structure including an essentially circular sheet;

means connected to said aircraft and to said rotary supporting structure for mounting said rotary supporting structure in said aircraft;

a set of antenna elements located on said circular sheet and constituting a directional television broadcast receiving antenna on said rotary supporting structure for receiving transmitted television signals;

means for selectively changing the orientation of said directional television antenna, including means coupled to said supporting structure for selectively rotating said supporting structure and means coupled to said supporting structure for selectively tilting said supporting structure relative to a horizontal plane through said aircraft; and

means connected to said directional television antenna for processing and displaying said received television signals inside said aircraft.

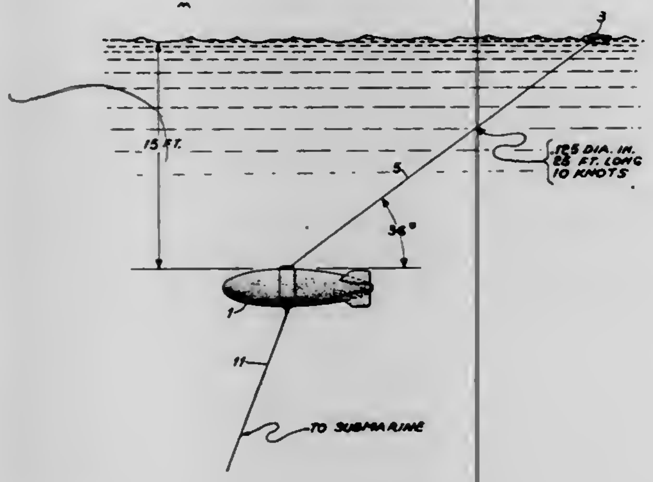
3,972,046
ANTENNA ARRANGEMENT FOR A SUBMERGED SUBMARINE

Anthony Joseph Lombardi, Flanders, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 25, 1975, Ser. No. 607,640

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—709 **9 Claims**



1. An antenna arrangement for a submerged submarine comprising:

a primary buoy;

a first electro-mechanical cable connecting said primary buoy to said submarine;

a secondary buoy carrying an antenna;

a second electro-mechanical cable having one end thereof connected to said secondary buoy and said antenna; and

a system contained within said primary buoy connected to the other end of said second cable to automatically control the deploying and the retrieving of said secondary buoy and to provide electrical continuity between said first and second cables.

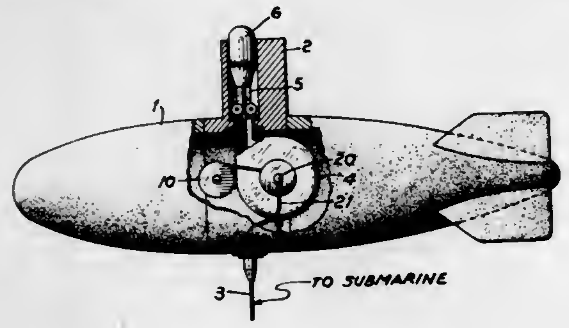
3,972,047
FLOATING CABLE ANTENNA SYSTEM

Anthony Joseph Lombardi, Flanders, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 25, 1975, Ser. No. 607,168

Int. Cl.² H01Q *1/34*

U.S. Cl. 343—709 **22 Claims**



1. A floating cable antenna system for a submerged submarine comprising:

a buoy;

an electro-mechanical cable connecting said buoy to said submarine;

an inflatable buoyant cable having a pressure accumulator containing a medium under a given pressure attached to one end of said buoyant cable adjacent the outer surface of said buoy;

a cable reel disposed in said buoy to store said buoyant cable, the other end of said buoyant cable being attached to said cable reel; and

an arrangement in said buoy associated with said buoyant cable and said cable reel to assist in deploying and retrieving said buoyant cable, said deploying and retrieving of said buoyant cable being under the control of sea pressure acting on said buoyant cable.

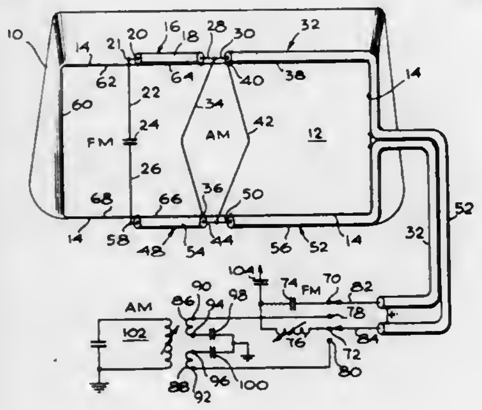
3,972,048
FM-AM WINDSHIELD ANTENNA

Ross Alan Davis, 724 Ala Moana Blvd., Honolulu, Hawaii 96813

Filed Nov. 29, 1974, Ser. No. 527,954

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—712 **8 Claims**



1. A vehicle body antenna system, including:

a window opening in said body, said opening having a conductive perimeter and being responsive to radio frequency fields in first and second spectral regions, respectively, to produce, between points along said perimeter, signal potentials corresponding to said fields;

said perimeter having a length greater than a resonant fraction of a wavelength at frequencies in said first spectral region and being small in relation to a resonant fraction of a wavelength in said second spectral region;

framing means including an electrical conductor and a series connected capacitor shunting a portion of the conductive perimeter for reducing, at frequencies in said first spectral region, the effective length of said perimeter;

conductive means medially located across said window for resonating said window in said second spectral region; and,

coupling means across said window for coupling to external circuits.

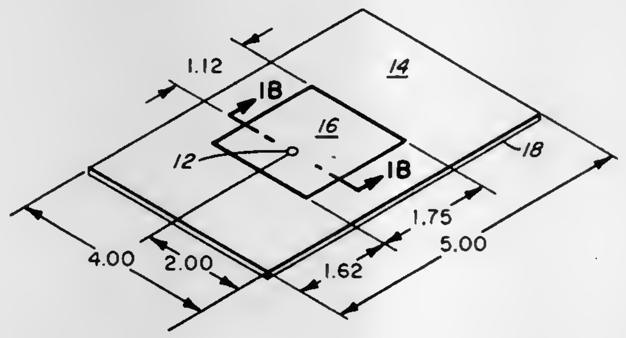
3,972,049
ASYMMETRICALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,158

Int. Cl.² H01Q *1/38*

U.S. Cl. 343—829 **11 Claims**



1. An asymmetrically fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiating element spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element having a feed point located along the centerline of the length thereof;

e. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;

f. the length of said radiating element determining the resonant frequency of said antenna;

g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said centerline between the antenna radiating element center point and the end of the radiating element in either direction without affecting the antenna radiation pattern;

h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width.

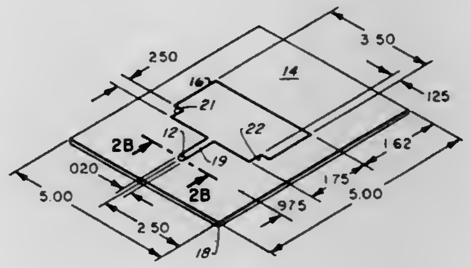
3,972,050
END FED ELECTRIC MICROSTRIP QUADRUPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,156

Int. Cl.² H01Q *1/38*

U.S. Cl. 343—846 **6 Claims**



1. An end fed electric microstrip quadrupole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiating element spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element having a feed point located at the end of the length on the centerline thereof;

e. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;

f. the length of said radiating element determining the resonant frequency of said antenna; the length of said radiating element being approximately one-half wavelength and the width being approximately one wavelength to provide quadrupole action;

g. said antenna operating in a degenerate mode with two oscillation modes occurring at the same frequency, oscillation in a dipole mode occurring along the length of the element and oscillation in a quadrupole mode occurring along the width of the element;

h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width.

3,972,051
AIR TURBULENCE CONTROL OF INFLIGHT INK DROPLETS IN NON-IMPACT RECORDERS

David E. Lundquist; Arvin D. McGregor, both of Birmingham, Mich., and Paul R. Hoffman, Exton, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 24, 1975, Ser. No. 625,811

Int. Cl.² G01D *15/18*

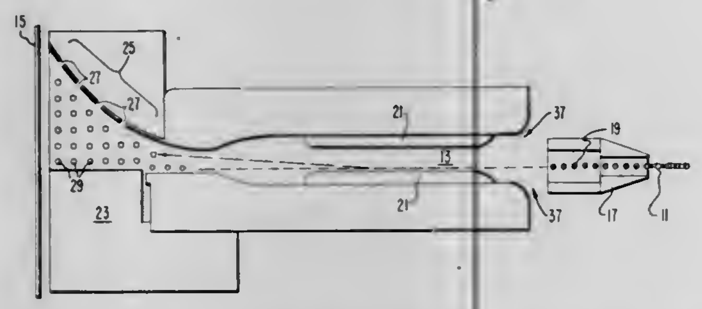
U.S. Cl. 346—1 **14 Claims**

13. A method of eliminating air disturbance effects on ink droplets which are directed onto a moving print medium in an ink jet printer, comprising the steps of:

passing a laminar flow of air collinear with droplet travel relative to the print medium of sufficient velocity to reduce relative air velocity of the droplets;

slowing the laminar flow of air in the proximity of the print medium;

turning the laminar flow of air away from the print medium in the region where the air flow slows; and



maintaining air laminarity of the flow in the region where the air flow changes its velocity.

3,972,052
COMPENSATION APPARATUS FOR HIGH SPEED DOT PRINTER

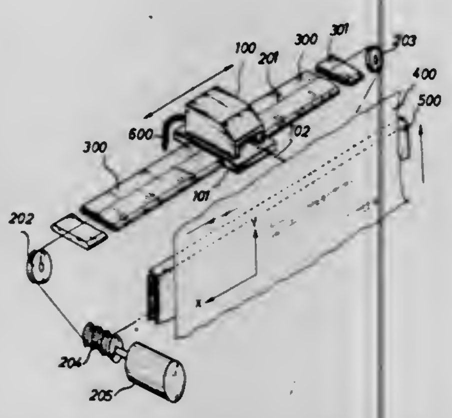
Shiro Atumi, Mitaka, and Kozo Yamada, Hachioji, both of Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Oct. 24, 1973, Ser. No. 409,289

Claims priority, application Japan, Dec. 28, 1972, 47-130205; Oct. 24, 1972, 47-105834

Int. Cl.² G01D *15/18*

U.S. Cl. 337 **5 Claims**



1. Compensation means for a printing apparatus which prints symbols formed by electrically charged ink dots deposited on a printing medium, said charged ink dots selectively being deflected to form said symbols, said printing apparatus comprising a nozzle means to supply ink to form an ink stream which is ejected onto said printing medium, means for splitting said ink stream into ink drops of uniform size having an equal spacing therebetween, charging means receiving voltage for charging said ink drops, at least a pair of main electrostatic deflection plates receiving a periodic voltage to deflect said charged ink drops in a main scanning direction, said symbol being formed by said ink drops selectively successively or non-successively being deposited as said ink drops are deflected in said main scanning direction and means for controlling said voltage applied to said charging means for forming the printed symbols, wherein the improvement comprises means for controlling the time when said voltage is applied to said charging means in response to the successive or non-successive deposition of adjacent ink drops.

3,972,053
INK DROP PRINTER WITH TRANSFER MEMBERS

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 421,425, Dec. 3, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 605,992

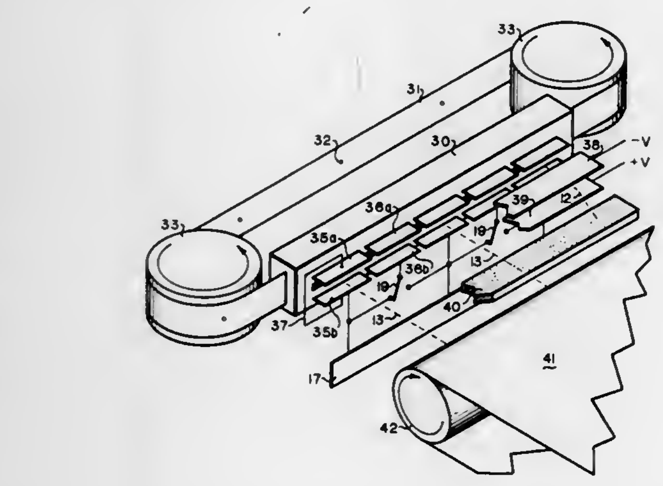
Int. Cl.² G01D *15/18, 9/00*

U.S. Cl. 346—75 **7 Claims**

1. A method of printing by selectively depositing liquid ink drops on a receiving surface in response to graphic information from a signal source, including the steps of

forming a plurality of equally spaced traversing ink drop trajectories,

projecting said ink drop trajectories toward a plurality of signal responsive selective structures having a linear array of signal members and transfer members, said transfer members switching between adjacent signal members, each member being separated from an adjacent member by a junction gap, and the spacing between the centers of similar members being equal to the spacing between said ink drop trajectories,



synchronizing switching of the transfer members with the position of the ink drop trajectories so that the signal members and the transfer members adjoining a junction gap are at the same selection intensity level when an ink drop trajectory is proximate to said junction gap, and

deflecting ink drops in said ink drop trajectories subject to said selection intensity levels so that ink drops selected for printing deposit on the receiving surface.

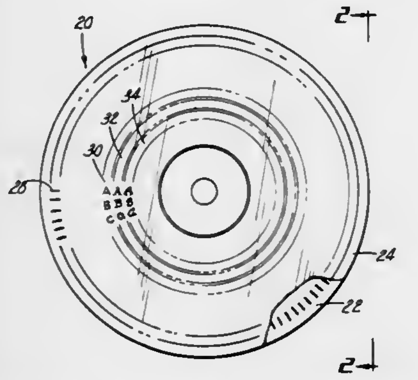
3,972,054
INDICIA DISC

Alfred H. Freericks, Hopatcong, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,706

Int. Cl.² B41B *17/32*

U.S. Cl. 354—15 **2 Claims**



1. A disc assembly for use as a font storage medium in a phototypesetting apparatus, comprising:

1. a transparent disc having a continuous planar front face substantially impervious to air flow thereto, said disc having a concentric form about an axis of rotation;
2. a flexible sheet member bearing graphic subject matter mounted contiguous to said disc concentrically of the axis of rotation of said disc, and clamp means holding said flexible sheet in the central area thereof in a tightly clamped condition to the central area of said disc to couple the disc and the sheet as an assembly in a non-rotatable relative relationship;
3. drive mounting means for rotating said disc and sheet member assembly about the area of clamped contact, whereby a rotative speed resulting in centrifugal expulsion of atmosphere from the interface of the disc and sheet will hold the sheet fixed to the plane established by the disc solely by pressure differential resulting in atmospheric pressure clamping of the sheet to the disc.

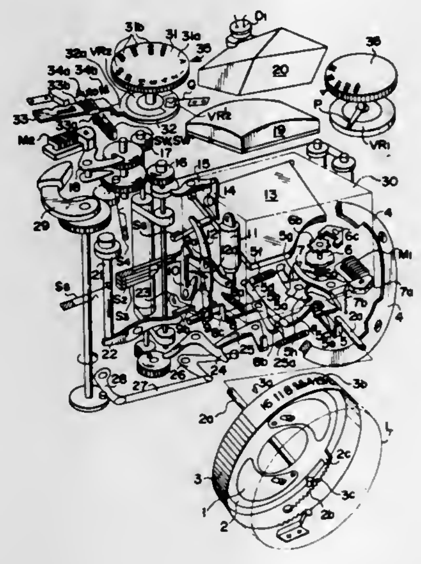
3,972,055
MULTI-EXPOSURE CONTROL DEVICE FOR CAMERAS

Motonobu Matsuda, Izumi; Norio Beppu, Sennan, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 21, 1975, Ser. No. 597,433

Int. Cl.² G03B *7/08*

U.S. Cl. 354—24 **4 Claims**



1. A multi-exposure control device for a camera, comprising:

- an objective lens and a variable diaphragm;
- means for automatically stopping-down said diaphragm from an open position prior to commencement of exposure in association with the release operation of the camera shutter mechanism;
- diaphragm adjusting means for stopping said diaphragm;
- means for selecting shutter speed providing a first mode for manual selection of shutter speed and a second mode for automatic shutter speed control;
- means for generating an output signal corresponding to the shutter speed manually selected in said first mode;
- means for producing an automatic exposure time control signal corresponding to the light passing through said objective lens and said diaphragm aperture;
- a diaphragm control circuit for comparing said automatic exposure time control signal with said output signal and enabling said diaphragm adjusting means to stop the diaphragm when a predetermined relationship exists between said output signal and said automatic exposure time control signal;
- means for stopping said diaphragm at a manually selected aperture;
- means for terminating exposure;
- an exposure time control circuit for controlling said means to terminate exposure in accordance with said automatic exposure time control signal;
- a switching member movable between a first position for effecting manual exposure control based on manually selected shutter speed and diaphragm aperture and a second position for effecting automatic exposure control for automatically controlling said diaphragm aperture and shutter speed; and
- means for connecting said output signal to said exposure time control circuit and for disconnecting said automatic exposure time control signal to said exposure time control circuit with said switching member in said first position.

3,972,056
VARIFOCAL LENS ASSEMBLY

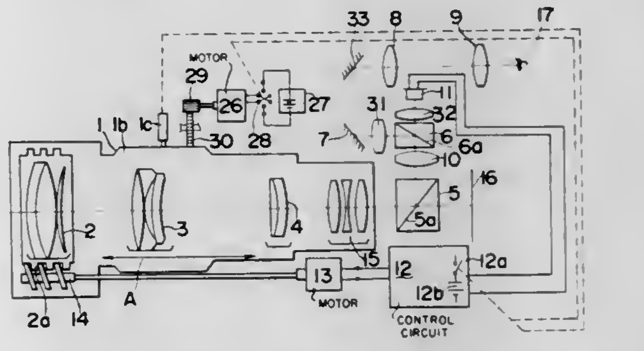
Kayoshi Tsujimoto, Osaka; Tohru Matsui; Haruo Abe, both of Sakai, and Mitsuaki Horimoto, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1974, Ser. No. 529,596

Claims priority, application Japan, Dec. 14, 1973, 48-140508

Int. Cl.² G03B *7/08;* **G01J** *1/20*

U.S. Cl. 354—25 **6 Claims**



1. A varifocal lens assembly for use with a camera having a focal plane where an image of an object to be focused is projected, which comprises a lens barrel adapted to be coupled to said camera, an objective lens means supported within said lens barrel and including a plurality of lens groups other than a compensator lens group, a focal length varying means coupled to a first one of said lens groups for axially moving said first one of said lens groups along said lens barrel for varying the focal length of the varifocal lens assembly, adjusting means coupled to said varifocal lens assembly for adjusting the position of at least part of the varifocal lens assembly to adjust the position of the image plane formed by said varifocal lens assembly to compensate for the shift of the image plane resulting from the movement of said first lens group, means for detecting the position of the image plane where the object image is formed through said varifocal lens assembly and for subsequently generating an electric output signal in response to displacements between said image plane and the focal plane of the camera, and control means for operating said adjusting means in response to said electric output signal to bring said image plane into alignment with said focal plane.

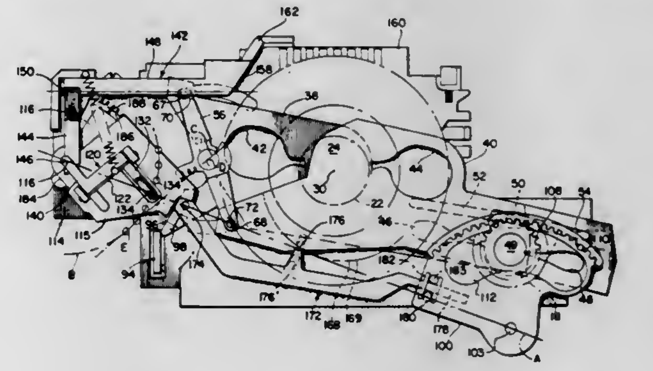
3,972,057
EXPOSURE CONTROL SYSTEM WITH FOLLOW FOCUS CAPABILITY

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,926

Int. Cl.² G03B *7/16*

U.S. Cl. 354—27 **33 Claims**



1. An exposure control mechanism for photographic apparatus of the type having a housing and an optical objective mounted on the housing comprising:

focusing means moveable to adjust the optical objective along an optical path;

exposure means having at least one element movable along a locus of travel and defining a range of apertures over the optical path in correspondence with said element movement;

first means disposed for rotation about a first pivot point in spaced relation with respect to said exposure element locus of travel for arresting movement of said exposure element along said locus of travel to define a select maximum aperture value out of said range of apertures on the optical path, said first means also including an interceptor edge;

second means for rotating said first means about said first pivot point in order to position said interceptor edge at a location along said locus of travel defining said select maximum aperture wherein said second means includes a rigid adder link member drivably contacting said first means and disposed for at least rotational movement with respect to a second pivot point spaced apart from said first pivot point; and

cam means movable in correspondence with said focusing means movement and drivably contactable with said adder link member for causing said adder link member to rotate said first means about said first pivot point in order to locate said interceptor edge at a select position establishing said select maximum aperture in correspondence with the distance at which the photographic scene is focused from the optical objective.

3,972,058

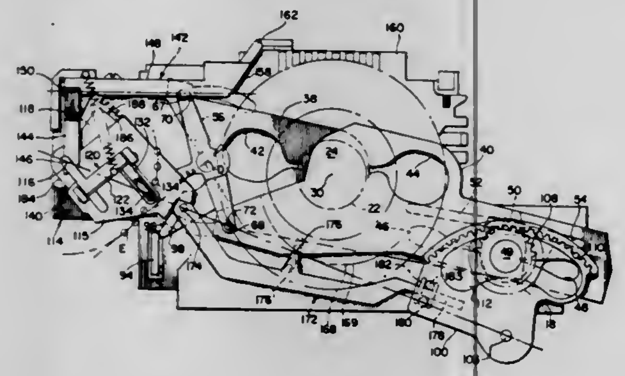
FOLLOW FOCUS INTERCEPT ACTUATING SYSTEM FOR PHOTOGRAPHIC APPARATUS

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,925

Int. Cl.² G03B *7/00*

U.S. Cl. 354—149 **27 Claims**



1. Apparatus for a camera including a housing and an objective lens mounted on said housing and defining a film plane, said apparatus comprising:

a socket mountable on the housing and configured to receive at least one terminal element connecting to a source of artificial light;

a blade assembly movable along a predetermined path between a first position wherein it precludes scene light from reaching the film plane and a second position wherein it defines a maximum size aperture, said blade assembly serving to define a range of progressively increasing sized apertures as it moves from its said first position to its said second position;

an actuator mounted for displacement with respect to said socket wherein a portion of said actuator is normally disposed adjacent said socket to automatically be engaged and displaced by the terminal element of the artificial light source as it is inserted into said socket;

an interceptor; and

means for connecting said interceptor to said actuator, said connecting means being configured and arranged to position said interceptor in spaced apart relation relative to the plane of said predetermined path so as not to interfere with the movement of said blade between its said first and second positions prior to the insertion of the terminal element of the source of artificial light into said socket and to cause said interceptor to be displaced transversely, responsive to said actuator being displaced when the terminal element of the source of artificial light is inserted into said socket, into said predetermined path so that it will be operative to restrain the movement of said blade assembly as said blade assembly moves from its said first position towards its said second position, said interceptor thus serving to establish the largest aperture to be defined by said blade assembly at such times.

3,972,059

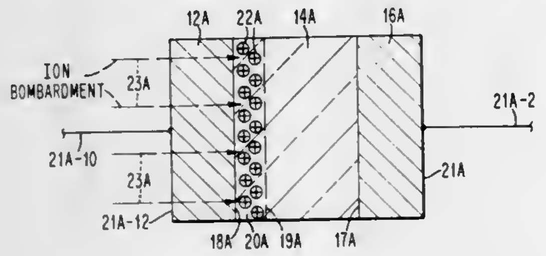
DIELECTRIC DIODE, FABRICATION THEREOF, AND CHARGE STORE MEMORY THEREWITH

Thomas Herman DiStefano, Tarrytown, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,460

Int. Cl.² H01L *49/02, 29/12, 29/88, 29/34*

U.S. Cl. 357—6 **6 Claims**



1. A multilayer diode operable with relatively low reverse bias leakage current and with relatively large forward bias Fowler-Nordheim tunneling current comprising:

a conductive anode electrode;

a first insulator layer adjacent to said anode electrode comprised of an insulator selected from the group of insulators consisting of SiO_2 and Al_2O_3, said insulator layer and said anode electrode having a relatively high contact energy barrier therebetween;

a second insulator layer adjacent to said first insulator layer comprised of an oxide of a metal selected from the group consisting of Nb, Ta, V, W, Hf, and Mn, said second insulator layer including a given concentration of substantially immobile excess positive ions and having thickness less than approximately 100 A; and

a metallic cathode electrode comprised of a metal selected from the group of metals consisting of Nb, Ta, Al, V, W, Hf and Mn adjacent to said second insulator layer, said cathode electrode said second insulator layer having a relatively low energy contact barrier therebetween due to said positive ions.

3,972,060

SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

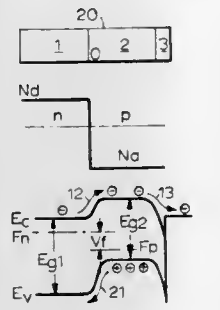
Filed Mar. 18, 1974, Ser. No. 451,754

Claims priority, application Japan, June 28, 1973, 48-72293

Int. Cl.² H01L *29/161, 27/14, 29/20*

U.S. Cl. 357—30 **2 Claims**

1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms in thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons and whose effective forbidden band gap is smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination and emitted from said surface of said second layer.



3,972,061

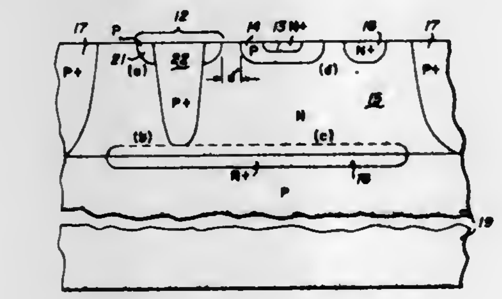
MONOLITHIC LATERAL S.C.R. HAVING REDUCED "ON" RESISTANCE

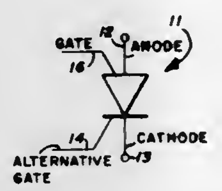
Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 511,289, Oct. 2, 1974, abandoned, which is a continuation of Ser. No. 385,348, Aug. 3, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,378

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **11 Claims**





1. In a monolithic lateral silicon controlled rectifier of the type having PNP and NPN transistor portions:

a silicon semiconductive body having laterally spaced first P, first N, second P, and second N type conductivity regions to define a lateral silicon controlled rectifier semiconductive structure, said first and second P and said second N type regions being embedded in said first N type region; and further said second N type region being embedded in said second P type region

said semiconductive member having an N+ type conductivity subcollector layer underlying said P, N, P and N regions in contiguous relation with said first N type region; and

said first P type conductivity region including a portion extending below the depth of said second P type region toward said underlying N+ subcollector layer for defining with said N+ subcollector and said second P type region a vertical PNP transistor portion of the silicon controlled rectifier, such vertical PNP transistor portion having a current gain which is relatively small compared to the current gain of the NPN transistor portion and for reducing the anode-to-cathode on resistance of the silicon controlled rectifier structure and the product of the current gains of the PNP and NPN transistor portions of said silicon controlled rectifier being greater than one.

3,972,062

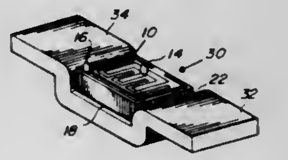
MOUNTING ASSEMBLIES FOR A PLURALITY OF TRANSISTOR INTEGRATED CIRCUIT CHIPS

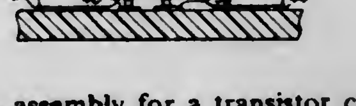
Gene P. Hopp, Wheeling, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 403,370, Oct. 4, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,941

Int. Cl.² H01L *23/48, 23/02, 25/04, 29/44*

U.S. Cl. 357—68 **8 Claims**





1. A mounting assembly for a transistor chip including a body portion having a first surface and an opposite surface, base and emitter electrodes extending predeterminedly from said first surface and a collector electrode formed along said opposite surface, said mounting assembly including in combination; said transistor chip and a support member of conductive material, the support member having a central cavity therein having a floor and portions adjacent said cavity comprising support feet extending laterally outwardly from said cavity on opposite sides thereof and having an upper surface, a tinned coating adhered to the support member including the cavity and the upper surface of the support feet, said cavity measured from said floor to the upper surface of said laterally extending portions being of a depth equal to the height of said transistor chip as measured from the free ends of said base and emitter electrodes to said collector electrode, said transistor chip being received in said cavity with said collector electrode being joined mechanically and electrically to the floor of the cavity, said base and emitter electrodes extending outwardly of said cavity such that the free ends of said electrodes are coplanar with the upper surface of said support feet.

3,972,063

VAPOR COOLED SEMICONDUCTOR DEVICE ENCLOSED IN AN ENVELOPE HAVING A COMPRESSION MECHANISM FOR HOLDING SAID DEVICE WITHIN SAID ENVELOPE

Yoshio Kimura; Hiroshi Mitsuoka, and Isamu Hosono, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,924

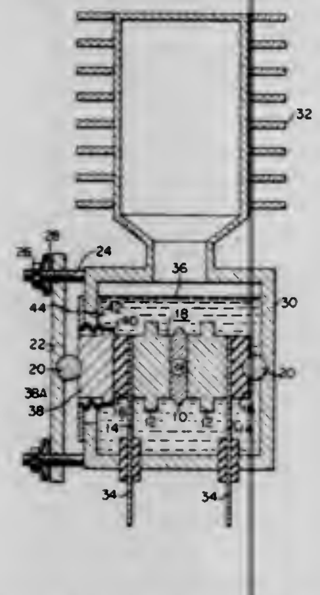
Claims priority, application Japan, Oct. 19, 1973, 48-117620; Nov. 10, 1973, 48-126989

Int. Cl.² H01L *25/04, 23/42, 23/44, 23/46*

U.S. Cl. 357—82 **18 Claims**

1. A vapor-cooled semiconductor device, said device comprising:

an envelope having at least one side wall with an opening therethrough;
a semiconductor stack fitted within said envelope with one end directed toward said opening, said stack comprising:
a pair of heat-dissipation blocks,
at least one semiconductor element sandwiched between said dissipation blocks,
at least two electrodes, one on each side of said dissipation blocks opposite the side contacting said semiconductor element, said electrodes extending through said envelope wall, and



electrical insulation against the sides of said electrodes opposite the sides thereof contacting said heat dissipation blocks;
sealing and pressurizing means fitted through said opening in said envelope and adjacent said semiconductor stack for hermetically closing said opening, pressurizing said envelope and holding said semiconductor stack within said envelope; and
cooling fluid partially filling said sealed envelope surrounding said stack, whereby said semiconductor element is cooled by the latent heat of vaporization of said cooling fluid.

3,972,064

APPARATUS AND METHODS FOR PLAYBACK OF COLOR PICTURE/SOUND RECORDS

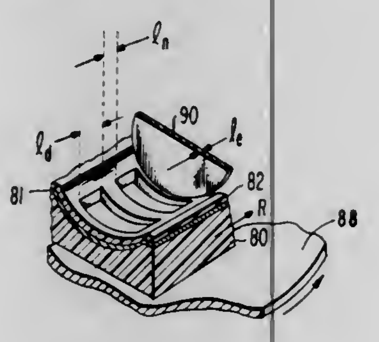
Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 441,069, Feb. 11, 1974. This application Dec. 9, 1974, Ser. No. 531,138

Claims priority, application United Kingdom, Mar. 20, 1973, 13234/73

Int. Cl.² H04N *5/76*

U.S. Cl. 358—4 **2 Claims**



1. Playback apparatus, for use with a disc record having a spiral groove containing an information track in the form of a succession of groove bottom geometry variations representative of associated color picture and sound information components, said playback apparatus comprising the combination of:

means including a record supporting turntable for rotating said disc record;
means, comprising a stylus having a groove-entering tip including a conductive electrode, for developing capacitance variations representative of the successive groove bottom geometry variations in the information track of said record under conditions of groove reception of said stylus tip and rotation of said record;
capacitance variation detecting means coupled to said stylus for developing, in response to said capacitance variations, an impulse train having a relatively high repetition rate which varies in accordance with a composite color video signal inclusive of a luminance signal component occupying a predetermined band of frequencies and a chrominance signal component sharing a midband portion of said predetermined band, and having a duty cycle which varies in cyclical fashion at a relatively low frequency which varies in accordance with said sound information components;
first band pass filter means responsive to the output of said detecting means and having a passband encompassing the variation range for said relatively low frequency and sideband regions adjacent thereto to the exclusion of the variation range for said relatively high repetition rate and to the exclusion of said midband portion of said predetermined band;
first FM demodulator means responsive to the output of said first bandpass filter means, for recovering said sound information components;
second band pass filter means responsive to the output of said detecting means and having a pass band encompassing the variation range for said relatively high repetition rate and sideband regions adjacent thereto to the exclusion of the variation range of said relatively low frequency; and
second FM demodulator means, responsive to the output of said second bandpass filter means, for recovering said composite color video signal.

3,972,065

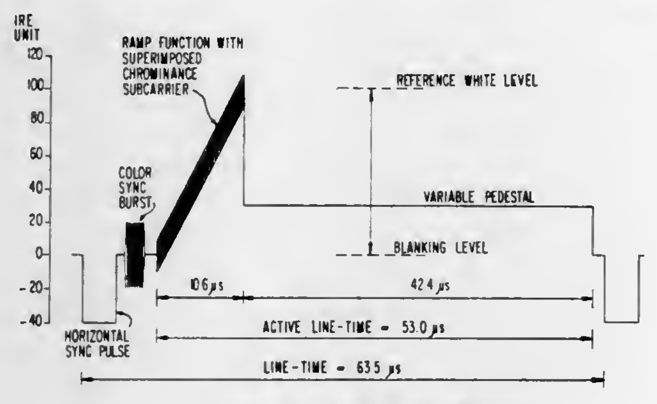
METHOD OF TESTING COLOR TELEVISION SYSTEMS

Melville Lynwood Helges, Jr.; Leonard Golding, both of Rockville, and Bela Banyasz, Kensington, all of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed June 30, 1975, Ser. No. 591,673

Int. Cl.² H04N *9/62*

U.S. Cl. 358—10 **4 Claims**



TV TEST SIGNAL WITH LINE-TO-LINE CORRELATION

1. A method of testing both analog and digital color television systems comprising:

generating a single test signal having a duration equal to the active line-time of one full line-time duration defined as the time between the leading edges of two consecutive horizontal synchronizing pulses, said test signal being composed of a linear ramp function having superimposed thereon a chrominance subcarrier for twenty percent of the duration of the active line-time and a variable amplitude pedestal for eighty percent at the duration of the active line-time,
applying said test signal to television equipment under test, and
measuring both the differential-phase and differential-gain of the television equipment under test.

3,972,066

METHOD FOR IMAGE REGULATION OF COLOR MONITORS IN PROOF-VIEWING AND AN APPARATUS THEREFOR

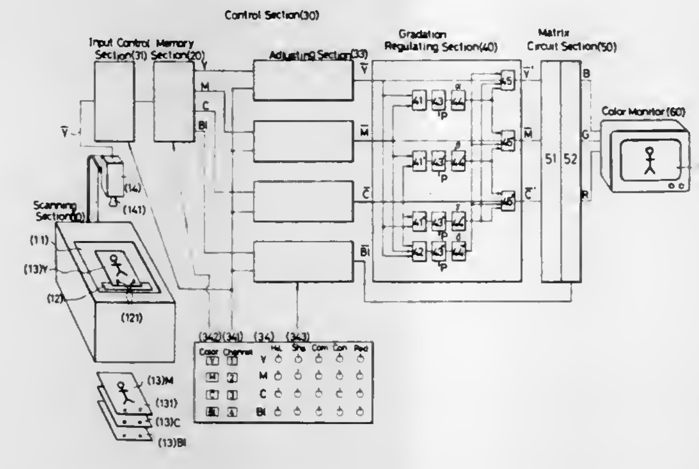
Ikuo Seki, Tokyo, and Masahiko Kato, Kodaira, both of Japan, assignors to Toppan Printing Co., Ltd. and Hitachi Electronics Ltd., both of Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,367

Claims priority, application Japan, May 31, 1974, 49-61504

Int. Cl.² H04N *9/02*

U.S. Cl. 358—76 **6 Claims**



1. A method for image regulation of a color monitor in proof-viewing which comprises the steps of: scanning a plurality of separation films, each film having one primary color, to obtain a like plurality of primary color picture signals; obtaining each of a plurality of secondary color picture signals from an NAM (Non-Additively Mixing) portion which is derived by detecting the maximum value of each respective one of all combinational pairs of said primary color picture signals; obtaining a tertiary color picture signal from the NAM portion which is derived by detecting the maximum value of a combination of all said primary color picture signals; regulating said secondary and tertiary color picture signals by multiplying regulation factors; correcting the gradations of said primary color picture signals by said regulated secondary and tertiary color picture signals; and producing an image on the color monitor screen wtih said corrected primary color picture signals and said tertiary color picture signal.

3,972,067

COLOR VIDEO SYNTHESIZER WITH MONOCHROME INPUT

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, New York, N.Y.

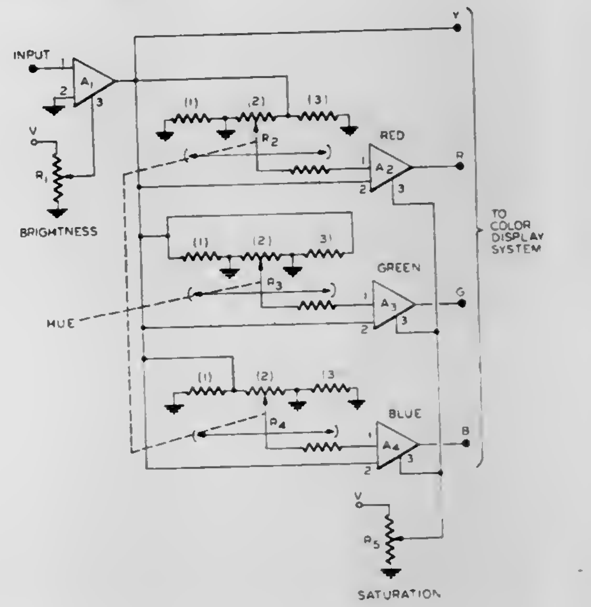
Filed Jan. 17, 1975, Ser. No. 541,844

Int. Cl.² H04N *9/02;* **G05F** *3/02;* **G09B** *9/08*

U.S. Cl. 358—81 **10 Claims**

2. Apparatus for presenting full color video signals to a color display system wherein the input signal to said apparatus is a video signal which may have no color content of its own, said apparatus comprising:

means to divide said input signal into at least three pair of signal paths;
means to simultaneously variably apportion among first ones of each pair of signal paths the level of said divided input signal appearing there;
means to add the signals on the first and second ones of each pair of signal paths in a simultaneously controlled manner such that the contribution to the sum signal from one signal path of said pairs will be descreased while the contribution from the other signal path of said pair will be increased; and



means to present each of said summed signal pairs to a color display system as color information signals; and
means to present a portion of said input signal to said color display system as a luminance signal.

3,972,068

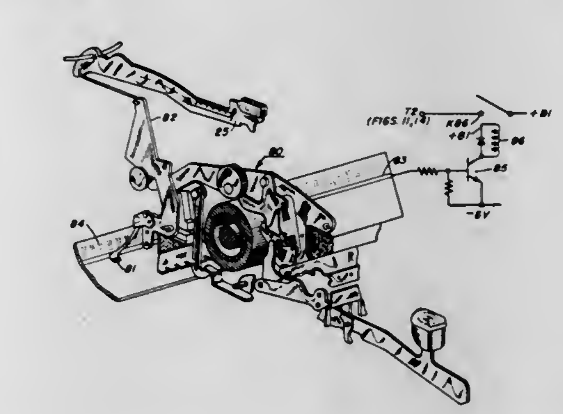
SYSTEM FOR TRANSLATING MAGNETICALLY ENCODED DATA TO VISUALLY READABLE CHARACTERS CORRESPONDING THERETO

Joseph R. Andreaggi, Short Hills; Robert J. Graf, Newark, and Matthew J. Relis, Teaneck, all of N.J., assignors to Joseph R. Andreaggi, Short Hills, N.J.

Division of Ser. No. 250,872, May 8, 1972, Pat. No. 3,823,405. This application Dec. 28, 1973, Ser. No. 429,680

Int. Cl.² G11B *5/00, 5/55*

U.S. Cl. 360—4 **2 Claims**



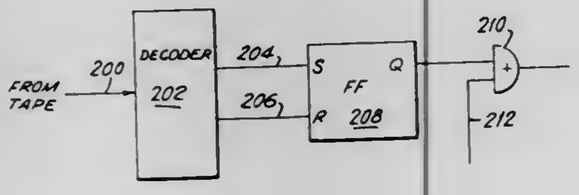
1. A system for translating a plurality of magnetically encoded tracks of data on one side of a flexible medium into corresponding visually readable characters comprising:

a drum of substantially cylindrical shape mounted for rotation about an axis thereof;
means mounting the medium on the exterior surface of said drum with the one side facing outwardly thereof and oriented such that at least certain ones of the data tracks are aligned substantially perpendicularly with said axis;
a magnetic read head mounted to contact the medium;
means for stepping said head in directions substantially parallel to said axis across a portion of the medium;
a portion of said drum extending substantially parallel to said axis providing an axially extending zone wherein the drum surface is devoid of magnetized data;
means responsive to the rotation of said drum coupled to the stepping means for synchronizing the stepping means to advance said head from one data track to another when the drum portion is opposite said head; and

means responsive to the electrical output of said head from printing visually readable characters representing the magnetic data on the medium.

3,972,069
MAGNETIC TAPE CONTROL SYSTEM CIRCUIT FOR SELECTIVELY BLOCKING THE EFFECT OF PARITY-CHECK CHARACTERS

Zane Frentress, Greenville, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 327,411, Jan. 29, 1973, which is a division of Ser. No. 185,689, Oct. 10, 1971, Pat. No. 3,741,139. This application May 28, 1974, Ser. No. 473,882
Int. Cl.² G11B *5/09*
U.S. Cl. 360—48 **3 Claims**



1. A circuit for use with a data store, a data reader, and a utilization device for said data, said data store having a plurality of pairs of records interleaved with each other and a parity character unequally spaced between successive pairs of said records so as to be closer to the pair of records on one side than to the pair or records on the other side, each of said pairs of records having at one of its ends a stop-command-forward character and at the other of its ends a stop-command-reverse character, said circuit comprising: gate means for passing read data, including data embodied in said parity character, from the data reader to the utilization device; means for identifying said stop-command-reverse character and said stop-command-forward character; and means for disabling said gate means in response to identification of one of said stop-command characters at the end of a record farther from the parity character between that record and the next record and for enabling said gate means in response to identification of the other of said stop-command character; at the beginning of a next record, whereby data corresponding to said parity character will not be passed to said utilization device.

3,972,070
MODE SELECTOR LOCKOUT MECHANISM FOR A CASSETTE TAPE RECORDER/REPRODUCER

Gary P. Fukayama, Roselle, Ill., and Laszlo N. Repay, Chagrin Falls, Ohio, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 16, 1974, Ser. No. 433,961
Int. Cl.² G11B *23/04, 15/44, 19/16*
U.S. Cl. 360—77 **10 Claims**

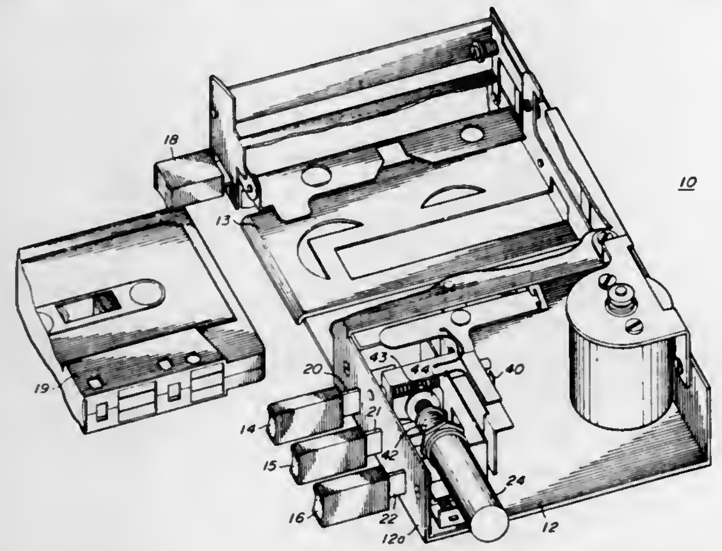
1. A mode selector mechanism for use in a magnetic tape recorder/reproducer device adapted for receipt of a tape cassette, and having a housing, a cassette receiving opening and a tape drive mechanism, the combination including:

a plurality of actuators mounted in said housing and including at least a play and a record actuator, each having a plunger arm portion extending outwardly therefrom and each being slideably movable between an at rest position and an operative position,

connector means coupled to said tape drive mechanism and engageable with at least one of said actuator plunger arm portions for actuating the tape drive mechanism to an operative condition with respect to said tape cassette,

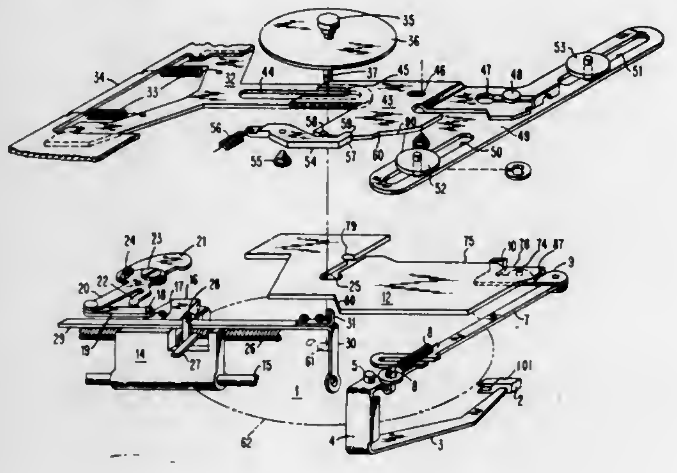
means mounted in the housing having an arm movable between an unoperated and operated position in accordance with the insertion of a cassette into the receiving opening for activating the mode selector mechanism, and,

actuator locking means positioned in the housing and having a first portion engaged by said arm, said first portion of said locking means being movable from a first position to a second position when said arm is in said operated position, said portion, when in said second position, being selectively engageable with at least one of said actuator plunger arms with the same being moved to the operative position to hold the said plunger arm in said last-mentioned position, said first portion being moved from the second to the first position to prevent movement of said actuator to the operative position, said locking means further including a second portion engageable by said play actuator arm when the latter is moved to said operative position, said second portion being moved from a first to a second position to prevent the movement of the record mode selector plunger arm portion to an operated position while said play actuator is in said operative position.



3,972,071
PORTABLE RECORDER CONTROL APPARATUS

William Marshall Arrington, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 27, 1975, Ser. No. 590,763
Int. Cl.² G11B *15/10, 15/24, 19/02, 19/18*
U.S. Cl. 360—86 **10 Claims**



1. A portable recorder control apparatus for both facilitating the performance of multiple dictation functions and performing record media handling operations through manipulation of a single button, said apparatus comprising:

a. first means operable by said button for causing a recorder to be conditioned for performing said dictation functions upon positioning said button in dictation function locations along a function and operation path;

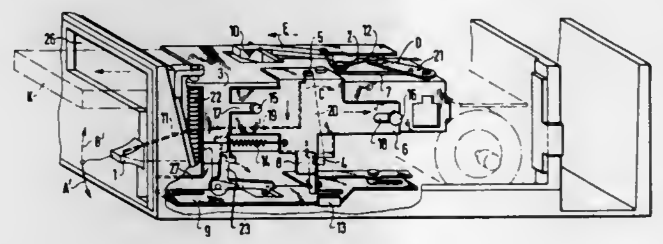
b. means for causing a record medium to be unloaded from said recorder;

c. means for causing a transducer to be repositioned during unloading of said record medium; and

d. second means operable by said button and including 1) means for causing said record medium to be unloaded by said unloading means, and 2) means for causing said transducer to be repositioned by said repositioning means, as said button is moved along said path to an operation location.

3,972,072
DEVICE FOR INTRODUCING AND EJECTING A MAGNETIC TAPE CASSETTE FOR A MAGNETIC TAPE RECORDER

Oskar Hubert Richt, Socking, Germany, assignor to Uher Werke Munchen, Munich, Germany
Filed May 8, 1974, Ser. No. 468,082
Claims priority, application Germany, May 8, 1973, 2323171
Int. Cl.² G11B *23/06, 15/24*
U.S. Cl. 360—93 **9 Claims**



1. A cassette introduction and ejection device for a tape recorder comprising, in combination, a cassette mounting lift arranged for pivotal movement between an upper inoperative position and a lower operative position, means for yieldingly urging said lift into said upper position, releasable locking means for locking said lift in said operative position, cassette gripping means slidably mounted on said lift, a dead center spring connected at one end to said cassette gripping means, linkage means operatively connected between said lift and the other end of said dead center spring, an operating element pivotally mounted on said lift in operative association with said linkage means, stop means on said lift, means for yieldingly urging said linkage means into a first position against said stop means to position said operating element in an intermediate position and to condition said dead center spring for movement of said gripping means in one direction to carry an inserted cassette into a fully inserted position in said lift, said operating element being pivotally movable downwardly from said intermediate position to move said lift into said lower operative position and to permit locking engagement between said locking means and said lift, said operating element being pivotally movable upwardly from said intermediate position to release said lift locking means for movement of said lift into said upper inoperative position by said urging means and to move said linkage means into a second position to condition said dead center spring for movement of said cassette gripping means in the opposite direction to reject said inserted cassette from said lift.

3,972,073
AUTOMATIC TAPE CARTRIDGE EJECTION MECHANISM FOR MULTITRACK CARTRIDGE PLAYERS

Edwin Stanley Bara, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 23, 1974, Ser. No. 535,773
Int. Cl.² G11B *25/04, 15/10, 15/29*
U.S. Cl. 360—93 **9 Claims**

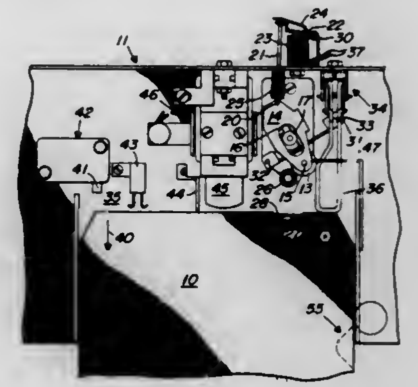
1. In a magnetic tape recorder/reproducer mechanism for utilizing a multitrack tape cartridge, a device for ejecting the cartridge, the device comprising:

a capstan;

lever means for ejecting the cartridge;

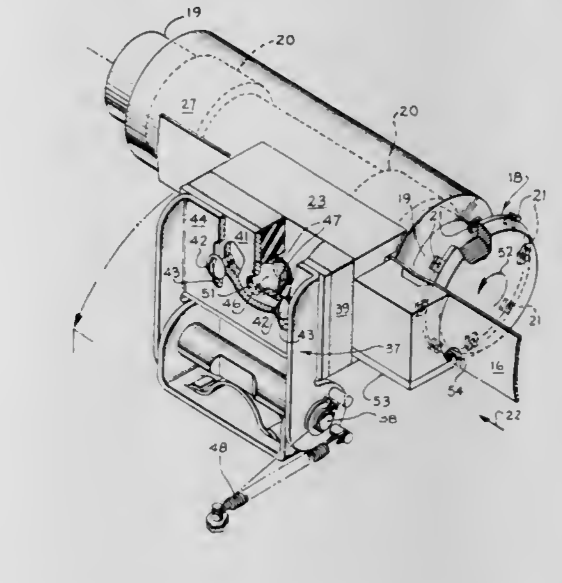
friction means for transferring actuating force from the capstan to the lever means, and including a movable support member, a linking means for activating the support member, a friction roller rotatably mounted on the support member, the roller deriving power for ejection from the capstan; and

electromagnetic means for actuating the linking means and the movable support member to bring the friction roller into wedging contact with the rotating capstan and a portion of the lever means, whereby the lever means is activated.



3,972,074
TAPE GUIDE ASSEMBLY FOR ROTATING HEAD

Charles A. Vogel, San Jose, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.
Filed Feb. 10, 1975, Ser. No. 548,236
Int. Cl.² G11B *15/60*
U.S. Cl. 360—130 **4 Claims**



1. A tape guide assembly for registering one side of a longitudinally moving record tape with a transducer moving in a plane disposed crosswise to the direction of movement of the tape, said guide assembly comprising a cylindrical barrel disposed alongside the path of said tape with the tape moving lengthwise of and in spaced relation to said barrel, said transducer rotating coaxially of said barrel in a transverse plane at a predetermined radius therein, a female guide including an elongate body portion having a relieved side portion confronting said barrel with the tape moving lengthwise between and in spaced relation to said relieved side portion and said, a pair of cylindrically shaped registration lands carried by said body portion and flanking said transverse plane, said registration lands engaging and registering the other side of said tape, the radius of said lands being sufficiently less than said predetermined radius to cause said transducer to uniformly engage and transduce a path crosswise of said tape, a plurality of pairs of surface portions carried by said body portion, each of the last named surface portions lying in an imaginary cylinder having a radius corresponding to the radius of said lands and taken about a center common to said lands and said surface portions, said surface portions of each pair engaging said barrel adjacent opposite edges of the tape, one said pair being displaced axially along said barrel from another said pair.

DESIGN PATENTS

GRANTED JULY 27, 1976

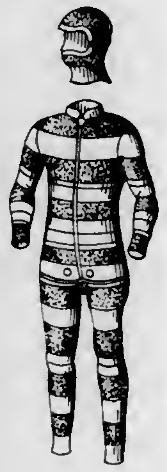
ERRATA

For CLASS	See PATENT NO.
025-089	240,724
025-075	240,725
023-058	240,727
016-008	240,766
016-026	240,765

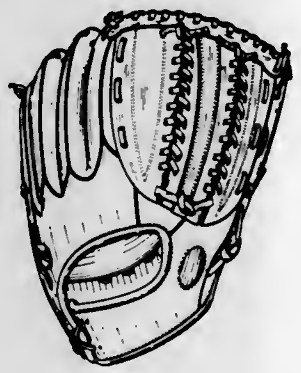
DESIGNS

JULY 27, 1976

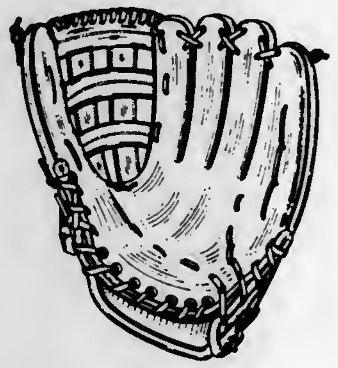
240,670
WET SUIT
Eric Gewirz, 7110 Crail Drive
Bethesda, Md. 20034
Filed Oct. 11, 1974, Ser. No. 514,075
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29



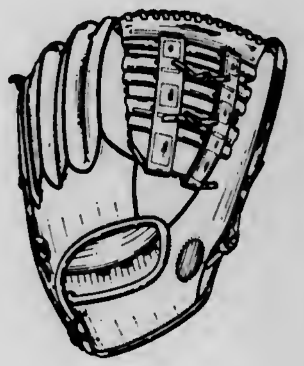
240,671
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,502
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



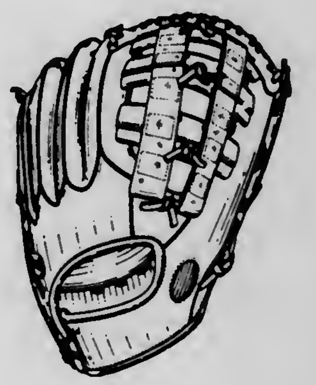
240,672
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,519
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



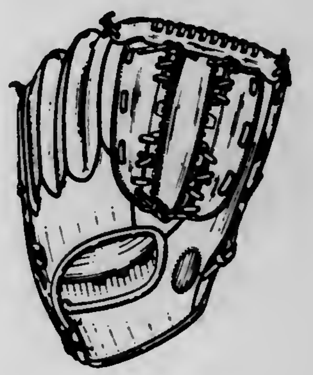
240,673
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,520
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



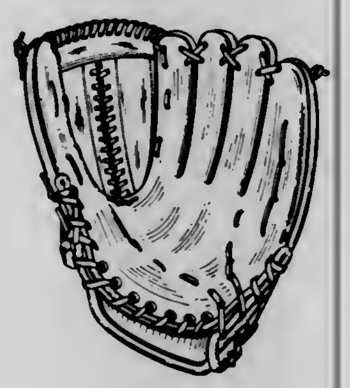
240,674
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,566
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



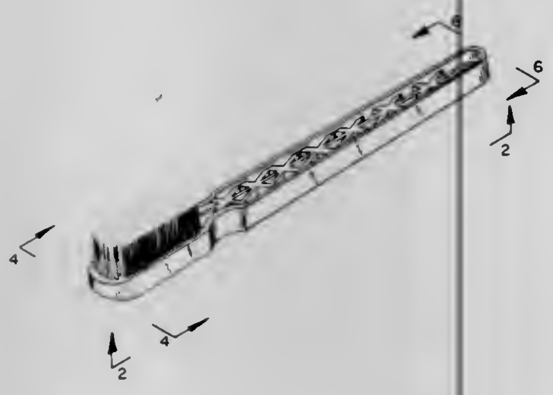
240,675
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,567
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



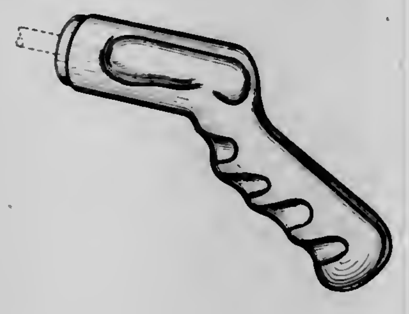
240,676
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,568
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



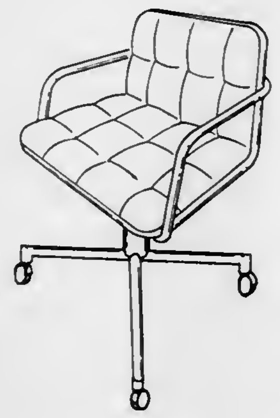
240,677
TOOTHBRUSH
Dallas Glenn Thompson, 250–A W. Vista Way,
Vista, Calif. 92083
Filed Apr. 24, 1975, Ser. No. 571,409
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



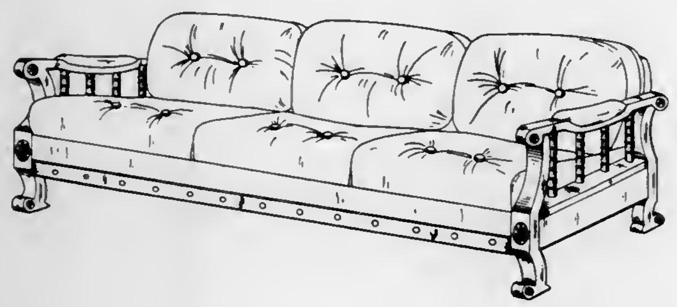
240,678
HANDLE FOR PAINT ROLLERS AND BRUSHES
Else Herig, Rechtenstein, Germany, assignor to
H. L. Sterkel AG, Comet-Pinselfabrik
Filed Oct. 21, 1974, Ser. No. 516,680
Claims priority, application Germany May 18, 1974
Term of patent 7 years
Int. Cl. D4—*04;* D8—*05*
U.S. Cl. D4—38



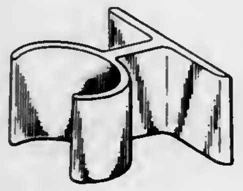
240,679
CHAIR
Charles Bernard, Montreuil-sous-Bois, France,
assignor to Airborne S.A.
Filed Mar. 20, 1972, Ser. No. 236,566
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



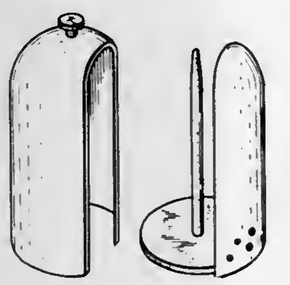
240,680
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Rte. 1, Riverhill Drive,
Johnson Creek, Wis. 53038
Filed Aug. 30, 1973, Ser. No. 392,854
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—62



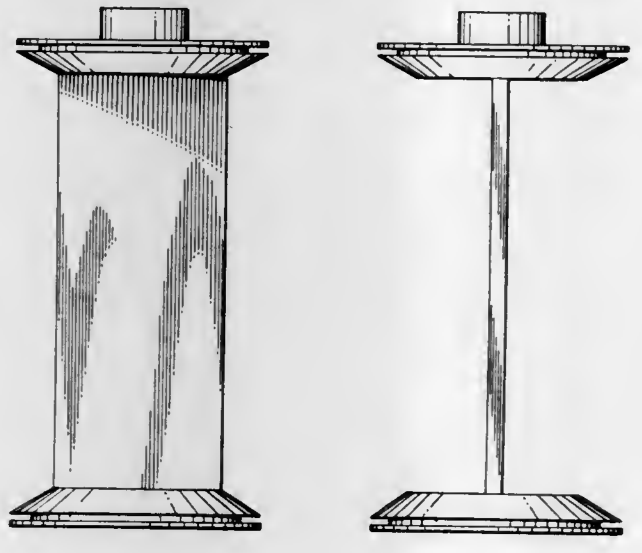
240,681
SUPPORT FOR RAZORS OR THE LIKE
Vincent J. Granatelli, Santa Monica, Calif, assignor to
Paxton Products, Inc., Santa Monica, Calif.
Filed July 25, 1975, Ser. No. 599,069
Term of patent 14 years
Int. Cl. D6—*04;* D8—*02;* D23—*02*
U.S. Cl. D6—88



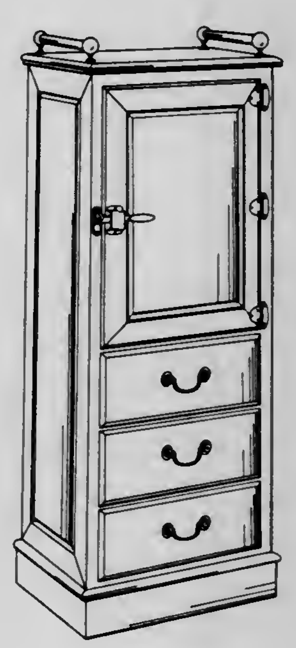
240,682
CONTAINER FOR TOILET TISSUE ROLLS AND TOILET BOWL BRUSHES AND THE LIKE
Gwendolyn Robles, 917 Sheridan Ave.,
Bronx, N.Y. 10451
Filed Mar. 25, 1975, Ser. No. 561,781
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02*
U.S. Cl. D6—97



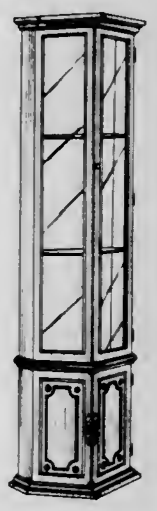
240,683
COMBINED AIR CIRCULATOR AND ROOM DIVIDER
Don A. Taylor, 216 Mills St.,
Wadsworth, Ohio 44281
Filed Dec. 30, 1974, Ser. No. 537,790
Term of patent 14 years
Int. Cl. D6—*06;* D23—*04*
U.S. Cl. D6—139



240,684
VERTICAL BAR OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW.,
Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,509
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



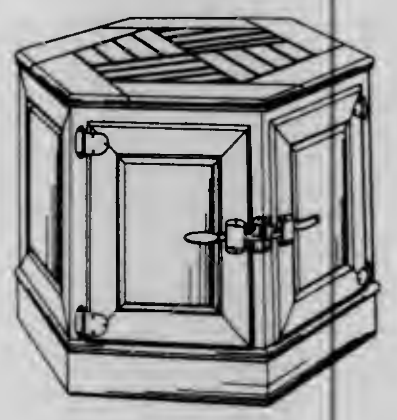
240,685
CURIO CABINET
Leonard Eisen, 14 Lomas Lane,
Montvale, N.J. 07645
Filed July 30, 1974, Ser. No. 493,156
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—148



240,686
HEXAGONAL COMMODE OR THE LIKE

David P. Zagaroli, 2035 11th Street Court NW.,
Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,508
Term of patent 14 years
Int. Cl. D6—*04*

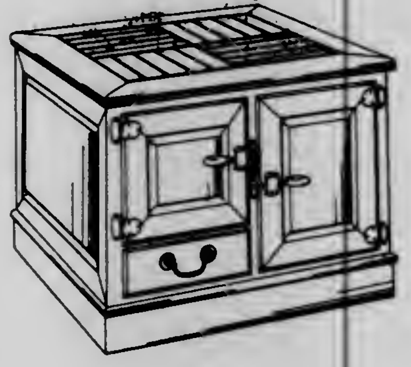
U.S. Cl. D6—149



240,687
COMMODE OR THE LIKE

David P. Zagaroli, 2035 11th Street Court NW.,
Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,507
Term of patent 14 years
Int. Cl. D6—*04*

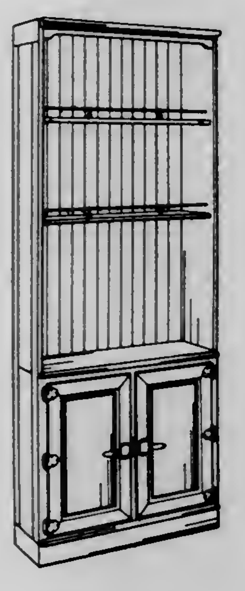
U.S. Cl. D6—158



240,688
BOOKCASE OR THE LIKE

David P. Zagaroli, 2035 11th Street Court NW.,
Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,511
Term of patent 14 years
Int. Cl. D6—*04*

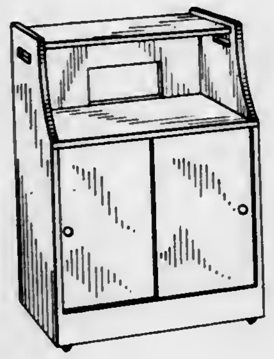
U.S. Cl. D6—168



240,689
CABINET FOR VIDEO EQUIPMENT OR THE LIKE

Richard J. Warneke, 915 W. Miner St.,
Arlington Heights, Ill. 60005
Filed July 29, 1974, Ser. No. 492,461
Term of patent 14 years
Int. Cl. D6—*04*

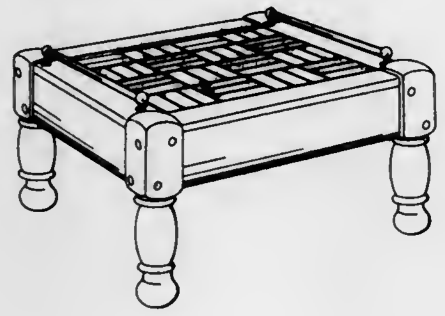
U.S. Cl. D6—174



240,690
COCKTAIL TABLE OR THE LIKE

David P. Zagaroli, 2035 11th Street Court NW.,
Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,510
Term of patent 14 years
Int. Cl. D6—*03*

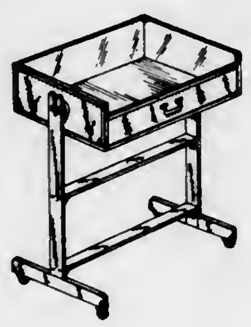
U.S. Cl. D6—177



240,691
MOBILE DISPLAY DEVICE

John M. Larkin, 6304 Colby Ave.,
Des Moines, Iowa 50311
Filed Dec. 17, 1974, Ser. No. 533,547
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*

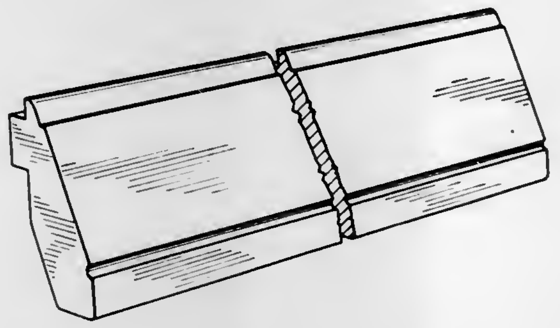
U.S. Cl. D6—181



240,692
PICTURE FRAME MOULDING

Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co., Ltd., Downsview, Ontario, Canada
Filed May 16 1975, Ser. No. 578,326
Term of patent 14 years
Int. Cl. D6—*07*

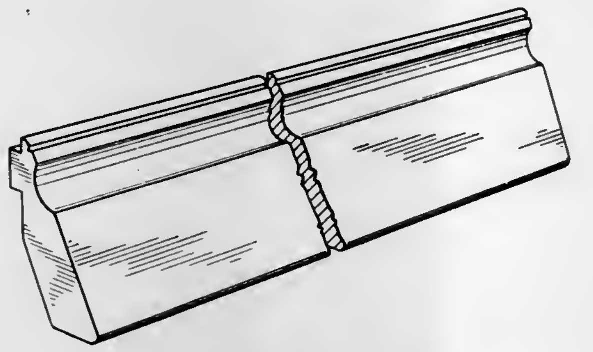
U.S. Cl. D6—246



240,693
PICTURE FRAME MOULDING

Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co., Ltd., Downsview, Ontario, Canada
Filed May 16, 1975, Ser. No. 578,327
Term of patent 14 years
Int. Cl. D6—*07*

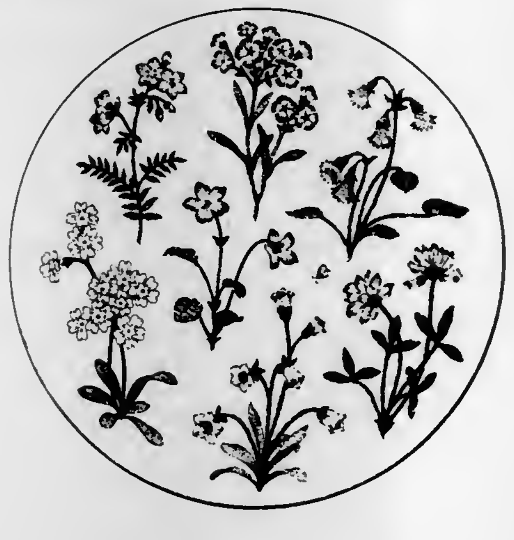
U.S. Cl. D6—246



240,694
PLATE OR SIMILAR ARTICLE

Seiichi Makita, Nagoya, Japan, assignor to Noritake Co., Limited (Nippon Toki Kabushiki Kaisha), Shin-machi, Nishi-ku, Nagoya, Japan
Filed Apr. 25, 1975, Ser. No. 571,661
Claims priority, application Japan Nov. 6, 1974
Term of patent 7 years
Int. Cl. D7—*01*

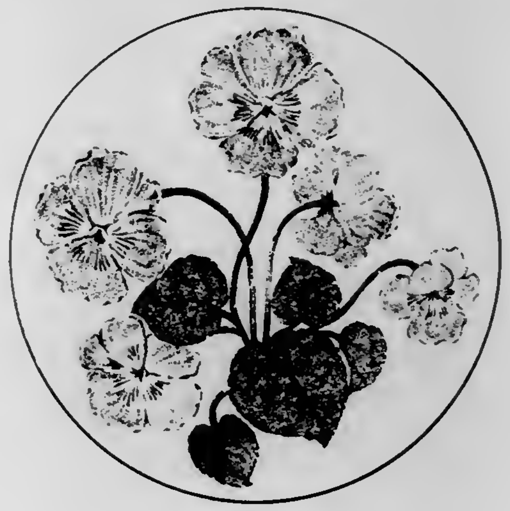
U.S. Cl. D7—23



240,695
PLATE OR SIMILAR ARTICLE

Seiichi Makita, Nagoya, Japan, assignor to Noritake Co., Limited (Nippon Toki Kabushiki Kaisha), Shin-machi, Nishi-ku, Nagoya, Japan
Filed Apr. 25, 1975, Ser. No. 571,662
Claims priority, application Japan Nov. 6, 1974
Term of patent 7 years
Int. Cl. D7—*01*

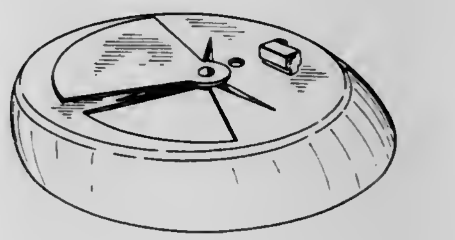
U.S. Cl. D7—23



240,696
MIXER BOWL SPLASH GUARD

Sarah Tretter, 45 Southport St.,
Toronto, Ontario, Canada
Filed Dec. 10, 1974, Ser. No. 531,259
Claims priority, application Canada June 17, 1974
Term of patent 14 years
Int. Cl. D7—*04*

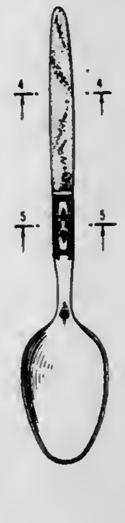
U.S. Cl. D7—131

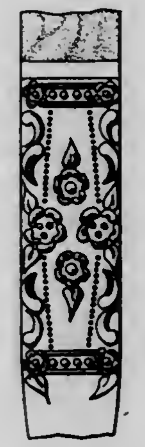


240,697
SPOON OR SIMILAR ARTICLE

Colin B. Richmond II, Oneida, N.Y., assignor to Oneida, Ltd., Oneida, N.Y.
Filed Mar. 11, 1974, Ser. No. 449,746
Term of patent 14 years
Int. Cl. D7—*03*

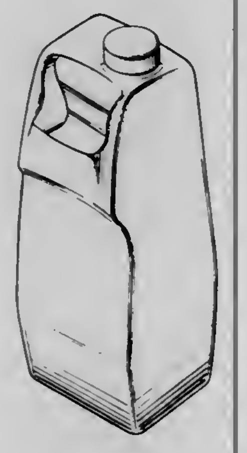
U.S. Cl. D7—151





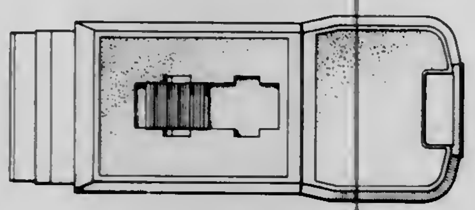
240,698
SHAMPOO TANK FOR A FLOOR CLEANING MACHINE OR THE LIKE

Charles V. Durkee, Indianapolis, Ind., assignor to Earl Grissmer Company, Inc., Indianapolis, Ind.
Filed Apr. 10, 1974, Ser. No. 459,596
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—170



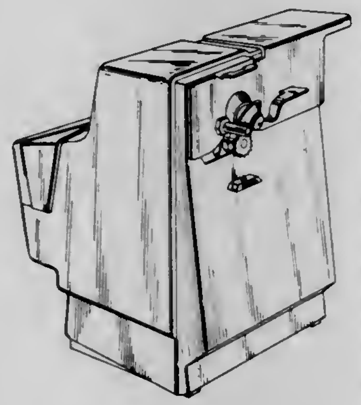
240,699
RAZOR BLADE SCRAPER

Ronald L. Gerson, Newton, and Lawrence A. Caprio, Whitman, Mass., assignors to Louis M. Gerson Co., Inc., Middleboro, Mass.
Filed Dec. 19, 1974, Ser. No. 534,451
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—181



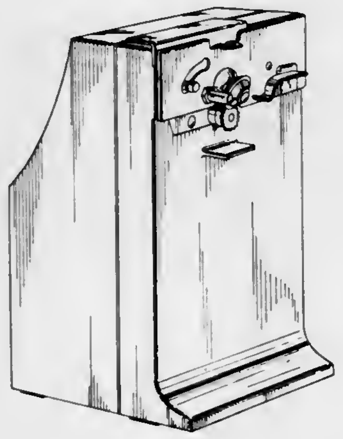
240,700
COMBINED ELECTRIC CAN OPENER AND CUTLERY GRINDER

Robert J. Scott, Blue Springs, and Bill G. Mead, Raytown, Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 20, 1975, Ser. No. 560,298
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—35



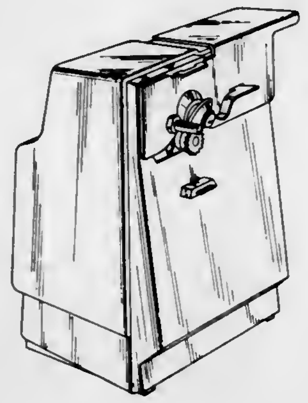
240,701
ELECTRIC CAN OPENER

Downer P. Dykes, Lawrence, Kans., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Oct. 31, 1974, Ser. No. 519,576
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—36



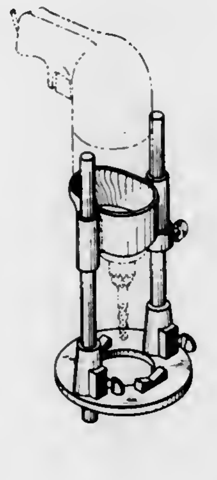
240,702
ELECTRIC CAN OPENER

Robert J. Scott, Blue Springs, and Bill G. Mead, Raytown, Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 20, 1975, Ser. No. 560,253
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—36



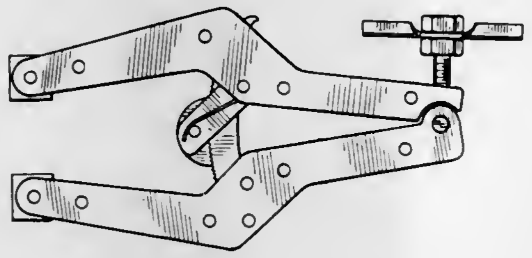
240,703
DRILL HOLDER

William D. Russell, San Diego, Calif., assignor to Portalign Tool Company, San Diego, Calif.
Filed Feb. 7, 1975, Ser. No. 548,154
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



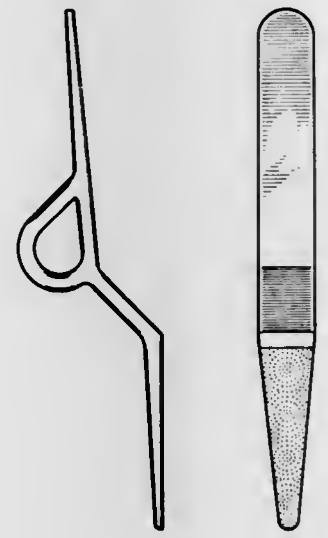
240,704
CLAMP

Harold M. Busse, 3563 Jerry St., White Bear Lake, Minn. 55110
Filed May 1, 1975, Ser. No. 573,726
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



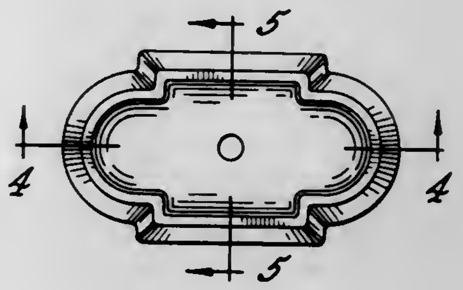
240,705
ABRADER

Hans Franzen, Vendelso, and Johnny Lind, Alvsjo, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed May 23, 1975, Ser. No. 580,225
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



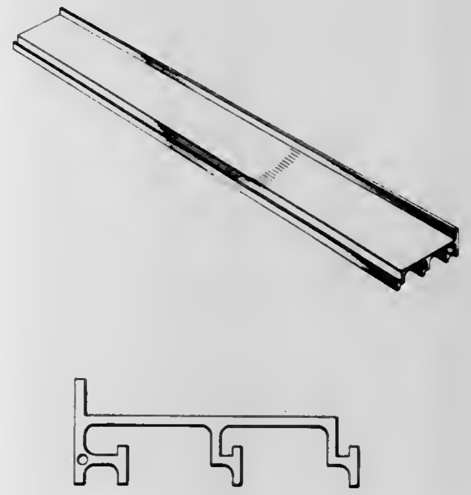
240,706
ESCUTCHEON

James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,396
Term of patent 14 years
Int. Cl. D8—*06, 09*
U.S. Cl. D8—179



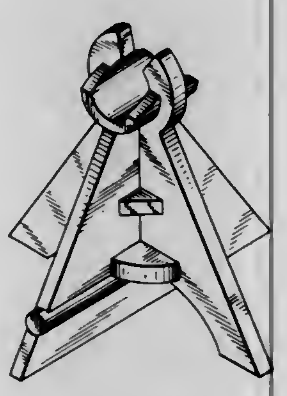
240,707
DRAPERY ROD

Robert S. Rudinski, 515 East St., Elkhart, Ind. 46614
Filed Aug. 29, 1975, Ser. No. 608,846
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—208



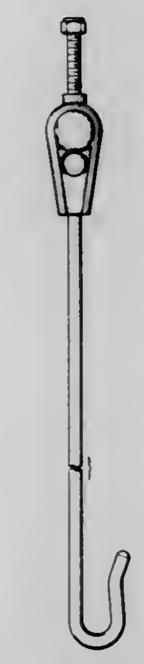
240,708
CONCRETE REINFORCING ACCESSORY

Robert J. Ilukowicz, Coram, N.Y., assignor to
Preco Industries, Ltd., Plainview, N.Y.
Filed May 29, 1975, Ser. No. 581,864
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—228



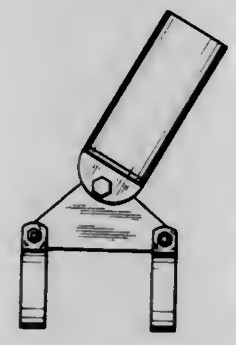
240,709
RADIAL ARM MILK HOSE SUPPORT

Ben W. Vandenberg, 17226 Roseton Ave., and August Vandenberg, 17306 Roseton Ave., both of Artesia, Calif. 90701, and Andrew W. Vandenberg, 1551 Ryon St., Bellflower, Calif. 90706
Filed Nov. 21, 1974, Ser. No. 525,878
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233



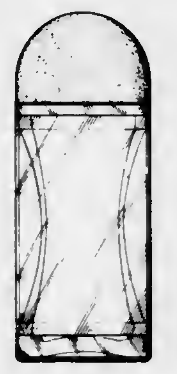
240,710
PLAYGROUND FITTING

Dwight C. Shaneour, Hillsdale, Mich., assignor to
Quality Industries, Inc., Hillsdale, Mich.
Filed Oct. 2, 1975, Ser. No. 618,904
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



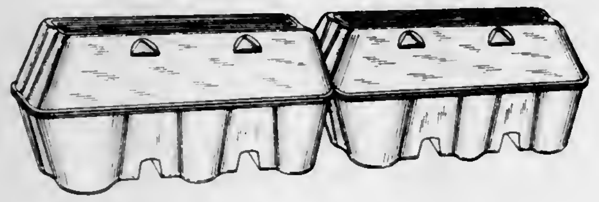
240,711
COMBINED BOTTLE AND CLOSURE

John D. Angleman, Brookside, N.J., and Doris Du Cret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Filed Jan. 9, 1975, Ser. No. 539,755
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10



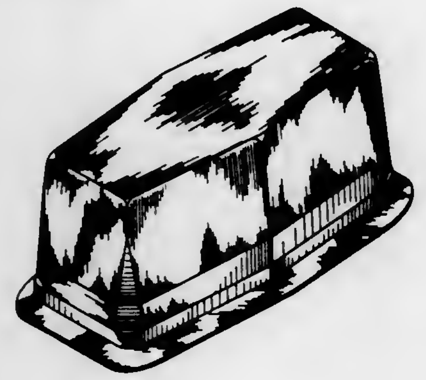
240,712
EGG CARTON

Bent Moller, Vaerlose, Denmark, assignor to
Aktieselskabet Brodrene Hartmann
Filed Mar. 16, 1973, Ser. No. 341,937
Claims priority, application Denmark Feb. 28, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190



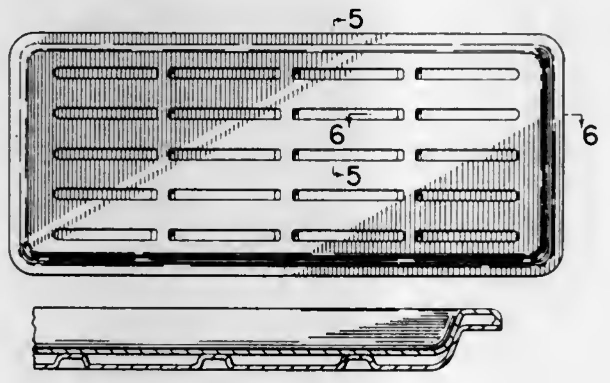
240,713
FOOD CONTAINER

Charles Calvin Barnhart, Hoffman Estates, Ill., and Carroll W. Cassidy, Fenton, Mo., assignors to Standard Container Company, St. Louis, Mo.
Filed Mar. 18, 1974, Ser. No. 451,758
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



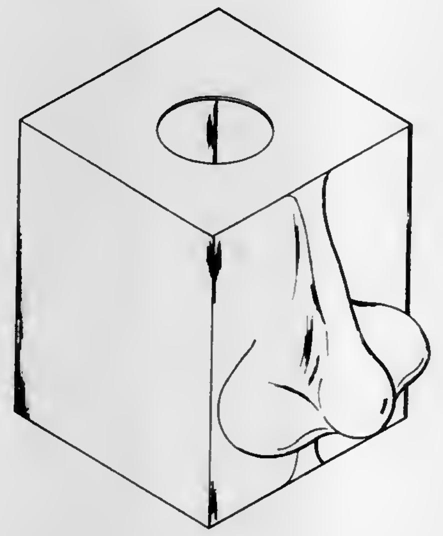
240,714
FOOD PACKAGING TRAY

Thomas H. White, Statesville, N.C., assignor to Rubbermaid Industrial Products Corporation, Statesville, N.C.
Filed Mar. 3, 1975, Ser. No. 554,757
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



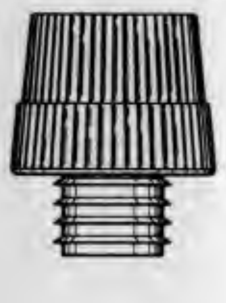
240,715
TISSUE BOX COVER OR SIMILAR ARTICLE

Ralph R. Schwartz, 11 Cypress Road,
East Chester, N.Y. 10709
Filed June 7, 1973, Ser. No. 367,718
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—259



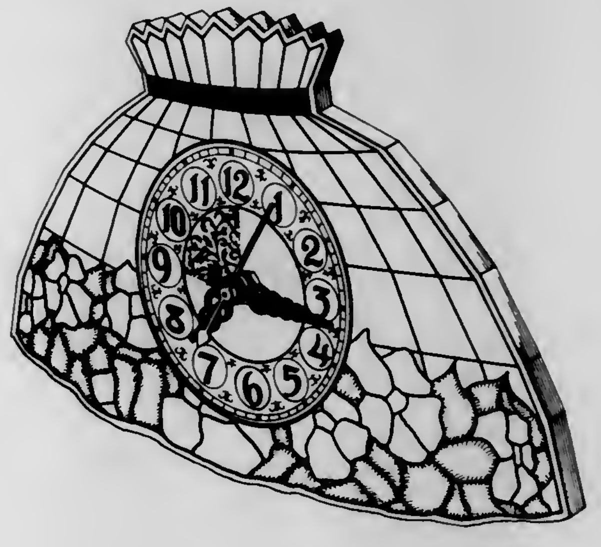
240,716
COMBINED CLOSURE CAP AND POURING SPOUT

Robert Hegi, im Buehl, CH 8113 Boppelsen, Switzerland
Filed Sept. 16, 1974, Ser. No. 505,991
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—278



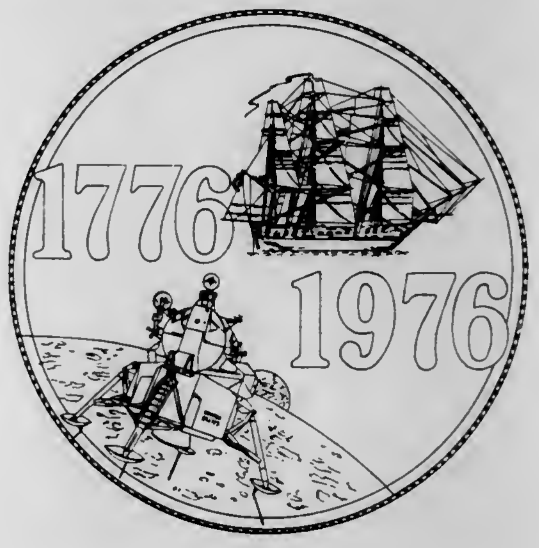
240,717
CLOCK OR SIMILAR ARTICLE

Arthur M. Felske, Westport, Conn., assignor to
General Electric Company
Filed Mar. 10, 1975, Ser. No. 556,642
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D10—6



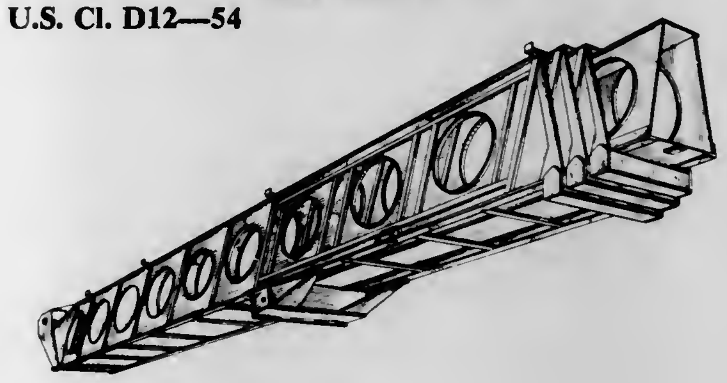
240,718
TIMEPIECE FACE OR SIMILAR ARTICLE

Helmut Herz, Forest Hills, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 14, 1974, Ser. No. 523,942
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



240,719
TELESCOPIC CRANE BOOM

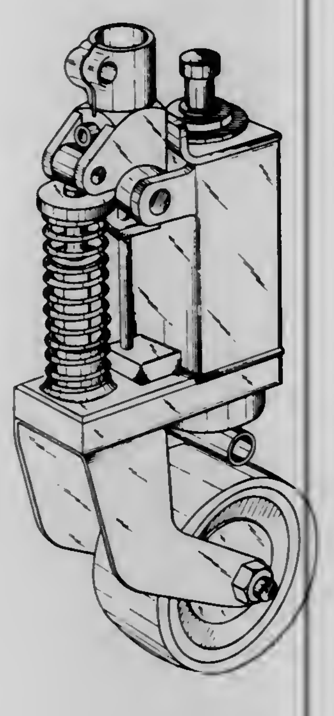
Eugene C. Gardenhour, Waynesboro, Pa., and Herbert S. Robins, Hagerstown, Md., assignors to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Apr. 23, 1974, Ser. No. 463,354
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54



240,720

COMBINED WHEEL AND JACK ASSEMBLY FOR A HAND-OPERATED PALLET TRUCK

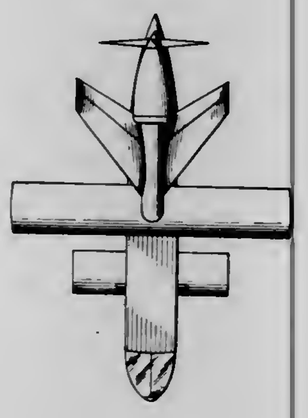
Hans Gustav Ingvar Larsson and Sven Gunnar Harald Stjarnqvist, Angelholm, Sweden, assignors to Marco Materialhantering AB
Filed Dec. 27, 1974, Ser. No. 536,806
Claims priority, application Sweden July 1, 1974
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60

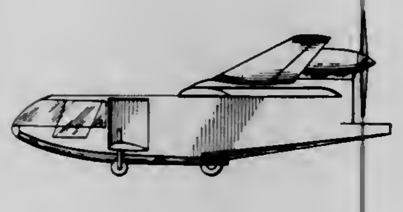


240,721

AIRPLANE

Kenneth L. Bunyard, 45 Oline Drive, Hialeah, Fla. 33010
Filed June 16, 1975, Ser. No. 587,431
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78

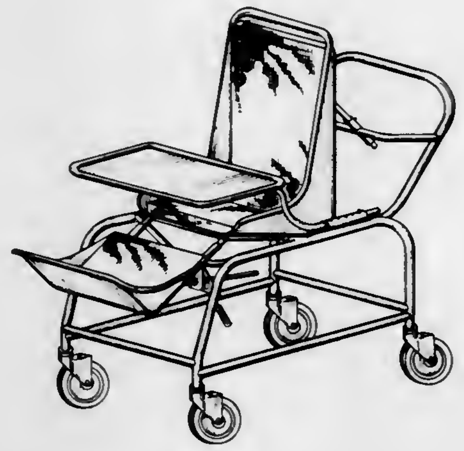




240,722

CHILD'S FLEXION WHEELCHAIR

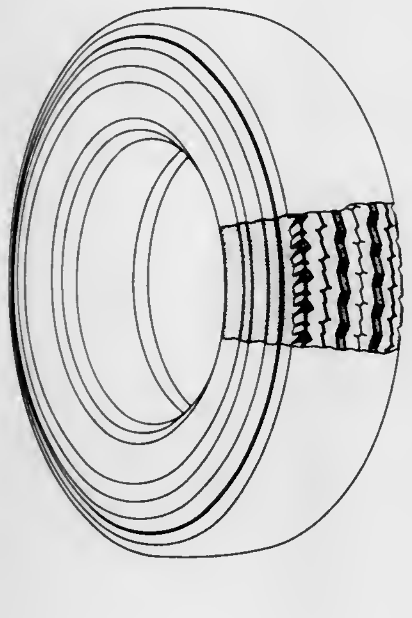
Thomas R. Blue, 17802 Norwood Park, Tustin, Calif. 92680
Filed Nov. 18, 1974, Ser. No. 524,787
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



240,723

TIRE

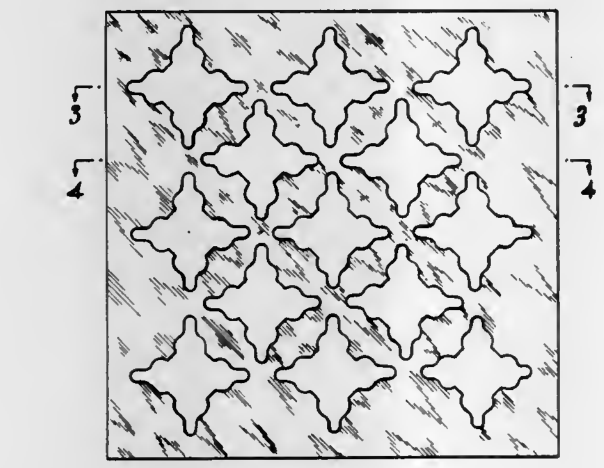
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, Puy-de-Dome, France
Filed Mar. 27, 1975, Ser. No. 562,791
Claims priority, application France Oct. 7, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



240,724

PERFORATED PANEL

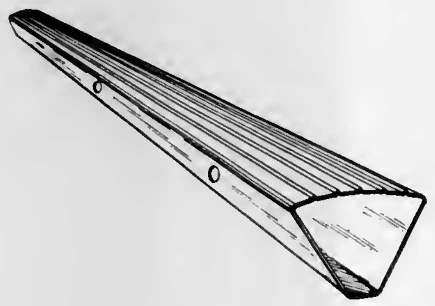
William G. Hale, Lake City, Ark., assignor to Gilbert International, Inc., Jonesboro, Ark.
Filed Nov. 12, 1974, Ser. No. 523,166
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—89



240,725

FLOORING MEMBER

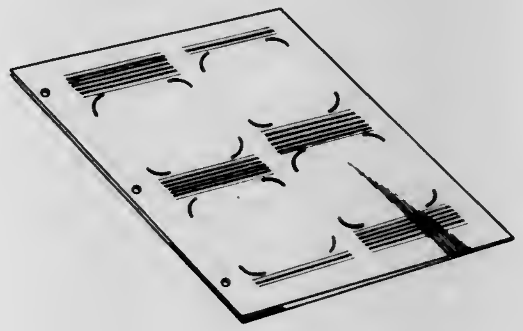
Ronald L. Dillon, 723 Fairway SE., Spencer, Iowa 51301
Filed Dec. 4, 1974, Ser. No. 529,471
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



240,726

PHOTO ALBUM PAGE

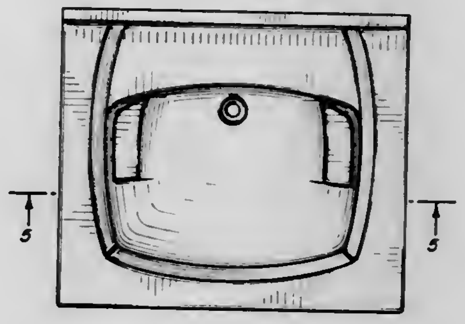
Stephen F. Harris, Brookline, Mass. (14 Valley Road, Chestnut Hill, Mass. 02167)
Filed June 20, 1974, Ser. No. 481,166
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33

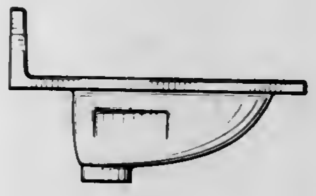


240,727

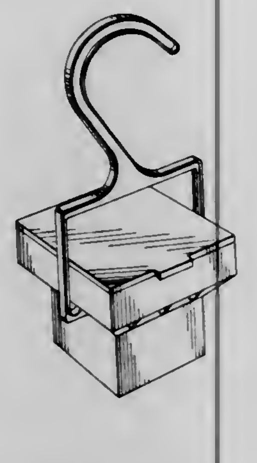
VANITY BASIN

Louis A. Garasi, North Hollywood, and Ronald F. Hayes, Northridge, Calif., assignors to L & M Cultured Marble, Chicago Ridge, Ill.
Filed Mar. 12, 1975, Ser. No. 557,628
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

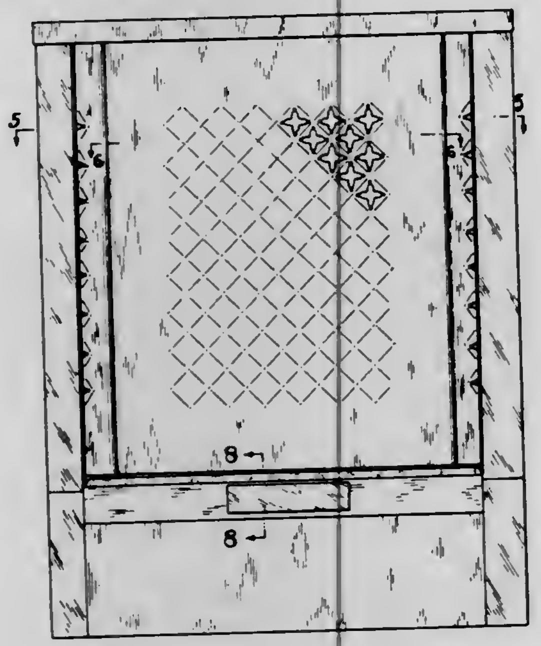




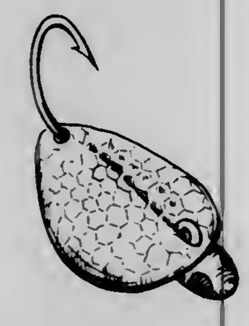
240,728
BUG BAIT TRAP
Harold A. Lutes, 5128 Coralite St., Long Beach, Calif. 90808
Filed Aug. 4, 1975, Ser. No. 601,794
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



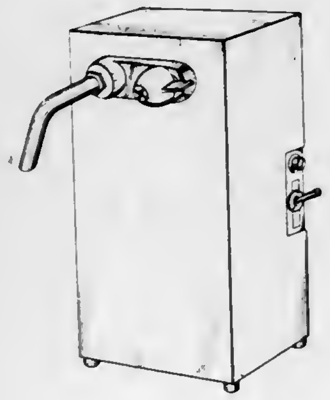
240,729
INSECT TRAP
William G. Hale, Lake City, Ark., assignor to Gilbert International, Inc., Jonesboro, Ark.
Filed Nov. 12, 1974, Ser. No. 523,167
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



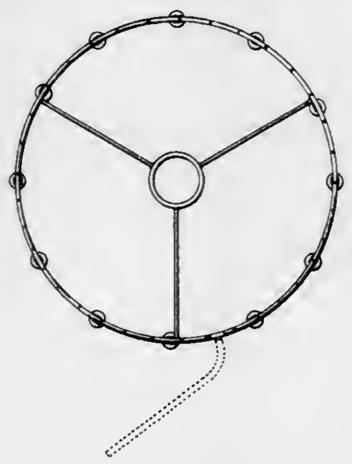
240,730
ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed July 25, 1974, Ser. No. 491,859
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



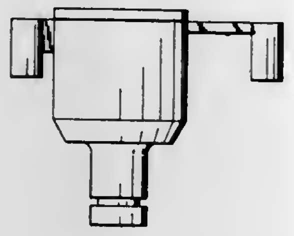
240,731
LIQUID STERILIZER AND DISPENSER
David Free, West Vancouver, British Columbia, and William A. Shand and Wolfgang Scherrelies, Vancouver, British Columbia, Canada, assignors to Naturvard Research (Canada) Ltd., Vancouver, British Columbia, Canada
Filed Apr. 29, 1974, Ser. No. 465,132
Claims priority, application Canada Feb. 15, 1974
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

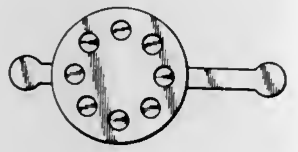


240,732
FLOATING FOUNTAIN
Robert M. Butcher, 295 Country Club Drive, Tequesta, Fla. 33458
Filed July 3, 1975, Ser. No. 592,886
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

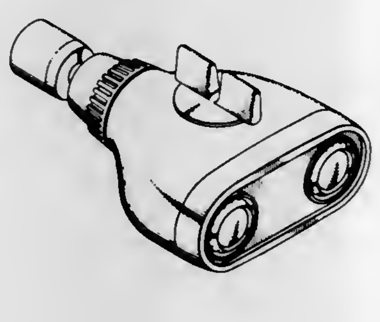


240,733
LIVE WELL VALVE
William G. Roller, Purdy, Mo., assignor to G & R Industries, Purdy, Mo.
Filed Aug. 19, 1974, Ser. No. 498,433
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

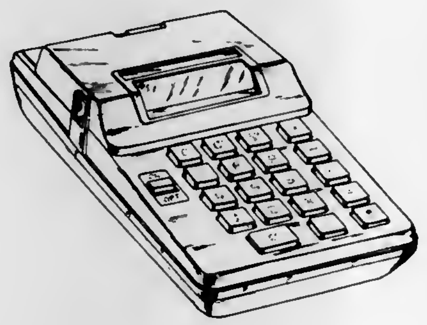




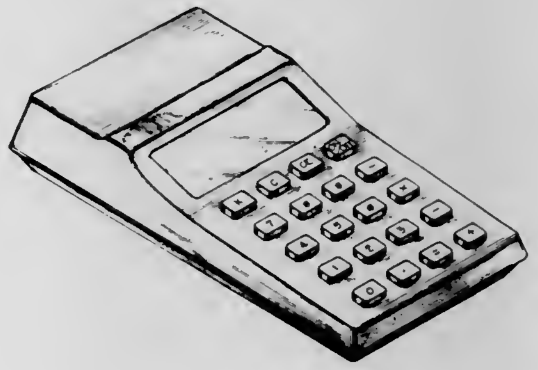
240,734
SHOWER SPRAY HEAD
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed July 28, 1975, Ser. No. 599,981
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



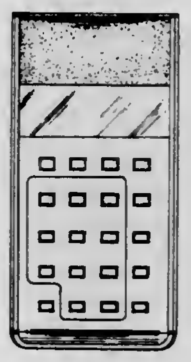
240,735
ELECTRONIC CALCULATOR
Shiro Anzai, Yamato, and Kunio Hirose, Tokyo, Japan, assignors to Canon K.K., Tokyo, Japan
Filed Aug. 5, 1974, Ser. No. 494,915
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

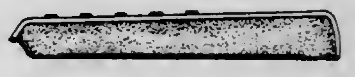


240,736
ELECTRONIC CALCULATOR
John Hunter Pemberton, 17 Fairbairn Road, Cambridge, England
Filed Oct. 21, 1974, Ser. No. 516,439
Claims priority, application Great Britain July 9, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

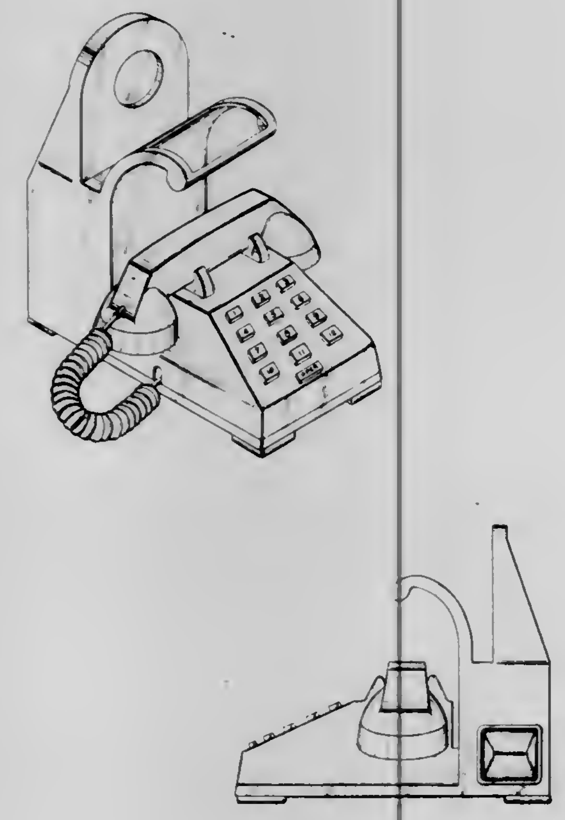


240,737
ELECTRONIC CALCULATOR
Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed July 10, 1974, Ser. No. 487,061
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D26—5 C

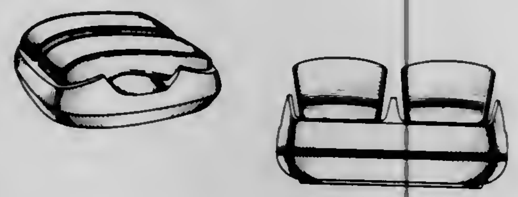




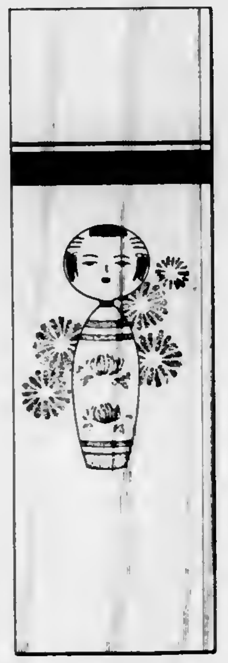
240,738
PORTABLE ONE-WAY AND TWO-WAY SINGLE COIN OPERATED TELEPHONE FOR INSTITUTIONS, HOSPITALS AND THE LIKE
Susan M. Peoples, 5201 Belleville Ave.,
Baltimore, Md. 21207
Continuation-in-part of abandoned design application Ser. No. 524,614, Nov. 18, 1974. This application Mar. 11, 1975, Ser. No. 557,261
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



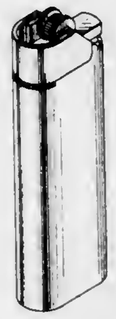
240,739
TELEPHONE
Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Oct. 20, 1975, Ser. No. 623,813
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



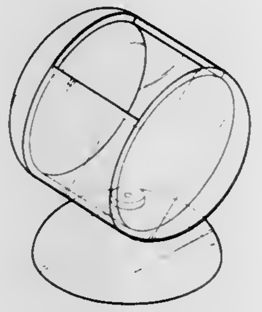
240,740
CIGARETTE PAPER
Kenji Fukushima, 1–14–8 Toneri-cho,
Adachi-ku, Tokyo, Japan
Filed Apr. 8, 1974, Ser. No. 458,594
Term of patent 14 years
Int. Cl. D27—*01*
U.S. Cl. D27—1



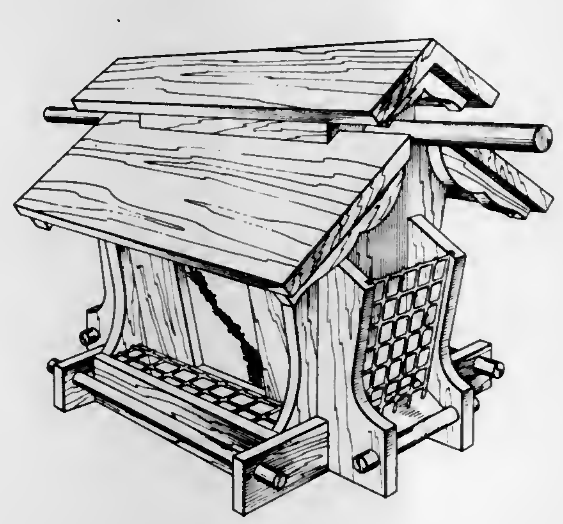
240,741
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Saitama, Japan
Filed Mar. 25, 1975, Ser. No. 561,779
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



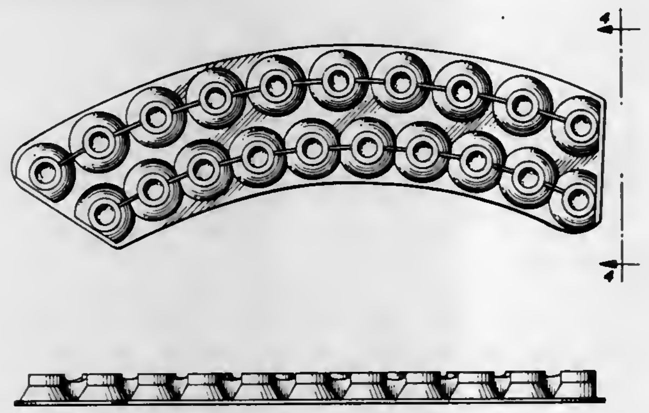
240,742
AQUARIUM OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway,
Houston, Tex. 77057
Filed Feb. 24, 1975, Ser. No. 552,051
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8



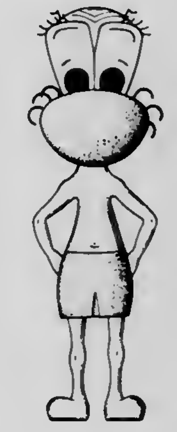
240,743
BIRD FEEDER
Joseph T. Renfro, Jr., 94 Oakwood Drive, Oakwood Knolls, Antioch, Ill. 60002
Filed Feb. 22, 1974, Ser. No. 444,987
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



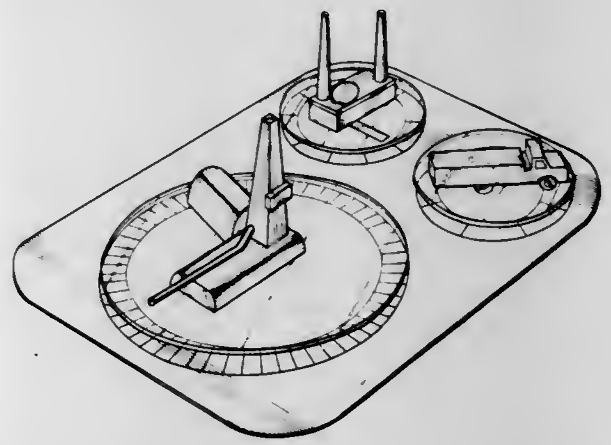
240,744
COVER FOR CUVETTES
Dennis J. Reisdorf, Santa Ana, Calif, assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Oct. 17, 1974, Ser. No. 515,774
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—2 C



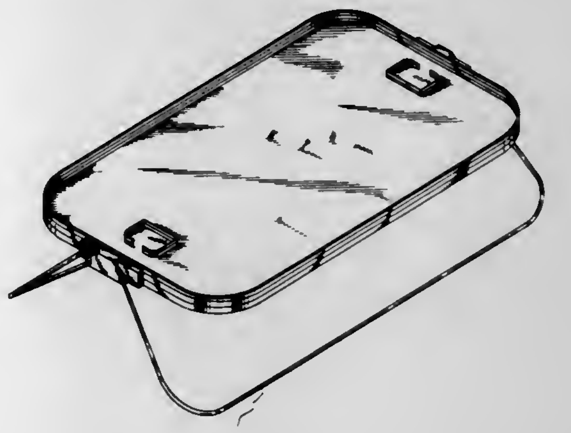
240,745
ANTHROPOMORPHIC FIGURE
Dorese E. Thulin, 2412 2nd St.,
Santa Monica, Calif. 90405
Filed Dec. 6, 1974, Ser. No. 530,203
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



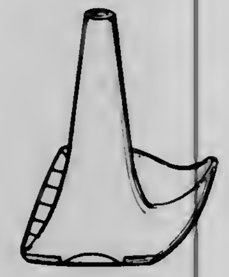
240,746
GAME BOARD
Rodney L. Smith, 1200 Garland St.,
Pampa, Tex. 79065
Filed July 29, 1974, Ser. No. 492,888
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



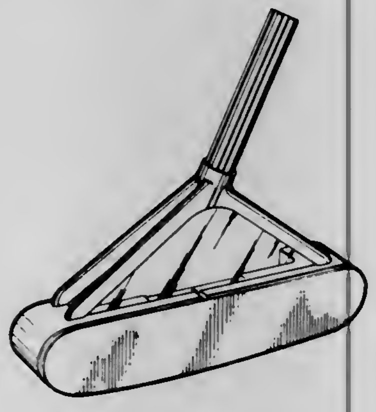
240,747
GAME TABLE
Eero A. T. Paasikallio, Kuopio, Finland, assignor to Veikko Matilainen & K:Nl Ky
Filed Feb. 25, 1974, Ser. No. 445,585
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J



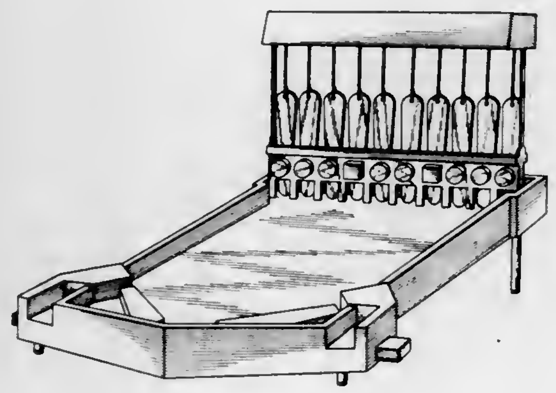
240,748
GOLF CLUB HEAD
Robert E. Bock, Prospect, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.
Continuation-in-part of abandoned design application Ser. No. 368,237, June 8, 1973. This application Sept. 3, 1974, Ser. No. 502,281
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



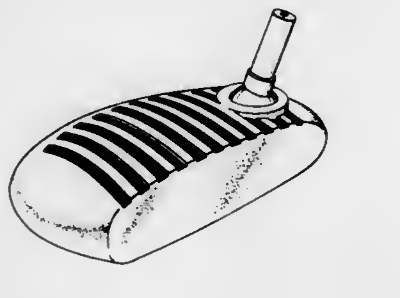
240,749
PUTTER HEAD
Glenn S. Benson, 705 N. Studebaker St., Mishawaka, Ind. 46544
Filed Jan. 24, 1975, Ser. No. 543,828
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



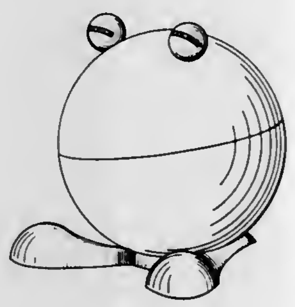
240,750
TARGET GAME BOARD
Jeffrey D. Breslow, Highland Park, and Michael J. Ferris, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 9, 1975, Ser. No. 566,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ



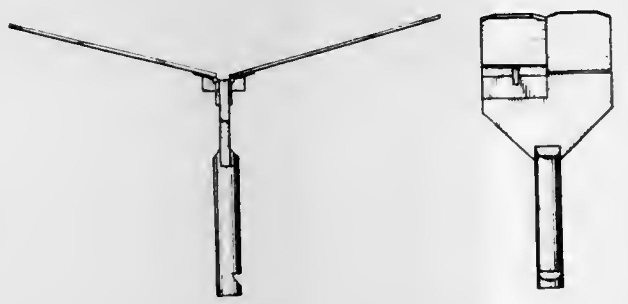
240,751
PUTTER HEAD AND MOUNTING
David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924
Filed May 14, 1975, Ser. No. 577,398
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



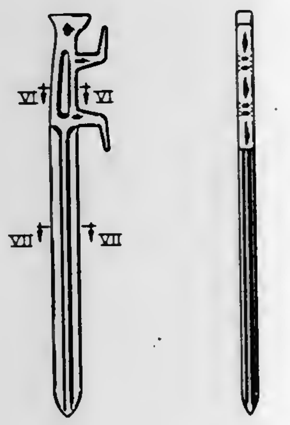
240,752
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushiki-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,865
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



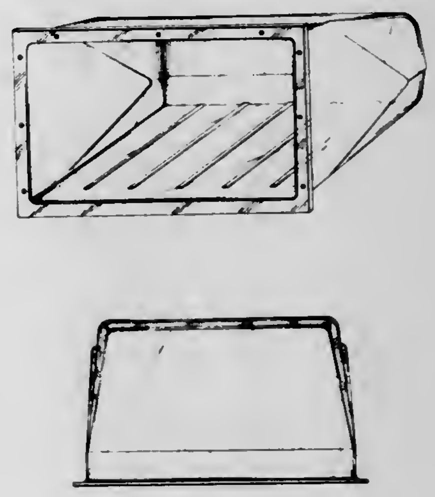
240,753
FLYING TOY
Davey L. Langston, 3616 Mount Vernon, Fort Worth, Tex. 76103
Filed May 23, 1975, Ser. No. 580,369
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 W



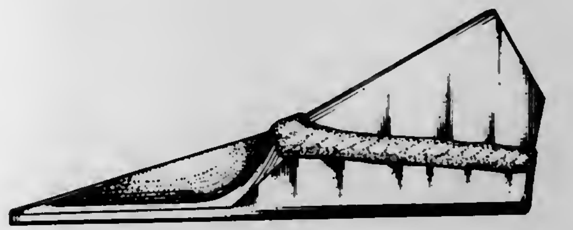
240,754
GARDEN ROW MARKER
Larry L. Shroyer, 306 Railroad St., Union City, Mich. 49094
Filed Aug. 1, 1974, Ser. No. 493,538
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D35—1



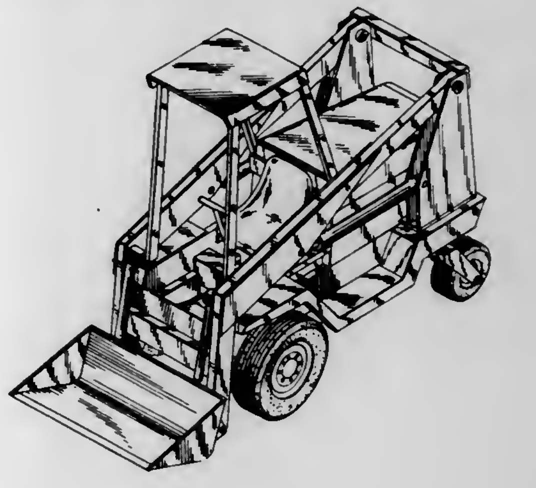
240,755
WINDOW GREENHOUSE
Charles Wheeler Clark, Dumont, and Charles Melvin Dye, Wyckoff, N.J., assignors to RCA Corporation
Filed Oct. 1, 1975, Ser. No. 618,491
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R



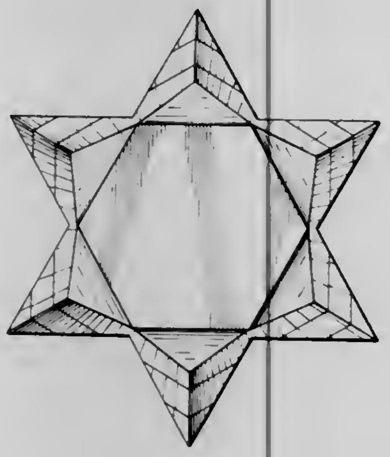
240,756
DIGGER TOOTH
Dwight M. Phillips, Corona Del Mar, Calif., assignor to Corona Forge Company, Corona, Calif.
Filed June 11, 1975, Ser. No. 586,043
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R



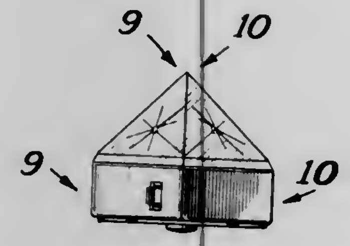
240,757
FRONT END LOADER
J. Craig Henderson, Thomas George Teller, and T. Herbert Morrell, Owatonna, Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.
Filed May 12, 1975, Ser. No. 576,359
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5

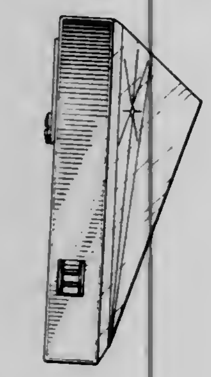


240,758
DIAMOND CUT IN STARFORM
George Saltzmann, Arenbergstraat 40,
2000 Anvers, Belgium
Filed Nov. 27, 1974, Ser. No. 527,820
Claims priority, application Belgium July 30, 1974
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1 A

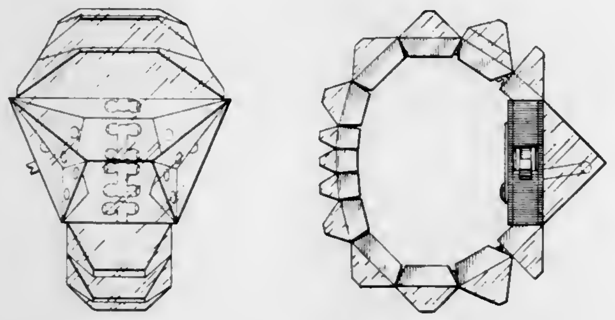


240,759
PENDANT
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed Feb. 20, 1974, Ser. No. 444,030
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 A

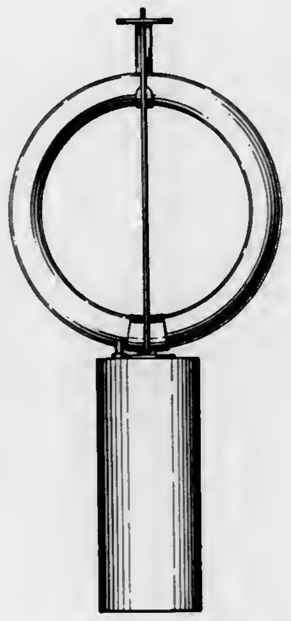




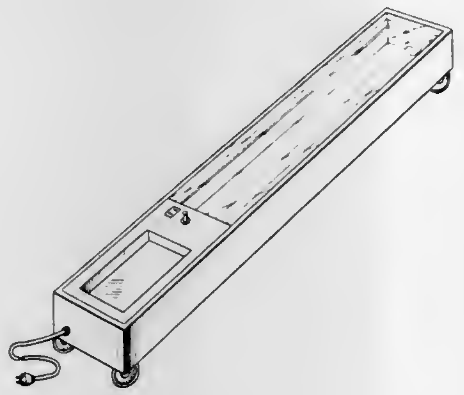
240,760
BRACELET HAVING TRANSPARENT PRISM FACE
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed July 11, 1974, Ser. No. 487,712
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 C



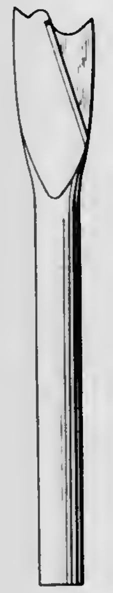
240,761
TABLE LAMP
Bruce W. Medford and Mary A. Medford, both of
852 Hopwood Lane, Virginia Beach, Va. 23455
Filed Mar. 20, 1975, Ser. No. 560,246
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



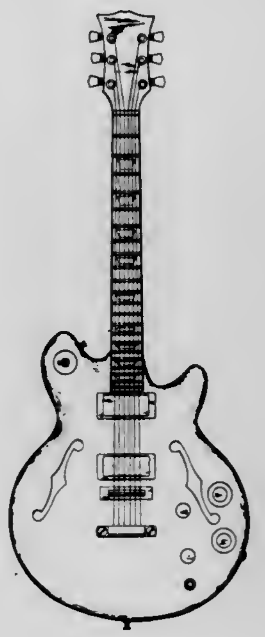
240,762
FLUORESCENT LAMP CREEPER
Roger A. Fraker, 4420 W. Ridge Road,
Gary, Ind. 46408
Filed Nov. 25, 1974, Ser. No. 526,511
Term of patent 14 years
Int. Cl. D12—*14;* D26—*99*
U.S. Cl. D48—20 D



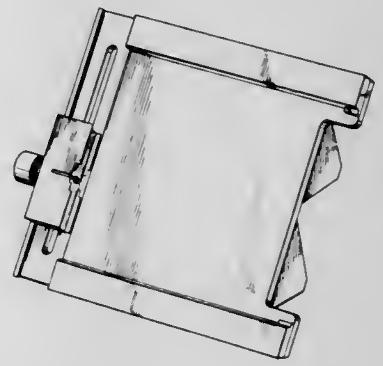
240,763
CUTTING TOOL
Richard W. Clemens, Jr., 9201 Wellington Court,
Seabrook, Md. 20801
Filed Oct. 4, 1974, Ser. No. 512,054
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D54—4



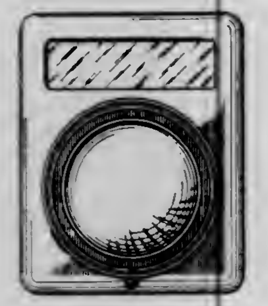
240,764
ELECTRIC GUITAR OR SIMILAR ARTICLE
Stanley E. Rendell, Kalamazoo, Mich., assignor to
Norlin Music, Inc., Lincolnwood, Ill.
Filed Sept. 23, 1974, Ser. No. 508,076
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



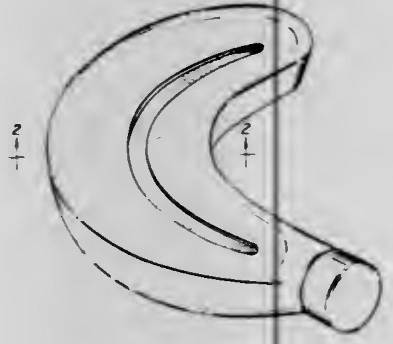
240,765
HOLDER FOR MICROFICHE CARRIERS
Clyde E. LeFevre, Orange, Gregory A. Leland, Huntington Beach, and William R. Swift, Placentia, Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Feb. 6, 1975, Ser. No. 547,631
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—26



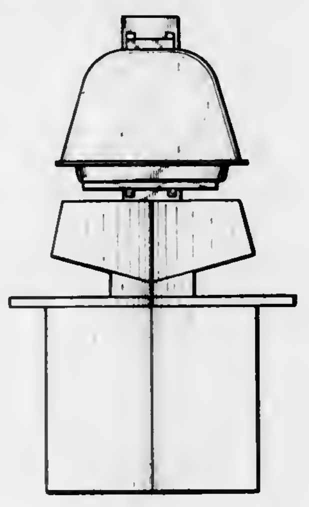
240,766
PHOTOGRAPHIC CAMERA
Rainer Franzmann, Mittelstrasse 24,
2 Norderstedt 2, Germany
Filed Mar. 4, 1975, Ser. No. 555,182
Claims priority, application Germany Sept. 13, 1974
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D16—8

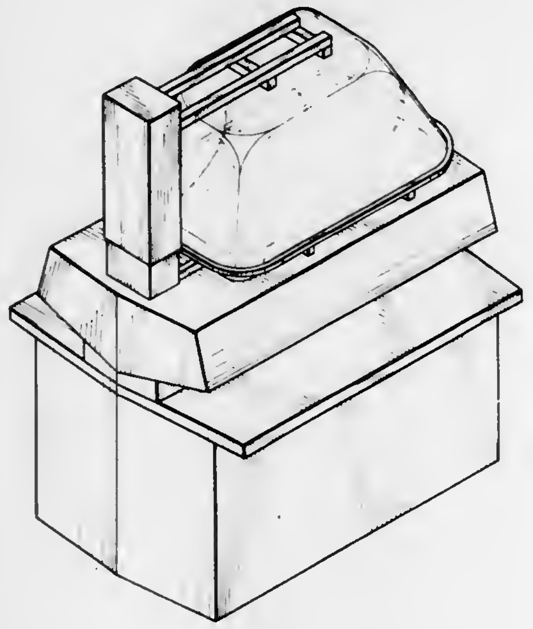


240,767
MEDICAL BASIN
Jerome H. Lemelson, 85 Rector St.,
Metuchen, N.J. 08840
Filed Feb. 19, 1974, Ser. No. 430,398
Term of patent 3½ years
Int. Cl. D24—*99*
U.S. Cl. D83—1 U

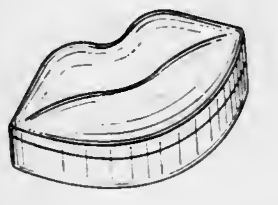


240,768
COMPREHENSIVE INFANT CARE SYSTEM
John W. Beld, O'Fallon, Warren G. Kinninger, Florissant, Robert E. N. Klohr, Fenton, and Paul A. Byrne, St. Louis, Mo., assignors to Puritan-Bennett Corporation, Kansas City, Mo.
Original design application Ser. No. 293,653, Sept. 29, 1972, now Pat. No. 236,165. This application Apr. 11, 1975, Ser. No. 567,181
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 G





240,769
CONTAINER FOR COSMETICS
Arleen Bowman, 302 W. 12th St.,
New York, N.Y. 10014
Filed Jan. 16, 1975, Ser. No. 541,635
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10 N



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JULY, 1976

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- Abe, Fumiyuki; and Otani, Syuichi, to Nissan Motor Company Limited. Safety seat belt device with an inflatable cushioning means. 3,971,569, Cl. 280-733.000.
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- Adams, Francis A. Tool for stripping insulation from multiconductor cables and individual insulated conductors. 3,971,129, Cl. 30-90.100.
- Adamson, James R., Jr., to United States of America, Army. Quick disconnect for night vision optics. 3,971,933, Cl. 250-213.0VT.
- Addressograph Multigraph Corporation: *See—*
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- Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Hagglund, Anders Carl Gustaf, to Sandvik Aktiebolag; and Atlas Copco Aktiebolag. Drill rod for percussion drilling. 3,971,447, Cl. 173-128.000.
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- Albin, Merritt Timothy; and Benton, James W. Bowling ball resurfacing machine. 3,971,164, Cl. 51-129.000.
- Albrecht-Buehler, Gunter, to Ciba-Geigy Corporation. Method and apparatus for generating a relieflike contrast at microscopic images of a transparent phase object. 3,971,621, Cl. 350-87.000.
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- Alfa Romeo S.p.A.: *See—*
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- Alford, Andrew. Antenna system for Doppler VOR ground stations. 3,972,044, Cl. 343-106.00D.
- Alia, Dominic A., to Okonite Company, The. Electrical cable having an outer sheath with improved pyrolysis properties. 3,971,882, Cl. 174-110.0SR.
- Alinder, Gilbert L.: *See—*
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- Allen, Dee Dexter, to U.S. Industries, Inc. Limit and control feeder for animals. 3,971,340, Cl. 119-52.0AF.
- Allen, Richard W.; Bond, Raymond E.; and Saba, Richard T., to Owens-Corning Fiberglas Corporation. Control system for controlling translation speed of carriage with respect to rotational speed of mandrel. 3,971,336, Cl. 118-8.000.
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- Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polystyrene and a bis-phenoxy flame retardant. 3,971,759, Cl. 260-45.9KA.
- Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyurethane and a bis-phenoxy flame retardant. 3,971,760, Cl. 260-45.9KA.
- Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyacrylates and a bis-phenoxy flame retardant. 3,971,761, Cl. 260-45.9KA.
- Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing poly(phenylene oxide) and a bis-phenoxy flame retardant. 3,971,762, Cl. 260-45.9KA.
- Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyesters and a bis-phenoxy flame retardant. 3,971,763, Cl. 260-45.9KA.
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- Baumann, Hans; Grychtol, Klaus; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Production of aminobenzaldehydes. 3,971,821, Cl. 260-465.00E.
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- Becker, Klaus; and Sprung, Hartwig, to Demag Aktiengesellschaft. Housing, including readily removable protective plates, for monorail electrical components. 3,971,459, Cl. 191-30.000.
- Becker, Reinhold; Hennecken, Manfred; and Zimmerman, Hans-Georg, to Hoechst Aktiengesellschaft. Process for the production of the closure of a hollow stick of shirred sausage casing . 3,971,301, Cl. 93-84.0TW.
- Becker, Wolf; and Weiss, Wolfgang, to Bayer Aktiengesellschaft. Recovery of hydrofluoric acid from aqueous fluosilicic acid. 3,971,845, Cl. 423-483.000.
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- Bellsmith, Joseph L. Portable spark plug cleaner. 3,971,162, Cl. 51-8.0SP.
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- Bertolini, William A.; and Feinberg, Isadore. Method of assembling shipping container. 3,971,122, Cl. 29-469.000.
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- Block, Hans-Jurgen, to Hauni-Werke Korber & Co., KG. Method and apparatus for the production of filter plugs. 3,971,695, Cl. 156-461.000.
- Blodgett, Francis E.; and Campagnuolo, Carl J., to United States of America, Army. Fluid driven electrical-mechanical safety and arming system. 3,971,321, Cl. 102-81.000.
- Bloom, Stanley. Urine-sensing pad. 3,971,371, Cl. 128-138.00A.
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- Boesten, Wilhelmus H. J., to Stamicarbon B.V. Process for the enzymatic resolution of DL-phenyl glycine amide into its optically active antipodes. 3,971,700, Cl. 195-2.000.
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- Borell, James J. Guitar string supporting device. 3,971,286, Cl. 84-298.000.
- Bossert, Friedrich; Wehinger, Egbert; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine esters. 3,971,796, Cl. 260-294.80F.
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- Brather, Wolfgang; and Hahn, Alfred, to Siemens Aktiengesellschaft. Operative location for the examination of patients by means of X-rays. 3,971,949, Cl. 250-446.000.
- Braun, David L., to Minnesota Mining and Manufacturing Company. Particle-loaded microfiber sheet product and respirators made therefrom. 3,971,373, Cl. 128-146.200.
- Bredow, Walter; Tamaschke, Walter; and Rott, Gunther. Angle shears with divided shear cutting members. 3,971,281, Cl. 83-519.000.
- Brehmer, Kurt A., to Carl Brehmer & Sohn, Firma. Hairpiece, particularly a toupet, and process for making same. 3,971,392, Cl. 132-53.000.
- Brenner, Joseph; Henderson, Gary H.; and Bergensten, Robert W., to Polak's Frutal Works, Inc. Process of encapsulating an oil and product produced thereby. 3,971,852, Cl. 426-103.000.
- Bresle, Ake Roland Albin, to Aminkemi AB. Method for inhibiting rust formation on iron-containing articles. 3,971,628, Cl. 21-2.70R.
- Breslow, David S., to Hercules Incorporated. Epoxy-azido compounds. 3,971,627, Cl. 8-115.500.
- Breslow, David S., to Hercules Incorporated. Epoxy-azido compounds. 3,971,743, Cl. 260-3.300.
- Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Chance amusement device. 3,971,557, Cl. 273-1.00E.
- Bridgeman, Cecil K., to Picker X-Ray Mfg. Limited. X-ray table. 3,971,953, Cl. 250-469.000.
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- Brownlee, Robert R.; Tyers, Frank O.; and Volz, Carl, Sr., to Research Company. Pacemaker low current pulse generator. 3,971,389, Cl. 128-419.0PG.
- Bruderly, Roland L.; and Tomayko, Edward A., to Bruderly, Roland L. Framing and modular base unit structure for display fixtures. 3,971,477, Cl. 211-189.000.

- Bruesch, Peter; Lehmann, Fritz; Schuler, Claus; and Zeller, Hans-Rudolf, to BBC Brown Boveri & Company Limited. Controllable electrochromic indicator device with ionic conducting intermediate layer and non-polarizable electrodes. 3,971,624, Cl. 350-160.00R.
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- Buhrer, Carl F., to GTE Laboratories Incorporated. Method of fabricating magnetic field drive coils for field accessed cylindrical domain memories. 3,971,126, Cl. 29-604.000.
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- Bussard, Charles B., to Monarch Marking Systems, Inc. Tag attaching apparatus. 3,971,498, Cl. 227-67.000.
- Byrne, John Frank, to Xerox Corporation. Method for repairing selenium photoreceptors. 3,971,169, Cl. 51-283.000.
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- Carlson, Robert C.; and Stoskopf, Albert H., to Minnesota Mining and Manufacturing Company. Amino terminated ionic polyurethane emulsion with polyepoxide emulsion. 3,971,745, Cl. 260-29.2TN.
- Carlsson, Ingemar, to Lihnell Vagn AB. Apparatus for handling and transporting containers, load supporting bodies, pallets and the like. 3,971,486, Cl. 214-505.000.
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- Carrubba, Francis P.; Franaszek, Peter A.; and Grossman, David D., to International Business Machines Corporation. Gain method and apparatus for a delta modulator. 3,971,987, Cl. 325-38.00B.
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- Cawrse, Richard S. Apparatus and method for applying lids to containers. 3,971,188, Cl. 53-39.000.
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- Cerelli, George S.: *See—*
  - Martinelli, Luigi E.; and Cerelli, George S., 3,971,514.
- Ceskoslovenska akademie ved: *See—*
  - Hudecek, Slavko; and Gavrilova, Ivana, 3,971,744.
  - Lochmann, Lubomir; and Trekoval, Jiri, 3,971,816.
  - Wichterle, Otto, 3,971,376.
- Chaivre, Joseph W., to Towne Robinson Fastener Company. Wheel nuts. 3,971,289, Cl. 85-35.000.
- Chamberlin, Thomas A.: *See—*
  - Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., 3,971,730.
- Chambers, Brian, to Thomas Walker Limited. Prong-attached garment fasteners devices with backing members. 3,971,106, Cl. 24-227.000.
- Chambers, George S.; and Lane, Lawrence J., to General Electric Company. Generator control system. 3,971,978, Cl. 322-68.000.
- Champion International Corporation: *See—*
  - Koenig, Raymond C., 3,971,612.
- Chappelle, Emmett W.: *See—*
  - Picciolo, Grace L.; and Chappelle, Emmett W., 3,971,703.
- Chatterjee, Pronoy Kumar, to Personal Products Company. Absorbent hydrophilic cellulosic product. 3,971,379, Cl. 128-285.000.
- Cheng, King Y.: *See—*
  - Motley, David M.; and Cheng, King Y., 3,971,996.
- Cherenko, Joseph: *See—*
  - Beestrice, William R.; Cherenko, Joseph; and Frey, William I., 3,971,864.
- Chevron Research Company: *See—*
  - Schinski, William L., 3,971,650.
- Chiba, Michiaki: *See—*
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- Chibata, Ichiro; Miyoshi, Munetugu; Ito, Hiroshi; Fujii, Toshiyuki; and Kawashima, Keisuke, to Tanabe Seiyaku Co., Ltd. Aspartyl amide sweetening agents. 3,971,822, Cl. 260-468.00R.
- Chicago Lock Co.: *See—*
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- Chicklis, E. P.: *See—*
  - Naiman, Charles S.; Chicklis, E. P.; and Linz, Arthur, 3,972,007.
- Childs, George William, deceased: *See—*
  - O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,971,914.
- Childs, Patricia M., executrix: *See—*
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- Chimura, Keizo: *See—*
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- Ching, Yau Chau; and Chow, Ming-Chwan, to Bell Telephone Laboratories, Incorporated. Synchronization system for variable length encoded signals. 3,971,888, Cl. 178-69.5TV.
- Chow, Ming-Chwan: *See—*
  - Ching, Yau Chau; and Chow, Ming-Chwan, 3,971,888.
- Chow, Sen-Te, to United States of America, Army. Method of controlling a reference temperature to restore DC level for a thermal imaging system. 3,971,886, Cl. 178-7.100.
- Christensen, Arne Orskov. Unit for ascertaining the presence of water in lubricating oil. 3,971,248, Cl. 73-61.10R.
- Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, to Semi-Elements, Inc.; and Solitron Devices, Inc., part interest to each. Semiconductor device material. 3,971,870, Cl. 428-336.000.

- Cianciosi, Mario N.: *See—*
  - Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.
- Ciba-Geigy AG: *See—*
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  - Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.
  - Fasciati, Alfred; and Back, Gerhard, 3,971,738.
  - Zondler, Helmut; and Pfleiderer, Wolfgang, 3,971,792.
- Ciba-Geigy Corporation: *See—*
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  - Cook, Barry, 3,971,795.
  - Gaetzi, Karl; and Fischer, Hanspeter, 3,971,647.
  - Green, George Edward; and Stark, Bernard Peter, 3,971,765.
  - Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.
  - McCrae, James McGeachie; and Midcalf, Christopher, 3,971,739.
  - Model, Ernst, 3,971,805.
  - Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, 3,971,813.
  - Rasberger, Michael, 3,971,757.
  - Rosenberger, Siegfried; and Schwarzenbach, Kurt, 3,971,803.
- Cimarusti, Christopher M.; Levine, Seymour D.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Steroidal[16α,17-b]1,4-dioxanes and Steroidal[16α,17-b]1,4-dioxins. 3,971,772, Cl. 260-239.55R.
- Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., to E. R. Squibb & Sons, Inc. Steroidal 9,11-dihalo-[16α,17-b]1,4-dioxanes. 3,971,773, Cl. 260-239.55R.
- Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Thio-β-lactam penicillins. 3,971,776, Cl. 260-239.100.
- Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Thio-β-lactam cephalosporins. 3,971,780, Cl. 260-243.00C.
- Cincinnati Electronics Corporation: *See—*
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- Cislaghi, Ezio; Gentili, Claudio; and Maccario, Ermanno, to Honeywell Information Systems Italia. Parity check system in a semiconductor memory. 3,972,033, Cl. 340-173.00R.
- Citizen Watch Co., Ltd.: *See—*
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  - Nomura, Yasushi; and Morokawa, Shigeru, 3,971,205.
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- Clark Equipment Company: *See—*
  - Patton, Jon Richard; and Sisson, Ronald Loren, 3,971,453.
- Clark, Gaylord J. Cylindrical brush with stub shaft support. 3,971,097, Cl. 15-179.000.
- Clay, Robert B.; and Udy, Lex L. Apparatus for dewatering boreholes. 3,971,437, Cl. 166-187.000.
- Clement, John B., to Recor, Inc. Method and apparatus for sorting and classifying metallic cans. 3,971,474, Cl. 209-73.000.
- Clements, Lloyd W., to Ireco Industries, Inc. Trail line moves. 3,971,573, Cl. 285-5.000.
- Clifford, Douglas M.: *See—*
  - Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 3,971,925.
- Coatta, Joseph; and Emery, Charles Leslie. Photoelastic load measurement alarm device. 3,971,934, Cl. 250-225.000.
- Coburn Optical Industries, Inc.: *See—*
  - Coburn, Orin W.; and Stith, Joe D., 3,971,170.
- Coburn, Orin W.; and Stith, Joe D., to Coburn Optical Industries, Inc. Vaccum chuck with sealable cavity. 3,971,170, Cl. 51-284.000.
- Cochran, C. Norman, to Aluminum Company of America. Carbothermic production of aluminum. 3,971,653, Cl. 75-10.00R.
- Coe, Richard H.: *See—*
  - Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,971,434.
- Cohen, Noal, to Hoffmann-La Roche Inc. 3a,4,7,7a-Tetrahydro-4-phenylethyl-7a-alkyl-5(6H)-indanones and process for the preparation thereof. 3,971,809, Cl. 260-345.900.
- Coldewey, Heiko; Ammazzalorso, Mario; and Kaps, Karl-Heinz, to Justin Huppe, Firma. Venetian blind profiled slats. 3,971,427, Cl. 160-166.00R.
- Colgate-Palmolive Company: *See—*
  - Douglass, Miriam Lois, 3,971,725.
  - Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., 3,971,726.
- Collier, Peter Dudley; Penman, Alistair; and Trussell, Frederick John, to Thomas J. Lipton, Inc. Extracting tea using an aqueous solution of ammonium bicarbonate or ammonia. 3,971,858, Cl. 426-597.000.
- Collin, Heinrich: *See—*
  - Nudinger, Gunter; Collin, Heinrich; and Moosburger, Hans, 3,971,524.
- Combustion Engineering, Inc.: *See—*
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  - Lesham, Adam; and Schukei, Glen Elwin, 3,971,575.
- Commissariat a l'Energie Atomique: *See—*
  - Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.
  - Libs, Gerard, 3,972,004.
  - Porte, Robert; and Rommens, Michel, 3,971,593.
- Communications Satellite Corporation (Comsat): *See—*
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- Compagnie Generale d'Electricite: *See—*
  - Duchet, Michel, 3,972,009.
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- Compagnie Honeywell Bull (Societe Anonyme): *See—*
  - Deproux, Jacques Roland, 3,971,311.
- Conger, Robert R., to Zenith Radio Corporation. Color cathode ray tube with improved faceplate-funnel referencing structures. 3,971,490, Cl. 220-2.10A.
- Conibear, Frank R. Actuator for animal trap. 3,971,155, Cl. 43-90.000.
- Conroy, William E.; Ehlke, Charles C.; and Sidles, Peter, Jr., to Caterpillar Tractor Co. Axially compact clutch and brake mechanism. 3,971,461, Cl. 192-18.00A.
- Consolidated Foods Corporation: *See—*
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- Constant, James N. High capacity recirculating delay loop integrator. 3,971,993, Cl. 328-127.000.
- Container Corporation of America: *See—*
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  - Helms, Charles R.; and Patrick, William D., 3,971,468.
- Continental Can Company, Inc.: *See—*
  - Friendship, Kenneth F. M., 3,971,173.
  - McNeill, Frank M.; and Martinek, Harold H., 3,971,187.
- Cook, Barry, to Ciba-Geigy Corporation. Piperidine derivatives. 3,971,795, Cl. 260-293.880.
- Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. Cephalosporins having (α-etherified oximino)acylamido groups at the 7-position. 3,971,778, Cl. 260-243.00C.
- Cooke, William Ernest, to Alcan Research and Development Limited. Method of brazing aluminum. 3,971,501, Cl. 228-248.000.
- Corbett, Joseph H., to Sherwood Medical Industries Inc. Medical tube with cuff. 3,971,385, Cl. 128-351.000.
- Cord Systems, Inc.: *See—*
  - Wiese, Frank D.; Link, Donald F.; and Brown, Charles W., 3,971,306.
- Cornell, Gerald J.: *See—*
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- Cornil, Jean-Philippe, to Gaz de France. Arrangements for preventing or minimizing over-pressures in gas pipes. 3,971,399, Cl. 137-119.000.
- Cortner, William C., Jr., to Dale Alley Co. Livestock dusting bag. 3,971,342, Cl. 119-159.000.
- Cosmo, Nicola, to Ing. C. Olivetti & C., S.p.A. Automatic sheet changing system for reprographic machines. 3,971,553, Cl. 271-3.000.
- Cottin, Jean-Pierre: *See—*
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- Couchman, Robert, Jr.: *See—*
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- Coueille, Daniel, to Saft-Societe des Accumulateurs Fixes et de Traction. Electrochemical cell with fluid-tight casing and method of construction. 3,971,673, Cl. 136-133.000.
- Coussot, Gerard; and Menager, Olivier, to Thomson-CSF. Surface elastic wave electromechanical device. 3,972,011, Cl. 333-30.00R.
- Cowdery, David J., to Telectronics Pty. Limited. Titanium covered cardiac pacemaker with elastomer coating and method of applying same. 3,971,388, Cl. 128-419.00P.
- Cowley, Brian Richard; and Martin, David George, to Glaxo Laboratories Limited. Process for preparing penicillin antibiotics. 3,971,775, Cl. 260-239.100.
- Cox, David Alexander: *See—*
  - Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.
- Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., to Dow Badische Company. Wear testing device. 3,971,245, Cl. 73-7.000.
- Craig, Henry A. Trolling planer. 3,971,154, Cl. 43-43.130.
- Craig, James R.; and Otto, George W., Jr., to American Radiologic Systems Inc. X-ray apparatus with improved housing for components. 3,971,946, Cl. 250-422.000.
- Crane Packing Company: *See—*
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- Critchett, Paul J. Multipurpose table. 3,971,327, Cl. 108-60.000.
- Crompton & Knowles Corporation: *See—*
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- Crooks, Thomas L.: *See—*
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- Crosby, Lawton H.; and Keane, Thomas H., to Morley Furniture Spring Corporation. Spring attachment assemblies. 3,971,082, Cl. 5-260.000.
- Crotti, Renato. Apparatus for collecting a coreless coiled thread package. 3,971,521, Cl. 242-47.000.
- Crover, Stephen Earl; and Brown, Gordon Eugene, to Stanley Works, The. Breaker construction and valve therefor. 3,971,448, Cl. 173-134.000.
- Crowder, John V., to Consolidated Foods Corporation. Frozen confection and method and apparatus for making same. 3,971,853, Cl. 426-249.000.

- Crowe, Talmadge L., to Baker Oil Tools, Inc. Wireline safety valve with split ball. 3,971,438, Cl. 166-224.00A.
- Csathy, Denis G., to Deltak Corporation. Coal fired package boiler. 3,971,345, Cl. 122-510.000.
- Culler, Virgil H.: *See—*
  - United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,363.
  - United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.
- Curtin, Hoyt S. Pipe coupling. 3,971,574, Cl. 285-31.000.
- Curtis, Daniel L.; and Le Vantine, Allan D. Fingerprint inking device. 3,971,335, Cl. 118-6.000.
- Curtis, William R.; and Trimble, David C., to Hercules Incorporated. U-shaped furniture frame. 3,971,587, Cl. 297-452.000.
- Cutler-Hammer, Inc.: *See—*
  - Piber, Earl T., 3,971,908.
- Cvitkovich, Mary, to Lawrence Peska Associates, Inc., a part interest. Dual compartment beverage urn. 3,971,304, Cl. 99-291.000.
- D. H. Baldwin Company: *See—*
  - Lampkin, Curtis M., 3,971,672.
  - Wayne, William C., Jr., 3,971,283.
- Daftary, Rasik D., to Archer Daniels Midland Company. Process for preparing soy protein concentrate. 3,971,856, Cl. 426-417.000.
- Daguet, Jacques Lucien: *See—*
  - Bellanger, Maurice Georges; and Daguet, Jacques Lucien, 3,971,922.
- Dahl, Myrland J., to Malt-o-Meal Company. Apparatus for continuous puffing. 3,971,303, Cl. 99-323.400.
- Dalamangas, Chris A.: *See—*
  - Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., 3,971,610.
- Dale Alley Co.: *See—*
  - Cortner, William C., Jr., 3,971,342.
- Damani, Nalinkant C., to Alza Corporation. Medicament dispensing process for inhalation therapy. 3,971,377, Cl. 128-266.000.
- Damratowski, Harold E., to Triad Fastener Corporation. Air-powered, self-feeding screw driving tool. 3,971,421, Cl. 144-32.000.
- Daniel, Daniel S.: *See—*
  - Herz, Arthur H.; and Daniel, Daniel S., 3,971,662.
- Dann, Fred M.; and Reigel, James. Projection forming of three-dimensional metal objects. 3,971,911, Cl. 219-162.000.
- Darling, Phillip H. Rotary knitting machine. 3,971,232, Cl. 66-1.00R.
- Dart Industries Inc.: *See—*
  - Spoeth, Carl R., Jr., 3,971,360.
- Daswick, Alexander C. Disposable beverage brewer. 3,971,305, Cl. 99-295.000.
- Daver, Edul M., to Alcan Aluminum Corporation. Sintering of particulate metal. 3,971,657, Cl. 75-211.000.
- Davila, Jose E.: *See—*
  - Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.
- Davis, Donald E. Gutter cleaning nozzle. 3,971,098, Cl. 15-410.000.
- Davis, Gerald G.; and Keough, Joan M., to SCM Corporation. Electrocoating process. 3,971,708, Cl. 204-181.000.
- Davis, Orin H. Pneumatic courier dispatch unit. 3,971,531, Cl. 243-25.000.
- Davis, Ross Alan. FM-AM windshield antenna. 3,972,048, Cl. 343-712.000.
- Davy Powergas Inc.: *See—*
  - Schneider, Raymond T., 3,971,844.
- Deal, Troy M. Dredge cutter head. 3,971,148, Cl. 37-66.000.
- de Chair, Rory Somerset. Gas generators. 3,971,209, Cl. 60-39.140.
- Deering Milliken Research Corporation: *See—*
  - Frentress, Zane, 3,972,069.
- Dehmel, Georg; and Blahak, Johannes, to Bayer Aktiengesellschaft. Water-insoluble polyazo dyestuff comprising two or three identical azo dyestuffs joined to a central nucleus by carboxyl bridges. 3,971,741, Cl. 260-173.000.
- Delaage, Jacques, to Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E. Switch for a printed or like circuit. 3,971,905, Cl. 200-77.000.
- Delalande S.A.: *See—*
  - Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.
- DeLaval Turbine Inc.: *See—*
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- Delorey, David R.: *See—*
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- Deltak Corporation: *See—*
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- Demag Aktiengesellschaft: *See—*
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- Demler, Henry William, Jr.: *See—*
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- Demuth, John W.: *See—*
  - Newman, Larry B.; and Demuth, John W., 3,971,518.
- Denenberg, Jeffrey Neil, to Bell Telephone Laboratories, Incorporated. AM/FM receiver using spectral parameter estimators. 3,971,988, Cl. 325-316.000.
- Dentsply Research & Development Corporation: *See—*
  - Leu, Robert F., 3,971,135.
- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-triazolo[4,5-c]pyridine-7-carboxylic acids and esters. 3,971,800, Cl. 260-295.50B.
- Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-triazolo[4,5-c]pyridine-7-carboxylic acids and esters. 3,971,801, Cl. 260-295.50B.
- DePenti, Kenneth L., to Midland-Ross Corporation. Railway car coupler. 3,971,479, Cl. 213-127.000.
- Deproux, Jacques Roland, to Compagnie Honeywell Bull (Societe Anonyme). Striking device for dot printer. 3,971,311, Cl. 101-93.040.
- Derickson, Richard B., III; and Rallapalli, Krishna, to Fairchild Camera and Instrument Corporation. Universal first-in first-out memory device. 3,972,034, Cl. 340-173.00R.
- Derry, Juanita. Refrigerator with dry ice coolant. 3,971,231, Cl. 62-388.000.
- Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, to Ciba-Geigy AG. Monoazo compounds. 3,971,740, Cl. 260-158.000.
- Desblache, Andre Eugene; Stern, Thomas Edwin; and Thirion, Philippe Emmanuel, to International Business Machines Corporation. Phase filter for reducing the effects of the noise components altering discrete phase modulated signals. 3,972,000, Cl. 329-105.000.
- Deshpande, Arun K., to Erco Industries Limited. Oxidation of phosphorus in aqueous medium. 3,971,707, Cl. 204-149.000.
- Desimone, David Anthony: *See—*
  - Fenkel, Stanley O., 3,971,572.
- Detert, Klaus; and Lipp, Hans-Jochen, to Licentia Patent-Verwaltungs-G.m.b.H. Magnetic material of high strength and toughness. 3,971,676, Cl. 148-121.000.
- Detraz, Jacques; and Gambut, Michel, to La Technique Integrale S.A. Screw-and-nut mechanism with ball or roller recirculation. 3,971,264, Cl. 74-459.000.
- Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G.: *See—*
  - Dorbandt, Klaus, 3,971,529.
- Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
  - Ulrich, Erich; and van Liempt, Adrianus Reinier, 3,971,343.
- Devrick, Charles E.; Houmis, Nicholas J.; and Johnson, Russell A., to Fibreboard Corporation. Apparatus for cutting a member and seal means for association with such member. 3,971,294, Cl. 90-20.000.
- de Waltoff, Lionel, to Handy Chemicals Limited. Alloy plating system. 3,971,861, Cl. 427-247.000.
- Dewrance & Company, Limited: *See—*
  - Wierzbicki, Alexander, 3,971,412.
- Diamond International Corporation: *See—*
  - Peppler, William S., 3,971,689.
- Dietrich, Georg: *See—*
  - Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, 3,971,632.
- Diforte, Mariano P., Jr., to Bat Weight, Inc. Weighting device for attachment to baseball bats. 3,971,559, Cl. 273-26.00R.
- DiSalvo, Walter A.: *See—*
  - Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., 3,971,726.
- DiStefano, Thomas Herman, to International Business Machines Corporation. Dielectric diode, fabrication thereof, and charge store memory therewith. 3,972,059, Cl. 357-6.000.
- Diveley, William R., to Hercules Incorporated. Metal salts of 1,1,5,5-tetrasubstituted dithiobiurets and their use as population control agents. 3,971,781, Cl. 260-246.00B.
- Dohanic, John L., Jr.; and Cornell, Gerald J., to Louis Marx & Co., Inc. DC potential controller. 3,972,017, Cl. 338-165.000.
- Doi, Masayuki: *See—*
  - Inakura, Tuneho; and Doi, Masayuki, 3,971,266.
- Dolby, Ray Milton. Compressors, expanders and noise reduction systems. 3,972,010, Cl. 333-14.000.
- Dolfini, Joseph E.: *See—*
  - Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,776.
  - Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,780.
- Domaracki, John F.: *See—*
  - Hedgewick, Peter; Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,971,623.
- Domokos, Alex: *See—*
  - Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, 3,971,954.
- Don, Jules M.: *See—*
  - Boyajian, Alfred Z.; and Don, Jules M., 3,971,131.
- Donahue, Charles R.; and Williams, Philip J., to GF Business Equipment, Inc. Portable wall assembly. 3,971,182, Cl. 52-282.000.
- Dorbandt, Klaus, to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G. Fishing reel. 3,971,529, Cl. 242-211.000.
- Dorn, Conrad P.: *See—*
  - Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 3,971,797.
- Douglas, Larry J., to Marathon Oil Company. Designing micellar displacement systems to minimize adsorption. 3,971,439, Cl. 166-252.000.
- Douglass, Miriam Lois, to Colgate-Palmolive Company. 2-Mercaptoquinoxaline-1-oxides, salts thereof and 2-(1-oxoquinoxalinyl)disulfides in detergent compositions. 3,971,725, Cl. 252-106.000.

- Dow Badische Company: *See—*
  - Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., 3,971,245.
- Dow Chemical Company, The: *See—*
  - Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., 3,971,730.
  - McGregor, Stanley D., 3,971,799.
  - Rains, William A.; Fox, Robert D.; and Flynn, James P., 3,971,681.
  - Skelcey, James S., 3,971,846.
  - Thomas, Robert C., 3,971,675.
- Dow Corning Corporation: *See—*
  - Bank, Howard M.; and Michael, Keith W., 3,971,747.
  - Lee, Chi-Long; and Marko, Ollie W., 3,971,818.
  - Trombley, Wayne E.; and Jacobson, Lawrence R., 3,971,163.
- Dowling, Vincent J., Jr.: *See—*
  - Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., 3,971,245.
- Dresser Industries, Inc.: *See—*
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- Droney, Patrick J.: *See—*
  - Messina, Thomas A.; and Droney, Patrick J., 3,971,785.
- Drzewiecki, Tadeusz M., to United States of America, Army. Laminar jet linear accelerometer. 3,971,257, Cl. 73-515.000.
- Duchateau, Georges Francois Michel Frederic: *See—*
  - Blaude, Joseph Emile Albert; and Duchateau, Georges Francois Michel Frederic, 3,971,667.
- Duchenne, Henri, to Regie Nationale des Usines Renault. Apparatus for molding cast iron parts containing spheroidal graphite. 3,971,433, Cl. 164-362.000.
- Duchet, Michel, to Compagnie Generale d'Electricite. Electron beam generator and gas laser head in combination therewith. 3,972,009, Cl. 331-94.5PE.
- Dudley, George M. Machine tool having internally routed cryogenic fluid for cooling interface between cutting edge of tool and workpiece. 3,971,114, Cl. 29-106.000.
- Duncan, Alexander William, to GTE Sylvania Incorporated. Automatic load compensating clamp truck jaws. 3,971,584, Cl. 294-88.000.
- Duncan, David Robertson. Spraying apparatus. 3,971,512, Cl. 239-1.000.
- Dunkelberger, David L.: *See—*
  - Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 3,971,835.
- Dunkle, Robert P.: *See—*
  - Burger, John H.; McClelland, John R.; and Dunkle, Robert P., 3,971,679.
- Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, to Commissariat a l'Energie Atomique. Radioelectrochemical energy converter. 3,971,671, Cl. 136-86.00R.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Gorrafa, Adly Abdel-Moniem, 3,971,108.
  - Setterquist, Robert Alton, 3,971,767.
  - Taylor, Harold J., 3,971,234.
  - Windley, William Thomas, 3,971,202.
- Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pyridyl alkylguanidine compounds, composition therewith, and methods of inhibiting H-2 histamine receptors. 3,971,786, Cl. 424-263.000.
- Durrer, Hermann A., to Sulzer Brothers Limited. Chimney for exhaust gas having an adjustable means for throttling a flow of exhaust gas. 3,971,302, Cl. 98-60.000.
- Duskin Franchise Co., Ltd.: *See—*
  - Komatsu, Toshiyoshi; and Chimura, Keizo, 3,971,093.
- Dymit, Joseph M.: *See—*
  - Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, 3,971,273.
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  - Cimarusti, Christopher M.; Levine, Seymour D.; and Weisenborn, Frank L., 3,971,772.
  - Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., 3,971,773.
  - Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,776.
  - Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,780.
  - Denzel, Theodor; and Hoehn, Hans, 3,971,800.
  - Denzel, Theodor; and Hoehn, Hans, 3,971,801.
  - Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, 3,971,823.
  - Heyer, Robert E.; and Bolter, Bernard J., 3,971,955.
- Eastman Kodak Company: *See—*
  - Herz, Arthur H.; and Daniel, Daniel S., 3,971,662.
  - Newman, Larry B.; and Demuth, John W., 3,971,518.
  - Staehle, Henry C., 3,971,660.
  - Van Meter, James P.; and Klanderman, Bruce H., 3,971,824.
  - Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, 3,971,755.
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  - Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.
- Economy, James; Lin, Ruey Y.; and Smith, William D., to Carborundum Company, The. Production of high strength carbide fibers by heat treatment. 3,971,840, Cl. 264-231.000.
- Edling, Porter R.; Yoast, Kenneth L.; and Wickline, Glenn D., deceased (by Wickline, Mrs. Glenn D., executrix), to Offshore Company, The. Emergency mooring release. 3,971,328, Cl. 114-221.00R.
- Ehlke, Charles C.: *See—*
  - Conroy, William E.; Ehlke, Charles C.; and Sidles, Peter, Jr., 3,971,461.
- Eikelberger, Rand Jeffrey, to Illinois Tool Works Inc. Wheel velocity sensor with exciter ring runout compensation. 3,971,995, Cl. 328-149.000.
- Eilo, Clyde W.: *See—*
  - Burkle, William C.; and Eilo, Clyde W., 3,971,318.
- Elast-O-Cor Products & Engineering Limited: *See—*
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- Electronic Memories and Magnetics Corporation: *See—*
  - Havelka, Steven E.; Graham, Paul L.; and Matschke, Carl L., 3,971,186.
- Elkuch, Erwin. Method for erecting a pile wall adapted to take compressive forces and a pile wall produced by the method. 3,971,224, Cl. 61-41.00A.
- Ellender, Robert D., Jr. Process for removing sulfur from crude oil. 3,971,713, Cl. 208-226.000.
- Ellis, Paul H.; and Kramer, Richard R., to United States of America, Army. Adjustable muzzle compensator. 3,971,285, Cl. 89-14.00C.
- Elrod, Donald L. Rectractable automobile trunk lid tie down. 3,971,589, Cl. 296-76.000.
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  - Coatta, Joseph; and Emery, Charles Leslie, 3,971,934.
- Emmett, John Colin: *See—*
  - Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.
- Endo, Yuzo, to Kimura, Shoichi; and Mitsui Construction Co., Ltd. Earth anchor work method and anchor device. 3,971,177, Cl. 52-166.000.
- Engineering Enterprises, Inc.: *See—*
  - Fox, Fred K., 3,971,450.
- England, Richard E.: *See—*
  - Amato, Frank M.; and England, Richard E., 3,971,112.
- Enos, Herman Isaac, Jr.: *See—*
  - Brown, Claud Lafayette; and Enos, Herman Isaac, Jr., 3,971,159.
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- Erco Industries Limited: *See—*
  - Deshpande, Arun K., 3,971,707.
- Erdell, John Buckland. Safelight filter. 3,971,929, Cl. 240-10.60R.
- Erickson, David J., to Sparton Corporation. Electromechanical transducer. 3,972,018, Cl. 340-10.000.
- Ernst, Franklin Henry, Jr.; and Nelson, Martin N. Tri-level selector. 3,971,473, Cl. 209-73.000.
- Ernst Winter & Sohn: *See—*
  - Sawluk, Wlodzimierz, 3,971,358.
- Essad, Robert A.: *See—*
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  - Mayfield, Glenn A., 3,971,979.
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- Ethyl Corporation: *See—*
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  - Robinson, Gene C., 3,971,728.
- Evans, Anthony Garth: *See—*
  - Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.
- Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., to Xerox Corporation. Independent compression and positioning device for use in mammography. 3,971,950, Cl. 250-451.000.
- Evans, Lyle B. Vehicle conveyor. 3,971,325, Cl. 104-172.00B.
- Everett, George, to Gros-ite Industries, Inc. Telescope assemblies. 3,971,620, Cl. 350-26.000.
- Everett, Harry F.: *See—*
  - Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C., 3,971,398.
- Everett, Richard C.: *See—*
  - Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C., 3,971,398.
- Ewbank, John R., to Atlantic Richfield Company. Continuous displacement chromatographic separation. 3,971,842, Cl. 423-7.000.
- Extrados Company Limited: *See—*
  - Svirklys, Ferdinand M., 3,971,326.
- Exxon Production Research Company: *See—*
  - Peters, Beldon A., 3,971,719.
- Eyraud, Charles: *See—*
  - Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.
- F. Kuppersbusch & Sohne Aktiengesellschaft: *See—*
  - Lohr, Alfred; Schwan, Wolfgang; Tschek, Wolfgang; and Schreiber, Gunter, 3,971,420.
- Factory Mutual Research Corporation: *See—*
  - Zenker, Karol R., 3,971,443.
- Fairchild Camera and Instrument Corporation: *See—*
  - Derickson, Richard B., III; and Rallapalli, Krishna, 3,972,034.
- Fantozzi, Louis J., to Xerox Corporation. Programmable billing system. 3,971,919, Cl. 235-92.0SB.

- Farley, Brent. Chair for aiding conjugal relations for the infirm. 3,971,592, Cl. 297-217.000.
- Fasano, Ernest L. Display device background component composition and method. 3,971,724, Cl. 252-63.200.
- Fasciati, Alfred; and Back, Gerhard, to Ciba-Geigy AG. Heavy metal complexes of azo compounds containing a halogeno-2,3-dihydroxy pyridine coupling component. 3,971,738, Cl. 260-146.00R.
- Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. Certain 6-(dialkylamino, pyrrolidino and piperidino)ethoxy-4,7-dimethoxy-5-(3-phenyl-1-hydroxypropyl)2,3-dihydrobenzofurans. 3,971,793, Cl. 260-293.580.
- Faust, Carl Walter; and Smith, Arnold Ray, to Bell Telephone Laboratories, Incorporated. Cable splice closure. 3,971,894, Cl. 174-41.000.
- Federhen, Herbert M.: *See—*
  - Speiser, Jeffrey M.; and Federhen, Herbert M., 3,971,927.
- Feeman, James F., to Crompton & Knowles Corporation. Sulfoalkyl aminophenyl disazo dyes. 3,971,769, Cl. 260-186.000.
- Feeney, Thomas Aquinas: *See—*
  - Varney, Justin Arnold; and Feeney, Thomas Aquinas, 3,971,255.
- Feinberg, Isadore: *See—*
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- Feine, Wolfgang: *See—*
  - Solf, Johannes; and Feine, Wolfgang, 3,971,094.
- Feit, Peter Werner, to Lovens Kemiske Fabrik Produktionsaktieselskab. 3-Amino, 4-thio-substituted, 5-sulphamyl-benzoic acid derivatives. 3,971,819, Cl. 260-465.00D.
- Feldstein, Cyril: *See—*
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  - United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.
- Felix, Ernst; and Locher, Hans, to Zellweger, Ltd. Regulation of electronically operated quality control equipment. 3,971,272, Cl. 83-13.000.
- Fenkel, Stanley O., to Desimone, David Anthony, a part interest. Magazine cover. 3,971,572, Cl. 281-46.000.
- Fernandez, Pablo Martinez, to Francisco Martin Martin. System for millesimal measure. 3,971,137, Cl. 33-164.00R.
- Ferranti, Limited: *See—*
  - Shepherd, Geoffrey, 3,971,994.
- Ferro Corporation: *See—*
  - Ruderer, Clifford G., 3,971,120.
- Fibreboard Corporation: *See—*
  - Devrick, Charles E.; Houmis, Nicholas J.; and Johnson, Russell A., 3,971,294.
- Figueroa, Raymond Oscar: *See—*
  - Bilsens, Gunars; and Figueroa, Raymond Oscar, 3,971,999.
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- Finck, Edward J.: *See—*
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- Finn, Lawrence R.: *See—*
  - Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., 3,971,277.
- Firth, Donald; Foster, Keith; and Hooke, Christopher John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Reciprocatable devices. 3,971,217, Cl. 60-486.000.
- Fischer, Hanspeter: *See—*
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- Fish, Paul R., Sr. Remotely controlled collapsible dust pan. 3,971,095, Cl. 15-257.700.
- Fishing Tools, Inc.: *See—*
  - Lee, William T., 3,971,436.
- Fitzmaurice, Michael W.; and Abshire, James B., to United States of America, National Aeronautics and Space Administration. Polarization compensator for optical communications. 3,971,930, Cl. 250-199.000.
- Fleetwood Systems, Inc.: *See—*
  - Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.
- Fleischer, Henry. Baby holding device. 3,971,079, Cl. 5-97.000.
- Fletcher, David T.: *See—*
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- Flippin, Anne: *See—*
  - United States of America, National Aeronautics and Space Administration; Flippin, Anne; and Schmitt, Arthur L., 3,971,915.
- Flournoy, Norman Eustace, to Texaco Inc. Timing mode selector. 3,971,959, Cl. 307-225.00R.
- Flynn, James P.: *See—*
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- Focht, Claude K.: *See—*
  - McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.
- Fogarty, John E., Jr. Continuous filter. 3,971,721, Cl. 210-401.000.
- Foley, James P., to Roanwell Corporation. Communications headset with rotatable and tiltable electrical connector. 3,971,900, Cl. 179-156.00A.
- Foley, James P., to Roanwell Corporation. Communications headset with reversible mounting means. 3,971,901, Cl. 179-156.00A.
- Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Fire resistant epoxy resins cured with phosphorus trihalides. 3,971,750, Cl. 260-37.0EP.
- Folgero, Kare; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Metallurgical furnace having a blast injection nozzle. 3,971,548, Cl. 266-218.000.
- Foller, Werner, to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen. Throttle valve. 3,971,415, Cl. 137-630.190.
- Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, to Puritan Equipment, Inc. Combined oxygen mask and smoke goggle apparatus with automatic flush valve. 3,971,368, Cl. 128-142.00R.
- Ford Motor Company: *See—*
  - Amato, Frank M.; and England, Richard E., 3,971,112.
- Foreman, Kenneth C. Rock separator. 3,971,716, Cl. 209-396.000.
- Foster, Keith: *See—*
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- Fountain, Craig. Rudder restraint for grounded aircraft. 3,971,532, Cl. 244-1.00R.
- Fowler, John H.: *See—*
  - Herd, David P.; and Fowler, John H., 3,971,576.
- Fowler, Stephen G. Weaving machine, apparatus and method. 3,971,418, Cl. 139-116.600.
- Fox, Duke M., to Fox Manufacturing Company. Two cycle engine with peripheral bypass for piston head and method of manufacture. 3,971,297, Cl. 92-169.000.
- Fox, Fred K., to Engineering Enterprises, Inc. Well drilling tool. 3,971,450, Cl. 175-107.000.
- Fox Manufacturing Company: *See—*
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- Fox, Robert D.: *See—*
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- Franaszek, Peter A.: *See—*
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- Francisco Martin Martin: *See—*
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- Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for use with an X-ray photographing device providing for a preset X-ray exposure time. 3,971,945, Cl. 250-402.000.
- Frantzen, John J.; and Barton, Lee C., to Buckbee-Mears Company. Etching process for accurately making small holes in thick materials. 3,971,682, Cl. 156-11.000.
- Franz, John E.; and Nufer, Hans L., to Monsanto Company. Herbicidal use of carboxyalkyl ester of N-phosphonomethyl glycine. 3,971,648, Cl. 71-86.000.
- Frech, Anton. Automatically actuated suspended railway cabin closures. 3,971,324, Cl. 104-28.000.
- Frechtling, Arthur C.; Johnston, Norman W.; and Shaw, Richard G., to Union Carbide Corporation. Polymer composites and preparation thereof. 3,971,753, Cl. 260-42.140.
- Frederick, Charles V. Wall structure. 3,971,180, Cl. 52-251.000.
- Fredrikson, Bengt; and Oberg, Karl-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Apparatus and method for refining metal. 3,971,547, Cl. 266-244.000.
- Freeborn, Lowell C.: *See—*
  - Budke, Robert L.; and Freeborn, Lowell C., 3,971,113.
- Freericks, Alfred H., to Addressograph Multigraph Corporation. Indicia disc. 3,972,054, Cl. 354-15.000.
- French, Neil S., to Raymond Lee Organization, Inc., The, a part interest. Propulsion pump for water borne vessels. 3,971,330, Cl. 115-32.000.
- Frentress, Zane, to Deering Milliken Research Corporation. Magnetic tape control system circuit for selectively blocking the effect of parity-check characters. 3,972,069, Cl. 360-48.000.
- Frey, William I.: *See—*
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- Frezza, Robert, to Samcoe Holding Corporation. High production steamer. 3,971,235, Cl. 68-5.00E.
- Fried, Mark A.: *See—*
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- Friendship, Kenneth F. M., to Continental Can Company, Inc. Process for heat treating plastic bottles. 3,971,173, Cl. 53-29.000.
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- Froumajou, Armand, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Fuel feed of rotary cylinder combustion engines. 3,971,349, Cl. 123-44.00D.
- Fruda, Ivan; and Trumbetas, Jerome Francis, to General Foods Corporation. Multifunctional sweetening composition. 3,971,857, Cl. 426-548.000.
- Fruehauf Corporation: *See—*
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- Fryer, Thomas B.: *See—*
  - Pope, Jack M.; and Fryer, Thomas B., 3,971,362.
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  - Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, 3,971,664.
- Fujii, Kiyoshi: *See—*
  - Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, 3,971,746.
- Fujii, Toshiyuki: *See—*
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- Fujita, Tatsuo: *See—*
  - Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, 3,971,606.
- Fukayama, Gary P.; and Repay, Laszlo N., to Motorola, Inc. Mode selector lockout mechanism for a cassette tape recorder/reproducer. 3,972,070, Cl. 360-77.000.
- Fukui, Takasuke: *See—*
  - Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, 3,971,981.
- Fukuoka, Yoshikazu; and Miwa, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Continuous hot-dip galvanizing process for steel strip. 3,971,862, Cl. 427-329.000.
- Fukutome, Satoru: *See—*
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- Funae, Yoshihiko: *See—*
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- G. D. Searle & Co.: *See—*
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- Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., to USM Corporation. Self-adjusting roll wipers for a shoe lasting machine. 3,971,089, Cl. 12-8.300.
- Gaetzi, Karl; and Fischer, Hanspeter, to Ciba-Geigy Corporation. Composition for the regulation of plant growth. 3,971,647, Cl. 71-76.000.
- Gaines, John W.: *See—*
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- Gallo, William C. Rotary valve assembly. 3,971,402, Cl. 137-382.000.
- Gambut, Michel: *See—*
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- Gaminde, Juan: *See—*
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- Ganellin, Charon Robin: *See—*
  - Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.
- Gans, Charles C. Knock-down drawer unit. 3,971,608, Cl. 312-257.00R.
- Gardetto, Alfred D. Base marker for baseball. 3,971,558, Cl. 273-25.000.
- Garmaise, David Lyon: *See—*
  - Prasad, Raj Nandan; and Garmaise, David Lyon, 3,971,849.
- Garrett Corporation, The: *See—*
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- Garrett, Douglas R.: *See—*
  - Millar, James S.; and Garrett, Douglas R., 3,971,405.
- Garsky, Victor M., to American Home Products Corporation. [2-Methyl-Ala^{8}]LRH. 3,971,737, Cl. 260-112.5LH.
- Garza, Jose G., to Raymond Lee Organization, Inc., The, a part interest. Weaving frame supporting device. 3,971,109, Cl. 28-15.000.
- Garziera, Gastone, to Ing. C. Olivetti & C., S.p.A. Skew compensation for a magnetic card reading-writing unit. 3,972,027, Cl. 340-172.500.
- Gates Rubber Company, The: *See—*
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- Gau, Gerald S.; and Zamora, Mario, to Halliburton Company. Simulator for an oil well circulation system. 3,971,926, Cl. 235-184.000.
- Gavrilova, Ivana: *See—*
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- Gay-Chatain, Guillaume Antonin; and Montjallard, Paul Rene Marius, to Etat Francais. Apparatus for electrically connecting two conductors between two rotatable elements. 3,971,460, Cl. 191-45.00R.
- Gaz de France: *See—*
  - Cornil, Jean-Philippe, 3,971,399.
- Gazuit, Georges, to NRM Corporation. Manufacture of radial-carcass tires. 3,971,694, Cl. 156-415.000.
- Geary, Henry R.: *See—*
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- Gelber, Robert M.; and Small, Edward A., Jr., to Optical Coating Laboratory, Inc. Liquid crystal display device and method. 3,971,869, Cl. 422-195.000.
- Gemmell, Frank S.; and Fried, Mark A., to Motorola, Inc. Detonation system and method. 3,971,317, Cl. 102-21.000.
- General American Transportation Corporation: *See—*
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- General Atomic Company: *See—*
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- Gentil, Henri. Hand loom. 3,971,417, Cl. 139-34.000.
- Gentil, Robert, to Industrielle de Constructions Mobiles. Prefabricated construction. 3,971,172, Cl. 52-28.000.
- Gentili, Claudio: *See—*
  - Cislaghi, Ezio; Gentili, Claudio; and Maccario, Ermanno, 3,972,033.
- Genuit, Luther L., to Honeywell Information Systems, Inc. Switching regulator employing biased saturable core reactors. 3,971,975, Cl. 321-18.000.
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- Gibson, Robert T., to Professional Surgical Manufacturing Company. Laparotomy sponge. 3,971,381, Cl. 128-296.000.
- Giguere, Winfield Joseph; and Padnes, David Richard, to Bell Telephone Laboratories, Incorporated. Method of fabricating a printed wiring board assembly. 3,971,127, Cl. 29-626.000.
- Gilbert, Ernst: *See—*
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- Gillis, Robert E. Bubble machine with protective transparent dome. 3,971,157, Cl. 46-7.000.
- Giordano, Antonio, to Viges S.p.A. Apparatus for applying a sole to an upper in the manufacture of shoes. 3,971,087, Cl. 12-1.00A.
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- Goffe, William L., to Xerox Corporation. Imaging process employing friction charging in the presence of an electrically insulating liquid. 3,971,658, Cl. 96-1.00C.
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- Goodrich, George E., Sr.: *See—*
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- Goodsmith, Dale H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener installation head. 3,971,116, Cl. 29-208.00D.
- Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, to Bell Telephone Laboratories, Incorporated. Recursive detector-oscillator circuit. 3,971,998, Cl. 328-167.000.
- Gorrafa, Adly Abdel-Moniem, to Du Pont de Nemours, E. I., and Company. Set apparatus for treating yarn and process for stringup thereof. 3,971,108, Cl. 28-1.400.
- Goto, Issei; and Hara, Suzo, to Parker Sangyo Co., Ltd. Method for preventing the adhesive deposition of sludge on the surface of parts of a plant for treating metal surfaces. 3,971,539, Cl. 250-529.000.
- Goto, Kazuo: *See—*
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- Gottfried, Arthur H.; Jasper, Louis J., Jr.; and Tancredi, John J., to United States of America, Army. Planar ring bar travelling wave tube. 3,971,966, Cl. 315-39.300.
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- Great Dane Trailers, Inc.: *See—*
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- Green, Philip S., to Stanford Research Institute. Linear transducer array for ultrasonic image conversion. 3,971,962, Cl. 310-8.100.
- Greenleaf, Charles W. Breakwater system for creating artificial sandbars. 3,971,221, Cl. 61-5.000.
- Greer, Kent Reaney; Hampson, William Rodney; and Smith, Benjamin James, to Imperial Chemical Industries Limited. Method for forming double-walled units. 3,971,687, Cl. 156-221.000.
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- Griffin, Raymond E. Manually operable self-closing valve. 3,971,541, Cl. 251-347.000.
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- Grotz, Charles A., to Boeing Company, The. Method of and apparatus for controlling flow attachment to the wing and flap surfaces of an upper surface blowing type aircraft. 3,971,534, Cl. 244-42.0CD.
- Grundell, Carl-Erik. Box-shaped product. 3,971,502, Cl. 229-14.00R.
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- Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor cold electron emission device. 3,972,060, Cl. 357-30.000.
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- Harms, John F. Device for use with fishing tackle. 3,971,153, Cl. 43-43.130.
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- Hashimoto, Syunichi. Series connector. 3,971,615, Cl. 339-98.000.
- Hashimoto, Syunichi. Electrical parallel connector. 3,971,616, Cl. 339-98.000.
- Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, to Rikagaku Kenkyusho. Plant growth modifier and a process for preparation thereof. 3,971,651, Cl. 71-122.000.
- Hasson, Harrith M. Surgical closure. 3,971,384, Cl. 128-335.000.
- Hastings, Donald R., to Nordson Corporation. Apparatus for electrostatically spraying highly electrically conductive water-based coating material. 3,971,337, Cl. 118-629.000.
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- Havelka, Steven E.; Graham, Paul L.; and Matschke, Carl L., to Electronic Memories and Magnetics Corporation. Wedge lock unit. 3,971,186, Cl. 52-753.00G.
- Hawkins, Edwin Francis, to Allied Chemical Corporation. Water-wettable wax composition and process for producing the same. 3,971,733, Cl. 252-311.000.

Hawkins, Henry H., to H. H. Hawkins Ltd. Fluorescent lamp installation having separate filament transformers and remotely located ballast. 3,971,967, Cl. 315-97.000.

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Hays, Bill J., to Bill J. Hays International Inc. Distributor means for high speed engines. 3,971,350, Cl. 123-117.00R.

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Heiges, Melville Lynwood, Jr.; Golding, Leonard; and Banyasz, Bela, to Communications Satellite Corporation (Comsat). Method of testing color television systems. 3,972,065, Cl. 358-10.000.

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Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 3,971,826, Cl. 260-520.00B.

Hess, William Emil, Jr.; and Vella-Coleiro, George Philip, to Bell Telephone Laboratories, Incorporated. Phase correcting drive circuit for a magnetic bubble field-access memory. 3,972,037, Cl. 340-174.0TF.

Hessert, James E.; and Clampitt, Richard L., to Phillips Petroleum Company. Method for treating subterranean formations with cellulose ether-polyacrylamide aqueous gels. 3,971,440, Cl. 166-270.000.

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Hill, Horace Kirby, to Amalgamated Dental Company Limited, The. Dental syringe. 3,971,375, Cl. 128-173.100.

Hilsum, Cyril; and Mears, Adrian Leonard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Display systems. 3,972,040, Cl. 340-324.00M.

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Hinnergardt, Larry C., to United States of America, Army. Method of producing freeze-dried, cooked beef steak and resulting product. 3,971,854, Cl. 426-281.000.

Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, to Kuraray Co., Ltd. Synthetic polyisoprene rubber latex. 3,971,746, Cl. 260-29.70D.

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Hirt, Adam; and Roderer, Herbert, to Robert Bosch G.m.b.H. Magneto generator supplied battery-less electric power supply system particularly for motor vehicles. 3,971,977, Cl. 322-1.000.

Hitachi Electronics Ltd.: *See—*
Seki, Ikuo; and Kato, Masahiko, 3,972,066.

Hitachi, Ltd.: *See—*
Sasaki, Shigeru; and Nakamura, Kiichi, 3,971,124.

Hobbs, Howard Frederick, to Variable Kinetic Drives, Ltd. Power transmission apparatus. 3,971,260, Cl. 74-337.500.

Hochtemperatur-Kernkraftwerk Gesellschaft mit beschrankter Haftung (HKG), Gemeinsames Europaisches: *See—*
Schweiger, Fritz; and Wohler, Jurgen, 3,971,444.

Hodges, Ronald R., to Steelcase, Inc. Tray for a document handling system. 3,971,475, Cl. 211-88.000.

Hoechst Aktiengesellschaft: *See—*
Becker, Reinhold; Hennecken, Manfred; and Zimmerman, Hans-Georg, 3,971,301.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,971,800.
Denzel, Theodor; and Hoehn, Hans, 3,971,801.

Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Bauer, Friedrich, 3,971,409.

Hoffman, Paul R.: *See—*
Lundquist, David E.; McGregor, Arvin D.; and Hoffman, Paul R., 3,972,051.

Hoffmann-La Roche Inc.: *See—*
Cohen, Noal, 3,971,809.

Hoffmeister, Wolfgang: *See—*
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Hoge, John H.: *See—*
Bodocsi, Andrew; Hoge, John H.; Hubbard, John H.; Hubbard, S. Jackson; and Roberto, Gerard, 3,971,179.

Hohmann, Walter; Wunderlich, Klaus; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,971,812, Cl. 260-380.000.

Hohner, Gary A.: *See—*
Buix, Louis F.; Gribnitz, Harry J.; and Hohner, Gary A., 3,971,629.

Hollander, James Fisher. Simulation apparatus. 3,971,142, Cl. 35-22.00R.

Hollis, John Edward; and Barrett, John Albert, to Plessey Handel und Investments AG. Telephone conference arrangement. 3,971,895, Cl. 179–1CN.

Holly, Frederick W.: *See—*
Wagner, Arthur F.; Holly, Frederick W.; Lin, Tsau-Yen; Shen, Tsung-Ying; and Hirschmann, Ralph F., 3,971,736.

Holmala, Aulis: *See—*
Nylund, Roger; and Holmala, Aulis, 3,971,449.

Holmqvist, Magnus Allan. Method of making a composite baking mold. 3,971,118, Cl. 29-412.000.

Holtzberg, Frederic; Mayadas, Ashok F.; Thompson, William A.; and von Molnar, Stephan, to International Business Machines Corporation. Detection of magnetic domains by tunnel junctions. 3,972,035, Cl. 340-174.0TF.

Homsy, Charles A. Implantable structure and method of making same. 3,971,670, Cl. 156-196.000.

Honeywell Inc.: *See—*
Bentsen, Louis J., 3,971,396.

Honeywell Information Systems, Inc.: *See—*
Bailey, Myrl Kennedy, Jr., 3,972,029.
Bailey, Myrl Kennedy, Jr., 3,972,030.
Genuit, Luther L., 3,971,975.

Honeywell Information Systems Italia: *See—*
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Hooke, Christopher John: *See—*
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Hooper, George W.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

Hopp, Gene P., to Motorola, Inc. Mounting assemblies for a plurality of transistor integrated circuit chips. 3,972,062, Cl. 357-68.000.

Hoppe, Walter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Corpuscular beam microscope, particularly electron microscope, with adjusting means for changing the position of the object to be imaged or the image of the object. 3,971,936, Cl. 250-311.000.

Hoppey, Thomas. Forklift attachment. 3,971,485, Cl. 214-313.000.

Horeth, Mathias, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process of extracting a hot slab from a continuous casting mould and an apparatus therefor. 3,971,429, Cl. 164-82.000.

Horimoto, Mitsuaki: *See—*
Tsujimoto, Kayoshi; Matsui, Tohru; Abe, Haruo; and Horimoto, Mitsuaki, 3,972,056.

Hoshino, Mitsuyuki: *See—*
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Hosono, Isamu: *See—*
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Houilleres du Bassin du Nord et du Pas-de-Calais: *See—*
Boel, Charles; Cottin, Jean-Pierre; and Guitard, Francois, 3,971,175.

Houmis, Nicholas J.: *See—*
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Houseman, John, to United States of America, National Aeronautics and Space Administration. Hydrogen-rich gas generator. 3,971,847, Cl. 423-650.000.

Howard, Shirly L., to International Telephone and Telegraph Corporation. Adaptive clutter velocity cancellation system for pulsed digital MTI system. 3,972,041, Cl. 343-7.700.

Hoya Glass Works, Ltd.: *See—*
Tajima, Hidemi; Asahara, Yoshiyuki; and Izumitani, Tetsuro, 3,971,723.

Hoyland, Trevor Barrie, to Thurne Engineering Company Limited. Machine for inserting objects into bags. 3,971,191, Cl. 53-112.00B.

Huang, Kwang Ta; and Brooks, James L., to United States of America, Navy. VLF antenna tower base insulator. 3,971,878, Cl. 174-30.000.

Hubbard, John H.: *See—*
Bodocsi, Andrew; Hoge, John H.; Hubbard, John H.; Hubbard, S. Jackson; and Roberto, Gerard, 3,971,179.

Hubbard, S. Jackson: *See—*
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Hudecek, Slavko; and Gavrilova, Ivana, to Ceskoslovenska akademie ved. Method for preparation of emulsions, concentrated dispersions and pastes. 3,971,744, Cl. 260-23.0EM.

Hudson, Eugene; and Geary, Henry R., to General Electric Company. Means for locating suction valve. 3,971,407, Cl. 137-516.150.

Huessy, Eric G., to Peavey Company. Technique for preparing edible food flavor pellets. 3,971,859, Cl. 426-618.000.

Hufton, Austen B., to Servicemaster Industries, Inc. Vacuum cleaner including dust bag and filter. 3,971,643, Cl. 55-372.000.

Hughes Aircraft Company: *See—*
Shapiro, Sanford S., 3,972,013.

Humbert, Daniel; and Ratouis, Roger, to Roussel-UCLAF. Pyridine derivative, processes of preparation and pharmaceutical compositions. 3,971,798, Cl. 260-295.0CA.

Hunkeler, Ernst J., to Gleason Works, The. Anti-backlash mechanism for generating train of gear cutting machine. 3,971,293, Cl. 90-5.000.

Hurko, Bohdan, to General Electric Company. Low thermal mass cooking utensil. 3,971,361, Cl. 126-390.000.

Hurt, James S. Belt transfer means for cigarettes or the like. 3,971,466, Cl. 198-20.00C.

Hurtes, Walter. Apparatus and procedure for manufacturing articles having a non-woven pile. 3,971,685, Cl. 156-72.000.

Husson, Frank, Jr., to Applied Oceanographic Technology Corporation. Fishing lure. 3,971,152, Cl. 43-42.060.

Hutson, Jearld L. Four quadrant symmetrical semiconductor switch. 3,972,014, Cl. 357-39.000.

Hycom Incorporated: *See—*
Motley, David M.; and Cheng, King Y., 3,971,996.

Hyduk, Walter: *See—*
Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, 3,971,565.

Hyfil Limited: *See—*
Wrzesien, Andrew Peter; Whitney, Ian; and Katona, Joseph, 3,971,669.

Hyler, John H., to Westinghouse Air Brake Company. Reentrant driving arrangement for scraper elevator. 3,971,146, Cl. 37-8.000.

Hyler, John H., to Westinghouse Air Brake Company. Torque-limited driving arrangement for scraper elevator. 3,971,147, Cl. 37-8.000.

I. D. Engineering, Inc.: *See—*
Martens, Martin A. J., 3,971,269.

Ibara, Hisato: *See—*
Norita, Toshimasa; Ibara, Hisato; Murakami, Masahiro; and Okano, Masao, 3,971,705.

IBM: *See—*
Romankiw, Lubomyr T., 3,971,710.

Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Apparatus for controlling the synchronous drive for direct-current motors. 3,971,974, Cl. 318-341.000.

ICI United States Inc.: *See—*
Lee, John T. M., 3,971,320.

Ikegami, Yoshio; Kimura, Hirohumi; Kohge, Tadashi; Sakamoto, Katsuji; and Higashimoto, Takenbu, to Kobe Steel Ltd.; and Sumitomo Electric Industries, Ltd. Mechanism for preventing the adverse effects of centrifugal force in a strand winding machine. 3,971,519, Cl. 242-25.00A.

Ilg, Rudolf: *See—*
Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, 3,971,632.

Illing, Henry, to Kieley & Mueller, Inc. Servo butterfly valve and vane. 3,971,414, Cl. 137-630.150.

Illinois Tool Works Inc.: *See—*
Eikelberger, Rand Jeffrey, 3,971,995.
Ward, William Edward, 3,971,904.

Imai, Kiyoshi: *See—*
Matuura, Yosio; Murakami, Shoichi; Yamaguchi, Norihisa; Kishida, Takashi; Kadokura, Sadao; and Imai, Kiyoshi, 3,971,517.

Imanari, Makoto: *See—*
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Imperial Chemical Industries Limited: *See—*
Greer, Kent Reaney; Hampson, William Rodney; and Smith, Benjamin James, 3,971,687.

Inada, Masami; and Okumura, Shuji, to Aisin Seiki Kabushiki Kaisha. Vapor fuel control apparatus. 3,971,406, Cl. 137-493.400.

Inakura, Tuneho; and Doi, Masayuki, to Nippondenso Co., Ltd. Power transmission device. 3,971,266, Cl. 74-675.000.

Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, to Victor Company of Japan, Limited. Pulse amplifier. 3,971,961, Cl. 307-268.000.

Inbar, Michael; and Shinitzky, Meir, to Yeda Research & Development Co. Ltd. Method of detecting abnormal behavior of mammalian cells. 3,971,952, Cl. 250-461.00B.

Industrielle de Constructions Mobiles: *See—*
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Infinetics, Inc.: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
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Garziera, Gastone, 3,972,027.

Ingersoll-Rand Company: *See—*
Wycoff, David C., 3,971,971.

Inka, Egons, to Crane Packing Company. Tape dispenser. 3,971,280, Cl. 83-436.000.

Inoue, Kenji: *See—*
Sakai, Kiyoshi; Yusa, Takashi; and Inoue, Kenji, 3,971,825.

Inoue, Shigeki: *See—*
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Institutul de Proiectare Tehnologica Pentru Laminoare —I-PROLAM—: *See—*
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International Business Machines Corporation: *See—*
Arrington, William Marshall, 3,972,071.
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.
Briska, Marian; Hoffmeister, Wolfgang; and Kuhlmey, Herbert, 3,971,683.
Broers, Alec N.; and Sedgwick, Thomas O., 3,971,860.
Carrubba, Francis P.; Franaszek, Peter A.; and Grossman, David D., 3,971,987.
Desblache, Andre Eugene; Stern, Thomas Edwin; and Thirion, Philippe Emmanuel, 3,972,000.
DiStefano, Thomas Herman, 3,972,059.
Holtzberg, Frederic; Mayadas, Ashok F.; Thompson, William A.; and von Molnar, Stephan, 3,972,035.

Lin, Burn Jeng; and Lin, Yeong Show, 3,971,887.
International Harvester Company: *See—*
Packard, Norman M.; and Gaines, John W., 3,971,165.
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International Nickel Company, Inc., The: *See—*
Mason, John Jefferson; and Penrice, Peter John, 3,971,677.
International Standard Electric Corporation: *See—*
Ohl, Wolf; and Ball, Herbert, 3,971,897.
Tournier, Christian Yves; and Kerihuel, Jean Bernard, 3,971,893.
International Telephone and Telegraph Corporation: *See—*
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Lombardi, Anthony Joseph, 3,972,047.
International Tools (1973) Ltd.: *See—*
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Intraco, Inc.: *See—*
Jones, Robert D.; and Hall, Jerry L., 3,971,714.
Iowa State University Research Foundation, Inc.: *See—*
Buchele, Wesley F., 3,971,199.
Ireco Industries, Inc.: *See—*
Clements, Lloyd W., 3,971,573.
Isayama, Katsuhiko; and Hatano, Itaru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vulcanizable silylether terminated polymer. 3,971,751, Cl. 260-37.00R.
Ishii, Masaaki, to Canon Kabushiki Kaisha. Endless tape cartridge. 3,971,523, Cl. 242-55.19A.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, 3,971,606.
Ishitobi, Kaoru: *See—*
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Ito, Hiroshi: *See—*
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Ito, Tetsuo. Damper for string instrument. 3,971,287, Cl. 84-453.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
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Iwatsu Electric Co., Ltd.: *See—*
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J. M. Huber Corporation: *See—*
Almagro, Guillermo; Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,631.
Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,727.
Jackson, Dennis E., to Naremco, Inc. Prevention of fungi and molds in poultry and animal feedstuffs with methyl rosaniline chloride additive. 3,971,855, Cl. 426-321.000.
Jackson, Jean Andre, Jr.: *See—*
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Jacobson, Lawrence R.: *See—*
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Jakeman, Eric; and Pusey, Peter Nicholas, to National Research Development Corporation. Measurement of surface roughness. 3,971,956, Cl. 250-571.000.
Japan Atomic Energy Research Institute: *See—*
Araki, Kunio; Sasaki, Takashi; and Goto, Kazuo, 3,971,711.
Jaquet, James R., to Infinetics, Inc. Ferromagnetic metal detector utilizing gradiometers positioned on opposite sides of the detection area with overlapping sensitivity. 3,971,983, Cl. 324-41.000.
Jasper, Louis J., Jr.: *See—*
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Jaworski, Eugene: *See—*
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Jayaraman, Ponnusami: *See—*
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Jefferson Chemical Company, Inc.: *See—*
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Jehle, Robert E., to United States of America, Navy. Led image tube light valve. 3,971,931, Cl. 250-213.00R.
Jenny, Walter: *See—*
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Jeunehomme, Michel L.; and Essad, Robert A., to Bendix Corporation, The. Ultraviolet radiation monitor. 3,971,943, Cl. 250-372.000.
Jezl, James L.: *See—*
Peters, Edwin F.; Spangler, Michael J.; Michaels, Glenn O.; and Jezl, James L., 3,971,768.
Joerns Furniture Company: *See—*
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Johansson, Rolf Anders Gunnar. Centrifugal clutch with engaging and releasing weights. 3,971,462, Cl. 192-105.0BA.
John Wyeth & Brother: *See—*
White, Alan Chapman; and Black, Robin Michael, 3,971,782.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; Boyle, John Arnott; and Saunders, John Christopher, 3,971,787.
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,971,789.
Johnsen, Frank Birger, to Titan Separator A/S. Centrifuge comprising an outer drum and an inner rotor provided with a conveyor screw. 3,971,509, Cl. 233-7.000.
Johnson, Ben C., to Thermon Manufacturing Company. Preinsulated pipe assembly and pipeline. 3,971,416, Cl. 138-33.000.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Follow focus intercept actuating system for photographic apparatus. 3,972,058, Cl. 354-149.000.
Johnson, Erlin J., to Minnesota Mining and Manufacturing Company. Thermoformable release liner. 3,971,866, Cl. 428-40.000.
Johnson & Johnson: *See—*
Aspelin, Gary B.; and Smith, James T., 3,971,369.
Tritsch, Ludwig, 3,971,380.
Johnson, Michael R.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,971,826.
Johnson, Philip Paul; Gourdeau, William F.; and Hahn, Ronald E., to Whirlpool Corporation. Control valve and mounting assembly for an appliance. 3,971,540, Cl. 251-143.000.
Johnson, Robert H., to Motorola, Inc. Metal target detection system. 3,972,042, Cl. 343-17.2PC.
Johnson, Robert P., to Bendix Corporation, The. Digital time-off-event encoding system. 3,971,920, Cl. 235-92.0SH.
Johnson, Russell A.: *See—*
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Johnston, Norman W.: *See—*
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Jones, Everett E., to Boeing Company, The. Method for die forming strip material. 3,971,243, Cl. 72-385.000.
Jones, Howard: *See—*
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 3,971,797.
Jones, Paul D.: *See—*
Uzelmeier, Christopher W.; and Jones, Paul D., 3,971,834.
Jones, Robert C.; and Anderson, Robert W. Mouthpiece extractor. 3,971,288, Cl. 84-453.000.
Jones, Robert D.; and Hall, Jerry L., to Intraco, Inc. Hopper screening apparatus. 3,971,714, Cl. 209-257.000.
Jones, Robert T., to United States of America, National Aeronautics and Space Administration. Oblique-wing supersonic aircraft. 3,971,535, Cl. 244-46.000.
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, to Ciba-Geigy Corporation. Process for the manufacture of monomethyl-tin trichloride. 3,971,817, Cl. 260-429.700.
Jungfer, Leopold; Kautschitsch, Dieter; and Weber, Richard, to Akkumulatorenfabrik Dr. Leopold Jungfer, Firma. Battery testing apparatus. 3,971,980, Cl. 324-29.500.
Jurecic, Anton, to Pennwalt Corporation. X-ray opaque, enamel-matching dental filling composition. 3,971,754, Cl. 260-42.150.
Justin Huppe, Firma: *See—*
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Kaloi, Cyril M., to United States of America, Navy. Asymmetrically fed electric microstrip dipole antenna. 3,972,049, Cl. 343-829.000.
Kaloi, Cyril M., to United States of America, Navy. End fed electric microstrip quadrupole antenna. 3,972,050, Cl. 343-846.000.
Kalopissis, Gregoire: *See—*
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Kamyr, Inc.: *See—*
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Kaps, Karl-Heinz: *See—*
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Karsh, Irving, to Bell & Howell Company. Tape centering methods and apparatus. 3,971,496, Cl. 226-3.000.

Kasahara, Fumio; and Takeshita, Kazuo, to Kimitsu Chemical Laboratory Co. Ltd.; and Showa Yakuhinkako Kabushiki Kaisha. Lubricating composition for mucosa or epidermis. 3,971,848, Cl. 424-180.000.
Kaspers, Helmut: *See—*
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Kawaguchi, Norio; and Yaehashi, Toshio. Circuit for driving a DC motor for a clock. 3,971,204, Cl. 58-23.00D.
Kawakita, Masaru: *See—*
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Keizer, Eugene Orville, to RCA Corporation. Apparatus and methods for playback of color picture/sound records. 3,972,064, Cl. 358-4.000.
Kelley, Robert K. Pneumatic beam pumping unit. 3,971,213, Cl. 60-372.000.
Kelley, Wilson E., Jr.: *See—*
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Kendall, Giles A.; and Wallace, William D., to Menasco Manufacturing Company; and Miner Enterprises, Inc. Shock absorber. 3,971,551, Cl. 267-65.00R.
Kennedy, Jesse: *See—*
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Kenney, Edward J.: *See—*
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Kienel, Joseph Edward. Label applying method. 3,971,686, Cl. 156-212.000.
Kimata, Yukinori: *See—*
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Kimitsu Chemical Laboratory Co. Ltd.: *See—*
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Kimmon Manufacturing Co., Ltd.: *See—*
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Kimura, Hirohumi: *See—*
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Kimura, Shoichi: *See—*
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Kimura, Yoshio; Mitsuoka, Hiroshi; and Hosono, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Vapor cooled semiconductor device enclosed in an envelope having a compression mechanism for holding said device within said envelope. 3,972,063, Cl. 357-82.000.
Kinase, Takeo; Yano, Isamu; Okubo, Kanichi; Kitakoga, Hidetoshi; and Tayama, Hiromitsu, to Mitsubishi Denki Kabushiki Kaisha. Oil fence. 3,971,220, Cl. 61-1.00F.
King, William: *See—*
Brandt, James L.; King, William; Minford, James Dean; and Valchar, Clement E., 3,971,674.
Kinoshita, Koichi, to Kinoshita Laboratory. Radiography apparatus for forming an electrostatic latent image of a body to be examined by the ionization of gas. 3,971,937, Cl. 250-315.00A.
Kinoshita Laboratory: *See—*
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Kintopf, Siegfried: *See—*
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.
Kirsch, Jordan; and Hamilton, James L. Display system. 3,971,928, Cl. 240-2.100.
Kiser, Fred W.: *See—*
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Kishida, Takashi: *See—*
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Kinase, Takeo; Yano, Isamu; Okubo, Kanichi; Kitakoga, Hidetoshi; and Tayama, Hiromitsu, 3,971,220.
Kito, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Remote control system for passenger conveyors. 3,971,885, Cl. 178-6.800.
Klanderman, Bruce H.: *See—*
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Klazar, Jaroslav: *See—*
Turpie, Derek W. F.; and Klazar, Jaroslav, 3,971,104.
Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, to Alphametrics Ltd. Ultraviolet camera system for dental photography and mouthpieces therefor. 3,971,954, Cl. 250-475.000.
Klip, Johan, to Konijn Machinebouw B.V.; and Bagger-en Constructie Bedrijf Johan Klip B.V. Dredge pump. 3,971,513, Cl. 241-46.00R.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Haas, Helmut; and Wolf, Manfred, 3,971,515.
Kloss, Wilfried: *See—*
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Knapp, Reinhard: *See—*
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Knauer, Gilbert: *See—*
Wines, Harry T.; Power, John J.; and Knauer, Gilbert, 3,971,969.
Knecht, George W., to Midland-Ross Corporation. Electrical connectors. 3,971,609, Cl. 339-14.00P.
Knowles, Charles R.; Miles, Leon H.; and Bell, Larry N., to Atlantic Richfield Company. Well completion in permafrost. 3,971,441, Cl. 166-285.000.
Kobayashi, Akiyoshi, to Toyoda Koki Kabushiki Kaisha. Feed mechanism for a machine tool. 3,971,258, Cl. 74-10.200.
Kobayashi, Osamu: *See—*
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Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, to Nippon Soda Company Limited. Process for the production of diaminomaleonitrile. 3,971,820, Cl. 260-465.50R.
Kobe Steel Ltd.: *See—*
Ikegami, Yoshio; Kimura, Hirohumi; Kohge, Tadashi; Sakamoto, Katsuji; and Higashimoto, Takenbu, 3,971,519.
Kobler, Robert James, to AMP Incorporated. Electrical housing member. 3,971,613, Cl. 339-59.00R.
Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., to Dow Chemical Company, The. Chlorinating composition of chlorine monoxide in 1,1,1-trichloroethane. 3,971,730, Cl. 252-187.00R.
Kodama, Hiroshi: *See—*
Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,971,752.
Koenig, Raymond C., to Champion International Corporation. Flip-top carton of trunk type for frozen ice cream and comestibles of similar consistency. 3,971,612, Cl. 229-37.00R.
Koenig, Stanley, to Atlantic Products Corporation. Combination identification card holder and luggage lock. 3,971,458, Cl. 190-41.00Z.
Kohge, Tadashi: *See—*
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Kohoutek, Jindrich: *See—*
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Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki. Electomagnetic rotary motion device and exposure control device using the same. 3,971,963, Cl. 310-154.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, 3,971,981.
Kollmeyer, Willy D.: *See—*
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Komatsu, Fumito; and Yazima, Sinkichi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Automatic stop device for tape recorders. 3,971,528, Cl. 242-191.000.
Komatsu, Toshiyoshi; and Chimura, Keizo, to Duskin Franchise Co., Ltd. Mop having a washing resistance. 3,971,093, Cl. 15-104.930.
Kondo, Toshiyuki, to Aisin Seiki Kabushiki Kaisha. Anti-skid brake control system. 3,971,595, Cl. 303-21.00F.
Kondos, George C.; and Angelou, Dimitrios I. Press for squeezing agricultural products. 3,971,310, Cl. 100-118.000.
Konigsberg, Eph: *See—*
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Konijn Machinebouw B.V.: *See—*
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Konsowski, Stephen G.: *See—*
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Konstant, Anthony N., to Speedrack Inc. Rail-carrying storage racks. 3,971,476, Cl. 211-134.000.

Kornhauser, Murray, to Safety Consultants. Energy absorbing bumper system. 3,971,583, Cl. 293-71.00P.

Kosiarski, Joseph P.: *See—*
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Kosmatka, Arthur J. Mooring device. 3,971,329, Cl. 114-230.000.

Koster, Rainer: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Kottmann, Helmut, to Mahle GmbH. Piston rod-connecting rod interconnections for internal combustion engines. 3,971,355, Cl. 123-197.00A.

Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., to Owens-Corning Fiberglas Corporation. Intermittently operable rotary chopping apparatus for matted fibrous material. 3,971,277, Cl. 83-176.000.

Kramer, Richard R.: *See—*
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Krantz, Kermit E., to Ortho Pharmaceutical Corporation. Expansible tampon. 3,971,378, Cl. 128-285.000.

Krasnov, Mikhail Mikhailovich. Method of non-surgical treatment of cataracts. 3,971,382, Cl. 128-303.100.

Krause, Helmut: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Krauss-Maffei Aktiengesellschaft: *See—*
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Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, to AGFA-Gevaert, A.G. Fixing arrangement for fusing tower images. 3,971,912, Cl. 219-216.000.

Kuhlmey, Herbert: *See—*
Briska, Marian; Hoffmeister, Wolfgang; and Kuhlmey, Herbert, 3,971,683.

Kulig, Stanislaw, to Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea. Piston assembly with compression and guiding rings. 3,971,298, Cl. 92-248.000.

Kuraray Co., Ltd.: *See—*
Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, 3,971,746.

Kurisu, Katsuyasu, to Nissan Motor Co., Ltd. Manual automotive transmission. 3,971,265, Cl. 74-475.000.

Kurshan, Robert Paul: *See—*
Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, 3,971,998.

Kushner, Gerald J.; and Nininger, John H., III, to General Electric Company. Method of metallurgically joining tubing to a wall segment. 3,971,500, Cl. 228-154.000.

Kwiatkowski, Gerald M.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

La Technique Integrale S.A.: *See—*
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LaBudde, Richard G., to GTE Sylvania Incorporated. Load engaging and gripping apparatus. 3,971,585, Cl. 294-88.000.

Ladouceur, Harold A.: *See—*
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Lambert, Douglas N.; and Bennett, Richard H. Ultraviolet water purifier. 3,971,947, Cl. 250-437.000.

Lamlee, Stewart. Interchangeable-face devices and method of making same. 3,971,156, Cl. 46-1.00L.

Lampkin, Curtis M., to D. H. Baldwin Company. Light diffuser for photovoltaic cell. 3,971,672, Cl. 136-89.000.

Lane, Joseph J., to Arctic Enterprises, Inc. Collector for a power lawnmower. 3,971,198, Cl. 56-202.000.

Lane, Lawrence J.: *See—*
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Langdon, William K.: *See—*
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Lapikas, Thomas S.: *See—*
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LaPorte, Jean-Claude: *See—*
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LaPorte, Jean-Michel; and LaPorte, Jean-Claude. Method and apparatus for throwing frangible targets. 3,971,357, Cl. 124-8.000.

Lappin, Gerald Ray: *See—*
Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, 3,971,755.

Larson, Lawrence L.: *See—*
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Larson, Richard Ralph, to Hercules Incorporated. Thermally actuated percussion initiatable explosive cartridge assembly. 3,971,319, Cl. 102-24.00R.

Larsson, Tore I.: *See—*
Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, 3,971,192.

Lavis, Stanley, to Phelps Time Recording Lock Corporation. Lock. 3,971,239, Cl. 70-134.000.

Lawrence Peska Associates, Inc.: *See—*
Cvitkovich, Mary, 3,971,304.

LeBoeuf, Albert R., to American Optical Corporation. Process for the production of an abrasion resistant optical element. 3,971,872, Cl. 428-412.000.

LeBrun, Michel A., Jr.: *See—*
McRoskey, John W.; Swartz, Delbert D.; and LeBrun, Michel A., Jr., 3,971,488.

Lecayon, Gerard: *See—*
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Lee, Chi-Long; and Marko, Ollie W., to Dow Corning Corporation. Method of preparing olefinic siloxane by GLC. 3,971,818, Cl. 260-448.20E.

Lee Company, The: *See—*
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Lee, John T. M., to ICI United States Inc. Electric initiator. 3,971,320, Cl. 102-28.00R.

Lee, Lawrence Y., to Lee, Lawrence Y. Removable filters on electronic chassis and method of assembling same. 3,971,877, Cl. 174-16.00R.

Lee, Leighton, II, to Lee Company, The. Fluid valve and valve system. 3,971,542, Cl. 251-58.000.

Lee, Michael John: *See—*
Whittle, Harry Reed; Lee, Michael John; and Causer, Roy, 3,971,299.

Lee, William T., to Fishing Tools, Inc. Cementing head. 3,971,436, Cl. 166-70.000.

Leesona Corporation: *See—*
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Lehmann, Fritz: *See—*
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Lehmann, Matt: *See—*
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Leitz, Ludwig; Heitmann, Knut; and Schneider, Eckart. System for monitoring spaces by electro-optical means. 3,972,021, Cl. 340-38.00P.

Lenk, Ronald J.; and Fletcher, David T. Oxygen-generating apparatus for scuba diving. 3,971,372, Cl. 128-142.00R.

Lennon, David C., to General Electric Company. Electrical assembly, electrical contact and method of mounting an electrical contact. 3,971,907, Cl. 200-238.000.

Lenoir, Janine: *See—*
Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.

Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Method for the preparation of alcohol-free alkali and alkaline earth metal alcoholates. 3,971,833, Cl. 260-632.00A.

Lesham, Adam; and Schukei, Glen Elwin, to Combustion Engineering, Inc. Releasable locking device. 3,971,575, Cl. 285-85.000.

Leu, Robert F., to Dentsply Research & Development Corporation. Dental bur. 3,971,135, Cl. 32-48.000.

Le Vantine, Allan D.: *See—*
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Leveque, Alain: *See—*
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Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., 3,971,773.

Levinsohn, Richard, deceased; Levinson, Joseph, administrator-with-will-annexed; and Jervis, James E., to Raychem Corporation. Hydraulic sealing member and process. 3,971,566, Cl. 277-206.00R.

Levinson, Joseph, administrator-with-will-annexed: *See—*
Levinsohn, Richard, deceased; Levinson, Joseph, administrator-with-will-annexed; and Jervis, James E., 3,971,566.

Levy, Albert. Activation indicator for a fire detector. 3,971,333, Cl. 116-114.500.

Lewchuk, Richard R.: *See—*
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Lewis, Bernard L.; and Olin, Irwin D., to United States of America, Navy. Sea spike suppression technique. 3,971,997, Cl. 328-165.000.

Lewis, Gerald F. Vehicle parts indicating instrument. 3,971,332, Cl. 116-114.0AM.

Lewis, Gilbert W.: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,363.
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.

Libs, Gerard, to Commissariat a l'Energie Atomique. Charge preamplifier. 3,972,004, Cl. 330-35.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Detert, Klaus; and Lipp, Hans-Jochen, 3,971,676.

Lihnell Vagn AB: *See—*
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Liljekvist, Bernt Soren: *See—*
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Lilley, James C.: *See—*
Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, 3,971,273.

Lin, Burn Jeng; and Lin, Yeong Show, to International Business Machines Corporation. Dynamic magnetic bubble display system. 3,971,887, Cl. 178-7.30D.

Lin, Ruey Y.: *See—*
Economy, James; Lin, Ruey Y.; and Smith, William D., 3,971,840.

Lin, Tsau-Yen: *See—*
Wagner, Arthur F.; Holly, Frederick W.; Lin, Tsau-Yen; Shen, Tsung-Ying; and Hirschmann, Ralph F., 3,971,736.

Lin, Yeong Show: *See—*
Lin, Burn Jeng; and Lin, Yeong Show, 3,971,887.

Lindberg, Frank A.; Konsowski, Stephen G.; Shamash, Maurice B.; and Ponemone, Seymour J., to Westinghouse Electric Corporation. Formation of openings in dielectric sheet. 3,971,661, Cl. 96-36.200.

Linder, John L., to United States of America, Navy. Ramp function generator. 3,971,923, Cl. 235-150.530.

Link, Donald F.: *See—*
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Linke, Gerhard: *See—*
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Linz, Arthur: *See—*
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Lipinski, Vincent B. Collapsible self-storing shelter. 3,971,395, Cl. 135-4.00R.

Lipp, Hans-Jochen: *See—*
Detert, Klaus; and Lipp, Hans-Jochen, 3,971,676.

Liu, Shing-gong, to RCA Corporation. Apparatus for mounting a diode in a microwave circuit. 3,972,012, Cl. 333-84.00M.

Locher, Hans: *See—*
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Lochmann, Lubomir; and Trekoval, Jiri, to Ceskoslovenska akademie ved. Esters of carboxylic acids formally substituted by sodium or potassium in the alpha-position and the method for their preparation. 3,971,816, Cl. 260-410.90R.

Lockwood, Glynn H., to Lockwood Technical, Inc. Hot melt applicator gun. 3,971,492, Cl. 222-146.0HE.

Lockwood Technical, Inc.: *See—*
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Locus, Silvan Stanley, to Northrop Corporation. Cross-polarizing lens reflector. 3,972,043, Cl. 343-18.00B.

Lohr, Alfred; Schwan, Wolfgang; Tschek, Wolfgang; and Schreiber, Gunter, to F. Kuppersbusch & Sohne Aktiengesellschaft. Dosing device for industrial cooking apparatus. 3,971,420, Cl. 141-231.000.

Lombardi, Anthony Joseph, to International Telephone and Telegraph Corporation. Antenna arrangement for a submerged submarine. 3,972,046, Cl. 343-709.000.

Lombardi, Anthony Joseph, to International Telephone and Telegraph Corporation. Floating cable antenna system. 3,972,047, Cl. 343-709.000.

Lombardino, Joseph G., to Pfizer Inc. Certain N′-alkyl-N′-(2′-alkoxycarbonylbenzenesulfonyl)-N-(2-thiazolyl)glycineamides. 3,971,802, Cl. 260-306.80R.

Longenecker, John G.; and Rubio, Manuel Jesus, to Barrera, Roberto Gonzalez. Materials handling apparatus. 3,971,481, Cl. 214-6.00H.

L'Oreal: *See—*
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Louis Marx & Co., Inc.: *See—*
Dohanic, John L., Jr.; and Cornell, Gerald J., 3,972,017.

Love, John A., Sr. Locking cover for television controls. 3,971,240, Cl. 70-160.000.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
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Luce, John B.: *See—*
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Lucerne Products, Inc.: *See—*
Sahrbacker, Edward V., 3,971,906.

Luchaco, David G.; and Peterson, William A., Jr., to Bendix Corporation, The. Increasing warm up enrichment as a function of manifold absolute pressure. 3,971,354, Cl. 123-179.00L.

Ludder, Rodney E., to Owens-Illinois, Inc. Close-nesting, light-weight, one-piece drinking cup and apparatus for the manufacture thereof. 3,971,471, Cl. 206-519.000.

Lundquist, David E.; McGregor, Arvin D.; and Hoffman, Paul R., to Burroughs Corporation. Air turbulence control of inflight ink droplets in non-impact recorders. 3,972,051, Cl. 346-1.000.

Lyman, Richard Ricker: *See—*
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Lynch Corporation: *See—*
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Maccario, Ermanno: *See—*
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Mach, John J. Nestable die alignment means for punch press machines. 3,971,275, Cl. 83-140.000.

Macher, Stephan: *See—*
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 3,971,115.

Machida, Minoru: *See—*
Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, 3,971,924.

Maddox, James A.; and Maddox, Jeffery R. Labels and label readers. 3,971,917, Cl. 235-61.11E.

Maddox, Jeffery R.: *See—*
Maddox, James A.; and Maddox, Jeffery R., 3,971,917.

Madsen, Erik H. Hygienic spray apparatus. 3,971,136, Cl. 32-58.000.

Maekawa, Hideyuki; and Ishitobi, Kaoru, to Shionogi & Co., Ltd. Diagnostic composition for saccharide determination. 3,971,702, Cl. 195-63.000.

Magee, Thomas J.; and Lehmann, Matt, to Stanford Research Institute. Memory system using ion implanted photodichroic materials. 3,972,032, Cl. 340-173.0CC.

Magrisso, Israel B.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Mahle GmbH: *See—*
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Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Multipurpose body exercising machine. 3,971,555, Cl. 272-118.000.

Maier, Roger F.: *See—*
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Mainland Industries, Inc.: *See—*
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Maitland, David S.: *See—*
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Mancke, Edgar B., to Bethlehem Steel Corporation. Method of injecting pelletized coal through blast furnace tuyeres. 3,971,654, Cl. 75-42.000.

Manfredi, John L., to Moore & White Company, The. Paper web decurling apparatus. 3,971,696, Cl. 162-271.000.

Mannesmann Aktiengesellschaft: *See—*
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Mantell, Michael J. Electro-therapeutic face mask. 3,971,387, Cl. 128-410.000.

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Marquis, Edward Thomas, to Jefferson Chemical Company, Inc. Preparation of methylene-bridged polyphenylpolyamine mixtures. 3,971,829, Cl. 260-570.00D.

Marschalko, Cornell S.; and Meszaros, George K. Apparatus for perforating contact lenses. 3,971,910, Cl. 219-121.00L.

Marsee, Frederick J., to Ethyl Corporation. Fuel induction system. 3,971,352, Cl. 123-122.0AC.

Marshall, Steven Grant. Article removal and pilferage detection system and apparatus. 3,972,039, Cl. 340-280.000.

Martens, Martin A. J., to I. D. Engineering, Inc. Fastening clip and tool for releasing same. 3,971,269, Cl. 81-3.00R.

Martin, David George: *See—*
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Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., to Shell Oil Company. Apparatus and method for oil-in-wax determination. 3,971,434, Cl. 165-12.000.

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Martinelli, Luigi E.; and Cerelli, George S. Meat grinder attachment. 3,971,514, Cl. 241-82.400.

Martinez, Arcadio. Keyboard interceptor ("intermegraf"). 3,971,140, Cl. 35-5.000.

Martino, Raymond R., to U.S. Electronic Services Corporation. Distributed watch. 3,971,206, Cl. 58-88.00R.

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Mason, John Jefferson; and Penrice, Peter John, to International Nickel Company, Inc., The. Low expansion alloys. 3,971,677, Cl. 148-31.000.

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Massachusetts Institute of Technology: *See—*
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- Matsuda, Motonobu; Beppu, Norio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Multi-exposure control device for cameras. 3,972,055, Cl. 354-24.000.
- Matsuguma, Yoshihiko: *See—*
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  - Murakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, 3,971,268.
- Matsuoka, Chikara; and Amano, Yuichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Eye-bush. 3,971,550, Cl. 267-57.10R.
- Matsushita Electric Industrial Co., Ltd.: *See—*
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- Matsushita, Keiji, to Kabushiki Kaisha Komatsu Seisakusho. Slide driving device for use in metal working press. 3,971,261, Cl. 74-52.000.
- Matthews, Charles W., to Gulf Oil Corporation. Coal gasifier having an elutriated feed stream. 3,971,635, Cl. 48-202.000.
- Matthews, Charles W., to Gulf Oil Corporation. Condensate scrubbing of coal gasifier product. 3,971,636, Cl. 48-202.000.
- Matthews, Charles W., to Gulf Oil Corporation. Coal gasification process utilizing waste water from an external process. 3,971,637, Cl. 48-202.000.
- Matthews, Charles W., to Gulf Oil Corporation. Coal gasification process utilizing high sulfur carbonaceous material. 3,971,638, Cl. 48-202.000.
- Matthews, Charles W., to Gulf Oil Corporation. Fluid bed coal gasification. 3,971,639, Cl. 48-202.000.
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- Mayfield, Johnny W. Quick release pipe vise. 3,971,552, Cl. 269-228.000.
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  - Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,727.
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- McEvoy Oilfield Equipment Co.: *See—*
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- McGill, Robert W., to A-T-O Inc. Article transfer apparatus having releasable rods. 3,971,190, Cl. 53-77.000.
- McGlamery, Merrill H., Sr., to Multi Tech Electronics, Inc. Isolation plug. 3,971,617, Cl. 339-113.00L.
- McGregor, Arvin D.: *See—*
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- McGregor, Stanley D., to Dow Chemical Company, The. Preparation of 3,5,6-trichloropicolinic acid. 3,971,799, Cl. 260-295.00R.
- McIntosh, Alexander C. Signalling device for key telephone systems. 3,971,899, Cl. 179-99.000.
- McKee, T. R. Fuel metering system. 3,971,351, Cl. 123-119.00R.
- McNamara, Earl J., to Taylor & Gaskin, Inc. Gas scrubber of the wet collector type. 3,971,641, Cl. 55-223.000.
- McNeill, Frank M.; and Martinek, Harold H., to Continental Can Company, Inc. Method of making vacuum wrapped shirred sausage casings. 3,971,187, Cl. 53-21.0FC.
- McReynolds, William W. Rotary internal combustion engine. 3,971,346, Cl. 123-8.410.
- McRoskey, John W.; Swartz, Delbert D.; and LeBrun, Michel A., Jr., to Republic Tool & Manufacturing Corporation. Tamperproof screw cap. 3,971,488, Cl. 215-254.000.
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- Meeks, Lawrence A.; and Biggs, James W., to National Distillers and Chemical Corporation. Silicone rubber-ethylene vinyl acetate adhesive laminates and preparation thereof. 3,971,883, Cl. 174-120.0SR.
- Meeks, Lawrence A.; and Biggs, James W., to National Distillers and Chemical Corporation. Ethylene-vinyl acetate silicone rubber adherent laminates and method of production. 3,971,884, Cl. 174-120.0SR.
- Meier, Gerhard, to Gesellschaft fur Kernforschung m.b.H.; and Werner & Pfleiderer, Firma. Apparatus for fixing radioactive waste. 3,971,732, Cl. 252-301.150.
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- Mendenhall, Robert L. Process for recycle of asphalt-aggregate compositions. 3,971,666, Cl. 106-281.00R.
- Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, to Zahnradfabrik Friedrichshafen AG. Sintered abrasion resistant iron alloy having a homogeneous carbide network. 3,971,632, Cl. 29-182.700.
- Mercier, Bernard. Assisted hydraulic control. 3,971,214, Cl. 60-386.000.
- Merck & Co., Inc.: *See—*
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- Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,971,790, Cl. 260-287.00K.
- Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,971,791, Cl. 260-287.00K.
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- Mikulecky, Harvey W., to RTE Corporation. Heat insulated fused high voltage bushing. 3,972,015, Cl. 337-202.000.
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- Millar, James S.; and Garrett, Douglas R., to Parker-Hannifin Corporation. Pressure controlled hydrant valve coupler. 3,971,405, Cl. 137-489 000.
- Miller, Frederick L. B., to Mainland Industries, Inc. Log feeder for canting machine. 3,971,423, Cl. 144-176.000.
- Miller, Jaydee W., to Pyromet, Inc. Process for removing sulfur impurities from a fluid by contact with silver articles. 3,971,712, Cl. 208-208.00R.
- Miller, Wendell E., to Scott & Fetzer Company, The. Load responsive system with synthetic signal. 3,971,216, Cl. 60-445.000.
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- Mita, Itaru; Okumura, Shigeo; Yamabe, Shigeru; Funae, Yoshihiko; and Matumoto, Junzo, to Santen Pharmaceutical Co. Ltd. N-(mercaptoacyl)aminoacids. 3,971,828, Cl. 260-534.00S.
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- Model, Ernst, to Ciba-Geigy Corporation. Iminoisoindolinone pigments and process for their manufacture. 3,971,805, Cl. 260-325.0PH.
- Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., to Fleetwood Systems, Inc. Apparatus for counting and packaging can ends. 3,971,189, Cl. 53-63.000.
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- Montgomery, Tom C. Variable magnetic lock. 3,971,581, Cl. 292-251.500.
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- Moreno, Roland, to Societe Internationale. Methods of data storage and data storage systems. 3,971,916, Cl. 235-61.70B.
- Morgan, Veldon. Separable double ply saddle pad. 3,971,194, Cl. 54-66.000.
- Mori, Hisashi: *See—*
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  - Johnson, Robert H., 3,972,042.
  - Means, Rodney J.; and Schriber, Gene A., 3,971,960.
  - Petri, Chris A., 3,972,001.
- Motoyama, Hiroshi. Apparatus and method for measuring the condition of the meridians and the corresponding internal organs of the living body. 3,971,366, Cl. 128-2.10Z.
- Mount, Wadsworth W. Lock nut. 3,971,085, Cl. 10-86.00A.
- Mourier, Emile, to Rhone-Poulenc S.A. Process for the semihydrogenation of citral to citronellal. 3,971,831, Cl. 260-601.00R.
- Mowatt-Larssen, Erling; and Lapikas, Thomas S., to General American Transportation Corporation. Intermodal tank container. 3,971,491, Cl. 220-71.000.
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- Multifastener Corporation: *See—*
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- Murakami, Masahiro: *See—*
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- Murakami, Masao; Amaya, Akio; and Kawakita, Masaru, to Sony Corporation. Adhesive resin composition. 3,971,865, Cl. 428-40.000.
- Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 3,971,267, Cl. 74-759.000.
- Murakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 3,971,268, Cl. 74-759.000.
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- Murata Kikai Kabushiki Kaisha: *See—*
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- Murdoch, Henry W.; and Schumacher, Percy W., Jr., to Reed Tool Company. Drill bit. 3,971,600, Cl. 308-8.200.
- Murvall, Ake Eugen, to ABU Aktiebolag. Fishing reel. 3,971,530, Cl. 242-217.000.
- Mushabac, David R. Dental restoration. 3,971,133, Cl. 32-2.000.
- Muto, Steve Yoneo, to Hewlett-Packard Company. Etching thin film circuits and semiconductor chips. 3,971,684, Cl. 156-13.000.
- Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., to Rohm and Haas Company. Vinyl halide polymer impact modifiers. 3,971,835, Cl. 260-876.00R.
- Myklebust, Paal, to Gerber Products Company. Non-splitting electric room vaporizer. 3,971,913, Cl. 219-284.000.
- Nagata, Hiromichi: *See—*
  - Murakami, Tomomi; Nagata, Hiromichi; Funazawa, Masakazu; and Fukutome, Satoru, 3,971,207.

- Nagel, Suzanne Rose: *See—*
    - Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.
- Naik, Navnitrai Nagarji: *See—*
    - Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.
- Naiman, Charles S.; Chicklis, E. P.; and Linz, Arthur, to Sanders Associates, Inc. Laser. 3,972,007, Cl. 331-94.50F.
- Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Magnetism detecting system. 3,971,981, Cl. 324-43.00R.
- Nakamura, Heiichiro: *See—*
    - Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, 3,971,606.
- Nakamura, Kanichi: *See—*
    - Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, 3,971,606.
- Nakamura, Kiichi: *See—*
    - Sasaki, Shigeru; and Nakamura, Kiichi, 3,971,124.
- Nakamura, Tadashi: *See—*
    - Asano, Setunobu; Nakamura, Tadashi; and Yamamoto, Yasuo, 3,971,735.
- Nakamura, Yasuharu: *See—*
    - Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, 3,971,664.
- Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Water lubricated bearing device. 3,971,606, Cl. 308-238.000.
- Nakano, Yoshinori, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rheostatic control system for a DC motor. 3,971,973, Cl. 318-251.000.
- Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, to Fuji Photo Film Co., Ltd. Fine grain silver halide emulsions with polyheteronuclear sensitizing dyes. 3,971,664, Cl. 96-127.000.
- Napper, Jack C. Method for extracting a mounted anchor bolt and anchor bolt extractor therefor. 3,971,121, Cl. 29-427.000.
- Naremco, Inc.: *See—*
    - Jackson, Dennis E., 3,971,855.
- Nash, Alan Richard Brine. Control means. 3,971,295, Cl. 91-386.000.
- National Carpet Jobbers: *See—*
    - Anderson, Lloyd E.; and Alinder, Gilbert L., 3,971,484.
- National Distillers and Chemical Corporation: *See—*
    - Meeks, Lawrence A.; and Biggs, James W., 3,971,883.
    - Meeks, Lawrence A.; and Biggs, James W., 3,971,884.
- National Forge Company: *See—*
    - Witkin, Donald E.; and Bowles, Arnold G., 3,971,876.
- National Research Development Corporation: *See—*
    - Jakeman, Eric; and Pusey, Peter Nicholas, 3,971,956.
- National Semiconductor Corporation: *See—*
    - Nelson, Carl T., 3,972,061.
- Navratil, Franz, to Siemens Aktiengesellschaft. Arrangement for rapid switching of a high frequency magnetic field. 3,972,036, Cl. 340-174.0TF.
- NCR Corporation: *See—*
    - Peck, Wayne P., 3,971,435.
- Nelligan, William B., to Schlumberger Technology Corporation. Two detector pulsed neutron porosity and water salinity apparatus and methods. 3,971,935, Cl. 250-262.000.
- Nelson, Bror H.: *See—*
    - Harris, John L.; and Nelson, Bror H., 3,971,469.
- Nelson, Carl T., to National Semiconductor Corporation. Monolithic lateral S.C.R. having reduced "on" resistance. 3,972,061, Cl. 357-38.000.
- Nelson, Martin N.: *See—*
    - Ernst, Franklin Henry, Jr.; and Nelson, Martin N., 3,971,473.
- Neuco Apparatebau AG: *See—*
    - Schnyder, Conrad W., 3,971,607.
- Nevins, John E., Jr.; and Winslow, Lester M., to Varian Associates. Ultrawide band traveling wave tube amplifier employing axially conductive circuit loading members. 3,972,005, Cl. 330-43.000.
- Newman, Larry B.; and Demuth, John W., to Eastman Kodak Company. Transfer tail apparatus for use with textile yarn winders. 3,971,518, Cl. 242-18.0PW.
- Nienberg, Raymond Frank. Agricultural do-all machine. 3,971,446, Cl. 172-311.000.
- Nihon Electronic Industry Co. Ltd.: *See—*
    - Saito, Minoru, 3,971,918.
- Nilsson, Elving: *See—*
    - Sterner, Erik; and Nilsson, Elving, 3,971,339.
- Nilsson, Karl Erik; and van Riesen, Reiner. Belt locking arrangement for a passive belt system for automobiles. 3,971,570, Cl. 280-746.000.
- Nimco Corporation: *See—*
    - Bachner, George L., 3,971,300.
- Nininger, John H., III: *See—*
    - Kushner, Gerald J.; and Nininger, John H., III, 3,971,500.
- Nippon Kogaku K.K.: *See—*
    - Rikukawa, Katsuji; and Onogi, Kenji, 3,971,951.
    - Shio, Megumu, 3,971,599.
- Nippon Kokan Kabushiki Kaisha: *See—*
    - Fukuoka, Yoshikazu; and Miwa, Hiroshi, 3,971,862.
- Nippon Oils and Fats Company Limited: *See—*
    - Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, 3,971,709.
- Nippon Soda Company Limited: *See—*
    - Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, 3,971,820.
- Nippon Steel Corporation: *See—*
    - Takashima, Kiyoshi; Arima, Keizi; Shozi, Takeshi; and Mori, Hisashi, 3,971,655.
- Nippondenso Co., Ltd.: *See—*
    - Inakura, Tuneho; and Doi, Masayuki, 3,971,266.
    - Nakano, Yoshinori, 3,971,973.
- Nishimura, Hideo; and Otsu, Ikuo, to Toyoda Koki Kabushiki Kaisha. Control apparatus for a machine tool. 3,971,168, Cl. 51-165.800.
- Nishiwaki, Eiji: *See—*
    - Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, 3,971,820.
- Niskin, Shale J. Dynamically balanced apparatus for water borne instruments. 3,971,251, Cl. 73-170.00A.
- Nissan Chemical Industries, Ltd.: *See—*
    - Suzuki, Keiki; Yoshida, Akitoshi; and Inoue, Shigeki, 3,971,665.
- Nissan Denshi Company Limited: *See—*
    - Arai, Kazuo, 3,971,985.
- Nissan Motor Company Limited: *See—*
    - Abe, Fumiyuki; and Otani, Syuichi, 3,971,569.
    - Kurisu, Katsuyasu, 3,971,265.
- Nitto Boseki Co.: *See—*
    - Araki, Kunio; Sasaki, Takashi; and Goto, Kazuo, 3,971,711.
- NL Industries, Inc.: *See—*
    - Bush, Harley E., 3,971,734.
- Nobbs, Arthur Joseph: *See—*
    - Pickard, John; Melling, Richard; and Nobbs, Arthur Joseph, 3,971,668.
- Nomura, Yasushi; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. All electronic-type timepiece. 3,971,205, Cl. 58-50.00R.
- Norberg, Carl Eric Bertil. Method and apparatus for indicating a load placed on a load-carrying vehicle platform. 3,971,451, Cl. 177-1.000.
- Norberg, Lars-Gunnar: *See—*
    - Folgero, Kare; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, 3,971,548.
- Nordson Corporation: *See—*
    - Hastings, Donald R., 3,971,337.
- Norita, Toshimasa; Ibara, Hisato; Murakami, Masahiro; and Okano, Masao, to Sanyo-Kokusaku Pulp Co., Ltd. Method of producing char from pulp manufacturing waste liquor. 3,971,705, Cl. 201-2.500.
- Northrop Corporation: *See—*
    - Locus, Silvan Stanley, 3,972,043.
- Northrup, King & Co.: *See—*
    - Bonucci, Peter A., 3,971,161.
- NRM Corporation: *See—*
    - Gazuit, Georges, 3,971,694.
- Nudelman, Abraham, to American Home Products Corporation. 7-[2-(5-Amino-1,3,4-thiadiazol-2-ylthio)acetamido]cephalosporins. 3,971,779, Cl. 260-243.00C.
- Nudinger, Gunter; Collin, Heinrich; and Moosburger, Hans, to Bayerische Berg-, Hutten- und Salzwerke AG. Device for connecting an expiring first web of a web-shaped material with the beginning of a second web of a web shaped material. 3,971,524, Cl. 242-58.400.
- Nufer, Hans L.: *See—*
    - Franz, John E.; and Nufer, Hans L., 3,971,648.
- Nulph, Robert J.: *See—*
    - Anderson, Arnold L.; and Nulph, Robert J., 3,971,758.
- Numata, Yukio: *See—*
    - Saikaishi, Noboru; Yamada, Tsuneo; Takahashi, Tetsuo; and Numata, Yukio, 3,971,992.
- Nylund, Roger; and Holmala, Aulis, to Oy Tampella AB. Procedure for controlling a rock drill and rock drill for carrying out the procedure. 3,971,449, Cl. 175-27.000.
- Obayashi, Nobuharu; and Sakashita, Tetsuzi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument capable of transposition. 3,971,282, Cl. 84-1.010.
- Oberg, Karl-Erik: *See—*
    - Folgero, Kare; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, 3,971,548.
    - Fredrikson, Bengt; and Oberg, Karl-Erik, 3,971,547.
- Oberlinner, Andreas: *See—*
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    - Baumann, Hans; Grychtol, Klaus; and Oberlinner, Andreas, 3,971,821.
- Offshore Company, The: *See—*
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- Ohara, Kazuo: *See—*
    - Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 3,971,267.
    - Murakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, 3,971,268.
- O'Hare, Louis Richard. Method of generating electricity from radiant energy called variable polarizability capacity generator. 3,971,938, Cl. 250-336.000.
- Ohe, Osamu: *See—*
    - Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, 3,971,709.

- Ohkubo, Hachiro. Container. 3,971,505, Cl. 229-45.00R.
- Ohl, Wolf; and Ball, Herbert, to International Standard Electric Corporation. Circuit arrangement for a selective signal receiver, particularly for use in telephone systems. 3,971,897, Cl. 179-84.0VF.
- Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, to Nippon Oils and Fats Company Limited. Method for forming smooth cured coated films. 3,971,709, Cl. 204-181.000.
- Ohta, Takeo; and Takenaga, Mutsuo, to Matsushita Electric Industrial Co., Ltd. Optical information storage material and method of making it. 3,971,874, Cl. 428-432.000.
- Okamura, Ryoji: *See—*
    - Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, 3,971,709.
- Okamura, Takayuki: *See—*
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- Okano, Masao: *See—*
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- Okasaka, Hotuma: *See—*
    - Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,971,752.
- Oki Electric Industry Company, Ltd.: *See—*
    - Atumi, Shiro; and Yamada, Kozo, 3,972,052.
- Okonite Company, The: *See—*
    - Alia, Dominic A., 3,971,882.
- Okubo, Kanichi: *See—*
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- Okumura, Shigeo: *See—*
    - Mita, Itaru; Okumura, Shigeo; Yamabe, Shigeru; Funae, Yoshihiko; and Matumoto, Junzo, 3,971,828.
- Okumura, Shuji: *See—*
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- Olin, Irwin D.: *See—*
    - Lewis, Bernard L.; and Olin, Irwin D., 3,971,997.
- Olsen, Charles R. Pressure actuated tube primer. 3,971,322, Cl. 102-86.500.
- Olsson, Erik Allan, to Olsson International Inc. Process of solidifying molten metal. 3,971,123, Cl. 29-527.700.
- Olsson International Inc.: *See—*
    - Olsson, Erik Allan, 3,971,123.
- Olympia Werke AG: *See—*
    - Weber, Gerald; and Sorgenfrei, Jurgen, 3,972,028.
- Olympus Optical Co., Ltd.: *See—*
    - Yoshinaga, Makoto, 3,971,622.
- O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased (by Childs, Patricia M., executrix), to Riverside Press, Inc. Voting machine. 3,971,914, Cl. 235-54.00R.
- O'Neil, Robert, to Beneke Division, Beatrice Foods Co. Adjustable height closet seat assembly. 3,971,077, Cl. 4-239.000.
- Ono, Kazuyoshi; Suzuki, Osamu; and Hidaka, Hideo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Safety device for stopping the bale plucking operation. 3,971,103, Cl. 19-.200.
- Ono, Tomoyoshi; and Matsuguma, Yoshihiko, to Teijin Limited. Pressure-sensitive adhesive and pressure-sensitive adhesive tape or drape. 3,971,766, Cl. 526-317.000.
- Ono, Tsuyoshi: *See—*
    - Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, 3,971,961.
- Onoda, Hajime, to Kimmon Manufacturing Co., Ltd. Electronic integration calorimeter. 3,971,252, Cl. 73-193.00R.
- Onogi, Kenji: *See—*
    - Rikukawa, Katsuji; and Onogi, Kenji, 3,971,951.
- Optical Coating Laboratory, Inc.: *See—*
    - Gelber, Robert M.; and Small, Edward A., Jr., 3,971,869.
- Ortheil, Hans, deceased (by Ortheil, Hildegard M., administratrix), to Kane and Company. Basic dyeing. 3,971,625, Cl. 8-82.000.
- Ortheil, Hildegard M., administratrix: *See—*
    - Ortheil, Hans, deceased, 3,971,625.
- Ortho Pharmaceutical Corporation: *See—*
    - Krantz, Kermit E., 3,971,378.
- Osborne, Irving R. Apparatus for cleaning vehicle parts. 3,971,394, Cl. 134-104.000.
- Osiadacz, William J., to Baxter Laboratories, Inc. Automated meat tenderization system. 3,971,088, Cl. 17-25.000.
- Osterhout, Richard E.; McCray, Walter A.; and Rudowicz, Mark J., to Hilti Aktiengesellschaft. Method of repairing ingot mold bottoms. 3,971,117, Cl. 29-401.00E.
- Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea: *See—*
    - Kulig, Stanislaw, 3,971,298.
- Otani, Syuichi: *See—*
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- Otsu, Ikuo: *See—*
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- Otto, Friedrich, to A. Stephan u. Sohne. Method of making liverwurst. 3,971,851, Cl. 426-646.000.
- Otto, George W., Jr.: *See—*
    - Craig, James R.; and Otto, George W., Jr., 3,971,946.
- Otto, Peter H.: *See—*
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    - Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., 3,971,750.
    - Haynes, Harold L.; and Harvey, Michael J., 3,971,871.
    - Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., 3,971,277.
- Owens-Illinois, Inc.: *See—*
    - Ludder, Rodney E., 3,971,471.
- Oy Tampella AB: *See—*
    - Nylund, Roger; and Holmala, Aulis, 3,971,449.
- Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Electronic calculator displaying a partial result obtained from a portion of a numerical expression. 3,971,924, Cl. 235-156.000.
- P. R. Mallory & Co., Inc.: *See—*
    - Voyles, Gerald A.; and Moss, Edward M., 3,971,970.
- Packard, Norman M.; and Gaines, John W., to International Harvester Company. Ring manufacture, productive of face contact seal. 3,971,165, Cl. 51-131.000.
- Padleckas, Henry; and Wenzlow, Ludwig. Interlocking clips and rafters for roof panels. 3,971,183, Cl. 52-478.000.
- Padnes, David Richard: *See—*
    - Giguere, Winfield Joseph; and Padnes, David Richard, 3,971,127.
- Padrutt, Paul W.: *See—*
    - Baron, George B.; and Padrutt, Paul W., 3,971,215.
- Panduit Corporation: *See—*
    - Caveney, Jack E., 3,971,105.
- Paniagua, Juan Garcia. Projector of fluid with electric charge, of portable type. 3,971,292, Cl. 89-1.00A.
- Panoduz-Anstalt Co.: *See—*
    - Privas, Yves Emile, 3,971,229.
- Panosh, James L., to Alpha Nova Development Corporation. Fluorescent table tennis assembly. 3,971,560, Cl. 273-30.000.
- Panta AG: *See—*
    - Brugger-Stuker, Ruth, 3,971,144.
- Pantel, Howard W., Jr.: *See—*
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- Paoli, Alfred; and Shah, Bipin J., to Akzona Incorporated. Electrical connector with means for maintaining a connected condition. 3,971,614, Cl. 339-89.00R.
- Parker, Darrell G. Portable smokehouse. 3,971,308, Cl. 99-467.000.
- Parker-Hannifin Corporation: *See—*
    - Millar, James S.; and Garrett, Douglas R., 3,971,405.
- Parker Sangyo Co., Ltd.: *See—*
    - Goto, Issei; and Hara, Suzo, 3,971,539.
- Parsson, Nils Owe, to Saab-Scania Aktiebolag. Operating device for locking mechanisms in doors, hatches and the like. 3,971,241, Cl. 70-275.000.
- Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich. Furnace for electroslag remelting of consumable electrodes. 3,971,430, Cl. 164-252.000.
- Patrick, William D.: *See—*
    - Helms, Charles R.; and Patrick, William D., 3,971,468.
- Patton, Jon Richard; and Sisson, Ronald Loren, to Clark Equipment Company. Hydrostatic control - pivot steering. 3,971,453, Cl. 180-6.480.
- Paul, Bernt: *See—*
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    - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.
- Pearson, Arthur David: *See—*
    - Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.
- Pearson, Bangt R.: *See—*
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- Peavey Company: *See—*
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- Peberdy, John Malcolm: *See—*
    - Wolff, Paul Heinz Walter; and Peberdy, John Malcolm, 3,971,698.
- Peck, Wayne P., to NCR Corporation. Heat transfer device. 3,971,435, Cl. 165-78.000.
- Pedersen, Ib Obel. Process and apparatus for joining objects together. 3,971,693, Cl. 156-273.000.
- Pehoushek, Joseph W.: *See—*
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- Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-(4-Chlorophenyl)-2-furyl phenyl ketone. 3,971,811, Cl. 260-347.800.
- Penman, Alistair: *See—*
    - Collier, Peter Dudley; Penman, Alistair; and Trussell, Frederick John, 3,971,858.
- Pennwalt Corporation: *See—*
    - Jurecic, Anton, 3,971,754.
- Penrice, Peter John: *See—*
    - Mason, John Jefferson; and Penrice, Peter John, 3,971,677.

- Peppler, William S., to Diamond International Corporation. Method for producing deckle-free edges and windows in molded fiber products. 3,971,689, Cl. 162-226.000.
- Peren, Karl Gunnar Magnus; and Svensson, Stig Ake Gosta, to AB Profila. Automatic apparatuses, robots and the like. 3,971,091, Cl. 15-49.00R.
- Perez, Manuel, to Aerosols Control Corporation. Gas scrubber. 3,971,642, Cl. 55-223.000.
- Perret, Ludwig A., to Bell & Howell Company. Aircraft with television system. 3,972,045, Cl. 343-705.000.
- Personal Products Company: *See—*
  - Chatterjee, Pronoy Kumar, 3,971,379.
- Persson, Bengt Arne, to B A Installationsutveckling AB. Sillcock. 3,971,401, Cl. 137-360.000.
- Peter, Richard: *See—*
  - Angliker, Hans-Joerg; and Peter, Richard, 3,971,771.
- Peters, Beldon A., to Exxon Production Research Company. Three-phase separator. 3,971,719, Cl. 210-104.000.
- Peters, David L., to Singer Company, The. Color video synthesizer with monochrome input. 3,972,067, Cl. 358-81.000.
- Peters, Edwin F.; Spangler, Michael J.; Michaels, Glenn O.; and Jezl, James L., to Standard Oil Company (Indiana). Vapor phase reactor off-gas recycle system for use in the vapor state polymerization of monomers. 3,971,768, Cl. 526-68.000.
- Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, to Peters, Leo. Meat slicing board. 3,971,273, Cl. 83-42.000.
- Peterson, C. Robert. Rollable sheet having target aperture and missile used therewith. 3,971,562, Cl. 273-95.00R.
- Peterson, Warren J., to Joerns Furniture Company. Side guard for beds. 3,971,083, Cl. 5-331.000.
- Peterson, William A., Jr.: *See—*
  - Luchaco, David G.; and Peterson, William A., Jr., 3,971,354.
- Petri, Chris A., to Motorola, Inc. Common mode rejection dynamic filter circuit. 3,972,001, Cl. 330-22.000.
- Petrie, Robert D.; Wensley, Thomas E.; Watkins, Charles; and Gaminde, Juan. Combination book end and dumbell apparatus and method of utilizing same. 3,971,556, Cl. 272-122.000.
- Pfarrwaller, Erwin, to Sulzer Brothers Limited. Apparatus for storage of filamentary material. 3,971,522, Cl. 242-47.010.
- Pfeiler, Manfred; and Linke, Gerhard, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for producing a transverse layer image. 3,971,948, Cl. 250-445.00T.
- Pfizer Inc.: *See—*
  - Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.
  - Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,971,826.
  - Lombardino, Joseph G., 3,971,802.
- Pfleiderer, Wolfgang: *See—*
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- Phelps Time Recording Lock Corporation: *See—*
  - Lavis, Stanley, 3,971,239.
- Phillips Petroleum Company: *See—*
  - Hessert, James E.; and Clampitt, Richard L., 3,971,440.
  - Reusser, Robert E., 3,971,810.
- Piber, Earl T., to Cutler-Hammer, Inc. Snap-in arrangement for mounting devices in a support panel aperture. 3,971,908, Cl. 200-296.000.
- Picciolo, Grace L.; and Chappelle, Emmett W., to United States of America, National Aeronautics and Space Administration. Method of detecting and counting bacteria. 3,971,703, Cl. 195-103.50R.
- Pickard, John; Melling, Richard; and Nobbs, Arthur Joseph, to Triplex Safety Glass Company Limited. Formation of laminated glass articles. 3,971,668, Cl. 156-104.000.
- Picker X-Ray Mfg. Limited: *See—*
  - Bridgeman, Cecil K., 3,971,953.
- Pietruska, Joachim: *See—*
  - Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, 3,971,912.
- Pilkington Brothers Limited: *See—*
  - Rhodes, William Jackson, 3,971,646.
- Pitzele, Barnett S.: *See—*
  - Baran, John S.; and Pitzele, Barnett S., 3,971,827.
- Plessey Handel und Investments AG: *See—*
  - Hollis, John Edward; and Barrett, John Albert, 3,971,895.
- Polak's Frutal Works, Inc.: *See—*
  - Brenner, Joseph; Henderson, Gary H.; and Bergensten, Robert W., 3,971,852.
- Polaroid Corporation: *See—*
  - Johnson, Bruce K.; and Whiteside, George D., 3,972,058.
  - Rubinstein, Leon, 3,971,841.
  - Whiteside, George D., 3,972,057.
  - Wilson, Stewart W., 3,971,141.
- Polymer Processing Research Institute Ltd.: *See—*
  - Yazawa, Masahide, 3,971,838.
- Ponemone, Seymour J.: *See—*
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- Pope, Jack M.; and Fryer, Thomas B., to United States of America, National Aeronautics and Space Administration. Miniature ingestible telemeter devices to measure deep-body temperature. 3,971,362, Cl. 128-2.00P.
- Porelon, Inc.: *See—*
  - Hansen, Frederick C., 3,971,315.
- Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, to Ciba-Geigy Corporation. Glycidyl compounds containing phosphorus. 3,971,813, Cl. 260-309.500.
- Porte, Robert; and Rommens, Michel, to Commissariat a l'Energie Atomique. Method of extraction of nodular sediments or the like from the sea floor and an installation for carrying. 3,971,593, Cl. 299-8.000.
- Pourrias, Bernard M.: *See—*
  - Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.
- Power, John J.: *See—*
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- PPG Industries, Inc.: *See—*
  - Beestrice, William R.; Cherenko, Joseph; and Frey, William I., 3,971,864.
  - Mazzoni, Renato J.; Bowser, George H.; and Lewchuk, Richard R., 3,971,178.
- Prasad, Raj Nandan; and Garmaise, David Lyon, to Abbott Laboratories. 1,N^{6}-etheno-5′-adenosine carboxylates for increasing coronary sinus partial pressure of oxygen. 3,971,849, Cl. 424-180.000.
- Price, Herbert K., to Reynolds Metals Company. Method of producing high brightness corrosion resistant finish on the surface of aluminum and its alloys. 3,971,873, Cl. 428-463.000.
- Prince, Paul O., to United States of America, Army. Holding device for measuring the capacity of small electrical components. 3,971,618, Cl. 339-143.00R.
- Privas, Yves Emile, to Panoduz-Anstalt Co. Apparatus for producing cold principally for the application of cold by contact on the body of living beings. 3,971,229, Cl. 62-3.000.
- Procter & Gamble Company, The: *See—*
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- Proctor, Ellen M.: *See—*
  - Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., 3,971,950.
- Professional Surgical Manufacturing Company: *See—*
  - Gibson, Robert T., 3,971,381.
- Properzi, Giulio. Cooling device for the wheel of a continuous casting machine. 3,971,431, Cl. 164-278.000.
- Pundsack, Arnold L., to Xerox Corporation. Coating device. 3,971,334, Cl. 118-5.000.
- Puritan Equipment, Inc.: *See—*
  - Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, 3,971,368.
- Pusey, Peter Nicholas: *See—*
  - Jakeman, Eric; and Pusey, Peter Nicholas, 3,971,956.
- Pyromet, Inc.: *See—*
  - Miller, Jaydee W., 3,971,712.
- Quaker Oats Company, The: *See—*
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- Quarmby, Robert C.: *See—*
  - Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., 3,971,089.
- Quarve, Vernon Kenneth, to Graco Inc. Hydraulic runaway control valve. 3,971,404, Cl. 137-462.000.
- Querfurth, William M.; Schwartz, Michael A.; and Wiltberger, Jon C., to Burgess Vibrocrafters, Inc. Electric grass sickle-shear. 3,971,130, Cl. 30-220.000.
- Quinby, Thomas C., to United States of America, Energy Research and Development Administration. Neutron dosimetry. 3,971,944, Cl. 250-391.000.
- Radford, Colin-Michael. Filter elements. 3,971,722, Cl. 210-486.000.
- Raffinerie Tirlemontoise: *See—*
  - Blaude, Joseph Emile Albert; and Duchateau, Georges Francois Michel Frederic, 3,971,667.
- Rainer, Georg: *See—*
  - Sommer, Richard; Rainer, Georg; and Wolfrum, Gerhard, 3,971,770.
- Rains, William A.; Fox, Robert D.; and Flynn, James P., to Dow Chemical Company, The. Composite double base propellant with triaminoguanidinium azide. 3,971,681, Cl. 149-19.800.
- Rallapalli, Krishna: *See—*
  - Derickson, Richard B., III; and Rallapalli, Krishna, 3,972,034.
- Ramanathan, Visvanathan: *See—*
  - Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.
- Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
  - Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.
- Randall, Robert L. Decorative acoustical building panel. 3,971,867, Cl. 428-45.000.
- Ranken, William A.; and Kemme, Joseph E., to United States of America, Energy Research and Development Administration. Heat pipe methanator. 3,971,634, Cl. 48-120.000.
- Rannels, Lynn Lee. Stud-truss and method of making same. 3,971,176, Cl. 52-86.000.
- Rasberger, Michael, to Ciba-Geigy Corporation. 3-Alkyl-4-oxo-imidazolidines and their 1-oxyls. 3,971,757, Cl. 260-45.80N.
- Rasmussen, Holgar, to Georgia-Pacific Corporation. Door lock. 3,971,237, Cl. 70-99.000.
- Ratouis, Roger: *See—*
  - Humbert, Daniel; and Ratouis, Roger, 3,971,798.
- Raychem Corporation: *See—*
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- Raymond International Inc.: *See—*
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- Raymond Lee Organization, Inc., The: *See—*
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  - Garza, Jose G., 3,971,109.
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- Raytheon Company: *See—*
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- RCA Corporation: *See—*
  - Keizer, Eugene Orville, 3,972,064.
  - Liu, Shing-gong, 3,972,012.
- Rebosio, Sergio. Method for making insulators and insulators thus obtained. 3,971,128, Cl. 29-631.000.
- Recor, Inc.: *See—*
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- Rediger, John R.: *See—*
  - Bowen, Robert B.; Maier, Roger F.; and Rediger, John R., 3,971,564.
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  - Batzer, Richard R.; and Redmond, John D., 3,971,197.
- Reed Tool Company: *See—*
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- Regalbuto, John A., to General Dynamics Corporation. Apparatus and method for vacuum hot press joining, compacting and treating of materials. 3,971,875, Cl. 13-31.000.
- Regie Nationale des Usines Renault: *See—*
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  - Duchenne, Henri, 3,971,433.
  - Froumajou, Armand, 3,971,349.
- Reid, Charles M, to Elast-O-Cor Products & Engineering Limited. Hydrocyclone separator or classifier. 3,971,718, Cl. 210-84.000.
- Reid, Joyce: *See—*
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- Reigel, James: *See—*
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- Relis, Matthew J.: *See—*
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- Renholt, Arnkjell, to A/S Norclean. Vacuum cleaner, operated by compressed air. 3,971,096, Cl. 15-326.000.
- Repay, Laszlo N.: *See—*
  - Fukayama, Gary P.; and Repay, Laszlo N., 3,972,070.
- Republic Tool & Manufacturing Corporation: *See—*
  - McRoskey, John W.; Swartz, Delbert D.; and LeBrun, Michel A., Jr., 3,971,488.
- Research Company: *See—*
  - Brownlee, Robert R.; Tyers, Frank O.; and Volz, Carl, Sr., 3,971,389.
- Reusser, Robert E., to Phillips Petroleum Company. Solid pesticidal chlorinated phenolic concentrates. 3,971,810, Cl. 424-347.000.
- Reynolds Metals Company: *See—*
  - Price, Herbert K., 3,971,873.
- Rhodes, William Jackson, to Pilkington Brothers Limited. Stirring of molten glass. 3,971,646, Cl. 65-157.000.
- Rhodia, Inc.: *See—*
  - Gradeff, Peter S., 3,971,830.
- Rhone-Poulenc Industries: *See—*
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- Rhone-Poulenc S.A.: *See—*
  - Mourier, Emile, 3,971,831.
- Richards, William; and Grolman, Bernard, to American Optical Corporation. Artificial intraocular lens. 3,971,073, Cl. 3-13.000.
- Richt, Oskar Hubert, to Uher Werke Munchen. Device for introducing and ejecting a magnetic tape cassette for a magnetic tape recorder. 3,972,072, Cl. 360-93.000.
- Richter, Hans Heinrich, to Leesona Corporation. Process and apparatus for continuous heat setting of carpet yarns. 3,971,200, Cl. 57-34.0HS.
- Richter, Robert Julius: *See—*
  - Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, 3,971,368.
- Rickard, Thomas A.: *See—*
  - Wagner, Frederick William, Jr.; and Rickard, Thomas A., 3,971,271.
- Rieder, Rudolf: *See—*
  - Bachmann, Robert; Bearda, Pieter; Stoidl, Walter; Brandli, Gerold; and Rieder, Rudolf, 3,971,968.
- Riemenschneider, Don H.; Townsend, William L.; and Pehoushek, Joseph W., to Zonic Technical Laboratories, Inc. Variable length shift register alternately operable to store and recirculate data and addressing circuit therefor. 3,972,031, Cl. 340-173.00R.
- Rikagaku Kenkyusho: *See—*
  - Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 3,971,651.
- Rikukawa, Katsuji; and Onogi, Kenji, to Nippon Kogaku K.K. Apparatus for measuring two different fluorescences of a sample. 3,971,951, Cl. 250-458.000.
- Ripper, Karl: *See—*
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- Riverside Press, Inc.: *See—*
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- Roanwell Corporation: *See—*
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  - Foley, James P., 3,971,901.
- Robert Bosch G.m.b.H.: *See—*
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- Roberto, Gerard: *See—*
  - Bodocsi, Andrew; Hoge, John H.; Hubbard, John H.; Hubbard, S. Jackson; and Roberto, Gerard, 3,971,179.
- Robinson, Gene C., to Ethyl Corporation. Sequestering agent. 3,971,728, Cl. 252-180.000.
- Robison, Russell O.: *See—*
  - Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., 3,971,132.
- Rochon, Marcel A. Process and apparatus for decreasing moisture content in wood. 3,971,139, Cl. 34-13.800.
- Rockwell International Corporation: *See—*
  - Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., 3,971,132.
  - Smith, Raymond W., Jr., 3,971,544.
- Rodder, Jerome A. Fluid measuring apparatus. 3,971,247, Cl. 73-27.00R.
- Roderer, Herbert: *See—*
  - Hirt, Adam; and Roderer, Herbert, 3,971,977.
- Roe, Richard C., to Sealy, Incorporated. Box spring unit with metal slats. 3,971,081, Cl. 5-246.000.
- Roenna, Robert Fred, to St. Regis Paper Company. Tear open and relockable container. 3,971,506, Cl. 229-51.0TC.
- Rogler, Walter: *See—*
  - Lenz, Arnold; and Rogler, Walter, 3,971,833.
- Rogora, Edoardo; and Giraudi, Walter, to Alfa Romeo S.p.A. Pulse generator for providing information as to the rate of rotation and phasing of an engine to an electronic apparatus intended to govern the fuel feed to an internal combustion engine of the fuel injection type. 3,971,958, Cl. 307-106.000.
- Rohm and Haas Company: *See—*
  - Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 3,971,835.
- Rohr Industries, Inc.: *See—*
  - Molzon, William R., 3,971,455.
  - Tantlinger, Keith W.; and Schubach, Theodor C., 3,971,580.
- Rohrssen, Donald J. Safe electrical connector. 3,971,619, Cl. 339-189.00R.
- Rollins, John H., Jr., to United States of America, Army. Combined helicopter flight controller. 3,971,536, Cl. 244-83.00F.
- Roman, Steven A.: *See—*
  - Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., 3,971,774.
- Romankiw, Lubomyr T., to IBM. Anodized articles and process of preparing same. 3,971,710, Cl. 204-15.000.
- Rommens, Michel: *See—*
  - Porte, Robert; and Rommens, Michel, 3,971,593.
- Rosberg, Bengt A.: *See—*
  - Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, 3,971,192.
- Rose, Manning I. Safety socket for lamps and the like. 3,971,611, Cl. 339-34.000.
- Rose, Willis Earl, to Dresser Industries, Inc. Start-up compressed air system for gas turbine engines. 3,971,210, Cl. 60-39.140.
- Rosen, Sidney. Valve system for filling machines. 3,971,494, Cl. 222-450.000.
- Rosenberg, Lee J.; and Wolf, E. Mark, to Anaconda Company, The. High frequency cable with bridging strip. 3,971,879, Cl. 174-36.000.
- Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. 3-Hydroxybenzyl-oxadiazolone and -thiadiazolone derivatives. 3,971,803, Cl. 260-307.00A.
- Ross, Gerald F., to Sperry Rand Corporation. Base-band pulse object sensor system. 3,971,990, Cl. 325-400.000.
- Rossaert, Edgard Emile Charles, to U.S. Philips Corporation. Device for winding toroidal deflection coils. 3,971,516, Cl. 242-4.00B.
- Rott, Gunther: *See—*
  - Bredow, Walter; Tamaschke, Walter; and Rott, Gunther, 3,971,281.
- Rousseau, Genevieve; and Torelli, Vesperto, to Roussel-UCLAF. Novel steroids and their use. 3,971,777, Cl. 260-239.500.
- Roussel-UCLAF: *See—*
  - Humbert, Daniel; and Ratouis, Roger, 3,971,798.
  - Rousseau, Genevieve; and Torelli, Vesperto, 3,971,777.
- Rowland-Hill, Edward W., to Sperry Rand Corporation. Infeed control for combine elevator. 3,971,195, Cl. 56-14.600.
- Rowland-Hill, Edward W.: *See—*
  - McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.
- RTE Corporation: *See—*
  - Mikulecky, Harvey W., 3,972,015.
- Rubinstein, Leon, to Polaroid Corporation. Molding devices and process for making a molded plastic lens mount. 3,971,841, Cl. 264-275.000.
- Rubio, Manuel Jesus: *See—*
  - Longenecker, John G.; and Rubio, Manuel Jesus, 3,971,481.
- Ruderer, Clifford G., to Ferro Corporation. Direct-on ceramic coating of carbon-rich iron. 3,971,120, Cl. 29-460.000.
- Rudge, Sydney James, to Glacier Metal Company Limited, The. Structural bearings. 3,971,598, Cl. 308-3.00R.
- Rudowicz, Mark J.: *See—*
  - Osterhout, Richard E.; McCray, Walter A.; and Rudowicz, Mark J., 3,971,117.
- Rudy, Erwin. Spinodal carbonitride alloys for tool and wear applications. 3,971,656, Cl. 75-203.000.

Ruegg, Frank A., to Beckman Instruments, Inc. Bandpass filter. 3,972,006, Cl. 330-107.000.

Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Co. Inc. Top lever retaining means for break-open firearms. 3,971,150, Cl. 42-44.000.

Ruhrchemie Aktiengesellschaft: *See—*
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Saab-Scania Aktiebolag: *See—*
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Sagel, John A.; and Weber, Clarence Edward, to Procter & Gamble Company, The. Acid mix process. 3,971,815, Cl. 260-400.000.

Sahrbacker, Edward V., to Lucerne Products, Inc. Trigger-lock control. 3,971,906, Cl. 200-157.000.

Saikaishi, Noboru; Yamada, Tsuneo; Takahashi, Tetsuo; and Numata, Yukio, to Trio Electronics Incorporated. Apparatus for presetting receivers of the synthesizing type. 3,971,992, Cl. 325-464.000.

St. Clair, Theodore A., to Textron, Inc. Gas pressure regulator having low pressure shut-off means. 3,971,410, Cl. 137-613.000.

St. Regis Paper Company: *See—*
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Saipem S.p.A.: *See—*
Silvestri, Antonio; and Brando, Pasquale, 3,971,228.

Saito, Minoru, to Nihon Electronic Industry Co. Ltd. Method and apparatus for measuring the number of stacked corrugated cardboards. 3,971,918, Cl. 235-92.0SB.

Sakai, Kiyoshi; Yusa, Takashi; and Inoue, Kenji, to Sankyo Company Limited. Pharmaceutically useful prostenoic acid derivatives. 3,971,825, Cl. 260-514.00D.

Sakakura, Kazufusa: *See—*
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Sakamoto, Katsuji: *See—*
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Sakashita, Tetsuzi: *See—*
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Sanders Associates, Inc.: *See—*
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Sandrock, Harold E.; Stark, Edward W.; and Gyori, Steven A., to Technicon Instruments Corporation. Apparatus and method for batch-type analysis of liquid samples. 3,971,630, Cl. 23-230.00R.

Sandvik Aktiebolag: *See—*
Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Hagglund, Anders Carl Gustaf, 3,971,447.

Sankyo Company Limited: *See—*
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Santen Pharmaceutical Co. Ltd.: *See—*
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Sasaki, Shigeru; and Nakamura, Kiichi, to Hitachi, Ltd. Method for manufacturing cylindrical armature. 3,971,124, Cl. 29-598.000.

Sasaki, Takashi: *See—*
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Sasnett, Russel M.: *See—*
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Sasnett, Russell M., to Sasnett, Russel M. Modular furnishings. 3,971,605, Cl. 312-198.000.

Sato, Akira: *See—*
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Sato, Masamichi; and Miyazuka, Hajime, to Xerox Corporation. Color electrophotographic process using photoconductive particles in liquid developer. 3,971,659, Cl. 96-1.200.

Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Thiazolidinone acetic acid derivatives. 3,971,794, Cl. 260-293.680.

Satzinger, Gerhard: *See—*
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Saunders, John Christopher: *See—*
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Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,971,789.

Saunders, Walter Selden. Drag reducer for land vehicles. 3,971,586, Cl. 296-1.00S.

Saunier Duval: *See—*
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Sawluk, Wlodzimierz, to Ernst Winter & Sohn. Method of and arrangement for dressing of grinding wheels. 3,971,358, Cl. 125-11.0CD.

Sawyer, Michael J. Plastic barricade panel. 3,971,331, Cl. 116-63.00P.

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Schaaf, Thomas K.: *See—*
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Schade, Jorg: *See—*
Wertelewski, Wilhelm; and Schade, Jorg, 3,971,225.

Schank, Richard L.; and Gunther, Wolfgang H. H., to Xerox Corporation. Process for smoothing waterless lithographic masters. 3,971,316, Cl. 101-465.000.

Schatka, Gunther: *See—*
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Scheffler, Knut: *See—*
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Schellenberg, Heinz, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for cocking a breechblock. 3,971,291, Cl. 89-1.00K.

Schemith, Gerard, to Scovill Manufacturing Company. Union device for flexible tubing. 3,971,577, Cl. 285-238.000.

Schemith, Gerard, to Scovill Manufacturing Company. Union device for flexible tubing. 3,971,578, Cl. 285-260.000.

Schenley Industries, Inc.: *See—*
Whyte, Adrian Alan, 3,971,504.

Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, to SKF Industries, Inc. Seal assembly for pillow block housing. 3,971,565, Cl. 277-59.000.

Schinski, William L., to Chevron Research Company. Herbicidal N^1-methoxycarbonyl-N^1-alkyl-3,5-dinitro-N^4-N^4-dialkylsulfanilamide. 3,971,650, Cl. 71-103.000.

Schlage, Robert E., to ACF Industries, Incorporated. Solenoid-dashpot. 3,971,356, Cl. 123-198.00D.

Schlichte, Max, to Siemens Aktiengesellschaft. Timing apparatus for PCM/TDM switching networks. 3,971,892, Cl. 179-15.0BA.

Schlumberger Technology Corporation: *See—*
Nelligan, William B., 3,971,935.

Schmidt, Paul Herman: *See—*
Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.

Schmit, David E.; and Wedig, Frank L., Jr., to Cincinnati Electronics Corporation. Apparatus for distinguishing time varying analog signals. 3,971,921, Cl. 235-151.350.

Schmitt, Arthur L.: *See—*
United States of America, National Aeronautics and Space Administration; Flippin, Anne; and Schmitt, Arthur L., 3,971,915.

Schmitt, Donald J., to Therm-O-Disc Incorporated. Thermostat. 3,972,016, Cl. 337-354.000.

Schneider, Charles A.; and Cake, William R., to Sherwin-Williams Company, The. Electroconductive paper. 3,971,680, Cl. 428-537.000.

Schneider, Eckart: *See—*
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Schneider, Raymond T., to Davy Powergas Inc. Method for removing sodium sulfate from aqueous solutions. 3,971,844, Cl. 423-182.000.

Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, to AGFA-Gevaert, A.G. Method of making roller. 3,971,115, Cl. 29-148.40D.

Schnyder, Conrad W., to Neuco Apparatebau AG. Fabric hand towel dispenser. 3,971,607, Cl. 312-38.000.

Schottler, Henry. Fluid transducer. 3,971,259, Cl. 74-25.000.

Schreiber, Gunter: *See—*
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Schreier, Wilford R., to Hammond Corporation. Plural mode envelope generator for voltage controlled amplifier. 3,971,284, Cl. 84-1.260.

Schriber, Gene A.: *See—*
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Schroeder, Franklin T.; and McAllister, John P., to Burroughs Corporation. Programmable microprocessor. 3,972,024, Cl. 340-172.500.

Schroeder, Paul Robert, to Bell Telephone Laboratories, Incorporated. High speed current detection amplifier circuit. 3,972,003, Cl. 330-30.00D.

Schubach, Theodor C.: *See—*
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Schukei, Glen Elwin: *See—*
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Schuler, Claus: *See—*
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Schumacher, Percy W., Jr.: *See—*
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Schurmann, Horst; Bung, Josef; and Van Aalten, Hendrikus Alouisius, to Akzona Incorporated. Process for producing a cationic polyurethane. 3,971,764, Cl. 260-77.5AM.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-Methyl-3-phenyl-1,2,3,10b-tetrahydroindeno[1,2,3-ij]-isoquinoline hydrobromide. 3,971,788, Cl. 260-286.00R.

Schwan, Wolfgang: *See—*
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Schwartz, Michael A.: *See—*
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Schwarzler, Peter: *See—*
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Schweiger, Fritz; and Wohler, Jurgen, to Hochtemperatur-Kernkraftwerk Gesellschaft mit beschrankter Haftung (HKG), Gemeinsames Europaisches. Reaction vessels charged with spherical elements. 3,971,444, Cl. 176-32.000.

Schwent, Glennon V., to Garrett Corporation, The. Gas turbine fuel control. 3,971,208, Cl. 60-39.030.

SCM Corporation: *See—*
Davis, Gerald G.; and Keough, Joan M., 3,971,708.

Scofield, Bruce A., to International Harvester Company. Computer means for sequential fuel injection. 3,971,348, Cl. 123-32.0EA.

Scott & Fetzer Company, The: *See—*
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Scott, Thomas W. Method of cleaning tubular members on a rig floor. 3,971,442, Cl. 166-315.000.

Scovill Manufacturing Company: *See—*
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Schemith, Gerard, 3,971,578.

Sea Life Exhibits, Inc.: *See—*
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Sedgwick, Thomas O.: *See—*
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Seibert, Carl F., Jr.: *See—*
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Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, to Ramot University Authority for Applied Research and Industrial Development Ltd. Gamma-ray camera including novel converter matrix useful therein. 3,971,942, Cl. 250-363.00S.

Seismograph Service Corporation: *See—*
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Seki, Ikuo; and Kato, Masahiko, to Toppan Printing Co., Ltd.; and Hitachi Electronics Ltd. Method for image regulation of color monitors in proof-viewing and an apparatus therefor. 3,972,066, Cl. 358-76.000.

Seki, Mitsuaki: *See—*
Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, 3,971,924.

Sekiguchi, Koichi: *See—*
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Sekiguchi, Kouichi, to Iwasaki Tsushinki Kabushiki Kaisha. Two-tone generator using switching transistors in LC resonant circuits controlled by push-button. 3,971,896, Cl. 179-84.0VF.

Semi-Elements, Inc.: *See—*
Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, 3,971,870.

Sergent, Andre. Safety valve. 3,971,403, Cl. 137-459.000.

Servicemaster Industries, Inc.: *See—*
Hufton, Austen B., 3,971,643.

Setterquist, Robert Alton, to Du Pont de Nemours, E. I., and Company. Olefin polymerization catalyst system and process for polymerization of olefins. 3,971,767, Cl. 526-65.000.

Seversen, Gordon F. Control means for a vending machine. 3,971,464, Cl. 194-10.000.

Sewell, Kenneth G.; and Volz, William B., to Varo, Inc. Apparatus for enhancing the long wavelength response of photodetectors. 3,971,932, Cl. 250-213.0VT.

Sewell, Kenneth G.; Herrington, James R.; and Volz, William B., to Varo, Inc. Quantum counter with temporal discrimination. 3,971,941, Cl. 250-330.000.

Shah, Bipin J.: *See—*
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Shamash, Maurice B.: *See—*
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Shanahan, William F. Tool and kit for electrical fishing. 3,971,543, Cl. 254-134.30R.

Shapiro, Sanford S., to Hughes Aircraft Company. Adjustable sliding electrical contact for waveguide post and coaxial line termination. 3,972,013, Cl. 333-97.00R.

Shaw, Richard G.: *See—*
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Sheets, Ronald E.: *See—*
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Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,971,434.
Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., 3,971,774.
Uzelmeier, Christopher W.; and Jones, Paul D., 3,971,834.

Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., to Merck & Co., Inc. S,S'-bis(pyridylmethyl)-carbonodithioates. 3,971,797, Cl. 260-294.80E.

Shen, Tsung-Ying: *See—*
Wagner, Arthur F.; Holly, Frederick W.; Lin, Tsau-Yen; Shen, Tsung-Ying; and Hirschmann, Ralph F., 3,971,736.

Shepherd, Geoffrey, to Ferranti, Limited. Frequency comparison circuit. 3,971,994, Cl. 328-133.000.

Sherman, Micheal I., to Kamyr, Inc. Solids level indicator. 3,971,254, Cl. 73-290.00R.

Sherwin-Williams Company, The: *See—*
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Sherwood Medical Industries Inc.: *See—*
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Shibata, Norio: *See—*
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Shimai, Junichiro, to Murata Kikai Kabushiki Kaisha. Apparatus for doffing and inserting empty cores on an automatic winder. 3,971,520, Cl. 242-35.50A.

Shimoni, Uri: *See—*
Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.

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Shionogi & Co., Ltd.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Shtanko, Jury Pavlovich: *See—*
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United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.

Silvestri, Antonio; and Brando, Pasquale, to Saipem S.p.A. Process and system for lifting submarine pipelines. 3,971,228, Cl. 61-114.000.

Silvey, George E. Method of tree felling. 3,971,422, Cl. 144-34.00B.

Simmons, Frank A., to Burgess Vibrocrafters, Inc. Sprayer nozzle construction. 3,971,408, Cl. 137-604.000.

Singer, Abraham; and Minkowski, Jan M., to United States of America, Army. Method and system for absolute measurement of noise power at all radio frequencies. 3,971,989, Cl. 325-363.000.

Singer Company, The: *See—*
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Sisson, Ronald Loren: *See—*
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Skala, Stephen F. Ink drop printer with transfer members. 3,972,053, Cl. 346-75.000.

Skelcey, James S., to Dow Chemical Company, The. Preparation of beryllium hydride and aluminum hydride. 3,971,846, Cl. 423-645.000.

SKF Industrial Trading and Development Company, B.V.: *See—*
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SKF Industries, Inc.: *See—*
Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, 3,971,565.

Skrmetta, Raphael Q. Shrimp peeler roller system. 3,971,102, Cl. 17-73.000.

Slack, Keith K.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Slater, Saul I. Convertible airship. 3,971,533, Cl. 244-30.000.

Slomski, Waclaw Kazimierz. Device for testing the ability of a person to recognize synchronous speeds. 3,971,143, Cl. 35-22.00R.

- Slosiar, Julius, to BBC Brown Boveri & Company Limited. Cylindric grid electrode structure for electronic tubes comprising carbon filaments coated with pyrolytic graphite. 3,971,964, Cl. 313-355.000.
- Small, Edward A., Jr.: *See—*
  - Gelber, Robert M.; and Small, Edward A., Jr., 3,971,869.
- Smith, Arnold Ray: *See—*
  - Faust, Carl Walter; and Smith, Arnold Ray, 3,971,894.
- Smith, Benjamin James: *See—*
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- Smith, Donald R.: *See—*
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- Smith, Everett C.: *See—*
  - Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, 3,971,870.
- Smith, Frank R.: *See—*
  - Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., 3,971,089.
- Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., to Colgate-Palmolive Company. Process for lowering the bulk density of alkali making built synthetic detergent compositions. 3,971,726, Cl. 252-132.000.
- Smith, James T.: *See—*
  - Aspelin, Gary B.; and Smith, James T., 3,971,369.
- Smith Kline & French Laboratories Limited: *See—*
  - Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.
- Smith, Leland B., to Beckman Instruments, Inc. Bioelectrical impedance measuring system. 3,971,365, Cl. 128-2.10Z.
- Smith, Raymond W., Jr., to Rockwell International Corporation. Apparatus for guiding a rod into a conduit. 3,971,544, Cl. 254-134.3FT.
- Smith, Richard S.: *See—*
  - Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.
- Smith, William D.: *See—*
  - Economy, James; Lin, Ruey Y.; and Smith, William D., 3,971,840.
- Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E.: *See—*
  - Delaage, Jacques, 3,971,905.
- Societe Internationale: *See—*
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- Solf, Johannes; and Feine, Wolfgang. Brush handles. 3,971,094, Cl. 15-143.00R.
- Solitron Devices, Inc.: *See—*
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- Sommer, Richard; Rainer, Georg; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Disulfimide disazo dyestuffs. 3,971,770, Cl. 260-186.000.
- Sony Corporation: *See—*
  - Hideshima, Yasuhiro; and Toyoshima, Masakatsu, 3,971,986.
  - Murakami, Masao; Amaya, Akio; and Kawakita, Masaru, 3,971,865.
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- Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, to Tetra Pak Development. Device for the displacement of filling material and the shaping of a material web in a packing machine. 3,971,192, Cl. 53-184.00R.
- South African Inventions: *See—*
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- Spangler, Michael J.: *See—*
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- Speedrack Inc.: *See—*
  - Konstant, Anthony N., 3,971,476.
- Speiser, Jeffrey M.; and Federhen, Herbert M., to United States of America, Navy. Modular discrete cosine transform system. 3,971,927, Cl. 235-186.000.
- Sperry Rand Corporation: *See—*
  - McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.
  - Ross, Gerald F., 3,971,990.
  - Rowland-Hill, Edward W., 3,971,195.
- Spier, I. Martin. Hull construction and method for forming same. 3,971,084, Cl. 9-6.00P.
- Spoeth, Carl R., Jr., to Dart Industries Inc. Insulated server. 3,971,360, Cl. 126-373.000.
- Sprenkle, George J., to Burroughs Corporation. Dressing finger for automatic wiring machines. 3,971,419, Cl. 140-93.00R.
- Sprung, Hartwig: *See—*
  - Becker, Klaus; and Sprung, Hartwig, 3,971,459.
- Staehle, Henry C., to Eastman Kodak Company. Lithographic printing plate comprising hydrophilic layer of polyvinylacetate crosslinked with tetraethylorthosilicate. 3,971,660, Cl. 96-33.000.
- Stahlwerke Peine-Salzgitter Aktiengesellschaft: *See—*
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- Staisch, Diether, to WABCO Westinghouse GmbH. Pump unloading valve device. 3,971,397, Cl. 137-116.000.
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  - Boesten, Wilhelmus H. J., 3,971,700.
- Stanaitis, Peter P., to Textron, Inc. Method of fabricating a fastener assembly. 3,971,086, Cl. 10-155.00A.
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- Standard Oil Company (Indiana): *See—*
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  - Magee, Thomas J.; and Lehmann, Matt, 3,972,032.
- Stange, Klaus K., to Xerox Corporation. Sheet stacker. 3,971,554, Cl. 271-195.000.
- Stanke, Walter; and Mertens, Gottfried, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Apparatus for cleaning the sealing surfaces of coke oven doors and door jambs. 3,971,092, Cl. 15-93.00A.
- Stanley Works, The: *See—*
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- Stegerwald, Harry R., to Uniroyal Inc. Tennis shoe and sole therefor. 3,971,145, Cl. 36-32.00R.
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- Sterner, Erik; and Nilsson, Elving. Feeding system. 3,971,339, Cl. 119-52.0AF.
- Stevenson, James S. Power mower. 3,971,196, Cl. 56-17.100.
- Stevenson, Mayne B., to Arvey Corporation. Folded money pack envelope. 3,971,507, Cl. 229-72.000.
- Stich, Frederick A., to Allis-Chalmers Corporation. Transistor inverter motor drive having voltage boost at low speeds. 3,971,972, Cl. 318-227.000.
- Stith, Joe D.: *See—*
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  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,971,790.
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- Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, to Warner-Lambert Company. Benzo(b)thiophene derivatives. 3,971,814, Cl. 260-330.500.
- Strow, Lawrence Evans; and Bolth, Franklin Anderson, to Minerec Corporation. Amine-stabilized dialkyl dithiophosphates. 3,971,836, Cl. 260-963.000.
- Stupak, Leonid Mikhailovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.
- Sturm, Ruger & Co. Inc.: *See—*
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  - Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, 3,971,664.
- Sugarman, Edward D., to Wal-Gen Corporation. Mixing and detoxification tank with filtration system. 3,971,644, Cl. 55-387.000.
- Sugimura, Shojiro, to Mitsui Shipbuilding and Engineering Co., Ltd. Shaft sealing apparatus using a fluid sealing system. 3,971,563, Cl. 277-27.000.
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  - Hedgewick, Peter; Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,971,623.
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  - Pfarrwaller, Erwin, 3,971,522.
- Sumikama, Sadao; Tanaka, Nobuyoshi; Arakawa, Yoshiaki; and Akama, Katsushi, to Showa Denko Kabushiki Kaisha. Method and apparatus for measuring the coefficient of thermal conductivity of a sample. 3,971,246, Cl. 73-15.00A.

- Sumitomo Electric Industries, Ltd.: *See—*
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- Sun Oil Company of Pennsylvania: *See—*
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- Sun Shipbuilding and Dry Dock Company: *See—*
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- Suzuki, Keiki; Yoshida, Akitoshi; and Inoue, Shigeki, to Nissan Chemical Industries, Ltd. Refractory compositions. 3,971,665, Cl. 106-58.000.
- Suzuki, Osamu: *See—*
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- Svirklys, Ferdinand M., to Extrados Company Limited. Pallet construction. 3,971,326, Cl. 108-56.100.
- Swanson, Roger; Thompson, Duncan M.; and Shulick, Robert J., to Babson Brothers Company. Method of and apparatus for processing cattle excrement. 3,971,720, Cl. 210-196.000.
- Swartz, Delbert D.: *See—*
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- Tada, Masao, to Mitsui Pharmaceuticals, Incorporated. 5-Fluorouracil derivatives. 3,971,784, Cl. 260-256.50R.
- Taddei, Vincent J., to Burroughs Corporation. Expanded memory paging for a programmable microprocessor. 3,972,025, Cl. 340-172.500.
- Tajima, Hidemi; Asahara, Yoshiyuki; and Izumitani, Tetsuro, to Hoya Glass Works, Ltd. Glass for Faraday rotator element. 3,971,723, Cl. 252-62.510.
- Takahashi, Tetsuo: *See—*
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- Takashima, Kiyoshi; Arima, Keizi; Shozi, Takeshi; and Mori, Hisashi, to Nippon Steel Corporation. Method for treatment of molten steel in a ladle. 3,971,655, Cl. 75-59.000.
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- Tamaschke, Walter: *See—*
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- Tantlinger, Keith W.; and Schubach, Theodor C., to Rohr Industries, Inc. Dual releasable window latch mechanism for transit vehicle. 3,971,580, Cl. 292-201.000.
- Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., to USM Corporation. Machines for sequencing diverse components. 3,971,193, Cl. 53-198.00R.
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- Taylor, Don A. Particle filled self-conformable cushion and method of making same. 3,971,839, Cl. 264-112.000.
- Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C. Apparatus for augmenting venous blood flow. 3,971,398, Cl. 137-119.000.
- Taylor, Franklyn H.; and Finck, Edward J., to General Electric Company. Turbine control system. 3,971,219, Cl. 60-660.000.
- Taylor & Gaskin, Inc.: *See—*
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- Thomas, Robert C., to Dow Chemical Company, The. Nonfuming soldering flux. 3,971,675, Cl. 148-26.000.
- Thomas Walker Limited: *See—*
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- Thompson, David L. Portable vacuum and pressure liquid tank apparatus. 3,971,400, Cl. 137-205.000.
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- Tornblom, Bengt, to Allmanna Svenska Elektriska Aktiebolaget. Plural frequency multi-phase transducer arrangement for detecting the presence and location of faults in a metal body and compensating for body movements. 3,971,982, Cl. 324-37.000.
- Toth, Michael, Jr.; and Jackson, Jean Andre, Jr., to DeLaval Turbine Inc. Means for preventing an engine turbocharger from being damaged by foreign objects. 3,971,218, Cl. 60-597.000.
- Tournier, Christian Yves; and Kerihuel, Jean Bernard, to International Standard Electric Corporation. Control system and process for a space-division switching network. 3,971,893, Cl. 179-18.0GE.
- Towne Robinson Fastener Company: *See—*
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- Townsend, Ray T.; and Beasley, Donald L., to Townsend Engineering Company. Apparatus for encasing a product. 3,971,101, Cl. 17-33.000.
- Townsend, William L.: *See—*
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- Trombley, Wayne E.; and Jacobson, Lawrence R., to Dow Corning Corporation. Abrasive tape apparatus for contouring a flexible lens. 3,971,163, Cl. 51-62.000.
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- Tsuruta, Yasuo. Process and device for automatic regulation of the internal pressure in a pneumatic tire. 3,971,425, Cl. 152-418.000.
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- Tugwell, John, to Kelor Limited. Pneumatic actuators. 3,971,296, Cl. 91-392.000.
- Turpie, Derek W. F.; and Klazar, Jaroslav, to South African Inventions. Textile fiber combing. 3,971,104, Cl. 19-115.00R.
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- Ulrich, Erich; and van Liempt, Adrianus Reinier, to Deutsche Babcock & Wilcox Aktiengesellschaft. Devices for the cleaning of heating surfaces. 3,971,343, Cl. 122-379.000.
- Underwood, Robert H. Textile spool. 3,971,526, Cl. 242-118.600.
- Union Carbide Corporation: *See—*
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  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H. Myocardium wall thickness transducer and measuring method. 3,971,363, Cl. 128-2.00S.
    - Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H. Catheter tip force transducer for cardiovascular research. 3,971,364, Cl. 128-2.00S.
    - Flippin, Anne; and Schmitt, Arthur L. Sun angle calculator. 3,971,915, Cl. 235-61.0NV.
    - Higa, Walter H. Stirling cycle engine and refrigeration systems. 3,971,230, Cl. 62-6.000.
    - Konigsberg, Eph. Accelerometer telemetry system. 3,972,038, Cl. 340-189.00M.
    - Saffren, Melvin M. Method and apparatus for generating coherent radiation in the ultra-violet region and above by use of distributed feedback. 3,972,008, Cl. 331-94.50C.
    - Sheets, Ronald E. Detector absorptivity measuring method and apparatus. 3,971,940, Cl. 250-340.000.
  - National Aeronautics and Space Administration: *See—*
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- Vajtay, Leslie. Environmental package. 3,971,160, Cl. 47-34.110.
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- van der Lely, Cornelis. Haymaking machines. 3,971,203, Cl. 56-370.000.
- van der Lely, Cornelis. Cultivators. 3,971,445, Cl. 172-59.000.
- van Gerven, Johannes T. M., to Erbe Elektromedizin KG. Cryogenic surgical instrument. 3,971,383, Cl. 128-303.100.
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- van Moppes, Michael. Tumbling apparatus. 3,971,167, Cl. 51-164.000.
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- Van Wagoner, John D., to Barlow, Robert M., a part interest. Insulated, water impermeable roofing system. 3,971,184, Cl. 52-613.000.
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- Varian Associates: *See—*
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- Varney, Justin Arnold; and Feeney, Thomas Aquinas. Exercise apparatus. 3,971,255, Cl. 73-379.000.
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  - Sewell, Kenneth G.; Herrington, James R.; and Volz, William B., 3,971,941.
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  - Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,971,791.
- Veenman, Jan Aalbert, to U.S. Philips Corporation. Carton with clamping strip. 3,971,472, Cl. 206-521.000.
- Velazquez, Pedro A. Combination pack frame and bed. 3,971,495, Cl. 224-10.000.
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- Vlad, Constantin, to Stahlwerke Peine-Salzgitter Aktiengesellschaft. Method of making cold-rolled sheet for electrical purposes. 3,971,678, Cl. 148-111.000.
- Voegelin, Heinrich, to Fritz Buser AG Maschinenfabrik. Attaching printing stencils to rotary screen printing presses. 3,971,313, Cl. 101-127.100.
- Vogel, Charles A., to American Videonetics Corporation. Tape guide assembly for rotating head. 3,972,074, Cl. 360-130.000.
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  - Sewell, Kenneth G.; and Volz, William B., 3,971,932.
  - Sewell, Kenneth G.; Herrington, James R.; and Volz, William B., 3,971,941.
- von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, to Mannesmann Aktiengesellschaft. Method and apparatus for pollution free, destructively processing waste. 3,971,704, Cl. 201-2.500.
- von Molnar, Stephan: *See—*
  - Holtzberg, Frederic; Mayadas, Ashok F.; Thompson, William A.; and von Molnar, Stephan, 3,972,035.
- Voyles, Gerald A.; and Moss, Edward M., to P. R. Mallory & Co., Inc. Electrical component with low impedance at high frequency. 3,971,970, Cl. 317-230.000.
- Vulovic, Radoje, to Sun Shipbuilding and Dry Dock Company. Loading ramp securing system. 3,971,090, Cl. 14-71.300.
- W. R. Grace & Co.: *See—*
  - Messina, Thomas A.; and Droney, Patrick J., 3,971,785.
- WABCO Westinghouse GmbH: *See—*
  - Staisch, Diether, 3,971,397.
- Wagner, Arthur F.; Holly, Frederick W.; Lin, Tsau-Yen; Shen, Tsung-Ying; and Hirschmann, Ralph F., to Merck & Co., Inc. Cathepsin in D inhibitors. 3,971,736, Cl. 260-112.50R.
- Wagner Electric Corporation: *See—*
  - Grix, Arthur R., 3,971,596.
- Wagner, Frederick William, Jr.; and Rickard, Thomas A. Wrench for surgical use. 3,971,271, Cl. 81-57.290.
- Wagner, William H. Symmetric padded bandage for injured palm of either hand. 3,971,374, Cl. 128-155.000.
- Waitman, Thomas Frank; and Lyman, Richard Ricker, to Hewlett-Packard Company. Linked list encoding method and control apparatus for refreshing a cathode ray tube display. 3,972,026, Cl. 340-172.500.
- Wal-Gen Corporation: *See—*
  - Sugarman, Edward D., 3,971,644.
- Walker, Brooks. Key actuated auxiliary door holding means. 3,971,238, Cl. 70-135.000.
- Walker, Brooks. Door latch. 3,971,582, Cl. 292-268.000.
- Walker, Francis H.: *See—*
  - Baker, Don R.; and Walker, Francis H., 3,971,850.
- Walker, Gordon Richard, to Filton Limited. Manufacture of rings comprising separable segments. 3,971,119, Cl. 29-416.000.
- Walker, Irene D. Recessed bathtub. 3,971,080, Cl. 4-173.00R.
- Walkner, Christian: *See—*
  - Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,971,537.
- Wallace, David L. Hinge assembly stop attachment. 3,971,099, Cl. 16-50.000.
- Wallace, Joseph T. Tweezers. 3,971,270, Cl. 81-43.000.
- Wallace, William D.: *See—*
  - Kendall, Giles A.; and Wallace, William D., 3,971,551.
- Wallick, William L. Microwave oven antenna. 3,971,909, Cl. 219-10.55F.
- Wang, Chen-Shen; and Blaha, Eli W., to Standard Oil Company. Graphite powder-polyphenylene mixtures and composites. 3,971,748, Cl. 260-37.00R.
- Ward, William Edward, to Illinois Tool Works Inc. Switch assembly for gas tap assembly having cam operated leaf spring contacts and split housing cam detent stop. 3,971,904, Cl. 200-6.0BB.
- Warman, Charles P. Fluid actuated dynamic brake. 3,971,545, Cl. 254-173.00R.
- Warner-Lambert Company: *See—*
  - Brown, Richard E., 3,971,806.
  - Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 3,971,794.
  - Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 3,971,814.
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- Watanabe, Yoshihisa; Takeda, Makoto; and Imanari, Makoto, to Mitsubishi Petrochemical Company Limited. Process for producing ortho-methylphenols. 3,971,832, Cl. 260-621.00R.
- Waterbury, Nelson J. System for generating electrical energy to supply power to propel vehicles. 3,971,454, Cl. 180-65.00R.
- Waters, William M.: *See—*
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- Watkins, Charles: *See—*
  - Petrie, Robert D.; Wensley, Thomas E.; Watkins, Charles; and Gaminde, Juan, 3,971,556.
- Wayne, William C., Jr., to D. H. Baldwin Company. Electronic Zimbelstern. 3,971,283, Cl. 84-1.260.
- Weber, Clarence Edward: *See—*
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- Weber, Gerald; and Sorgenfrei, Jurgen, to Olympia Werke AG. Data processing system including a plurality of memory chips each provided with its own address register. 3,972,028, Cl. 340-172.500.
- Weber, Richard: *See—*
  - Jungfer, Leopold; Kautschitsch, Dieter; and Weber, Richard, 3,971,980.
- Weber, Walter. Motor truck. 3,971,483, Cl. 214-75.00G.
- Wedig, Frank L., Jr.: *See—*
  - Schmit, David E.; and Wedig, Frank L., Jr., 3,971,921.
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- Wehner, Albert. Device for sieving, sorting, filtering and the like. 3,971,715, Cl. 209-310.000.

- Weisenborn, Frank L.: *See—*
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  - Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., 3,971,773.
- Weiss, Wolfgang: *See—*
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- Welch, Bing; and Wheeler, William R., to Aluminum Company of America. Container closure. 3,971,489, Cl. 215-261.000.
- Wende, Charles W. J., to United States of America, Energy Research and Development Administration. Neutronic reactor. 3,971,699, Cl. 176-52.000.
- Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., to Hewlett-Packard Company. Adaptable programmed calculator having provision for plug-in keyboard and memory modules. 3,971,925, Cl. 235-156.000.
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- Wenzel, Le Roy S. Storable multi-use children's exercising assembly. 3,971,561, Cl. 272-56.50R.
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- Wertelewski, Wilhelm; and Schade, Jorg, to Becorit Grubenausbau GmbH. Mine support assemblies. 3,971,225, Cl. 61-45.00D.
- West, Vallie D.; and Kennedy, Jesse. Apparatus for changing giant tires in the field. 3,971,426, Cl. 157-1.280.
- Westinghouse Air Brake Company: *See—*
  - Hyler, John H., 3,971,146.
  - Hyler, John H., 3,971,147.
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- Wheeler, William R.: *See—*
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- Whirlpool Corporation: *See—*
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- White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother. Fluorene derivatives. 3,971,782, Cl. 260-251.00R.
- White, Velton C. X-ray cassette film holder. 3,971,470, Cl. 206-455.000.
- Whiteside, George D., to Polaroid Corporation. Exposure control system with follow focus capability. 3,972,057, Cl. 354-27.000.
- Whiteside, George D.: *See—*
  - Johnson, Bruce K.; and Whiteside, George D., 3,972,058.
- Whitney, Ian: *See—*
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- Whittle, Harry Reed; Lee, Michael John; and Causer, Roy, to United Kingdom Atomic Energy Authority. Manufacture of bags. 3,971,299, Cl. 93-33.00H.
- Whyte, Adrian Alan, to Schenley Industries, Inc. Banded carton and blank assembly. 3,971,504, Cl. 229-38.000.
- Wich, Horst W. Carriage positioning mechanism. 3,971,278, Cl. 83-413.000.
- Wichterle, Otto, to Ceskoslovenska akademie ved. Method and apparatus for introducing fluids into the body. 3,971,376, Cl. 128-260.000.
- Wickline, Glenn D., deceased: *See—*
  - Edling, Porter R.; Yoast, Kenneth L.; and Wickline, Glenn D., deceased, 3,971,328.
- Wickline, Mrs. Glenn D., executrix: *See—*
  - Edling, Porter R.; Yoast, Kenneth L.; and Wickline, Glenn D., deceased, 3,971,328.
- Widdig, Arno; Hammann, Ingeborg; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Bis-trifluoro methyl-imino-imidazolones. 3,971,804, Cl. 260-309.700.
- Wierzbicki, Alexander, to Dewrance & Company, Limited. Quick acting valves. 3,971,412, Cl. 137-625.500.
- Wiese, Frank D.; Link, Donald F.; and Brown, Charles W., to Cord Systems, Inc. System for manufacturing animal feed. 3,971,306, Cl. 99-348.000.
- Wilentchik, Jerzy J. Multi slider switch. 3,971,903, Cl. 200-16.00C.
- Williams, David Michael. Combination transportable container and dispensing receiver. 3,971,493, Cl. 222-185.000.
- Williams, Lloyd E.: *See—*
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- Windley, William Thomas, to Du Pont de Nemours, E. I., and Company. Cobulked continuous filament yarns. 3,971,202, Cl. 57-140.0BY.
- Wines, Harry T.; Power, John J.; and Knauer, Gilbert, to Swingline, Inc. Electrically operated stapling device. 3,971,969, Cl. 317-148.50B.
- Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, to Krauss-Maffei Aktiengesellschaft. Adjustable track mounting device in rail system for magnetic-suspension vehicles. 3,971,537, Cl. 248-23.000.
- Winslow, Arthur, to Mead, Stanley L. Semi-automatic hanking apparatus. 3,971,525, Cl. 242-110.000.
- Winslow, Lester M.: *See—*
  - Nevins, John E., Jr.; and Winslow, Lester M., 3,972,005.
- Wirtgen, Reinhard. Apparatus for milling road surfaces. 3,971,594, Cl. 299-39.000.
- Witkin, Donald E.; and Bowles, Arnold G., to National Forge Company. Temperature control apparatus. 3,971,876, Cl. 13-31.000.
- Wohler, Jurgen: *See—*
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- Wolcott, John R., to Martin Marietta Corporation. Adaptable time division switch. 3,971,891, Cl. 179-15.0AP.
- Wolf, E. Mark: *See—*
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- Wolf, Manfred: *See—*
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- Wolff, Paul Heinz Walter; and Peberdy, John Malcolm, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,971,698, Cl. 176-43.000.
- Wolfla, Thomas A.; and Tucker, Robert C., Jr., to Union Carbide Corporation. Two layer coating system. 3,971,633, Cl. 29-195.000.
- Wolfrum, Gerhard: *See—*
  - Sommer, Richard; Rainer, Georg; and Wolfrum, Gerhard, 3,971,770.
- Wood, Norman J., to Subsea Equipment Associates. Debris cap mechanism for a subsea wellhead. 3,971,171, Cl. 52-19.000.
- Worley, Paul J. Adjustable molding system. 3,971,138, Cl. 33-174.00L.
- Wright, Harold R. All terrain vehicle. 3,971,597, Cl. 305-10.000.
- Wright, Leonard E., to Tradewind Industries, Inc. Self-supporting nesting cart. 3,971,568, Cl. 280-33.99H.
- Wright, Robert: *See—*
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- Wright, William T. Copy trimmer machine. 3,971,279, Cl. 83-425.400.
- Wrzesien, Andrew Peter; Whitney, Ian; and Katona, Joseph, to Hyfil Limited. Carbon fiber composites. 3,971,669, Cl. 156-181.000.
- Wulf, LaVern Dale; and Demler, Henry William, Jr., to AMP Incorporated. Keyboard switch assembly having one piece plural pushbutton actuator and resilient mounting structure for plural cantilever beam contacts. 3,971,902, Cl. 200-5.00A.
- Wunderlich, Klaus: *See—*
  - Hohmann, Walter; Wunderlich, Klaus; and Bien, Hans-Samuel, 3,971,812.
- Wycoff, David C., to Ingersoll-Rand Company. Electric hoist control and braking system. 3,971,971, Cl. 318-203.00A.
- Wyott Corporation: *See—*
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- Yamada, Masayoshi. Thorn tweezers. 3,971,386, Cl. 128-354.000.
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- Yamaguchi, Norihisa: *See—*
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- Yamazoe, Shigeharu: *See—*
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- Yazawa, Masahide, to Polymer Processing Research Institute Ltd. Process for continuously producing shaped articles of polystyrene foam. 3,971,838, Cl. 264-51.000.
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- Yeda Research & Development Co. Ltd.: *See—*
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- Yglesias, James Raymon, to Great Dane Trailers, Inc. Trailer top rail system. 3,971,590, Cl. 296-104.000.
- Yim, George. Device for holding flexible material. 3,971,107, Cl. 24-243.00K.
- Yoast, Kenneth L.: *See—*
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- Yoda, Naoya: *See—*
  - Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,971,752.
- Yonce, Everett R. Handle-rung module. 3,971,456, Cl. 182-90.000.
- Yoshida, Akitoshi: *See—*
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- Yoshida Kogyo Kabushiki Kaisha: *See—*
  - Murai, Ryukichi, 3,971,868.
- Yoshinaga, Makoto, to Olympus Optical Co., Ltd. Microscope assembly having base mount for receiving dimmer circuit components. 3,971,622, Cl. 350-87.000.
- Yoshino, Sadafumi: *See—*
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- Yoshioka, Koji, to Kayabakogyokabushikikaisha; and Yoshioka, Koji. Front wheel suspension unit for motorcycles. 3,971,571, Cl. 280-276.000.
- Yusa, Takashi: *See—*
  - Sakai, Kiyoshi; Yusa, Takashi; and Inoue, Kenji, 3,971,825.
- Yxfeldt, Leif Johan. Shower-bath arrangement. 3,971,074, Cl. 4-145.000.
- Zaffaroni, Alejandro, to Alza Corporation. Intrauterine device having means for changing from uterine-retentive shape to nonuterine-retentive shape. 3,971,367, Cl. 128-130.000.
- Zahnradfabrik Friedrichshafen AG: *See—*
  - Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, 3,971,632.
- Zamora, Mario: *See—*
  - Gau, Gerald S.; and Zamora, Mario, 3,971,926.
- Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, to Eastman Kodak Company. Polymer compositions containing titanium dioxide having improved visible and ultraviolet light stability. 3,971,755, Cl. 260-42.450.
- Zeller, Hans-Rudolf: *See—*
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- Zengerer, Hans. Impact tool. 3,971,244, Cl. 72-395.000.
- Zenith Radio Corporation: *See—*
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  - Tanaka, Akio, 3,971,991.
- Zenker, Karol R., to Factory Mutual Research Corporation. Discharge head having dual function plug retaining member. 3,971,443, Cl. 169-39.000.
- Zetlin, Lev. Beamless floor and roof structure. 3,971,181, Cl. 52-263.000.
- Ziamatic Corporation: *See—*
  - Ziaylek, John, 3,971,591.
- Ziaylek, John, to Ziamatic Corporation. Quic-seat. 3,971,591, Cl. 297-191.000.
- Zimmerman, Hans-Georg: *See—*
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  - Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,727.
- Zindler, Hugh A. Progressively engaged centrifugal clutch. 3,971,463, Cl. 192-105.0BA.
- Zondler, Helmut; and Pfleiderer, Wolfgang, to Ciba-Geigy AG. Process for the manufacture of 4-amino-3-aminomethylpiperidine. 3,971,792, Cl. 260-293.520.
- Zonic Technical Laboratories, Inc.: *See—*
  - Riemenschneider, Don H.; Townsend, William L.; and Pehoushek, Joseph W., 3,972,031.
- Zook, Herbert A.; and High, Richard W., to United States of America, National Aeronautics and Space Administration. Meteoroid capture cell construction. 3,971,256, Cl. 73-425.200.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JULY, 1976

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Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, to Bell Telephone Laboratories, Incorporated. Speech processor using controlled center clipping. Re. 28,919, Cl. 179-170.800.
Electrophysikaische Anstalt Bernard Berghaus: *See*—
 Humbert, Gerhard Philipp, Re. 28,918.
Foust, Michael L.: *See*—
 Rice, Charles A.; and Foust, Michael L., Re. 28,916.
Harris, Marvin E., Jr., to Reynolds Metals Company. Wire unreeling system. Re. 28,917, Cl. 72-183.000.
Humbert, Gerhard Philipp, to Electrophysikaische Anstalt Bernard Berghaus. Components of a rotary piston machine. Re. 28,918, Cl. 418-178.000.
Mitchell, Olga Mary Mracek: *See*—
 Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, Re. 28,919.
Pierce, John Robinson: *See*—
 Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, Re. 28,919.
Reynolds Metals Company: *See*—
 Harris, Marvin E., Jr., Re. 28,917.
Rice, Charles A.; and Foust, Michael L. Inflatable aquatic rescue board and method of rescue. Re. 28,916, Cl. 5-82.00R.

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Aktieselskabet Brodrene Hartmann: *See*—
 Moller, Bent. 240,712.
Amerock Corp.: *See*—
 Palm, James M., Jr. 240,706.
Angleman, John D., and D. Du Cret, to Bristol-Myers Co. Combined bottle and closure. 240,711, 7-27-76, Cl. D9—10.
Anzai, Shiro, and K. Hirose, to Canon K.K. Electronic calculator. 240,735, 7-27-76, Cl. D26—5.
Barnhart, Charles C., and C. W. Cassidy, to Standard Container Co. Food container. 240,713, 7-27-76, Cl. D9—219.
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 Reisdorf, Dennis J. 240,744.
Beld, John W., W. G. Kinninger, R. E. N. Klohr, and P. A. Byrne, to Puritan-Bennett Corp. Comprehensive infant care system. 240,768, 7-27-76, Cl. D83—1.
Benson, Glenn S. Putter head. 240,749, 7-27-76, Cl. D34—5.
Bernard, Charles, to Airborne S.A. Chair. 240,679, 7-27-76, Cl. D6—31.
Blue, Thomas R. Child's flexion wheelchair. 240,722, 7-27-76, Cl. D12—131.
Bock, Robert E., to O. F. Mossberg & Sons, Inc. Golf club head. 240,748, 7-27-76, Cl. D34—5.
Bowman, Arleen. Container for cosmetics. 240,769, 7-27-76, Cl. D86—10.
Breslow, Jeffrey D., and M. J. Ferris, to Marvin Glass & Associates. Target game board. 240,750, 7-27-76, Cl. D34—5.
Bristol-Myers Co.: *See*—
 Angleman, John D., and Du Cret. 240,711.
Bunyard, Kenneth L. Airplane. 240,721, 7-27-76, Cl. D12—78.
Busse, Harold M. Clamp. 240,704, 7-27-76, Cl. D8—72.
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McTear, James R. Baseball glove. 240,673, 7-27-76, Cl. D2—361.
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72	3,971,341
159	3,971,342
CLASS 122	
379	3,971,343
504	3,971,344
510	3,971,345
CLASS 123	
8.41	3,971,346
8.45	3,971,347
32EA	3,971,348
44D	3,971,349
117R	3,971,350
119R	3,971,351
122AC	3,971,352
179K	3,971,353
179L	3,971,354
197A	3,971,355
198D	3,971,356
CLASS 124	
8	3,971,357
CLASS 125	
11CD	3,971,358
CLASS 126	
270	3,971,359
373	3,971,360
390	3,971,361
CLASS 127	
9	3,971,667
CLASS 128	
2P	3,971,362
2S	3,971,363
	3,971,364
2.1Z	3,971,365
	3,971,366
130	3,971,367
136	3,971,370
138A	3,971,371
142R	3,971,368
	3,971,372
146.2	3,971,369
	3,971,373
155	3,971,374
173.1	3,971,375
260	3,971,376
266	3,971,377
285	3,971,378
	3,971,379
287	3,971,380
296	3,971,381
303.1	3,971,382
	3,971,383
335	3,971,384
351	3,971,385
354	3,971,386
410	3,971,387
419PG	3,971,389
419P	3,971,388
CLASS 130	
27JT	3,971,390
CLASS 132	
7	3,971,391
53	3,971,392
CLASS 133	
2	3,971,393
CLASS 134	
104	3,971,394
CLASS 135	
4R	3,971,395
CLASS 136	
86R	3,971,671
89	3,971,672
133	3,971,673
CLASS 137	
82	3,971,396
116	3,971,397
119	3,971,398
	3,971,399
205	3,971,400
360	3,971,401
382	3,971,402
459	3,971,403
462	3,971,404
489	3,971,405
493.4	3,971,406
516.15	3,971,407
604	3,971,408
613	3,971,409
	3,971,410
625.3	3,971,411
625.5	3,971,412
630.14	3,971,413
630.15	3,971,414
630.19	3,971,415
CLASS 138	
33	3,971,416
CLASS 139	
34	3,971,417
116.6	3,971,418
CLASS 140	
93R	3,971,419
CLASS 141	
231	3,971,420
CLASS 144	
32	3,971,421
34B	3,971,422
176	3,971,423
CLASS 148	
6.27	3,971,674
26	3,971,675
31	3,971,677
111	3,971,678
113	3,971,679
121	3,971,676
CLASS 149	
19.8	3,971,681
CLASS 152	
209R	3,971,424

418	3,971,425
CLASS 156	
11	3,971,682
13	3,971,683
	3,971,684
72	3,971,685
104	3,971,668
181	3,971,669
196	3,971,670
212	3,971,686
221	3,971,687
241	3,971,692
273	3,971,693
295	3,971,688
309	3,971,690
415	3,971,694
461	3,971,695
497	3,971,691
CLASS 157	
1.28	3,971,426
CLASS 160	
166R	3,971,427
CLASS 162	
226	3,971,689
271	3,971,696
CLASS 164	
46	3,971,428
82	3,971,429
252	3,971,430
278	3,971,431
318	3,971,432
362	3,971,433
CLASS 165	
12	3,971,434
78	3,971,435
CLASS 166	
70	3,971,436
187	3,971,437
224A	3,971,438
252	3,971,439
270	3,971,440
285	3,971,441
315	3,971,442
CLASS 169	
39	3,971,443
CLASS 172	
59	3,971,445
311	3,971,446
CLASS 173	
128	3,971,447
134	3,971,448
CLASS 174	
16R	3,971,877
30	3,971,878
36	3,971,879
	3,971,880
41	3,971,894
42	3,971,881
110SR	3,971,882
120SR	3,971,883
	3,971,884
CLASS 175	
27	3,971,449
107	3,971,450
CLASS 176	
11	3,971,697
32	3,971,444
43	3,971,698
52	3,971,699
CLASS 177	
1	3,971,451
CLASS 178	
6.8	3,971,885
7.1	3,971,886
7.3D	3,971,887
69.5TV	3,971,888
CLASS 179	
1AT	3,971,889
1GQ	3,971,890
15AP	3,971,891
15BA	3,971,892
18GE	3,971,893
18HB	3,971,895
84VF	3,971,896
	3,971,897
99	3,971,898
	3,971,899
156A	3,971,900
	3,971,901
170.8	Re.28,919
CLASS 180	
1FV	3,971,452
6.48	3,971,453
65R	3,971,454
89R	3,971,455
CLASS 182	
90	3,971,456
CLASS 188	
18A	3,971,457
CLASS 190	
41Z	3,971,458
CLASS 191	
30	3,971,459
45R	3,971,460
CLASS 192	
18A	3,971,461
105BA	3,971,462
	3,971,463
CLASS 194	
10	3,971,464
CLASS 195	
2	3,971,700
47	3,971,701
63	3,971,702
103.5R	3,971,703
CLASS 197	
1R	3,971,465
CLASS 198	
20C	3,971,466
164	3,971,467
CLASS 200	
5A	3,971,902
6BB	3,971,904
16C	3,971,903
77	3,971,905
157	3,971,906
238	3,971,907
296	3,971,908
CLASS 201	
2.5	3,971,704
	3,971,705
CLASS 204	
15	3,971,710
98	3,971,706
149	3,971,707
159.19	3,971,711
181	3,971,708
	3,971,709
CLASS 206	
193	3,971,468
452	3,971,469
455	3,971,470
519	3,971,471
521	3,971,472
CLASS 208	
208R	3,971,712
226	3,971,713
CLASS 209	
73	3,971,473
	3,971,474
257	3,971,714
310	3,971,715
396	3,971,716
CLASS 210	
59	3,971,717
84	3,971,718
104	3,971,719
196	3,971,720
401	3,971,721
486	3,971,722
CLASS 211	
88	3,971,475
134	3,971,476
189	3,971,477
CLASS 212	
11	3,971,478
CLASS 213	
127	3,971,479
CLASS 214	
1BB	3,971,480
6H	3,971,481
27	3,971,482
75G	3,971,483
85.5	3,971,484
313	3,971,485
505	3,971,486
CLASS 215	
216	3,971,487
254	3,971,488
261	3,971,489
CLASS 219	
10.55F	3,971,909
121L	3,971,910
162	3,971,911
216	3,971,912
284	3,971,913
CLASS 220	
2.1A	3,971,490
71	3,971,491
CLASS 222	
146HE	3,971,492
185	3,971,493
450	3,971,494
CLASS 224	
10	3,971,495
CLASS 226	
3	3,971,496
CLASS 227	
67	3,971,497
	3,971,498
CLASS 228	
54	3,971,499
154	3,971,500
248	3,971,501
CLASS 229	
14R	3,971,502
37R	3,971,612
38	3,971,503
	3,971,504
45R	3,971,505
51TC	3,971,506
72	3,971,507
CLASS 233	
4	3,971,508
7	3,971,509
27	3,971,510
CLASS 235	
54R	3,971,914
61NV	3,971,915
61.11E	3,971,917
61.7B	3,971,916
92SB	3,971,918
	3,971,919
92SH	3,971,920
150.53	3,971,923
151.35	3,971,921
152	3,971,922
156	3,971,924
	3,971,925
184	3,971,926
186	3,971,927
CLASS 237	
12.3A	3,971,511
CLASS 239	
1	3,971,512
CLASS 240	
2.1	3,971,928
10.6R	3,971,929
CLASS 241	
46R	3,971,513
82.4	3,971,514
175	3,971,515
CLASS 242	
4B	3,971,516
18PW	3,971,518
18R	3,971,517
25A	3,971,519
35.5A	3,971,520
47	3,971,521
47.01	3,971,522
55.19A	3,971,523
58.4	3,971,524
110	3,971,525
118.6	3,971,526
118.7	3,971,527
191	3,971,528
211	3,971,529
217	3,971,530
CLASS 243	
25	3,971,531
CLASS 244	
1R	3,971,532
30	3,971,533
42CD	3,971,534
46	3,971,535
83F	3,971,536
CLASS 248	
23	3,971,537
278	3,971,538
CLASS 250	
199	3,971,930
213VT	3,971,932
	3,971,933
213R	3,971,931
225	3,971,934
262	3,971,935
311	3,971,936
315A	3,971,937
330	3,971,941
336	3,971,938
339	3,971,939
340	3,971,940
363S	3,971,942
372	3,971,943
391	3,971,944
402	3,971,945
422	3,971,946
437	3,971,947
445T	3,971,948
446	3,971,949
451	3,971,950
458	3,971,951
461B	3,971,952
469	3,971,953
475	3,971,954
507	3,971,955
529	3,971,539
571	3,971,956
CLASS 251	
58	3,971,542
143	3,971,540
347	3,971,541
CLASS 252	
62.51	3,971,723
63.2	3,971,724
106	3,971,725
132	3,971,726
135	3,971,727
180	3,971,728
187R	3,971,729
	3,971,730
301.15	3,971,732
301.32	3,971,731
311	3,971,733
389A	3,971,734
432	3,971,735
CLASS 254	
134.3FT	3,971,544
134.3R	3,971,543
173R	3,971,545
CLASS 256	
14	3,971,546
CLASS 260	
2M	3,971,742
3.3	3,971,743
23EM	3,971,744
29.2TN	3,971,745
29.7D	3,971,746
33.4PQ	3,971,749
37EP	3,971,750
37SB	3,971,747
37R	3,971,748
	3,971,751
40R	3,971,752
42.14	3,971,753
42.15	3,971,754
42.45	3,971,755
45.7R	3,971,756
45.8N	3,971,757
45.9KA	3,971,758
	3,971,759
	3,971,760
	3,971,761
	3,971,762
	3,971,763
77.5AM	3,971,764
78A	3,971,765
112.5LH	3,971,737
112.5R	3,971,736
146R	3,971,738
151	3,971,739
158	3,971,740
173	3,971,741
186	3,971,769
	3,971,770
207	3,971,771
239BC	3,971,774
239.1	3,971,775
	3,971,776
239.5	3,971,777
239.55R	3,971,772
	3,971,773
243C	3,971,778
	3,971,779
	3,971,780
246B	3,971,781
251R	3,971,782
256.4Q	3,971,783
256.5R	3,971,784
286R	3,971,787
	3,971,788
	3,971,789
287K	3,971,790
	3,971,791
293.52	3,971,792
293.58	3,971,793
293.68	3,971,794
293.88	3,971,795
294.8E	3,971,797
294.8F	3,971,796
295CA	3,971,798
295R	3,971,799
295.5B	3,971,800
	3,971,801
306.8R	3,971,802
307A	3,971,803
309.5	3,971,813
309.7	3,971,804
325PH	3,971,805
326.28	3,971,806
326.9	3,971,807
330.5	3,971,814
345.2	3,971,808
345.9	3,971,809
347.8	3,971,811
380	3,971,812
400	3,971,815
410.9R	3,971,816
429.7	3,971,817
448.2E	3,971,818
465D	3,971,819
465E	3,971,821
465.5R	3,971,820
468R	3,971,822
473R	3,971,824
490	3,971,823
514D	3,971,825
520B	3,971,826
526N	3,971,827
534S	3,971,828
570D	3,971,829
601R	3,971,830
	3,971,831
621R	3,971,832
632A	3,971,833
837R	3,971,834
876R	3,971,835
963	3,971,836
CLASS 264	
46.6	3,971,837
51	3,971,838
112	3,971,839
231	3,971,840
268	3,971,785
275	3,971,841
CLASS 266	
215	3,971,549
218	3,971,548
244	3,971,547
CLASS 267	
57.1R	3,971,550
65R	3,971,551
CLASS 269	
228	3,971,552
CLASS 271	
3	3,971,553
195	3,971,554
CLASS 272	
56.5R	3,971,561
118	3,971,555
122	3,971,556
CLASS 273	
1E	3,971,557
25	3,971,558
26R	3,971,559
30	3,971,560
95R	3,971,562
CLASS 277	
27	3,971,563
30	3,971,564
59	3,971,565
206R	3,971,566
CLASS 280	
33.99H	3,971,568
276	3,971,571
618	3,971,567
733	3,971,569
746	3,971,570
CLASS 281	
46	3,971,572
CLASS 285	
5	3,971,573
31	3,971,574
85	3,971,575
87	3,971,576
238	3,971,577
260	3,971,578
353	3,971,579
CLASS 292	
201	3,971,580
251.5	3,971,581
268	3,971,582
CLASS 293	
71P	3,971,583
CLASS 294	
88	3,971,584
	3,971,585
CLASS 296	
1S	3,971,586
28R	3,971,588
76	3,971,589
104	3,971,590
CLASS 297	
191	3,971,591
217	3,971,592
452	3,971,587
CLASS 299	
8	3,971,593
39	3,971,594
CLASS 303	
21F	3,971,595
40	3,971,596
CLASS 305	
10	3,971,597
CLASS 307	
64	3,971,957
106	3,971,958
225R	3,971,959
268	3,971,961
CLASS 308	
3A	3,971,599
3R	3,971,598
8.2	3,971,600
16	3,971,601
160	3,971,602
168	3,971,603
183	3,971,604
238	3,971,606
CLASS 310	
8.1	3,971,962
154	3,971,963
CLASS 312	
38	3,971,607
198	3,971,605
257R	3,971,608
CLASS 313	
355	3,971,964
CLASS 315	
3.5	3,971,965
39.3	3,971,966
97	3,971,967
108	3,971,968
CLASS 317	
148.5B	3,971,969
230	3,971,970
CLASS 318	
203A	3,971,971
227	3,971,972
251	3,971,973
341	3,971,974
CLASS 321	
4	3,971,976
18	3,971,975
CLASS 322	
1	3,971,977
68	3,971,978
CLASS 323	
1	3,971,979
CLASS 324	
29.5	3,971,980
37	3,971,982
41	3,971,983
43R	3,971,981
132	3,971,984
CLASS 325	
21	3,971,985
37	3,971,986
38B	3,971,987
316	3,971,988
363	3,971,989
400	3,971,990
464	3,971,991
	3,971,992
CLASS 328	
127	3,971,993
133	3,971,994
149	3,971,995
155	3,971,996
165	3,971,997
167	3,971,998
206	3,971,960
CLASS 329	
105	3,971,999
	3,972,000
CLASS 330	
22	3,972,001
28	3,972,002
30D	3,972,003
35	3,972,004
43	3,972,005
107	3,972,006
CLASS 331	
94.5PE	3,972,009
94.5C	3,972,008
94.5F	3,972,007
CLASS 333	
14	3,972,010
30R	3,972,011
84M	3,972,012
97R	3,972,013
CLASS 337	
1	3,972,052
202	3,972,015
354	3,972,016
CLASS 338	
165	3,972,017
CLASS 339	
14P	3,971,609
17R	3,971,610
34	3,971,611
59R	3,971,613
89R	3,971,614
98	3,971,615
	3,971,616
113L	3,971,617
143R	3,971,618
189R	3,971,619
CLASS 340	
10	3,972,018
15.5AF	3,972,020
15.5TS	3,972,019
38P	3,972,021

52D	3,972,022
172.5	3,972,023
	3,972,024
	3,972,025
	3,972,026
	3,972,027
	3,972,028
	3,972,029
	3,972,030
173CC	3,972,032
173R	3,972,031
	3,972,033
	3,972,034
174TF	3,972,035
	3,972,036
	3,972,037
189M	3,972,038
280	3,972,039
324M	3,972,040
CLASS 343	
7.7	3,972,041
17.2PC	3,972,042
18B	3,972,043
106D	3,972,044
705	3,972,045
709	3,972,046
	3,972,047
712	3,972,048
829	3,972,049
846	3,972,050
CLASS 346	
1	3,972,051
75	3,972,053
CLASS 350	
26	3,971,620
87	3,971,621
	3,971,622
103	3,971,623
160R	3,971,624
CLASS 354	
15	3,972,054
24	3,972,055
25	3,972,056
27	3,972,057
149	3,972,058
CLASS 357	
6	3,972,059
30	3,972,060
38	3,972,061
39	3,972,014
68	3,972,062
82	3,972,063
CLASS 358	
4	3,972,064
10	3,972,065
76	3,972,066
81	3,972,067
CLASS 360	
4	3,972,068
48	3,972,069
77	3,972,070
86	3,972,071
93	3,972,072
	3,972,073
130	3,972,074
CLASS 418	
178	Re.28,918
CLASS 422	
195	3,971,869
CLASS 423	
7	3,971,842
112	3,971,843
182	3,971,844
483	3,971,845
645	3,971,846
650	3,971,847
CLASS 424	
180	3,971,848
	3,971,849
263	3,971,786
324	3,971,850
347	3,971,810
CLASS 426	
103	3,971,852
249	3,971,853
281	3,971,854
321	3,971,855
417	3,971,856
548	3,971,857
597	3,971,858
618	3,971,859
646	3,971,851
CLASS 427	
43	3,971,860
247	3,971,861
329	3,971,862
CLASS 428	
40	3,971,865
	3,971,866
45	3,971,867
194	3,971,868
336	3,971,870
392	3,971,871
407	3,971,863
412	3,971,872
423	3,971,864
432	3,971,874
463	3,971,873
537	3,971,680
CLASS 526	
65	3,971,767
68	3,971,768
317	3,971,766

CLASSIFICATION OF DESIGNS

D 2—	29	240,670
	361	240,671
		240,672
		240,673
		240,674
		240,675
		240,676
D 4—	25	240,677
	38	240,678
D 6—	31	240,679
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